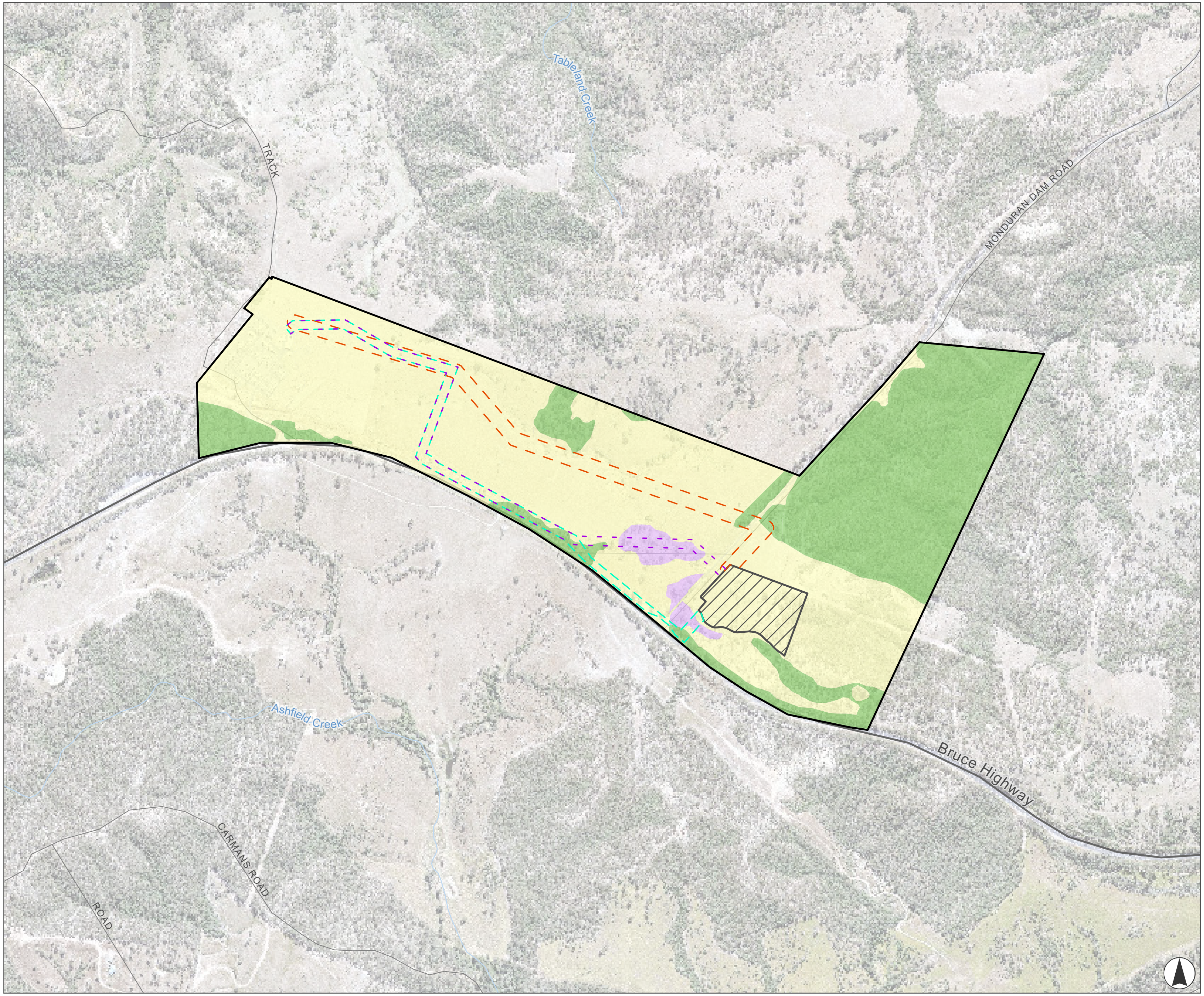
Photo 4.4 Modified Habitat Comprising Farm Dam (left) and Low Order Waterways (right)

FIGURE 4.4

Fauna Habitat Types



D:\UMWELT (AUSTRALIA) PTY. LTD\31628 - 03 S&V\02_Projects\31628_R02_MNES_v7.aprx - 31628_R02_0404_FaunaHabitatTypes_v4

Legend

- Study Area
- State Controlled Road
- Local Road
- Watercourse

Terrestrial Habitat Types

- Eucalypt fringing
- Mixed Eucalypt
- Modified

Proposed Disturbance Footprint

- Proposed BESS Facility

Indicative Transmission Routes

- Route A
- Route B
- Route C

0 0.3 0.6

Kilometres

Scale 1:15,000 at A4

GDA2020 MGA Zone 56

Image Source: ESRI Basemap (2024) | **Data Source:** NSW DFSI (2024)

4.2.6.2 Fauna Diversity

A total of 32 fauna species were identified within the Study Area throughout the field surveys comprising of 24 birds, six mammals and two amphibians. The full list of fauna species recorded within the Study Area is provided in **Appendix C**.

Introduced Fauna Species

One introduced fauna species have been recorded; Cane toad (*Rhinella marina**)

Due to the high degree of existing disturbance within the Study Area, as well easy access to water resources (dams) and food sources, numerous introduced fauna species are likely to occur, including red fox (*Vulpes vulpes**) and feral cat (*Felis catus**).

Threatened Species

A total of 31 threatened fauna species listed under the EPBC Act were identified during the desktop assessment based on a 20 km buffer of the Study Area: this included 15 birds, nine mammals, one fish and six reptiles. Locations of the available desktop records for threatened fauna species previously recorded within the Study Area or 20 km buffer are displayed on **Figure 4.3.**

The likelihood of occurrences assessment determined eight threatened fauna species with the potential to occur within the Study Area based on the habitat encountered during the field surveys: two have a high likelihood of occurring and six have a moderate likelihood of occurring. A summary of these species along with their relevant EPBC Act status are provided in **Table 4.4**. Species habitat mapping was developed for species identified as known, high or moderate and is detailed in **Appendix D**, and includes a discussion of potential habitat for each species.

All remaining threatened species are regarded as having a low likelihood of occurring or are unlikely to occur within the Study Area and therefore is not discussed further. Refer to **Appendix B** for the full likelihood of occurrence assessment.

Table 4.9 Threatened Fauna Likelihood of Occurrence Results

Scientific Name	Common Name	EPBC Act Status
High likelihood of occurrence		
Hirundapus caudacutus	White-throated needletail	Vulnerable, Migratory
Phascolarctos cinereus	Koala	Endangered
Moderate likelihood of occurrence		
Dasyurus hallucatus	Northern Quoll	Endangered
Furina dunmalli	Dunmall's snake	Vulnerable
Gallinago hardwickii	Latham's Snipe	Vulnerable, Migratory
Petaurus australis australis	Yellow-bellied glider (south-eastern)	Vulnerable
Petauroides volans	Greater glider (southern and central)	Endangered
Pteropus poliocephalus	Grey-headed flying-fox	Vulnerable

Migratory Species

A total of 17 migratory species listed under the EPBC Act were identified during the desktop assessment based on a 20 km buffer of the Study Area. Locations of the available desktop records for migratory species previously recorded within the Study Area or 20 km buffer are displayed on **Figure 4.3**.

The likelihood of occurrences assessment determined four migratory species with the potential to occur within the Study Area based on the habitat encountered during the field surveys: three have a high likelihood of occurring and one has a moderate likelihood of occurring. A summary of these species along with their relevant EPBC Act status are provided in **Table 4.11.** Species habitat mapping was developed for species identified as known, high or moderate and is detailed in **Appendix D**, and includes a discussion of potential habitat for each species.

All remaining migratory species are regarded as having a low likelihood of occurring or are unlikely to occur within the Study Area and therefore is not discussed further. Refer to **Appendix B** for the full likelihood of occurrence assessment.

Table 4.10 Migratory Fauna Likelihood of Occurrence Results

Scientific Name	Common Name	EPBC Act Status
High likelihood of occurrence		
Apus pacificus	Fork-tailed swift	Migratory
Cuculus optatus	Oriental cuckoo	Migratory
Hirundapus caudacutus	White-throated needletail	Vulnerable, Migratory
Moderate likelihood of occurrence		
Gallinago hardwickii	Latham's snipe	Vulnerable, Migratory

5.0 Potential Impacts

Potential impacts to MNES may arise throughout all phases of the Project; construction, operation and decommissioning, and may include both direct and indirect impacts.

The Proponent is in the process of refining the design and is investigating three route options for connection between the existing substation and the BESS. A Transmission Line Corridor has been identified, in which the Disturbance Footprint will occur. This includes the maximum disturbance for the Project based on all three route options.

Route A is above ground and traverses the north of the Study Area, whereas Route B and Route C are below ground and will be largely trenched. They traverse the southern boundary within the Study Area. While impacts for all routes have assumed complete loss of all vegetation within the Disturbance Footprint, it is considered likely portions of this vegetation will be retained.

The route options are shown in **Figure 1.2.** The Significant Impact Assessments (**Section 7.0**) considers the worst-case scenario for each route option, which may differ between species. These impacts areas are considered the upper limit and will not be exceeded, no matter the design changes and micro-siting.

5.1 Construction

The greatest risk of potential impact on MNES from the Project will occur during the construction phase. The construction activities will involve vegetation clearing, trenching and/or excavation and ground reinstatement. Direct and indirect impacts associated with construction are discussed in **Section 5.1.1** and **Section 5.1.2.**

5.1.1 Direct Impacts During Construction

5.1.1.1 Vegetation Clearence and Habitat Loss

The most significant direct impacts to MNES generally occur during construction phase activities which require the clearance of vegetation and habitat, and associated land disturbance activities (i.e. levelling of ground). Potential impacts resulting from clearing native vegetation can include:

- Reduced patch size of vegetation communities potentially compromising the viability of the community and associated habitat.
- Loss of habitat causing a reduction of biological diversity or loss of local populations and genotypes.
- Loss of or disturbance to microhabitat features such as tree hollows, leaf litter, ground timber, dense shrubs and hollows.
- Loss of floristic diversity and the food resources this provides such as foliage, flowers, nectar, fruit and seeds.
- Fragmentation of habitats resulting in reduced dispersal opportunities for fauna.
- Destruction of abiotic features necessary to support vegetation communities and habitat types.

The areas proposed to be cleared for the Project are detailed in **Table 5.1**. Conservatively, all areas within each route option have been assumed as complete clearance. However, it is most likely that large portions of Route A will be spanned (overhead transmission), and habitat areas within Route B and Route C will be avoided due to the construction methodology (under boring). The worst-case scenario in regard to impact area is identified in **Table 5.1** based on the impact within each route option**.**

It should be noted that the proposed maximum direct impact on MNES differs depending on the ecological value being assessed and the route option. For example, Route A might be better for one species but represent a maximum direct impact for another. Therefore, a tailored approach which considers the habitat utilisation type, potential maximum impact and the proposed transmission route has been applied when considering the direct impact area within the Disturbance Footprint.

Table 5.1 Vegetation Clearing Required for the Project

Value	Utilisation	Area (ha) present within Study Area	Area (ha) within Disturbance Footprint (Maximum Impact)
Regional Ecosystem			
RE 12.3.3	-	2.7	0.6
RE 12.11.6	-	36.2	0.2
RE 12.11.14	-	4.2	0.6
Threatened Flora Habitat			
Cycas megacarpa	Potential habitat	29.3	-
Samadera bidwillii	Potential habitat	29.3	-
Threatened Fauna Habitat			
White-throated needletail (*Hirundapus caudacutus*)	Foraging and dispersal	114.5	10.9
Latham's snipe (*Gallinago hardwickii*)	Roosting and foraging	5.2	1.1
Greater glider (southern and central) (*Petauroides volans*)	Likely or current denning	29.3	-
	Unoccupied/ disconnected habitat	13.7	1.0
Yellow-bellied glider (south-eastern) (*Petaurus australis australis*)	Denning, foraging and dispersal	29.9	-
Grey-headed flying-fox (*Pteropus poliocephalus*)	Foraging	43.0	1.0
Koala (*Phascolarctos cinereus*)	Climate refugia	2.7	0.6
	Breeding and foraging	40.3	0.8
	Dispersal	71.5	10.6
	Denning and refuge	29.3	-

Value	Utilisation	Area (ha) present within Study Area	Area (ha) within Disturbance Footprint (Maximum Impact)
Northern quoll (*Dasyurus hallucatus*)	Foraging	13.7	1.0
	Dispersal	71.5	10.6
Dunmall's snake (*Furina dunmalli*)	Potential habitat	29.3	-
Migratory Fauna			
Oriental cuckoo (*Cuculus optatus*)	Foraging and dispersal	43.0	1.0
Fork-tailed swift (*Apus pacificus*)	Foraging and dispersal	114.5	10.9

[1]Note white-throated needletail and Latham's snipe have only been detailed once under listed threatened species.

5.1.1.2 Fauna Injury and Mortality

Fauna mortality is a direct impact that may occur to MNES species during the construction phase. Fauna may be injured or killed during construction principally through:

- Strike from moving vehicles/machinery – key issue for ground dwelling species, particularly those with poor mobility.
- Entrapment in habitat during removal – key issue during tree felling for species that use tree hollows or hollow logs for roosting and denning; or for species which utilise subterranean habitat for refuge.
- Entrapment in trenches/holes – key issue for ground dwelling species (reptiles and small mammals), particularly those that are active at night and cannot detect trenches to avoid.

The potential impact of fauna mortality as the result of the Project is likely to be at a very low frequency given the extensive clearing that has been undertaken with the Project Area, the extent and condition of habitat (i.e. cleared pasture and cropping) within areas where vehicles will be regularly traversing and the mitigation measures that will be implemented (spotter-catcher presence during clearing, appropriate speed limits, minimal night works). The impact duration will be limited to the construction period, with the impact magnitude likely to be low (rare occurrence of individuals). However, it is noted that this risk profile does differ between species and broader fauna groups. For example, cryptic species that are more likely to stay still when threatened rather than disperse away from the disturbance will have a higher mortality risk.

5.1.1.3 Loss of Fauna Movement Opportunities

The Disturbance Footprint is compact and largely restricted to non-remnant areas. Patches of remnant vegetation are already fragmented from historical clearing that has been undertaken.

High-security fencing is required to be installed around the BESS. Where possible, this fencing will be made 'fauna-friendly' (e.g. no barbed wire), however, the priority for the fencing is security. The fencing will cause a localised barrier to fauna movement of ground-dwelling mammals, such as koala. Due to the design and small area the where the fence will protect, retention of large vegetation patches and riparian vegetation, along with the abundance of similar movement opportunities, it is considered unlikely that the fencing will provide a significant barrier to fauna movement opportunities.

5.1.2 Indirect Impacts During Construction

Proposed construction activities, including the loss of vegetation and habitat, may result in indirect or secondary impacts to flora, fauna and vegetation.

5.1.2.1 Introduction and/or Exacerbation of Weeds

Construction activities inherently have the potential to introduce and spread weeds and diseases. This can subsequently impact the integrity of remaining vegetation, increase the intensity and/or frequency of fire, as well as threaten the long-term survival of threatened species.

Introduced flora are present throughout the Study Area, including WoNS. The vast majority of introduced flora taxa recorded are common pasture weeds. Given the long disturbance history and current land use practises within the Study Area, construction activities are unlikely to introduce new weed species or exacerbate existing ones.

Nonetheless, best practice construction and operational methods will be implemented, including the development and implementation of a Construction Environmental Management Plan (CEMP), which would include weed management measures.

5.1.2.2 Introduction and/or Exacerbation of Pest Fauna

Pest fauna, such as red fox and feral cat, are likely to be present, whilst cane toads are known throughout the Study Area. These species are known to predate on native fauna. The Project may result in an increase presence of pest fauna as they can often be attracted to construction sites.

5.1.2.3 Noise and Vibration

Construction activities will temporarily result in increased noise and vibration levels in the vicinity of the construction works. These will be intermittent and restricted to when construction works are being undertaken.

The Disturbance Footprint is located primarily on cleared, agricultural land and local fauna will have been subject to intermittent noise and vibration levels associated with this land use in the past. Noise and vibration impacts will be mitigated through development and implementation of a Project CEMP.

5.1.2.4 Edge Effects

Edge effects resulting from removal of vegetation can reduce the condition and quality of remaining vegetation communities and habitat types. Primarily, this would occur where larger tracts of remnant vegetation are disturbed. However, most of the vegetation clearing occurs within smaller, isolated patches of vegetation that exhibited signs of existing edge effects impacts. The Project will be predominately within existing modified vegetation types, with only some limited loss of vegetation proposed.

5.1.2.5 Soil Erosion and Sedimentation

Construction of the Project may result in soil exposure resulting in an increased risk of erosion and sedimentation, which in turn, may result in reduction of water quality and degradation of aquatic habitats. Soil erosion and sedimentation impacts will be mitigated through development and implementation of a Project CEMP.

5.1.2.6 Dust Impacts

Earthworks and clearing of vegetation have the potential to increase dust levels. There is the potential for dust to settle on adjacent vegetation, particularly if excessive levels are sustained over extended periods. The majority of the Disturbance Footprint is cleared agricultural land and is unlikely to be adversely impacted by increased dust levels. Nonetheless, best practice dust suppression will be undertaken during construction, in line with the Project CEMP.

5.2 Operation and Maintenance Phase

During the operation and maintenance phase, the Project will be predominantly monitored and controlled remotely. On-site activities are expected to include scheduled and unscheduled maintenance activities for the battery systems and electrical balance of plant. Major maintenance that might be required would include replacement of equipment (battery modules, inverters, switchgear, transformers, or other infrastructure). This may involve a large number of personnel for limited periods, as required.

The battery system will operate around the clock, typically charging during the day while there is excess renewable energy generation and discharging during peak periods. The Project is expected to operate for a minimum of 25 years, with potential extensions through component replacements and upgrades.

Impacts to flora and fauna during the operation and maintenance phase of the Project are expected to be minimal and relate primarily to the following impacts:

- Noise
- Fire
- Vehicle strikes
- Transmission line strikes (Route A).

5.2.1.1 Noise

During operation, the batteries and associated infrastructure will generate noise. The key source of the noise will be the inverters and cooling fans. Given the cooling fans are dependent on ambient temperatures and the most stringent assigned noise levels is the night period when temperatures are expected to be the coolest, it is unlikely that the inverters fans will be operating at 100% overnight.

The anticipated level of noise is expected to be consistent with the current use of the Study Area, for example from tractors and machinery. Noise from the Project will only be during periods when the project is operating at almost full capacity which is expected to be for short intervals, and noise will be at a consistent low volume rather than explosive noises that would be expected to be more disruptive to native fauna.

5.2.1.2 Fire

The Project has the potential to pose a fire hazard which could result in uncontrolled fires within and surrounding the Study Area, resulting in impacts to flora, fauna and air quality. A Bushfire Management Plan (BMP) has been developed and will detail mitigation measures to protect against bushfire and to manage fire risk from the Project. This will include establishing and maintaining an Asset Protection Zone around proposed infrastructure.

5.2.1.3 Vehicle Strikes

During operations when local staff may be accessing the site, there will be some limited vehicle activity. This is considered a very limited impact, and negligible in comparison to the existing threat levels associated with the adjacent Bruce Highway.

5.2.1.4 Transmission Line Strikes

An overhead transmission line is proposed for Route A and transmission line strikes are a risk. Route B utilises underground transmission lines and therefore, fauna strikes are not a risk.

Existing transmission lines already intersect the Study Area and surrounding areas. There is potential for collisions from birds and bats, but the increased risk level is considered low given the existing infrastructure and absence of heavily treed vegetation surrounding the proposed route.

5.3 Decommissioning and Rehabilitation Phase

Decommissioning of the Project will adopt the best practice approach for the removal of infrastructure. Areas of disturbed land will be revegetated with species that were present prior to construction.

Direct impacts associated with the decommissioning and revegetation phase are expected to be minor. The main potential direct impact is vehicle and equipment strike. Indirect impacts associated with decommissioning and rehabilitation are expected to include; noise and vibration; dust generation as a result of increased vehicle and machinery use.

6.0 Avoidance, Mitigation and Management

The avoidance, mitigation and management measures to be implemented to reduce the impacts of the Project on vegetation, flora and fauna are identified below. Specific mitigation measures for EPBC Act listed flora and fauna species that are considered moderate or have a high potential to occur within the Study Area are discussed in **Section 6.2.3.**

6.1 Avoid and Minimise

6.1.1 Site Selection and Design

Iberdrola undertook an initial site selection process to choose an appropriate location for the Project. Avoiding the clearance of native vegetation was a key criterion that was used when selecting the Study Area over other proposed locations. The Study Area has advantages over other feasible sites in relation to potential impacts to biodiversity as:

- It is in close proximity to strong existing energy infrastructure, including the Powerlink controlled Gin Gin Substation. As such, there is only minimal requirements for additional transmission infrastructure, which can predominately be co-located with existing transmission lines, within modified vegetation types.
- The Study Area is predominantly cleared non-remnant land, and as a result there is reduced impact to native vegetation and biodiversity (relative to other heavily vegetated locations).
- The site is large enough to accommodate a 500 MW battery project, without significant constraints or impacts.
- There is good access to the road network, with no requirement to construct new access roads.

The design of the Project has been optimised so that most of the Disturbance Footprint is located within cleared land. Within the Disturbance Footprint, the infrastructure layout has been optimised through an iterative design process. A key consideration in the design concept was to maximise existing non-remnant areas and avoid the clearance of native vegetation. This was informed by the existing ecological report and other early environmental technical studies. This is demonstrated through setbacks from waterways and drainage features for the BESS.

6.2 Mitigation and Management

Mitigation and management measures proposed to be implemented to reduce impacts from the Project are discussed in **Section 6.2.1.1** to **Section 6.2.3**.

6.2.1.1 Vegetation Clearing

Mitigation and management measures that relate to vegetation clearing include:

- Where vegetation clearing is proposed, boundaries will be clearly demarcated.

- Where trees are to be removed, they will be felled away from areas of retained vegetation, where safe and practicable. Where trees unavoidably fall into retained areas, they will be left in-situ to mimic natural tree fall and provide habitat for ground-dwelling fauna.
- Micro-siting of transmission line infrastructure will maximise the use of existing breaks in vegetation and areas of previously cleared land as far as practical.
- Fauna spotter-catchers will be present during all vegetation clearing activities.
- A CEMP for the Project will be developed and implemented and will include the measures described in this report, as well as:
    - Appropriate measures will be implemented to minimise indirect impacts to native vegetation adjacent to the Project, including control of runoff and erosion.
    - A site induction so that all staff and contractors are aware of site environmental values and controls.
    - Management measures to limit the spread of State Restricted weed, *Lantana camara**.

6.2.1.2 Fauna

Mitigation and management measures relating to fauna include:

- Micro-siting of Project infrastructure will aim to retain habitat trees where possible.
- Where habitat features such as hollow logs cannot be retained in-situ, they will be relocated to adjacent areas of suitable habitat if safe and practical.
- Security fencing will be made as 'fauna-friendly' as possible, while still providing adequate security.
- Construction personnel will be educated (through site inductions and toolbox talks) on the potential presence of fauna, in particularly, EPBC Act-listed fauna.
- Where encountered, personnel shall keep their distance from fauna and not harm or trap them.
- Where injured fauna are encountered, a wildlife carer or vet will be contacted.

6.2.1.3 Weeds and Pests

Mitigation and management measures related to weeds and pests include:

- Weed and hygiene control measures will be in place during construction in accordance with a Project CEMP.
- Prior to entering the Study Area, the origin of construction materials, machinery and equipment will be determined and certified where applicable.
- During construction and operation, waste will be contained within fauna proof bins so as not to attract pest species.

6.2.2 General Mitigation Measures

General mitigation and management measures include:

- Erosion and sediment control devices will be implemented in accordance with IECA Best Practice Erosion and Sediment Control documents during construction, to minimise the risk of potential sedimentation to sensitive receptors including areas of MNES habitat. Relevant measures may be captured in the Project's CEMP, or a dedicated plan.
- To minimise dust impacts, vegetation clearing will not be undertaken in high wind conditions unless dust suppression measures such as water tanks are being used.
- Hot/hazardous works will not to be undertaken during a Total Fire Ban or on a day with a Fire Danger Rating of 'Extreme' or 'Catastrophic'.
- Firefighting water hydrants and a dedicated firefighting water tank will be installed.

6.2.3 MNES-specific Mitigation Measures

Mitigation and management measures specific to the potentially (high and moderate) occurring MNES within the Study Area are detailed in **Table 6.1** below.

Key threatening processes to each MNES are detailed in the made/adopted National Recovery Plans, SPRAT database, Approved Conservation or Conservation Listings. These documents have been reviewed to ensure the mitigation measures are appropriate and relevant.

Table 6.1 MNES-Specific Mitigation Measures

Relevant MNES	Mitigation Measures
All MNES	• In the very unlikely event that threatened flora or fauna individual listed under the EPBC Act is damaged, removed or killed as a result of Project activities, DCCEEW will be notified within a maximum period of 2 business days.
Cycas megacarpa ***Samadera bidwillii***	• Avoid all mapped habitat for *Cycas megacarpa* and *Samadera bidwillii*.
Greater glider (southern and central)	• Where clearing is proposed for areas of greater glider (southern and central) habitat (including unoccupied habitat), pre-clearance surveys must include canopy searches and inspections of suitably sized hollows (>8 cm diameter). Where inspection of hollows cannot be safely undertaken prior to felling, the hollow-bearing tree will be slow felled to minimise the chances of injury or death and will be inspected by a qualified fauna spotter to confirm presence or absence of greater glider. • Every effort will be made to retain suitable hollow bearing trees (those containing hollows >8 cm diameter). The retention of trees >30 cm DBH on patch edges will be prioritised next in areas of unoccupied greater glider (southern and central) habitat. Trees to be retained within the Disturbance Footprint must be clearly demarcated and avoided. If deemed necessary, a Tree Protection Zone (TPZ) may be established.

Relevant MNES	Mitigation Measures
Greater glider (southern and central) **yellow-bellied glider (south-eastern)**	• In the unlikely event that an individual is found to be present, it will be inspected for injury and if healthy, relocated to an adjacent area of mapped breeding and denning habitat after dusk. If the individual is injured, it will be transported to a local wildlife carer and rehabilitated prior to releasing in a suitable area adjacent to the location in which it was found. • No barbed wire fencing will be installed as part of the Project within the Study Area unless strictly necessary (i.e. BESS area).
Grey-headed flying-fox	• In the event that a grey-headed flying-fox congregation is identified within the Disturbance Footprint, an exclusion zone will be established. A suitably qualified person will refer to the *Interim Policy for Determining When a Flying-fox Congregation is Regarding as flying-fox Roost under Section 88C of the Nature Conservation Act 1991* (DES, 2021) to determine if the congregation could be considered a roost. If determined that the congregation constitutes a roost, impacts to the grey-headed flying-fox congregation will be managed in accordance with the *Code of practice – Ecologically Sustainable Management of Flying-fox Roosts* (DES, 2020).

Koala	• Pre-clearance surveys will include canopy searches for koalas. If a koala is located during pre-clearance surveys or during clearing activities:
	  ○ The individual must not be forcibly relocated.
	  ○ Any tree which houses a koala as well as any tree with a crown that overlaps that tree will not be cleared until the koala vacates the tree on its own volition.
	  ○ Allow a clearing buffer surrounding the tree, equal to the height of the tree or deemed suitable by the fauna spotter-catcher.
	  ○ Any injured koala (and fauna in general) should be transported to a vet or recognised wildlife carer.
	• Requirements for koalas subject to handling to be examined and if suspected of Chlamydia infection will be taken to a predesignated veterinarian/wildlife care facility for treatment prior to release.
	• Clearing must be carried out in a way that ensures any koala present has time to move out of the clearing site without human intervention.

Latham's snipe	• Water extraction activities will not be undertaken from areas of potential habitat.
Northern quoll	• Project infrastructure will avoid all mapped denning and refuge habitat. • Where pits, voids or trenches are required, include appropriate cover to prevent extended water retention in these spaces and/or subsequent breeding opportunities for cane toads. • Construction areas that may inadvertently provide potential denning opportunities through stockpiling of materials will have fauna exclusion fencing installed around the perimeter.
Dunmall's snake	• Micro-siting of Project infrastructure will aim to retain terrestrial habitat features including fallen timber (logs), bark and other coarse woody debris. Habitat features that can be avoided will be demarcated. Where they cannot be retained in situ, features will be relocated to adjacent areas of suitable habitat if safe and practical (i.e. the relocation of habitat features must not cause unnecessary disturbance) and at the discretion of the fauna-spotter-catcher. • Any open excavations will be checked regularly. • Clearing extents will be demarcated to avoid unintentional clearing outside of approved disturbance limits.

7.0 Significant Impact Assessments

The potential significance of Project impacts has been assessed for twelve MNES (two flora species, eight fauna species and two migratory species). Assessments in accordance with the *Matters of National Environmental Significance: Significant impact guidelines* (Department of the Environment 2013b) have been undertaken and are documented below..

7.1 Cycas megacarpa

7.1.1 Status under the EPBC Act

Cycas megacarpa is listed as Endangered under the EPBC Act.

7.1.2 Distribution and Habitat Requirements

Cycas megacarpa is endemic to south-east Queensland, found from as far south as Woolooga to Bouldercombe in the north. It is found in woodland, open woodland and open forests dominated by *Eucalyptus crebra, Corymbia citriodora* (lemon-scented gum) as well as *Corymbia erythrophloia* (red bloodwood), *E. melanophloia* (silver-leaved ironbark) and *Lophostemon confertus* (brush box), often in conjunction with a grassy understory. It occurs at altitudes of 40–680 m, typically on undulating, hilly terrain either on gentle to steep slopes or hill crests (Queensland Herbarium 2007a). The soils are generally well drained, shallow, often stony, sandy loam to clay loam in texture and derived from sandstones, fine grained sediments and acid and basic volcanic rocks (Queensland Herbarium 2007a).

This species has been recorded in several REs that are considered suitable habitat for *Cycas megacarpa*. According to the Queensland Herbarium (2007), relevant REs that *Cycas megacarpa* have been recorded in include:

- South East Queensland Bioregion: REs 12.1.3, 12.5.5, 12.11.2, 12.11.6, 12.11.7, 12.12.3, 12.12.4, 12.12.5, 12.12.7, 12.12.9, 12.12.11, 12.12.12, 12.12.16, 12.12.23, 12.12.27.

It is noted that the majority of published information available on *Cycas megacarpa* has come from the National Recovery Plan (Queensland Herbarium, 2007), which is now 15 years old. Since the National Recovery Plan was published, several field surveys have been conducted for proposed developments within Queensland and have recorded the presence of *Cycas megacarpa*.

Based on records held at the Queensland Herbarium, 46 known populations of *Cycas megacarpa* are documented, with an estimated minimum area of occupancy of 2,527 ha and a projected total number of individuals greater than 372,964 across the species range (Queensland Herbarium 2007a).

Of the 46 known populations, 20 populations are known to occur in reserve tenures, consisting of:

- National Parks (4 populations).
- State Forests (12 populations).
- Roadside Reserves (3 populations).
- Forest Reserve (1 population).

The remaining 26 populations occur in freehold, vacant crown land, grazing homestead or unknown tenure types. Population sizes range from <10 – >1,000. As reported by the Queensland Herbarium (2007), seven of these populations are identified as being important populations considered to be viable in the long term (outlined in **Table 7.1**). Based on two surveyed populations of *Cycas megacarpa*, between 3,500 – 4,500 plants are considered to constitute a minimum viable population for the species (Queensland Herbarium, 2007).

Table 7.1 *Cycas megacarpa* Known Important Populations

Population	Tenure Type	Projected Occupancy of Population (ha)	Projected Number of Plants in Population	Approximate Number Plants per ha	Approximate Distance from Study Area Population[1]
Population Eight (Biloela)	State Forest Reserve	800	115,200	144	20 km south-east
Population Nineteen (Kroombit)	State Forest Reserve	c.250	76,750	307	49 km south-east
Population Thirty (Wonbah)	State Forest Reserve	c. 20	Thousands (not defined within the SPRAT profile for the species)	N/A	146 km south-east
Population Two (Bouldercombe)	Not available	c. 100	Thousands (not defined within the SPRAT profile for the species)	N/A	16 km north
Population Three (Mt Morgan)	Freehold Title	>850	159,800	188	19 km north-west
Population Five (Dee Range)	Freehold Title & Road Reserve	c. 100	5,600	56	5 km north
Population Fourteen (Biloela)	Freehold Title & Road Reserve	>200	14,400	72	58 km south

[1] Approximate location obtained from ALA records.

7.1.3 Threats

The National Multi-species Recovery Plan for the cycads, *Cycas megacarpa*, *Cycas ophiolitica* (Marlborough blue), *Macrozamia cranei* (Crane's macrozamia), *Macrozamia lomandroides*, *Macrozamia pauli-guilielmi* and *Macrozamia platyrhachis* (Queensland Herbarium 2007b) lists the following threats as relevant to *Cycas megacarpa*:

- Destruction due to land clearing, including for development for housing, road building, mining and permitted land clearing.
- Legal harvesting and commercial salvage.
- Illegal harvesting, whole plants and seed.
- Loss of genetic variation and insect pollinators, particularly relevant for small populations.

- Land management practices, including:
    - Fire
    - Timber harvesting.

Two additional threats that are not directly included within the 'Threats Section' within The National Multi-species Recovery Plan for the cycads, *Cycas megacarpa*, *Cycas ophiolitica*, *Macrozamia cranei*, *Macrozamia lomandroides*, *Macrozamia pauli-guilielmi* and *Macrozamia platyrhachis* (Queensland Herbarium 2007b) are noted for Cycas megacarpa.

The beetle, *Lilioceris nigripes* and the cycad blue butterfly (*Theclinesthes onycha*) are known to predate on cycads. Little is known about their role, evidence suggests that impacts to new foliage from these species can be devastating. Feral pigs (*Sus scrofa*) can also cause damage to *Cycas megacarpa* individuals and habitat. There is evidence of feral pigs foraging on rhizomes, bulbs and tubers from *Macrozamia spp.* and as such other members of the Cycadaceae family may provide a foraging resource for feral pigs (Choquenot, Mcllr, and Korn 1996).

7.1.4 Occurrence and Potential Habitat

Cycas megacarpa was not recorded within the Study Area, with most areas searched as part of the field survey. Based on the presence of a large patch of suitable habitat in the north-east of the Study Area, the presence of nearby records, the species has been considered to have a moderate likelihood of occurrence. Within the Study Area, potential habitat for the species comprises a single, large patch of RE 12.11.6 which was unable to be comprehensively assessed in the field. Other eucalypt dominated REs within the Study Area have been excluded as potential habitat as they've not been identified by the Queensland Herbarium and/or no *Cycas megacarpa* individuals were recorded within those patches during the site assessment. This is considered appropriate given the small size of extant patches that were searched.

The extent of suitable habitat within the Study Area is detailed in **Table 7.2.** Potential habitat for the species within the Study Area is shown on **Figure 10.1**.

Table 7.2 Potential Habitat within the Study Area: *Cycas megacarpa*

Habitat Criteria	Mapping Justification	Area (ha)	
		Within the Study Area	Impact Area (Worst-case Scenario)
Potential Habitat			
The species is found in woodland, open woodland, and open forests, often in conjunction with a grassy understory. This species is found in habitat dominated by *Eucalyptus crebra* and *Corymbia citriodora* as well as *C. erythrophloia*, *E. melanophloia* and *Lophostemon confertus*. There are also reports that it can be found in or on the edge of rainforest habitat. According to the Queensland Herbarium (2007), the species occurs in the following REs within the South East Queensland bioregion: 12.1.3, 12.5.5, 12.11.2, 12.11.6, 12.11.7, 12.12.3, 12.12.4, 12.12.5, 12.12.7, 12.12.9, 12.12.11, 12.12.12, 12.12.16, 12.12.23, 12.12.27.	Suitable habitat is present within Study Area, specifically RE 12.11.6, which is identified as by the Queensland Herbarium as suitable habitat. Small, isolated patches were excluded as they were searched and the species was not recorded within them.	29.3	-

7.1.5 Habitat Critical to the Survival of the Species

As per the National Multi-species Recovery Plan for the cycads, *Cycas megacarpa, Cycas Macrozamia cranei, Macrozamia lomandroides, Macrozamia pauli-guilielmi and Macrozamia platyrhachis* (Queensland Herbarium 2007b), habitat where remaining viable populations occur is considered to be critical to the survival of *Cycas megacarpa*. Although no individuals are known to occur within the Study Area, a single, large vegetation patch in the northeast corner of the Study Area is conservatively considered habitat critical to the survival of the species.

7.1.6 Potential Project Impacts and Key Mitigation Measures

Potential impacts on this species as a result of the Project include habitat degradation, edge effects, soil erosion, dust generation, introduction and exacerbation of introduced flora species and increased intensity and frequency of fires.

In addition to the general mitigation and management measures outlined in **Section 6.2.2**, the following species-specific mitigation measures will be implemented:

- No direct impacts to any threatened flora individuals listed under the EPBC Act will be permissible at any time throughout the life of the Project.
- Where a plant is identified to potentially be a species' listed under the EPBC Act, but formal identification cannot be made at the time of surveying, the plants will be assumed to be the threatened species and managed accordingly until proper identification occurs.
- In the unlikely event that threatened flora plant listed under the EPBC Act is damaged or removed as a result of Project activities, DCCEEW will be notified within a maximum period of 2 business days.

7.1.7 Significant Impact Assessment

The significant impact assessment for *Cycas megacarpa* is presented in T**able 7.3**. In summary, the assessment found that the Project is **unlikely to result in a significant impact on *Cycas megacarpa.***

Table 7.3 Significant Impact Assessment: *Cycas megacarpa*

Evaluation Criteria	Response
Lead to a long-term decrease in the size of a population	**Unlikely.** There are currently no known populations of the species within the Disturbance Footprint or Study Area. Therefore, no known population will be impacted by the Project. As a population is currently not known to occur within the Disturbance Footprint or Study Area and avoidance and management measures will be implemented if it is recorded, the Project is unlikely to lead to a long-term decrease in the size of a population.

Evaluation Criteria	Response
Reduce the area of occupancy of the species	**Unlikely.** The area of occupancy for *Cycas megacarpa* is 46 km² within an extent of occurrence of 18,726 km² over the species range (Queensland Herbarium 2007b). It is noted that the area of occupancy may be potentially overstated given the low resolution in the mapping methodology used (2 km x 2 km grid). There are currently no known populations within the Disturbance Footprint or Study Area and therefore, a population is unlikely to be impacted by the Project. Based on current field knowledge, the Project will not reduce the area of occupancy of the species. As no individuals are proposed to be removed by the Project, the Project is unlikely to reduce the area of occupancy of the species.
Fragment an existing population into two or more populations	**Unlikely.** As described on the species' SPRAT profile, many populations of *Cycas megacarpa* are very small and greatly fragmented, with only a handful of adult plants (Forster 2007). Cycad species are known to have little genetic flow between fragmented populations and seed dispersal is predominantly gravitational resulting in the occurrence of new plants not far from the parent plant (Queensland Herbarium 2007). There are currently no known population of *Cycas megacarpa* within the Disturbance Footprint or Study Area. The Project is avoiding all mapped potential habitat areas. Therefore, the Project is unlikely to fragment an existing population into two or more populations. The closest Wildlife online or ALA record of this species is 2 km west of the Study Area from 1989, however, has a spatial uncertainty of 2 km. Given the existing high levels of fragmentation and disturbance across the Study Area, and the absence of the species from the Development Footprint, the extent, location and configuration of vegetation clearing is unlikely to reduce the population's ability to continue to exchange genetic material between individuals and reproduce at the regional scale. The Project is therefore unlikely to fragment an existing population into two or more populations.
Adversely affect habitat critical to the survival of a species	**Unlikely.** As per the National Recovery Plan, habitat where remaining viable populations occur is considered to be critical to the survival of *Cycas megacarpa* (Queensland Herbarium 2007a). No *Cycas megacarpa* were recorded within the Development Footprint, however potential habitat is mapped in a single, large vegetation patch in the north-east corner of the Study Area. This area is conservatively considered habitat critical to the survival of the species. The Project is avoiding all mapped potential *Cycas megacarpa* habitat. Indirect impacts on identified habitat will be managed via the implementation of Project management plans. Given the commitment to avoid mapped habitat and the management of indirect impacts, it is considered unlikely that the Project will adversely affect habitat critical to the survival of the species.

Evaluation Criteria	Response
Disrupt the breeding cycle of a population	**Unlikely.** There are currently no known important populations within the Disturbance Footprint or Study Area, although potential habitat is mapped (and avoided). The Project may disrupt the breeding cycle of the species through altered fire regimes, removal of potential habitat and exacerbating weed incursion. These risks will be managed through the implementation of Project management plans and by avoiding direct impacts on mapped habitat areas. Therefore, given a population of the species is not currently known from the Disturbance Footprint, and potential threats from the Project will be managed, it is unlikely that the Project will disrupt the breeding cycle of a population.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	**Unlikely.** All mapped areas of potential habitat will be avoided by the Project. Mapped habitat areas are separated by the development by an existing transmission line, and thus unlikely to be subject to further degradation as altered fire regimes, dust and weed incursion will be actively monitored and managed as required through Project management plans. Based on the reasons above, the Project is not anticipated 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 an endangered species becoming established in the endangered species' habitat	**Unlikely.** Weed incursion is not a recognised risk to *Cycas megacarpa*. Weeds were recorded throughout the Study Area, in varying degrees of severity. Additionally, it should be noted that the beetle, *Lilioceris nigripes* and the lycaenid butterfly, *Theclinesthes onycha*, are known to predate on cycads, and are a potential threat to *Cycas megacarpa*. There is an inherent biosecurity risk with any infrastructure project. Therefore, the Project will follow best practice construction and operational methods, such as the implementation of a weed and pest management measures (as part of the Project CEMP) to prevent the introduction or exacerbation of weeds. As a result, it is unlikely that the Project will result in an invasive species becoming established. In summary, due to the recorded absence of the species, avoidance of mapped habitat and that tailored mitigation measures will be implemented, it is unlikely that the Project will result in an invasive species becoming established.
Introduce disease that may cause the species to decline	**Unlikely.** There are no known diseases affecting the species. The Project will employ best practice biosecurity protocols; therefore, introduction of a disease that may cause the species to decline is unlikely.
Interfere with the recovery of the species	**Unlikely.** No individuals have currently been recorded within the Disturbance Footprint or Study Area and no individuals, or mapped habitat are proposed to be removed. Weed management protocols prescribed within a CEMP would minimise the risk of introducing or causing the proliferation of weed infestations throughout the Disturbance Footprint and adjacent areas. The CEMP will also be managing the risks associated with bushfire. Given the species is not known to occur, mapped habitat is avoided, and indirect impacts will be managed via a CEMP, it is unlikely that the Project would interfere substantially with the recovery of the species.

7.2 Samadera bidwillii

7.2.1 Status under the EPBC Act

Samadera bidwillii is listed Vulnerable under the EPBC Act.

7.2.2 Distribution, Ecology and Habitat Requirements

Samadera bidwillii is endemic to Queensland and is currently known to occur in several localities between Scawfell Island near Mackay and Goomboorian, north of Gympie (Department of the Environment Water Heritage and the Arts 2008c). The nearest historical record for the species is located 45 km southeast of the Project associated with Cordalba State Forest (Atlas of Living Australia 2024).

Samadera bidwillii commonly occurs in lowland rainforest or at rainforest margins, but it can also be found in other forest types, such as open eucalypt forest and woodland. It is commonly found in areas adjacent to both temporary and permanent watercourses in locations up to 510 m altitude (Department of the Environment Water Heritage and the Arts 2008c). The species occurs on lithosols, skeletal soils, loam soils, sands, silts and sands with clay subsoils (Department of the Environment Water Heritage and the Arts 2008c).

Commonly associated tree species for *Samadera bidwillii* include *Corymbia citriodora, Eucalyptus propinqua, E. acmenoides, E. tereticornis, C. intermedia, E. siderophloia, E. moluccana, E. cloeziana* and *E. fibrosa* (Department of the Environment Water Heritage and the Arts 2008).

Genetic studies have found that *Samadera bidwillii* has a low level of genetic diversity on a population level, but high between regions. Three distinct genetic clusters were identified; Callide, Hervey Bay region and Mary River. A strong differentiation between regions indicates that distance between regions is having an adverse effect on gene migration (Naik 2016).

New leaves are produced in summer and dropped throughout the year. Flowering has been recorded from November to March and fruits mature from February to April (Naik 2016).

7.2.3 Threats

As per the Conservation Advice for the species, identified threats include soil erosion and habitat clearing. Potential threats to the species include:

- Inappropriate fire regimes.
- Exotic shrubs and grasses (e.g. *Lantana camara*, Megathyrsus maximus** and *Chloris gayana**).

7.2.4 Occurrence and Potential Habitat

Following the field survey program, no population of *Samadera bidwillii* was recorded. Targeted searches for the species were completed throughout the field assessments. Searches generally comprised opportunistic and random walking meanders in areas of suitable habitat. No records of this species were made and as such, the extent of mapped habitat that was unable to be thoroughly searched remains potential.

Based on the description of potential habitat provided within the Approved Conservation Advice (Department of the Environment Water Heritage and the Arts 2008c) and SPRAT, modelled habitat includes all areas of remnant vegetation below 510 m altitude. All remnant vegetation types within the Study Area have broad alignment to the habitat description for the species, given the presence of dominance of eucalypt species in the canopy. Modified vegetation has been excluded given the extent of disturbance noted, including presence of threats such as clearing, fire and exotic shrubs and grasses.

The extent that habitat is mapped throughout the Study Area and Development Footprint is provided in **Table 7.4**. Desktop records and modelled habitat within the Study Area is shown in **Figure 4.3.**

Table 7.4 Potential Habitat within the Study Area: *Samadera bidwillii*

Habitat Criteria	Mapping Justification	Area (ha)	
		Within the Study Area	Impact Area (Worst-case Scenario)
Potential Habitat			
Lowland rainforest or rainforest margins, and other forest types including open eucalypt forest and woodland up to 510 m altitude.	One patch of RE 12.11.6 in the north-east corner of the Study Area. This patch has good connectivity to surrounding habitat and exhibited less disturbance than smaller patches accessed by cattle. Small, isolated patches were excluded as they were searched and the species was not recorded within them.	29.3	-

7.2.5 Important Populations

No specific definition for an important population exists for this species. Based on the generic definition provided in **Section 3.5**, there is no important populations within the Study Area as *Samadera bidwillii* is not currently known to the Study Area.

7.2.6 Habitat Critical to the Survival of the Species

Habitat critical to the survival of the species is not specifically defined for the species. However, the Significant Impact Guidelines 1.1 – MNES (Department of the Environment 2013a) define habitat critical to the survival of a species or ecological community as areas that are necessary:

- For activities such as foraging, breeding, roosting, or dispersal.
- For the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators).
- To maintain genetic diversity and long-term evolutionary development.
- For the reintroduction of populations or recovery of the species or ecological community.

Based on the above definition, potential habitat within the Study Area is not considered habitat critical to the survival of the species due to:

- The species was not detected during the field survey program.
- The habitat within the Study Area excludes habitat elements such as rainforest or rainforest margins.

7.2.7 Potential Project Impacts and Key Mitigation Measures

Potential impacts on this species as a result of the Project include habitat degradation, edge effects, soil erosion, dust generation, introduction and exacerbation of introduced flora species and increased intensity and frequency of fires.

In addition to the general mitigation and management measures outlined in **Section 6.2.3**, the following species-specific mitigation measures will be implemented:

- No direct impacts to any threatened flora plants listed under the EPBC Act will be permissible at any time throughout the life of the Project.
- Where a plant is identified to potentially be a species' listed under the EPBC Act, but formal identification cannot be made at the time of surveying, the plants will be assumed to be the threatened species and managed accordingly until proper identification occurs.
- In the unlikely event that threatened flora plant listed under the EPBC Act is damaged or removed as a result of Project activities, DCCEEW will be notified within a maximum period of two business days.

7.2.8 Significant Impact Assessment

The significant impact assessment for *Samadera bidwillii* is presented in **Table 7.5**. In summary, the assessment found that the Project is **unlikely to result in a significant impact on *Samadera bidwillii***.

Table 7.5 Significant Impact Assessment: *Samadera bidwillii*

Evaluation Criteria	Response
Lead to a long-term decrease in the size of an important population of a species	**Unlikely**. There are currently no known populations of the species within the Disturbance Footprint or Study Area. Therefore, no known population will be impacted by the Project. As a population is currently not known to occur within the Disturbance Footprint or Study Area and avoidance and management measures will be implemented if it is recorded, the Project is unlikely to lead to a long-term decrease in the size of a population.
Reduce the area of occupancy of an important population	**Unlikely**. There are currently no known populations within the Disturbance Footprint, therefore, an important population is unlikely to be impacted by the Project. Based on current field knowledge, the Project will not reduce the area of occupancy of the species. As no individuals are proposed to be removed by the Project, the Project is unlikely to reduce the area of occupancy of the species

Evaluation Criteria	Response
Fragment an existing important population into two or more populations	**Unlikely.** There are currently no known population of *Samadera bidwillii* within the Disturbance Footprint or Study Area. Therefore, the Project is unlikely to fragment an existing population into two or more populations. The closest Wildlife online or ALA record of this species is 45 km southeast of the Project, associated with Cordalba State Forest. Three records exist, of which two are from 1992 and the other is from 1987. Large portions of the Disturbance Footprint are located in existing cleared areas, therefore reducing the likelihood for further fragmentation. Furthermore, given the existing high levels of fragmentation and disturbance across the Study Area, the extent, location and configuration of vegetation clearing is unlikely to reduce the population's ability to continue to exchange genetic material between individuals and reproduce at the local site scale, if an individual were to be identified. The Project is therefore unlikely to fragment an existing population into two or more populations.
Adversely affect habitat critical to the survival of a species	**Unlikely.** As per the definition from the Significant Impact Guidelines 1.1 – MNES (Department of the Environment 2013b), habitat within the Disturbance Footprint and Study Area is currently not considered habitat critical to the survival of the species as no individuals have been recorded. The Project is avoiding all mapped potential *Samadera bidwillii* habitat. Indirect impacts on identified habitat will be managed via the implementation of Project management plans. Therefore, it is unlikely that Project activities will adversely affect habitat critical to the survival of the species.
Disrupt the breeding cycle of an important population	**Unlikely.** There are currently no known important populations within the Disturbance Footprint or Study Area. Information is limited on the dispersal mechanism of the species, but flower morphology and fleshy fruit suggest adaptations to attract insect and vertebrate pollination and dispersal could occur. As such it is considered unlikely that Project activities will prevent cross pollination and dispersal between patches. The Project may disrupt the breeding cycle of the species through altered fire regimes, removal of potential habitat and exacerbating weed incursion. These risks will be managed through the implementation of Project management plans and by avoiding direct impacts on mapped habitat areas. Therefore, given a population of the species is not currently known from the Disturbance Footprint, and potential threats from the Project will be managed, it is unlikely that the Project will disrupt the breeding cycle of an important population.
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	**Unlikely**. All mapped areas of potential habitat will be avoided. Mapped habitat areas are separated by the development by an existing transmission line, and thus unlikely to be subject to further degradation as altered fire regimes, dust and weed incursion will be actively monitored and managed as required through Project management plans. Based on the reasons above, the Project is not anticipated to modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.

Evaluation Criteria	Response
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	**Unlikely**. Weeds incursion is a threat to *Samadera bidwillii*, as is fire sensitivity. Weeds were recorded throughout the Disturbance Footprint, in varying degrees of severity. *Lantana camara* was the only State Restricted weed and WONS recorded during field surveys. There is an inherent biosecurity risk with any infrastructure project. Therefore, the Project will follow best practice construction and operational methods, such as the implementation of a weed and pest management measures (as part of the Project CEMP) to prevent the introduction or exacerbation of weeds. As a result, it is unlikely that the Project will result in an invasive species becoming established. In summary, due to the recorded absence of the species, avoidance of mapped habitat and that tailored mitigation measures will be implemented, it is unlikely that the Project will result in an invasive species becoming established.
Introduce disease that may cause the species to decline	**Unlikely**. Disease is not an identified threat to *Samadera bidwillii*. The Project will employ best practice biosecurity protocols; therefore, introduction of a disease that may cause the species to decline is unlikely.
Interfere substantially with the recovery of the species	**Unlikely**. No individuals have currently been recorded within the Disturbance Footprint or Study Area and no individuals, or mapped habitat are proposed to be removed. Weed management protocols prescribed within a CEMP would minimise the risk of introducing or causing the proliferation of weed infestations throughout the Disturbance Footprint and adjacent areas. The CEMP will also be managing the risks associated with bushfire. Given the species is not known to occur, mapped habitat is avoided, and indirect impacts will be managed via a CEMP, it is unlikely that the Project would interfere substantially with the recovery of the species.

7.3 Greater glider (southern and central) (*Petauroides volans*)

7.3.1 Status under the EPBC Act

The greater glider (southern subspecies) is listed as Endangered under the EPBC Act.

7.3.2 Distribution and Habitat Requirements

Greater glider (southern subspecies) has a broad and mostly continuous distribution from Proserpine in Queensland, south through NSW and the ACT, to Wombat State Forest in central Victoria (Department of Climate Change Energy the Environment and Water 2022).

Greater gliders are typically found in highest abundance in taller, montane, moist eucalypt forests with relatively old trees and abundant hollows. During the day, this species spends most of its time denning in hollowed trees, with each animal inhabiting up to twenty different dens within its home range. Hollows are therefore an important and limiting habitat resource. As described in the species' Conservation Advice (Department of Climate Change Energy the Environment and Water 2022), the species' probability of occurrence is positively correlated with the availability of tree hollows.

Greater gliders are primarily folivorous, with a diet mostly comprising the leaves and flowers of Myrtaceae (e.g. eucalypt) trees. The species favours forests with a diversity of eucalypt species due to seasonal variation in its preferred foraging tree species. Within the South East Queensland Bioregion, a number of tree species have been identified as dominant, co-dominant, sub-dominant or associated species in greater glider (southern and central) associated REs, including species recorded within the Study Area: *Lophostemon suaveolens* (swamp box), *Angophora leiocarpa* (rusty gum), *Eucalyptus crebra*, *Eucalyptus exserta* (Queensland peppermint), *Eucalyptus tereticornis, Corymbia tessellaris* (Moreton Bay ash) and *Corymbia citriodora* (Department of the Environment and Science 2022).

The *Guide to greater glider habitat in Queensland* (Department of the Environment and Science 2022) defines habitat for the species as:

- **Habitat** which includes:
    - Regional ecosystems with confirmed greater glider records.
    - Habitat attributes (but not necessarily all attributes), such as live and dead hollow-bearing trees for denning, feed trees, large trees, habitat connectivity across the landscape.
- Potential habitat which includes:
    - Regional ecosystems that do not have confirmed greater glider records but are identified by experts as potential greater glider habitat.
    - Contains habitat attributes (but not necessarily all attributes), such as live and dead hollow-bearing trees for denning, feed trees, large trees, habitat connectivity across the landscape.
- **Not habitat** which includes:
    - Regional ecosystems with no confirmed records of greater gliders and identified by experts as non-habitat.
    - Does not contain habitat attributes such as live and dead hollow-bearing trees for denning, feed trees, large trees, habitat connectivity across the landscape.

This document also defines the importance of the size of trees for greater gliders, 'with trees >30 cm DBH preferentially selected for foraging and >50 cm DBH for denning. Certain tree species are favoured by greater gliders for foraging and contribute the bulk of the diet in any one area. Young foliage is selected if available and this can alter the pattern of forage tree selection at different times of the year (Department of the Environment and Science 2022). For example, Comport (1996) found that foraging on *Eucalyptus tereticornis* and *E. crebra* was variable, with gliders favouring the species in some months and avoiding them in others. Studies in the South East Queensland Bioregion found that favoured feed tree species included *Eucalyptus latisinensis, Corymbia intermedia, E. crebra, C. citriodora* and *Melaleuca quinquinervia*. However, this list may reflect bias in survey, localised effort and species availability and is not considered a complete list.

Hollow-bearing trees are an essential structural element, that provide foraging and sheltering resources for greater gliders, and their presence or absence may be used to indicate habitat suitability for greater gliders. Selection of some tree species over others for denning by greater gliders will depend on the age and senescence stage of the tree and the species inherent propensity to form hollows. For example, species such as *Eucalyptus latisinensis* as well as the bloodwoods such as *Corymbia intermedia* tend to develop hollows at a younger age/smaller DBH than does *C. citriodora* and ironbark species.

A brief review of studies on ground-based estimates of hollows in trees concludes that there is high variability and low reliability among observers. This can lead to inconsistent reporting of greater glider habitat or potential habitat if used as a habitat-defining indicator. The demonstrated correlation between tree DBH (i.e. to determine 'large trees' which may be selected for sheltering) and presence of hollows is well established and is increasingly used across Australia as a surrogate of tree habitat value. The advantage of using DBH thresholds (i.e. for large trees) as an indicator is that it can be directly and precisely measured. Therefore, it has been recommended that assessors use tree size rather than presence or absence of hollow-bearing tree s to determine greater glider habitat ((Department of the Environment and Science 2022).

In Queensland, the assessment of RE tree diameter thresholds to determine when a tree is 'large' is an ongoing, state-wide program undertaken by the Queensland Herbarium The *Guide to greater glider habitat in Queensland* (Department of the Environment and Science 2022). To determine what constitutes a 'large tree' in Queensland, and hence suitability for greater glider shelter habitat, the *Guide to greater glider habitat in Queensland* ((Department of the Environment and Science 2022) suggests using the benchmark 'large tree' DBH threshold from the BioCondition framework for the relevant REs which are considered habitat for greater gliders. This estimate concords well with observed average den tree sizes from specific studies of greater glider.

7.3.3 Threats

As outlined in the species' Conservation Advice (Department of Climate Change Energy the Environment and Water 2022), key threats to the greater glider (southern and central) are habitat loss, fragmentation and modification (via inappropriate fire regimes, land clearing and timber harvesting), barbed wire fencing, climate change, hyper-predation by owls and predation by introduced species including feral cat and red fox.

The species is considered particularly sensitive to habitat fragmentation as a result of their low dispersal ability, relatively small home ranges and reliance on large hollow-bearing trees. The greater glider (southern and central) is absent from cleared areas and has little dispersal ability to move through cleared areas between fragments (Department of Climate Change Energy the Environment and Water 2022).

Hollows develop extraordinarily slowly in Australian eucalypts, with figures most often quoted as minimum lag times of 150–360 years from germination to the beginning of hollow development (Gibbons and Lindenmayer 2002). A fall in the number of hollows below a minimum critical threshold for greater gliders could cause a decline in any local population and compromise population viability in the longer term if there is not a new cohort of hollow trees available to replace trees lost (Lindenmayer, Cunningham, and Donnelly 1997).

It was identified in 2016 that the species requires a Recovery Plan, however one has not yet been developed. Although taxonomically different, the related mahogany glider (*Petaurus gracilis*) has very similar key threats and a developed Draft Recovery Plan (Jackson and Diggins 2020). The draft Recovery Plan states that "direct observations of Mahogany Gliders have found them able to glide over gaps in their habitat including tracks, roads and powerline corridors, as long as the trees on each side of the gap are tall enough to allow a complete glide and landing". Based on this, a widening of existing gaps between habitat areas may not significantly impede the species mobility should tall trees remain on either side that facilitate movement and clearing widths do not exceed volplane distances.

7.3.4 Occurrence and Potential Habitat

This species was not recorded during the field surveys. The nearest record, from 2016, is approximately 15 km to the north-east of the Study Area, in connective vegetation within the Littabella South Forest Reserve.

In consideration of the habitat definitions provided in the *Guide to greater glider habitat in Queensland* (Department of Environment and Science, 2022) potential habitat within the Study Area has been categorised as follows:

- **Likely or Current Denning Habitat,** which includes all areas associated with a single large patch of 12.11.16 in the northeast of the Study Area. This patch has good connectivity to surrounding habitat beyond the Study Area. During the field survey, hollows of all sizes were recorded. Although not explicitly counted or measured, field survey findings confirmed large mature trees >30 cm DBH in varying abundance. Connectivity from this patch into the Study Area is prevented by an existing transmission line and the Lake Monduran Access Road.
- **Unoccupied/disconnected habitat**, which includes mapped areas of 12.3.3, 12.11.6 and 12.11.14 including varying abundances of tree hollows and mature trees >30 cm DBH. These areas were spotlighted on two consecutive nights, and based on the presence of existing road network, transmission lines, small patch size and distance between patches were deemed functionally disconnected from habitat, and thus unoccupied.

The extent of greater glider habitat within the Study Area is provided in **Table 7.6.** Potential habitat of the species is shown in **Figure 10.4.**

Table 7.6 Habitat Extent and Justification for Greater Glider (Southern and Central)

Habitat Criteria	Mapping Justification	Area (ha)	
		Within the Study Area	Impact Area (Worst-case Scenario)
Likely or Current Denning Habitat			
Eucalypt forests and woodlands in Queensland REs considered habitat or potential habitat as per the Species Guidance – Greater Glider habitats in Queensland (DES, 2022) containing appropriate tree species with a diameter at breast height greater than the RE threshold for large trees.	One patch of RE 12.11.6 in the north-east of the Study Area. This patch has good connectivity to surrounding habitat. Other patches were excluded as they are considered disconnected from habitat such that the species presence is not expected.	29.3	-

Habitat Criteria	Mapping Justification	Area (ha)	
		Within the Study Area	Impact Area (Worst-case Scenario)
Likely or Current Denning Habitat Impact		**29.3**	**-**
Unoccupied/disconnected habitat			
Habitat that may be regarded as likely or current denning or represent potential foraging and dispersal habitat should habitat connectivity be plausible.	RE 12.3.3, 12.11.6 and 12.11.14, excluding likely of current denning habitat. Areas that may be recognised as 'likely or current denning' or 'foraging and dispersal habitat' but are otherwise disconnected such that they are considered unoccupied by the species.	13.7	1.0
Unoccupied/disconnected Habitat Impact		**13.7**	**1.0**
Total Impact Area		**43.0**	**1.0**

7.3.5 Habitat Critical to the Survival of the Species

Habitat critical to the survival of the greater glider (southern and central) is defined in the species' Conservation Advice (Department of Climate Change Energy the Environment and Water 2022) as:

- Large contiguous areas of eucalypt forest, which contain mature hollow-bearing trees and a diverse range of the species' preferred food species in a particular region.
- Smaller or fragmented habitat patches connected to larger patches of habitat, that can facilitate dispersal of the species and/or that enable recolonisation.
- Cool microclimate forest/woodland areas (e.g. protected gullies, sheltered high elevation areas, coastal lowland areas, southern slopes).
- Areas identified as refuges under future climate changes scenarios.
- Short-term or long-term post-fire refuges (i.e. unburnt habitat within or adjacent to recently burnt landscapes) that allow the species to persist, recover and recolonise burnt areas.

Likely or current denning habitat for greater glider (southern and central) occurs within the north-east of the Study Area. This habitat forms a part of larger, contiguous patches to the north and east. This patch also contains preferred food trees for the species. Therefore, likely or current denning habitat within the Study Area is considered critical to the survival of the species.

Other treed habitat is deemed unsuitable due to its isolation and fragmentation and is considered unlikely to be occupied by the species. This habitat is not considered critical to the survival of the species.

7.3.6 Potential Project Impacts and Key Mitigation Measures

Potential impacts on this species because of the Project include indirect impacts such as habitat degradation, and exacerbation of pest populations. The Project has been designed and sited within the Study Area to maximise the use of existing cleared areas and minimise overall habitat fragmentation of mapped habitat areas, via avoidance.

In addition to the general mitigation and management measures outlined in **Section 6.2.2** which include pest monitoring, the following species-specific mitigation measures will be implemented:

- Where clearing is proposed for areas of greater glider (southern and central) habitat (including unoccupied habitat), pre-clearance surveys must include canopy searches and inspections of suitably sized hollows (>8 cm diameter). Where inspection of hollows cannot be safely undertaken prior to felling, the hollow-bearing tree will be slow felled to minimise the chances of injury or death and will be inspected by a qualified fauna spotter to confirm presence or absence of greater glider.
- Every effort will be made to retain suitable hollow bearing trees (those containing hollows >8 cm diameter). The retention of trees >30 cm DBH on patch edges will be prioritised next in areas of potential greater glider (southern and central) habitat. Trees to be retained within the Disturbance Footprint must be clearly demarcated and avoided. If deemed necessary, a Tree Protection Zone (TPZ) may be established.
- In the unlikely event that an individual is found to be present, it will be inspected for injury and if healthy, relocated to an adjacent area of mapped breeding and denning habitat after dusk. If the individual is injured, it will be transported to a local wildlife carer and rehabilitated prior to releasing in a suitable area adjacent to the location in which it was found.
- No barbed wire fencing will be installed as part of the Project within the Study Area unless strictly necessary (i.e. BESS area).
- In the very unlikely event that threatened flora or fauna individual listed under the EPBC Act is damaged, removed or killed as a result of Project activities, DCCEEW will be notified within a maximum period of 2 business days.

7.3.7 Significant Impact Assessment

The significant impact assessment for the species is presented in **Table 7.7**. This assessment considers the latest species information presented in the *Guide to Greater Glider Habitat in Queensland* (Department of the Environment and Science 2022) and the species' Conservation Advice (Department of Climate Change Energy the Environment and Water 2022). In summary, the assessment found that the Project is **unlikely to result in a significant impact on greater glider (central and southern).**

Table 7.7 Significant Impact Assessment: Greater Glider (Southern and Central)

Evaluation Criteria	Response
Lead to a long-term decrease in the size of a population	**Unlikely.** No individuals were recorded within the Study Area although likely or current denning habitat is mapped within the north-east portion of the Study Area. This is area will be avoided by the Project and is functionally separated by existing infrastructure and cleared areas. As a result of these existing barriers, potential indirect impacts, such as weed encroachment, exacerbation of pest animal species and erosion and sedimentation, on the species because of the Project are expected to be limited but will be actively managed via the Project management plans which will include specific measures for the greater glider including pre-clearance survey requirements within areas of unoccupied habitat. Based on the above, a long-term decrease in the size of a population is unlikely to result from the Project. Given the species ecology and its inability to persist in small habitat parches, a long-term decrease in the size of a population as a result of mapped unoccupied areas is unlikely.
Reduce the area of occupancy of the species	**Unlikely.** The greater glider (central and southern) has a large distribution extending across the majority of the east coast of Australia. The species area of occupancy is estimated at 15,316 km^2, however this may be overstated given the low resolution in the mapping methodology used by the Commonwealth (2 km x 2 km grid). Direct impacts via vegetation clearing are not proposed, and the loss of unoccupied habitat is considered negligible, noting the species ecology and its inability to persist in small habitat parches. With the avoidance of likely or current denning habitat, connection to areas beyond the Study Area (north) will remain following the construction of the Project and no additional patch isolation of likely or current denning habitat will occur. Furthermore, the Study Area does not occur near the limit of the species distribution. Based on this, Project works are considered unlikely to materially reduce the availability or quality of habitat for the species to the point where the occupancy of the species would be reduced.
Fragment an existing population into two or more populations	**Unlikely.** As per the species' Conservation Advice, the greater glider (southern and central) is known to have a low dispersal ability and be susceptible to disturbance and edge effects. As a result, they have a low persistence in small forest fragments. They also exhibit poor dispersal tendencies across non-native vegetation, which adds to localised pressures. While no individuals were recorded within the Study Area, likely or current denning habitat is mapped within the north-east portion of the Study Area. This is area will be avoided by the Project and is functionally separated by existing infrastructure and cleared areas. The likely or current denning habitat within the Study Area is functionally connected to vegetated areas and large tracts of suitable habitat that exist beyond the Study Area. This connectivity will not be impacted by the Project. For the reasons above, proposed removal of unoccupied habitat will not to be to the extent or nature that it will fragment an existing population into two or more populations.
Adversely affect habitat critical to the survival of a species	**Unlikely.** All likely or current denning habitat within the Study Area is considered habitat critical to the survival of the species. These areas will be avoided by the Project and are further buffered from indirect impacts due to existing infrastructure (transmission lines and roads). Despite this separation, indirect impacts on mapped habitat will be actively managed via the Project management plans and include measures for the threats such as bushfire and weeds.

Evaluation Criteria	Response
	For reasons provided in the sections above, unoccupied and disconnected habitat patches are not considered habitat critical to the species. This is consistent with the species' Conservation Advice, which details that the greater glider (southern and central) is known to have a low dispersal ability and be susceptible to disturbance and edge effects. As a result, they have a low persistence in small forest fragments. They also exhibit poor dispersal tendencies across non-native vegetation, which adds to localised pressures Based on the justification above, the Project is unlikely to adversely affect habitat critical to the survival of the species.
Disrupt the breeding cycle of a population	**Unlikely.** The species is reliant on hollow-bearing trees for breeding and has a low reproductive rate. Females give birth to a single young between March–June (McKay 2008). Suitable hollows were observed in some patches of disconnected and unoccupied habitat (namely areas of alluvial woodland associated with RE 12.3.3), however these areas are functionally isolated and patches are too small to support a viable population. This is consistent with the Conservation advice for the species. Mapped areas of likely or current denning habitat will be avoided and connection to areas beyond the Study Area will be maintained. Due to the avoidance of likely or current denning habitat, and management of indirect impacts via a CEMP, it is considered unlikely the Project would disrupt the breeding cycle of a population.
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	**Unlikely.** Mapped areas of likely or current denning habitat will be avoided and connection to areas beyond the Study Area will be maintained. These areas will be avoided by the Project and are further buffered from indirect impacts due to existing infrastructure (transmission lines and roads). Despite this separation, indirect impacts on mapped habitat will be actively managed via the Project management plans and include measures for the threats such as bushfire and weeds. Based on the above, the Project is unlikely to modify, destroy, remove or isolate or decrease the availability of habitat to the extent that the species is likely to decline.
Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	**Unlikely.** Invasive species, such as red fox and feral cat, are known to predate upon the greater glider (central and southern). While these species were not recorded during the field survey program, they are likely to occur within the Study Area and wider region. It is unlikely the Project will result in the establishment of further feral species or exacerbate current populations within greater glider habitat. Nonetheless, the Project will employ best practice control methods for weeds and pests which includes monitoring and adaptive management.
Introduce disease that may cause the species to decline	**Unlikely.** The species is not known to be vulnerable to disease directly. Phytophthora root fungus (*Phytophthora cinnamomic*) has the potential to indirectly impact the species via the infection of eucalyptus trees. The Project will implement best practice biosecurity protocols therefore, introduction of a disease that may cause the species to decline is unlikely.

Evaluation Criteria	Response
Interfere with the recovery of the species	**Unlikely.** There is no recognised recovery plan for the species, however one is required to stop decline and abate threats. The recently published Conservation Advice (Department of Climate Change Energy the Environment and Water 2022) includes conservation and management priorities which are grouped into four key themes including habitat loss, disturbance and modification (including fire), climate change, invasive species (including threats from predation, grazing, trampling) and ex-situ recovery actions. All likely or current denning habitat within the Study Area is considered habitat critical to the survival of the species. These areas will be avoided by the Project and are further buffered from indirect impacts due to existing infrastructure (transmission lines and roads). Despite this separation, indirect impacts on mapped habitat will be actively managed via the Project management plans and include measures for the threats such as bushfire and weeds. Based on the reasons above, the Project is unlikely to interfere with the recovery of the species.

7.4 Yellow-bellied glider (south-eastern) *(Petaurus australis australis*)

7.4.1 Status under the EPBC Act

The yellow-bellied glider (south-eastern) is listed as Vulnerable under the EPBC Act.

7.4.2 Distribution and Habitat Requirements

The distribution of the yellow-bellied glider (south-eastern) coincides with the Gondwana Rainforests of Australia World Heritage Area, hence, is patchily distributed from south-eastern Qld to far south-eastern South Australia. It is found at altitudes ranging from 0 to 1400 m ASL, with the species predominately occurring in forests along the extent of the NSW east coast (Department of Agriculture Water and the Environment 2022a). Most of the Qld distribution is coastal, along the east coast from north of Mackay to the NSW–Qld border, with subpopulations also occurring within the Blackdown and Carnarvon Ranges of central Qld. Despite a seemingly extensive distribution, it is highly disjunct due to a combination of biogeographic processes and land clearing. Their specific habitat requirements can also lead to a disjunct distribution even within areas of continuous forest (Department of Agriculture Water and the Environment 2022a).

The yellow-bellied glider (south-eastern) occurs in eucalypt-dominated woodlands and forests, including both wet and dry sclerophyll forests (Department of Agriculture Water and the Environment 2022a). They show a preference for large patches of mature old growth forest that provide suitable trees for foraging and shelter. There is clear preference for forests with a high proportion of winter-flowering and smooth-barked eucalypts due to the foraging resources they provide (Department of Agriculture Water and the Environment 2022a). Yellow-bellied gliders (south-eastern) also require habitat with floristic diversity for year-round food supplies (e.g. the presence of sap feed trees) and are unlikely to persist in forests dominated by only one or two tree species. Many tree species are found in the subspecies' habitat, with some used for sap feeding. Trees known to be used for sap-feeding as per the species' Conservation Advice (Department of Agriculture Water and the Environment 2022a) include, but are not limited to, *Eucalyptus tereticornis*, *E. crebra* and *E. moluccana*. Abundance of the species is highly dependent on habitat suitability, which is dependent on floristics and forest age.

This species has low dispersal capabilities and shelter in live tree hollows usually more than 1 m in diameter (Department of Agriculture Water and the Environment 2022a). Small social groups occupy large and exclusive home ranges at low densities (groups of 2–6 individuals within a home range of approximately 50–65 ha) due to the wide dispersal of trees used as foraging substrates. Hence, the protection of large areas of forest is required to maintain viable subpopulations. They also have a slow generation time of four to five years (Department of Agriculture Water and the Environment 2022a).

Yellow-bellied glider (south-eastern) habitat suitability is based on the availability of the total set of attributes (i.e. presence of feed and shelter trees, connectivity) required by the subspecies to meet its' survival and feeding requirements. In consideration of this, yellow-bellied glider (south-eastern) habitat will often include:

- Mature forest, with live-hollow bearing trees for denning, preferably winter-flowering and smooth barked eucalypt.
- Sap feed trees with floristic diversity.
- Access to forest corridors to facilitate movement to habitat resources over time and space.

Although the yellow-bellied glider (south-eastern) is considered a gliding marsupial like the greater glider, guidance outlined in the *Guide to greater glider habitat in Queensland* (Eyre et. al 2022) is not applicable to this species. The guideline states that information outlined is specific to species within the *Petauroides* genus of the Pseudocheiridae family. The yellow-bellied glider (south-eastern) is from the genus *Petaurus* within the Petauridae family.

While some broad similarities occur between the habitat preferences of the yellow-bellied glider (south-eastern) and the greater glider, foraging requirements are notably different as the greater glider is primarily folivorous, while the yellow-bellied glider (south-eastern) is a sap-feeder. As described above, the subspecies relies on a finite list of suitable sap feed trees and as a result of their large home ranges, minimum patch size thresholds are required for habitat to be considered suitable.

7.4.3 Threats

As outlined in the subspecies' Conservation Advice (Department of Agriculture Water and the Environment 2022a), key threats to the yellow-bellied glider (south-eastern) are clearing of habitat, fragmentation and timber harvesting, fire disturbance, invasive species predation, mortality by barbed wire fencing and habitat degradation.

The subspecies is particularly sensitive to habitat fragmentation, primarily because of extensive land clearing for agriculture and development throughout the species' range. Yellow-bellied gliders (south-eastern) are vulnerable to fragmentation impacts due to their large, exclusive home ranges. They require large areas of forest for habitat and have an inability to cross cleared areas of land due to restrictions of gliding distances.

7.4.4 Occurrence and Potential Habitat

This species was not recorded within the Study Area during field surveys. It has been recorded approximately 10 km south of the Study Area in Moolboolaman in 1999 (Atlas of Living Australia 2024).

Numerous records (collected 1992–1997) also occur within Bania National Park, approximately 25 km west of the Study Area.

Within the Study Area, only large, remnant patches of RE 12.11.6 exhibited habitat features suitable for the species. Other patches were significantly fragmented, functionally disconnected and were considered too small to viably support the species.

The extent of modelled habitat within the Study Area is provided in **Table 7.8.** Potential habitat within the Study Area is displayed in **Figure 10.4**.

Table 7.8 Habitat Extent and Justification for Yellow-bellied glider

Habitat Criteria	Mapping Justification	Area (ha)	
		Within the Study Area	Impact Area (Worst-case Scenario)
Breeding and Denning			
Floristically diverse, mature eucalypt woodland and forest comprising intact and connected patches that contain live and large hollow-bearing trees. Habitat areas collectively (breeding and denning with foraging and dispersal) must form relatively large (>50 ha) tracts which may extend beyond the Study Area.	One large patch of remnant RE 12.11.6 is considered suitable for breeding and denning based on the presence of suitable hollow-bearing trees. Only vegetation in remnant condition contains suitable hollow-bearing trees as per the field validated data.	29.9	-

7.4.5 Important Populations

The Conservation Advice (Department of Agriculture Water and the Environment 2022a) defines important populations as stronghold populations, ecologically or genetically distinct populations (e.g. those at the limits of the subspecies' range, outlying populations), research populations, and other populations where recovery actions are being implemented. However, this list of important populations is not exhaustive. In the absence of such information, all known populations should be considered important.

All known populations of this subspecies are also considered important populations including:

- Carnarvon Range (inland population)
- Blackdown Tableland (inland population).

A population has not been recorded within the Study Area and habitat can be used as a surrogate in this instance. If it was to be recorded in future surveys, it would be considered an important population.

7.4.6 Habitat Critical to the Survival of the Species

Habitat critical to the survival of this subspecies is defined as (Department of Agriculture Water and the Environment 2022a):

- Large contiguous areas of floristically diverse eucalypt forest, which are dominated by winter-flowering and smooth-barked eucalypts, including mature living hollow-bearing trees and sap trees.
- Areas identified as refuges under future climate change scenarios.
- Short- or long-term post-fire refuges (i.e. unburnt habitat within or adjacent to recently burnt landscapes) that allow the species to persist, recover and recolonise burnt areas.
- Habitat corridors required to facilitate dispersal of the subspecies between fragmented habitat patches and/or that enable recolonisation or movement away from threats. Yellow-bellied gliders (south-eastern) have a glide ratio (horizontal distance/height dropped) of around 2.0, and corridors spanning gaps larger than the distance gliders are likely to be able to travel should be considered critical to the survival. There is not enough evidence to define the canopy and width characteristics of appropriate corridors. In the absence of such information, a precautionary approach should be taken to maximise dispersal by considering all habitat corridors in the species' range to be habitat critical to the survival.
- Areas in which some trees have evidence of use for sap extraction by the yellow-bellied glider (south-eastern).

Habitat meeting any one of the criteria above is considered habitat critical to the survival of the yellow-bellied glider (south-eastern), irrespective of the abundance or density of the species or the perceived quality of the site. Forest areas currently unoccupied by the yellow-bellied glider (south-eastern) may still represent habitat critical to survival, if the recruitment of hollow-bearing trees in the future could allow the species to colonise these areas and ensure persistence of a population.

The habitat within the Study Area is largely fragmented, however habitat corridors to facilitate dispersal, do occur in the north-east. Based on this, all mapped habitat within the Study Area is conservatively assessed as being considered habitat critical to the survival of the species.

7.4.7 Potential Project Impacts and Key Mitigation Measures

Potential impacts on this species as a result of the Project include habitat loss, fragmentation and degradation, loss of key habitat resources and exacerbation of pest populations. No denning, foraging and dispersal habitat is proposed to be removed by the Project.

In addition to the general mitigation and management measures outlined in **Section 6.2.2** which include pest monitoring, the following species-specific mitigation measures will be implemented:

- In the unlikely event that an individual is found to be present, it will be inspected for injury and if healthy, relocated to an adjacent area of mapped breeding and denning habitat after dusk. If the individual is injured, it will be transported to a local wildlife carer and rehabilitated prior to releasing in a suitable area adjacent to the location in which it was found.
- No barbed wire fencing will be installed as part of the Project within the Study Area unless strictly necessary (i.e. BESS area).
- In the event that a yellow-bellied glider (south-eastern) is killed as a result of Project activities, DCCEEW will be notified within a maximum period of two business days.

7.4.8 Significant Impact Assessment

The significant impact assessment for this species is presented in **Table 7.9** below. In summary, the assessment found that the Project is unlikely to result in a significant impact on the yellow-bellied glider (south-eastern).

Table 7.9 Significant Impact Assessment: Yellow-bellied glider

Evaluation Criteria	Response
Lead to a long-term decrease in the size of an important population of a species	**Unlikely.** Yellow-bellied glider (south-eastern) was recorded not recorded within the Study Area. Suitable breeding and denning habitat for the yellow-bellied glider (south-eastern) is limited to the north-east corner of the Study Area. Habitat fragmentation impacts have been considered in the design and siting of the Project, with all mapped yellow-bellied glider (south-eastern) breeding and denning habitat will be avoided by the Project. Potential indirect impacts on the sub-species because of the Project are expected to be limited but will be actively managed via the Project management plans. Indirect impacts area further buffered, spatially separated from the BESS from the existing transmission lines and cleared areas. Furthermore, habitat availability is expected to be high in the wider local area, based on aerial imagery and State Forests and National Parks in the wider area (Monduran State Forest is 4 km north). Connectivity to external areas including the State Forests will be maintained following the construction of the Project. Based on the above, a long-term decrease in the size of an important population is unlikely to result from the Project.
Reduce the area of occupancy of an important population	**Unlikely.** The modelled distribution of the yellow-bellied glider (south-eastern) extends inland approximately 250–500 km from the coastal Victoria, along the east-coast to central Queensland. The sub-species area of occupancy is estimated at 12,724 km^2, however this may be overstated given the low resolution in the mapping methodology used by the Commonwealth (2 km x 2 km grid). There is no population known within the Study Area and the Study Area does not occur at the edge of the sub-species documented range. Large tracts of connected habitat will remain following the construction of the Project and no significant patch isolation will occur. Given no population is known from within the Study Area, and mapped habitat will be avoided, it is unlikely the Project will reduce the area of occupancy of an important population.
Fragment an existing important population into two or more populations	**Unlikely**. No population is known from within the Study Area, however suitable habitat for the yellow-bellied glider (south-eastern) is mapped to the north-east corner of the Study Area. The Study Area has been subject to fragmentation because of historical clearing and ongoing agricultural practises. As a result, and due to barriers such as grazing paddocks, transmission lines and roads, many remaining small vegetation patches are functionally disconnected from larger habitat areas in the northeast Study Area. This is supported by Conservation advice, which notes that the sub-species is known to have limited dispersal abilities and is sensitive to habitat fragmentation, preferring large patches of continuous woodland habitat. Habitat fragmentation impacts have been considered in the design and siting of the Project, with all mapped yellow-bellied glider (south-eastern) breeding and denning habitat will be avoided by the Project.

Evaluation Criteria	Response
	As there is no known population within the Study Area and mapped habitat will be avoided, it is unlikely the Project to fragment and existing population into two or more populations.
Adversely affect habitat critical to the survival of a species	**Unlikely.** All mapped habitat within the Study Area is conservatively assessed as being considered habitat critical to the survival of the species, recognised as suitable for breeding and denning. Habitat clearing impacts have been considered in the design and siting of the Project, with all mapped yellow-bellied glider (south-eastern) breeding and denning habitat to be avoided by the Project. Potential indirect impacts on the sub-species because of the Project are expected to be limited but will be actively managed via the Project management plans. Indirect impacts are spatially separated from the BESS from the existing transmission lines and cleared areas. Furthermore, habitat availability is expected to be high in the wider local area, based on aerial imagery and State Forests and National Parks in the wider area (Monduran State Forest is 4 km north). Connectivity to external areas including the State Forests will be maintained following the construction of the Project. Based on these reasons, the Project is unlikely to adversely affect habitat critical to the survival of the species.
Disrupt the breeding cycle of an important population	**Unlikely.** The sub-species has low breeding potential, with a single offspring produced per year, or every second year (NPWS 2003). A population of the sub-species has not been recorded within the Study Area; however, it is conservatively assumed an important population is present within mapped breeding and denning habitat. Habitat clearing impacts have been considered in the design and siting of the Project, with all mapped yellow-bellied glider (south-eastern) breeding and denning habitat to be avoided by the Project. Potential indirect impacts on the sub-species because of the Project are expected to be limited but will be actively managed via the Project management plans. Indirect impacts are spatially separated from the BESS from the existing transmission lines and cleared areas. Furthermore, habitat availability is expected to be high in the wider local area, based on aerial imagery and State Forests and National Parks in the wider area (Monduran State Forest is 4 km north). Connectivity to external areas including the State Forests will be maintained following the construction of the Project. Tree hollows within isolated vegetation patches may be cleared by the Project. However, due to barriers such as grazing paddocks, transmission lines and roads, many remaining small vegetation patches are functionally disconnected from larger habitat areas in the northeast Study Area. This is supported by Conservation advice, which notes that the sub-species is known to have limited dispersal abilities and is sensitive to habitat fragmentation, preferring large patches of continuous woodland habitat. Based on the reasons above, the Project is unlikely to disrupt the breeding cycle of an important population.
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	**Unlikely.** Habitat clearing impacts have been considered in the design and siting of the Project, with all mapped yellow-bellied glider (south-eastern) breeding and denning habitat to be avoided by the Project. Potential indirect impacts on the sub-species because of the Project are expected to be limited but will be actively managed via the Project management plans. Indirect impacts are spatially separated from the BESS from the existing transmission lines and cleared areas. Furthermore, habitat availability is expected to be high in the wider local area, based on aerial imagery and State Forests and National Parks in the wider area (Monduran State Forest is 4 km north). Connectivity (from mapped habitat) to external areas including the State Forests will be maintained following the construction of the Project. For the reasons above, the Project is unlikely to cause the species to decline.

Evaluation Criteria	Response
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	**Unlikely.** European fox and feral cats are invasive species that may predate upon the yellow-bellied glider (south-eastern). While these species were not recorded during field surveys, it is likely that they occur within the Study Area and wider region. Project management plans will include best practice control methods for weeds and pests. It is unlikely the Project will result in the establishment of further feral species or exacerbate current populations within yellow-bellied glider (south-eastern) habitat.
Introduce disease that may cause the species to decline	**Unlikely.** The species is not known to be vulnerable to disease directly. Phytophthora root fungus has the potential to indirectly impact the species via the infection of eucalyptus trees. The Project will implement best practice biosecurity protocols therefore, introduction of a disease that may cause the species to decline is unlikely.
Interfere substantially with the recovery of the species	**Unlikely.** There is no recognised national recovery plan for the sub-species, however one is required to stop decline and abate threats. The recently published Conservation Advice (Department of Agriculture Water and the Environment 2022a) includes conservation and management priorities which are grouped into three key themes including habitat loss, climate change and invasive species (including threats from predation, grazing, trampling). Habitat loss is a recognised threat to the species. All mapped habitat will be avoided by the Project and management plans will be implemented to manage the potential indirect impacts, such as exacerbation of weed species and altered fire regime. Based on this information, it is considered unlikely that the Project will interfere substantially with the recovery of the species.

7.5 Grey-headed flying-fox (*Pteropus poliocephalus*)

7.5.1 Status under the EPBC Act

The grey-headed flying-fox is listed as Vulnerable under the EPBC Act.

7.5.2 Distribution and Habitat Requirements

Grey-headed flying-fox is endemic to Australia and occurs from Ingham in Queensland to Adelaide in South Australia. They are usually found on the coastal lowlands and slopes of eastern Australia below altitudes of 200 m (Department of Environment and Water 2021). The species is widespread throughout their range in summer, whilst in autumn it occupies coastal lowlands and is uncommon inland. Grey-headed flying-fox is highly mobile and considered 'highly adaptable' given its proclivity to occupy urbanised environments.

Grey-headed flying-fox requires foraging resources and roosting sites. It is a canopy-feeding frugivore and nectarivore, which utilises vegetation communities including rainforests, open forests, closed and open woodlands, *Melaleuca* swamps and *Banksia* woodlands. It also feeds on commercial fruit crops and on introduced tree species in urban areas. The primary food source is blossom from *Eucalyptus* and related genera but in some areas it also utilises a wide range of rainforest fruits. None of the vegetation communities used by grey-headed flying-fox produce continuous foraging resources throughout the year. As a result, the species has adopted complex migration traits in response to ephemeral and patchy food resources and only a small proportion of its' wide range is used at any one time.

Grey-headed flying-fox roosts in aggregations of various sizes on exposed branches. Roost sites are typically located near water, such as lakes, rivers or the coast. Roost vegetation includes rainforest patches, stands of *Melaleuca*, mangroves and riparian vegetation.

Grey-headed flying-fox commute daily to foraging areas, usually within 15 km of the day roost site. They are capable of nightly flights of up to 50 km from their roost to different feeding areas as food resources change. At most times of the year there is a complete exodus from the colony site at dusk.

7.5.3 Threats

The *National recovery plan for the Grey-headed flying-fox Pteropus poliocephalus* (Department of Environment and Water 2021) identifies the key threats to the species as:

- Habitat loss, particularly:
    - Clearing of winter foraging resources.
    - Loss of roosting habitat.
- Camp disturbance via conflict with humans.
- Mortality in commercial fruit crops – animals being killed from crop management practices including shooting by orchardists.
- Heat stress.
- Entanglement in netting and barbed wire fencing – animals can become entangled in netting over fruit trees and thousands of animals die or face permanent injury from entanglement in barbed wire.
- Climate change – has the potential to affect food availability and heat-related mortality.
- Bushfires – resulting in the loss of foraging habitat and resources leading to mortalities.
- Electrocution on powerlines.
- Zoonotic diseases.

7.5.4 Occurrence and Potential Habitat

This species was not observed during field surveys. The species has been recorded 24 km to the south-east of the Study Area, in Wallaville in 1995. Other records in the wider area include several observations north and south of the Study Area, as well as in Bundaberg. The species was conservatively given a moderate likelihood of occurrence based on the seasonal foraging opportunities the Study Area may provide.

Based on the quarterly data from the National Flying-fox Monitoring Program (contained within the National Flying-fox Monitoring Viewer), the nearest regularly occupied camps are in Bundaberg, approximately 52 km to the east of the Study Area. The locations of flying-fox camps are generally stable through time, although pattens of camp occupation vary. Given the paucity of grey-headed flying-fox camps within proximity to the Study Area, and no camps being observed during field surveys despite comprehensive survey coverage, it is considered that roosting habitat is absent from the Study Area.

The Study Area falls outside the typical nightly foraging commute (20 km) for the species and is outside of the indicative extent of foraging habitat as per Map 1 of the *National Recovery Plan for the Grey-headed Flying-fox* (Department of Environment and Water 2021). The nearest Nationally important flying-fox camp which support grey-headed flying-fox are mapped approximately 95 km south/south-east, the nearest being Woocoo. There are several other camps with historical records of the species are located in the wider area (50 km). The nearest in Avoca, Qld (McCoys Creek). Although movements of these distances are rare, it is considered possible that the species could sporadically forage in *Eucalyptus* woodlands in the Study Area which contain known important foraging species known important foraging species in these vegetation communities include *Eucalyptus crebra*, *E. tereticornis* and *Corymbia citriodora* (RE 12.3.3, 12.11.6, 12.11.14). If used by grey-headed flying-fox, it is likely to be infrequent, given the distance from known camps and the sporadic occupation of these camps.

Based on the above, the habitat within the Study Area is likely to be suitable for foraging, however used seasonally when Eucalypts and other species are flowering. The extent of grey-headed flying-fox habitat within the Study Area is provided in **Table 7.10.** Potential habitat for this species is shown in **Figure 10.5.**

Table 7.10 Habitat Extent and Justification for Grey-headed Flying-fox

Habitat Criteria	Mapping Justification	Area (ha)	
		Within the Study Area	Impact Area (Worst-case Scenario)
Foraging			
Any vegetation community (remnant) which contains important winter/spring flowering species as defined in the National Recovery Plan) within 40 km of known camps (Avoca, McCoys Creek #712). Important species include *Eucalyptus tereticornis, E. albens, E. crebra, E. fibrosa, E. melliodora, E. paniculata,* *E. pilularis, E. robusta, E. seeana, E. sideroxylon, E. siderophloia, Banksia integrifolia, Castanospermum australe, Corymbia citriodora, C. eximia, C. maculata, Grevillea robusta, Melaleuca quinquenervia* or *Syncarpia glomulifera*	The REs listed below where they occur within 40 km of a known camp and contained important winter/spring flowering species: REs 12.3.3, 12.11.6, 12.11.14.	43.0	1.0

7.5.5 Important Populations

Important populations are not identified in the *National Recovery Plan for the Grey-headed Flying-fox Pteropus poliocephalus* (Department of Environment and Water 2021). As such the generic definition for important populations in the *Significant Impact Guidelines 1.1 - Matters of National Environmental Significance* (Department of the Environment 2013a) has been applied. This document defines an 'important population' as a population that is necessary for a species' long-term survival and recovery. This may 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.
- Populations that are near the limit of the species range.

Nationally Important Camps have been identified on the DCCEEW interactive flying-fox web viewer (Department of Climate Change, Energy, the Environment and Water 2023b). Nationally Important Camps for grey-headed flying-fox are camps that have contained ≥ 10,000 grey-headed flying-foxes in more than one year in the last 10 years or have been occupied by more than 2,500 grey-headed flying-foxes permanently or seasonally every year for the last 10 years (Department of Environment and Water 2021). Nationally Important Camps are located within 100 km of the Study Area, but do not occur within nightly foraging distances – the nearest is in Woocoo, approximately 95 km to the southeast. Further, the nearest known camp is approximately 47 km east of the Study Area at Avoca, which has only recorded 1–499 grey-headed flying-foxes during a single survey event (2019). The low number of individuals which sporadically use camps in the region would not be sufficient to constitute a key source population for breeding or dispersal.

Although the species is spatially structured into colonies, there is constant genetic exchange and movement between camps throughout the species' entire geographic range. Given this ongoing movement between camps and the species high mobility capacity, no population or sub-population within the Study Area would be necessary for maintaining genetic diversity. Furthermore, the species is known to occur from Geelong in Victoria to Ingham in far north Queensland and therefore the population is not near the limit of the species range.

Given the context above, any population which may utilise the Study Area is unlikely to represent an important population.

7.5.6 Habitat Critical to the Survival of the Species

Habitat critical to the survival of this species, as described in the *National Recovery Plan for the Grey-headed Flying-fox Pteropus poliocephalus* (Department of Environment and Water 2021) includes:

- Important winter and spring vegetation communities that contain the following species:
    - *Eucalyptus tereticornis, Eucalyptus albens, Eucalyptus crebra, Eucalyptus fibrosa, Eucalyptus melliodora, Eucalyptus paniculata* (grey ironbark), *Eucalyptus pilularis, Eucalyptus robusta, Eucalyptus seeana, Eucalyptus sideroxylon* (Mugga ironbark), *Eucalyptus siderophloia, Banksia integrifolia, Castanospermum australe* (black bean*), Corymbia citriodora, Corymbia eximia, Corymbia maculata, Grevillea robusta* (silky oak), *Melaleuca quinquenervia or Syncarpia glomulifera.*
- Vegetation communities that contain native species that are known to be productive as foraging habitat during the final weeks of gestation, and during the weeks of birth, lactation and conception (August to May).
- Vegetation communities that contain native species used for foraging and occur within 20 km of a nationally important camp as identified on the Department's interactive flying-fox web viewer.
- Vegetation communities that contain native and or exotic species used for roosting at the site of a nationally important Grey-Headed Flying-Fox camp as identified on the Department's interactive flying-fox web viewer.

Within the Study Area, vegetation communities which broadly meet the above definitions includes those which contain *Eucalyptus crebra*, *E. tereticornis* and *Corymbia citriodora*. Therefore, potential foraging habitat within the Study Area is considered habitat critical to the survival of the species.

7.5.7 Potential Project Impacts and Key Mitigation Measures

A maximum total of 1.0 ha of potential foraging habitat will be cleared for construction of the Project. However, as detailed above habitat within the Disturbance Footprint and likely within the wider Study Area is unlikely to be relied upon by a population, given the large areas of potential habitat that are likely to occur in closer proximity to known roosts. The Study Area does not occur between known roosts or Nationally Important Camps, indicating it is unlikely to be used as a movement corridor.

Potential impacts to grey-headed flying-fox as a result of the Project may occur during the operation phase. A known threat to the species is electrocution by powerlines. Powerlines already intersect the Study Area. Route B and Route C proposes to use underground cabling and will not pose a risk to grey-headed flying-fox but Route A proposes overhead powerlines.

Other Project related indirect impacts relevant to the grey-headed flying-fox include disturbance to unidentified roosts. The field survey included comprehensive coverage of the Study Area, and no roosts were recorded.

In addition to the general mitigation and management measures outlined in **Section 6.2.2**, the following species-specific mitigation measures will be implemented:

- In the event that a grey-headed flying-fox congregation is identified within the Disturbance Footprint, an exclusion zone will be established. A suitably qualified person will refer to the *Interim Policy for Determining When a Flying-fox Congregation is Regarding as flying-fox Roost under Section 88C of the Nature Conservation Act 1991* (DES, 2021) to determine if the congregation could be considered a roost. If determined that the congregation constitutes a roost, impacts to the grey-headed flying-fox congregation will be managed in accordance with the *Code of practice – Ecologically Sustainable Management of Flying-fox Roosts* (DES, 2020).
- A single grey-headed flying-fox death will be a reportable incident to DCCEEW.

7.5.8 Significant Impact Assessment

The significant impact assessment for the species is presented in **Table 7.11** below. This assessment considers the latest species information presented in the *National Recovery Plan for the Grey-headed Flying-fox Pteropus poliocephalus* (Department of Environment and Water 2021). In summary, the assessment found that the Project is **unlikely to result in a significant impact on grey-headed flying-fox**.

Table 7.11 Significant Impact Assessment: Grey-headed Flying-fox

Evaluation Criteria	Response
Lead to a long-term decrease in the size of an important population of a species	**Unlikely**. This species was not recorded during the field survey program, however, as per the National Flying Fox Monitoring program it is known from roosts in the wider region. The nearest camp with grey-headed flying-foxes occurs approximately 50 km east of the Study Area, however this camp does not meet the definition of a Nationally Important Camp. An important population is unlikely to utilise potential habitat within the Study Area. Under worst-case scenario, a maximum of 1.0 ha of potential foraging habitat will be directly impacted via vegetation clearing required for construction of the Project. Given its location in the landscape (away from known roosts), potential habitat is likely to only be utilised occasionally by a small number of individuals under ideal conditions when canopy trees are in flower. Final clearing areas are expected to be lower as clearing will only be completed as strictly necessary and will be minimised via micro-siting of Project infrastructure. The quantum of habitat that will remain following construction of the Project will be sufficient to maintain any individuals that may temporarily use the site. Furthermore, the State Forests and adjacent areas are likely to contain large areas of suitable and higher quality habitat. Given that an important population does not occur, and potential habitat is unlikely to support an important population, it is unlikely that the Project will lead to a long-term decrease in the size of an important population of this species.
Reduce the area of occupancy of an important population	**Unlikely**. Grey-headed flying-fox has a large distribution across eastern Australia. Patterns of occupancy and relative abundance within its distribution vary widely seasonally and temporally. Potential habitat within the Study Area occurs at the limit of the species nightly foraging distances. Large areas of higher quality habitat are likely to occur in the wider area (based on aerial imagery). Furthermore, the Study Area does not occur between known camps and therefore it is unlikely transiting individuals would occur. No known roosts in the region comprise a Nationally Important Camp. An important population is unlikely to utilise the Study Area given an absence of a known population (as camps or individual) of this species. Given the above, the Project is unlikely to reduce the area of occupancy of an important population.
Fragment an existing important population into two or more populations	**Unlikely**. This species was not recorded during the field survey program. An important population is unlikely to utilise potential habitat. This species is highly mobile, travelling large distances across cleared and developed landscapes at night in search of suitable foraging habitat. It is adaptable and known to occur in high human use areas such as townships. The removal of habitat within the Disturbance Footprint is unlikely to limit this species capacity to travel between known roosts or other areas of foraging habitat, as clearing will largely be linear in shape and the species has extremely high mobility capacity. An increase in activity during construction is unlikely to disturb any individuals that may occur temporarily, noting that construction activity at night will likely be low to absent. However, the Study Area does not occur between known camps and it is therefore unlikely the Study Area occurs within a regular movement corridor. Given this, and the absence of an important population present, the proposed impact is unlikely to fragment an existing important population into two or more populations.

Evaluation Criteria	Response
Adversely affect habitat critical to the survival of a species	**Unlikely.** Potential foraging habitat within the Study Area broadly meets the definition of habitat critical to the species as it includes vegetation communities which contain *Eucalyptus crebra*, *E. tereticornis* and *Corymbia citriodora*. Vegetation clearing required for the Project will result in the removal of a maximum of 1.0 ha of potential foraging habitat. However, clearing will be linear in nature and minimised where possible via micro-siting. The quantum of potential habitat that will remain should be sufficient to maintain any individuals that may occur. Furthermore, suitable foraging habitat is likely to occur extensively within the wider region, including in areas much closer to known camps. The Project is unlikely to lead to material indirect impacts on the species or the species habitat. In the unlikely event that a flying-fox congregation is identified within the Study Area, an exclusion zone will be established. A suitably qualified person will refer to the *Interim Policy for Determining When a Flying-fox Congregation is Regarding as flying-fox Roost under Section 88C of the Nature Conservation Act 1991* (DES, 2021) to determine if the congregation could be considered a roost. If determined that the congregation constitutes a roost, impacts to the flying-fox congregation will be managed in accordance with the *Code of practice – Ecologically Sustainable Management of Flying-fox Roosts* (DES, 2020). DES will be contacted to ensure no unintentional impacts on a potential roost will occur. Based on the above, it is considered unlikely the Project will adversely affect habitat critical to the survival of the species.
Disrupt the breeding cycle of an important population	**Unlikely.** This species breeds annually in camps with births occurring from October to December when foraging resources are generally most abundant. As per the National Flying-fox monitoring viewer, the closest known roost is 50 km east of the Study Area and the species was last recorded at this location in 2019 (500-2,499 individuals). Given the distance to the nearest known camp, clearing works required for construction of the Project are highly unlikely to disturb roosting individuals. In the unlikely event that a flying-fox congregation is identified within the Development Corridor, an exclusion zone will be established and no disturbance to that area permissible until the potential presence of a roost is determined in consultation with DES. Furthermore, as foraging resources during this period are likely to abundant in the wider area the maximum loss of 1.0 ha of foraging habitat is unlikely to materially reduce the availability of suitable foraging habitat required by any breeding individuals that may be temporarily utilising the area. As described above the Study Area is not considered to support an important population. The Project is therefore unlikely to disrupt the breeding cycle of an important population.
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	**Unlikely**. The maximum loss of 1.0 ha of foraging habitat is considered to have a low to negligible impact on the species given the landscape context which offers large, continuous patches of remnant vegetation in protected areas to the north, south and west. This species is unlikely to rely on the potential habitat contained within the Study Area given its location relative to known roosts, occurring at a distance greater than the average nightly foraging commute (with the exception of small areas of potential habitat within the access road corridor). Further, this species is highly mobile and known to fly over cleared or modified environments and as such clearing associated with the Project would not result in isolation of habitat.

Evaluation Criteria	Response
	The removal of habitat proposed for the Project is therefore unlikely to modify, destroy, remove or 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	**Unlikely**. Both weed and pest species were recorded during field surveys. However, invasive species are not a known threat to the grey-headed flying-fox in any capacity. Nonetheless, the Project will employ best practice control methods for weeds and pests and is unlikely to introduce or exacerbate weeds or pests beyond existing levels. Therefore, the Project is unlikely to result in the establishment of invasive species in grey-headed flying-fox habitat.
Introduce disease that may cause the species to decline	**Unlikely**. There is very little information available on the impact of disease on Australian flying-fox populations, including grey-headed flying-foxes. Australian flying-foxes, including the grey-headed flying-fox, are natural reservoirs for at least three zoonotic diseases including Australian Bat Lyssavirus, Hendra virus and Menangle virus. The incidence of Lyssavirus in the species is low (<1 %). The Project is highly unlikely to facilitate the spread of zoonotic diseases. In the unlikely event that an injured individual is located, an authorised and vaccinated wildlife rescuer will be engaged. The Project will employ best practice biosecurity measures during construction and operation. Based on this, it is considered unlikely the Project will introduce disease that may cause the species to decline.

Interfere substantially with the recovery of the species	**Unlikely**.
	As defined in the *National Recovery Plan for Grey-headed Flying-fox Pteropus poliocephalus* (Department of Environment and Water 2021), recovery objectives for this species include:
	• development of a robust estimate of an increasing population trend
	• an improved understanding of habitat critical to the survival of the species
	• an increase in protection of habitat critical to the survival of the species and nationally important camp sites
	• implementation of effective habitat restoration projects
	• a reduction of conflict between people and flying-foxes in residential areas through
	  ○ investment in household mitigation measures
	  ○ greater uptake of crop netting under subsidy schemes
	• decrease in the number of licences issued to harm the species
	• an improved understanding of threats with as yet unquantified impacts on flying foxes, such as electrocution, entanglements and climate change.
	The Project is considered unlikely to impede on any of the above recovery objectives. Habitat loss and degradation, possibly the greatest threat to the species, is likely to occur to allow for construction of the Project. However, potential habitat to be impacted is highly unlikely to be relied upon by the species given its distance from known roosts and the availability of similar habitat in the region. Furthermore, large areas will be retained within the Study Area that are of sufficient size to maintain any individuals that may occur. Noting that higher quality habitat exists in closer proximity to known roosts, the nature and scale of the impact is unlikely to have a material effect on the species persistence within the region or as a whole.

7.6 Koala (*Phascolarctos cinereus*)

7.6.1 Status under the EPBC Act

The koala is listed as Endangered under the EPBC Act.

7.6.2 Distribution and Habitat Requirements

Koalas are reported to be widespread across Qld, occurring in patchy and often low-density populations across the different bioregions (Department of Agriculture Water and the Environment 2022b) from the border of NSW in the south to Cairns in the north. The species' distribution is not continuous within its range with a number of populations isolated by cleared land or unsuitable habitat (Department of Agriculture Water and the Environment 2022b).

Koalas occur in coastal and inland locations and inhabit eucalypt forests and woodlands. Their specialist dietary requirements determine their potential habitat and range distributions. The koala's diet is defined by the availability and palatability of a limited variety of *Eucalyptus, Corymbia* and *Angophora* species in a given region (Department of Agriculture Water and the Environment 2022b). Patterns in tree preferences are largely driven by the nutritional quality of the trees in a given area and potentially other tree attributes that influence their suitability for resting and/or thermoregulation such as tree size, canopy cover and bark type. Given that the nutritional quality of trees can vary within and between species, a commonly eaten, high nutritional quality food tree species in one area may be less palatable and largely ignored by koalas in another area (Moore and Foley 2000), (Youngentob, Marsh, and Skewes 2021). The species that are regularly browsed by koala in a particular bioregion and could be considered a substantial portion of the koala's diet are referred to as locally important koala trees (LIKTs) (Youngentob, Marsh, and Skewes 2021). Within the South East Queensland Bioregion, 46 *Eucalyptus* species and two *Corymbia* species have been identified as LIKTs. An additional 17 species are classified as ancillary habitat trees, which are unlikely to be preferred browse trees, but are likely to make important contributions to koala habitat when they occur in association with LIKTs (Youngentob, Marsh, and Skewes 2021). As described in the *National Recovery Plan for the Koala* (Department of Agriculture Water and the Environment, 2022b), koalas use these as shelter trees to thermoregulate, especially during hot days and to avoid predators. Koalas appear to prefer larger and more shady trees for refuge during the day and use a wide range of tree species for shelter including rainforest trees, *Callitris glaucophylla* (white cypress pine), *Callitris columellaris* (white cypress pine), *Acacia harpophylla* (brigalow) and *Melaleuca bracteata* (black tea-tree).

Koalas are nocturnal and spend significant periods of time moving across the ground between food and shelter trees. Movement increases in the breeding season (typically September to February). Over a longer timescale, individuals' use of habitat is influenced by seasonal changes in food quality, changes in habitat caused by drought, disturbance history, the long-term results of a changing climate and competition with other species (e.g. bell miner (*Manorina melanophrys**)) (Department of Agriculture Water and the Environment 2022b). Home ranges across the species' distribution are highly variable; in Qld and NSW individual home ranges are reported to vary between 3 and 500 ha (Department of Agriculture Water and the Environment 2022b). Koalas shift between locations for habitat resources in space and time and, therefore, areas can constitute koala habitat even if a koala is not present at a given time (Department of Agriculture Water and the Environment 2022b).

Koala habitat suitability is based on the availability of the total set of attributes (i.e. presence of feed (i.e. LIKTs) and shelter trees (i.e. ancillary habitat trees), connectivity, proximity to other populations) required by the species to meet its foraging, survival (predator avoidance), growth, movement and reproduction requirements (Department of Agriculture Water and the Environment 2022b). For an individual koala, these resources include access to sufficient quality food and shelter trees to meet their daily energetic requirements and reproductive needs and a place to avoid predators. In consideration of this, koala habitat will often include:

- Forests or woodlands, especially with a higher proportion of feed tree species, and may include remnant or non-remnant vegetation.
- Roadside and railway vegetation and paddock trees.
- Safe intervening ground for travelling between trees and patches to forage, shelter and reproduce.
- Access to vegetated corridors or paddock trees to facilitate movement between patches.

As per (Department of Agriculture Water and the Environment 2022b), climate refugia such as drainage lines, riparian zones and patches that are resilient to drying conditions due to favourable hydrological systems can also be important attributes as they are likely to provide a cooler refuge during periods of bushfire and heatwaves.

7.6.3 Threats

The main identified threats to the species are (Department of Agriculture Water and the Environment 2022b):

- Climate change driven processes and drivers:
    - Loss of climatically suitable habitat
    - Increased intensity/frequency of drought, heatwave, and bushfire
    - Declining nutritional value of foliage.
- Human related activities:
    - Clearing and degradation of koala habitat
    - Mortality from vehicle strike
    - Mortality from dog attack.
- Disease and health:
    - Koala retrovirus (KoRV)
    - Chlamydia (Chlamydia percorum).

7.6.4 Occurrence and Potential Habitat

This species was not recorded during field surveys. It has been recorded nearby (Atlas of Living Australia 2024) with records between 1987 and 2005 approximately 15 km south-east of the Study Area. These records occur around Gin Gin and the broader Gin Gin township.

Suitable habitat for the species is available across the Study Area in one form or another. The Study Area is dominated by cleared and modified vegetation, currently used for cattle grazing. Scattered mature eucalypts are present, and these areas likely facilitate movement between the various patches of climate refugia or breeding and foraging habitat. Riparian vegetation (RE 12.3.3) is the only vegetation type considered to provide climate refugia, whereas other forests or woodland vegetation containing LIKTs may provide breeding and dispersal habitat (RE 12.11.6, 12.11.14).

The extent of koala habitat within the Study Area is provided in **Table 7.12** and shown in **Figure 10.6.**

Table 7.12 Habitat Extent and Justification for Koala

Habitat Criteria	Mapping Justification	Area (ha)	
		Within the Study Area	Impact Area (Worst-case Scenario)
Climate Refugia			
Eucalypt forests or woodlands on alluvial associated with permanent water features (dams, wetlands and/or watercourses) that are resilient to drying conditions, likely to provide a cooler refuge during periods of bushfire and heatwaves.	Remnant RE 12.3.3	2.7	0.6
Breeding and Foraging			
Any forest or woodland that contains LIKTs and is not climate refugia.	Remnant RE 12.11.6 and 12.11.14. Patches included are considered viable (i.e. 0.5 ha or greater or extend beyond the Study Area bounds).	40.3	0.8
Dispersal			
Vegetation that may provide a safe intervening ground for the species to move across the landscape, particularly to and from areas of potential breeding and foraging habitat. In non-remnant condition, these areas are largely dominated by cleared exotic pasture but may contain sporadic small stands of trees and/or individual paddock trees.	Areas of cleared pasture with scattered regrowth eucalypts were present within the Study Area. Trees generally had DBHs ranging >10 cm and were in average health given their isolated nature in the landscape. Noting the highly cleared nature of the Study Area, it is considered possible that these areas may provide key dispersal opportunities for the species, facilitating movement to and from areas of breeding, foraging and climate refugia habitat.	71.5	10.6
	Total	**114.5**	**12.0**

7.6.5 Habitat Critical to the Survival of the Species

Potential significant impacts on koala may occur if habitat that is considered to be critical to the survival of the species is adversely impacted. The *Conservation Advice for Phascolarctos cinereus (Koala)* (Department of Agriculture Water and the Environment 2022b) (Department of Agriculture Water and the Environment, 2022b) defines habitat critical to the survival of the species as "the areas that the species relies on to avoid or halt decline and promote the recovery of the species".

For an individual koala, resources necessary for foraging, survival, growth, reproduction and movement include access to sufficient quality food and shelter trees to meet their daily energetic requirements and reproductive needs, and a place to avoid predators. This includes forests or woodlands, roadside and rail vegetation and paddock trees, safe intervening ground matrix for travelling between trees and patches to forage and shelter and reproduce and access to vegetated corridors or paddock trees to facilitate movement between patches (Department of Agriculture Water and the Environment 2022b).

A population of koalas requires a sufficient total amount of resources within their habitat of adequate quality to support a viable biological population where mortality, survival and recruitment are balanced or recruitment is increasing to optimal carrying capacity and within the bounds of natural fluctuations (Department of Agriculture Water and the Environment 2022b).

The following factors may be considered when identifying habitat that is critical to the survival of a species:

- Whether the habitat is used during periods of stress (e.g. flood, drought or fire).
- Whether the habitat is used to meet essential life cycle requirements (e.g. foraging, breeding, nesting, roosting, social behaviour patterns or seed dispersal processes).
- The extent to which the habitat is used by important populations.
- Whether the habitat is necessary to maintain genetic diversity and long-term evolutionary development.
- Whether the habitat is necessary for use as corridors to allow the species to move freely between sites used to meet essential life cycle requirements.
- Whether the habitat is necessary to ensure the long-term future of the species or ecological community through reintroduction or re-colonisation.
- Any other way in which habitat may be critical to the survival of a listed threatened species or a listed threatened ecological community.

As per the species' Conservation advice (Department of Agriculture Water and the Environment 2022b), such areas, if identified, would be expected to include habitat occupied and habitat currently unoccupied, areas necessary for population processes and maintenance of genetic diversity and evolutionary potential, and areas required to accommodate future population increase, recolonisation, reintroduction, or as climate refugia.

The Study Area is not currently known to be occupied by koala, however potential habitat of varying quality is present. Habitat which represents climatically suitable refugia is associated with the riparian zones, as they are likely to be resilient to drying conditions and provide a cooler refuge during periods of bushfire and heatwaves. Breeding and foraging habitat may provide ancillary habitat functions such as shelter for thermoregulation and temporary refuge from predators. Based on this, all potential climate refugia and breeding and foraging habitat mapped in the Study Area is considered to comprise habitat critical to the survival of the species.

There is no data to support the notion that areas within the Study Area identified as dispersal habitat are relied on by the species to avoid or halt decline and promote the recovery of the species. These areas also include or are immediately adjacent to high threat pressures such as major vehicle movements (Bruce Highway) or habitation by dingo. As such, for the purposes of this assessment areas mapped as dispersal habitat are not considered to be critical to the survival of the species.

7.6.6 Potential Project Impacts and Key Mitigation Measures

Potential impacts on this species as a result of the Project include habitat loss and degradation, mortality from vehicle strike, operational noise masking mating calls and exacerbation of pest populations or predators such as dingo. Vegetation clearing required for the construction of the Project has the potential to result in direct impacts to a maximum of 0.6 ha of climate refugia habitat, 0.8 ha of potential breeding and foraging habitat and 10.6 ha of dispersal habitat. Although a one-off event, the loss of habitat is expected to be the impact with the greatest potential consequences.

Although habitat fragmentation is a known threat to the species, it is not anticipated that impacts from the Project would result in isolation of koala populations due to habitat fragmentation. This is due to the avoidance of large remnant areas in the north-east, and that impacts to dispersal habitat are likely overstated, with habitat other spanned over (Route A) or reinstated (Route B and Route C). Connectivity from breeding and foraging habitat to adjacent protected areas beyond the Study Area will be maintained and the extent of clearing would not result in a barrier to movement for the species.

The severity of operational noise impact to koalas is expected to be low, noting the separation of the BESS area from existing large habitat patches in the north-east.

In addition to the general mitigation and management measures outlined in **Section 6.2.2** which include pest monitoring, the following species-specific mitigation measures will be implemented:

- Pre-clearance surveys will include canopy searches for koalas. If a koala is located during pre-clearance surveys or during clearing activities:
    - The individual must not be forcibly relocated.
    - Any tree which houses a koala as well as any tree with a crown that overlaps that tree will not be cleared until the koala vacates the tree on its own volition.
    - Allow a clearing buffer surrounding the tree, equal to the height of the tree or deemed suitable by the fauna spotter-catcher.
    - Any injured koala (and fauna in general) should be transported to a vet or recognised wildlife carer.

- Requirements for koalas subject to handling to be examined and if suspected of Chlamydia infection will be taken to a predesignated veterinarian/wildlife care facility for treatment prior to release.
- Clearing must be carried out in a way that ensures any koala present has time to move out of the clearing site without human intervention.
- Speed limit restrictions (40 km/h) will be enforced on private property during construction and operation to minimise potential vehicle strike risk to the species.
- In the unlikely event that a koala is killed as a result of Project activities, DCCEEW will be notified within a maximum period of 2 business days.

7.6.7 Significant Impact Assessment

The significant impact assessment for the species is present in **Table 7.13** below. This assessment considers the latest species information presented in the *Conservation Advice* (Department of Agriculture Water and the Environment 2022b), *National Recovery Plan* (Department of Agriculture Water and the Environment 2022c) and recent Referral Guidelines.

In summary, the assessment found that the Project is **unlikely to result in a significant impact on koala**.

Table 7.13 Significant Impact Assessment – Koala

Evaluation Criteria	Response
Lead to a long-term decrease in the size of a population	**Unlikely.** The species was not recorded within the Study Area. A maximum of 0.8 ha of potential breeding and foraging habitat, 0.6 ha of potential climate refugia habitat and 10.6 ha of dispersal habitat will be potentially directly impacted by the Project. Potential habitat for koala within the development footprint is not considered high quality due to the ongoing disturbance from cattle grazing, weeds and pests. Potential habitat associated with the non-remnant vegetation communities (dispersal habitat) especially, is highly disturbed and in places contains a low abundance of koala food trees. Apart from the BESS area which will be fenced, impacts to dispersal habitat are likely overstated, with transmission lines in Route A spanning over, and maintaining the function of this habitat type. Within the wider region, potential habitat occurs extensively and likely include areas of higher quality particularly in protected areas such as the nearby State Forests. Large habitat areas in the north-east of the Study Area will be avoided. Based on this, the extent of habitat that will remain following the construction of the Project is of the magnitude and quality to support a population. Indirect impacts on the species as a result of the Project are anticipated to be limited, as the Project is unlikely to exacerbate predatory pest populations or vehicle strikes beyond existing levels. Nonetheless, koala specific management measures are also proposed and will be captured in Project management plans. Given the avoidance of large, connected habitat and prioritisation of modified vegetation, as well as the implementation of mitigation measures and Project management plans, a long-term decrease in the size of a population is unlikely to result from the Project.

Evaluation Criteria	Response
Reduce the area of occupancy of the species	**Unlikely.** The area of occupancy for the koala is estimated at 19,428 km^2 and is contracting. It is noted that the area of occupancy may be potentially overstated given the low resolution in the mapping methodology used by the Commonwealth (2 km x 2 km grid). The koala is widespread across Queensland and the Study Area is not located near the limit of the species distribution. Although the Project would result in the potential maximum removal of up to 12.0 ha of habitat, movement between patches of breeding and foraging habitat within and beyond the Study Area will be maintained. As such, the quantum of potential habitat that will remain is sufficient to continue to maintain the current population. Based on the above, the Project activities are considered unlikely to materially reduce the availability or quality of habitat for the species to the extent that the area of occupancy of a population would be reduced.
Fragment an existing population into two or more populations	**Unlikely.** The species is considered highly mobile and known to readily disperse large distances including across cleared areas. Suitable habitat within the Study Area generally has moderate to high levels of fragmentation as a result of historical clearing and ongoing agricultural practices. Where potential habitat is associated with modified vegetation, existing fragmentation impacts are more pronounced, and the canopy cover overall is notably lower. Breeding and foraging habitat within the north-east of the Study Area (RE 12.11.6) does however have a relatively high degree of connectivity to adjacent protected areas, and the Project will avoid direct impacts on this habitat. The use of existing cleared areas has been maximised, and the function of these areas (dispersal habitat) will continue to be maintained, with transmission lines to span over these areas (Route A). The BESS area will be fenced and present a local barrier to koala, however movement in all directions around the BESS footprint will be possible (via retention of road easement vegetation, waterway vegetation and existing dispersal habitat to the north and east). Based on the above, the Project is considered unlikely to present significant barriers to the species local movement to the extent that it fragments a population into two or more populations.
Adversely affect habitat critical to the survival of a species	**Unlikely.** Climate refugia and breeding and foraging habitat mapped within the Study Area may comprise habitat critical to the survival of the species. Climate refugia habitat is likely to be resilient during drying condition and breeding and foraging habitat may provide ancillary habitat functions. Based on the three design options, a maximum 0.6 ha of climate refugia habitat would be removed. The avoidance of large habitat patches has been prioritised by the Project. The final area of impact likely to reduce through the detailed design process and micro-siting. The Project will not lead to the further degradation of retained habitat, as potential indirect impacts such as altered fire regimes, edge effects, weeds and pests will be actively managed via Project management plans. The magnitude of habitat removal required for the Project is unlikely to be considered an 'adverse effect' on habitat critical as per the Conservation Advice.

Evaluation Criteria	Response
Disrupt the breeding cycle of a population	**Unlikely**. Male koalas are known to disperse large distances during the breeding season in search of a mate, and dispersal will not be hindered by the Project. Koalas are nocturnal and mating calls generally occur at night when construction noise would be minimal. The severity of operational noise impact to koalas is expected to be low, noting the separation of the BESS area from existing large breeding and foraging habitat patches in the north-east. As the species does not have specific breeding requirements, all potential habitat may be suitable for breeding and large areas will be retained following construction of the Project. Potential habitat degradation through indirect impacts will be actively managed through the Project management plans. Based on this information, the Project is unlikely to disrupt the breeding cycle of a population.
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	**Unlikely**. The species has very broad habitat requirements and can inhabit vegetation in varying condition, including modified vegetation areas. Habitat that may be used preferentially for climate refuge (eucalypt woodland on alluvial soils) has been largely avoided by the Project. A maximum of 0.8 ha of potential breeding and foraging habitat, 0.6 ha of potential climate refugia habitat and 10.6 ha of dispersal habitat will be potentially directly impacted by the Project. The impacts to dispersal habitat are unlikely to prevent dispersal following construction, with the majority of habitat to remain available in its current modified form. The largest, highest quality habitat patches have been avoided. This retained habitat is anticipated to be of sufficient size and quality to support any individuals if present. The Project will not result in degradation of retained habitat, as potential impacts such as weed incursion will be actively managed the Project management plans. As already described, habitat fragmentation impacts have been minimised through considered design and siting of the Disturbance Footprint. The use of existing cleared areas has been maximised and no patches will become more isolated than they currently area. As such, it is unlikely that the Project will alter habitat to the extent where the species is likely to decline.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	**Unlikely.** Invasive fauna species are likely to occur within the Study Area, such as wild dogs. Suitable habitat is lowly to moderately connected, existing conduits for movement do occur comprising cleared areas for tracks, roads, fence lines and cattle grazing areas. Based on this, it is considered unlikely that clearing required for construction of the Project will significantly exacerbate the movement of exotic predators. The Project will employ best practice control methods for weeds and pests and is unlikely to introduce or exacerbate weeds or pests beyond existing levels.
Introduce disease that may cause the species to decline	**Unlikely**. Chlamydia and Koala Retrovirus (KoRV) are known threats to the species. Project works are unlikely to spread disease; nonetheless, best practice biosecurity measures will be implemented through the Project management plans. Should an unwell koala be identified during clearing works, it will be handled appropriately by a qualified spotter catcher and taken to a predesignated veterinarian/wildlife care facility for treatment prior to release. Based on the above, it is unlikely the Project will introduce disease that may cause the species to decline.

Evaluation Criteria	Response
Interfere substantially with the recovery of the species	**Unlikely.** A National Recovery Plan for the Koala was published in 2022. Four main objectives are detailed: • Stabilise and then increase the area of occupancy and size of populations that are declining. • Maintain or increase the area of occupancy and size of populations that are stable. • Metapopulation processes are maintained or improved. • Partners, communities and individuals have a greater role and capability in koala monitoring, conservation and management. Several threatening processes have increased in the region in recent decades which may have halted or slowed recovery including road traffic, wild dog populations, bushfires and clearing for agricultural purposes. The species was not recorded within the Study Area. If present, only a small, low - density population of the species is likely to inhabit the Study Area. Habitat for koala occurs throughout the Study Area and is not considered unique or high quality due to the ongoing disturbance from cattle grazing, weeds and pests. Habitat associated with the non-remnant vegetation communities especially, is highly disturbed and in places contains a low abundance of koala food trees. Within the wider region, habitat is likely to occur extensively and include areas of higher quality particularly in protected areas such as the nearby State Forests. The extent of habitat that would remain following the construction of the Project is of the magnitude and quality to support a population, if one was to occur. Noting this, any population present in the region is expected to continue to persist and the quantum and quality of habitat which would be removed as a result of the Project would not be sufficient to interfere with the species' recovery.

7.7 Latham's Snipe (*Gallinago hardwickii*)

7.7.1 Status under the EPBC Act

Latham's snipe is listed as Vulnerable and Migratory under the EPBC Act.

7.7.2 Distribution and Habitat Requirements

Latham's snipe is a non-breeding visitor to the southeastern region of Australia and migrates through the northern part of the country. Its presence has been documented along Australia's east coast, stretching from Cape York Peninsula to southeastern South Australia. This includes areas such as the Adelaide plains, the Mount Lofty Ranges, and the Eyre Peninsula (Department of Climate Change Energy the Environment and Water 2024).

The bird's range extends inland over the eastern tablelands in southeastern Queensland and occasionally reaches as far north as Rockhampton and as far west as the Great Dividing Range in New South Wales. The species is prevalent in Tasmania and is found in all regions of Victoria, with the exception of the northwest. Most birds spend the non-breeding period at sites located south of the Richmond River in New South Wales. The species is occasionally recorded at sites located to the west of the core range, including northwestern and southwestern Queensland, northwestern New South Wales, mid-northern South Australia, the Northern Territory, and Western Australia (Department of Climate Change Energy the Environment and Water 2024).

In terms of foraging habitat and diet, Latham's snipe typically feeds in soft mudflats or shallow water, primarily at night, early morning, or evening. The species is omnivorous, consuming seeds and other plant material, primarily from families such as *Cyperaceae, Poaceae, Juncaceae, Polygonaceae, Ranunculaceae*, and *Fabaceae*. It also feeds on invertebrates, including insects (mainly flies and beetles), earthworms, spiders, and occasionally molluscs, isopods, and centipedes. The species feeds by thrusting its long bill into mud with an up and down 'sewing machine' action (Department of Climate Change Energy the Environment and Water 2024).

As for roosting habitat, Latham's snipe can roost individually or in groups. They take shelter during the day in small wetlands, including urban water bodies and saltmarshes, as well as creek edges, where there is adequate shallow flooded or inundated substrate. They also use crops and pasture for roosting. They are mostly found among dense cover comprising sedges, grasses, lignum, reeds, and rushes. The bird tends to disperse after dusk to forage over larger areas (Department of Climate Change Energy the Environment and Water 2024).

Regarding breeding habitat, Latham's snipes breed in Hokkaido and highland areas of Honshu in Japan, and in Sakhalin and the nearby Kuril Islands of far eastern Russia. Breeding occurs in a variety of grassland habitats including meadowlands, croplands, dry reed and sedge fields, clearings and edges of woodland, and low-density urban fringes (Department of Climate Change Energy the Environment and Water 2024).

7.7.3 Threats

The main identified threats to the species have been summarised in the species' Conservation Advice (Department of Climate Change Energy the Environment and Water 2024). These include:

- Habitat loss: Particularly relating to clearing for residential and commercial developments. Vegetation clearing for agricultural purposes (increased livestock feed) as well as for various small-scale logging operations has been undertaken throughout the Study Area and may continue to occur within some land parcels.
- Habitat degradation: Exacerbated by overgrazing of domestic livestock, exotic species (i.e. European rabbit (*Oryctolagus cuniculus*) and native herbivores. Impacts from grazing species such as domestic livestock, kangaroos and invasive herbivores (primarily rabbits) threatens the extent and productivity of foraging habitat for the species and impedes regeneration of native vegetation.
- Climate change: Increased temperature as a result of a changing climate increases the frequency and intensity of extreme weather events which may threaten this species and its habitat. The Project region has experienced recent heatwaves, drought conditions and bushfires and increasing frequency and intensity of these events would continue to threaten the species.
- Altered fire regimes: Alteration of fire regimes may lead to changes in composition and/or structure of vegetation, increased weed invasion following fire, reduction in low, vegetation and reduction in invertebrate abundance. Fire continues to be an ongoing impact to vegetation communities in the Project region.
- Fox and cat predation: Modelling predicts that species which nest and forage close to the ground are susceptible to predation by these species.

7.7.4 Occurrence and Potential Habitat

This species was not recorded within the Study Area during the field surveys. There is a record approximately 8 km to the west of the Study Area (Atlas of Living Australia 2024) from 2023. This record occurs adjacent a lacustrine wetland/large farm dam associated with Bucandy Creek. No other records occur within 20 km of the Study Area.

Wetlands within the Study Area, comprising farm dams and highly disturbed ponds along drainage lines, were typically dominated by exotic pasture species and scattered mature eucalypts around the edge. Native reed beds fringed the eastern side of the dam and water lilies (Genus *Nymphaea*) were present within the farm dam. Wetlands within the Study Area may provide marginal sheltering opportunities for the species.

The extent of modelled habitat within the Study Area is detailed in **Table 7.14.** Potential habitat for this species shown in **Figure 10.7**.

Table 7.14 Habitat Extent and Justification for Latham's Snipe

Habitat Criteria	Mapping Justification	Area (ha)	
		Within Study Area	Impact Area (Worst-case Scenario)
Roosting and Foraging			
Roosting and foraging habitat includes open, freshwater wetlands with low, dense vegetation such as swamps, flooded grasslands or heathlands, around bogs and other water bodies. Foraging occurs at night where they disperse to feed in nearby wet paddocks, ditches and other open flooded areas. Foraging habitats are characterised by areas of mud (either exposed or beneath a very shallow covering of water).	Suitable wetland habitat (including agricultural dams) where suitable low, dense vegetation skirts the waterbody and muddy margins are present or likely temporally available under suitable conditions (i.e. muddy/soil substrate with shallow sloping banks). Remnant 12.3.3 and non-remnant vegetation. Areas of 12.3.3 where standing water is absent were excluded.	5.2	1.1
	Total	**5.2**	**1.1**

7.7.5 Important Populations

Important populations of the Latham's snipe are not defined in the Conservation Advice (Department of Climate Change Energy the Environment and Water 2024) and no recovery plan exists at this time. As such the generic definition for important populations in the *Significant Impact Guidelines 1.1 – Matters of National Environmental Significance* (Department of the Environment 2013b) has been applied. This document defines an 'important population' as a population that is necessary for a species' long-term survival and recovery. This may 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.
- Populations that are near the limit of the species range.

A population of this species is not known to occur within the Study Area or surrounding region, however, this species occurrence is highly dependent on availability of suitable wetlands, of which then Study Area and Project region may provide during optimal seasonal conditions.

An important population of this species is unlikely to occupy habitats within the Study Area due to the absence or infrequent use of habitats by this species. In addition, the Study Area does not provide the quality or extent of habitat that would concentrate a population of this species where it would constitute a key source population for breeding or dispersal nor would any potentially occurring population constitute a population that are necessary for maintaining genetic diversity.

7.7.6 Ecologically Significant Proportion of the Population

An ecologically significant proportion of the population of Latham's snipe has not been defined in the species' Conservation Advice (Department of Climate Change Energy the Environment and Water 2024). However, an area is considered to be important for the species if it supports at least 18 individuals. Therefore, this number has been adopted as the threshold for ecological significance. This species was not detected within the Study Area, and database records do not identify this species within the Study Area. Further, habitat within the Study Area is considered marginal and is unlikely to support a population of this size given the infrequency of this species congregating in such numbers.

7.7.7 Habitat Critical to the Survival of the Species

Based on the definition provided in the species' conservation advice (Department of Climate Change Energy the Environment and Water 2024), habitat critical to the survival of the Latham's snipe includes habitat which is necessary:

- For activities such as foraging, breeding, roosting, or dispersal.
- For the long-term maintenance of the species (including the maintenance of species essential to the survival of the Latham's snipe, such as macrobenthos).
- To maintain genetic diversity and long-term evolutionary development. Or,
- For the re-introduction of populations or recovery of the species.

While habitat has been mapped within the Study Area, these areas are considered marginal and would only be relied on by the species intermittently, or during times of severe drought when regional, more suitable low-lying wetlands are dry and fail to provide a foraging resource to the species. In addition, habitat mapped within the Study Area occurs at the edges of waterbodies that are used primarily for stock watering, and therefore support a moderate level of degradation by stock which feed on and trample low, fringing vegetation that are required by the species for refuge. Due to the high disturbance of the habitats and the typical lack of low vegetation cover around the waterbodies, the mapped habitat is not considered to be critical to the survival of the species.

7.7.8 Important Habitat

Latham's snipe typically disperse in small numbers across larger habitat areas (Department of Climate Change Energy the Environment and Water 2024). Important habitat for Latham's snipe occurs at sites that have previously been identified as internationally important for the species, or sites that:

- Support at least 18 individuals of the species (ecologically significant proportion of the population).
- Are naturally occurring open freshwater wetland with vegetation cover nearby (for example, tussock grasslands, sedges, lignum or reeds within 100 m of the wetland).

The conservation advice notes that it is difficult to determine which sites are most important for Latham's snipe in Australia due to difficulties associated with surveying for the species (Department of Climate Change Energy the Environment and Water 2024). However, six important sites (i.e. those with major populations) have been identified based on surveys in Victoria, Tasmania and South Australia. No important habitat sites have been identified in Queensland.

This species may use modified artificial habitats within the Study Area (i.e. farm dams and wetlands). Due to the high disturbance of the habitats (due to impacts from livestock watering and vegetation clearing) and the typical poor condition of low vegetation cover around the wetlands, the mapped habitat is not considered to be important habitat for the species.

7.7.9 Potential Project Impacts and Key Mitigation Measures

Under the worst-case scenario, a total of 1.1 ha of potential roosting and foraging habitat will be impacted for construction of the Project. However, as detailed above habitat within the Disturbance Footprint and the wider Study Area is unlikely to be relied upon by a population, given the marginal quality of habitat

The Project may result in a further decrease in habitat quality due to proliferation of pest and weed species. The Project may also result in alterations to the fire regime and there is a risk of increased bushfire resulting from the Project. These risks will be managed through a Project CEMP.

In addition to the general mitigation and management measures outlines in **Section 6.2.2,** the following species-specific mitigation measures will be implemented:

- Water extraction activities will not be undertaken from areas of potential habitat.
- In the unlikely event that a Latham's snipe is killed as a result of the Project, DCCEEW will be notified within a maximum period of two business days.

7.7.10 Significant Impact Assessment

The significant impact assessment for the species is present in **Table 7.15**. Latham's snipe is listed as Vulnerable and Migratory under the EPBC Act, however, only the Vulnerable criteria has been assessed. In summary, the assessment found that the Project is **unlikely to results in a significant impact on Latham's snipe.**

Table 7.15 Significant Impact Assessment: Latham's Snipe

Evaluation Criteria	Response
Lead to a long-term decrease in the size of an important population of a species	**Unlikely.** No individuals were recorded within the Study Area. Potential habitat for this species is mapped around waterbodies that may support intermittent roosting and foraging habitat among bank vegetation. These waterbodies comprise agricultural dams with varying degrees of degradation from livestock grazing and watering as can be seen from aerial imagery sources. Where the Study Area does support habitat for this species, it is considered marginal, likely only to be used during times be relied on by the species intermittently, or during times of severe drought when regional, more suitable low-lying wetlands are dry and fail to provide a foraging resource to the species. An important population of this species is unlikely to occupy habitats within the Study Area due to the absence or infrequent use of habitats by this species. In addition, the Study Area does not provide the quality or extent of habitat that would concentrate a population of this species where it would constitute a key source population for breeding or dispersal nor would any potentially occurring population constitute a population that are necessary for maintaining genetic diversity. A maximum of 1.1 ha of roosting and foraging habitat is proposed to be removed for the construction of the Project. This area is likely to be reduced through detailed design and micro-siting. It is anticipated that overhead lines will be able to span lower lying areas of suitable habitat. Given the above, it is considered unlikely that the Project will lead to a long-term decrease in the size of an important population of this species.
Reduce the area of occupancy of an important population	**Unlikely.** No individuals were recorded within the Study Area and it is considered unlikely that the Study Area would support an important population. The estimated area of occupancy for this species as provided in the species conservation advice (Department of Climate Change Energy the Environment and Water 2024) is 13,000 km^2. A maximum of 1.1 ha of roosting and foraging habitat is proposed to be removed for the construction of the Project. This area is likely to be reduced through detailed design and micro-siting. A maximum of 1.1 ha of roosting and foraging habitat is proposed to be removed for the construction of the Project. This area is likely to be reduced through detailed design and micro-siting. It is anticipated that overhead lines will be able to span lower lying areas of suitable habitat.
Fragment an existing important population into two or more populations	**Unlikely.** No individuals were recorded within the Study Area and it is considered unlikely that the Study Area would support an important population. The population of this species is not severely fragmented (Department of Climate Change Energy the Environment and Water 2024) given its ability to travel long distances by flight to productive foraging habitat. These areas are generally isolated within the landscape, existing as seasonally inundated wetlands throughout eastern Australia. While in Australia, the species moves between wetland habitats depending on resource availability and rainfall (Department of Climate Change Energy the Environment and Water 2024).

Evaluation Criteria	Response
	Regionally, the species is likely to move between large wetlands and waterbodies in response to rainfall and resource availability and may utilised habitat within the Study Area intermittently. The construction of the Project is unlikely to present a material barrier to this species movement on a local or regional scale the species has a high capacity for mobility and is capable of travelling long distances over unsuitable habitat in search of resources. In addition, any potentially occurring population of the species within the Study Area has been determined not to be an important population.
Adversely affect habitat critical to the survival of a species	**Unlikely.** Potential roosting and foraging habitat for Latham's snipe has been mapped within the Study Area in association with waterbodies which support the species habitat requirements. This habitat is not considered critical to the species survival given the marginal suitability of the habitat and the disturbance to low vegetation by livestock. While not considered habitat critical to the survival of the species, a maximum of 1.1 ha of roosting and foraging habitat is proposed to be impacted for the construction of the Project. This area will be minimised through the detailed design process and micro-siting. Indirect impacts such as erosion, weed incursion, contamination and water extraction have been identified based on Project activities. Indirect impacts will be avoided, minimised or mitigated based on actions that will be described in the Project's management plans. As such, in consideration of mapped habitat not being considered critical to the survival of the species and the instalment of environmental management plans, it is considered unlikely that the Project would adversely affect habitat critical to the survival of the species.
Disrupt the breeding cycle of an important population	**Unlikely.** No individuals were recorded within the Study Area and it is considered unlikely that the Study Area would support an important population. Latham's snipe breeds in Hokkaido, Japan and is a seasonal visitor to Australia during the warmer months of the year. No breeding activity occurs within Australia. The Study Area provides minimal and marginal roosting and foraging habitat which would not be directly impacted and as such, the Project would not result in a reduction of resources which could affect individuals' ability to make the return journey to breeding grounds. Therefore, the Project is unlikely to disrupt the breeding cycle of an important population of the species.
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	**Unlikely.** A maximum of 1.1 ha of roosting and foraging habitat is proposed to be impacted for the construction of the Project. This area is likely to be reduced through detailed design and micro-siting. This habitat is considered marginal and only likely to be used by the species intermittently. It is recognised that potential indirect impacts on foraging and roosting habitat may occur as a result of the Project including: • Introduction or proliferation of pest and weed species resulting in degradation of habitat. • Alterations to fire regimes and potential for increased accidental bushfire that may result from construction and/or operation. • Soil exposure resulting in an increased risk of erosion and sedimentation of water bodies, reducing water quality and degrading aquatic habitats. • Increased risk of contamination of water bodies associated with activities such as refueling or storage of chemicals. • Extraction of water from existing constructed wetlands and farm dams for Project activities degraded or reducing the availability of potential habitat. Increased activity at these locations may result in temporary avoidance.

Evaluation Criteria	Response
	• Periodic bursts of elevated noise levels (i.e. from blasting) may startle and disorientate individuals within close proximity. These impacts will be actively managed via the Project's management plans. The implementation of these plans is considered sufficient to manage the potential indirect impacts to this species from the Project and as such, the Project is unlikely to modify, destroy, remove or 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	**Unlikely.** Predation by feral cat and red fox is a recognised threat to Latham's snipe as this species forages on the ground. These animals are assumed to be present within the Study Area. The occurrence and proliferation of invasive species within the Study Area will be managed via a Project CEMP which will employ best practice control methods for pests. Given the implementation of a CEMP, the impact of invasive species on Latham's snipe is unlikely to be exacerbated.
Introduce disease that may cause the species to decline	**Unlikely.** Disease has not been identified as a threat to the species. Nevertheless, the Project will follow appropriate biosecurity protocols; therefore, introduction of a disease is unlikely.
Interfere substantially with the recovery of the species	**Unlikely.** The species' Conservation Advice (Department of Climate Change Energy the Environment and Water 2024) details primary conservation outcomes for the species designed to evaluate the recovery of the species. Key conservation outcomes relevant to the Project include: • Latham's snipe populations are stable or increasing within the Australian jurisdiction. • Ensure no further loss of habitat critical to the survival of Latham's snipe throughout Australia (including habitat predicted to become habitat critical to the survival in the future because of climate change). • Protect and manage important feeding and roosting areas in Australia and staging and breeding areas throughout the East Asian–- Australasian Flyway for Latham's snipe. A maximum of 1.1 ha of roosting and foraging habitat is proposed to be impacted for the construction of the Project. This area is likely to be reduced through detailed design and micro-siting. This habitat is considered marginal and only likely to be used by the species intermittently and is not considered habitat critical to the survival of the species. Indirect impacts on suitable habitat may occur, although considered unlikely to be substantial based on the implementation of Project management plans. Potential impacts from the Project are unlikely to interfere with the stated conservation outcomes and as such, the Project is unlikely to interfere substantially with the recovery of this species.

7.8 Northern quoll (*Dasyurus hallucatus*)

7.8.1 Status under the EPBC Act

The northern quoll is listed as Endangered under the EPBC Act.

7.8.2 Distribution and Habitat Requirements

The distribution of the northern quoll is discontinuous across northern Australia with core populations in rocky and/or high rainfall areas (Hill and Ward 2010). In Queensland, the species is known to occur as far south as Brisbane and Toowoomba, as far north as Cape York and extends as far west into central Queensland to the Carnarvon Range National Park. The species' distribution is highly fragmented in Queensland and surveys by (Woinarski et al. 2008) indicate severe reductions from the species' former distribution.

The northern quoll occupies a diversity of habitats including rocky areas, eucalypt forest and woodlands, rainforests, sandy lowlands and beaches, shrubland, grasslands and desert. Habitat generally encompasses some form of rocky area for denning purposes with surrounding vegetated habitats used for foraging and dispersal. Eucalypt forest or woodland habitats usually have a high structural diversity containing large diameter trees, termite mounds or hollow logs for denning purposes. A study of northern quolls in Queensland found that the species is "more likely to be present in high relief areas that have shallower soils, greater cover of boulders, less fire impact and were closer to permanent water" (Woinarski et al. 2008).

The *EPBC Act referral guidelines for the northern quoll Dasyurus hallucatus* (Department of the Environment 2016) states that, "on current knowledge, foraging or dispersal habitat is recognised to be any land comprising predominantly native vegetation in the immediate area (i.e. within 1 km) of shelter habitat, quoll records or land comprising predominately native vegetation that is connected to shelter habitat within the range of the species".

Northern quolls are opportunistic omnivores, which consume a wide range of prey items including invertebrates, carrion, fruit nectar, mammals, birds, reptiles and frogs. Cane toads are a food item of particular concern because ingestion of their toxins is a major cause of decline in northern quoll populations.

7.8.3 Threats

Key threats to the northern quoll include the loss, degradation and fragmentation of habitat, inappropriate fire regimes, and lethal toxic ingestion caused by cane toads – a key threatening process listed under the EPBC Act (Department of the Environment 2022a). As per the species SPRAT profile, other recognised potential threats to the species include:

- Introduction of invasive species leading to increased competition, direct predation and habitat degradation (i.e. gamba grass, which may limit dispersal).
- Direct mortality as a result of vegetation clearing and traffic.
- Pastoralism, leading to altered fuel loads and fire regimes.
- Disease e.g. toxoplasmosis.

7.8.4 Occurrence and Potential Habitat

Northern quoll was not known from the Study Area, although a targeted trapping campaign was not completed given the relatively small area of interest and avoidance strategy taken by the Project. The nearest record is 30 km east of the Study Area from 2018, west of South Kolan. Additional records exist with 60–100 km north-west of the Study Area (Atlas of Living Australia 2024).

Suitable denning habitat is present in the north-eastern extent of the Study Area, comprising a large patch of remnant Eucalypt woodland. Other habitat within the Study Area is typically very small in size, lacked key denning microhabitat and disturbed from weeds and cattle access. These areas may support the species however are only considered suitable for foraging and/or dispersal for the reasons outlined.

The extent for northern quoll habitat within the Study Area is provided in **Table 7.16.**

Table 7.16 Habitat Extent and Justification for Northern Quoll

Habitat Criteria	Mapping Justification	Area (ha)	
		Within the Study Area	Impact Area (Worst-case Scenario)
Denning and Refuge			
Rocky habitats (such as major drainage lines or treed creek lines) and structurally diverse woodlands with moderate to high density of denning opportunities (i.e. large diameter trees, termite mounds, large hollow logs).	Remnant 12.11.6 where denning resources were confirmed.	29.3	-
Foraging			
Any land comprising predominantly native vegetation within 1 km of breeding and refuge habitat.	All remnant and regrowth vegetation communities within 1 km of shelter habitat (mapped within and surrounding the Study Area) were identified as foraging and dispersal habitat. Only remnant vegetation was mapped, comprising and 12.3.3 and 12.11.14.	13.7	1.0
Dispersal			
All land that provides a connective medium between denning and refuge and foraging habitat.	Non-remnant vegetation	71.5	10.6
	Total	**114.5**	**11.6**

7.8.5 Important Populations

As northern quoll is listed as Endangered under the EPBC, important populations aren't considered in the significant impact assessment. However, for additional context for determining habitat critical to the survival of the species, important populations are discussed below.

As stated in the *EPBC Act referral guideline for the endangered northern quoll Dasyurus hallucatus* (Department of the Environment 2016), populations important for the long-term survival of the species includes populations which are:

- High density quoll populations, which occur in refuge-rich habitat critical to the survival of the species, including where cane toads are present.
- Occurring in habitat that is free of cane toads and unlikely to support cane toads upon arrival i.e. granite habitats in WA, populations surrounded by desert and without permanent water.
- Subject to ongoing conservation or research actions i.e., populations being monitored by government agencies or universities or subject to reintroductions or translocations.

For the purposes of this assessment, populations important for the long-term survival of the species are considered the same as important populations conceptually.

No individuals have been recorded within the Study Area or within 30 km of the Study Area. However, using a conservative approach of assessment, if a population was recorded within the Study Area, it would be considered an important population.

7.8.6 Habitat Critical to the Survival of the Species

The *EPBC Act referral guideline for the endangered northern quoll Dasyurus hallucatus* (Department of the Environment 2016) defines habitat critical to the survival of the species as habitat within the modelled distribution of the species which provides shelter for breeding, refuge from fire or predation and potential poisoning from cane toads. As stated in the Referral Guideline, critical habitat usually occurs in the form of:

- Off-shore islands where the northern quoll is known to exist.
- Rocky habitats such as ranges, escarpments, mesas, gorges, breakaways, boulder fields, major drainage lines or treed creek lines.
- Structurally diverse woodland or forest areas containing large diameter trees, termite mounds or hollow logs.
- Dispersal and foraging habitat associated with or connecting 'populations important for the long-term survival of the northern quoll' is also considered critical habitat.

Modelled denning and refuge habitat (rocky gullies and treed creek lines, structurally diverse woodlands with denning resources) may constitute habitat critical to the survival of the species through the provision of shelter for breeding. Based on the above definitions the modelled habitat is conservatively considered as habitat critical to the survival of the species. A low-density population is anticipated, due to the existing condition of woodland, fragmentation and disturbance to habitat in the ground layer as a result of cattle access.

7.8.7 Potential Project Impacts and Key Mitigation Measures

Potential impacts on this species as a result of the Project include habitat loss and fragmentation, direct mortality, altered foraging behaviour and exacerbation of pest populations including cane toad and feral predators. Vegetation clearing required for the construction of the Project will potentially result in a maximum direct impact to 1.0 ha of foraging and 10.6 ha of dispersal habitat.

In addition to the general mitigation and management measures outlined in **Section 6.2.2** which include pest monitoring and sediment and erosion control, the following species-specific mitigation measures will be implemented:

- Micro-siting of Project infrastructure will aim to retain potential denning habitat features including large hollow logs and large boulders piles.
- Where pits, voids or trenches are required, include appropriate cover to prevent extended water retention in these spaces and/or subsequent breeding opportunities for cane toads.
- Construction areas that may inadvertently provide potential denning opportunities through stockpiling of materials will have fauna exclusion fencing installed around the perimeter.
- In the event that a northern quoll is killed as a result of Project activities, DCCEEW will be notified within a maximum period of 2 business days.

7.8.8 Significant Impact Assessment

An assessment against the *EPBC Act referral guideline for the endangered northern quoll Dasyurus hallucatus* (Department of the Environment 2016) is presented in **Table 7.17** below. This assessment considers the latest species information presented in the referral guidelines and the species SPRAT profile (last updated on 13 July 2017). In line with the *Significant Impact Guidelines 1.1 – MNES* (Department of the Environment 2013a), only the adverse impacts on the species that may arise as a result of the Project have been considered (and not potential beneficial impacts). In summary, the Project is **unlikely to result in a significant impact on northern quoll.**

Table 7.17 Significant Impact Assessment: Northern Quoll

Evaluation Criteria	Response
Result in the loss of habitat critical to the survival of the northern quoll	**Unlikely.** Suitable denning and refuge habitat mapped within the Study Area meets the definition of habitat critical to the survival of the species. A maximum of 11.6 ha of suitable habitat will be directly impacted via vegetation clearing, however of this area, none is denning and refuge and considered and therefore, critical habitat. This area of impact is expected to reduce as an outcome of the detailed design process and micro-siting. The area of suitable habitat proposed for removal is limited to the edge of a patch and it is likely this area will be avoided due to micro-siting. If the removal of potential shelter features is proposed, they will be relocated to retained habitat where possible. Due to small area of critical habitat proposed to be removed, as well as the proposed retention of shelter features, the Project is considered unlikely to result in the loss of habitat critical to the survival of northern quoll.

Evaluation Criteria	Response
Decrease the size of a population important for the long-term survival of the northern quoll and therefore interfere with the recovery of the species	**Unlikely.** Northern quoll was not recorded within the Study Area. If a population was present, it would be considered low-density and would not be considered an important population. A maximum of 11.6 ha of northern quoll habitat will be directly impacted for construction of the Project, including 1.0 ha suitable for foraging and 10.6 ha for dispersal. All denning and refuge habitat will be avoided by the Project. Suitable habitat within the Study Area is degraded due to the historical clearing for agricultural works and ongoing disturbance from cattle grazing, weeds and pests. Foraging and dispersal habitat has been subject to vegetation clearing and fragmentation exists. Denning and refuge habitat is generally connected to areas outside of the Study Area. Given the avoidance of this habitat, and the retention of dispersal habitat within the transmission line routes following development of the Project, this connectivity will largely be maintained following construction. Potential indirect impacts on the species as a result of the Project are expected to be limited but will be actively managed through the Project's management plans which will include specific measures for the northern quoll. Based on the above, the Project is unlikely to decrease the size of a population important for the long-term survival of northern quoll.
Introduce inappropriate fire regimes or grazing activities (i.e. increasing the risk of late dry season high intensity fires to the area) that substantially degrade habitat critical to the survival of the northern quoll or decrease the size of a population important for the long-term survival of the species.	**Unlikely.** Northern quoll was not recorded within the Study Area. If a population was present, it would be considered low-density. Although approximately 1.0 ha suitable for foraging and 10.6 ha suitable for dispersal will be impacted, large areas of suitable habitat, including denning and refuge habitat will remain and be of sufficient size to maintain a population, if present. Retained habitat will not be subject to further degradation as altered fire regimes, weed and pest incursion will be actively monitored or managed as required through Project management plans. Cattle grazing operations will continue, largely unchanged, once construction is completed, and as such, fuel loads are unlikely to be significantly altered from current levels. As such, it is unlikely that the Project will introduce inappropriate fire regimes or grazing activities that substantially degrade habitat critical or decrease the size of an important population.
Fragment a population important for the long-term survival into two or more populations	**Unlikely.** The northern quoll is highly mobile and may utilise open habitats such as grasslands while foraging or dispersing through the landscape. Suitable denning and refuge habitat within the Study Area has relatively high degree of connectivity to external areas, and this level of connectivity will not be impacted by the Project. Suitable foraging and dispersal habitat has been subject to historical vegetation clearing and is already disturbed and highly fragmented. Habitat fragmentation impacts have been considered in the design and siting of the Disturbance Footprint. The use of existing cleared areas has been maximised and no significant patch isolation will occur. During construction, increased vehicle activity and ground excavations may present temporary barriers to dispersing individuals. However, the risk of mortality as a result of entrapment and collision will be actively managed via the Project's management plans. Any open excavations will contain materials to aid evacuation (i.e. ramps, sticks, hessian sacks) and be checked at set times by a spotter catcher. These excavations would be temporary and only present in a small area within the site at any one time. Based on the above reasons, the Project is unlikely to present significant barriers to the existing population to the extent where it would become fragmented into two or more populations.

Evaluation Criteria	Response
Result in invasive species or increases of them that are harmful to the northern quoll becoming established in its habitat, namely cane toads, feral cats, red foxes or exotic grasses which increase fire risk.	**Unlikely.** Several invasive species are considered a recognised threat to northern quoll. Weeds may degrade habitat and exotic fauna species including feral cat, pig, wild dog and cattle may directly predate or compete with the northern quoll or spread disease. Cane toads in particular have known to cause significant local declines as ingestion usually results in death. Invasive species relevant to northern quoll, particularly weeds including exotic grasses and cane toads, were recorded throughout the field survey program and are likely to be well established in the Study Area and surrounds. Although suitable habitat is generally moderately to highly connected, existing conduits for movement do occur comprising cleared areas for tracks, fence lines and cattle grazing areas. Although the Project is unlikely to exacerbate invasive species levels beyond the current extent, the Project will employ best practice control methods for weeds and pests. To ensure cane toad breeding opportunities are not provided, where pits, voids or trenches are required they will be appropriately covered to prevent extended water retention in these spaces. Monitoring will ensure any pest population outbreaks are detected and managed as required.

7.9 White-throated needletail (*Hirundapus caudacutus*)

7.9.1 Status under the EPBC Act

White-throated needletail is listed as Vulnerable and Migratory under the EPBC Act.

7.9.2 Distribution and Habitat Requirements

White-throated needletail is a large species of swift which is a non-breeding migrant to Australia typically arriving in September and October. They most commonly migrate to Australia via the Torres Strait and disperse in a southerly direction along the eastern and western sides of the Great Divide in Qld and NSW. By November the species reaches the southern extent of its range in Australia dispersing throughout parts of Victoria, south-eastern South Australia and Tasmania (Higgins 1999). In the Northern Territory and Western Australia, they occur as vagrants. Estimates place the white-throated needletail's range in Australia at 126,200 km^2 (Higgins 1999).

White-throated needletails are an almost exclusively aerial species that are insectivorous, feeding on a variety of insect prey items during their migration in Australia across a range of habitat types and landscapes. Whilst in Australia the species is gregarious, observed flying in flocks of hundreds and even thousands of birds. They are occasionally observed individually or in smaller groups and can sometimes be found in mixed flocks with other insectivorous aerial species such as fork-tailed swift and fairy martins (*Hirundo ariel*). Australia-wide trends in mean number of white-throated needletails counted per flock have fallen from 164 (± 37.3) in 1951–1960 to 42 (± 1.7) in 2001–2010 (Tarburton 2014), and 36 (± 0.9) in 2011–2017 (Threatened Species Scientific Committee 2019).

They are regularly recorded above wooded areas including open forest and rainforest, though may also fly below the canopy between trees or in clearings. When flying above farmland, they are more often recorded above partly cleared pasture, plantations, or remnant vegetation at the edge of paddocks. According to the *Draft referral guideline for 14 birds listed as migratory species under the EPBC Act* (Department of the Environment, 2015) trees with dense canopy foliage and tree hollows are considered to provide roosting habitat for white-throated needletail, although the degree to which the species roosts in trees in potentially over-emphasised (Higgins 1999). Home ranges and territories are not maintained while the birds are in Australia.

7.9.3 Threats

It is thought that the greatest risk to the species globally is the logging of Taiga forests in Siberia (where most of the population breeds) (Threatened Species Scientific Committee 2019). However, threats within Australia include the loss of roosting sites, collisions with wind turbines, overhead wires, windows, and lighthouses, although the scale of impact to the species at a population level needs more research (Threatened Species Scientific Committee 2019). The use of pesticides (particularly organochlorines) either through a reduction in the abundance of invertebrates or through secondary poisoning through bioaccumulation may also be threatening this species, but further research is required (Threatened Species Scientific Committee 2019). Habitat loss is also impacting this species with the loss of forest and woodland habitats leading to the decline of roosting sites and reduction in invertebrate prey, globally.

7.9.4 Occurrence and Potential Habitat

White-throated needletail was not recorded within the Study Area during field surveys. However, the Study Area is situated within the migratory flight path along eastern Australia. There are numerous records (ALA) within 20 km of the Study Area. The closest is approximately 8 km north-west of the Study Area, from 2000.

Potential habitat for white-throated needletail within the Study Area consists of roosting, foraging and dispersal habitat. Given the species is a non-breeding migrant to Australia, no breeding habitat exists and will not be considered further.

The Study Area is dominated by woodland communities dominated by *Eucalyptus* species and non-remnant pasture which provide foraging habitat for the species. The Study Area forms a part of the Great Dividing Range. South-easterly trade winds generated by warm Pacific and Tasman maritime air create the potential for convection along the Great Dividing Range which is aided by orographic lift, the movement of air masses from lower to higher elevations over rising terrain (Spassiani 2020). During the summer months, easterly troughs along the inland side of the Great Dividing Range from a boundary between moist coastal air and the drier air that occurs inland producing a ridge of high pressure along the coast (Bureau of Meteorology 2010). The combination of montane topography and pressure systems along the Great Dividing Range produce updrafts and with it, foraging opportunities for white-throated needletail.

Given the preference for roosting on tall and/or hollow bearing trees at the top of ridges, as well as vertical tree trunks, rock faces and dense canopy foliage, white-throated needletail roosting habitat not considered present within the Study Area. Due to the species broad habitat requirements for foraging and dispersal and aerial nature, all areas of remnant vegetation are considered potential foraging and dispersal habitat.

The extent of modelled habitat within the Study Area is provided in **Table 7.18**. Potential habitat within the Study Area is displayed on **Figure 10.9**.

Table 7.18 Habitat Extent and Justification for White-throated needletail

Habitat Criteria	Mapping Justification	Area (ha)	
		Within the Study Area	Impact Area (Worst-case Scenario)
Foraging and Dispersal			
A range of habitats, although more often over wooded areas, where it is almost exclusively aerial.	All vegetation communities.	114.5	10.9
	Total	**114.5**	**10.9**

7.9.5 Important Populations

The SPRAT database does not identify 'important populations' of the white-throated needletail. However, it does state that while in Australia, all individual white-throated needletails are expected to comprise a single, continuous population. The total population for the species is estimated to be approximately 41,000 birds (Garnett, Baker, and Barry 2022). Therefore, if a population was recorded within the Study Area, it would be considered an important population.

7.9.6 Ecologically Significant Proportion of the Population

An ecologically significant proportion of a population for white-throated needletail is considered to be 410 (1% of the population) individuals with a significance internationally and 41 (0.1% of the population) individuals with a significance nationally (Department of the Environment 2015). While no individuals were recorded during field surveys, is it plausible that the airspace above the Study Area could be utilised by at least 41 individuals at one time due to the size and availability of habitat.

7.9.7 Habitat Critical to the Survival of the Species

Habitat critical to the survival of the species is not specifically defined for the species. However, the *Significant Impact Guidelines 1.1 – MNES* (Department of the Environment 2013b) define habitat critical to the survival of a species or ecological community as areas that are necessary:

- for activities such as foraging, breeding, roosting, or dispersal.
- for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators).
- to maintain genetic diversity and long-term evolutionary development.
- for the reintroduction of populations or recovery of the species or ecological community.

The species is a non-breeding migrant to Australia and is mostly aerial, foraging on the wing and moving with weather systems. Foraging habitat requirements are therefore very broad. The species may roost in tall, hollow bearing trees at the top of ridges, on vertical tree trunks, rock faces and dense canopy foliage (Department of the Environment 2015). The species is a non-breeding migrant to Australia and is mostly aerial, foraging on the wing and moving with weather systems. Foraging habitat requirements are therefore very broad. The species may roost in tall, hollow bearing trees at the top of ridges, on vertical tree trunks, rock faces and dense canopy foliage (Department of the Environment 2015).

Relative to foraging and dispersal habitat, roosting habitat is likely to be more restrictive. As roosting habitat is considered absent from the Study Area, no areas of modelled habitat are considered critical to the survival of the species.

7.9.8 Potential Project Impacts and Key Mitigation Measures

Under the worst-case scenario, a maximum of 10.9 ha of foraging and dispersal habitat will be cleared for the construction of the Project. Noting that the species is almost exclusively aerial, occurs above a range of habitat types and extensive habitat of similar value will remain, this loss of habitat is likely to represent only a minor impact to the species.

Potential impacts may also occur during operation of the Project. There is a risk of white-throated needletail mortality through collision with transmission line, as well as alteration to fire regimes and potential for increased accidental bushfire. In addition to the general mitigation and management measures outlined in **Section 6.2.2**, the following species-specific mitigation measures will be implemented:

- a single white-throated needletail death will be a reportable incident to DCCEEW and trigger further investigation regarding causation.

7.9.9 Significant Impact Assessment

The significant impact assessment for this species is presented in **Table 7.19** below. White-throated needletail is listed as Vulnerable and Migratory under the EPBC Act, however, only the Vulnerable criteria has been assessed. In summary, the assessment found that the Project is **unlikely to result in a significant impact to white-throated needletail.**

Table 7.199 Significant Impact Assessment: White-throated needletail

Evaluation Criteria	Response
Lead to a long-term decrease in the size of an important population of a species	**Unlikely.** While no individuals were recorded during field surveys, is it plausible that the airspace above the Study Area could be utilised by at least 41 individuals at one time due to the size and availability of habitat. It is a non-breeding migrant to eastern Australia where it occurs as transient populations, often influenced by prevailing weather conditions. The species generally arrives in Australia during spring and migrates along both sides of the Great Diving Range in Queensland and NSW to the southern parts of their range. While migrating, it is likely the species will inhabit the airspace above all remnant and non-remnant habitat types within the Study Area. While an important population may utilise the Study Area, as described above, the population is only present for a short period before it continues to move north or south. The quantum of habitat that will remain is likely to be sufficient to support the ecological requirements of a population. Under worst-case scenario, up to 10.9 ha of foraging and dispersal habitat will be directly impacted via vegetation clearing for construction of the Project. Relative to the area that will be cleared, large areas of suitable habitat will remain. Given the species aerial nature and broad requirements for roosting and foraging, it is unlikely this loss of habitat will result in a material change to the species' utilisation of the area. Indirect impacts to habitat retained within the Study Area will be mitigated through implementation of Project management plans. Based on the above information, it is considered unlikely that the Project will lead to a long-term decrease in the population.

Evaluation Criteria	Response
Reduce the area of occupancy of an important population	**Unlikely.** While in Australia the species has a large distribution that extends across eastern Australia. As per the species' Conservation Advice, the estimated area of occupancy within Australia is >18,000 km^2 however this may be overstated given the mapping methodology used by the Commonwealth (2 km x 2 km grid). Although the Project will result in a maximum loss of up to 10.9 ha of foraging and dispersal habitat, habitat is likely to only be utilised temporarily while on migration. The quantum of habitat that will remain is likely to be sufficient to support the ecological requirements of a population. Furthermore, areas of suitable habitat are likely to occur extensively within the wider region. Given the aerial nature and high mobility of the species, as well as the broad habitat requirements and habitat availability in the broader region, the Project is unlikely to reduce the area of occupancy of an important population.
Fragment an existing important population into two or more populations	**Unlikely.** While no individuals were recorded during field surveys, is it plausible that the airspace above the Study Area could be utilised by at least 41 individuals at one time due to the size and availability of habitat. The species is highly mobile, flying for thousands of kilometres during migration. It is known to occur within fragmented landscapes as well as over a range of habitat types. The Project has been strategically sited to maximise the use of cleared areas, minimising additional habitat fragmentation including within foraging and dispersal habitat, which may be preferred habitat while a population is present in the area. Given the aerial nature of the species, vegetation clearance associated with the Project is unlikely to reduce the dispersal opportunities for the species and will not result in the fragmentation of a population. As such, it is unlikely the Project will fragment an existing important population into two or more populations.
Adversely affect habitat critical to the survival of a species	**Unlikely.** Habitat mapped within the Study Area is not considered habitat critical to the survival of the species. While not considered habitat critical to the survival of the species, a maximum of 10.9 ha of foraging and dispersal habitat is proposed to be removed for the construction of the Project. This area will be minimised through the detailed design process and micro-siting. Indirect impacts such as erosion, weed incursion, contamination and water extraction have been identified based on Project activities. Indirect impacts will be avoided, minimised or mitigated based on actions that will be described in the Project's management plans. As such, in consideration of mapped habitat not being considered critical to the survival of the species and the instalment of environmental management plans, it is considered unlikely that the Project would adversely affect habitat critical to the survival of the species.
Disrupt the breeding cycle of an important population	**Unlikely.** The species is a non-breeding migrant to Australia. As the species forages predominantly on insects, foraging resources are widely available and are not a limitation to building sufficient energy reserves required for their return migration to breeding grounds. Therefore, the Project is unlikely to disrupt the breeding cycle of a population of the species.

Evaluation Criteria	Response
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	**Unlikely.** As described above, vegetation clearing required for construction of the Project will result in direct impacts to a maximum of 10.9 ha of foraging and dispersal habitat. However, the species is mostly aerial and likely to only utilise the potential habitat for a short period while on migration south or north. The species is known to utilise fragmented landscapes and will occur over cleared areas. Via micro-siting, hollow-bearing trees which may be important for roosting will be avoided where possible. The quantum of habitat, and habitat resources that will remain following construction is expected to be sufficient to support any population present in the future. Although some minor fragmentation impacts are anticipated, it is highly unlikely these will impact the species or limit its mobility. The Project will not lead to the further degradation of retained habitat, as potential indirect impacts such as altered fire regimes, edge effects, weeds and pests will be actively managed via Project management plans. Therefore, the Project is unlikely to modify, destroy, remove or 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	**Unlikely.** Invasive species are not known to be a threat to the white-throated needletail. Nonetheless, the Project will employ best practice control methods for weeds and pests and is unlikely to introduce or exacerbate weeds or pests beyond existing levels.
Introduce disease that may cause the species to decline	**Unlikely.** There are no known diseases affecting the species. The Project will employ best practice biosecurity protocols during construction and operation; therefore, introduction of a disease that may cause the species to decline is unlikely.
Interfere substantially with the recovery of the species	**Unlikely.** As identified on the SPRAT database, a recovery plan for the white-throated needletail is not required as the necessary information is provided in the species' Conservation Advice. This document identifies the primary conservation actions for the species as the protection of breeding habitat in East Asia and the protection of important habitat in Australia. There is currently no evidence to suggest that the species relies on the habitat of the Study Area while in Australia or during migration. No roosting locations were identified during field surveys, and no potential roosting habitat has been identified based on the topography of the site and presence of hollow-bearing trees. Following construction of the Project, large and extensive areas of potential roosting and foraging habitat will remain which are of sufficient scale to support any individuals that may occur. Given the above, it is unlikely that Project will interfere with recovery of the species.

7.10 Dunmall's snake (*Furina dunmalli*)

7.10.1 Status under the EPBC Act

Dunmall's snake is listed as Vulnerable under the EPBC Act.

7.10.2 Distribution and Habitat Requirements

The known distribution of Dunmall's snake extends across central and south-eastern Queensland, through to northern New South Wales near Ashford. It is mostly known however from the Brigalow Belt region in the south-eastern interior of Queensland. The species' distribution is highly fragmented, largely as a result of extensive historical cropping and grazing activities, especially within the Darling Downs region. As per the species' distribution map on SPRAT, the Study Area occurs within a 'may occur' area towards the southerly limit.

In Queensland, Dunmall's snake has been recorded at Archokoora, Oakey, Miles, Glenmorgan, Wallaville, Gladstone, Lake Broadwater, Exhibition Range National Park, roadside reserves between Inglewood and Texas, Rosedale, Yeppoon, Lake Broadwater Conservation Park and also Mount Archer (DoE 2014).
As described on SPRAT, records indicate the species prefers habitats between 200 and 500 m ASL.

The Dunmall's snake is very rare, difficult to detect and commonly misidentified. Stephenson and Schmida (2008) intensively surveyed for Dunmall's snake in likely habitat throughout the area bounded by Goondiwindi, Inglewood, Sundown National Park (Queensland) and Bonshaw (NSW) over many years and during different seasons without locating any individuals. Little is known about the species' ecological requirements, although captive specimens indicate that it is a nocturnal species, sheltering under fallen timber and in deep soil cracks and other cavities.

Dunmall's snake is found in open forest, particularly *Acacia harpophylla* forest and woodland growing on floodplains of deep-cracking black clay and clay loam soils (DoE 2014). Suitable habitats across its range include (Brigalow Belt Reptiles Workshop 2010):

- Forests and woodlands on black alluvial cracking clay and clay loams dominated by *Acacia harpophylla*, other wattles including *Acacia burrowii*, *Acacia deanei*, *Acacia leiocalyx*, *Callitris spp.* (native cypress) or *Allocasuarina luehmannii*.
- *Corymbia citriodora*, ironbark species including *Eucalyptus crebra* and *Eucalyptus melanophloia*, *Callitris glaucophylla* (white cypress pine) and *Allocasuarina luehmannii* open forest and woodland associations on sandstone derived soils.
- This species' SPRAT profile (last updated in 2011) references two records of the species in other environments, including the edge of dry vine scrub near Tarong Power Station, Queensland, and on hard ironstone country (Queensland Regional Ecosystem Land Zone 7) at Lake Broadwater near Dalby, Queensland. As per ALA however, all records at these locations are unconfirmed and pre-1995.

7.10.3 Threats

Key threats to Dunmall's snake include broadscale land clearing and habitat modification. Preferred habitat for the species has been extensively modified and continues to be threatened by other land use activities such as overgrazing by stock, modification for grazing and agriculture, crop production and urban development.

As per the species SPRAT profile, other recognised potential threats to the species include:

- Predation by feral animals.
- Possible drainage of swamps.
- Extensive clearing of habitat for development (mining and urban), agriculture or pasture improvement.
- Loss of fallen timber and ground litter, e.g. fuel reduction burns, firewood collection.
- Invasion of habitat by predatory animals and introduced weeds.

7.10.4 Occurrence and Potential Habitat

Dunmall's snake was not known from the Study Area. Surveys within the Study Area active searches during habitat assessments and 4 hours (comprising 2 ecologists) of spotlighting on foot and from a vehicle to locate the species. However, the species is highly cryptic and notoriously difficult to locate. The nearest ALA record occurs approximately 30 km north of the Study Area near Littabella Conservation Park. The record is considered confirmed, it has no date and has a spatial uncertainty of 1.8 km (Atlas of Living Australia 2024). Other records occur 82 km south (undated) and 90 km west (2013) of the Project (Atlas of Living Australia 2024).

The Study Area does not support preferred habitat for the species. *Acacia harpophylla* forests and woodlands and floodplains with cracking clay are absent from the Study Area. However, larger remnant tracks of Eucalypt woodland on sandstone soils (RE 12.11.6) are noted within the Study Area and may offer suitable habitat for this cryptic species. Soil cracks were not detected during the field survey program. Additionally, elevation within the Study Area only occurs to 150 m ASL, showing that the Study Area does not occur within the species preferred altitudinal range (200–500 m).

Given there are potential data deficiencies relating to the understanding of the species' ecology and habitat preferences, a conservative approach to the habitat modelling of the species was applied. Potential habitat within the Study Area was considered to comprise suitable woodland communities on land zone 11, where microhabitat was present including mats of leaf litter, rocks, logs, bark and woody debris. For the reasons outlined above, habitat is considered marginally suitable and unlikely to be of high value for the species.

The extent of Dunmall's snake habitat within the Study Area is provided in **Table 7.20.**

Table 7.20 Habitat Extent and Justification for Dunmall's snake

Habitat Criteria	Mapping Justification	Area (ha)	
		Within the Study Area (ha)	Impact Area (Worst-case Scenario)
Potential Habitat			
Remnant woodland communities with suitable microhabitat features (rocks, logs, bark and other coarse woody debris, and leaf litter occurring on Land Zone 11.	Remnant RE 12.11.6 where microhabitat features have been confirmed. Large patch of vegetation located in the north-eastern corner.	29.3	-

7.10.5 Important Populations

As per the Draft referral guidelines for the nationally listed Brigalow Belt reptiles (Department of Climate Change, Energy, the Environment and Water 2023a), the occurrence of known important habitat is a surrogate for an important population for this species.

Known important habitat for the Dunmall's snake is defined as 'suitable habitat within the known/likely-to occur distribution of the species (see Map 11 in Draft referral guidelines for the nationally listed Brigalow Belt reptiles) and any habitat corridors in between'. Suitable habitat for the Dunmall's snake is defined as 'Forests to woodlands within the range of the species (see Map 8 in Appendix A)'.

As described in **Section 7.10.4**, potential habitat has been conservatively identified within the Study Area due to the cryptic nature of the species. This habitat is considered marginal due to a range of factors. The Study Area is not located within the known/likely-to occur distribution of the species. Based on this, potential habitat supported by the Study Area is not considered 'important habitat. Important habitat is considered to be a surrogate for an important population for this species, therefore, no important population is likely to occur.

7.10.6 Habitat Critical to the Survival of the Species

There are no species-specific guidelines for determining habitat critical to the survival of the Dunmall's snake, and at present no recovery plan exists. As important habitat has been defined in the Draft Referral Guidelines for the Nationally Listed Brigalow Belt Reptiles (DSEWPC 2011), this terminology is considered to be interchangeable with 'habitat critical to the survival of the species'. Potential habitat has been mapped within the Study Area; however, it does not meet the definition of 'important habitat'.

7.10.7 Potential Project Impacts and Key Mitigation Measures

Potential impacts on this species as a result of the Project include habitat degradation and direct mortality. Potential habitat for the species will be avoided, minimising impacts to the species. Mitigation measures which are relevant to the species are provided below:

- Micro-siting of Project infrastructure will aim to retain terrestrial habitat features including fallen timber (logs), bark and other coarse woody debris. Habitat features that can be avoided will be demarcated. Where they cannot be retained in situ, features will be relocated to adjacent areas of suitable habitat if safe and practical (i.e. the relocation of habitat features must not cause unnecessary disturbance) and at the discretion of the fauna-spotter-catcher.

- Any open excavations will be checked trapped regularly.
- Clearing extents will be demarcated to avoid unintentional clearing outside of approved disturbance limits.
- In the event that a Dunmall's snake is killed as a result of Project activities, DCCEEW will be notified within a maximum period of 2 business days.

7.10.8 Significant Impact Assessment

The significant impact assessment for the species is presented in **Table 7.21** below. information provided in the SPRAT, the approved conservation advice (DoE 2014), and the Draft Referral Guidelines for the Nationally Listed Brigalow Belt Reptiles (DSEWPC 2011). In summary, the assessment found that the Project **is unlikely to have a significant impact** on the Dunmall's snake.

Table 7.21 Significant Impact Assessment: Dunmall's snake

Evaluation Criteria	Response
Lead to a long-term decrease in the size of an important population of a species	**Unlikely**. The species is conservatively considered to have the potential to occur, primarily due to the cryptic nature of the species and the presence of suitable habitat within the Study Area. Dunmall's snake was not detected during field surveys, despite a range of survey methods being employed, however it is acknowledged that the species is highly cryptic and difficult to locate. As detailed in the section above, the potential habitat present within the Study Area is only marginally suitable and does not meet the criteria to be considered 'important'. As important habitat is considered the surrogate for important populations, it is considered unlikely that an important population occurs. No individuals were located during field surveys and the closest known record is approximately 30 km north of the Study Area near Littabella Conservation Park. The record is considered confirmed, it has no date and has a spatial uncertainty of 1.8 km (Atlas of Living Australia 2024). Suitable habitat is contained within the northeastern corner of the Study Area, and it is likely this area will be avoided. Indirect impacts on the species as a result of the Project are expected to be limited. The Project is unlikely to increase or introduce predatory pests. Biosecurity management measures will be implemented as part of the CEMP which will include measures to ensure that pest populations are controlled and not exacerbated as a result of the Project. As such, it is unlikely that the Project will lead to a long-term decrease in the size of a population or important habitat.
Reduce the area of occupancy of an important population	**Unlikely**. No estimates of the area of occupancy are available for this species and very limited information is known about the extent of area that it inhabits. However, given the vast extent of similar habitat in the wider region, and the fact that that the habitat within the Study Area is already subject to a number of threatening processes, including historical clearing it is unlikely that the Project will reduce the area of occupancy for the species. Furthermore, any population which may occur within the Study Area is not considered to be an important population.
Fragment an existing important population into two or more populations	**Unlikely**. No individuals were recorded during field surveys. The dispersal capacity of the species is not well documented, however, given the size of the species, its cryptic nature, reliance on microhabitat and its susceptibility to predation by pest animals, it's unlikely that it would disperse across wide cleared areas.

Evaluation Criteria	Response
	Suitable habitat is contained within the northeastern corner of the Study Area, and this area will be avoided. The Draft Referral Guidelines for the Nationally Listed Brigalow Belt Reptiles (DSEWPC 2011) notes that "removal or degradation of habitat which is not considered to be important habitat for one or more Brigalow Belt reptiles" is a low risk of significant impact. Habitat within the Study Area is not considered to be important habitat, and an important population is unlikely to occur. As such the Project would not fragment an existing important population into two or more populations.
Adversely affect habitat critical to the survival of a species	**Unlikely**. In the context of the Brigalow Belt reptiles, the concept of important habitat is interchangeable with habitat critical to the survival of the species. The Draft Referral Guidelines for the Nationally Listed Brigalow Belt Reptiles (DSEWPC 2011) states that clearing four or more hectares of important habitat is considered to have a 'high risk of significant impact'. The Study Area does not contain important habitat as defined by the guidelines nor is habitat preferred by the species. Also, suitable habitat is contained within the northeastern corner of the Study Area, and this area will be avoided. Therefore, the Project is unlikely to adversely affect habitat critical to the survival of the species.
Disrupt the breeding cycle of an important population	**Unlikely**. There is very limited information about the life cycle or reproductive behaviour for this species other than it is known that they lay eggs rather than birth live young. Mitigations relevant to limiting disruption of the breeding cycle include limiting night works to the greatest extent possible. Although potential habitat may be marginally suitable for all of Dunmall's snake lifecycle requirements, including breeding, all potential habitat will be avoided. Therefore, the Project would not disrupt the breeding cycle of an important population.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	**Unlikely**. The potential habitat within the Study Area is not preferred by the species. The potential habitat within the Study Area does not occur at the species preferred altitudinal range. Habitat is not considered to be important for the species, and all potential habitat will be avoided. Therefore, the Project 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	**Unlikely**. Invasion by pest predatory animals (i.e. fox, cat, pig) has been identified as a key threat to the Dunmall's snake. Due to the high degree of existing disturbance within the Study Area, as well easy access to water resources (dams) and food sources, numerous introduced fauna species are likely to occur, including red fox (*Vulpes vulpes*) and feral cat (*Felis catus*). However, it is important to note that these species were not observed during the field survey. The Study Area is already fragmented with existing conduits for movement, and therefore it is considered unlikely that clearing required for construction of the Project will significantly exacerbate the movement of pest predators. Nevertheless, pest predators and weeds will be actively managed via the biosecurity protocols stipulated in the CEMP. As such it is unlikely that the Project would result in introduction or exacerbation of pests beyond existing levels.

Evaluation Criteria	Response
Introduce disease that may cause the species to decline	**Unlikely**. There are no known diseases affecting the species. Nonetheless, the Project will follow appropriate biosecurity protocols during both construction and operation; therefore, introduction of a disease is unlikely.
Interfere substantially with the recovery of the species	**Unlikely**. There is no recovery plan for this species. The Conservation Advice (DoE 2014) notes the priority actions applicable to the species are as follows: • Protect and monitor known populations and identify threats. • Develop a fire management strategy for known populations and habitat. • Minimise adverse impacts from land use including road widening and maintenance. • Identify and control threatening weeds in Dunmall's snake habitat. The Project will not affect a known population of the species, fire risk and weeds will be managed via the CEMP and adverse impacts from land clearing will be minimal given the low suitability of habitat for the species, and avoidance measures. It is therefore considered unlikely that the Project will substantially interfere with the recovery of the species.

7.11 Fork-tailed swift (*Apus pacificus*)

7.11.1 Status under the EPBC Act

The fork-tailed swift is listed as Migratory under the EPBC Act.

7.11.2 Distribution and Habitat Requirements

The fork-tailed swift is found across a range of habitats in Australia, from inland open plains to wooded areas, where it is exclusively aerial (Department of the Environment 2015). It spends most of the year at high altitudes, feeding on invertebrates carried aloft in the air column known as aerial plankton. The fork-tailed swift comes down, near to the ground during bad weather.

The species migrates to Australia during the warmer months of the year from breeding habitat in South-east Asia, where it nests in colonies on cliffs. No breeding habitat is known in Australia.

7.11.3 Occurrence and Potential Habitat

Despite the high likelihood of occurrence rating for this species, the fork-tailed swift was not identified during the field survey program. The air space above remnant woodlands, open pasture grassland and non-remnant vegetation communities all have the potential to be used by this species for foraging and dispersal within the Study Area. Desktop records occur in scattered locations within 20 km of the Study Area. The nearest record is from 2023 and is located approximately 12 km south of the Study Area.

The extent of suitable habitat within the Study Area, Development Corridor and Disturbance Footprint is detailed in **Table 7.22.** Potential habitat for the species within the Study Area is shown on **Figure 10.3.**

Table 7.22 Habitat Extent and Justification for Fork-tailed Swift

Habitat Criteria	Mapping Justification	Area (ha)	
		Within the Study Area	Impact Area (Worst-case Scenario)
Foraging and dispersal			
The air space above remnant and regrowth woodlands, open pasture grassland and non-remnant vegetation communities.	All remnant and non-remnant vegetation communities included.	114.5	10.9

7.11.4 Threats

In Australia, there are no significant threats to the fork-tailed swift. Potential threats may include habitat destruction and predation by feral animals; however, these threats are likely negligible due to the wide range of the species.

7.11.5 Important Habitat

Important habitat for fork-tailed swift is defined in the *Draft referral guideline for 14 birds listed as migratory species under the EPBC Act* (Department of the Environment, 2015) as a range of habitat, from inland open plains to wooded areas. This broadly includes all habitat within the Study Area, although utilisation of this habitat by the fork-tailed swift is limited to the airspace above the Study Area due to its exclusively aerial nature in Australia.

There are no defined area thresholds for important habitat which may constitute a significant impact to the species in the referral guidelines (Department of the Environment, 2015).

7.11.6 Ecologically Significant Proportion of the Population

The upper (1%) and lower (0.1%) thresholds for ecologically significant proportions of the population of this species are estimated at 1,000 and 100 respectively. The species is likely to be a seasonal visitor to the Study Area when in transit from breeding grounds in south-east Asia. The Study Area does not support breeding habitat for this species and where foraging and dispersal habitat is present, the species is exclusively aerial. The species is known to feed in flocks of up to 1,000 birds (Higgins 1999) and as such, if foraging conditions are suitable and birds are utilising the region, there is a potential for an ecologically significant proportion of the population to use the air space above the Study Area.

7.11.7 Potential Project Impacts and Key Mitigation Measures

Under the worst-case scenario, a total of 10.9 ha of foraging and dispersal habitat will be cleared for construction of the Project. However, as described above the species is almost exclusively aerial and highly mobile, constantly moving in search of food. Potential habitat within the Disturbance Footprint (or the wider Study Area) is unlikely to be regularly inhabited or necessary for supporting any part of the species lifecycle. This loss of habitat is likely to be inconsequential to the species success within Queensland. Further, the majority of areas of modified habitat will continue to function has modified habitat following the construction of the Project.

Potential impacts may also occur during operation of the Project. There is a risk of mortality through collision with transmission lines, as well as alteration to fire regimes and potential for increased accidental bushfire.

In addition to the general mitigation and management measures detailed in **Section 6.2**, the following species-specific mitigation measures will be implemented:

- In the unlikely event that fork-tailed swift death occurs as a result of the Project, DCCEEW will be notified within a maximum period of 2 business days.

7.11.8 Significant Impact Assessment

The significant impact assessment for fork-tailed swift is presented in **Table 7.23**. This assessment reflects the guidance for determining potential significant impacts provided in the *Draft referral guideline for 14 birds listed as migratory species under the EPBC Act* (Department of the Environment, 2015). In summary, the assessment found that the Project is **unlikely to result in a significant impact on fork-tailed swift.**

Table 7.23 Significant Impact Assessment: Fork-tailed swift

Evaluation Criteria	Response
Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species	**Unlikely.** Important habitat broadly includes all habitat within the Study Area, although utilisation of this habitat by the fork-tailed swift is limited to the airspace above the Study Area due to its exclusively aerial nature in Australia. Habitat within the Study Area has already been previously modified through historical clearing, weeds and pests. Impact area thresholds for the species are not outlined in the *Draft referral guidelines for 14 birds listed as migratory species under the EPBC Act*. Direct impacts to habitat have been minimised through considered siting and design of the Disturbance Footprint, ensuring the use of existing cleared areas has been maximised. No fragmentation impacts are anticipated due to the species high mobility capacity. The Project will not lead to the further degradation of retained habitat, as potential indirect impacts such as altered fire regimes, edge effects, weeds and pests will be actively managed via Project management plans. Based on the above, the Project is unlikely to substantially modify, destroy or isolate an area of important habitat.
Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species	**Unlikely.** There are no significant threats to the fork-tailed swift in Australia however potential threats include habitat destruction and predation by feral animals. Invasive species including feral animals, were recorded throughout the field survey program, however their impact is negligible given the species aerial nature. Across the Study Area, existing cleared areas created for fences, tracks, roads or for grazing purposes are likely to act as conduits for pest movement. Clearing for the Project is therefore unlikely to further facilitate the movement of any pests that occur. The Project will employ best practice control methods for weeds and pests and is unlikely to introduce or exacerbate weeds or pests beyond existing levels.

Evaluation Criteria	Response
Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species	**Unlikely.** It is possible an ecologically significant proportion of the national population may occur within the Study Area during the life of the Project. However, based on the species aerial nature and broad habitat requirements, it is unlikely the population will rely on the potential habitat within the Study Area for any part of its lifecycle. Utilisation will be limited to the migratory period (October to April), while flocks are completing local movements and/or foraging. Collision with transmission lines is a risk for Route A. A single fork-tailed swift death is considered a reportable incident to DCCEEW. Given the predicted size and wide-ranging distribution of the global population, it is considered unlikely that the Project will seriously disrupt the lifecycle of an ecologically significant proportion of the population.

7.12 Oriental cuckoo (*Cuculus optatus*)

7.12.1 Status under the EPBC Act

Oriental cuckoo is listed as Migratory under the EPBC Act.

7.12.2 Distribution and Habitat Requirements

Oriental cuckoo is a migratory species found in a range of vegetation types including rainforest, vine-thicket and wet sclerophyll forests. It also inhabits open communities such as *Casuarina*, *Acacia* and *Eucalyptus* woodland, favouring edges or ecotones between forest types (Department of the Environment, 2015). While on passage, this species has been recorded occupying plantations, cleared areas and gardens, typically at lower elevations (Birdlife International, 2022a).

A non-breeding migrant to Australia, oriental cuckoo transits to northern and eastern Australia in summer reaching as far south on the east coast as Bega, NSW (Birdlife International, 2022a).

7.12.3 Threats

There is very little information on the known threats associated with oriental cuckoo in Australia. Potential threats may include habitat destruction and the use of insecticides which can harm insect populations, reducing the species food source (BirdLife International 2024). However, these threats are likely negligible due to the widespread distribution of the species.

7.12.4 Occurrence and Potential Habitat

Oriental cuckoo was not recorded within the Study Area during the field survey program. This species was assessed as having a high likelihood of occurring within the Study Area due to the presence of suitable habitat and records within 20 km of the Study Area, including near Gin Gin (15 km south-east of the Study Area) (Atlas of Living Australia 2024). Although it is noted that many of these records are from the 1960s and 1970s.

While no breeding habitat occurs within the Australia, large tracts of eucalypts woodlands throughout the Study Area may be suitable for foraging and dispersal purposes.

The extent of suitable habitat within the Study Area is detailed in **Table 7.24**. Potential habitat for the species within the Study Area is shown on **Figure 10.3.**

Table 7.22 Habitat Extent and Justification for Oriental Cuckoo

Habitat Criteria	Mapping Justification	Area (ha)	
		Within the Study Area	Impact Area (Worst-case Scenario)
Foraging and Dispersal			
Remnant eucalypt woodlands	All vegetation communities are regarded as suitable, where they exist in remnant condition.	43.0	1.0

7.12.5 Important Habitat

Important habitat for oriental cuckoo is defined in the *Draft referral guideline for 14 birds listed as migratory species under the EPBC Act* (Department of the Environment 2015) as:

- Monsoonal rainforest.
- Vine thickets.
- Wet sclerophyll forest.
- Open Casuarina, Acacia or Eucalyptus woodlands.
- Edges or ecotones between habitat types.

All potential foraging and dispersal habitat in the Study Area meets this broad definition.

Based on the referral guidelines, the area thresholds for important habitat likely to result in a significant impact are 250,000 ha (international significance) and 25,000 ha (national significance).

7.12.6 Ecologically Significant Proportion of the Population

The upper (1%) and lower (0.1%) thresholds for ecologically significant proportions of the population of this species are estimated at 10,000 and 1,000 respectively. The species is likely to be a seasonal visitor to the Study Area when in transit between its northern hemisphere breeding habitat and northern and eastern Australia. This species may transit through the Study Area in low densities, utilising available foraging and dispersal habitat, given this, it is unlikely that it would support the ecological requirements of an ecologically significant proportion of the population.

7.12.7 Potential Project Impacts and Key Mitigation Measures

Under the worst-case scenario, a maximum of 1.0 ha of foraging and dispersal habitat will be cleared for construction of the Project. However, the species is not known to occur within the Study Area and tends to be solitary. Potential habitat is therefore likely to only be used by a small number of individuals, temporarily while completing local migrations. As described above, potential habitat is unlikely to support an ecologically significant proportion of the population.

In addition to the general mitigation and management measures outlined in **Section 6.2.2**, the following species-specific mitigation measures will be implemented:

- In the unlikely event that fork-tailed swift death occurs as a result of the Project, DCCEEW will be notified within a maximum period of 2 business days.

7.12.8 Significant Impact Assessment

A significant impact assessment for oriental cuckoo is provided in **Table 7.25** below. This assessment reflects the guidance for determining potential significant impacts provided in the *Draft referral guideline for 14 birds listed as migratory species under the EPBC Act* (Department of the Environment 2015). In summary, the assessment found that the Project is **unlikely to result in a significant impact on the oriental cuckoo**.

Table 7.23 Significant Impact Assessment: Oriental Cuckoo

Evaluation Criteria	Response
Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species	**Unlikely.** The species is a regular non-breeding migrant to Australia in small numbers. While in Australia, it migrates south for the autumn and north for the spring. Suitable habitat within the Disturbance Footprint (and the wider Study Area) has already been modified through historical clearing, weeds and pests. Nonetheless, potential habitat is considered to comprise important habitat. Table 4 of the *Draft referral guidelines for 14 birds listed as migratory species under the EPBC Act* (Department of the Environment 2015) indicates that a significant impact on oriental cuckoo may occur if 25,000 ha of important habitat is cleared. Up to 1.0 ha of foraging and dispersal habitat will be directly impacted via vegetation clearing for construction of the Project. This area is significantly below the clearing threshold. Habitat fragmentation impacts have been minimised through considered siting and design of the Disturbance Footprint, the majority of Project infrastructure has been sited within existing cleared areas and no patches are isolated. The Project will not lead to the further degradation of retained habitat, as potential indirect impacts such as altered fire regimes, edge effects, weeds and pests will be actively managed via Project management plans. Based on the above, the Project is unlikely to substantially modify, destroy or isolate an area of important habitat.
Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species	**No.** There is no evidence to suggest the oriental cuckoo is vulnerable to impacts relating to invasive species. Invasive species, particularly weeds, were recorded throughout the field surveys. The Project will employ best practice control methods for weeds and pests and is unlikely to introduce or exacerbate weeds or pests beyond existing levels.
Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species	**No.** Suitable habitat within the Disturbance Footprint is unlikely to support an ecologically significant proportion of the national or international population. The species tends to be solitary and has broad habitat requirements. It is unlikely the population will rely on the habitat within the Disturbance Footprint for any part of its lifecycle. Utilisation will be limited to the migratory period (November to March), while individuals or small flocks are completing local movements and/or foraging. Given the predicted size and wide-ranging distribution of the global population, it is considered unlikely that the Project will seriously disrupt the lifecycle of an ecologically significant proportion of the population.

8.0 Conclusion

The aim of this report was to provide a summary of the ecological values and potential impacts that may result from the Project to support the referral under the EPBC Act.

Using a combination of desktop information, field-validated data and extrapolated field survey results, the potential presence and habitat extent of MNES within the Study Area was determined. A total of twelve MNES were considered to have a moderate or high likelihood of occurring, including two flora species, eight fauna species and two migratory species.

Potential impacts on potentially occurring MNES were determined. Both direct and indirect impacts may occur as a result of the Project, with the greatest risk to MNES occurring during the construction phase, as a result of vegetation clearing and associated habitat loss. Significant impact assessments for these MNES were undertaken in accordance with the *Significant Impact Guidelines 1.1 – Matters of National Environmental Significance* (Department of the Environment 2013a). With consideration of the implementation of mitigation measures detailed in **Section 6.0**, the Significant impact assessments for these MNES were undertaken in accordance with the *Significant Impact Guidelines 1.1 – Matters of National Environmental Significance* (Department of the Environment 2013a). With the implementation of mitigation measures it was determined that the Project is unlikely to result in a significant impact on any of the identified MNES.

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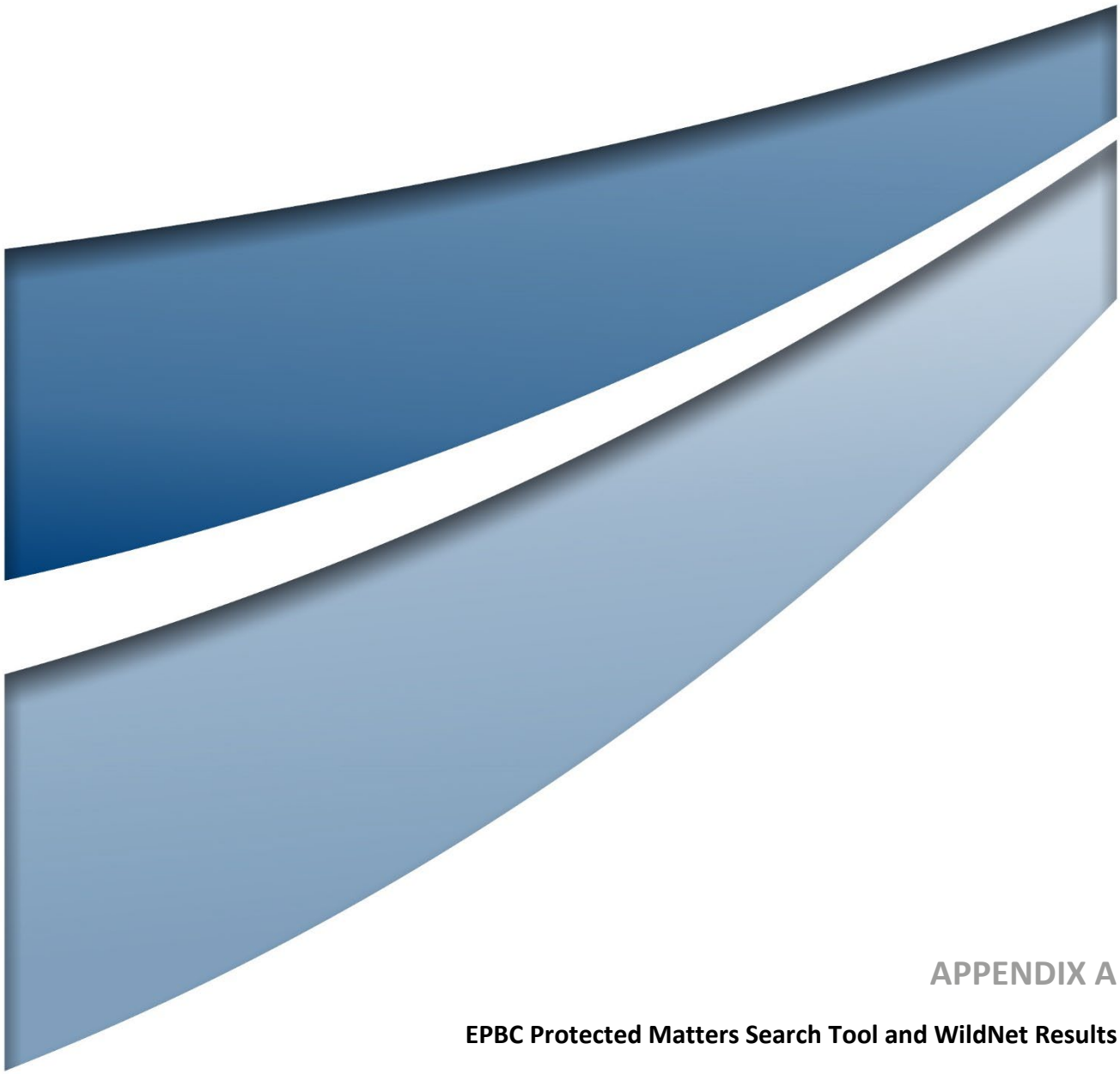

APPENDIX A

EPBC Protected Matters Search Tool and WildNet Results

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. Please see the caveat for interpretation of information provided here.

Report created: 01-Nov-2024

Summary

Matters of National Environment 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 (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	5
Listed Threatened Species:	45
Listed Migratory Species:	13

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 https://www.dcceew.gov.au/parks-heritage/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 Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	22
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

State and Territory Reserves:	1
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	3
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

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.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community	Endangered	Community may occur within area	In buffer area only
Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland	Endangered	Community may occur within area	In buffer area only
Lowland Rainforest of Subtropical Australia	Critically Endangered	Community likely to occur within area	In feature area
Poplar Box Grassy Woodland on Alluvial Plains	Endangered	Community may occur within area	In buffer area only
Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions	Endangered	Community likely to occur within area	In feature area

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat may occur within area	In feature area
Cyclopsitta diophthalma coxeni Coxen's Fig-Parrot [59714]	Critically Endangered	Species or species habitat may occur within area	In feature area
Erythrotriorchis radiatus Red Goshawk [942]	Endangered	Species or species habitat known to occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Geophaps scripta scripta Squatter Pigeon (southern) [64440]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Roosting known to occur within area	In feature area
Neochmia ruficauda ruficauda Star Finch (eastern), Star Finch (southern) [26027]	Endangered	Species or species habitat likely to occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area	In feature area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Tringa nebularia](#) Common Greenshank, Greenshank [832]	Endangered	Species or species habitat may occur within area	In feature area
[Turnix melanogaster](#) Black-breasted Button-quail [923]	Vulnerable	Species or species habitat likely to occur within area	In feature area
MAMMAL			
[Dasyurus hallucatus](#) Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat likely to occur within area	In feature area
[Dasyurus maculatus maculatus (SE mainland population)](#) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat may occur within area	In buffer area only
[Macroderma gigas](#) Ghost Bat [174]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Nyctophilus corbeni](#) Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat may occur within area	In buffer area only
[Petauroides volans](#) Greater Glider (southern and central) [254]	Endangered	Species or species habitat known to occur within area	In feature area
[Petaurus australis australis](#) Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat likely to occur within area	In feature 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]	Endangered	Species or species habitat likely to occur within area	In feature area
[Potorous tridactylus tridactylus](#) Long-nosed Potoroo (northern) [66645]	Vulnerable	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
PLANT			
Arthraxon hispidus Hairy-joint Grass [9338]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Bosistoa transversa Three-leaved Bosistoa, Yellow Satinheart [16091]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Bulbophyllum globuliforme Miniature Moss-orchid, Hoop Pine Orchid [6649]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Cossinia australiana Cossinia [3066]	Endangered	Species or species habitat likely to occur within area	In feature area
Cryptostylis hunteriana Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Cupaniopsis shirleyana Wedge-leaf Tuckeroo [3205]	Vulnerable	Species or species habitat known to occur within area	In feature area
Cycas megacarpa [55794]	Endangered	Species or species habitat known to occur within area	In feature area
Dichanthium setosum bluegrass [14159]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Eucalyptus raveretiana Black Ironbox [16344]	Vulnerable	Species or species habitat may occur within area	In feature area
Fontainea venosa [24040]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Leuzea australis listed as Rhaponticum australe			
Austral Cornflower, Native Thistle [9363]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Macadamia integrifolia			
Macadamia Nut, Queensland Nut Tree, Smooth-shelled Macadamia, Bush Nut, Nut Oak [7326]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Polianthion minutiflorum			
[82772]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Samadera bidwillii			
Quassia [29708]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Sophora fraseri			
[8836]	Vulnerable	Species or species habitat may occur within area	In buffer area only
REPTILE			
Delma torquata			
Adorned Delma, Collared Delma [1656]	Vulnerable	Species or species habitat known to occur within area	In feature area
Egernia rugosa			
Yakka Skink [1420]	Vulnerable	Species or species habitat may occur within area	In feature area
Elseya albagula			
Southern Snapping Turtle, White-throated Snapping Turtle [81648]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Furina dunmalli			
Dunmall's Snake [59254]	Vulnerable	Species or species habitat known to occur within area	In feature area
Hemiaspis damelii			
Grey Snake [1179]	Endangered	Species or species habitat likely to occur within area	In feature area
Phyllurus caudiannulatus			
Ringed Thin-tail Gecko [1681]	Endangered	Species or species habitat may occur within area	In buffer area only
Listed Migratory Species			[Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Marine Species			
Crocodylus porosus Salt-water Crocodile, Estuarine Crocodile [1774]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat known to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Roosting known to occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat may occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Pandion haliaetus](#) Osprey [952]		Species or species habitat known to occur within area	In feature area
[Tringa nebularia](#) Common Greenshank, Greenshank [832]	Endangered	Species or species habitat may occur within area	In feature area

Other Matters Protected by the EPBC Act

Listed Marine Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
[Actitis hypoleucos](#) Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
[Anseranas semipalmata](#) Magpie Goose [978]		Species or species habitat may occur within area overfly marine area	In feature area
[Apus pacificus](#) Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
[Bubulcus ibis as Ardea ibis](#) Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
[Calidris acuminata](#) Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat may occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat likely to occur within area overfly marine area	In feature area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Roosting known to occur within area overfly marine area	In feature area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat likely to occur within area overfly marine area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Pterodroma cervicalis			
White-necked Petrel [59642]		Species or species habitat may occur within area	In feature area
Rhipidura rufifrons			
Rufous Fantail [592]		Species or species habitat likely to occur within area overfly marine area	In feature area
Rostratula australis as Rostratula benghalensis (sensu lato)			
Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
Symposiachrus trivirgatus as Monarcha trivirgatus			
Spectacled Monarch [83946]		Species or species habitat likely to occur within area overfly marine area	In feature area
Tringa nebularia			
Common Greenshank, Greenshank [832]	Endangered	Species or species habitat may occur within area overfly marine area	In feature area
Reptile			
Crocodylus porosus			
Salt-water Crocodile, Estuarine Crocodile [1774]		Species or species habitat likely to occur within area	In feature area

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	Buffer Status
Littabella	National Park	QLD	In buffer area only

EPBC Act Referrals				[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Gin Gin Battery Energy Storage System BESS	2024/09909		Referral Decision	In feature area
Not controlled action				
Bruce Highway Realignment - between Cabbage Tree Creek and Carman Road, north of Gin Gin	2013/6815	Not Controlled Action	Completed	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data is available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance on the contents of this report.

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and 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

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

Where little information is available for a 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 detailed distribution mapping methods are used to update these distributions when time permits.

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

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

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded breeding sites; and
- seals which have only been mapped for breeding sites near the Australian continent

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

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

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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Canberra ACT 2601 Australia
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Queensland Government

WildNet species list

Search Criteria: Species List for a Specified Point
Species: All
Type: All
Queensland status: All
Records: All
Date: All
Latitude: -24.9076
Longitude: 151.8330
Distance: 20
Email: jgui@umwelt.com.au
Date submitted: Tuesday 20 Aug 2024 16:18:44
Date extracted: Tuesday 20 Aug 2024 16:20:02

The number of records retrieved = 801

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	amphibians	Bufonidae	*Rhinella marina*	cane toad	Y			8/1
animals	amphibians	Hylidae	*Cyclorana alboguttata*	greenstripe frog		C		1/1
animals	amphibians	Hylidae	*Cyclorana brevipes*	superb collared frog		C		2/1
animals	amphibians	Hylidae	*Cyclorana novaehollandiae*	eastern snapping frog		C		1/1
animals	amphibians	Hylidae	*Litoria caerulea*	common green treefrog		C		5/2
animals	amphibians	Hylidae	*Litoria fallax*	eastern sedgefrog		C		6/1
animals	amphibians	Hylidae	*Litoria gracilenta*	graceful treefrog		C		2
animals	amphibians	Hylidae	*Litoria inermis*	bumpy rocketfrog		C		2/1
animals	amphibians	Hylidae	*Litoria latopalmata*	broad palmed rocketfrog		C		3/1
animals	amphibians	Hylidae	*Litoria nasuta*	striped rocketfrog		C		4/1
animals	amphibians	Hylidae	*Litoria peronii*	emerald spotted treefrog		C		1/1
animals	amphibians	Hylidae	*Litoria rothii*	eastern laughing treefrog		C		5
animals	amphibians	Hylidae	*Litoria rubella*	ruddy treefrog		C		12/2
animals	amphibians	Hylidae	*Litoria wilcoxii*	eastern stony creek frog		C		5/1
animals	amphibians	Limnodynastidae	*Adelotus brevis*	tusked frog		V		2/1
animals	amphibians	Limnodynastidae	*Limnodynastes peronii*	striped marshfrog		C		3/1
animals	amphibians	Limnodynastidae	*Limnodynastes salmini*	salmon striped frog		C		1
animals	amphibians	Limnodynastidae	*Limnodynastes tasmaniensis*	spotted grassfrog		C		4
animals	amphibians	Limnodynastidae	*Limnodynastes terraereginae*	scarlet sided pobblebonk		C		4/1
animals	amphibians	Limnodynastidae	*Platyplectrum ornatum*	ornate burrowing frog		C		5
animals	amphibians	Myobatrachidae	*Crinia parinsignifera*	beeping froglet		C		1
animals	amphibians	Myobatrachidae	*Mixophyes fasciolatus*	great barred frog		C		2
animals	amphibians	Myobatrachidae	*Pseudophryne major*	great brown broodfrog		C		5/2
animals	amphibians	Myobatrachidae	*Uperoleia laevigata*	eastern gungan		C		1
animals	amphibians	Myobatrachidae	*Uperoleia rugosa*	chubby gungan		C		1
animals	amphibians	Myobatrachidae	*Uperoleia sp.*			C		1
animals	birds	Acanthizidae	*Acanthiza lineata*	striated thornbill		C		1
animals	birds	Acanthizidae	*Acanthiza pusilla*	brown thornbill		C		1
animals	birds	Acanthizidae	*Gerygone olivacea*	white-throated gerygone		C		8
animals	birds	Acanthizidae	*Gerygone palpebrosa*	fairy gerygone		C		4
animals	birds	Acanthizidae	*Pyrrholaemus sagittatus*	speckled warbler		C		1
animals	birds	Acanthizidae	*Sericornis frontalis*	white-browed scrubwren		C		4
animals	birds	Acanthizidae	*Sericornis magnirostra*	large-billed scrubwren		C		1
animals	birds	Acanthizidae	*Smicrornis brevirostris*	weebill		C		1
animals	birds	Accipitridae	*Accipiter cirrocephalus*	collared sparrowhawk		C		2
animals	birds	Accipitridae	*Accipiter fasciatus*	brown goshawk		C		3
animals	birds	Accipitridae	*Accipiter novaehollandiae*	grey goshawk		C		2
animals	birds	Accipitridae	*Aquila audax*	wedge-tailed eagle		C		9
animals	birds	Accipitridae	*Aviceda subcristata*	Pacific baza		C		2
animals	birds	Accipitridae	*Circus approximans*	swamp harrier		C		1
animals	birds	Accipitridae	*Circus assimilis*	spotted harrier		C		1
animals	birds	Accipitridae	*Elanus axillaris*	black-shouldered kite		C		2
animals	birds	Accipitridae	*Erythrotriorchis radiatus*	red goshawk		E	E	2
animals	birds	Accipitridae	*Haliaeetus leucogaster*	white-bellied sea-eagle		C		5
animals	birds	Accipitridae	*Haliastur indus*	brahminy kite		C		2
animals	birds	Accipitridae	*Haliastur sphenurus*	whistling kite		C		17

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Accipitridae	*Hieraaetus morphnoides*	little eagle		C		1
animals	birds	Accipitridae	*Lophoictinia isura*	square-tailed kite		C		3
animals	birds	Accipitridae	*Milvus migrans*	black kite		C		2
animals	birds	Aegothelidae	*Aegotheles cristatus*	Australian owlet-nightjar		C		8
animals	birds	Alaudidae	*Mirafra javanica*	Horsfield's bushlark		C		1
animals	birds	Alcedinidae	*Ceyx azureus*	azure kingfisher		C		5
animals	birds	Alcedinidae	*Dacelo leachii*	blue-winged kookaburra		C		1
animals	birds	Alcedinidae	*Dacelo novaeguineae*	laughing kookaburra		C		47
animals	birds	Alcedinidae	*Todiramphus macleayii*	forest kingfisher		C		16
animals	birds	Alcedinidae	*Todiramphus pyrrhopygius*	red-backed kingfisher		C		1
animals	birds	Alcedinidae	*Todiramphus sanctus*	sacred kingfisher		C		7
animals	birds	Anatidae	*Anas gracilis*	grey teal		C		8
animals	birds	Anatidae	*Anas superciliosa*	Pacific black duck		C		18
animals	birds	Anatidae	*Aythya australis*	hardhead		C		3
animals	birds	Anatidae	*Chenonetta jubata*	Australian wood duck		C		14
animals	birds	Anatidae	*Cygnus atratus*	black swan		C		6
animals	birds	Anatidae	*Dendrocygna arcuata*	wandering whistling-duck		C		2
animals	birds	Anatidae	*Dendrocygna eytoni*	plumed whistling-duck		C		3
animals	birds	Anatidae	*Nettapus coromandelianus*	cotton pygmy-goose		C		3
animals	birds	Anatidae	*Spatula rhynchotis*	Australasian shoveler		C		2
animals	birds	Anhingidae	*Anhinga novaehollandiae*	Australasian darter		C		12
animals	birds	Apodidae	*Apus pacificus*	fork-tailed swift		SL		1
animals	birds	Apodidae	*Hirundapus caudacutus*	white-throated needletail		V	V	4
animals	birds	Ardeidae	*Ardea alba modesta*	eastern great egret		C		10
animals	birds	Ardeidae	*Ardea intermedia*	intermediate egret		C		2
animals	birds	Ardeidae	*Ardea pacifica*	white-necked heron		C		9
animals	birds	Ardeidae	*Bubulcus ibis*	cattle egret		C		6
animals	birds	Ardeidae	*Butorides striata*	striated heron		C		4
animals	birds	Ardeidae	*Egretta garzetta*	little egret		C		1
animals	birds	Ardeidae	*Egretta novaehollandiae*	white-faced heron		C		17
animals	birds	Ardeidae	*Ixobrychus flavicollis*	black bittern		C		1
animals	birds	Ardeidae	*Nycticorax caledonicus*	nankeen night-heron		C		1
animals	birds	Artamidae	*Artamus cyanopterus*	dusky woodswallow		C		2
animals	birds	Artamidae	*Artamus leucorynchus*	white-breasted woodswallow		C		7
animals	birds	Artamidae	*Artamus minor*	little woodswallow		C		1
animals	birds	Artamidae	*Artamus personatus*	masked woodswallow		C		1
animals	birds	Artamidae	*Cracticus nigrogularis*	pied butcherbird		C		33
animals	birds	Artamidae	*Cracticus torquatus*	grey butcherbird		C		20
animals	birds	Artamidae	*Gymnorhina tibicen*	Australian magpie		C		45
animals	birds	Artamidae	*Strepera graculina*	pied currawong		C		22
animals	birds	Burhinidae	*Burhinus grallarius*	bush stone-curlew		C		3
animals	birds	Cacatuidae	*Cacatua galerita*	sulphur-crested cockatoo		C		3
animals	birds	Cacatuidae	*Calyptorhynchus banksii*	red-tailed black-cockatoo		C		6
animals	birds	Cacatuidae	*Calyptorhynchus lathami*	glossy black-cockatoo		V		1
animals	birds	Cacatuidae	*Eolophus roseicapilla*	galah		C		8
animals	birds	Cacatuidae	*Nymphicus hollandicus*	cockatiel		C		2

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animals	birds	Cacatuidae	*Zanda funerea*	yellow-tailed black-cockatoo		C		6
animals	birds	Campephagidae	*Coracina lineata*	barred cuckoo-shrike		C		1
animals	birds	Campephagidae	*Coracina novaehollandiae*	black-faced cuckoo-shrike		C		26
animals	birds	Campephagidae	*Coracina papuensis*	white-bellied cuckoo-shrike		C		5
animals	birds	Campephagidae	*Edolisoma tenuirostre*	common cicadabird		C		4
animals	birds	Campephagidae	*Lalage leucomela*	varied triller		C		1
animals	birds	Campephagidae	*Lalage tricolor*	white-winged triller		C		1
animals	birds	Caprimulgidae	*Caprimulgus macrurus*	large-tailed nightjar		C		2
animals	birds	Charadriidae	*Charadrius mongolus*	lesser sand plover		E	E	1
animals	birds	Charadriidae	*Charadrius ruficapillus*	red-capped plover		C		1
animals	birds	Charadriidae	*Elseyornis melanops*	black-fronted dotterel		C		2
animals	birds	Charadriidae	*Erythrogonys cinctus*	red-kneed dotterel		C		1
animals	birds	Charadriidae	*Vanellus miles*	masked lapwing		C		3
animals	birds	Charadriidae	*Vanellus miles novaehollandiae*	masked lapwing (southern subspecies)		C		13
animals	birds	Charadriidae	*Vanellus tricolor*	banded lapwing		C		1
animals	birds	Ciconiidae	*Ephippiorhynchus asiaticus*	black-necked stork		C		4
animals	birds	Cisticolidae	*Cisticola exilis*	golden-headed cisticola		C		7
animals	birds	Climacteridae	*Climacteris picumnus*	brown treecreeper		C		2
animals	birds	Climacteridae	*Cormobates leucophaea*	white-throated treecreeper		C		1
animals	birds	Climacteridae	*Cormobates leucophaea metastasis*	white-throated treecreeper (southern)		C		8
animals	birds	Columbidae	*Chalcophaps longirostris*	Pacific emerald dove		C		1
animals	birds	Columbidae	*Geopelia humeralis*	bar-shouldered dove		C		24
animals	birds	Columbidae	*Geopelia placida*	peaceful dove		C		24
animals	birds	Columbidae	*Leucosarcia melanoleuca*	wonga pigeon		C		3
animals	birds	Columbidae	*Lopholaimus antarcticus*	topknot pigeon		C		1
animals	birds	Columbidae	*Ocyphaps lophotes*	crested pigeon		C		12
animals	birds	Columbidae	*Phaps chalcoptera*	common bronzewing		C		2
animals	birds	Columbidae	*Ptilinopus regina*	rose-crowned fruit-dove		C		1
animals	birds	Coraciidae	*Eurystomus orientalis*	dollarbird		C		9
animals	birds	Corcoracidae	*Corcorax melanorhamphos*	white-winged chough		C		8
animals	birds	Corcoracidae	*Struthidea cinerea*	apostlebird		C		8
animals	birds	Corvidae	*Corvus orru*	Torresian crow		C		48
animals	birds	Corvidae	*Corvus sp.*			C		1
animals	birds	Cuculidae	*Cacomantis flabelliformis*	fan-tailed cuckoo		C		8
animals	birds	Cuculidae	*Cacomantis pallidus*	pallid cuckoo		C		2
animals	birds	Cuculidae	*Cacomantis variolosus*	brush cuckoo		C		2
animals	birds	Cuculidae	*Centropus phasianinus*	pheasant coucal		C		13
animals	birds	Cuculidae	*Chalcites basalis*	Horsfield's bronze-cuckoo		C		1
animals	birds	Cuculidae	*Chalcites lucidus*	shining bronze-cuckoo		C		2
animals	birds	Cuculidae	*Chalcites minutillus barnardi*	Eastern little bronze-cuckoo		C		3
animals	birds	Cuculidae	*Cuculus optatus*	oriental cuckoo		SL		6
animals	birds	Cuculidae	*Eudynamys orientalis*	eastern koel		C		10
animals	birds	Cuculidae	*Scythrops novaehollandiae*	channel-billed cuckoo		C		11
animals	birds	Dicaeidae	*Dicaeum hirundinaceum*	mistletoebird		C		13
animals	birds	Dicruridae	*Dicrurus bracteatus*	spangled drongo		C		17
animals	birds	Estrildidae	*Lonchura castaneothorax*	chestnut-breasted mannikin		C		5

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Estrildidae	*Neochmia temporalis*	red-browed finch		C		2
animals	birds	Estrildidae	*Taeniopygia bichenovii*	double-barred finch		C		23
animals	birds	Eurostopodidae	*Eurostopodus mystacalis*	white-throated nightjar		C		2
animals	birds	Falconidae	*Falco berigora*	brown falcon		C		6
animals	birds	Falconidae	*Falco cenchroides*	nankeen kestrel		C		10
animals	birds	Falconidae	*Falco longipennis*	Australian hobby		C		1
animals	birds	Falconidae	*Falco peregrinus macropus*	Australian peregrine falcon		C		2
animals	birds	Falconidae	*Falco subniger*	black falcon		C		1
animals	birds	Gruidae	*Antigone rubicunda*	brolga		C		2
animals	birds	Hirundinidae	*Hirundo neoxena*	welcome swallow		C		20
animals	birds	Hirundinidae	*Petrochelidon ariel*	fairy martin		C		126
animals	birds	Hirundinidae	*Petrochelidon nigricans*	tree martin		C		13
animals	birds	Jacanidae	*Irediparra gallinacea*	comb-crested jacana		C		9
animals	birds	Laridae	*Chlidonias hybrida*	whiskered tern		C		1
animals	birds	Laridae	*Chlidonias leucopterus*	white-winged black tern		SL		1
animals	birds	Laridae	*Chroicocephalus novaehollandiae*	silver gull		C		1
animals	birds	Laridae	*Gelochelidon macrotarsa*	Australian tern		SL		1
animals	birds	Laridae	*Hydroprogne caspia*	Caspian tern		SL		2
animals	birds	Locustellidae	*Cincloramphus cruralis*	brown songlark		C		1
animals	birds	Locustellidae	*Cincloramphus mathewsi*	rufous songlark		C		1
animals	birds	Locustellidae	*Cincloramphus timoriensis*	tawny grassbird		C		6
animals	birds	Locustellidae	*Poodytes gramineus*	little grassbird		C		2
animals	birds	Maluridae	*Malurus cyaneus*	superb fairy-wren		C		1
animals	birds	Maluridae	*Malurus lamberti*	variegated fairy-wren		C		2
animals	birds	Maluridae	*Malurus melanocephalus*	red-backed fairy-wren		C		16
animals	birds	Megapodiidae	*Alectura lathami*	Australian brush-turkey		C		4
animals	birds	Meliphagidae	*Acanthorhynchus tenuirostris*	eastern spinebill		C		1
animals	birds	Meliphagidae	*Caligavis chrysops*	yellow-faced honeyeater		C		1
animals	birds	Meliphagidae	*Conopophila rufogularis*	rufous-throated honeyeater		C		3
animals	birds	Meliphagidae	*Entomyzon cyanotis*	blue-faced honeyeater		C		31
animals	birds	Meliphagidae	*Lichenostomus melanops*	yellow-tufted honeyeater		C		2
animals	birds	Meliphagidae	*Lichmera indistincta*	brown honeyeater		C		21
animals	birds	Meliphagidae	*Manorina melanocephala*	noisy miner		C		22
animals	birds	Meliphagidae	*Meliphaga lewinii*	Lewin's honeyeater		C		13
animals	birds	Meliphagidae	*Melithreptus albogularis*	white-throated honeyeater		C		21
animals	birds	Meliphagidae	*Melithreptus gularis*	black-chinned honeyeater		C		7
animals	birds	Meliphagidae	*Melithreptus lunatus*	white-naped honeyeater		C		1
animals	birds	Meliphagidae	*Myzomela obscura*	dusky honeyeater		C		3
animals	birds	Meliphagidae	*Myzomela sanguinolenta*	scarlet honeyeater		C		18
animals	birds	Meliphagidae	*Philemon citreogularis*	little friarbird		C		13
animals	birds	Meliphagidae	*Philemon corniculatus*	noisy friarbird		C		28
animals	birds	Meliphagidae	*Plectorhyncha lanceolata*	striped honeyeater		C		1
animals	birds	Meliphagidae	*Ptilotula fusca*	fuscous honeyeater		C		2
animals	birds	Meropidae	*Merops ornatus*	rainbow bee-eater		C		18
animals	birds	Monarchidae	*Grallina cyanoleuca*	magpie-lark		C		29
animals	birds	Monarchidae	*Monarcha melanopsis*	black-faced monarch		SL		1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Monarchidae	*Myiagra cyanoleuca*	satin flycatcher		SL		2
animals	birds	Monarchidae	*Myiagra inquieta*	restless flycatcher		C		7
animals	birds	Monarchidae	*Myiagra rubecula*	leaden flycatcher		C		8
animals	birds	Monarchidae	*Symposiachrus trivirgatus*	spectacled monarch		SL		1
animals	birds	Motacillidae	*Anthus novaeseelandiae*	Australasian pipit		C		6
animals	birds	Neosittidae	*Daphoenositta chrysoptera*	varied sittella		C		8
animals	birds	Oriolidae	*Oriolus sagittatus*	olive-backed oriole		C		7
animals	birds	Oriolidae	*Sphecotheres vieilloti*	Australasian figbird		C		19
animals	birds	Pachycephalidae	*Colluricincla harmonica*	grey shrike-thrush		C		10
animals	birds	Pachycephalidae	*Colluricincla megarhyncha*	little shrike-thrush		C		3
animals	birds	Pachycephalidae	*Pachycephala pectoralis*	golden whistler		C		4
animals	birds	Pachycephalidae	*Pachycephala rufiventris*	rufous whistler		C		18
animals	birds	Pandionidae	*Pandion haliaetus cristatus*	eastern osprey		SL		7
animals	birds	Pardalotidae	*Pardalotus striatus*	striated pardalote		C		32
animals	birds	Passeridae	*Passer domesticus*	house sparrow	Y			3
animals	birds	Pelecanidae	*Pelecanus conspicillatus*	Australian pelican		C		10
animals	birds	Petroicidae	*Eopsaltria australis*	eastern yellow robin		C		3
animals	birds	Petroicidae	*Microeca fascinans*	jacky winter		C		5
animals	birds	Petroicidae	*Petroica goodenovii*	red-capped robin		C		1
animals	birds	Petroicidae	*Petroica rosea*	rose robin		C		4
animals	birds	Phalacrocoracidae	*Microcarbo melanoleucos*	little pied cormorant		C		14
animals	birds	Phalacrocoracidae	*Phalacrocorax carbo*	great cormorant		C		5
animals	birds	Phalacrocoracidae	*Phalacrocorax sulcirostris*	little black cormorant		C		10
animals	birds	Phalacrocoracidae	*Phalacrocorax varius*	pied cormorant		C		3
animals	birds	Phasianidae	*Coturnix pectoralis*	stubble quail		C		2
animals	birds	Phasianidae	*Synoicus ypsilophorus*	brown quail		C		7
animals	birds	Pittidae	*Pitta versicolor*	noisy pitta		C		1
animals	birds	Podargidae	*Podargus ocellatus plumiferus*	plumed frogmouth		V		1
animals	birds	Podargidae	*Podargus strigoides*	tawny frogmouth		C		8
animals	birds	Podicipedidae	*Poliocephalus poliocephalus*	hoary-headed grebe		C		1
animals	birds	Podicipedidae	*Tachybaptus novaehollandiae*	Australasian grebe		C		8
animals	birds	Pomatostomidae	*Pomatostomus temporalis*	grey-crowned babbler		C		18
animals	birds	Psittaculidae	*Alisterus scapularis*	Australian king-parrot		C		28
animals	birds	Psittaculidae	*Aprosmictus erythropterus*	red-winged parrot		C		1
animals	birds	Psittaculidae	*Glossopsitta concinna*	musk lorikeet		C		1
animals	birds	Psittaculidae	*Parvipsitta pusilla*	little lorikeet		C		10
animals	birds	Psittaculidae	*Platycercus adscitus*	pale-headed rosella		C		20
animals	birds	Psittaculidae	*Platycercus eximius*	eastern rosella		C		7
animals	birds	Psittaculidae	*Psephotus haematonotus*	red-rumped parrot		C		1
animals	birds	Psittaculidae	*Trichoglossus chlorolepidotus*	scaly-breasted lorikeet		C		20
animals	birds	Psittaculidae	*Trichoglossus moluccanus*	rainbow lorikeet		C		46
animals	birds	Psophodidae	*Psophodes olivaceus*	eastern whipbird		C		4
animals	birds	Ptilonorhynchidae	*Sericulus chrysocephalus*	regent bowerbird		C		1
animals	birds	Rallidae	*Amaurornis moluccana*	pale-vented bush-hen		C		2
animals	birds	Rallidae	*Fulica atra*	Eurasian coot		C		2
animals	birds	Rallidae	*Gallinula tenebrosa*	dusky moorhen		C		19

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animals	birds	Rallidae	*Gallirallus philippensis*	buff-banded rail		C		1
animals	birds	Rallidae	*Porphyrio melanotus*	purple swamphen		C		3
animals	birds	Recurvirostridae	*Himantopus leucocephalus*	pied stilt		C		3
animals	birds	Recurvirostridae	*Recurvirostra novaehollandiae*	red-necked avocet		C		1
animals	birds	Rhipiduridae	*Rhipidura albiscapa*	grey fantail		C		21
animals	birds	Rhipiduridae	*Rhipidura leucophrys*	willie wagtail		C		30
animals	birds	Rhipiduridae	*Rhipidura rufifrons*	rufous fantail		SL		1
animals	birds	Scolopacidae	*Actitis hypoleucos*	common sandpiper		SL		1
animals	birds	Scolopacidae	*Arenaria interpres*	ruddy turnstone		SL	V	1
animals	birds	Scolopacidae	*Calidris acuminata*	sharp-tailed sandpiper		SL	V	1
animals	birds	Scolopacidae	*Gallinago hardwickii*	Latham's snipe		SL	V	1
animals	birds	Scolopacidae	*Tringa nebularia*	common greenshank		SL	E	1
animals	birds	Scolopacidae	*Tringa stagnatilis*	marsh sandpiper		SL		1
animals	birds	Strigidae	*Ninox boobook*	southern boobook		C		10
animals	birds	Strigidae	*Ninox connivens*	barking owl		C		5
animals	birds	Strigidae	*Ninox strenua*	powerful owl		V		2
animals	birds	Threskiornithidae	*Platalea regia*	royal spoonbill		C		2
animals	birds	Threskiornithidae	*Plegadis falcinellus*	glossy ibis		SL		1
animals	birds	Threskiornithidae	*Threskiornis molucca*	Australian white ibis		C		7
animals	birds	Threskiornithidae	*Threskiornis spinicollis*	straw-necked ibis		C		9
animals	birds	Turnicidae	*Turnix melanogaster*	black-breasted button-quail		V	V	4
animals	birds	Turnicidae	*Turnix varius*	painted button-quail		C		1
animals	birds	Tytonidae	*Tyto javanica*	eastern barn owl		C		2
animals	birds	Tytonidae	*Tyto longimembris*	eastern grass owl		C		2
animals	birds	Zosteropidae	*Zosterops lateralis*	silvereye		C		7
animals	insects	Hesperiidae	*Telicota ancilla ancilla*	greenish darter				1
animals	insects	Nymphalidae	*Charaxes sempronius sempronius*	tailed emperor				1
animals	insects	Papilionidae	*Papilio anactus*	dainty swallowtail				1
animals	lobe-finned fishes	Ceratodontidae	*Neoceratodus forsteri*	Australian lungfish			V	13
animals	mammals	Acrobatidae	*Acrobates pygmaeus*	feathertail glider		C		2
animals	mammals	Bovidae	*Bos taurus*	European cattle	Y			2
animals	mammals	Canidae	*Canis familiaris (dingo)*	dingo				1
animals	mammals	Dasyuridae	*Planigale maculata*	common planigale		C		2
animals	mammals	Dasyuridae	*Sminthopsis murina*	common dunnart		C		1
animals	mammals	Equidae	*Equus caballus*	horse	Y			1
animals	mammals	Felidae	*Felis catus*	cat	Y			1
animals	mammals	Leporidae	*Lepus europaeus*	European brown hare	Y			2
animals	mammals	Leporidae	*Oryctolagus cuniculus*	rabbit	Y			1
animals	mammals	Macropodidae	*Macropus giganteus*	eastern grey kangaroo		C		2
animals	mammals	Macropodidae	*Notamacropus dorsalis*	black-striped wallaby		C		1
animals	mammals	Macropodidae	*Notamacropus parryi*	whiptail wallaby		C		5
animals	mammals	Macropodidae	*Notamacropus rufogriseus*	red-necked wallaby		C		4
animals	mammals	Macropodidae	*Thylogale stigmatica*	red-legged pademelon		C		1
animals	mammals	Macropodidae	*Wallabia bicolor*	swamp wallaby		C		2
animals	mammals	Miniopteridae	*Miniopterus australis*	little bent-wing bat		C		5/4
animals	mammals	Miniopteridae	*Miniopterus orianae oceanensis*	eastern bent-wing bat		C		12/10

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	mammals	Muridae	*Hydromys chrysogaster*	water rat		C		2
animals	mammals	Muridae	*Melomys cervinipes*	fawn-footed melomys		C		1
animals	mammals	Muridae	*Mus musculus*	house mouse	Y			1
animals	mammals	Muridae	*Rattus sordidus*	canefield rat		C		1
animals	mammals	Muridae	*Rattus tunneyi*	pale field-rat		C		1
animals	mammals	Ornithorhynchidae	*Ornithorhynchus anatinus*	platypus		SL		2
animals	mammals	Peramelidae	*Isoodon macrourus*	northern brown bandicoot		C		1
animals	mammals	Petauridae	*Petaurus australis australis*	yellow-bellied glider (southern subspecies)		V	V	1
animals	mammals	Petauridae	*Petaurus norfolcensis*	squirrel glider		C		1
animals	mammals	Petauridae	*Petaurus notatus*	Krefft's glider		C		1
animals	mammals	Phalangeridae	*Trichosurus vulpecula*	common brushtail possum		C		3
animals	mammals	Phascolarctidae	*Phascolarctos cinereus*	koala		E	E	4
animals	mammals	Potoroidae	*Aepyprymnus rufescens*	rufous bettong		C		3/1
animals	mammals	Pseudocheiridae	*Petauroides volans volans*	southern greater glider		E	E	3
animals	mammals	Pteropodidae	*Pteropus poliocephalus*	grey-headed flying-fox		C	V	1
animals	mammals	Pteropodidae	*Pteropus scapulatus*	little red flying-fox		C		1
animals	mammals	Pteropodidae	*Pteropus sp.*	flying-fox		C		1
animals	mammals	Tachyglossidae	*Tachyglossus aculeatus*	short-beaked echidna		SL		3
animals	mammals	Vespertilionidae	*Vespadelus troughtoni*	eastern cave bat		C		2/2
animals	ray-finned fishes	Eleotridae	*Hypseleotris galii*	firetail gudgeon				1
animals	ray-finned fishes	Poeciliidae	*Gambusia holbrooki*	mosquitofish	Y			1
animals	ray-finned fishes	Terapontidae	*Leiopotherapon unicolor*	spangled perch				2/2
animals	reptiles	Agamidae	*Chlamydosaurus kingii*	frilled lizard		C		2
animals	reptiles	Agamidae	*Diporiphora australis*	tommy roundhead		C		1
animals	reptiles	Agamidae	*Intellagama lesueurii*	eastern water dragon		C		3/1
animals	reptiles	Agamidae	*Pogona barbata*	bearded dragon		C		3
animals	reptiles	Boidae	*Morelia spilota*	carpet python		C		2
animals	reptiles	Carphodactylidae	*Saltuarius salebrosus*	rough-throated leaf-tailed gecko		C		1
animals	reptiles	Chelidae	*Chelodina expansa*	broad-shelled river turtle		C		3
animals	reptiles	Chelidae	*Chelodina longicollis*	eastern snake-necked turtle		C		1
animals	reptiles	Chelidae	*Elseya albagula*	white-throated snapping turtle		CR	CE	6
animals	reptiles	Chelidae	*Emydura macquarii krefftii*	Krefft's river turtle		C		6
animals	reptiles	Chelidae	*Wollumbinia latisternum*	saw-shelled turtle		C		3
animals	reptiles	Colubridae	*Boiga irregularis*	brown tree snake		C		2/1
animals	reptiles	Colubridae	*Dendrelaphis punctulatus*	green tree snake		C		2
animals	reptiles	Colubridae	*Tropidonophis mairii*	freshwater snake		C		1
animals	reptiles	Diplodactylidae	*Oedura tryoni*	southern spotted velvet gecko		C		1
animals	reptiles	Elapidae	*Cryptophis nigrescens*	eastern small-eyed snake		C		1
animals	reptiles	Elapidae	*Demansia psammophis*	yellow-faced whipsnake		C		1
animals	reptiles	Elapidae	*Demansia vestigiata*	lesser black whipsnake		C		2
animals	reptiles	Elapidae	*Furina diadema*	red-naped snake		C		1
animals	reptiles	Elapidae	*Hoplocephalus bitorquatus*	pale-headed snake		C		1
animals	reptiles	Elapidae	*Pseudechis porphyriacus*	red-bellied black snake		C		2
animals	reptiles	Elapidae	*Pseudonaja textilis*	eastern brown snake		C		2
animals	reptiles	Elapidae	*Vermicella annulata*	bandy-bandy		C		1

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animals	reptiles	Gekkonidae	*Gehyra versicolor*			C		1
animals	reptiles	Gekkonidae	*Hemidactylus frenatus*	house gecko	Y			1/1
animals	reptiles	Gekkonidae	*Heteronotia binoei*	Bynoe's gecko		C		1
animals	reptiles	Pygopodidae	*Lialis burtonis*	Burton's legless lizard		C		1
animals	reptiles	Scincidae	*Anomalopus verreauxii*	three-clawed worm-skink		C		1
animals	reptiles	Scincidae	*Calyptotis scutirostrum*	scute-snouted calyptotis		C		1
animals	reptiles	Scincidae	*Carlia pectoralis sensu lato*			C		1
animals	reptiles	Scincidae	*Carlia schmeltzii*	robust rainbow-skink		C		2/1
animals	reptiles	Scincidae	*Carlia vivax*	tussock rainbow-skink		C		1
animals	reptiles	Scincidae	*Concinnia tenuis*	bar-sided skink		C		1
animals	reptiles	Scincidae	*Cryptoblepharus pulcher pulcher*	elegant snake-eyed skink		C		2
animals	reptiles	Scincidae	*Ctenotus spaldingi*	straight-browed ctenotus		C		1
animals	reptiles	Scincidae	*Ctenotus taeniolatus*	copper-tailed skink		C		1
animals	reptiles	Scincidae	*Cyclodomorphus gerrardii*	pink-tongued lizard		C		1
animals	reptiles	Scincidae	*Eremiascincus richardsonii*	broad-banded sand swimmer		C		1
animals	reptiles	Scincidae	*Eulamprus quoyii*	eastern water skink		C		2
animals	reptiles	Scincidae	*Lampropholis adonis*	diamond-shielded sunskink		C		1
animals	reptiles	Scincidae	*Lampropholis delicata*	dark-flecked garden sunskink		C		1
animals	reptiles	Scincidae	*Lygisaurus foliorum*	tree-base litter-skink		C		1
animals	reptiles	Scincidae	*Ophioscincus ophioscincus*	yolk-bellied snake-skink		C		1
animals	reptiles	Scincidae	*Tiliqua scincoides scincoides*	eastern bluetongue		C		1
animals	reptiles	Typhlopidae	*Anilios ligatus*	robust blind snake		C		1
animals	reptiles	Varanidae	*Varanus gouldii*	sand monitor		C		1
animals	reptiles	Varanidae	*Varanus tristis*	black-tailed monitor		C		1
animals	reptiles	Varanidae	*Varanus varius*	lace monitor		C		1
plants	land plants	Acanthaceae	*Dyschoriste depressa*		Y			1/1
plants	land plants	Acanthaceae	*Pseuderanthemum tenellum*			C		3/1
plants	land plants	Acanthaceae	*Pseuderanthemum variabile*	pastel flower		C		1
plants	land plants	Acanthaceae	*Thunbergia alata*	black-eyed Susan	Y			1
plants	land plants	Amaranthaceae	*Achyranthes aspera*			C		1
plants	land plants	Amaranthaceae	*Amaranthus interruptus*			C		2/2
plants	land plants	Amaranthaceae	*Amaranthus spinosus*	needle burr	Y			1/1
plants	land plants	Amaranthaceae	*Nyssanthes diffusa*	barbed-wire weed		C		1/1
plants	land plants	Anacardiaceae	*Mangifera indica*	mango	Y			1
plants	land plants	Anacardiaceae	*Pleiogynium timorense*	Burdekin plum		C		2/1
plants	land plants	Anacardiaceae	*Rhodosphaera rhodanthema*	tulip satinwood		C		1
plants	land plants	Annonaceae	*Fitzalania bidwillii*			C		2/2
plants	land plants	Annonaceae	*Fitzalania heteropetala*			C		1
plants	land plants	Annonaceae	*Huberantha nitidissima*			C		1
plants	land plants	Annonaceae	*Melodorum leichhardtii*			C		2
plants	land plants	Apiaceae	*Cyclospermum leptophyllum*		Y			1/1
plants	land plants	Apiaceae	*Platysace linearifolia*			C		1/1
plants	land plants	Apocynaceae	*Alstonia constricta*	bitterbark		C		2
plants	land plants	Apocynaceae	*Alyxia ruscifolia*			C		4
plants	land plants	Apocynaceae	*Asclepias curassavica*	red-head cottonbush	Y			2/1
plants	land plants	Apocynaceae	*Carissa ovata*	currantbush		C		4/1

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plants	land plants	Apocynaceae	*Catharanthus roseus*	pink periwinkle	Y			1
plants	land plants	Apocynaceae	*Gymnanthera oblonga*			C		1/1
plants	land plants	Apocynaceae	*Hoya australis*			C		1
plants	land plants	Apocynaceae	*Leichhardtia brevis*			C		2/2
plants	land plants	Apocynaceae	*Leichhardtia racemosa*			C		1/1
plants	land plants	Apocynaceae	*Melodinus australis*	southern melodinus		C		1
plants	land plants	Apocynaceae	*Parsonsia eucalyptophylla*	gargaloo		C		1/1
plants	land plants	Apocynaceae	*Parsonsia leichhardtii*	black silkpod		C		1
plants	land plants	Apocynaceae	*Parsonsia rotata*	veinless silkpod		C		2
plants	land plants	Apocynaceae	*Parsonsia velutina*	hairy silkpod		C		3/1
plants	land plants	Apocynaceae	*Secamone elliptica*			C		2
plants	land plants	Apocynaceae	*Tabernaemontana pandacaqui*	banana bush		C		2
plants	land plants	Apocynaceae	*Vincetoxicum grandiflorum*			C		1
plants	land plants	Apocynaceae	*Vincetoxicum ovatum*			C		1
plants	land plants	Araceae	*Alocasia brisbanensis*			C		1
plants	land plants	Araliaceae	*Hydrocotyle acutiloba*			C		1/1
plants	land plants	Araliaceae	*Hydrocotyle elegans*			C		1/1
plants	land plants	Araliaceae	*Polyscias elegans*	celery wood		C		3
plants	land plants	Araucariaceae	*Araucaria cunninghamii*	hoop pine		C		1
plants	land plants	Aristolochiaceae	*Aristolochia elegans*	calico-flower	Y			1
plants	land plants	Asparagaceae	*Asparagus plumosus*	feathered asparagus fern	Y			1
plants	land plants	Aspleniaceae	*Asplenium attenuatum*	walking fern		C		2
plants	land plants	Aspleniaceae	*Asplenium attenuatum var. attenuatum*			C		2/2
plants	land plants	Aspleniaceae	*Asplenium paleaceum*	scaly asplenium		C		1/1
plants	land plants	Asteraceae	*Ageratum houstonianum*	blue billygoat weed	Y			1
plants	land plants	Asteraceae	*Bidens pilosa*		Y			1
plants	land plants	Asteraceae	*Cirsium vulgare*	spear thistle	Y			1
plants	land plants	Asteraceae	*Glossocardia bidens*	native cobbler's pegs		C		1/1
plants	land plants	Asteraceae	*Peripleura hispidula var. setosa*			C		1/1
plants	land plants	Asteraceae	*Praxelis clematidea*		Y			2/1
plants	land plants	Asteraceae	*Pterocaulon redolens*			C		1/1
plants	land plants	Asteraceae	*Senecio quadridentatus*	cotton fireweed		C		1/1
plants	land plants	Asteraceae	*Sigesbeckia orientalis*	Indian weed		C		1/1
plants	land plants	Asteraceae	*Sphaeromorphaea subintegra*			C		2/2
plants	land plants	Asteraceae	*Symphyotrichum subulatum*		Y			1
plants	land plants	Asteraceae	*Xanthium occidentale*		Y			1/1
plants	land plants	Bignoniaceae	*Dolichandra unguis-cati*	cat's claw creeper	Y			7/2
plants	land plants	Bignoniaceae	*Pandorea jasminoides*			C		1
plants	land plants	Bignoniaceae	*Pandorea pandorana*	wonga vine		C		2
plants	land plants	Bignoniaceae	*Tecoma stans var. stans*		Y			1/1
plants	land plants	Blechnaceae	*Blechnum neohollandicum*			C		1
plants	land plants	Blechnaceae	*Blechnum spinulosum*			SL		1
plants	land plants	Boraginaceae	*Heliotropium amplexicaule*	blue heliotrope	Y			2/1
plants	land plants	Campanulaceae	*Lobelia membranacea*			NT		2/2
plants	land plants	Campanulaceae	*Lobelia purpurascens*	white root		SL		1/1
plants	land plants	Campanulaceae	*Lobelia quadrangularis*			SL		1/1

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plants	land plants	Cannabaceae	*Aphananthe philippinensis*			C		4/1
plants	land plants	Cannabaceae	*Trema tomentosa var. tomentosa*			C		1/1
plants	land plants	Capparaceae	*Capparis arborea*	brush caper berry		C		3
plants	land plants	Capparaceae	*Capparis sarmentosa*	scrambling caper		C		2
plants	land plants	Caryophyllaceae	*Stellaria media*	chickweed	Y			1/1
plants	land plants	Casuarinaceae	*Casuarina cristata*	belah		C		1
plants	land plants	Casuarinaceae	*Casuarina cunninghamiana*			C		1
plants	land plants	Celastraceae	*Celastrus subspicata*	large-leaved staffvine		C		2
plants	land plants	Celastraceae	*Denhamia disperma*			C		2
plants	land plants	Celastraceae	*Pleurostylia opposita*			C		1
plants	land plants	Celastraceae	*Siphonodon australis*	ivorywood		C		3
plants	land plants	Commelinaceae	*Commelina lanceolata*			C		1/1
plants	land plants	Commelinaceae	*Murdannia graminea*	murdannia		C		1/1
plants	land plants	Commelinaceae	*Murdannia nudiflora*		Y			1/1
plants	land plants	Convolvulaceae	*Polymeria calycina*	pink bindweed		C		1/1
plants	land plants	Cornaceae	*Alangium polyosmoides subsp. polyosmoides*			C		1
plants	land plants	Cornaceae	*Alangium polyosmoides subsp. tomentosum*			C		1
plants	land plants	Cucurbitaceae	*Cucumis metuliferus*	prickly cucumber	Y			1
plants	land plants	Cucurbitaceae	*Diplocyclos palmatus*			C		1
plants	land plants	Cycadaceae	*Cycas megacarpa*			E	E	11/10
plants	land plants	Cyperaceae	*Abildgaardia ovata*			C		1/1
plants	land plants	Cyperaceae	*Bulbostylis barbata*			C		1/1
plants	land plants	Cyperaceae	*Cyperus aggregatus*		Y			1/1
plants	land plants	Cyperaceae	*Cyperus bowmanni*			C		1/1
plants	land plants	Cyperaceae	*Cyperus brevifolius*	Mullumbimby couch	Y			1/1
plants	land plants	Cyperaceae	*Cyperus compressus*		Y			2/2
plants	land plants	Cyperaceae	*Cyperus cuspidatus*			C		1/1
plants	land plants	Cyperaceae	*Cyperus cyperoides*			C		1/1
plants	land plants	Cyperaceae	*Cyperus distans*			C		1/1
plants	land plants	Cyperaceae	*Cyperus exaltatus*	tall flatsedge		C		1
plants	land plants	Cyperaceae	*Cyperus flavidus*			C		1/1
plants	land plants	Cyperaceae	*Cyperus fulvus*			C		3/3
plants	land plants	Cyperaceae	*Cyperus gracilis*			C		1/1
plants	land plants	Cyperaceae	*Cyperus leiocaulon*			C		1/1
plants	land plants	Cyperaceae	*Cyperus leptocarpus*			C		1/1
plants	land plants	Cyperaceae	*Cyperus nervulosus*			C		1/1
plants	land plants	Cyperaceae	*Cyperus polystachyos*			C		1
plants	land plants	Cyperaceae	*Cyperus procerus*			C		1/1
plants	land plants	Cyperaceae	*Cyperus rotundus*	nutgrass	Y			1/1
plants	land plants	Cyperaceae	*Cyperus sculptus*			C		1/1
plants	land plants	Cyperaceae	*Cyperus sesquiflorus*		Y			1/1
plants	land plants	Cyperaceae	*Cyperus squarrosus*	bearded flatsedge		C		1/1
plants	land plants	Cyperaceae	*Fimbristylis acicularis*			C		1/1
plants	land plants	Cyperaceae	*Fimbristylis cinnamometorum*			C		1/1
plants	land plants	Cyperaceae	*Fimbristylis dichotoma*	common fringe-rush		C		2/2
plants	land plants	Cyperaceae	*Fimbristylis microcarya*			C		1/1

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plants	land plants	Cyperaceae	*Gahnia aspera*			C		1
plants	land plants	Cyperaceae	*Gahnia sieberiana*	sword grass		C		1
plants	land plants	Cyperaceae	*Lepidosperma laterale*			C		2/2
plants	land plants	Cyperaceae	*Lepidosperma longitudinale*	pithy swordsedge		C		1
plants	land plants	Cyperaceae	*Schoenoplectus tabernaemontani*			C		1
plants	land plants	Cyperaceae	*Schoenus brevifolius*			C		1
plants	land plants	Cyperaceae	*Scleria brownii*			C		1/1
plants	land plants	Dioscoreaceae	*Dioscorea transversa*	native yam		C		1
plants	land plants	Droseraceae	*Drosera spatulata*			SL		1
plants	land plants	Dryopteridaceae	*Lastreopsis decomposita*	trim shield fern		SL		1
plants	land plants	Dryopteridaceae	*Lastreopsis tenera*			SL		1/1
plants	land plants	Ebenaceae	*Diospyros australis*	black plum		C		4/1
plants	land plants	Ebenaceae	*Diospyros fasciculosa*	grey ebony		C		3
plants	land plants	Ebenaceae	*Diospyros geminata*	scaly ebony		C		2
plants	land plants	Ebenaceae	*Diospyros pentamera*	myrtle ebony		C		2
plants	land plants	Elaeocarpaceae	*Elaeocarpus obovatus*	blueberry ash		C		1
plants	land plants	Erpodiaceae	*Solmsiella solmsiellacea*			C		1/1
plants	land plants	Erythroxylaceae	*Erythroxylum australe*	cocaine tree		C		1
plants	land plants	Euphorbiaceae	*Alchornea ilicifolia*	native holly		C		2
plants	land plants	Euphorbiaceae	*Baloghia inophylla*	scrub bloodwood		C		1/1
plants	land plants	Euphorbiaceae	*Croton acronychioides*	thick-leaved croton		C		2/1
plants	land plants	Euphorbiaceae	*Croton insularis*	Queensland cascarilla		C		1
plants	land plants	Euphorbiaceae	*Croton stigmatosus*	white croton		C		1
plants	land plants	Euphorbiaceae	*Mallotus claoxyloides*	green kamala		C		2/1
plants	land plants	Euphorbiaceae	*Mallotus discolor*	white kamala		C		2
plants	land plants	Euphorbiaceae	*Mallotus philippensis*	red kamala		C		3
plants	land plants	Euphorbiaceae	*Ricinus communis*	castor oil bush	Y			1
plants	land plants	Euphorbiaceae	*Tragia novae-hollandiae*	stinging-vine		C		1
plants	land plants	Frullaniaceae	*Frullania rubella*			C		4/4
plants	land plants	Goodeniaceae	*Goodenia rotundifolia*			C		1/1
plants	land plants	Haloragaceae	*Myriophyllum*					1
plants	land plants	Haloragaceae	*Myriophyllum verrucosum*	water milfoil		C		1/1
plants	land plants	Hemerocallidaceae	*Dianella caerulea var. petasmatodes*			C		1/1
plants	land plants	Hemerocallidaceae	*Geitonoplesium cymosum*	scrambling lily		C		4
plants	land plants	Hydrocharitaceae	*Egeria densa*	dense waterweed	Y			1
plants	land plants	Juncaceae	*Juncus continuus*			C		1
plants	land plants	Lamiaceae	*Anisomeles moschata*			C		2/2
plants	land plants	Lamiaceae	*Callicarpa pedunculata*	velvet leaf		C		1/1
plants	land plants	Lamiaceae	*Clerodendrum floribundum*			C		1
plants	land plants	Lamiaceae	*Clerodendrum longiflorum var. glabrum*			C		1/1
plants	land plants	Lamiaceae	*Coleus graveolens*			C		1/1
plants	land plants	Lamiaceae	*Glossocarya hemiderma*			C		1
plants	land plants	Lamiaceae	*Leucas lavandulifolia*		Y			2/2
plants	land plants	Lamiaceae	*Mentha satureioides*	native pennyroyal		C		2/2
plants	land plants	Lamiaceae	*Mesosphaerum suaveolens*		Y			1/1
plants	land plants	Lamiaceae	*Vitex lignum-vitae*			C		2

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plants	land plants	Lamiaceae	*Vitex melicopea*			C		2
plants	land plants	Lauraceae	*Cryptocarya hypospodia*	north Queensland purple laurel		C		1
plants	land plants	Lauraceae	*Cryptocarya microneura*	murrogun		C		1
plants	land plants	Lauraceae	*Cryptocarya triplinervis*			C		2
plants	land plants	Lauraceae	*Endiandra muelleri*			C		1
plants	land plants	Laxmanniaceae	*Eustrephus latifolius*	wombat berry		C		2
plants	land plants	Laxmanniaceae	*Lomandra beaniana*			C		1/1
plants	land plants	Laxmanniaceae	*Lomandra filiformis subsp. filiformis*			C		1/1
plants	land plants	Laxmanniaceae	*Lomandra longifolia*			C		1
plants	land plants	Leguminosae	*Acacia aulacocarpa*			C		2
plants	land plants	Leguminosae	*Acacia conferta*			C		2/2
plants	land plants	Leguminosae	*Acacia crassa subsp. longicoma*			C		4/4
plants	land plants	Leguminosae	*Acacia disparrima subsp. disparrima*			C		4/4
plants	land plants	Leguminosae	*Acacia harpophylla*	brigalow		C		1
plants	land plants	Leguminosae	*Acacia leiocalyx subsp. leiocalyx*			C		1/1
plants	land plants	Leguminosae	*Acacia maidenii*	Maiden's wattle		C		2/1
plants	land plants	Leguminosae	*Acacia melanoxylon*	blackwood		C		1
plants	land plants	Leguminosae	*Acacia penninervis var. longiracemosa*			C		1/1
plants	land plants	Leguminosae	*Acacia penninervis var. penninervis*			C		1/1
plants	land plants	Leguminosae	*Austrosteenisia blackii*	bloodvine		C		3
plants	land plants	Leguminosae	*Castanospermum australe*	black bean		C		3/1
plants	land plants	Leguminosae	*Chamaecrista rotundifolia var. rotundifolia*		Y			1/1
plants	land plants	Leguminosae	*Crotalaria calycina*			C		1/1
plants	land plants	Leguminosae	*Crotalaria incana subsp. incana*		Y			1/1
plants	land plants	Leguminosae	*Crotalaria spectabilis*	showy rattlepod	Y			1/1
plants	land plants	Leguminosae	*Ctenodon falcatus*		Y			1/1
plants	land plants	Leguminosae	*Cullen tenax*	emu-foot		C		1
plants	land plants	Leguminosae	*Desmodium tortuosum*	Florida beggar-weed	Y			1/1
plants	land plants	Leguminosae	*Desmodium triflorum*		Y			1/1
plants	land plants	Leguminosae	*Erythrina vespertilio subsp. vespertilio*			C		1/1
plants	land plants	Leguminosae	*Galactia tenuiflora var. lucida*			C		1/1
plants	land plants	Leguminosae	*Hardenbergia violacea*			C		1/1
plants	land plants	Leguminosae	*Indigofera suffruticosa*		Y			1/1
plants	land plants	Leguminosae	*Indigofera trifoliata*			C		1/1
plants	land plants	Leguminosae	*Macrotyloma axillare var. axillare*		Y			1/1
plants	land plants	Leguminosae	*Mezoneuron nitens*			C		1/1
plants	land plants	Leguminosae	*Pararchidendron pruinosum*			C		1
plants	land plants	Leguminosae	*Pycnospora lutescens*	pycnospora		C		1/1
plants	land plants	Leguminosae	*Senna*					1
plants	land plants	Leguminosae	*Senna gaudichaudii*			C		2/2
plants	land plants	Leguminosae	*Tephrosia astragaloides*			C		2/2
plants	land plants	Leguminosae	*Tephrosia juncea*			C		1/1
plants	land plants	Leguminosae	*Tephrosia rufula*			C		1/1
plants	land plants	Leguminosae	*Vachellia bidwillii*			C		2/1
plants	land plants	Leguminosae	*Zornia floribunda*			C		1/1
plants	land plants	Leguminosae	*Zornia muriculata subsp. muriculata*			C		1/1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	land plants	Linderniaceae	*Artanema fimbriatum*			C		1/1
plants	land plants	Linderniaceae	*Torenia crustacea*			C		1/1
plants	land plants	Lindsaeaceae	*Lindsaea ensifolia*			C		1
plants	land plants	Loganiaceae	*Strychnos psilosperma*	strychnine tree		C		2
plants	land plants	Lygodiaceae	*Lygodium microphyllum*	snake fern		C		1
plants	land plants	Lythraceae	*Cuphea carthagenensis*		Y			1/1
plants	land plants	Malvaceae	*Abutilon auritum*	Chinese lantern		C		2/1
plants	land plants	Malvaceae	*Abutilon grandifolium*		Y			1
plants	land plants	Malvaceae	*Hibiscus divaricatus*			C		1
plants	land plants	Malvaceae	*Malvastrum coromandelianum subsp. coromandelianum*		Y			2/1
plants	land plants	Malvaceae	*Sida cordifolia*		Y			2/1
plants	land plants	Meliaceae	*Melia azedarach*	white cedar		C		2
plants	land plants	Meliaceae	*Owenia venosa*	crow's apple		C		1
plants	land plants	Meliaceae	*Turraea pubescens*	native honeysuckle		C		2
plants	land plants	Menispermaceae	*Hypserpa decumbens*			C		1
plants	land plants	Menispermaceae	*Legnephora moorei*			C		3
plants	land plants	Menispermaceae	*Pleogyne australis*	wiry grape		C		3
plants	land plants	Menispermaceae	*Stephania japonica*			C		1
plants	land plants	Menyanthaceae	*Nymphoides indica*	water snowflake		SL		1
plants	land plants	Monimiaceae	*Wilkiea macrophylla*	large-leaved wilkiea		C		1
plants	land plants	Moraceae	*Ficus coronata*	creek sandpaper fig		C		1
plants	land plants	Moraceae	*Ficus fraseri*	white sandpaper fig		C		1
plants	land plants	Moraceae	*Ficus macrophylla forma macrophylla*	Moreton Bay fig		C		2
plants	land plants	Moraceae	*Ficus opposita*			C		1
plants	land plants	Moraceae	*Ficus racemosa var. racemosa*			C		3
plants	land plants	Moraceae	*Maclura cochinchinensis*	cockspur thorn		C		2
plants	land plants	Moraceae	*Malaisia scandens subsp. scandens*			C		4
plants	land plants	Moraceae	*Streblus brunonianus*	whalebone tree		C		6/2
plants	land plants	Myrsinaceae	*Embelia australiana*	embelia		C		2
plants	land plants	Myrsinaceae	*Myrsine variabilis*			C		2
plants	land plants	Myrtaceae	*Angophora subvelutina*			C		1
plants	land plants	Myrtaceae	*Corymbia citriodora subsp. citriodora*			C		2
plants	land plants	Myrtaceae	*Corymbia clarksoniana*			C		1/1
plants	land plants	Myrtaceae	*Corymbia erythrophloia*	variable-barked bloodwood		C		2/2
plants	land plants	Myrtaceae	*Corymbia intermedia*	pink bloodwood		C		3
plants	land plants	Myrtaceae	*Corymbia tessellaris*	Moreton Bay ash		C		1
plants	land plants	Myrtaceae	*Corymbia trachyphloia subsp. trachyphloia*			C		1
plants	land plants	Myrtaceae	*Eucalyptus acmenoides*			C		2
plants	land plants	Myrtaceae	*Eucalyptus crebra*	narrow-leaved red ironbark		C		3/1
plants	land plants	Myrtaceae	*Eucalyptus exserta*	Queensland peppermint		C		2
plants	land plants	Myrtaceae	*Eucalyptus hallii*	Goodwood gum		V	V	1
plants	land plants	Myrtaceae	*Eucalyptus melanophloia*			C		1
plants	land plants	Myrtaceae	*Eucalyptus moluccana*	gum-topped box		C		1/1
plants	land plants	Myrtaceae	*Eucalyptus portuensis*			C		1/1
plants	land plants	Myrtaceae	*Eucalyptus siderophloia*			C		1/1
plants	land plants	Myrtaceae	*Eucalyptus tereticornis*			C		4

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	land plants	Myrtaceae	*Gossia bidwillii*			C		3
plants	land plants	Myrtaceae	*Lophostemon confertus*	brush box		C		5/3
plants	land plants	Myrtaceae	*Melaleuca bracteata*			C		1
plants	land plants	Myrtaceae	*Melaleuca cheelii*			NT		1
plants	land plants	Myrtaceae	*Melaleuca trichostachya*			C		2
plants	land plants	Myrtaceae	*Melaleuca viminalis*			C		2
plants	land plants	Myrtaceae	*Psidium guajava*	guava	Y			1/1
plants	land plants	Myrtaceae	*Rhodamnia dumicola*	rib-fruited malletwood		E		1
plants	land plants	Myrtaceae	*Syzygium australe*	scrub cherry		C		2
plants	land plants	Myrtaceae	*Syzygium francisii*	giant watergum		C		2
plants	land plants	Myrtaceae	*Waterhousea floribunda*	weeping lilly pilly		C		3/1
plants	land plants	Oleaceae	*Jasminum simplicifolium subsp. australiense*			C		3/1
plants	land plants	Oleaceae	*Notelaea microcarpa*			C		2
plants	land plants	Onagraceae	*Ludwigia peploides subsp. montevidensis*			C		1
plants	land plants	Ophioglossaceae	*Ophioglossum reticulatum*			C		1/1
plants	land plants	Orchidaceae	*Bulbophyllum schillerianum*	red rope orchid		SL		1/1
plants	land plants	Orchidaceae	*Cymbidium canaliculatum*			SL		1/1
plants	land plants	Orchidaceae	*Dendrobium monophyllum*			SL		1/1
plants	land plants	Orchidaceae	*Dendrobium speciosum subsp. grandiflorum*			SL		2/2
plants	land plants	Orchidaceae	*Dendrobium tetragonum*	tree spider orchid		SL		1
plants	land plants	Orchidaceae	*Dockrillia bowmanii*	scrub pencil orchid		SL		1/1
plants	land plants	Orchidaceae	*Dockrillia linguiformis*	tongue orchid		SL		1/1
plants	land plants	Orchidaceae	*Oberonia complanata*			SL		1/1
plants	land plants	Orchidaceae	*Sarcochilus ceciliae*	fairy bells		SL		1/1
plants	land plants	Orthotrichaceae	*Macromitrium aurescens*			C		1/1
plants	land plants	Oxalidaceae	*Oxalis corniculata*		Y			1
plants	land plants	Papaveraceae	*Argemone ochroleuca subsp. ochroleuca*	Mexican poppy	Y			1
plants	land plants	Passifloraceae	*Passiflora aurantia*			C		1
plants	land plants	Passifloraceae	*Passiflora aurantia var. aurantia*			C		2/2
plants	land plants	Passifloraceae	*Passiflora foetida*		Y			2/2
plants	land plants	Passifloraceae	*Passiflora pallida*		Y			1/1
plants	land plants	Passifloraceae	*Passiflora subpeltata*	white passion flower	Y			1
plants	land plants	Petiveriaceae	*Rivina humilis*		Y			1
plants	land plants	Phyllanthaceae	*Actephila mooreana*			C		1
plants	land plants	Phyllanthaceae	*Breynia oblongifolia*			C		3/1
plants	land plants	Phyllanthaceae	*Bridelia exaltata*			C		1
plants	land plants	Phyllanthaceae	*Bridelia leichhardtii*			C		1
plants	land plants	Phyllanthaceae	*Cleistanthus cunninghamii*	omega		C		3
plants	land plants	Phyllanthaceae	*Glochidion ferdinandi var. ferdinandi*			C		1/1
plants	land plants	Phyllanthaceae	*Phyllanthus novae-hollandiae*			C		1
plants	land plants	Phyllanthaceae	*Phyllanthus subcrenulatus*			C		2/1
plants	land plants	Phyllanthaceae	*Phyllanthus virgatus*			C		1
plants	land plants	Phyllanthaceae	*Synostemon albiflorus*			C		1/1
plants	land plants	Pinaceae	*Pinus elliottii*	slash pine	Y			1
plants	land plants	Piperaceae	*Peperomia leptostachya*			C		1/1
plants	land plants	Pittosporaceae	*Bursaria incana*			C		1

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plants	land plants	Pittosporaceae	*Pittosporum revolutum*	yellow pittosporum		C		2
plants	land plants	Pittosporaceae	*Pittosporum spinescens*			C		1
plants	land plants	Pittosporaceae	*Pittosporum tinifolium*			C		1/1
plants	land plants	Pittosporaceae	*Pittosporum viscidum*	black-fruited thornbush		C		1
plants	land plants	Plantaginaceae	*Bacopa monnieri*			C		1
plants	land plants	Plantaginaceae	*Mecardonia procumbens*		Y			1/1
plants	land plants	Poaceae	*Ancistrachne uncinulata*	hooky grass		C		1
plants	land plants	Poaceae	*Aristida gracilipes*			C		1/1
plants	land plants	Poaceae	*Aristida queenslandica var. queenslandica*			C		1/1
plants	land plants	Poaceae	*Bothriochloa bladhii subsp. bladhii*			C		1/1
plants	land plants	Poaceae	*Bothriochloa decipiens var. cloncurrensis*			C		1/1
plants	land plants	Poaceae	*Chloris divaricata var. divaricata*	slender chloris		C		1/1
plants	land plants	Poaceae	*Chrysopogon filipes*			C		1
plants	land plants	Poaceae	*Chrysopogon sylvaticus*			C		4/4
plants	land plants	Poaceae	*Cynodon dactylon var. dactylon*		Y			1
plants	land plants	Poaceae	*Dichanthium sericeum subsp. sericeum*			C		1/1
plants	land plants	Poaceae	*Digitaria*					1/1
plants	land plants	Poaceae	*Digitaria diminuta*			C		1/1
plants	land plants	Poaceae	*Digitaria divaricatissima*	spreading umbrella grass		C		1/1
plants	land plants	Poaceae	*Digitaria longiflora*			C		1/1
plants	land plants	Poaceae	*Digitaria ramularis*			C		1/1
plants	land plants	Poaceae	*Dinebra decipiens var. decipiens*			C		2/2
plants	land plants	Poaceae	*Enteropogon unispiceus*			C		1/1
plants	land plants	Poaceae	*Eragrostis sororia*			C		1/1
plants	land plants	Poaceae	*Eragrostis spartinoides*			C		1/1
plants	land plants	Poaceae	*Eragrostis tenuifolia*	elastic grass	Y			1/1
plants	land plants	Poaceae	*Hemarthria uncinata var. spathacea*			C		1/1
plants	land plants	Poaceae	*Heteropogon contortus*	black speargrass		C		1/1
plants	land plants	Poaceae	*Imperata cylindrica*	blady grass		C		1
plants	land plants	Poaceae	*Ischaemum australe var. villosum*			C		1/1
plants	land plants	Poaceae	*Melinis minutiflora*	molasses grass	Y			1/1
plants	land plants	Poaceae	*Microlaena stipoides var. stipoides*			C		1/1
plants	land plants	Poaceae	*Oplismenus aemulus*	creeping shade grass		C		4/1
plants	land plants	Poaceae	*Panicum effusum*			C		1/1
plants	land plants	Poaceae	*Panicum simile*			C		1/1
plants	land plants	Poaceae	*Paspalidium distans*	shotgrass		C		1/1
plants	land plants	Poaceae	*Sarga leiocladum*			C		1/1
plants	land plants	Poaceae	*Schizachyrium fragile*	firegrass		C		1/1
plants	land plants	Poaceae	*Sehima nervosum*			C		1/1
plants	land plants	Poaceae	*Setaria incrassata*		Y			1/1
plants	land plants	Poaceae	*Sorghum nitidum forma aristatum*			C		2/2
plants	land plants	Poaceae	*Sporobolus africanus*	Parramatta grass	Y			1/1
plants	land plants	Poaceae	*Sporobolus creber*			C		2/2
plants	land plants	Poaceae	*Sporobolus elongatus*			C		2/2
plants	land plants	Poaceae	*Sporobolus laxus*			C		1/1
plants	land plants	Poaceae	*Themeda quadrivalvis*	grader grass	Y			2/2

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plants	land plants	Poaceae	*Tripogon loliiformis*	five minute grass		C		1/1
plants	land plants	Poaceae	*Urochloa foliosa*			C		1/1
plants	land plants	Poaceae	*Urochloa mutica*		Y			1
plants	land plants	Poaceae	*Urochloa whiteana*			C		1/1
plants	land plants	Polygalaceae	*Polygala triflora*			C		1/1
plants	land plants	Polygonaceae	*Persicaria decipiens*	slender knotweed		C		1/1
plants	land plants	Polygonaceae	*Persicaria lapathifolia*	pale knotweed		C		2/2
plants	land plants	Polygonaceae	*Rumex*					1
plants	land plants	Polygonaceae	*Rumex brownii*	swamp dock		C		1/1
plants	land plants	Polypodiaceae	*Drynaria rigidula*			SL		1/1
plants	land plants	Polypodiaceae	*Microsorum punctatum*			SL		2/2
plants	land plants	Polypodiaceae	*Pyrrosia confluens*			SL		1
plants	land plants	Polypodiaceae	*Pyrrosia rupestris*	rock felt fern		SL		1/1
plants	land plants	Potamogetonaceae	*Potamogeton tepperi*			SL		1/1
plants	land plants	Proteaceae	*Xylomelum salicinum*			C		1/1
plants	land plants	Pteridaceae	*Adiantum aethiopicum*			SL		2
plants	land plants	Pteridaceae	*Adiantum atroviride*			SL		1/1
plants	land plants	Pteridaceae	*Adiantum formosum*			C		1
plants	land plants	Pteridaceae	*Adiantum hispidulum*			SL		3
plants	land plants	Pteridaceae	*Adiantum hispidulum var. hispidulum*			SL		1/1
plants	land plants	Pteridaceae	*Adiantum hispidulum var. minus*			SL		1/1
plants	land plants	Pteridaceae	*Cheilanthes distans*	bristly cloak fern		C		1/1
plants	land plants	Pteridaceae	*Cheilanthes nudiuscula*			C		1/1
plants	land plants	Pteridaceae	*Cheilanthes tenuifolia*	rock fern		C		1/1
plants	land plants	Pteridaceae	*Doryopteris concolor*			SL		1/1
plants	land plants	Pteridaceae	*Pellaea falcata*			SL		2
plants	land plants	Pteridaceae	*Pellaea nana*			SL		1/1
plants	land plants	Ptychomitriaceae	*Ptychomitrium australe*			C		1/1
plants	land plants	Ptychomniaceae	*Garovaglia elegans subsp. dietrichiae*			C		1/1
plants	land plants	Putranjivaceae	*Drypetes deplanchei*	grey boxwood		C		3/1
plants	land plants	Restionaceae	*Baloskion pallens*			C		1
plants	land plants	Rhamnaceae	*Alphitonia excelsa*	soap tree		C		3
plants	land plants	Ripogonaceae	*Ripogonum brevifolium*	small-leaved supplejack		C		1
plants	land plants	Rubiaceae	*Atractocarpus chartaceus*			C		4/1
plants	land plants	Rubiaceae	*Cyclophyllum coprosmoides*			C		1
plants	land plants	Rubiaceae	*Everistia vacciniifolia var. nervosa*			C		2
plants	land plants	Rubiaceae	*Gynochthodes canthoides*			C		1
plants	land plants	Rubiaceae	*Gynochthodes jasminoides*			C		1
plants	land plants	Rubiaceae	*Ixora beckleri*	brown coffeewood		C		2
plants	land plants	Rubiaceae	*Mitracarpus hirtus*		Y			1/1
plants	land plants	Rubiaceae	*Pavetta australiensis*			C		3
plants	land plants	Rubiaceae	*Psychotria*					1/1
plants	land plants	Rubiaceae	*Psychotria loniceroides*	hairy psychotria		C		1
plants	land plants	Rubiaceae	*Psychotria sp. (Shute Harbour L.J.Webb+ 7916)*			C		1/1
plants	land plants	Rubiaceae	*Psydrax odorata*			C		2
plants	land plants	Rubiaceae	*Psydrax odorata forma buxifolia*			C		1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	land plants	Rutaceae	*Acronychia laevis*	glossy acronychia		C		2/1
plants	land plants	Rutaceae	*Bosistoa transversa*	three-leaved bosistoa		C	V	1
plants	land plants	Rutaceae	*Citrus x limon*		Y			1
plants	land plants	Rutaceae	*Flindersia australis*	crow's ash		C		2
plants	land plants	Rutaceae	*Flindersia schottiana*	bumpy ash		C		1
plants	land plants	Rutaceae	*Geijera salicifolia*	brush wilga		C		2
plants	land plants	Rutaceae	*Micromelum minutum*	clusterberry		C		1
plants	land plants	Rutaceae	*Murraya paniculata 'Exotica'*		Y			1
plants	land plants	Rutaceae	*Sarcomelicope simplicifolia subsp. simplicifolia*	yellow aspen		C		2/1
plants	land plants	Salicaceae	*Casearia multinervosa*	casearia		C		1
plants	land plants	Salicaceae	*Xylosma terrae-reginae*	xylosma		C		2/2
plants	land plants	Salviniaceae	*Azolla pinnata*	ferny azolla		C		1
plants	land plants	Santalaceae	*Exocarpos latifolius*			C		2
plants	land plants	Sapindaceae	*Alectryon subdentatus*			C		1
plants	land plants	Sapindaceae	*Alectryon tomentosus*			C		3
plants	land plants	Sapindaceae	*Arytera divaricata*	coogera		C		3
plants	land plants	Sapindaceae	*Arytera microphylla*			C		3/1
plants	land plants	Sapindaceae	*Atalaya salicifolia*			C		3
plants	land plants	Sapindaceae	*Cardiospermum grandiflorum*	heart seed vine	Y			2
plants	land plants	Sapindaceae	*Cardiospermum halicacabum var. halicacabum*		Y			1/1
plants	land plants	Sapindaceae	*Cupaniopsis anacardioides*	tuckeroo		C		2
plants	land plants	Sapindaceae	*Cupaniopsis parvifolia*	small-leaved tuckeroo		C		1
plants	land plants	Sapindaceae	*Cupaniopsis shirleyana*	wedge-leaf tuckeroo		V	V	1
plants	land plants	Sapindaceae	*Cupaniopsis sp. (Watalgan A.R.Bean 8611)*			C		4/4
plants	land plants	Sapindaceae	*Dodonaea lanceolata var. subsessilifolia*			C		1/1
plants	land plants	Sapindaceae	*Dodonaea triquetra*	large-leaved hop bush		C		1
plants	land plants	Sapindaceae	*Elattostachys bidwillii*			C		2/2
plants	land plants	Sapindaceae	*Elattostachys xylocarpa*	white tamarind		C		1
plants	land plants	Sapindaceae	*Guioa semiglauca*	guioa		C		1
plants	land plants	Sapindaceae	*Harpullia hillii*			C		1
plants	land plants	Sapindaceae	*Harpullia pendula*			C		2/1
plants	land plants	Sapindaceae	*Jagera pseudorhus*			C		3
plants	land plants	Sapindaceae	*Mischocarpus anodontus*	veiny pearfruit		C		1
plants	land plants	Sapindaceae	*Mischocarpus pyriformis*			C		1
plants	land plants	Sapindaceae	*Sarcopteryx stipata*	steelwood		C		1
plants	land plants	Sapotaceae	*Planchonella cotinifolia*			C		1
plants	land plants	Sapotaceae	*Planchonella cotinifolia var. pubescens*			C		1
plants	land plants	Sapotaceae	*Planchonella pohlmaniana*			C		2/1
plants	land plants	Sematophyllaceae	*Sematophyllum subpinnatum*			C		1/1
plants	land plants	Smilacaceae	*Smilax australis*	barbed-wire vine		C		3
plants	land plants	Solanaceae	*Capsicum frutescens*		Y			1/1
plants	land plants	Solanaceae	*Cestrum parqui*	green cestrum	Y			1
plants	land plants	Solanaceae	*Physalis angulata*		Y			1
plants	land plants	Solanaceae	*Solanum ellipticum*	potato bush		C		1/1
plants	land plants	Solanaceae	*Solanum erianthum*	potato tree	Y			1/1
plants	land plants	Solanaceae	*Solanum seaforthianum*	Brazilian nightshade	Y			2

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	land plants	Solanaceae	*Solanum stelligerum*	devil's needles		C		3/1
plants	land plants	Solanaceae	*Solanum torvum*	devil's fig	Y			1
plants	land plants	Sparrmanniaceae	*Triumfetta rhomboidea*	chinese burr	Y			1/1
plants	land plants	Sterculiaceae	*Argyrodendron sp. (Kin Kin W.D.Francis AQ81198)*	rusty tulip oak		C		1
plants	land plants	Sterculiaceae	*Argyrodendron trifoliolatum*	booyong		C		2
plants	land plants	Sterculiaceae	*Brachychiton bidwillii*	little kurrajong		SL		1/1
plants	land plants	Sterculiaceae	*Sterculia quadrifida*	peanut tree		C		1
plants	land plants	Thelypteridaceae	*Christella dentata*	creek fern		SL		2
plants	land plants	Typhaceae	*Typha*					1
plants	land plants	Urticaceae	*Dendrocnide photiniphylla*	shiny-leaved stinging tree		C		1
plants	land plants	Urticaceae	*Pipturus argenteus*	white nettle		C		1/1
plants	land plants	Verbenaceae	*Lantana camara*	lantana	Y			5
plants	land plants	Verbenaceae	*Verbena*					1
plants	land plants	Verbenaceae	*Verbena rigida*		Y			1
plants	land plants	Vitaceae	*Apocissus antarctica*			C		1
plants	land plants	Vitaceae	*Apocissus oblonga*			C		1
plants	land plants	Vitaceae	*Causonis clematidea*			C		2
plants	land plants	Vitaceae	*Clematicissus opaca*			C		1
plants	land plants	Vitaceae	*Tetrastigma nitens*	shining grape		C		1
plants	land plants	Zamiaceae	*Macrozamia macleayi*			SL		4/4

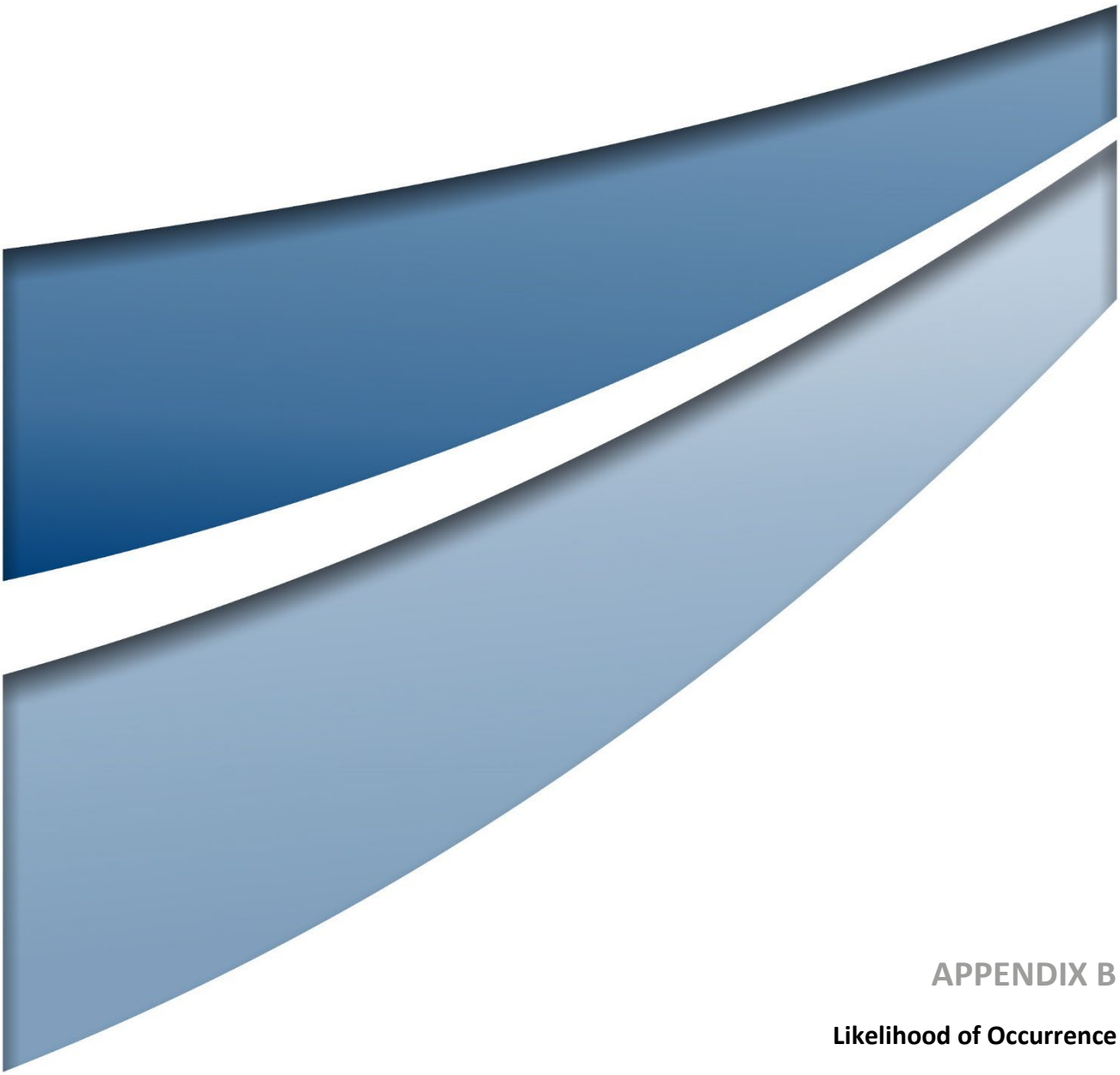
CODES

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 (EX), Extinct in the Wild (PE), Critically Endangered (CR), Endangered (E), Vulnerable (V), Near Threatened (NT), Special Least Concern (SL) and Least Concern (C).

A - Indicates the Australian conservation status of each taxon under the *Environment Protection and Biodiversity Conservation Act 1999.*
The values of EPBC are Extinct (EX), Extinct in the Wild (XW), Critically Endangered (CE), Endangered (E), Vulnerable (V) and Conservation Dependent (CD).

Records - The first number indicates the total number of records of the taxon (wildlife records and species listings for selected areas).
This number is output as 99999 if it equals or exceeds this value. A second number located after a / indicates the number of specimen records for the taxon.
This number is output as 999 if it equals or exceeds this value.



APPENDIX B

Likelihood of Occurrence

Scientific Name	Common Name	EPBC Act	EPBC Migratory	NC Act	Habitat	Likelihood of Occurrence
Threatened Ecological Communities						
Poplar Box Grassy Woodland on Alluvial Plains		Endangered	-	-	The Poplar Box Grassy Woodland on Alluvial Plains ecological community is typically a grassy woodland with a canopy dominated by *Eucalyptus populnea* and understorey mostly of grasses and other herbs. The ecological community mostly occurs in gently undulating to flat landscapes and occasionally on gentle slopes on a wide range of soil types of alluvial and depositional origin. Corresponding REs in the Southeast Queensland bioregion include: 12.3.10. Key diagnostic criteria and condition thresholds must be assessed during field surveys to conclusively determine if analogous REs meet TEC status.	**No.** All areas of the Study Area were validated as part of field surveys. *Eucalyptus populnea* was not recorded in the Study Area and thus, no analogous vegetation communities are present.
Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions		Endangered	-	-	The structure of the ecological community, in its undisturbed state, varies from tall open forest to woodland, although partial clearing may have reduced the canopy to scattered trees in some areas. The tree canopy is dominated by eucalypts and/or other myrtaceous trees (specifically from the *Angophora*, *Corymbia, Lophostemon* and *Syncarpia* genera), often as a mixture of species. The ecological community is found on alluvial landforms, including floodplains, the riparian zones of parent rivers and other order tributaries, alluvial flats, floodplain/alluvial terraces and periodically flooded depressions. It generally occurs below 50 m ASL, although it can occur up to 250 m ASL. Corresponding REs in the Southeast Queensland bioregion include:	**No.** All areas of the Study Area were validated as part of field surveys. One analogous RE (RE 12.3.3) was recorded, associated with a drainage line that runs along the southern boundary. Targeted assessments of patches of RE 12.3.3 patches were completed, and it was concluded that no patches met the key diagnostic characteristics and minimum condition thresholds of the TEC. A breakdown of the targeted assessment is further detailed in **Section 4.2.5.2.**

Scientific Name	Common Name	EPBC Act	EPBC Migratory	NC Act	Habitat	Likelihood of Occurrence
					12.3.3/12.3.3a/12.3.3d, 12.3.19, 12.3.10 and 12.3.18. Key diagnostic criteria and condition thresholds must be assessed during field surveys to conclusively determine if analogous REs meet TEC status.	
Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland		Endangered	-	-	This TEC often has a layered canopy, dominated by melaleucas and/or *Eucalyptus robusta*. The ecological community typically occurs in low-lying coastal alluvial areas with minimal relief, such as swamps, floodplain pockets, depressions, alluvial flats, back-barrier flats, fans, terraces, and behind fore-dunes. Corresponding REs in the Southeast Queensland bioregion include: 12.2.7, 12.3.4/12.3.4a, 12.3.5, 12.3.6 and 12.3.20. Key diagnostic criteria and condition thresholds must be assessed during field surveys to conclusively determine if analogous REs meet TEC status.	**No.** All areas of the Study Area were validated as part of field surveys. No areas of vegetation consistent with the description of the community were identified during the field assessment.
Lowland Rainforest of Subtropical Australia		Critically Endangered	-	-	The ecological community is generally a moderately tall (≥20 m) to tall (≥30 m) closed forest (canopy cover ≥70%). Tree species with compound leaves are common and leaves are relatively large (notophyll to mesophyll). Typically, there is a relatively low abundance of species from the genera *Eucalyptus, Melaleuca* and *Casuarina*. The ecological community occurs on basalt and alluvial soils, including sand and old/elevated alluvial soils as well as floodplain alluvia. It also occurs occasionally on historically enriched rhyolitic soils and basal enriched metasediments. Lowland Rainforest mostly occurs in areas. Corresponding REs in the Southeast Queensland bioregion include:	**No**. All areas of the Study Area were validated as part of field surveys. No areas of vegetation consistent with the description of the community were identified during the field assessment. Vine forest / rainforest communities were not present within the Study Area.

Scientific Name	Common Name	EPBC Act	EPBC Migratory	NC Act	Habitat	Likelihood of Occurrence
					12.3.1, 12.5.13, 12.8.3, 12.8.4, 12.8.13, 12.11.1, 12.11.10, 12.12.1 and 12.12.16. Key diagnostic criteria and condition thresholds must be assessed during field surveys to conclusively determine if analogous REs meet TEC status.	
Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South East Queensland ecological community		Endangered	-	-	This TEC is characterised by the dominant presence of *Casuarina glauca* (swamp oak) within the canopy layer. It is often associated with other vegetation types such as coastal saltmarsh, mangroves, freshwater wetlands, littoral rainforests or swamp sclerophyll. This TEC generally occurs on unconsolidated sediment and where groundwater is saline or brackish. Corresponding REs in the Southeast Queensland bioregion include: 12.1.1 and 12.3.20. Key diagnostic criteria and condition thresholds must be assessed during field surveys to conclusively determine if analogous REs meet TEC status.	**No.** All areas of the Study Area were validated as part of field surveys. *Casuarina glauca* was not recorded within the Study area. No areas of vegetation consistent with the description of the community were identified during the field assessment.
Flora						
Arthraxon hispidus	Hairy-joint grass	Vulnerable	-	Vulnerable	This species occurs in or on the edges of rainforest and in wet eucalypt forest, often near creeks or swamps, as well as woodland. In the South-East Qld Bioregion, this species has also been recorded growing around freshwater springs on coastal foreshore dunes, in shaded small gullies, on creek banks, and on sandy alluvium in creek beds in open forests, and with bog mosses in mound springs (Department of the Environment, Water, Heritage and the Arts 2008a).	**Low** Identified on the PMST search, with mapped areas of 'may occur' in the search extent. The nearest record of the species is 73 km west of the Study Area, near Cynthia State Forest. Habitat within the Study Area is considered marginal, with rainforest, wet eucalypt forest, swamps and mound springs not present.

Scientific Name	Common Name	EPBC Act	EPBC Migratory	NC Act	Habitat	Likelihood of Occurrence
Bosistoa transversa	Three-leaved bosistoa	Vulnerable	-	Least concern	The species grows in lowland subtropical rainforest up to 300 m above sea level. In Queensland, the species has been found in a variety of habitats including complex notophyll vine forest with emergent *Lophostemon confertus* on reddish loam over basalt; complex notophyll vine forest with *Excoecaria dallachyana* and *Dissiliaria baloghioides* on brown loamy soils; and remnant vine forest pockets within highly disturbed and weed infested habitats.	**Low.** The species has not been recorded within 20 km of the Study Area. The nearest record is 23 km south-east of the Study Area (ALA). Suitable habitat, comprising notophyll vine forest, is not present within the Study Area.
Bulbophyllum globuliforme	miniature moss-orchid	Vulnerable	-	Near Threatened	The species is host-specific, only growing on the hoop pine, where it colonises the upper branches of mature trees. The hoop pine occurs in upland (usually 100-900 m ASL) subtropical rainforest communities. Hoop pines must be over 100 years old (Department of Environment, Science and innovation 2024). The species SPRAT profile identifies this species from four known locations, including Puzzle Creek near Paluma (north-east Queensland), Krombit Tops near Calliope (Central Queensland), Cainbable Creek in Lamington National Park (south-east Queensland) and Levers Plateau (north-east New South Wales. (	**No** Identified on the PMST search, with mapped areas of 'likely occur' in the search extent. The nearest record of the species is 100 km north of the Study Area, associated with Kroombit Tops National Park. No hoop pine or subtroprical rainforest communities are present in the Study Area.
Cossinia australiana	Cossinia	Endangered	-	Endangered	The species occurs in relict patches of araucarian vine forests or vine thickets on fertile soils in central and southern Qld (Department of Climate Change Energy the Environment and Water 2008c).	**No** Identified on the PMST search, with mapped areas of 'likely occur' in the search extent. Numerous records exist within 40-50 km of the Study Area, including within protected estate. Suitable habitat in the form of vine forest or vine thickets are absent from the Study Area.

Scientific Name	Common Name	EPBC Act	EPBC Migratory	NC Act	Habitat	Likelihood of Occurrence
Cryptostylis hunteriana	Leafless tongue-orchid	Vulnerable	-	Special least concern	Across its range, the species occupies a range of habitats, including heathlands, heathy woodland, sedgelands, Xanthorrhoea spp. Plains, dry sclerophyll forests, forested wetlands, freshwater wetlands, grasslands, grassy woodlands, rainforests and wet sclerophyll forests (Department of the Environment 2024b). In Qld, this species is found from the Tin Can Bay area and along the coast to the Glasshouse Mountains, and populations have been recorded from sandy heathlands (Department of the Environment 2024b).	**No** Identified on the PMST search, with mapped areas of 'may occur' in the search extent. The nearest records exist 100 km south east of the Study Area, and the range of known habitat types are largely absent from the Study Area.
Cupaniopsis shirleyana	Wedge-leaf tuckeroo	Vulnerable	-	Vulnerable	The species occurs in a variety of dry rainforest vegetation types, including vine thicket communities on hillsides, stream beds and along riverbanks at altitudes up to 550 m asl. This species is also likely to occur on the margins of native vegetation in scrubby urbanised areas. It is predominately found on dark brown sandy loams and sandy clay loams (pH 5 - 7.5) and rocky scree slopes.	**Low.** The species has been previously recorded within approximately 9.4 km north of the Study Area in 1989 (ALA), however, the record has a spatial uncertainty of 10 km. There are no other records within 20 km of the Study Area. Suitable habitat, comprising vine thicket communities, is not present within the Study Area. Due to the age and the spatial uncertainty of the existing record, and absence of suitable habitat, it is considered a low likelihood of occurring.
Cycas megacarpa	-	Endangered	-	Endangered	The species is found in woodland, open woodland, and open forests, often in conjunction with a grassy understory. This species is found in habitat dominated by *Eucalyptus crebra* and *Corymbia citriodora* as well as *C. erythrophloia*, *E. melanophloia* and *Lophostemon confertus*. There are also reports that it can be found in or on the edge of rainforest habitat. According to the Queensland Herbarium (2007), the species occurs in the following REs within the South East Queensland bioregion: 12.1.3, 12.5.5, 12.11.2, 12.11.6, 12.11.7, 12.12.3, 12.12.4,	**Moderate.** Records for the species are protected due to the threat of illegal collection by specialist collectors. There is an ALA records within 2 km west of the Study Area, however, this records has a spatial uncertainty of 2 km (ALA). The Study Area is within the known distribution of the species. Suitable habitat is present within Study Area, specifically RE 12.11.6, which is identified as by the Queensland Herbarium as suitable habitat. The field surveys targeted patches of suitable habitat, with no records of Cy*cas megacarpa* detected.

Scientific Name	Common Name	EPBC Act	EPBC Migratory	NC Act	Habitat	Likelihood of Occurrence
					12.12.5, 12.12.7, 12.12.9, 12.12.11, 12.12.12, 12.12.16, 12.12.23, 12.12.27.	
Dichanthium setosum	Bluegrass	Vulnerable	-	Least concern	The species occurs on heavy soils (predominantly cracking clays or alluvium, often in gilgai) in woodland or open woodland usually dominated by *Acacia* and/or *Eucalyptus* spp. Associated climate is tropical to subtropical and seasonal, with the habitat drying out for part of the year (Department of the Environment 2024d)	**Low** Identified on the PMST search, with mapped areas of 'likely occur' in the search extent. The nearest records exist over 100 km from the Study Area. Habitat within the Study Area is marginal, being highly degraded as a result of exotic pasture species. Cracking clays and gilgai are absent from the Study Area.
Eucalyptus hallii	Goodwood gum	Vulnerable	-	Vulnerable	The species is found in open eucalypt forest or woodland in coastal areas on low, flat to undulating terrain with gentle slopes to broad rises. It occurs up to 60 m ASL. It grows on acidic, grey silty or white sandy soils. It is endemic to coastal lowlands between Bundaberg and Maryborough.	**Low.** The species has been recorded approximately 23 km south-east of the Study Area from 1994. The record has a spatial uncertainty of 2 km. The Study Area occurs outside the known species distribution. Woodland communities within the Study Area are not considered suitable habitat as they are not coastal and typically occur between 135–180 m ASL.
Eucalyptus raveretiana	Black ironbox	Vulnerable	-	Least concern	*Eucalyptus raveretiana* grows along watercourses and occasionally on river flats. It occurs in open forest or woodland communities. The species prefers sites with moderately fertile soil and adequate sub-soil moisture. The alluvial soils in which it grows are sands, loams, light clays or cracking clays.	**Low** Identified on the PMST search, with mapped areas of 'may occur' overlapping the Study Area. The nearest records exist far beyond the Study Area (greater than 250 km). Suitable alluvial habitat is marginal, heavily degraded with habitat clearance and impacts from *Lantana camara.* The conspicuous species was not detected during field surveys.

Scientific Name	Common Name	EPBC Act	EPBC Migratory	NC Act	Habitat	Likelihood of Occurrence
Fontainea venosa	-	Vulnerable	-	Vulnerable	*Fontainea venosa* occurs in notophyll vine forest and vine thicket with a mean annual rainfall of 1000-1100 mm on soils derived from and containing abundant andesitic rocks, often on rocky outcrops or along creeks. Associated species include *Backhousia citriodora, Actephila lindleyi, Bosistoa medicinalis, Diospyros fasciculosa, Barkly syringifolia, Araucaria cunninghamii, Owenia venosa, Aphananthe philippinensis, Argyrodendron trifoliolatum, Croton acronychioides, Pentaceras australe* and *Planchonella myrsinoides* (Qld Herbarium, 2012).	**No** Identified on the PMST search, with mapped areas of 'may occur' in the search extent. Numerous records exist within 80 km of the Study Area, near Biloela, Qld. Suitable habitat in the form of vine forest or vine thickets are absent from the Study Area.
Leuzea australis	Austral cornflower	Vulnerable	-	Vulnerable	The species is often found in woodland and grassland and in association with *Eucalyptus crebra, E. orgadophila, E. populnea, E. tereticornis, E. melanophloia, Angophora subvelutina, A. floribunda, Cirsium vulgare, Dichanthium sericeum* and *Themeda triandra* (Department of Climate Change, Energy, the Environment and Water 2024d). Populations are often confined to roadsides and cultivation headlands. It usually grows on heavy black or red-brown clay, or clay loams derived from basalt (Department of Climate Change, Energy, the Environment and Water 2024d)	**No** The species was identified on the PMST search as 'may occur', with nearest records beyond 50 km west of the Study area. Suitable grasslands or grassy woodlands on heavy clay soils are not present within the Project Boundary.

Scientific Name	Common Name	EPBC Act	EPBC Migratory	NC Act	Habitat	Likelihood of Occurrence
Macadamia integrifolia	Macadamia nut	Vulnerable	-	Vulnerable	This species is distributed along the foothills and coastal ranges of southeast Qld from the NSW border to Mt Bauple near Maryborough. It is more widespread and frequent in the northern half of its range. The largest number of recorded populations and individuals are located in an area centred on the Amamoor Valley, southwest of Gympie, this area may contain up to 90% of the total extant number of individuals, potentially more than 10,000. The species is generally found within lowland warm complex notophyll vine forest and Araucarian notophyll vine forest on metamorphosed sediments and interbedded volcanics, or alluvia in higher rainfall areas. This species occupies all topographic positions including ridges, scree slopes, foot slopes, gullies, benches and riverine terraces (Department of Climate Change, Energy, the Environment and Water 2023g). Habitat critical for this species is a range of vegetation communities comprising complex and simple notophyll vine forests, simple microphyll-notophyll vine forests with emergent Araucaria spp., and Argyrodendron sp., and sclerophyll forests where rainforest is subdominant, and its presence is mediated by fire. The REs in which it is known to occur are REs 12.3.1, 12.8.3, 12.11.10 and 12.12.16 (Department of the Environment Water Heritage and the Arts 2008a)	**No** The PMST identifies areas of 'may occur' and 'likely occur' within the search extent, however not overlapping the Study Area. Suitable habitat critical for this species, such as complex and simple notophyll vine forests, simple microphyll-notophyll vine forests with emergent Araucaria spp., and Argyrodendron sp., and sclerophyll forests where rainforest is subdominant, and its presence is mediated by fire are absent from the Study Area. The species was not detected during survey and the majority of the Study Area has been historically cleared and subject to active grazing disturbance.

Scientific Name	Common Name	EPBC Act	EPBC Migratory	NC Act	Habitat	Likelihood of Occurrence
Polianthion minutiflorum	-	Vulnerable	-	Vulnerable	This species has a scattered distribution across five locations in eastern Qld. Ranging approximately 800 km, records exist from Redcliffe Vale (west of Mackay) south to the Kingaroy area. These areas typically have skeletal soil or deeper soils near weathered laterite. Specific documented locations include Redcliffe Vale, near Blackwater, the Callide Range, East Boogalgopal, and the Kingaroy area. While the extent of its occurrence is unknown, herbarium records suggest varying population densities across its range, from rare to common. This species falls within the Burdekin, Fitzroy, and Burnett Mary (Qld) Natural Resource Management Regions. This species is usually found in forest and woodland on sandstone slopes and gullies with skeletal soil, or sometimes deeper sands adjacent to deeply weathered laterite. Associated species and vegetation include open woodland of *Acacia shirleyi, Lysicarpus angustifolius, Corymbia aureola*; woodland of *Eucalyptus corynodes, Corymbia trachyphloia, E. cloeziana* on sandy soil over sandstone.; sandstone plateau with *Eucalyptus dura, E. fibrosa, Angophora leiocarpa, E. major* (Qld Herbarium, 2012).	**Low** Identified on the PMST search, with mapped areas of 'may occur' in the search extent. The nearest records exist beyond 80 km west of the Study Area, associated with Coominglah State Forest. Habitat in the Study Area appears marginal, with Sandstone slopes present however skeletal soils and laterite absent, along with the slopes being largely cleared, degraded or not supporting relevant associated species.

Scientific Name	Common Name	EPBC Act	EPBC Migratory	NC Act	Habitat	Likelihood of Occurrence
Samadera bidwillii	Quassia	Vulnerable	-	Vulnerable	Quassia is endemic to Qld and is known to occur in several localities between Scawfell Island, near Mackay, and Goomboorian, north of Gympie. The species commonly occurs in lowland rainforest 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 in locations up to 510 m altitude. The species occurs on lithosols, skeletal soils, loam soils, sands, silts, and sands with clay subsoils. Commonly associated tree species include *Corymbia citriodora, Eucalyptus propinqua, E. acmenoides, E. tereticornis, C. intermedia, E. siderophloia, E. moluccana, E. cloeziana and E. fibrosa*. (Department of Climate Change Energy the Environment and Water 2008j).	**Moderate** Identified on the PMST as intersecting habitat mapping of 'likely to occur'. Nearest records are within 45 km south east, associated with Cordalba State Forest. Whilst rainforest is not present, suitable forest and woodlands associated with the single large vegetation patch of 12.11.6 could support the species. All other patches are considered too small, highly degraded and flora surveys did not detect the species.
Sophora fraseri	-	Vulnerable	-	Vulnerable	The species normally grows in wet sclerophyll forest and a range of rainforest types. It has been reported growing in hilly terrain on hillslopes at altitudes at altitudes from 60 to 660 m ASL, mostly shallow stony to shaly soils, of loam to clay texture derived from sandstone or basalt rocks. Associated species include: *Corymbia citriodora, Eucalyptus carnea, E. microcorys, E. acmenoides, E. propinqua and Lophostemon confertus*. The shrub appears to prefer growing along rainforest margins, in eucalypt forests in the vicinity of rainforests or in large canopy gaps in closed forest communities (Department of the Environment Water Heritage and the Arts 2008b)	**Low** Identified on the PMST search, with mapped areas of 'may occur' in the search extent. The nearest records exist within 85 km of the Study Area, near Kroombit Top National Park, Qld. Suitable habitat in the form of wet sclerophylly forest, rainforest or closed forest are absent from the Study Area. Large remnant patches of 12.11.6 may be considered as marginal habitat. The species was not detected during the field survey.

Scientific Name	Common Name	EPBC Act	EPBC Migratory	NC Act	Habitat	Likelihood of Occurrence
Fauna						
Birds						
Actitis hypoleucos	Common sandpiper	-	Migratory	Special Least Concern	The species utilises a wide range of coastal wetlands and some inland wetlands with varying levels of salinity. The species is mostly found around muddy margins or rocky shores and rarely on mudflats. It has been recorded in estuaries and deltas of streams, as well as on banks further upstream; around lakes, pools, billabongs, reservoirs, dams and claypans, and occasionally piers and jetties.	**Low** This species was identified in the WildNet search, with historical records (ALA) 25–30 km of the Study Area. Of these records, the most recent is 1995, situated in proximity to the Burnett River. Habitat is limited in the Study Area and immediate surrounds, confined to farm dams and highly disturbed ponds along drainage lines. These areas are frequent regularly by cattle. Habitat is therefore regarded as marginal habitat.
Apus pacificus	Fork-tailed swift	-	Migratory	Special Least Concern	The species is almost exclusively aerial, flying from less than 1 m to at least 300 m above ground and probably much higher.	**High** Many records in the surrounding region, including 12 km south of the Study Area (2023). The species is wide-ranging and has potential to overfly and forage within the Study Area.
Arenaria interpres	Ruddy turnstone	Vulnerable	Migratory	Special Least Concern	This bird can be found along rocky shores, sandy beaches, and mudflats, often near estuaries, inlets, and coastal lagoons.	**No** The species is primarily distributed along coastlines, with scattered records inland typically near larger waterways. The Study Area is over 50 km west of the coastline. The farm dams and highly disturbed ponds along drainage lines are not considered suitable for the species.

Scientific Name	Common Name	EPBC Act	EPBC Migratory	NC Act	Habitat	Likelihood of Occurrence
Calidris acuminata	Sharp-tailed sandpiper	Vulnerable	Migratory	Special Least Concern	The species prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh, or other low vegetation. This includes lagoons, swamps, lakes and pools near the coast, and dams, waterholes, soaks, bore drains and bore swamps, saltpans, and hypersaline salt lakes inland. They also occur in salt works and sewage farms.	**Low** This species was identified in the WildNet search, with historical records (ALA) 18 km north west and south east of the Study Area. Of these records, the most recent is 2013, situated east of Gin Gin, Qld. Habitat is limited in the Study Area and immediate surrounds, confined to farm dams and highly disturbed ponds along drainage lines. These areas are frequented regularly by cattle. Habitat is therefore regarded as marginal habitat.
Calidris ferruginea	Curlew sandpiper	Critically Endangered	Migratory	Critically Endangered	The species mainly occurs on intertidal mudflats in sheltered coastal areas such as estuaries, bays, inlets and lagoons, and around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. They are also recorded less often inland, including around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand, occurring in both fresh and brackish waters.	**Low** The distribution of the species is considered more coastal, with the Study Area situated west, although overlapping with PMST areas of 'habitat may occur'. The species is infrequently recorded inland. Potential habitat is limited in the Study Area and immediate surrounds, confined to farm dams and highly disturbed ponds along drainage lines. These areas are frequented regularly by cattle. Habitat is therefore regarded as marginal habitat.
Calyptorhynchus lathami lathami	Glossy black-cockatoo	Vulnerable	-	Vulnerable	The species prefers habitat dominated by Allocasuarina, or open sclerophyll forests and woodlands with a stratum of Allocasuarina beneath a canopy of myrtaceous species. They are known to feed in *Casuarina cristata* and *Allocasuarina luehmannii* forests. This species feeds almost exclusively on Casuarina and Allocasuarina seeds. Requires tree hollows, usually mature Eucalyptus for breeding.	**No** The species was identified in the WildNet search and did not return on the PMST. The species distribution as provided by SPRAT does not overlap with the Study Area.

Scientific Name	Common Name	EPBC Act	EPBC Migratory	NC Act	Habitat	Likelihood of Occurrence
Charadrius leschenaultii	Greater sand plover	Vulnerable	Migratory	Vulnerable	The species is almost entirely coastal, inhabiting littoral and coastal wetlands. Occurs in a variety of sheltered coastal habitat including beaches, mudflats and sand banks. Roosts on sand spits and banks usually above the high tide mark.	**No** Identified on the WildNet and not returned on the PMST. The species is entirely coastal, of which the Study Area is over 50 km west. No supporting habitat is present.
Charadrius mongolus	Lesser sand plover	Endangered	Migratory	Endangered	This species can be found in several habitats such as beaches, mudflats, saltmarshes, and lagoons, which provide the necessary resources of food, shelter, and nesting sites. The species is known to occur in Queensland, specifically in the far north at Roebuck Bay, along the coastline of Cape York Peninsula, and in the Gulf of Carpentaria. These regions are significant stopover locations during the bird's migration and serve as essential wintering places for the species.	**Low** Returned on the PMST within the search area. The species is primarily distributed along coastlines, with scattered records inland typically near larger waterways. The Study Area is over 50 km west of the coastline. The farm dams and highly disturbed ponds along drainage lines are not considered suitable for the species.
Chlidonias leucopterus	White-winged black tern	-	Migratory	Special Least Concern	The species mostly inhabits fresh, brackish or saline, and coastal or subcoastal wetlands. White-winged black terns frequent tidal wetlands, such as harbours, bays, estuaries and lagoons, and their associated tidal sandflats and mudflats. Terrestrial wetlands, including swamps, lakes, billabongs, rivers, floodplains, reservoirs, saltworks, sewage ponds and outfalls are also inhabited.	**Low** Species was returned on the WildNet search, with records in the search extent. The species was not identified on the PMST. The species prefers larger bodied wetlands, with disturbed farm dams and drainage lines within the Study Area representing marginal habitat.

Scientific Name	Common Name	EPBC Act	EPBC Migratory	NC Act	Habitat	Likelihood of Occurrence
Cuculus optatus	Oriental cuckoo	-	Migratory	Special Least Concern	The species uses a range of vegetated habitats such as monsoon rainforest, wet sclerophyll forest, open woodlands and often along edges of forests, or ecotones between forest types.	**High** Identified in the PMST and WildNet. Numerous recent and historical records within the search extent, with the most spatially valid records near Gin Gin, Qld (15 km). Habitat within the Study area may support the species, particularly remnant eucalypt woodlands.
Cyclopsitta diophthalma coxeni	Coxen's fig-parrot	Critically Endangered	-	Critically Endangered	The species occurs in rainforest habitats including subtropical, dry, littoral and vine forest types. Within these habitats, the species is likely to favour alluvial areas that support figs and other trees with fleshy fruits. The species has also been recorded in sub-littoral mixed scrub; corridors of riparian vegetation in woodland, open woodland, or other types of cleared habitat; and isolated stands of fig or other trees on urban, agricultural, or cleared land.	**Low** The Study Area occurs within the mapped distribution, identified from the PMST. Nearest records are approximately 45 km north associated with Bulburin National Park. Within the Study Area there is limited suitable habitat present, with no rainforest or vine forest vegetation. Fig trees were noted within riparian woodland types, although rare.
Erythrotriorchis radiatus	Red goshawk	Endangered	-	Endangered	The species occurs in coastal and sub-coastal tall open forests and woodlands, preferring areas with a mosaic of vegetation types, permanent water, and abundant small birds. Associated with gorge and escarpment country in partially cleared country in eastern Queensland. In eastern Australia, populations seem to move from inland nest sites to coastal plains in winter, thus occupying home ranges of 50–220 $km^{2.}$	**Low** This species was identified from the PMST search results and the Study Area occurs within an area mapped as 'species or species habitat likely to occur' within the PMST. A species historical record is noted within the Study Area and immediately east (approximately 4 km) both from 1992. Spatial accuracy is generalised to 1,800 m. The Study Area does not occur within the species breeding range and the species is thought to have become locally extinct since 2010 in Southeast Qld (DEECCW 2023). Given this species has been documented as being locally extinct, it has a Low likelihood of occurrence based on the presence of suitable habitat.

Scientific Name	Common Name	EPBC Act	EPBC Migratory	NC Act	Habitat	Likelihood of Occurrence
Falco hypoleucos	Grey falcon	Vulnerable	-	Vulnerable	The species occurs in arid and semi-arid Australia, including the Murray-Darling Basin, Eyre Basin, central Australia and Western Australia. The species is mainly found where annual rainfall is less than 500 mm, except when wet years are followed by drought when the species might become marginally more widespread, although it is essentially confined to the arid and semi-arid zones at all times. The species frequents timbered lowland plains, particularly Acacia shrublands that are crossed by tree-lined water courses. It has been observed hunting in treeless areas and frequents tussock grassland and open woodland, especially in winter	**Low** The Project Area occurs within the species 'likely to occur' distribution extent as per SPRAT. The Project Area does not support Acacia shrubland however does comprise open woodland, although fragmented and comprising both regrowth and remnant patches. The Project Area location and surrounding region is not considered arid or semi-arid. Additionally, the species is mainly found where annual rainfall is less than 500 mm and the Project Area has a mean annual rainfall of approximately 1,000 mm (Gin Gin Post Office BoM Station #039040). As such, the potential habitat present is unlikely to be suitable. The nearest record is over 100 km south of the Study Area.
Gallinago hardwickii	Latham's snipe	Vulnerable	Migratory	Special Least Concern	In Australia, the species occurs in permanent and ephemeral wetlands up to 2,000 m asl. They usually inhabit open, freshwater wetlands with low, dense vegetation such as swamps, flooded grasslands or heathlands, around bogs and other water bodies.	**Moderate** Returned from both the PMST and WildNet desktop search. Study area is within area of 'likely to occur' based on PMST. A recent record (2023) is located approximately 8 km west of the Study Area, centred on a lacustrine wetland / large farm dam associated with Bucandy Creek. The farm dams and highly disturbed ponds along drainage lines may occasionally support the species. Aquatic vegetation associated with the farm dam within the Study Area may provide some marginal shelter opportunities.

Scientific Name	Common Name	EPBC Act	EPBC Migratory	NC Act	Habitat	Likelihood of Occurrence
Geophaps scripta scripta	Squatter pigeon (southern)	Vulnerable	-	Vulnerable	The known distribution of the squatter pigeon (southern) extends south from the Burdekin-Lynd divide in the southern region of Cape York Peninsula to the Border Rivers region of northern NSW, and from the east coast to Hughenden, Longreach and Charleville, Qld. Overall, the subspecies' known distribution is estimated to occur within the latitudes, 17° to 30° S, and the longitudes, 141° to 153° 30' E. The species occurs in open, dry woodland with a grassy understorey in proximity to permanent water. Prefers areas of sandy soil with sparser cover of low grasses; and less common on heavier soils with dense grass cover. In Qld, squatter pigeon (southern) foraging and breeding habitat is known to occur on well-draining, sandy or loamy soils on low, gently sloping, flat to undulating plains and foothills (i.e. Qld Regional Ecosystem land zone 5), and lateritic (duplex) soils on low 'jump-ups' and escarpments (i.e. Land zone 7), as well as alluvial (i.e. Land zone 3).	**Low** Returned on the PMST and WildNet searches. Study Area is situated within an area of 'May occur'. Historical records exist beyond the search area, with the nearest records (35 km) centred on Bulburin National Park to the north west. Permanent water is present in the Study Area, although disturbed by cattle egress. Woodlands exist within the Study Area however in alluvial areas, grass cover is very high and dominated by exotic species (*Hyparrhenia rufa* and *Megathyrsus maximus*). Other woodland types are on situated on unsuitable land zones. The species is easily detected when present, however not recorded during field surveys. Based on marginal habitat within alluvial woodlands as well as a paucity of nearby records, a low likelihood rating is justified.
Hirundapus caudacutus	White-throated needletail	Vulnerable	Migratory	Vulnerable	The species is found across a range of habitats, more often over wooded areas, where it is almost exclusively aerial, though it roosts in tree hollows and the foliage canopy. It forages for insects aerially, flying anywhere between "cloud level" and "ground level", often forming mixed feeding flocks with other species. The species roosts in tall trees at night, mainly in forests.	**High** The Study Area is situated within the migratory flight path along eastern Australia. There are numerous records in the surrounding region, the closest situated approximately 8 km north west of the Study Area. The species is wide-ranging and has potential to overfly and forage within the Study Area. Habitat is unlikely to represent roosting habitat, given suitability of higher elevation woodlands elsewhere in the region.

Scientific Name	Common Name	EPBC Act	EPBC Migratory	NC Act	Habitat	Likelihood of Occurrence
Hydroprogne caspia	Caspian tern	-	Migratory	Special Least Concern	The Caspian Tern can be found in various habitats that include seacoasts, bays, estuaries, lakes, marshes, and rivers.	**Low** Returned on the WildNet search within the search area. Nearby records are associated with Lake Monduran, a large waterbody 2 km north of the Study Area. The species is anticipated to be a regular visitor and inhabitant of this location. The species is primarily distributed with larger waterbodies, and despite the proximity to Lake Monduran, the farm dams and highly disturbed ponds along drainage lines are not considered suitable for the species.
Neochmia ruficauda ruficauda	Star finch (eastern)	Endangered	-	Endangered	The distribution of the star finch (eastern) is very poorly known. The subspecies occurs only in central Qld. Recent records have been obtained only from scattered sites in central Qld (i.e. between 21°S and 25°S, and 141°E and 150°E) and consequently, the star finch (eastern) now appears to be extinct in both south-eastern Qld and northern NSW. It occurs mainly in grasslands and grassy woodlands that are located close to bodies of fresh water.	**Low** The Study Area occurs within the species 'likely to occur' distribution extent as per SPRAT, although near the mapped southern boundary. The Study Area supports limited habitat associated with eucalypt woodlands near permanent water sources. This habitat typically supports marginal foraging habitat, dominated by pasture grasses. No ALA records occur in the desktop search extent or wider local area. The nearest ALA record of the species (not subspecies) occurs greater than 150 km to the southeast. The subspecies is presumed extinct (Pizzey & Knight, 2024). No contemporary records of star finch (eastern) are available.

Scientific Name	Common Name	EPBC Act	EPBC Migratory	NC Act	Habitat	Likelihood of Occurrence
Numenius madagascariensis	Eastern curlew	Critically Endangered	Migratory	Critically Endangered	The species occurs in sheltered coasts, especially estuaries, bays, harbours, inlets and coastal lagoons, with large intertidal mudflats or sandflats, often with beds of seagrass. The species occurs on ocean beaches (often near estuaries), and coral reefs, rock platforms, or rocky islets. They are often recorded among saltmarsh and on mudflats fringed by mangroves, sometimes within the mangroves. They are also found in coastal saltworks and sewage farms.	**Low** The distribution of the species is considered more coastal, with the Study Area situated 50 km west. The Study Area does not overlap with PMST mapped areas of habitat, although is immediately adjacent to Lake Monduran, for which the species has been historically recorded. Contemporary records are associated with the Bundaberg coastal zones and coastal reaches of the Burnett River. Potential habitat is limited in the Study Area and immediate surrounds, confined to farm dams and highly disturbed ponds along drainage lines. These areas are frequented regularly by cattle. Habitat is conservatively regarded as marginal habitat and a Low likelihood due to proximity to Lake Monduran.
Pandion haliaetus cristatus	Eastern osprey	-	Migratory	Special Least Concern	The Eastern Osprey commonly found along the eastern coast of Australia, including Queensland, depends on fish populations in its habitat for survival. It thrives in areas with a stable supply of fish. The bird typically builds its nest on high platforms, such as power poles and channel markers, in coastal regions, including islands and the mainland of Queensland. It mostly hunts in mangroves, estuaries, and freshwater systems by diving onto the fish from a height. Estuaries and freshwater systems provide a stable fish supply for the species during the breeding season.	**Low** The Study Area overlaps with PMST mapped areas of 'May' and 'Likely' habitat, although 'Likely' areas are more associated with the Lake Monduran, 2 km north. Numerous records existing in the search extent, including Lake Monduran, and larger watercourses such as Gin Gin Creek and the Burnett River. Potential habitat is limited in the Study Area and immediate surrounds, confined to farm dams and highly disturbed ponds along drainage lines. These areas are fragmented, and lack the larger waterbodies required for foraging. Large trees are presented along alluvial woodlands, although unlikely to support nesting given the preference to be located near stable fish supply. The species is conservatively regarded a Low likelihood due to proximity to Lake Monduran and other larger wetlands / watercourses in the surrounding region.

Scientific Name	Common Name	EPBC Act	EPBC Migratory	NC Act	Habitat	Likelihood of Occurrence
Plegadis falcinellus	Glossy ibis	-	Migratory	Special Least Concern	The glossy ibis' preferred habitat for foraging and breeding are freshwater marshes at the edges of lakes and rivers, lagoons, flood-plains, wet meadows, swamps, reservoirs, sewage ponds, rice-fields and cultivated areas under irrigation. The species is occasionally found in coastal locations such as estuaries, deltas, saltmarshes and coastal lagoons	**Low** Returned on the WildNet search results. Nearby records are associated with the Gin Gin water resources dam, approximately 15 km south. The species is primarily distributed with larger waterbodies with areas of aquatic vegetation. Despite the proximity to contemporary records, the farm dams and highly disturbed ponds along drainage lines are only marginal habitat due to their size, cattle disturbance.
Rostratula australis	Australian painted snipe	Endangered	-	Endangered	The species occurs in shallow freshwater wetlands or saltmarshes, including inundated grasslands, dams and bore drains, generally with good cover of grasses or low scrub.	**No** Only returned on the PMST search results, with no records within 20 km. Contemporary records for the species exist within Bundaberg, Qld approximately 50 km east of the Study Area. These records are centred around the Burnett River system. Within the Study Area, the farm dams and highly disturbed ponds along drainage lines are unlikely to represent suitable habitat due to their size, cattle disturbance and lack of vegetated cover.
Stagonopleura guttata	Diamond firetail	Vulnerable	-	Vulnerable	Diamond firetail occur in lightly timbered habitats such as eucalypt, acacia or casuarina woodlands, open forests, including farmland, heath and grassland that have scattered trees (Higgins et al. 2007). The species preference is high grass cover, few large logs, low tree density, and little litter cover. (Antos et al. 2008). The species occur on the Australian south-east coast and extends 300 km inland. The range extends from south-east Qld to Eyre Peninsula, South Australia (Department of Climate Change, Energy, the Environment and Water 2023e). In Qld their range occur only in the very south of the state however, this	**Low** Returned on the PMST search, with the Study Area overlapping areas mapped as 'May occur'. No species records occur within the search extent, although recent records (2019) exist approximately 35 km north west, centred around Kalpowar, Qld locality. The Queensland distribution of the species is largely further south, from Toowoomba. The woodlands and permanent water within the Study Area broadly align with the habitat definition of the species, however dense exotic grasses are unlikely to be favoured. The species would be an infrequent visitor, if at all present.

Scientific Name	Common Name	EPBC Act	EPBC Migratory	NC Act	Habitat	Likelihood of Occurrence
					range once extended to Cardwell in north Qld (Hodder et al. 2021).	
Turnix melanogaster	Black-breasted button-quail	Vulnerable	-	Vulnerable	The species is restricted to rainforests and forests, mostly in areas with 770-1,200 mm rainfall per annum. They prefer drier low closed forests, particularly semi-evergreen vine thicket, low microphyll vine forest, Araucarian microphyll vine forest and Araucarian notophyll vine forest. They may also be found in low, dense acacia thickets and, in littoral areas, in vegetation behind sand dunes.	**Low** Returned on both the WildNet and PMST search results. The Study Area intersects areas mapped as 'May Occur' on the PMST. Historical records (1930) exist within 2 km of the Study Area, near Lake Monduran. Contemporary records (2010, 2019) exist approximately 50 km north west, centred around Kalpowar State Forest and Bulburin National Park. No rainforest or vine thickets exist within the Study Area, however dense gullies are present within select remnant woodlands. Leaf litter was typically not dense, only comprising a thin layer. Cattle egress is present throughout, although impacts are likely reduced in the denser gullies. For this reason habitat is likely to be marginal for the species and confined to remnant vegetation north of the existing powerline only.
Tringa nebularia	Common greenshank	Endangered	Migratory	Endangered	The species is found in a wide variety of inland wetlands and sheltered coastal habitats of varying salinity. It occurs in sheltered coastal habitats, typically with large mudflats and saltmarsh, mangroves or seagrass. Habitats include embankments, harbours, river estuaries, deltas and lagoons.	**Low** Returned on both the WildNet and PMST search results. The Study Area does not overlap with a mapped area of habitat as per the PMST. Lake Monduran is mapped as 'May occur' on the PMST, positioned 2 km north of the Study Area. Typically, the mapped distribution of the species overlaps coastal habitat areas, with inland wetlands represented to a lesser extent. Within the region historical records exist within 30 km south, associated with reaches of the Burnett River. Habitat within the Study Area is limited to the farm dam and small pools associated with cleared drainage lines. These areas are considered marginal habitat for the species.

Scientific Name	Common Name	EPBC Act	EPBC Migratory	NC Act	Habitat	Likelihood of Occurrence
Tringa stagnatilis	Marsh sandpiper	-	Migratory	Special Least Concern	This species inhabits warm inland wetlands from open steppe to boreal forest. It can be found in a variety of habitats, including shallow freshwater and brackish marshlands, grassy or marshy lake-edges, river valleys, flooded meadows, and occasionally salt-lake margins. It also occurs in inland freshwater and brackish wetlands such as rice paddy-fields, swamps, salt-pans, salt-marshes, sewage works, and marshy lake-edges. Although rare on open coastlines, it can occasionally be found on estuaries, lagoons, and intertidal mudflats.	**Low** Returned on the WildNet search results only. Within the region historical records exist within 30 km south, associated with reaches of the Burnett River. Otherwise, records are scattered throughout the broader inland environment and coastal areas. Habitat within the Study Area is limited to the farm dam and small pools associated with cleared drainage lines. These areas are considered marginal habitat for the species.
Fish						
Neoceratodus forsteri	Australian lungfish	Vulnerable	-	Vulnerable	The species occurs in the Mary, Burnett and Brisbane River systems and possibly the Pine River system. It occurs in a number of water body types, ranging from relatively undisturbed streams to highly altered environments, such as Lake Samsonvale and Lake Wivenhoe. It requires still or slow-flowing, shallow, vegetated pools with clear or turbid water in which to spawn and feed and is restricted to areas of permanent water.	**No** This species is exclusively known to the Burnett and Mary Rivers. The Burnett River is situated approximately 30 km south of the Study Area.
Reptiles						
Elseya albagula	White-throated snapping turtle	Critically endangered	-	Critically endangered	The species is only found in the Burnett, Fitzroy, Raglan and Mary River drainages of south-east Queensland. It prefers permanent flowing water habitats where there are suitable shelters and refuges.	**No** Returned on the PMST and WildNet searches. The species prefers permanent flowing water habitats where there are suitable shelters and refuges. This habitat is absent from the Project.

Scientific Name	Common Name	EPBC Act	EPBC Migratory	NC Act	Habitat	Likelihood of Occurrence
						Records of the species, since 1998, are noted throughout the broader catchment, along the Kolan River, Burnett River and Gin Gin Creek. Whilst habitat within the Study Area is not suitable to directly support the species, downstream impacts on suitable habitat should be considered.
Delma torquata	Collared delma	Vulnerable	-	Vulnerable	The species is typically found in eucalypt dominated woodlands and open forests in Qld Regional Ecosystem Land Zones 3 (alluvium), 9 (undulating country on fine-grained sedimentary rocks), and 10 (sandstone ranges). The presence of rocks, logs, coarse woody debris, and leaf litter are essential characteristics of its microhabitat (Department of the Environment, Water, Heritage and the Arts 2008d).	**Low** The PMST has mapped areas of 'likely occur' and 'may occur' within the search extent. The Study Area intersects areas of 'may occur'. Recent records (1997) were collected near Bullyard, Qld which is south-east of the Study Area and Gin Gin, Qld. Habitat is considered marginal, with surface rocks interspersed with leaf litter largely absent. One select area of surface rocks (total area 10 m^2) on land zone 11 was searched during the field survey, but the species was not detected. Larger areas of 12.11.6 in the north of the Study Area were assessed and surface rocks with leaf litter were not recorded.
Egernia rugosa	Yakka skink	Vulnerable	-	Vulnerable	The species occurs in a variety of drier forests and woodlands, usually on well-drained, gritty soils, including *Eucalyptus populnea* on alluvial soils, *Callitris glaucophylla* on sands, *Allocasuarina luehmannii*, *Acacia harpophylla*, *A. catenulata* and *A. aneura* (Threatened Species Network 2008). The species inhabits burrows, abandoned rabbit warrens, and hollow logs or in deep rock crevices (Ferguson and Mathieson 2014; Threatened Species Network 2008). The core habitat of this species is within the Mulga Lands and Brigalow Belt South Bioregions.	**Low** The desktop search extent and Study Area is mapped in the PMST as areas of 'may occur'. Records for the species are predominately much further west, in the Brigalow below. A record of the species is noted from Bundaberg, 50 km east (undated). Within the Study Area, land zone 3 woodlands offer marginal habitat, however existing disturbance and fragmentation render them mostly unsuitable. Extensive searches within these small patches did not detection the species or evidence of the species. Woodlands on Land zone 11 are not considered to provide suitable habitat.

Scientific Name	Common Name	EPBC Act	EPBC Migratory	NC Act	Habitat	Likelihood of Occurrence
Furina dunmalli	Dunmall's snake	Vulnerable	-	Vulnerable	The species has been found in a broad range of habitats, including forests and woodlands on black alluvial cracking clay/ clay loams dominated by including *Acacia harpophylla* and other *Acacia spp., Callitris spp. or Allocasuarina luehmannii,* and various *Corymbia citriodora*, *Eucalyptus crebra* and *E. melanophloia* and *Callitris glaucophylla* open forest and woodland associations on sandstone derived soils (Department of the Environment 2014a).	**Moderate** The PMST has mapped areas of 'likely occur' and 'may occur' within the search extent. The Study Area intersects areas of 'may occur', whilst the nearest records exist 30 km north (undated), 82 km south (undated) and 90 km west (2013). The Study Area does not include cracking clay soils, however large remnant Eucalypt woodland on sandstone soils (12.11.6) may offer suitable habitat for this cryptic species.
Hemiaspis damelii	Grey snake	Endangered	-	Endangered	In Qld, grey snake habitat is Brigalow (*Acacia harpophylla*) and Belah (*Casuarina cristata*) woodlands on heavy, dark brown to black cracking clay soils, particularly in association with water bodies, areas with small gullies and ditches, and floodplain environments where the species shelters beneath logs, rocks and soil cracks (Department of Environment and Science 2019)). Habitat in Qld also includes Qld bluegrass *Dichanthium sericeum* and/or Mitchell grass *Astrebla spp*. grassland on alluvial plains with cracking clay soils (Department of Environment and Science 2019)). Key attributes of grey snake habitat are the floodplains and ephemeral wetlands which provide breeding habitat for the frog species that are its main prey, the presence of the frog species themselves, and the heavy clay soils which provide and cracks and crevices that the species uses in its hunting strategy and for shelter (Department of Climate Change, Energy, the Environment and Water 2022c)	**No** The PMST has identified areas of 'likely to occur' and 'may occur' within the search extent. The Study Area intersects areas of 'may occur'. The nearest records of the species are over 145 km south west, near the Barakula State Forest. Key habitat features such as black cracking clays, wetlands and gilgai are absent from the Study Area.

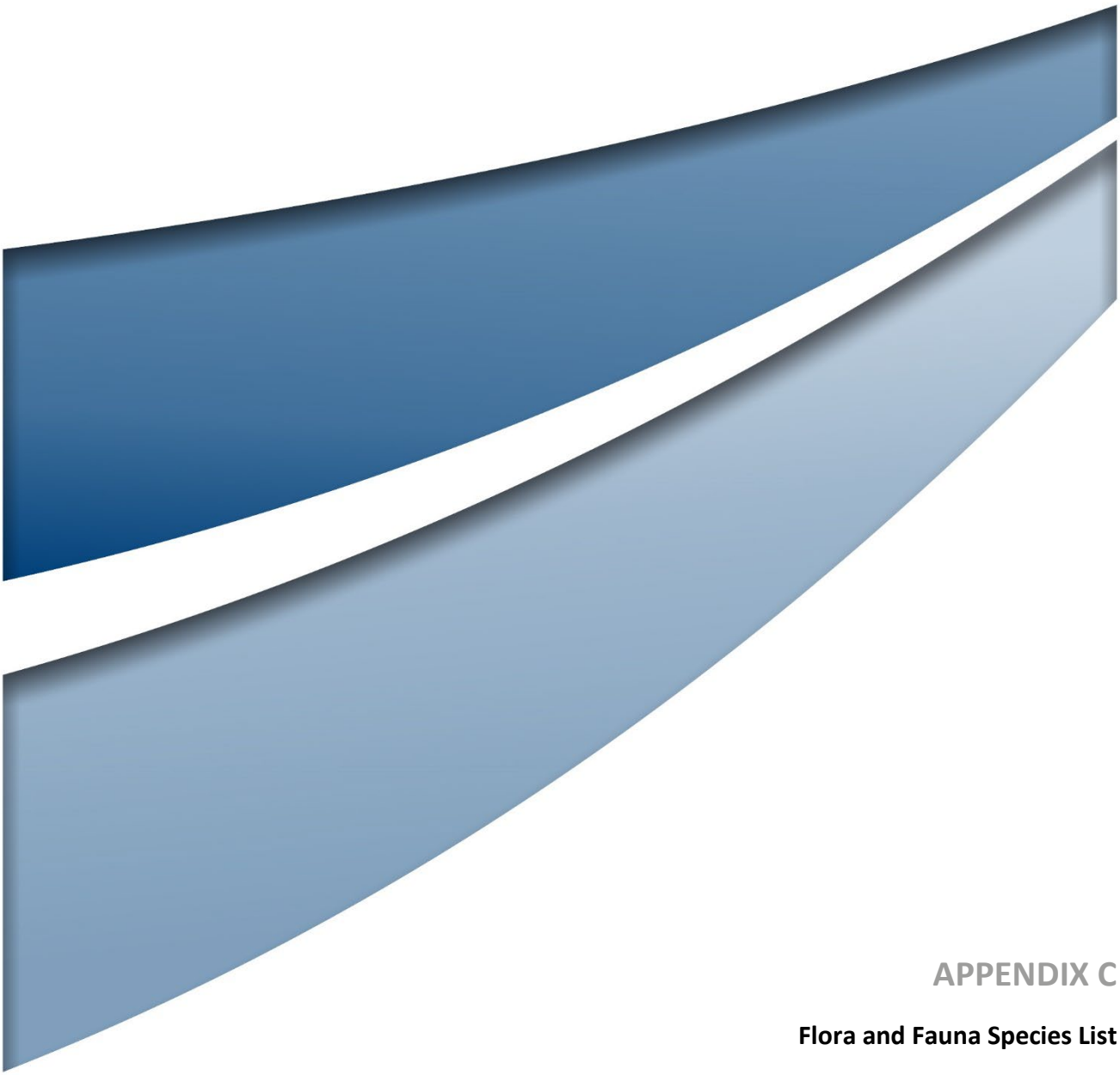
Scientific Name	Common Name	EPBC Act	EPBC Migratory	NC Act	Habitat	Likelihood of Occurrence
Phyllurus caudiannulatus	Ringed thin-tail Gecko	Endangered	-	Endangered	This species can be found in subtropical vine forest, adjacent wet sclerophyll forest and hoop pine plantation between 180–600 m. The geology where P. caudiannulatus occurs is quartz-syenite and granite.	**No** Returned on the PMST, with habitat mapped as 'may occur' within the extremities of the desktop search extent. Habitat mapping is correlated with records associated with Bulburin National Park (55 km north). Given the absence of dense vegetation including subtropical vine forest, wet eucalypt forest and hoop pine the species is an unlikely inhabitant of the Study Area.
Mammals						
Dasyurus hallucatus	Northern quoll	Endangered	-	Endangered	The species occupies a diversity of habitats including rocky areas, eucalypt forest and woodlands, rainforests, sandy lowlands, and beaches, shrubland, grasslands and desert. The species is also known to occupy non-rocky lowland habitats such as beach scrub communities in central Queensland. The species generally encompasses some form of rocky area for denning purposes, with surrounding vegetated habitats used for foraging and dispersal. Rocky habitats are usually of high relief, often rugged and dissected.	**Moderate** Returned on the PMST desktop search only. The nearest species record is approximately 30 km east of the Study Area, with a record date of 2018. Other records exist to the north-west, approximately 60–100 km from the Study Area. The species can be cryptic in nature and has a high dispersal capacity. Habitat requirements are broad, although denning does typically require rocky outcrops, ground timber and vine thicket habitat types. Suitable habitat is present in the surrounding region, and remnant woodlands in the north of the Study Area may provide potential denning opportunities. Remaining habitat is typically disturbed and likely only suitable for foraging or dispersal.

Scientific Name	Common Name	EPBC Act	EPBC Migratory	NC Act	Habitat	Likelihood of Occurrence
Dasyurus maculatus maculatus (SE mainland population)	Spot-tailed quoll	Endangered	-	Endangered	The southern subspecies, *D. m. maculatus*, has been observed in a wide array of habitats including rainforest, wet and dry sclerophyll forest, coastal heathland, scrub and dunes, woodland, heathy woodland, swamp forest, mangroves, beaches, and occasionally in grassland or pastoral areas near forested regions. Den sites include rock crevices, hollow logs, hollow tree buttresses, tree hollows, windrows, vegetation clumps, caves, boulder tumbles, under buildings, and underground burrows, including those of rabbits and wombats.	**Low** Returned on the PMST, with areas of 'May Occur' mapped in the search extent. No mapped areas, as shown on the PMST, overlap the Study Area. The distribution of the species indicate the species existing core range is further south, although areas historical records to the west and north west of the Study Area are noted. The most recent record within the desktop search extent is centred on the Bulburin National Park, collection date being 1995. The Study Area comprises fragmented woodlands, although the species would likely have high dispersal capacity. Suitable denning habitat is limited to larger remnant vegetation areas, where complex vegetation areas and ground habitat was noted. Given the paucity of nearby records, absence of rugged terrain, existing fragmentation and disturbances within Study Area, a 'low' likelihood of occurrence is justified.
Nyctophilus corbeni	Corben's long-eared bat	Vulnerable	-	Vulnerable	The south-eastern long-eared bat is found in southern central Queensland, central western New South Wales, north-western Victoria and eastern South Australia, where it is patchily distributed, with most of its range in the Murray Darling Basin. Most records are from inland of the Great Dividing Range.	**No** Identified as 'may occur' within the search extent of the PMST. According to the BatMaps, the Study Area is outside the species current distribution. The Study Area does not support suitable habitat for the species and no records occur within the desktop search extent.

Scientific Name	Common Name	EPBC Act	EPBC Migratory	NC Act	Habitat	Likelihood of Occurrence
					The species inhabits a range of inland dry forest habitats including *Eucalyptus camaldulensis*, mallee, brigalow (*Acacia harpophylla*) and other arid and semi-arid habitats; in southern Qld it is more common in box/ironbark and Callitris forests on sandy soils. The species is most abundant in vegetation with a distinct canopy and a dense, cluttered shrub layer, and in large, continuous remnants. Roosts solitarily in tree hollows, crevices, and under loose bark (particularly on dead *Allocasuarina luehmannii* or *Casuarina cristata*).	
Macroderma gigas	Ghost bat	Vulnerable	-	Endangered	The species occurs in a variety of habitat types, but relies on caves, deep rock crevices and old mines for roosting habitat. Foraging habitat generally includes woodland and shrubland within proximity of roosts.	**No** Returned on the PMST search, with PMST mapping indicating areas of 'May occur' and 'Likely occur' within the Study Area and surrounds. No records returned from the WildNet search. The Study Area is situated well beyond the accepted distribution of the species, as provided by BatMaps (2023). Records. The nearest historical record (1985) is located over 150 km north west in Central Queensland.
Petaurus australis australis	Yellow-bellied glider (south-eastern)	Vulnerable	-	Vulnerable	The species occurs in eucalypt-dominant forests and woodlands. Prefers large, wet patches of mature old-growth forest that provide suitable trees for foraging and shelter. Yellow-bellied gliders require a diverse range of tree species for food throughout the year, feed on sap from certain tree species and are unlikely to persist in forests dominated by only one or two tree species.	**Moderate** Returned on both the PMST and WildNet search. Mapped in area of 'May occur' on the PMST. The nearest record is 10 km south of the Study Area, Moolboolaman, Qld (recorded 1999). Numerous records (collected 1992-1997) are also within the Bania National Park approximately 25 km west. The species prefers larger vegetation patches, typically with a diversity of tree species. Within the Study Area, only larger, remnant patches of 12.11.6 exhibited habitat features suitable for the species. Whilst riparian woodlands (12.3.3) supported large hollows and a high canopy tree

Scientific Name	Common Name	EPBC Act	EPBC Migratory	NC Act	Habitat	Likelihood of Occurrence
						diversity, they are highly fragmented and small in total area (1-2 ha). The species was not recorded during the spotlight field survey, which comprised 2 nights effort in September 2024.
Petauroides volans	Greater glider (southern subspecies)	Endangered	-	Endangered	The species is largely restricted to eucalypt forests and woodlands; it is typically found in highest abundance in taller, montane, moist eucalypt forests with relatively old trees and abundant hollows.	**Moderate** Returned on both the PMST and WildNet search. Mapped in area of 'Likely occur' on the PMST. The nearest record (collected 2016) is approximately 15 km north-east, in connective vegetation with the Littabella South Forest Reserve. State RE mapping of the record identifies REs 12.11.6 and 12.3.3 as the dominant vegetation types. Within the Study Area, only larger, remnant patches of 12.11.6 exhibited habitat features suitable for the species. Whilst riparian woodlands (12.3.3) supported large hollows and a high canopy tree diversity, they are highly fragmented and small in total area (1-2 ha). The species was not recorded during the spotlight field survey, which comprised 2 nights effort in September 2024.
Phascolarctos cinereus	Koala	Endangered	-	Endangered	The species inhabits a range of temperate, sub-tropical and tropical forest, woodland and semi-arid communities dominated by eucalypt species. The species is limited by habitat (restricted to below 800 m asl (above sea level)), temperature and, at the western and northern ends of the range, leaf moisture.	**High** Returned on the PMST and WildNet searches. Nearby records (collected between 1987-2020) exist to the south of the Study Area, approximately 15 km, centred on Gin Gin Creek and broader Gin Gin township. All areas of the Study Area are considered to comprise koala habitat in one form or another, with cleared areas representing dispersal zones between climate refugia or breeding and foraging habitat. Koala were not recorded during the field survey.

Scientific Name	Common Name	EPBC Act	EPBC Migratory	NC Act	Habitat	Likelihood of Occurrence
Pteropus poliocephalus	Grey-headed flying-fox	Vulnerable	-	Least concern	The species occurs in rainforests, open forests, woodlands and *Melaleuca* swamps. Roosting camps are usually in dense riparian vegetation.	**Moderate** Returned on the PMST and WildNet searches. As shown on the National Flying-fox monitoring viewer, there are several camps with historical records of the species are located in the wider area (50 km). The nearest in Avoca, Qld (McCoys Creek). All patches of vegetation within the Study Area were visited and inspected, or within distance and earshot to recognise the presence of a flying-fox camp. None were recorded. The nearest Nationally important flying-fox camps which support grey-headed flying-fox are mapped approximately 95 km south / south east. Based on the above, the habitat within the Study Area is likely to be suitable for foraging, however used seasonally when Eucalypts and other species are flowering.
Potorous tridactylus tridactylus	Long-nosed potoroo	Vulnerable	-	Vulnerable	There is limited information about the species' habitat in Qld. There is no consistent pattern to the habitat of the species; it can be found in wet eucalypt forests to coastal heaths and scrubs (Department of Agriculture Water and the Environment 2022c). The main factors would appear to be access to some form of dense vegetation for shelter and the presence of an abundant supply of fungi for food (Department of Agriculture Water and the Environment 2022c)	**No** Returned on the PMST, with habitat mapped as 'may occur' within the extremities of the desktop search extent. Habitat mapping is correlated with records associated with Bulburin National Park (55 km north). Given the absence of dense vegetation including wet eucalypt forest, coastal heaths and scrubs the species is an unlikely inhabitant of the Study Area.



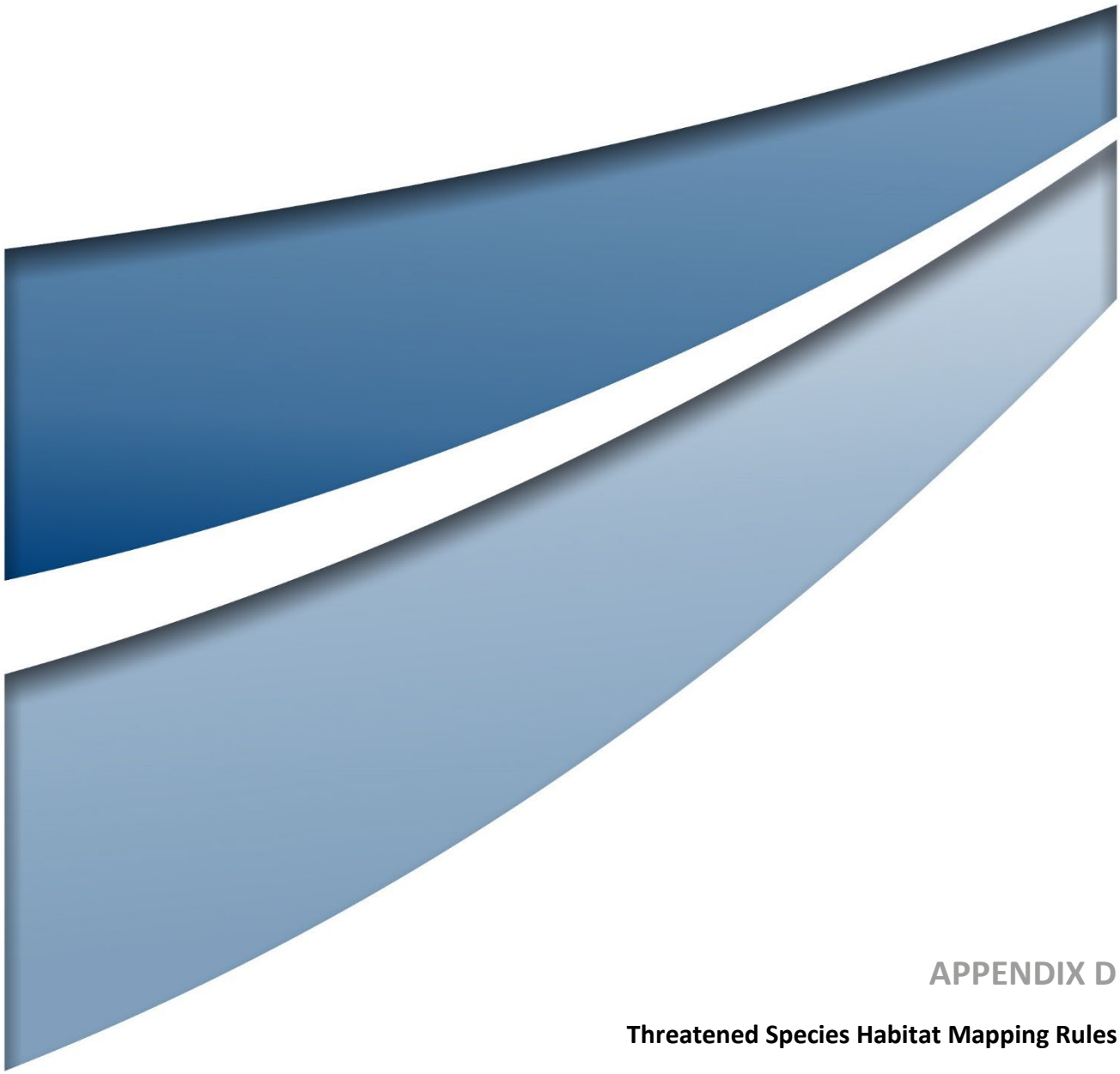
APPENDIX C

Flora and Fauna Species List

Table C.1 Flora and Fauna Species List

Family	Scientific Name	Common name	Status
Flora			
Anacardiaceae	*Euroschinus falcatus*	Ribbonwood	-
Apocynaceae	*Gomphocarpus physocarpus*	Balloon cottonbush	Introduced
Asteraceae	*Pterocaulon sphacelatum*	Applebush	-
Casuarinaceae	*Allocasuarina* sp.	-	-
Cyperaceae	*Fimbristylis dichotoma*	Common fringe-rush	-
Juncaceae	*Juncus* sp.	-	-
Leguminosae	*Acacia disparrima*	-	-
Leguminosae	*Acacia* sp.	-	-
Leguminosae	*Erythrina vespertilio*	Grey corkwood	-
Leguminosae	*Lysiphyllum* sp.	-	-
Leguminosae	*Stylosanthes* sp.	-	Introduced
Moraceae	*Ficus opposita*	Sandpaper fig	-
Moraceae	*Ficus rubiginosa*	Port Jackson fig	-
Myrtaceae	*Angophora floribunda*	Rough-barked apple	-
Myrtaceae	*Angophora leiocarpa*	Rusty gum	-
Myrtaceae	*Corymbia citriodora*	Spotted gum	-
Myrtaceae	*Corymbia clarksoniana*	Clarkson's bloodwood	-
Myrtaceae	*Corymbia tessellaris*	Moreton Bay ash	-
Myrtaceae	*Eucalyptus crebra*	Narrow-leaved red ironbark	-
Myrtaceae	*Eucalyptus exserta*	Queensland peppermint	-
Myrtaceae	*Eucalyptus tereticornis*	Queensland blue gum	-
Myrtaceae	*Lophostemon confertus*	Brush box	-
Myrtaceae	*Lophostemon suaveolens*	Swamp box	-
Nymphaeaceae	*Nymphaea* sp.	-	-
Picrodendraceae	*Petalostigma pubescens*	Quinine tree	-
Poaceae	*Aristida* sp.	-	-
Poaceae	*Chloris virgata*	Feathertop rhodes grass	Introduced
Poaceae	*Hyparrhenia rufa*	Thatch grass	Introduced
Poaceae	*Megathyrsus maximus* var. *maximus*	Guinea grass	Introduced
Poaceae	*Melinis repens*	Red natal grass	Introduced
Poaceae	*Sporobolus fertilis*	Giant Parramatta grass	Introduced
Polygonaceae	*Persicaria* sp.	-	-
Rhamnaceae	*Alphitonia excelsa*	Soap tree	-
Sapindaceae	*Cupaniopsis anacardioides*	Tuckeroo	-
Verbenaceae	*Lantana camara*	Lantana	State Restricted, WONS
Xanthorrhoeaceae	*Xanthorrhoea* sp.	-	-

Family	Scientific Name	Common name	Status
Fauna			
Amphibian	*Litoria fallax*	Eastern sedgefrog	-
Amphibian	*Rhinella marina*	Cane toad	Introduced
Bird	*Aegotheles cristatus*	Australian owlet-nightjar	-
Bird	*Anas superciliosa*	Pacific black duck	-
Bird	*Bubulcus ibis*	Cattle egret	-
Bird	*Coracina novaehollandiae*	Black-faced cuckoo-shrike	-
Bird	*Corvus orru*	Torresian crow	-
Bird	*Cracticus nigrogularis*	Pied butcherbird	-
Bird	*Dacelo novaeguineae*	Laughing kookaburra	-
Bird	*Entomyzon cyanotis*	Blue-faced honeyeater	-
Bird	*Gerygone olivacea*	White-throated gerygone	-
Bird	*Grallina cyanoleuca*	Magpie-lark	-
Bird	*Lichmera indistincta*	Brown honeyeater	-
Bird	*Malurus melanocephalus*	Red-backed fairy-wren	-
Bird	*Manorina melanocephala*	Noisy miner	-
Bird	*Meliphaga lewinii*	Lewin's honeyeater	-
Bird	*Melithreptus albogularis*	White-throated honeyeater	-
Bird	*Microcarbo melanoleucos*	Little pied cormorant	-
Bird	*Myiagra rubecula*	Leaden flycatcher	-
Bird	*Ocyphaps lophotes*	Crested pigeon	-
Bird	*Pachycephala rufiventris*	Rufous whistler	-
Bird	*Philemon corniculatus*	Noisy friarbird	-
Bird	*Podargus strigoides*	Tawny frogmouth	-
Bird	*Rhipidura leucophrys*	Willie wagtail	-
Bird	*Scythrops novaehollandiae*	Channel-billed cuckoo	-
Bird	*Trichoglossus moluccanus*	Rainbow lorikeet	-
Mammal	*Canis familiaris*	Dingo	-
Mammal	*Macropus giganteus*	Eastern grey kangaroo	-
Mammal	*Petaurus breviceps*	Sugar glider	-
Mammal	*Trichosurus caninus*	Short-eared possum	-
Mammal	*Trichosurus vulpecula*	Common brushtail possum	-
Mammal	*Wallabia bicolor*	Swamp wallaby	-



APPENDIX D

Threatened Species Habitat Mapping Rules

	Broad Habitat Definition	Utilisation	Vegetation Condition	Associated RE and Mapping Layers	Assumptions and Exclusions
Koala	Eucalypt forests or woodlands on alluvial associated with permanent water features (dams, wetlands and/or watercourses) that are resilient to drying conditions, likely to provide a cooler refuge during periods of bushfire and heatwaves.	Climate refugia	Remnant	12.3.3	-
	Any forest or woodland that contains LIKTs and is not climate refugia.	Breeding and foraging	Remnant	12.11.6, 12.11.14	Patches included are considered viable (i.e. 0.5 ha or greater or extend beyond the Study Area bounds).
	Vegetation that may provide a safe intervening ground for the species to move across the landscape, particularly to and from areas of potential breeding and foraging habitat. In non-remnant condition, these areas are largely dominated by cleared exotic pasture but may contain sporadic small stands of trees and/or individual paddock trees.	Dispersal	Non-remnant	Non-remnant	Areas of cleared pasture with scattered regrowth eucalypts were present within the Study Area. Trees generally had DBHs ranging >10 cm and were in average health given their isolated nature in the landscape. Noting the highly cleared nature of the Study Area, it is considered possible that these areas may provide key dispersal opportunities for the species, facilitating movement to and from areas of breeding, foraging and climate refugia habitat.
Latham's snipe	Roosting and foraging habitat includes open, freshwater wetlands with low, dense vegetation such as swamps, flooded grasslands or heathlands, around bogs and other water bodies. Foraging occurs at night where they disperse to feed in nearby wet paddocks, ditches and other open flooded areas. Foraging habitats are characterised by areas of mud (either exposed or beneath a very shallow covering of water).	Roosting and foraging	Remnant, regrowth and non-remnant	12.3.3, non-remnant	Areas of 12.3.3 where standing water is absent were excluded.

	Broad Habitat Definition	Utilisation	Vegetation Condition	Associated RE and Mapping Layers	Assumptions and Exclusions
White-throated needletail	Includes a range of habitats, although more often over wooded areas, where it is almost exclusively aerial.	Foraging and dispersal	Remnant and non-remnant	12.3.3, 12.11.6, 12.11,14, non-remnant	-
Northern quoll	Rocky habitats (such as major drainage lines or treed creek lines) and structurally diverse woodlands with moderate to high density of denning opportunities (i.e. large diameter trees, termite mounds, large hollow logs).	Denning and refuge	Remnant	12.11.6	-
	Any land comprising predominantly native vegetation within 1 km of denning and refuge habitat.	Foraging and dispersal	Remnant	12.3.3, 12.11.14	The Study Area exists adjacent to hills and slopes, as well as waterways not surveyed. All habitat areas, not mapped as denning and refuge, are conservatively mapped as foraging and dispersal habitat.
	All land that provides a connective medium between denning and refuge and foraging habitat.	Dispersal	Non-remnant vegetation	Non-remnant	-
Yellow-bellied glider	Floristically diverse, mature eucalypt woodland and forest comprising intact and connected patches that contain live and large hollow-bearing trees. Habitat areas collectively (breeding and denning with foraging and dispersal) must form relatively large (>50 ha) tracts which may extend beyond the Study Area.	Breeding and denning	Remnant	12.11.6	Areas of 12.3.3 were excluded based on the level of fragmentation, existing breaks in vegetation including by roads and highways.
	Mature eucalypt woodlands and forests that are floristically diverse or contain known sap trees in large (> 50 ha) or connected intact patches but lack live and large hollow-bearing trees. Habitat areas collectively (breeding and denning with foraging and dispersal) must form relatively large (>50 ha) tracts which may extend beyond the Study Area.	Foraging and Dispersal	-	-	All remaining vegetation patches do not form intact, tracts of vegetation and have therefore been excluded.

	Broad Habitat Definition	Utilisation	Vegetation Condition	Associated RE and Mapping Layers	Assumptions and Exclusions
Greater glider	Eucalypt forests and woodlands in Qld REs considered habitat or potential habitat as per the Species Specific Guidance – Greater Glider habitats in Qld containing trees with a DBH greater than 30 cm (used as a proxy for hollow-bearing trees).	Likely or current denning	Remnant	12.11.6	Only one select area is included as 'likely or current denning' habitat. All other areas are considered disconnected from habitat such that the species presence is not expected.
	Eucalypt forest and woodlands where locally important tree species for foraging are dominant/co-dominant AND in Queensland REs considered habitat or potential habitat as per the Species Specific Guidance – Greater Glider habitats in Queensland (DES, 2022). Habitat is connective with likely or current denning habitat.	Foraging and dispersal habitat	-	-	Requires connectivity to areas beyond the Study Area or habitat mapped as 'likely or current denning'. The vegetation within the Study Area is largely disconnected by roads, grazing paddocks and powerline easements.
	Habitat that may be regarded as likely or current denning or represent potential foraging and dispersal habitat should habitat connectivity be plausible.	Unoccupied/disconnected habitat	Remnant	12.3.3, 12.11.6, 12.11.14	Areas that may be recognised as 'likely or current denning' or 'foraging and dispersal habitat' but are otherwise disconnected such that they are considered unoccupied by the species.
Grey-headed flying-fox	Any vegetation community (remnant) which contains important winter/spring flowering species as defined in the National Recovery Plan) within 40 km of known camps (Avoca, McCoys Creek #712). Important species include *Eucalyptus tereticornis, E. albens, E. crebra, E. fibrosa, E. melliodora, E. paniculata,* *E. pilularis, E. robusta, E. seeana, E. sideroxylon, E. siderophloia, Banksia integrifolia, Castanospermum australe, Corymbia citriodora, C. eximia, C. maculata, Grevillea robusta, Melaleuca quinquenervia or Syncarpia glomulifera*	Foraging	Remnant	12.3.3, 12.11.6, 12.11.14	The Study Area is approximately 40 km from the Avoca roost, where the species was last recorded in 2019. The Study Area is considered at the extreme limit of the foraging range, however has been conservatively included as supporting foraging habitat.

	Broad Habitat Definition	Utilisation	Vegetation Condition	Associated RE and Mapping Layers	Assumptions and Exclusions
	Any vegetation community (remnant and regrowth REs) located within a 20 km radius of a flying fox camp known to regularly support grey headed flying-foxes.	Roosting	-	-	No camps (based on DCCEW's interactive flying-fox web viewer) that fit the habitat mapping criteria are known to occur. Further, no observations of flying-fox camps have been made during the extensive field survey effort. As such no roosting habitat has been mapped.
Dunmall's snake	Remnant woodland communities with suitable microhabitat features (rocks, logs, bark and other coarse woody debris, and leaf litter occurring on Land Zone 11.	Potential habitat	Remnant	12.11.6	Remnant 12.11.6 where microhabitat features have been confirmed. Large patch of vegetation located in the north-eastern corner.
Cycas megacarpa	The species is found in woodland, open woodland and open forests, often in conjunction with a grassy understory. This species is found in habitat dominated by *Eucalyptus crebra* and *Corymbia citriodora* as well as *Corymbia erythrophloia*, *Eucalyptus melanophloia* and *Lophostemon confertus*. There are also reports that it can be found in or on the edge of rainforest habitat.	Potential habitat	Remnant	12.11.6, 12.11.14	Areas that were comprehensively surveyed and did not record the species habitat been excluded from the mapping.
Samadera bidwillii	Lowland rainforest or rainforest margins, and other forest types including open eucalypt forest and woodland up to 510 m altitude.	Potential habitat	Remnant	12.11.6	One patch of RE 12.11.6 in the north-east corner of the Study Area. This patch has good connectivity to surrounding habitat and exhibited less disturbance than smaller patches accessed by cattle. Small, isolated patches were excluded as they were searched and the species was not recorded within them, and they have high degree of disturbance.

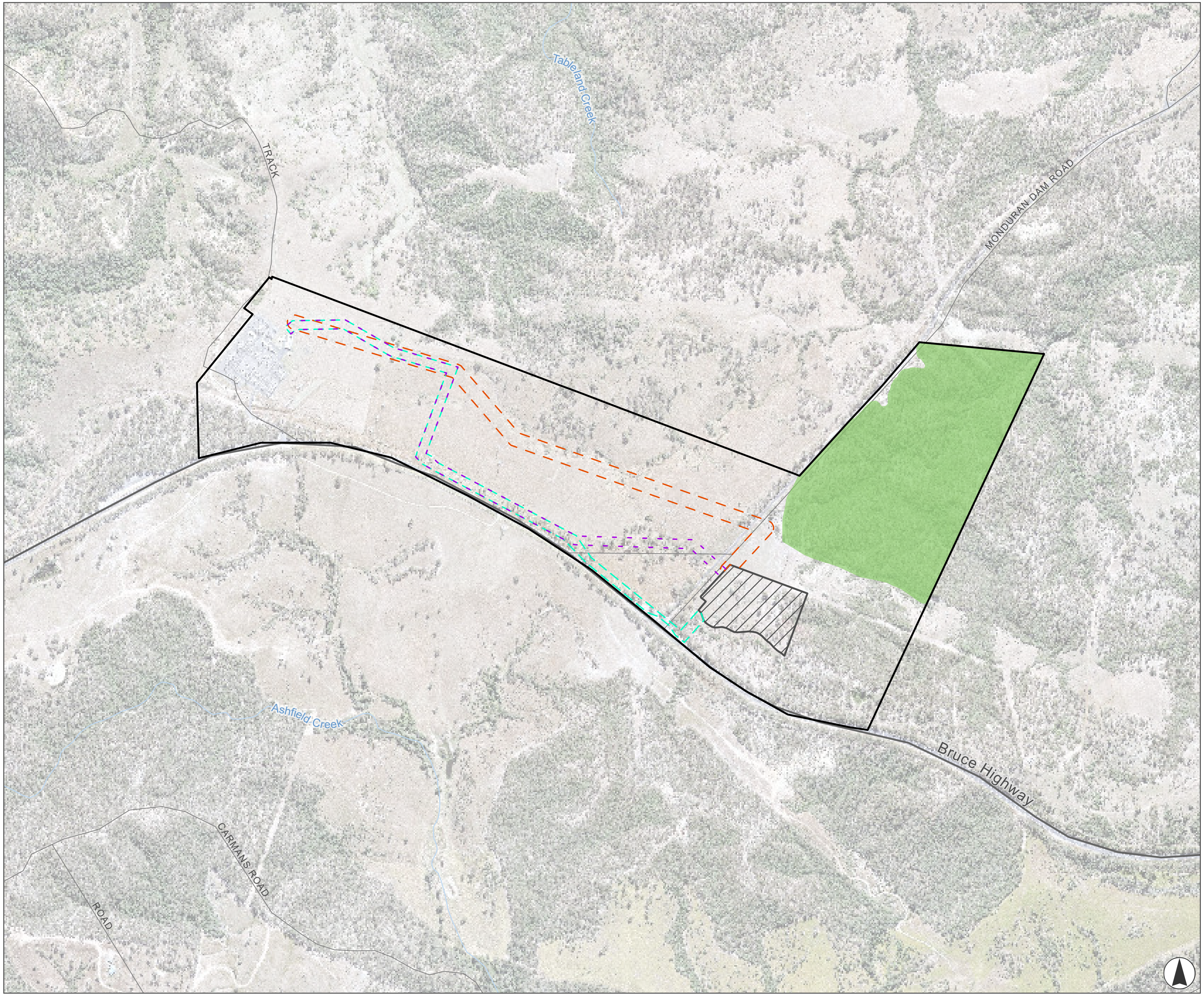
	Broad Habitat Definition	Utilisation	Vegetation Condition	Associated RE and Mapping Layers	Assumptions and Exclusions
Fork-tailed tailed	The air space above remnant and regrowth woodlands, open pasture grassland and non-remnant vegetation communities.	Foraging and dispersal	Remnant, non-remnant	12.3.3, 12.11.6, 12.11.14, non-remnant	-
Oriental cuckoo	Eucalypt woodlands.	Foraging and dispersal	Remnant	12.3.3, 12.11.6, 12.11.14	All Eucalypt woodlands are regarded as suitable where they in remnant condition. Non-remnant vegetation did not support suitable structure or connectivity.

APPENDIX E

Potential Habitat Figures

FIGURE E.1

Potential Habitat for *Cycas megacarpa*



Legend

- Study Area
- State Controlled Road
- Local Road
- Watercourse

Suitable habitat for *cycas megacarpa*

- Potential Habitat

Proposed Disturbance Footprint

- Proposed BESS Facility

Indicative Transmission Routes

- Route A
- Route B
- Route C

0 0.3 0.6

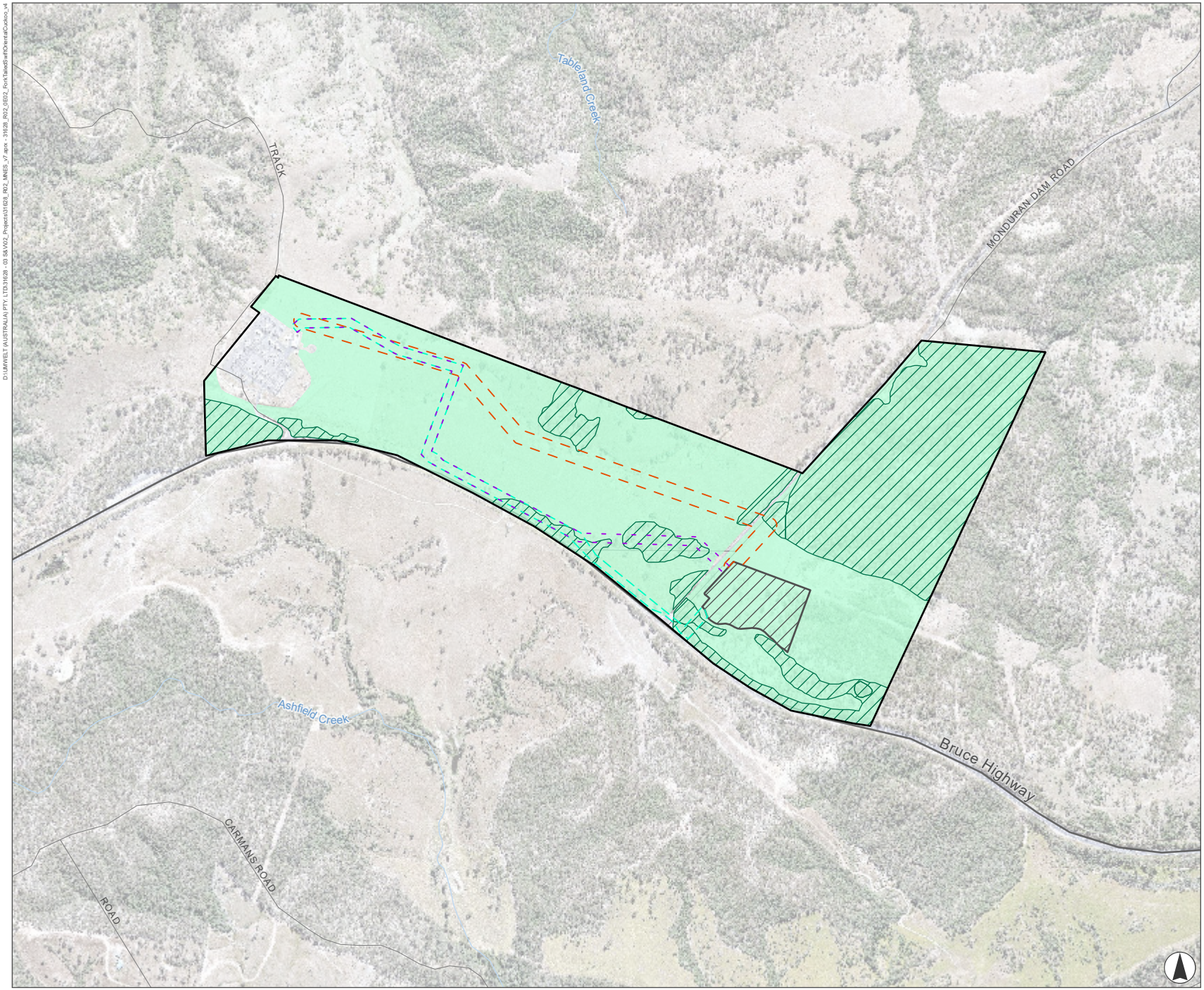
Kilometres

Scale 1:15,000 at A4
GDA2020 MGA Zone 56

Image Source: ESRI Basemap (2024) | **Data Source:** NSW DFSI (2024)

FIGURE E.2

Potential Habitat for Fork-tailed swift *(Apus pacificus)* and Oriental cuckoo *(Cuculus optatus)*



Legend

- Study Area
- State Controlled Road
- Local Road
- Watercourse

Suitable Habitat for migratory bird species

Fork-tailed swift

- Foraging and dispersal

Oriental cuckoo

- Foraging and dispersal

Proposed Disturbance Footprint

- Proposed BESS Facility

Indicative Transmission Routes

- Route A
- Route B
- Route C

0 0.3 0.6

Kilometres

Scale 1:15,000 at A4
GDA2020 MGA Zone 56

Image Source: ESRI Basemap (2024) | **Data Source:** NSW DFSI (2024)

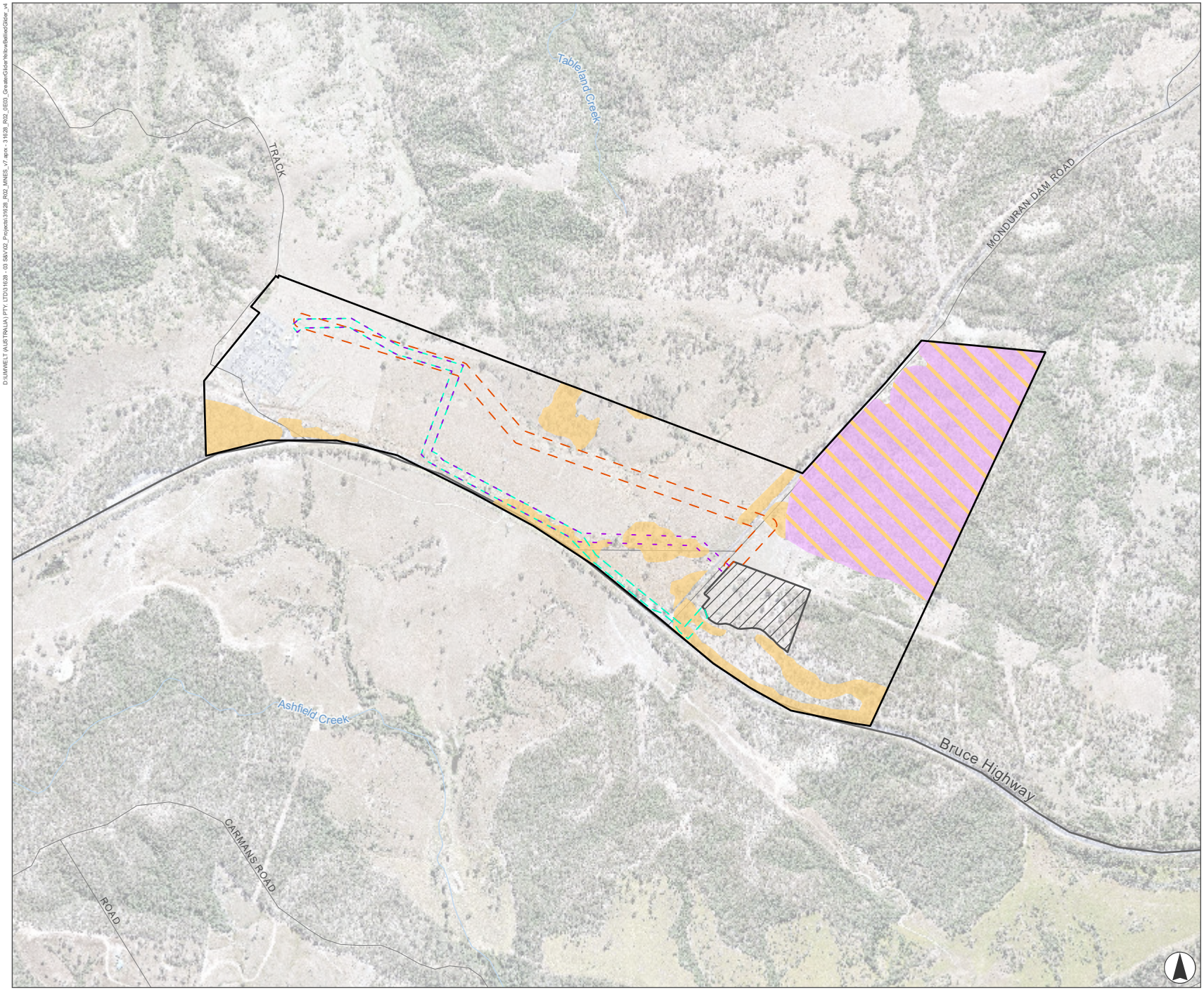


FIGURE E.3

Potential Habitat for Greater glider (southern subspecies) *(Petauroides volans volans)* and Yellow-bellied glider (south-eastern) *(Petaurus australis australis)*

Legend

- Study Area
- State Controlled Road
- Local Road
- Watercourse

Suitable habitat for gliders

Great Glider

- Likely or Current Denning
- Unoccupied

Yellow-bellied Glider

- Breeding and denning

Proposed Disturbance Footprint

- Proposed BESS Facility

Indicative Transmission Routes

- Route A
- Route B
- Route C

0 0.3 0.6

Kilometres

Scale 1:15,000 at A4
GDA2020 MGA Zone 56

Image Source: ESRI Basemap (2024) | **Data Source:** NSW DFSI (2024)

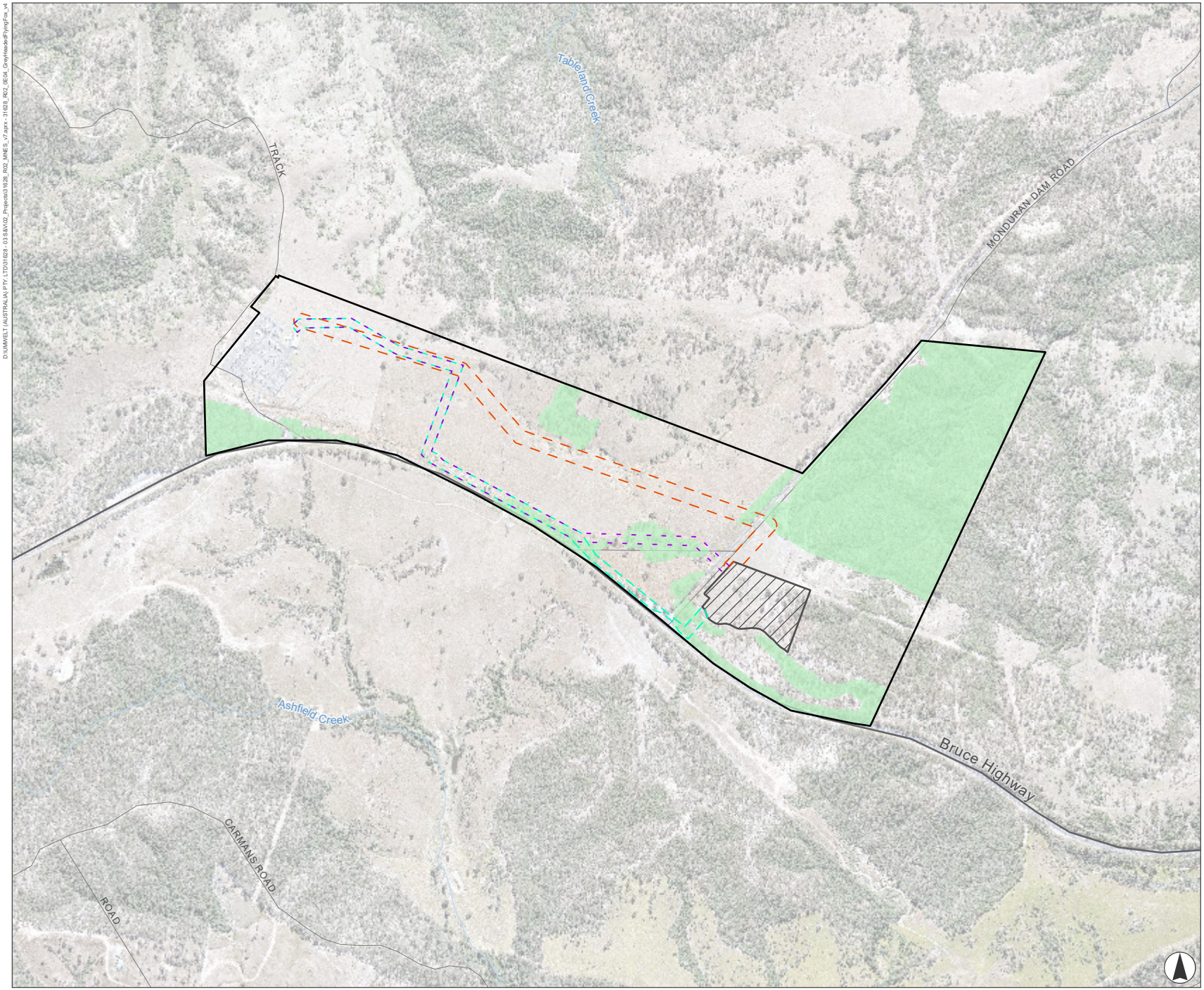


FIGURE E.4

Potential Habitat for Grey-headed flying-fox *(Pteropus poliocephalus)*

Legend

- Study Area
- State Controlled Road
- Local Road
- Watercourse

Suitable Habitat for grey-headed flying-fox

- Foraging

Proposed Disturbance Footprint

- Proposed BESS Facility

Indicative Transmission Routes

- Route A
- Route B
- Route C

0 0.3 0.6

Kilometres

Scale 1:15,000 at A4
GDA2020 MGA Zone 56

Image Source: ESRI Basemap (2024) | **Data Source:** NSW DFSI (2024)

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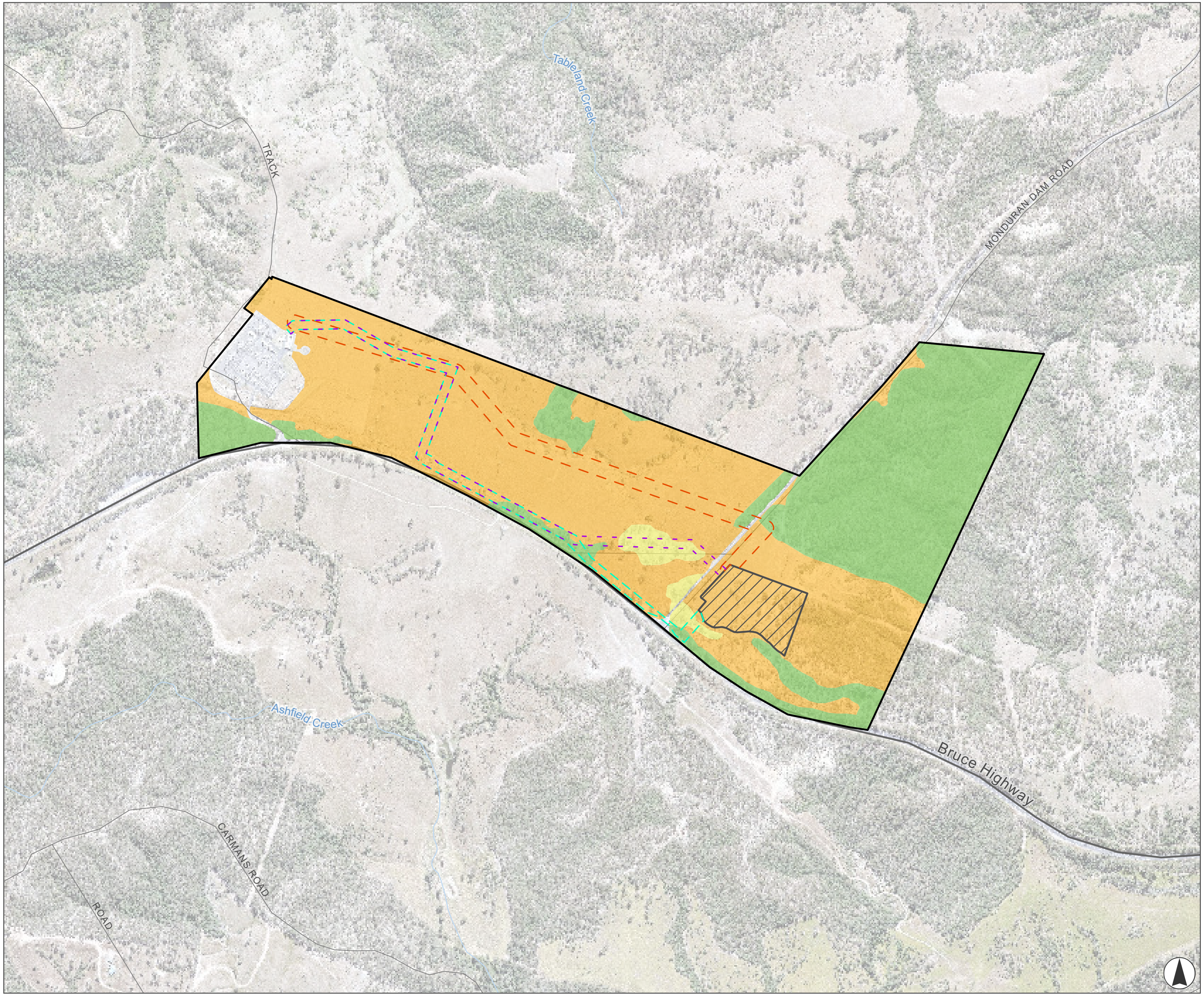
FIGURE E.5

Potential Habitat for Koala *(Phascolarctos cinereus)*



Legend

- Study Area
- State Controlled Road
- Local Road
- Watercourse

Suitable Habitat for Koala

- Breeding and foraging
- Climate refugia
- Dispersal

Proposed Disturbance Footprint

- Proposed BESS Facility

Indicative Transmission Routes

- Route A
- Route B
- Route C

0 0.3 0.6
Kilometres

Scale 1:15,000 at A4
GDA2020 MGA Zone 56

Image Source: ESRI Basemap (2024) | **Data Source:** NSW DFSI (2024)

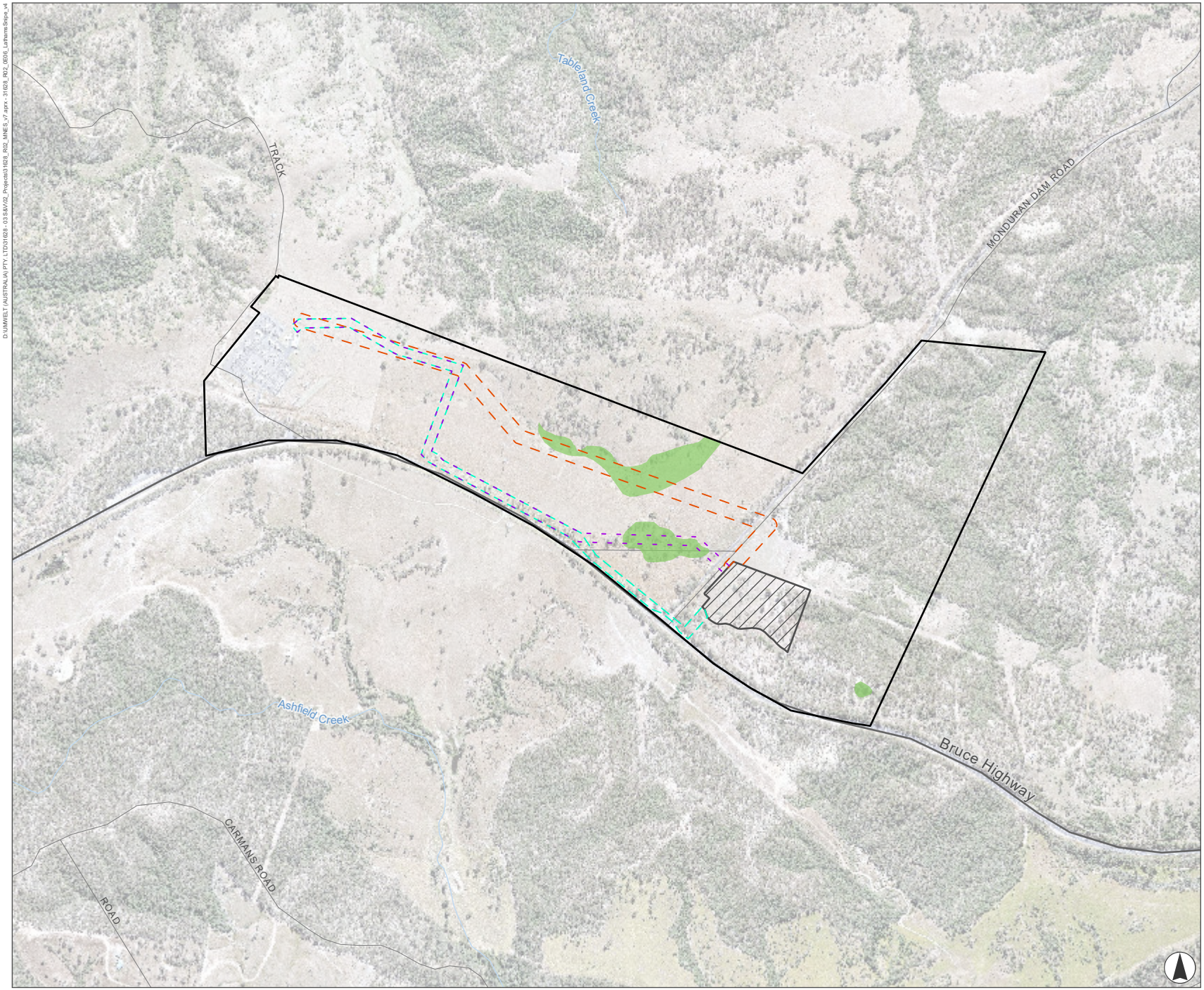


FIGURE E.6

Potential Habitat for Latham's Snipe *(Gallinago hardwickii)*

Legend

- Study Area
- State Controlled Road
- Local Road
- Watercourse

Suitable Habitat for Latham's snipe

- Roosting and foraging

Proposed Disturbance Footprint

- Proposed BESS Facility

Indicative Transmission Routes

- Route A
- Route B
- Route C

0 0.3 0.6

Kilometres

Scale 1:15,000 at A4
GDA2020 MGA Zone 56

Image Source: ESRI Basemap (2024) | **Data Source:** NSW DFSI (2024)

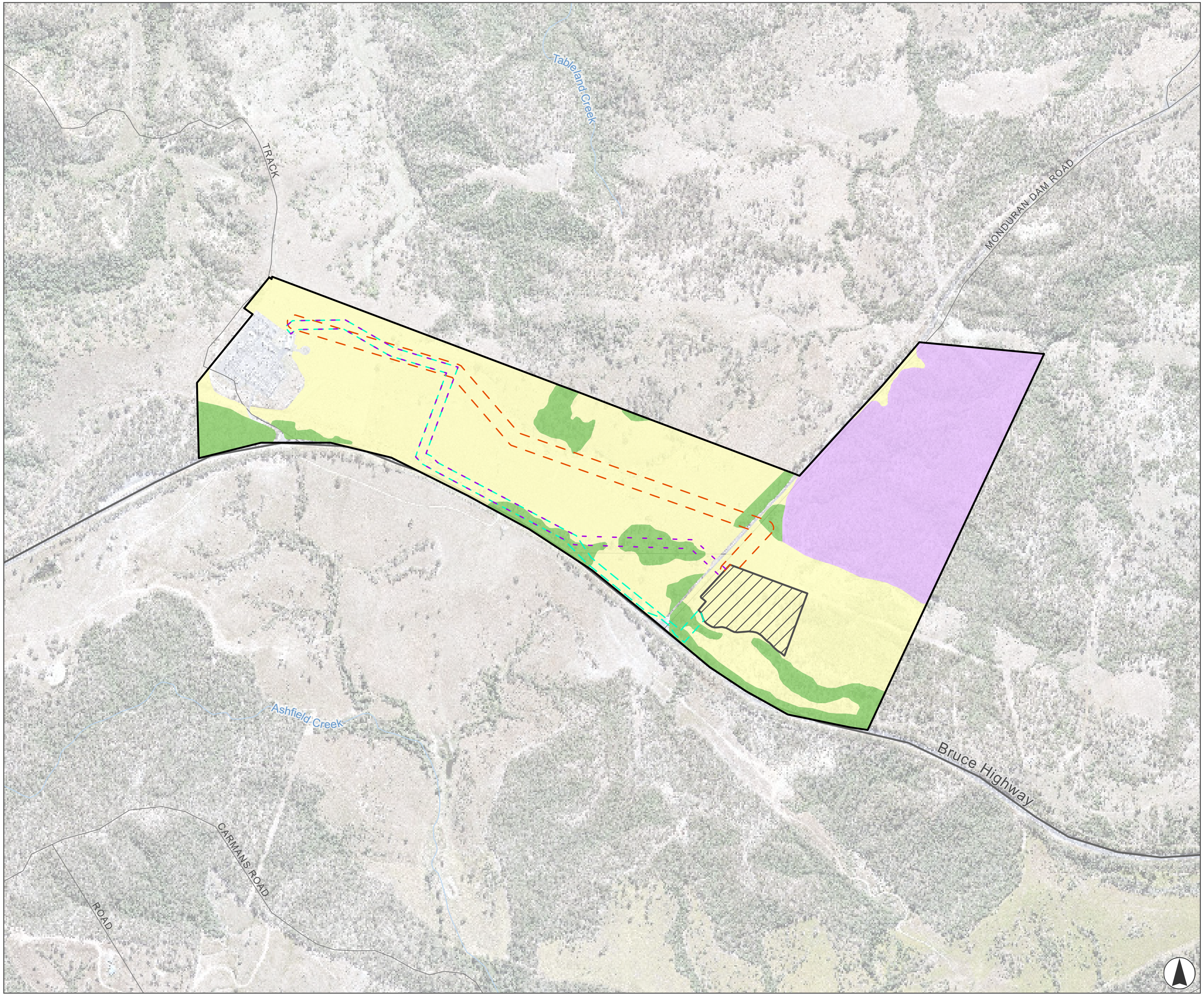


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FIGURE E.7

Potential Habitat for Northern quoll *(Dasyurus hallucatus)*

Legend

- Study Area
- State Controlled Road
- Local Road
- Watercourse

Suitable Habitat for northern quoll

- Denning and refuge
- Dispersal
- Foraging and dispersal

Proposed Disturbance Footprint

- Proposed BESS Facility

Indicative Transmission Routes

- Route A
- Route B
- Route C

0 0.3 0.6
Kilometres

Scale 1:15,000 at A4
GDA2020 MGA Zone 56

Image Source: ESRI Basemap (2024) | **Data Source:** NSW DFSI (2024)