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Biodiversity Assessment Report

Proposed Continuation & Expansion of Sand Extraction Operations, Larbert, NSW.

Lots 332 & 333 DP 755418

552 Larbert Road, Larbert, NSW

Walbanga Country

October 2025



Version	Final
Date	27 October 2025
Project Number	140325_1

Summary

Description of proposal

The proponent currently operates a sand extraction operation on the subject land approved in 2023, the parts of the land not subject to this operation is used for routine grazing employing agricultural operations such as sowing and slashing, tilling lines were evident during site inspections and historic aerial imagery indicate this has been carried on for at least 2 decades.

The proposal is to continue and expand the existing sand extraction operation within parts of Lots 332 & 333 DP 755418, see Figure 1-1 illustrating the proposal, as outlined below, specific details are available in the EIS.

- Staged, progressive expansion of the existing sand extraction area by an additional 18.1 ha, with an estimated resource of 1.23 million tonnes
- Increase in the rate of sand extraction, from the currently approved 25,000 tonnes per annum, to increase to 200,000 tonnes per annum
- Reliance on existing approved access to and from the existing sand pit back to Larbert Road.
- A minor increase in the currently approved hours of operation of sand extraction and processing
- A proposed increase in truck volumes as a result of the increase in the rate of sand extraction proposed on site, equivalent to an average of 20 loaded trucks per day, or a maximum of up to 50 loaded trucks per day
- Avoiding extraction of sand from significant trees on site and from a drainage depression located to the north of the currently approved extraction area
- Avoiding extraction over identified Aboriginal sites
- The project would initially rely on the existing sand processing and washing plant on the Project Site
- Progressive rehabilitation of each stage once sand extraction is completed.

BAM Triggers

The proposed development is being assessed as 'designated development' under s.4.10 of the Environmental Planning and Assessment Act 1970 and does not trigger the BAM.

The proposal;

- requires no removal of native vegetation
- does not impact BVM mapping
- will not significantly impact a threatened matter.

Plant Community Types and Vegetation Zones

One plant community type of one condition state was identified for the site, *3348 Southern Tableland Granites Ribbon Gum Grassy Forest* which occurs in a moderate poor, mostly as isolated paddock trees.

Exotic managed grassland occurs across the majority of the subject land.

No native vegetation occurs in the development area.

Threatened matters

No threatened fauna, flora or ecological communities were found on the project area or considered to have a risk of significant impact by the proposal.

Serious and irreversible impact species

No species were found likely to occur on the subject land that are listed as at risk of a Serious and Irreversible Impact.

Avoidance and Minimise Impacts

During the design phase impacts to biodiversity have been avoided and minimised as practical while delivering a sustainable and much needed asset to the community. The proposal has been designed to be restricted to areas of the lowest condition vegetation and to prevent further fragmentation of habitat.

Impact mitigation

Several measures to mitigate residual impacts to biodiversity are prescribed in this report, these measures ensure biodiversity impacts are minor and that indirect impacts do not impact biodiversity beyond the project area.

Offsets

Offsetting is not required, site regeneration will include measures to improve biodiversity.

high

Abbreviations

APZ	Asset protection zone
BAM	Biodiversity Assessment Method
BAM-C	Biodiversity Assessment Method Calculator
BC Act	Biodiversity Conservation Act 2016 (NSW)
BC Regulation	Biodiversity Conservation Regulation 2017 (NSW)
SEPP (Biodiversity and Conservation)	State Environmental Planning Policy (Biodiversity and Conservation) 2021
BDAR	Biodiversity Development Assessment Report
BOAMS	Biodiversity Offsets and Agreement Management System
BOS	Biodiversity Offsets Scheme
CEEC	critically endangered ecological community
DBH	diameter at breast height over bark
EC	ecological community listed under the EPBC Act
EIS	Environmental Impact Statement
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)
EP&A Act	Environmental Planning and Assessment Act 1979 (NSW)
EEC	endangered ecological community
HTW	high threat weed
IBRA	Interim Biogeographic Regionalisation for Australia
LLS Act	Local Land Services Act 2013 (NSW)
MNES	matters of national environmental significance
NPW Act	National Parks and Wildlife Act 1974 (NSW)
PCT	Plant community type
SAII	serious and irreversible impact

SEARs	Secretary's Environmental Assessment Requirements
TBDC	Threatened Biodiversity Data Collection
Transport	Transport for NSW
TEC	threatened ecological community
VEC	vulnerable ecological community
Vegetation SEPP	State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017 (NSW)

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1. Introduction

1.1 Proposed Development

1.1.1 Development overview

The subject land occurs in a rural area of the Southern Tablelands of NSW 13km to the north of Braidwood. The landscape has largely been cleared for agriculture however significant tracts of native forest as well as some areas of native woodland persist, often as isolated paddock trees. The Shoalhaven River occurs 1km to the west of the subject land, a significant perennial river system that drains a large area of the southeast Southern Tablelands.

The proponent currently operates a sand extraction operation on the subject land approved in 2023, the parts of the land not subject to this operation is used for routine grazing employing agricultural operations such as sowing and slashing, tilling lines were evident during site inspections and historic aerial imagery indicate this has been carried on for at least 2 decades.

The proposal is to continue and expand the existing sand extraction operation within parts of Lots 332 & 333 DP 755418, see Figure 1-1 illustrating the proposal, as outlined below, specific details are available in the EIS.

- Staged, progressive expansion of the existing sand extraction area by an additional 18.1 ha, with an estimated resource of 1.23 million tonnes
- Increase in the rate of sand extraction, from the currently approved 25,000 tonnes per annum, to increase to 200,000 tonnes per annum
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- Avoiding extraction of sand from significant trees on site and from a drainage depression located to the north of the currently approved extraction area
- Avoiding extraction over identified Aboriginal sites
- The project would initially rely on the existing sand processing and washing plant on the Project Site
- Progressive rehabilitation of each stage once sand extraction is completed.

The proposal would be undertaken in accordance with best practice for extractive industry and rehabilitation and adhere strictly to conditions imposed by consent including implementation of various management plans.

1.1.2 Location

The proposed project is located in the Queanbeyan – Palerang Regional Local Government Area (LGA), 13km to the north of Braidwood and 60km to the east of Queanbeyan. It is accessed via an existing vehicular track and accessway from Larbert Road, 5460m from its intersection with The Kings Highway. The extent and location of the subject land is shown in Map 1-1 of this report.

The proposal is contained within the following parcels:

- Lot 332 (DP) 755915, containing the existing sand extraction operation
- Lot 333 (DP) 755915,

The existing accessway occurs on;

- Lot 331 (DP) 755915

The extent of works and development footprint are detailed in the concept plans in the EIS.

1.1.3 Site Description

The assessment area occurs in a rural environment of low to moderate productivity lands that have generally been subject to European agricultural practices for over a century. Some areas have been left uncleared, 18% of the assessment area, supporting largely native forest however some native woodland and secondary native grassland occurs.

Agricultural production occurs across most of the area and additional sand extraction operations occur to the north.

The Shoalhaven River is a significant landscape feature occurring to the northwest of the assessment area. Several minor drainage lines first and second order, drain the area to the west including a first and second order stream on the subject land. A fourth order stream, Durren Durra Creek occurs close to the southern boundary of the subject land.

The amenity of the area generally is that of a modified landscape supporting agriculture and sand quarrying operations.

1.2 Purpose of this Biodiversity Assessment Report

Terminology used in this report aims to be consistent with the NSW Biodiversity Assessment Method 2020;

- Assessment area refers to the local environment surrounding the subject land, it is a buffer distance of 1500m of the subject land.
- Subject land refers to the parcel of land containing the proposed development;
 - Lot 332 (DP) 755915, containing the existing sand extraction operation &
 - Lot 333 (DP) 755915.
- Development footprint refers to the areas of direct impacts of the proposal, it includes the footprint of the development and any ancillary works, facilities, accesses and hazard reduction zones that support the construction or operation of the development the development footprint is identified in Map 1-1 and shown in detail in concept plans in the EIS.

The purpose of this report is to identify and assess the terrestrial biodiversity, including flora, fauna and ecological communities occurring in the subject land and the likely impacts of the proposed development on these matters, with consideration of the site's landscape context. This report addresses the legislative framework below;

- 1) The Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)
 - a. Biodiversity Matters of National Environmental Significance
Identification of protected matters at risk of impact and assessment of significance of any impact
- 2) NSW Biodiversity Conservation Act 2016 (BC Act)
 - a. Part 6 Biodiversity offsets scheme
Application of the BAM in relation to this proposal

b. Part 4, Divisions 2 and 5

Consideration of listed species, ecological communities and key threatening processes to be considered under s7.3

c. Section 7.3

Test of Significance, for determining whether proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats

3) State Environmental Planning Policy (Biodiversity and Conservation) 2021

a. Chapter 3 Koala habitat protection 2020

b. Chapter 4 Koala habitat protection 2021

The Koala SEPP has been addressed in Section 7 of this report.

4) Queanbeyan-Palerang Regional Local Environmental Plan 2022 (LEP)

a. Clause 7.2 – Terrestrial Biodiversity

The objectives of this clause are to protect, maintain or improve the diversity of the native vegetation, including:

(a) protecting native fauna and flora, and

(b) protecting the ecological processes necessary for the continued existence of native fauna and flora, and

(c) encouraging the conservation and recovery of native fauna and flora and their habitats.

This clause applies to development on land that is identified as “Biodiversity” on the Terrestrial Biodiversity Map.

The majority of the subject land is mapped as ‘Biodiversity’ by this map. This this report addresses each part of this clause throughout the report.

It is important to note that not all species that occur on or use this site, particularly fauna, could be identified without an extended survey period of several seasons and over numerous site visits. A survey of this extent is beyond the scope of this assessment. To compensate for this, habitats have been assessed with consideration of potentially occurring species applying the principle, particularly in relation to listed matters.

This Biodiversity Assessment considers the potential impact on flora and fauna of the proposal including matters protected under legislation. The impact assessment is based on all construction requirements of the project including any removal of vegetation, earthworks, construction methodology, temporary facilities as well as intended subsequent land use.

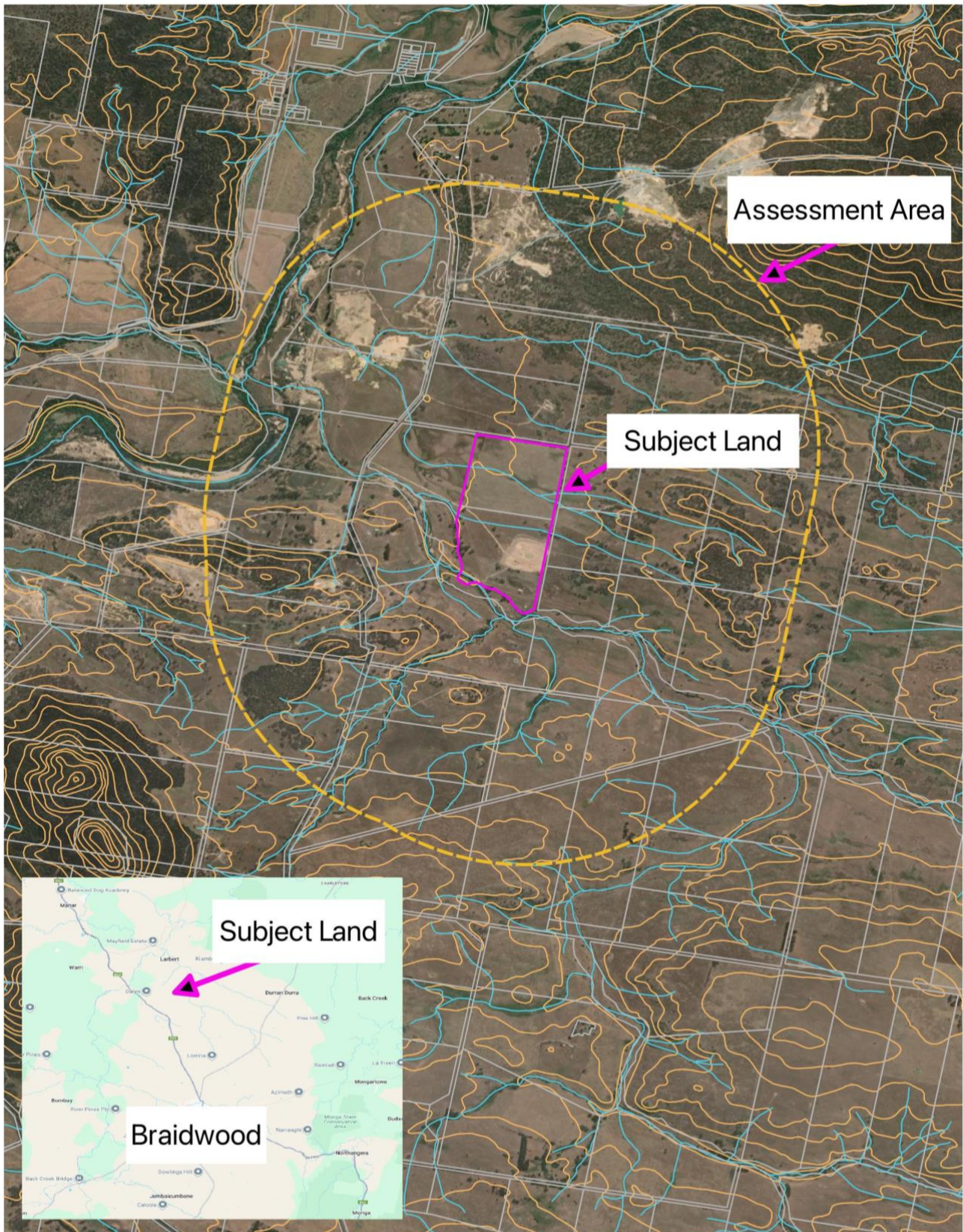
1.3 Information Sources

The following information sources were used in the development of this report:

- Proposal concept plans prepared Outline Planning Consultants, several drafts, 2025
- Commonwealth Government Species Profiles and Threats (SPRAT) database
<http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl>
- Commonwealth Department of Climate Change, Energy, the Environment and Water Protected Matters Search Tool
<https://pmst.awe.gov.au/#/map?lng=131.50634765625003&lat=-28.671310915880834&zoom=5&baseLayers=Imagery,ImageryLabels>
- NSW Threatened Biodiversity Database Collection (TBDC)

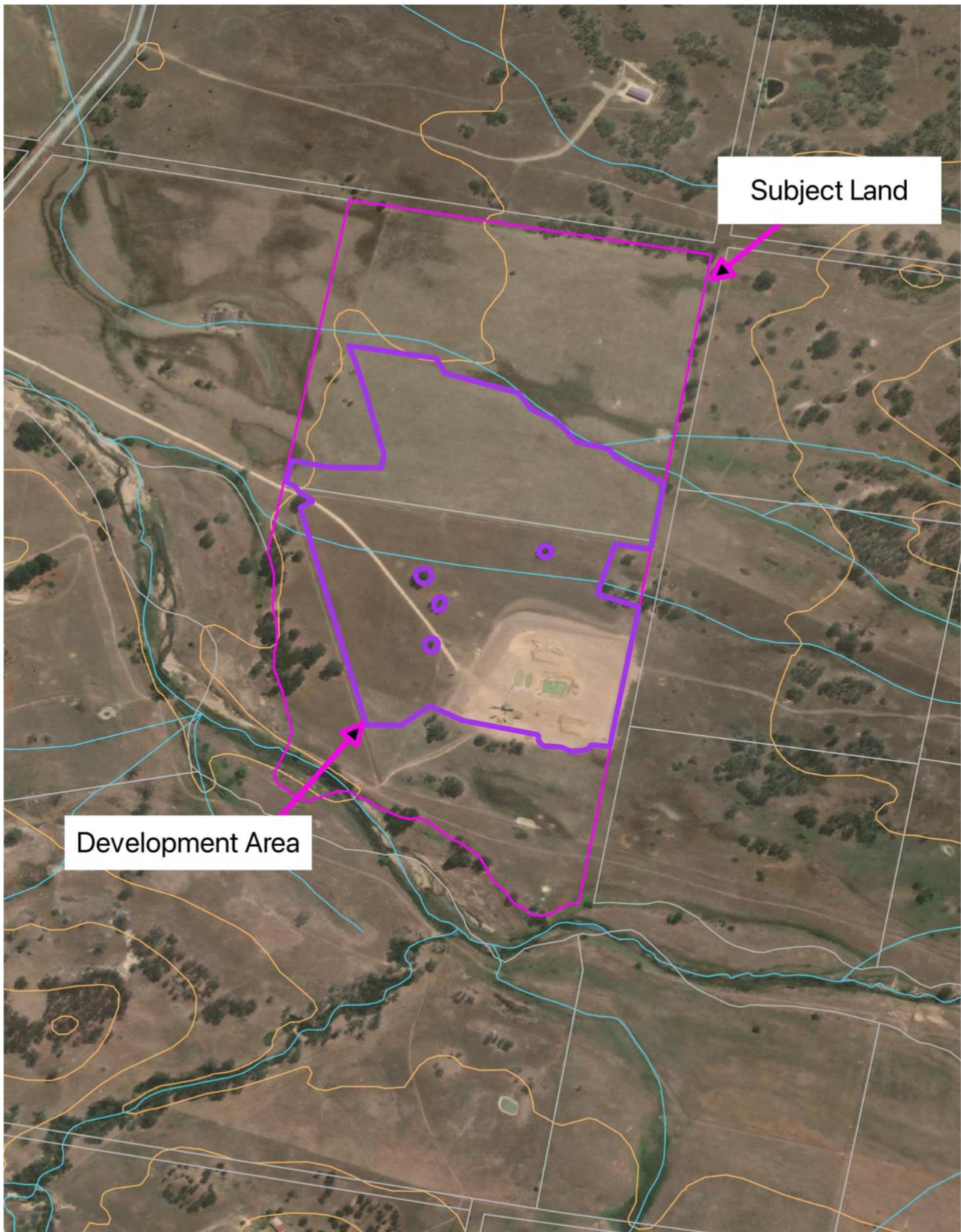
<https://www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity/nsw-bionet>

- Australia's IBRA Bioregions and sub-bioregions
<http://environment.gov.au/land/nrs/science/ibra/australias-bioregions-maps>
- Department of Environment and Climate Change NSW (DECC) (2002). Descriptions for NSW (Mitchell) Landscapes, Version 2.
- NSW Biodiversity Offsets and Agreement Management System (BOAMS), including BAM Calculator
- NSW Government SEED Mapping
- ePlanning spatial viewer <https://www.planningportal.nsw.gov.au/spatialviewer>
- NSW Biodiversity Values Map
- State Vegetation Type Map (SVTM) November 2024
- NSW Spatial Services SixMaps <https://maps.six.nsw.gov.au>
- Queanbeyan-Palerang Regional Local Environmental Plan 2022
- BAM 2020



Map 1-1
Assessment Area &
Locality





Map 1-2
Subject Land &
Development Area

0 100 200 m



2 Methods

2.1 Site context methods

2.1.1 Landscape features

Landscape features were considered using a range of online mapping tools, see Section 1.5 above, to gain an understanding of the general nature of the site context and landscape features that relate to the subject land. Field investigations on the subject land and publicly accessible parts of surrounding lands were undertaken on 24 July 2025 to confirm or clarify findings of desktop research.

2.1.2 Native vegetation cover

Aerial photography produced by NSW Sixmaps was used to determine native vegetation cover along with vegetation mapping provided by the SVTM 2024 and images taken on 24 & 25 July 2025. Ground truthing on publicly accessible areas within the assessment area, with the use of a drone mounted camera as well as familiarity with several nearby freehold lands previously surveyed confirmed native vegetation cover.

2.2 Native vegetation, threatened ecological communities and vegetation integrity methods

2.2.1 Existing information

The TBDC and SCTM were considered to shortlist the likely and possible PCTs and TECs occurring in the landscape.

2.2.2 Mapping native vegetation extent

Vegetation mapping on the subject land was undertaken by traversing the project site on foot targeting each vegetation type in the development area using the random meander technique (Cropper 1993) recording the extent of native vegetation and flora species present with a handheld gis tablet. Vegetation stratification into vegetation zones based on prima facie PCT and condition was undertaken in order to define zones for plot base surveys, this could be estimated with sufficient confidence following a random meander survey, considering assemblages of plants present and extent of disturbance from past land management, the absence of vegetation or components of forest structure and familiarity with local vegetation communities. The route of the random meander survey is shown on Map 2-1.

Trees occurring in the draft development area were recorded including their location, DBH and species.

No PCTs of adequate size were found appropriate for the BAM survey, native vegetation is restricted to isolated trees and narrow disjunct strips of grassland. Narrow filaments of vegetation of often less than 1m are present which could not practically be included in a vegetation zone.

2.2.3 Plot-based vegetation survey

Due to the small size of native vegetation zones present on the subject land and avoidance of native vegetation from the development footprint no BAM plot were surveyed.

2.2.4 Vegetation integrity survey

Due to the small size of native vegetation zones present and lack of vegetation structure on the subject land and avoidance of native vegetation from the development footprint no vegetation integrity plots were surveyed.

2.3 Threatened flora survey methods

No BAM-C predicted flora species credit species were identified as requiring survey.

2.4 Threatened fauna survey methods

No BAM-C predicted fauna species credit species were identified as requiring survey.

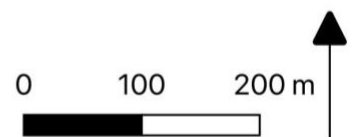
2.4.1 Habitat constraints assessment

It is unlikely habitats present in the development area could support threatened fauna, particularly given the ongoing agricultural management of the site. Consideration was given to the possibility of *Delma impar* (striped legless lizard) occurring as it can be found in grassland with high exotic component however the structure of the grassland being continually grazed and cropped is inadequate for this species and there are no loose rock to provide shelter. The threatened grasshopper *Keyacris scurra* (keys matchstick) was also considered as it has been found in grasslands with exotic species including *Phalaris* and has been recorded more frequently in the Southern Tablelands. This species was incidentally surveyed during flora surveys which occurred at an appropriate time of the year and time of the day to detect this species, no grasshopper species were found.

As no suitable habitat is present for these or other threatened fauna a species polygon could not be prepared.



Map 2-1
Random Meander Survey
Transect



3 Site Context

3.1 Assessment area

As a site based development a 1500m buffer was applied to the subject land to define the assessment area as identified in Map 1-1.

3.2 Landscape features

3.2.1 IBRA bioregions and IBRA subregions

Bioregions are large, geographically distinct areas of land with common characteristics such as geology, landform patterns, climate, ecological features, and flora and fauna communities. The northern fifth of the assessment area occurs within the Bungonia IBRA subregion, within the greater South Eastern Highlands IBRA bioregion. The remainder of the assessment area including the project area occurs within the South East Coastal Ranges IBRA subregion, within the South East Corner IBRA bioregion.

3.2.2 Rivers, streams, estuaries and wetlands

The subject land drains via several unnamed drainage lines to the west, 1km to the Shoalhaven River. Several minor drainage lines - both first and second order, drain the area to the west including a first and second order stream on the subject land. A fourth order stream, Durren Durra Creek occurs close to the southern boundary of the subject land entering a small section of the subject land across its far southwestern corner – 100m from the development area.

A first order drainage depression traverses the development area, it appears to flow very infrequently. No other surface water features occur other than those forming part of the existing sand extraction operation.

3.2.3 Habitat connectivity

Habitat forming connectivity for flora and fauna consists of large tracts of native forest vegetation to the northeast and to a lesser extent the southwest. Connectivity extends to the Shoalhaven River and its associated riparian vegetation. Much of this connectivity is improved through the intermittent presence of isolated paddock trees and regrowth.

Dispersal potential for flora species and less mobile fauna species is low given the land uses in the vicinity.

Habitat corridors for aquatic species are limited to the waterways/ streams mentioned above, most of which are ephemeral, and therefore, mobility is limited to periods of high rainfall when the waterways have flow.

3.2.4 Karst, caves, crevices, cliffs, rocks or other geological features of significance

No karst or cave features occur in the assessment area. No coastal cliffs occur in this area or significant areas of cliffs or exposed rock and crevice.

3.2.5 Areas of outstanding biodiversity value

No areas of outstanding biodiversity value, as identified under the BC Act occur within the subject land, assessment area or nearby.

3.2.6 NSW (Mitchell) landscape

The subject land and assessment area occur within the Shoalhaven Gorge and Braidwood Granites NSW (Mitchell) landscapes.

3.3 Native vegetation cover

Vegetation within the subject land, and within the 1500 metre buffer assessment area, was assessed using aerial photograph interpretation, field investigation and SVTM mapping. Table 3-1 summarises the extent of native vegetation cover within the assessment area.

Table 3-1 Native vegetation cover in the assessment area

Assessment area (ha)	1224
Total area of native vegetation cover (ha)	220
Percentage of native vegetation cover (%)	18
Class (0-10, >10-30, >30-70 or >70%)	>10-30

4 Native vegetation, threatened ecological communities and vegetation integrity

4.1 Native vegetation extent

On the subject land, native vegetation is largely restricted to isolated paddock trees, in these areas where implements have been unable to work the soil groundcover species have been able to persist. Additionally, in the drainage depression to the north of the development footprint native rushes occur

4.1.1 Changes to the mapped native vegetation extent

Field investigations indicate native vegetation extent for woody species does not vary from aerial imagery and is generally consistent with gis mapping resources. SVTM mapping significantly overestimates the native vegetation present in the assessment area indicating large tracts of PCT 3413 Monaro Kangaroo Grass Woodland-Grassland Complex, occurring in areas of highly managed exotic grassland.

4.1.2 Areas that are not native vegetation

The majority of the subject land is devoid of native vegetation including the managed exotic grassland and areas of the existing sand extraction operation.

4.2 Plant community types

4.2.1 Overview

Native vegetation within the subject land has been assessed as aligning with the BioNet Vegetation Classification PCTs identified within Table 4-1 and their extent is shown in Map 4-1 Plant community types. Detailed descriptions of each PCT are provided in the following subsections.

Given the small areas of native vegetation present it is not possible to use a subjective assessment method to define a PCT, this determination is based on species present and likely fit within PCTs occurring locally.

Table 4-1 PCTs identified within the subject land

PCT ID	PCT name	Subject land area (ha)
3348	Southern Tableland Granites Ribbon Gum Grassy Forest	2.39
Not native vegetation	N/A	49.31
Total area		51.7

4.2.2 Southern Tableland Granites Ribbon Gum Grassy Forest

This PCT is described as;

A tall grassy sclerophyll open forest to woodland restricted to undulating to rolling tableland landscapes on sandy soils derived from granitoid and acid volcanic substrates of moderately high and cool north-east parts of the South Eastern Highlands bioregion. This PCT has a disjunct distribution with a southern cluster from Snowball north to Durran Durra, Mount Fairy and Bungonia, central plots in the Taralga to Laggan area, and northern plots in the Cocks River catchment around Hartley and Hampton. It occurs at elevations of 550-1100 metres asl, with means of 650-1000 mm precipitation and 6-45 frost days annually. A sparse to mid-dense

canopy almost always includes *Eucalyptus viminalis*, occasionally with *Eucalyptus pauciflora* and/or *Eucalyptus radiata*, with a sparse small tree stratum that includes occasional *Acacia melanoxylon*. Plots sometimes include a very sparse layer of smaller shrubs, most frequently with *Bursaria spinosa*. A mid-dense to dense, grassy ground layer is very frequently dominated by *Microlaena stipoides*, commonly with *Themeda triandra*, *Rytidosperma racemosum* and occasional *Poa labillardierei* var. *labillardierei* and/or *Poa sieberiana*. Other common ground layer species include *Pteridium esculentum*, *Lomandra longifolia*, *Lomandra multiflora* subsp. *multiflora* clumps, *Rubus parvifolius*, *Dichondra repens*, *Acaena novae-zelandiae*, *Desmodium varians*, *Glycine clandestina*, *Hydrocotyle laxiflora*, *Lomandra filiformis*, *Stellaria pungens*, *Geranium solanderi* and *Gonocarpus tetragynus*. This community is commonly replaced on footslopes and creek flats by PCT 3347.

This PCT is not associated with a TEC listing.

Table 4-2 PCT 3348 Southern Tableland Granites Ribbon Gum Grassy Forest

PCT ID	3348
PCT name	Southern Tableland Granites Ribbon Gum Grassy Forest
Vegetation formation	Grassy Woodlands
Vegetation class	Tableland Clay Grassy Woodlands
Per cent cleared value (%)	82.1
Extent within subject land (ha)	2.39

Date & Time: Thu Jul 24 15:39:07 AEST 2025
Position: 55 S 752760 6088072
Altitude: 583m
Datum: AUSTRALIAN GEODETIC 1994 (GDA94)
Azimuth/Bearing: 021° N21E 0373mils (True)
Zoom: 1X



Photo 4-1 PCT 3348 Southern Tableland Granites Ribbon Gum Grassy Forest typical of the subject land, in a poor condition state represented only by isolated paddock trees in exotic grassland



Photo 4-2 vegetation typical of the development area, exotic *Phalaris aquatica* dominant grassland with occasional *Nassella trichotoma*.

4.2.3 Condition states

One distinct condition state for 3348 Southern Tableland Granites Ribbon Gum Grassy Forest has been stratified for the subject land. In all cases this PCT occurs in a poor condition state including isolated paddock trees with minimal native understory or, as isolated rushes occurring in a drainage depression.

4.3 Alignment with TECs

This PCT is not associated with a threatened ecological community listing.

4.4 Vegetation zones

One condition state for 3348 Southern Tableland Granites Ribbon Gum Grassy Forest was identified covering all the native vegetation in the subject land.

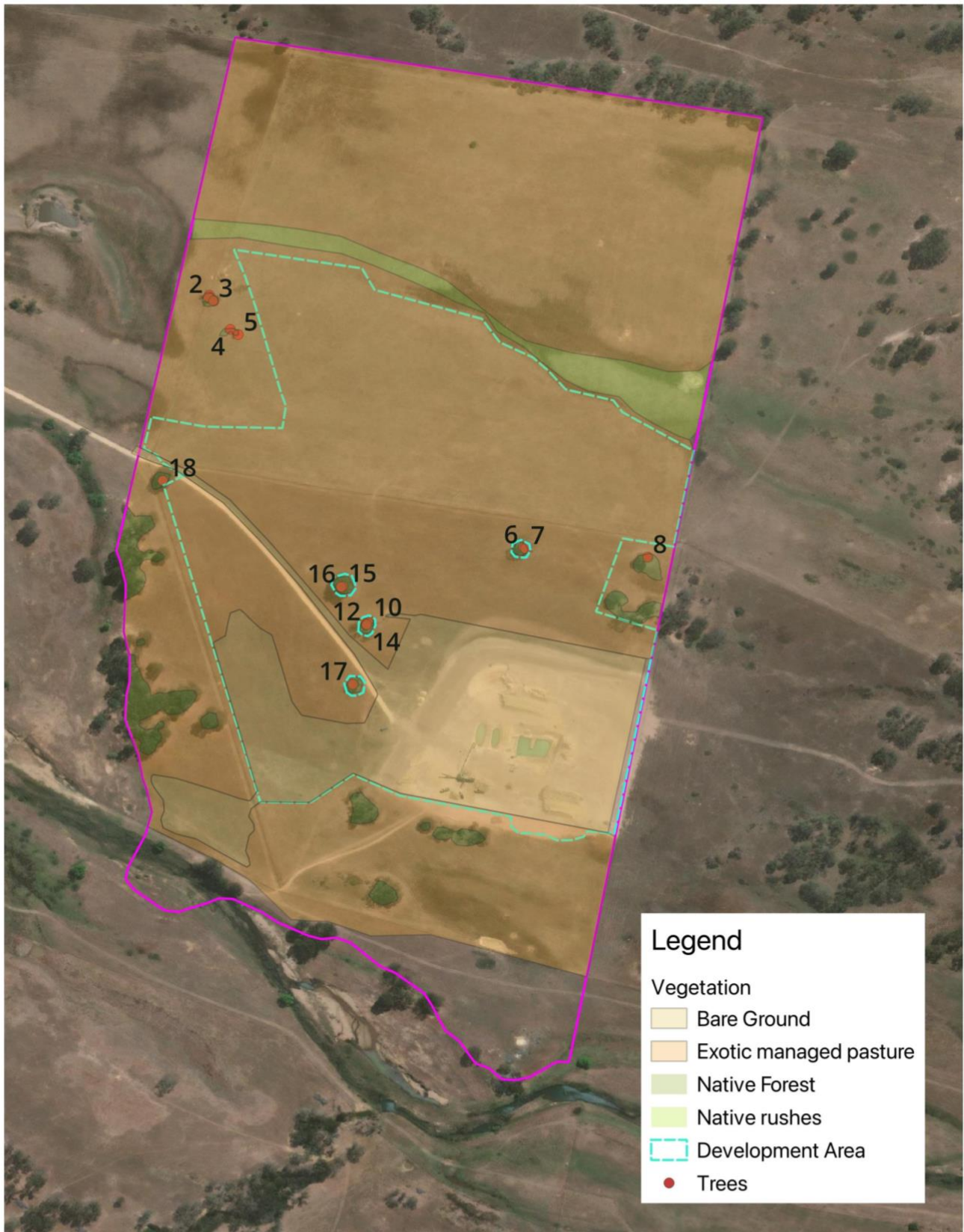
4.5 Vegetation condition

4.5.1 Vegetation across development area

Vegetation across the development area is exotic grassland dominated by *Phalaris aquatica* that is routinely grazed, sown and tilled. Vegetation condition across the development area is mapped in Map 4-1 below and illustrated in Photos 4-3 to 4-8.

Trees in the vicinity of the development area have been recorded below;

Tree Number	Species	DBH
1	<i>E.pauciflora</i>	49
2	<i>E.pauciflora</i>	54
3	<i>E.pauciflora</i>	67
4	<i>E.pauciflora</i>	89
5	<i>E.pauciflora</i>	43
6	<i>E.viminalis</i>	152
7	<i>E.viminalis</i>	7
8	<i>E.viminalis</i>	107
9	<i>E.pauciflora</i>	23
10	<i>E.pauciflora</i>	24
11	<i>E.pauciflora</i>	20
12	<i>E.pauciflora</i>	24
13	<i>E.pauciflora</i>	24
14	<i>E.pauciflora</i>	26
15	<i>E.viminalis</i>	40
16	<i>E.viminalis</i>	183
17	<i>E.pauciflora</i>	122
18	<i>E.viminalis</i>	179



Map 4-1
Native Vegetation



Date & Time: Thu Jul 24 15:35:14 AEST 2025
Position: 55 S 752705 6087944
Altitude: 583m
Datum: AUSTRALIAN GEODETIC 1994 (GDA94)
Azimuth/Bearing: 058° N58E 1031mils (True)
Zoom: 1X



Photo 4-3, typical vegetation condition, exotic grassland, looking across northern third of development area.

Date & Time: Thu Jul 24 15:50:54 AEST 2025
Position: 55 S 752774 6088135
Altitude: 585m
Datum: AUSTRALIAN GEODETIC 1994 (GDA94)
Azimuth/Bearing: 055° N55E 0978mils (True)
Zoom: 1X



Photo 4-4, clump of blackberry adds structural diversity to the Phalaris grassland.

Date & Time: Thu Jul 24 16:02:45 AEST 2025
Position: 55 S 753101 6088005
Altitude: 586m
Datum: AUSTRALIAN GEODETIC 1994 (GDA94)
Azimuth/Bearing: 313° N47W 5564mils (True)
Zoom: 1X



Photo 4-5, native rushes now excluded from development area.

Date & Time: Thu Jul 24 16:06:49 AEST 2025
Position: 55 S 753184 6087896
Altitude: 589m
Datum: AUSTRALIAN GEODETIC 1994 (GDA94)
Azimuth/Bearing: 273° N87W 4853mils (True)
Zoom: 1X



Photo 4-6, typical vegetation condition, exotic grassland, looking across mid third of development area.



Photo 4-6, scattered paddock trees to east of development area, iterative design process resulted in avoiding impacts to these trees.



Photo 4-7, serrated tussock among the managed exotic grassland, existing sand extraction works in background.

Date & Time: Thu Jul 24 16:29:41 AEST 2025
Position: 55 S 752852 6087789
Altitude: 585m
Datum: AUSTRALIAN GEODETIC 1994 (GDA94)
Azimuth/Bearing: 068° N68E 1209mils (True)
Zoom: 1X



Photo 4-8, tree 16, *E. viminalis* with DBH of 183, the largest tree in vicinity of development area. The iterative design process resulted in avoiding impacts to this and all other paddock trees.

Date & Time: Thu Jul 24 16:49:55 AEST 2025
Position: 55 S 752561 6088026
Altitude: 580m
Datum: AUSTRALIAN GEODETIC 1994 (GDA94)
Azimuth/Bearing: 134° S46E 2382mils (True)
Zoom: 1X



Photo 4-8 existing accessway, requiring no works.

5 Threatened Species, Populations and Ecological Communities

The potential for protected matters to be impacted by the proposed development has been assessed in the threatened matter evaluations table at Appendix 3 of this report.

The findings of this assessment are as follows;

5.1 Threatened Species

Appendix 3 considered several listed species that have been recorded within 10km of the study area or wider areas of the Southern Tablelands and considered to have some potential to occur on the subject land. This preliminary threatened species assessment considered each of these species in the context of the habitats present nearby as well proposed impacts resulting from the proposal.

Following this assessment, it was considered that no species required further assessment through a Test of Significance undertaken in line with the Threatened Species Test of Significance Guidelines, OEH 2018.

No Threatened Species listed under the BC Act were considered likely to occur on the site or be impacted by the proposal.

5.2 Endangered Populations

No Endangered Populations listed under the BC Act have been considered likely to be at risk of impact by the proposal.

5.3 Threatened Ecological Communities

Appendix 3 addressed 3 listed communities, following this assessment, it was considered that no community warranted further assessment due to not being present

6 Identifying prescribed impacts

Prescribed impacts are the impacts identified in clause 6.1 of the BC Regulation. These can be direct or indirect impacts and are additional to the impacts of native vegetation clearing. Prescribed impacts are considered in relation to the proposal in Table 6-1 below.

Table 6-1 Prescribed impacts identified

Feature	Present	Description of feature characteristics and location	Threatened entities that use, are likely to use, or are part of the habitat feature. Where relevant, threatened species or fauna that are part of a TEC or EEC, that are at risk of vehicle strike
Karst, caves, crevices, cliffs, rocks or other geological features of significance	☐ Yes / ☒ No	Site inspections considered the presence of and confirmed no karst, caves, crevices, cliffs, rocks or other geological features of significance occur on or nearby the subject site.	N/A
Human-made structures	☒ Yes / ☐ No	Structures present are rural fences and roads.	These human made structures are basic steel post and wire construction or conventional masonry are not likely to be in use by or a habitat feature for any threatened entity due to their simple design and lack of habitat values.
Non-native vegetation	☒ Yes / ☐ No	Non-native vegetation occurs across majority of project area	These areas of non-native vegetation are not likely to be in use by or a habitat feature for any threatened entity, they offer little structural or foraging value and are heavily impacted by agricultural operations
Habitat connectivity	☒ Yes / ☐ No	The subject land has good continuity to areas of native vegetation in all directions including habitat of similar and greater condition the subject land may be part of a movement corridor for a range of biodiversity	The proposal will not impede habitat connectivity.

Feature	Present	Description of feature characteristics and location	Threatened entities that use, are likely to use, or are part of the habitat feature. Where relevant, threatened species or fauna that are part of a TEC or EEC, that are at risk of vehicle strike
Waterbodies, water quality and hydrological processes	☐ Yes / ☒ No	Waterbodies are not present on the development area	N/A
Wind turbine strikes (wind farm development only)	☐ Yes / ☒ No	Windfarm development not proposed	N/A
Vehicle strikes	☒ Yes / ☐ No	The proposal includes increased traffic to service the quarry	It is unlikely that the proposal will increase the risk of vehicle strikes as the increased traffic will be traveling at slow speeds

7 State Environmental Planning Policy (Biodiversity and Conservation) 2021

The State Environmental Planning Policy (Biodiversity and Conservation) 2021 (BC SEPP) consolidates several repealed SEPPs that help to manage conservation of biodiversity.

7.1 BC SEPP Chapter 3 Koala habitat protection 2020

Chapter 3 Koala habitat protection 2020 applies to the subject land as it is zoned RU 1 Primary Production.

This Chapter aims to encourage the proper conservation and management of areas of natural vegetation that provide habitat for koalas to ensure a permanent free-living population over their present range and reverse the current trend of koala population decline. In the context of this proposal the following sections are applied;

3.6 Step 1—Is the land potential koala habitat?

- (1) Before a council may grant consent to a development application for consent to carry out development on land to which this Part applies, the council must be satisfied as to whether or not the land is a potential koala habitat.
- (2) The council may be satisfied as to whether or not land is a potential koala habitat only on information obtained by it, or by the applicant, from a person who is qualified and experienced in tree identification.
- (3) If the council is satisfied—
 - (a) that the land is not a potential koala habitat, it is not prevented, because of this Chapter, from granting consent to the development application, or
 - (b) that the land is a potential koala habitat, it must comply with section 3.7.

3.7 Step 2—Is the land core koala habitat?

- (1) Before a council may grant consent to a development application for consent to carry out development on land to which this Part applies that it is satisfied is a potential koala habitat, it must satisfy itself as to whether or not the land is a core koala habitat.
- (2) The council may be satisfied as to whether or not land is a core koala habitat only on information obtained by it, or by the applicant, from a person with appropriate qualifications and experience in biological science and fauna survey and management.
- (3) If the council is satisfied—
 - (a) that the land is not a core koala habitat, it is not prevented, because of this Chapter, from granting consent to the development application, or
 - (b) that the land is a core koala habitat, it must comply with section 3.8.

1. Is the land potential koala habitat?

Trees present on the subject land are Schedule 1 Feed tree species.

2. Is the land core koala habitat?

The BC SEPP defines core koala habitat as an area of land with a resident population of koalas, evidenced by attributes such as breeding females, being females with young, and recent sightings of and historical records of a population.

There are no recent recordings of koalas in nearby areas, no signs of koalas were found during site inspections. The habitat present is sparse and inadequate volume to support a

koala population. It is highly unlikely that a local koala population occurs.

The proposal will not remove koala habitat, the proposal is likely to have low or no impact on koalas or koala habitat and the council may grant consent to the development application.

8 Environment Protection and Biodiversity Conservation Act 1999

The Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) specifies that approval is required from the Commonwealth Minister for the Environment for actions that have, will have or are likely to have a significant impact on a matter of “national environmental significance” of the nine matters of national environmental significance, Matters number 4 (Threatened species, ecological communities) and 5 (Migratory species) are relevant to this proposal.

8.1 Threatened Species & Ecological Communities:

Threatened species listed under this act have been considered in the Appendix 3 assessment along with NSW BC Act listed species.

The Commonwealth Environment Department protected matters search tool was used to highlight any matters of national environmental significance that could be of concern. No additional matters were considered likely to be impacted by the proposal.

8.2 Migratory Species:

In addition to threatened species and ecological communities, the EPBC Act allows for the listing of internationally protected migratory species, i.e. species listed under the Japan-Australia Migratory Bird Agreement (JAMBA), the China - Australia Migratory Bird Agreement (CAMBA) and the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention).

No protected migratory species were observed on site at the time of this assessment or considered likely to occur on the site or rely on resources provided by its habitat

9 NSW Fisheries Management Act 1994

The Fisheries Management Act 1994 provides for the protection of fish and marine vegetation, endangered populations and ecological communities by a listing process. No species, populations or communities listed under this act were recorded on site at the time of this assessment or are considered likely to occur on this site. No Tests of Significance have been prepared for species protected by this act in relation to the proposed development.

10 Avoid and minimise impacts

10.1 Avoid and minimise direct and indirect impacts

10.1.1 Project location

The proposal has been co-located with an existing sand extraction operation in an area of very low biodiversity value.

10.1.2 Project design

The proposal has been designed to minimise impacts to biodiversity, along with meeting other environmental planning criteria, the project design reduces impacts to biodiversity by limiting the extent of the development and avoiding trees.

Retaining trees in the vicinity of the development area will also significantly assist regeneration works post extraction.

10.1.3 Indirect impacts

During construction indirect impacts of dust, noise, erosion and sedimentation and weed spread are impacts that works may impose on adjoining and downstream lands, these will be avoided and minimised through the implementation of best management practices prescribed through management plans to be implemented during works.

10.2 Avoid and minimise prescribed impacts

10.2.1 Project location

The proposal has been located in an area that avoids prescribed (clause 6.1 of the BC Regulation) impacts, see Section 6.

10.2.2 Project design

During the design phase it was identified that prescribed impacts are unlikely, due to the nature of the development and the limited biodiversity values it offers in terms of habitat connectivity.

10.2.3 Summary of measures to avoid and minimise impacts

Measures implemented to avoid and minimise direct, indirect and prescribed impacts are documented below;

Action	Outcome (Describe the outcome of implementing the measure, with reference to specific entities identified in Sections 4 and 5)	Timing	Responsibility
Knowledge of biodiversity values has informed decisions about the location of the proposal	The location of the proposal is on land that is already subject to impacts of quarrying operations and extends in to lands that have little biodiversity value. Initial designs were altered to avoid areas of higher biodiversity values including native trees	Design phase	Proponent

Action	Outcome (Describe the outcome of implementing the measure, with reference to specific entities identified in Sections 4 and 5)	Timing	Responsibility
Biodiversity values of the local area and likely to occur onsite informed design of the proposal	Biodiversity impacts have been minimised by locating the most intense parts of the proposal in the areas of least biodiversity value, where practical, with consideration of both direct impacts to vegetation and habitat as well as indirect impacts of biological continuity.	Design phase	Proponent

11 Assessment of the Biodiversity Impact

Considering the information detailed above that has been summarised from information collected during field and desktop investigations and assessments of significance for threatened species and communities the following final assessments are made.

11.1 Direct Impacts

The proposal and likely future uses will have impacts on biodiversity as follows

- Temporary (12 years) removal of 15.13ha of exotic grassland.

11.2 Potential Impacts on Flora

Vegetation impacts described above will not significantly impact any threatened flora or endangered ecological communities. The proposal will not involve the removal of any important or significant vegetation, plant habitats or significantly degrade the ecological value of the project area.

11.3 Potential Impacts on Fauna and Habitat

Habitat resources impacted are all common on the subject site and throughout the landscape. Impacts will not fragment habitat to any extent than is currently the case and will not impede the movement of fauna across the site.

11.4 Indirect Impacts

Indirect impacts likely to result from the proposal are identified below;

Table 10-2 Indirect Impacts

Indirect impact	Impacted entities	Extent	Duration	Project phase/ timing of impact	Likelihood/ consequences of failure & mitigation measures
Inadvertent construction impacts on adjacent habitat and vegetation; Accidental mechanical damage	Paddock trees	Lands adjoining development area	Short term	Construction	Unlikely. Consequences include damage to vegetation Retained trees are to be protected with physical barriers.
Reduced viability of adjacent habitat due to edge effects	Paddock trees and adjoining forests	Lands adjoining project's boundaries	Long term	Construction & Operation	Existing impact, unlikely to be exacerbated. Edge effects are currently impacting adjoining vegetation, potential increase in impact are minor

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Indirect impact	Impacted entities	Extent	Duration	Project phase/ timing of impact	Likelihood/ consequences of failure & mitigation measures
Transport of weeds and pathogens from the site to adjacent vegetation	Paddock trees and adjoining forests	Lands adjoining project's boundaries	Long term	Construction & Operation	Existing impact. During construction plant and machinery may import weed material to the site, hygiene protocols and best practice will manage this risk. During the operation phase risk will be similar to current Consequences are minor, adjoining lands already suffer weed impacts
Increased risk of starvation or exposure, and loss of shade or shelter	N/A, works will not incorporate this risk	-	-	N/A	N/A
Loss of breeding habitat	N/A, works will not impact potential nearby breeding habitat	-	-	N/A	N/A
Trampling of threatened flora species	N/A, works will not incorporate this risk	-	-	N/A	N/A
Inhibition of nitrogen fixation and increased soil salinity	N/A, works will not incorporate this risk	-	-	N/A	N/A
Fertilizer drift	N/A, works will not incorporate this risk	-	-	N/A	N/A
Rubbish dumping	N/A, works will not	-	-	N/A	N/A

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Indirect impact	Impacted entities	Extent	Duration	Project phase/ timing of impact	Likelihood/ consequences of failure & mitigation measures
	incorporate this risk				
Wood collection	N/A, works will not incorporate this risk	-	-	N/A	N/A
Bush rock removal and disturbance	-	-	-	N/A	N/A
Increase in predatory/ pest species populations	Any surrounding native habitats at risk	Existing extent	Long term	Operation	Existing impact – unlikely to increase
Increased risk of fire	Adjoining woody vegetation at risk	Existing extent	Long term	Operation	Existing impact unlikely to change
Disturbance to specialist breeding and foraging habitat	N/A – specialist habitats do not occur nearby	-	-	N/A	N/A
Indirect impacts on receiving waters during construction	Receiving waters	Down stream waterways	Short term	Construction & Operation	Unlikely, potential consequences moderate, An Erosion and Sediment Control Plan (ESCP) for the construction of the development is to be prepared and implemented in accordance with “The Blue Book” (Landcom, 2004) and issuance of any subsequent construction certificate for the works is to consider the adequacy of this ESCP

11.5 Mitigating residual impacts – management measures and implementation

10-3 Summary of proposed mitigation and management measures for residual impacts (direct, indirect and prescribed)

Mitigation measure	Method/ technique	Timing	Frequency	Responsibility	Likely efficacy
Indirect impacts on native vegetation and habitat					
Install temporary tree protection and clearing limit barriers	Works limits to be clearly delineated by barrier visible to plant operators	Construction	Throughout construction	Construction contractor	low risk of failure
Hygiene protocols to prevent the spread of weeds or pathogens between infected areas and uninfected areas	works methodology to include mechanisms for ensuring plant and equipment are weed free prior to entering and leaving the site	Construction	Throughout construction	Construction contractor	low risk of failure
Preparation and implementation of a Vegetation Management Plan (VMP) for the works by a suitably experienced ecologist	VMP to adequately address; Implementation of above measures as well as; Recommendations that will be implemented during construction to minimise impacts on biodiversity and animal welfare An arboricultural assessment that prescribes adequate measures to protect retained trees in close proximity to the extraction area	Construction	Throughout construction	Proponent & Construction contractor	low risk of failure

Mitigation measure	Method/ technique	Timing	Frequency	Responsibility	Likely efficacy
	A rehabilitation plan to establish PCT 3348 Southern Tableland Granites Ribbon Gum Grassy Forest linkages across subject land				
Net loss of biodiversity					
N/A					
Prescribed biodiversity impacts					
N/A					

12 Serious and irreversible impacts

12.1 Assessment for serious and irreversible impacts on biodiversity values

No species listed as at risk of a Serious and Irreversible Impact have been found likely to use the subject and or be impacted by the proposal.

13 Conclusion

This report has assessed the flora and fauna associated with this site and the extent and nature of impacts on biodiversity of the proposed development.

The proposed development will require the temporary (12 years) removal of 15.13ha of exotic grassland.

Several native trees have been avoided that will be retained which will significantly improve effectiveness of rehabilitation of the site post extraction.

Indirect impacts have been found to be of a quantum extent that will have a negligible impact on biodiversity outside the project area.

No other biodiversity impacts are expected, largely as the works are in an area that has suffered extensive impacts in the past including agricultural operations and extractive industry.

The proposal is not likely to have a significant impact on listed threatened species, populations or ecological communities.

It is essential that this report's impact mitigation measures be implemented in order to manage potential weed issues on the site and ensure that adjoining lands are not impacted.

There are no other biodiversity issues associated with this proposal the net impact of this proposal on flora and fauna and biodiversity generally will be negligible.

14 References

- Cogger, H. (1992). Reptiles and Amphibians of Australia, Revised Edition. Reed, Sydney.
- Commonwealth of Australia (1999). Environment Protection and Biodiversity Conservation Act 1999. Commonwealth Government, Canberra.
- Commonwealth Department of the Environment (DoE) (2013). Matters of National Environmental Significance: Significant impact guidelines 1.1 Environmental Protection and Biodiversity Conservation Act 1999. Canberra.
- Commonwealth Department of the Environment (DoE). Protected Matters Search Tool. Accessed at: <http://www.environment.gov.au/epbc/protected-matters-search-tool>
- Department of Environment and Conservation NSW Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities Working Draft (November 2004)
- NSW Office of Environment and Heritage (OEH) (2018). Threatened Species Survey and Assessment Guidelines.
- NSW Office of Environment and Heritage (OEH) – Threatened Species website <http://maps.nationalparks.nsw.gov.au/tsprofile/index.aspx>.
- Environment Australia (2000). Administrative Guidelines for Determining whether an Action has, will have, or is likely to have a Significant Impact on a Matter of National Environmental Significance under the Environmental Protection and Biodiversity Conservation Act 1999.
- Fairley, A. and Moore, P. (2002). Native Plants of the Sydney District – an identification guide, Revised Edition. Kangaroo Press, Sydney.
- Morcombe, M. (2000). Field Guide to Australian Birds. Steve Parish Publishing Pty Ltd, Queensland.
- NSW Government, Threatened Biodiversity Data Collection. Online database of species records, various contributors, periodically updated.
- Strahan, R. (1995). The Mammals of Australia. Australian Museum/Reed Books, Sydney.

Appendix 1 – Concept Plans



Disclaimer:
- This plan is a conceptual design only
- This plan should be used for visual reference only

Date: 25/09/2025

Drawn By: Abbey Richards

Appendix 2 – Flora Recorded

Family	Species	Common Name	BC Act	EPBC Act	Exotic
Amaranthaceae	<i>Alternanthera denticulata</i>	Lesser Joyweed			
Apiaceae	<i>Hydrocotyle laxiflora</i>	Stinking Pennywort			
Asphodelaceae	<i>Dianella revoluta</i>	Blueberry Lily			
Asteraceae	<i>Arctotheca calendula</i>	Capeweed			*
Asteraceae	<i>Carthamus lanatus</i>	Saffron Thistle			*
Asteraceae	<i>Cirsium vulgare</i>	Spear Thistle			*
Asteraceae	<i>Conyza spp.</i>				*
Asteraceae	<i>Euchiton spp.</i>				
Asteraceae	<i>Hypochaeris radicata</i>	Catsear			*
Asteraceae	<i>Lactuca serriola</i>	Prickly Lettuce			*
Asteraceae	<i>Onopordum acanthium subsp. acanthium</i>	Scotch Thistle			*
Asteraceae	<i>Taraxacum officinale</i>	Dandelion			*
Boraginaceae	<i>Echium plantagineum</i>	Patterson's Curse			*
Brassicaceae	<i>Hirschfeldia incana</i>	Buchan Weed			*
Brassicaceae	<i>Lepidium bonariense</i>				*
Campanulaceae	<i>Wahlenbergia spp.</i>	Bluebell			
Chenopodiaceae	<i>Einadia nutans</i>	Climbing Saltbush			
Clusiaceae	<i>Hypericum perforatum</i>	St. Johns Wort			*
Cyperaceae	<i>Cyperus eragrostis</i>	Umbrella Sedge			*
Cyperaceae	<i>Lepidosperma laterale</i>	Variable Sword-sedge			
Dennstaedtiaceae	<i>Pteridium esculentum</i>	Bracken			
Dilleniaceae	<i>Hibbertia obtusifolia</i>	Hoary Guinea Flower			
Fabaceae (Faboideae)	<i>Trifolium spp.</i>				*
Geraniaceae	<i>Erodium cicutarium</i>	Common Crowfoot			*
Lomandraceae	<i>Lomandra longifolia</i>	Spiny-headed Mat-rush			
Myrtaceae	<i>Eucalyptus pauciflora</i>	White Sally			

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Family	Species	Common Name	BC Act	EPBC Act	Exotic
Myrtaceae	<i>Eucalyptus viminalis</i>	Ribbon Gum			
Plantaginaceae	<i>Plantago lanceolata</i>	Lamb's Tongues			*
Poaceae	<i>Briza minor</i>	Shivery Grass			*
Poaceae	<i>Cynodon dactylon</i>	Common Couch			
Poaceae	<i>Dactylis glomerata</i>	Cocksfoot			*
Poaceae	<i>Holcus lanatus</i>	Yorkshire Fog			*
Poaceae	<i>Hordeum leporinum</i>	Barley Grass			*
Poaceae	<i>Imperata cylindrica</i>	Blady Grass			
Poaceae	<i>Lolium perenne</i>	Perennial Ryegrass			*
Poaceae	<i>Nassella trichotoma</i>	Serrated Tussock			*
Poaceae	<i>Paspalum dilatatum</i>	Paspalum			*
Poaceae	<i>Phalaris aquatica</i>	Phalaris			*
Polygonaceae	<i>Acetosella vulgaris</i>	Sheep Sorrel			*
Rosaceae	<i>Rubus fruticosus</i> sp. agg.	Blackberry complex			*
Scrophulariaceae	<i>Verbascum thapsus</i> subsp. <i>thapsus</i>	Great Mullein			*
Solanaceae	<i>Lycium ferocissimum</i>	African boxthorn			*
Verbenaceae	<i>Verbena bonariensis</i>	Purpletop			*

Appendix 3 – Threatened Species Evaluations

Threatened Species Evaluations

The following table present the evaluations for threatened species, endangered ecological communities and endangered populations found either

1. Within a 10km buffer of the study site in the Atlas of NSW Wildlife (Bionet).
2. Identified as potentially occurring in the area by the Commonwealth EPBC Protected Matters Search Tool.
3. Considered to have potential to occur in the landscape given habitats available

The assessment of potential for impact to the species or ecological community is based on the nature of the proposal, it's direct and indirect impacts and the ecology of the species. Where a potential impact to a threatened species, ecological community or endangered populations has been identified a *Test of Significance* for determining whether proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats has been undertaken in line with Section 7.3 of the *Biodiversity Conservation Act 2016*.

Abbreviations

Matter status under each act, *NSW Biodiversity Conservation Act 2016* (BC Act) or the *Commonwealth Environment Protection & Biodiversity Conservation Act 1999* (EPBC Act) (depending on the table column the abbreviation is placed in) are abbreviated as follows;

- E: listed as endangered
- V: listed as vulnerable
- CE: listed as Critically Endangered
- EEC: listed as an Endangered Ecological Community
- CEEC: listed as a Critically Endangered Ecological Community
- M: Migratory Species under the EPBC Act.

References

Department of the Environment. Species Profile and Threats Database, Department of the Environment, Canberra. [Online]. Available from: <http://www.environment.gov.au/sprat>.

Office of Environment and Heritage. Threatened Species Profile Search. [Online]. Available from: <http://www.environment.nsw.gov.au/threatenedspeciesapp/>.

Department of Primary Industries. Listed threatened species, populations and ecological communities. [Online]. Available from: <http://www.dpi.nsw.gov.au/fishing/species-protection/conservation>.

Species name	Habitat requirements	TSC Act	EPBC Act	Presence of habitat	Likelihood of occurrence	Potential impact
Fauna						
Birds						
<i>Anthochaera</i> <i>Phrygia</i> Regent Honeyeater	The regent honeyeater inhabits dry open forest and woodland, particularly Box-Ironbark woodland, and riparian forests of River Sheoak. These woodlands have significantly large numbers of mature trees, high canopy cover and abundance of mistletoes. The Regent Honeyeater is a generalist forager, although it feeds mainly on the nectar from a relatively small number of eucalypts that produce high volumes of nectar. Key eucalypt species include Mugga Ironbark, Yellow Box, White Box and Swamp Mahogany. Also utilises <i>E. microcarpa</i> , <i>E. punctata</i> , <i>E. polyanthemos</i> , <i>E. moluccana</i> , <i>Corymbia robusta</i> , <i>E. crebra</i> , <i>E. caleyi</i> , <i>Corymbia maculata</i> , <i>E. mckieana</i> , <i>E. macrorhyncha</i> , <i>E. laevopinea</i> , and <i>Angophora floribunda</i> . Nectar and fruit from the mistletoes <i>Amyema miquelii</i> , <i>A. pendula</i> and <i>A. cambagei</i> are also utilised. When nectar is scarce lerp and honeydew can comprise a large proportion of the diet.	CE	CE	Present in landscape, feed trees and mistletoe present in close proximity of site	Possible rare visitor to this landscape	Not likely to be impacted Proposal will not impact potential habitat
<i>Grantiella picta</i> Painted Honeyeater	Inhabits Boree/ Weeping Myall (<i>Acacia pendula</i>), Brigalow (<i>A. harpophylla</i>) and Box-Gum Woodlands and Box-Ironbark Forests. A specialist feeder on the fruits of mistletoes growing on woodland eucalypts and acacias. Prefers mistletoes of the genus <i>Amyema</i> . Insects and nectar from mistletoe or eucalypts are occasionally eaten. Nest from spring to autumn in a small, delicate nest hanging within the outer canopy of drooping eucalypts, she-oak, paperbark or mistletoe branches.	V	V	Present, woodland habitat and mistletoe present in landscape	Possible occasional visitor to this landscape	Not likely to be impacted Proposal will not impact potential habitat
<i>Melithreptus gularis gularis</i> Black-chinned Honeyeater (eastern subspecies)	Occupies mostly upper levels of drier open forests or woodlands dominated by box and ironbark eucalypts, especially Mugga Ironbark (<i>Eucalyptus sideroxylon</i>), White Box (<i>E. albens</i>), Inland Grey Box (<i>E. microcarpa</i>), Yellow Box (<i>E. melliodora</i>), Blakely's Red Gum (<i>E. blakelyi</i>) and Forest Red Gum (<i>E. tereticornis</i>). Also inhabits open forests of smooth-barked gums, stringybarks, ironbarks, river sheoaks (nesting habitat) and tea-trees. Feeding territories are large making the species	V		Absent	Unlikely	No

Species name	Habitat requirements	TSC Act	EPBC Act	Presence of habitat	Likelihood of occurrence	Potential impact
	locally nomadic. The Black-chinned Honeyeater tends to occur in the largest woodland patches in the landscape as birds forage over large home ranges of at least 5 hectares.					
<i>Botaurus poiciloptilus</i> Australasian Bittern	Favours permanent freshwater wetlands with tall, dense vegetation, particularly bullrushes (<i>Typha</i> spp.) and spikerushes (<i>Eleocharis</i> spp.). Hides during the day amongst dense reeds or rushes and feed mainly at night on frogs, fish, yabbies, spiders, insects and snails.		E	Absent	Unlikely	No
<i>Calidris ferruginea</i> Curlew Sandpiper	The curlew sandpiper generally occupies littoral and estuarine habitats, and in New South Wales is mainly found in intertidal mudflats of sheltered coasts. It also occurs in non-tidal swamps, lakes and lagoons on the coast and sometimes inland. It forages in or at the edge of shallow water, occasionally on exposed algal mats or waterweed, or on banks of beach-cast seagrass or seaweed.		CE,M	Absent	Unlikely	No
<i>Callocephalon fimbriatum</i> Gang-gang Cockatoo	In spring and summer, the species is generally found in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. In autumn and winter, the species often moves to lower altitudes in drier more open eucalypt forests and woodlands, particularly box-gum and box-ironbark assemblages, or in dry forest in coastal areas and often found in urban areas. May also occur in sub-alpine Snow Gum (<i>Eucalyptus pauciflora</i>) woodland and occasionally in temperate rainforests. Favours old growth forest and woodland attributes for nesting and roosting. Feed mainly on seeds of native and introduced trees and shrubs, with a preference for eucalypts, wattles and introduced hawthorns. They will also eat berries, fruits, nuts and insects and their larvae. Nests are located in hollows that are 10 cm in diameter or larger and at least 9 m above the ground in eucalypts.	V		Present in landscape, hollow bearing trees and foraging habitat in nearby forest	Possible, while passing through landscape	Unlikely to be impacted Proposal will not significantly impact potential habitat
<i>Calyptorhynchus lathami</i> Glossy Black-Cockatoo	Inhabits open forest and woodlands of the coast and the Great Dividing Range where stands of sheoak occur. Black Sheoak (<i>Allocasuarina littoralis</i>) and Forest Sheoak (<i>A. torulosa</i>) are important foods. Inland populations feed on a wide range of sheoaks, including Drooping Sheoak, <i>Allocasuarina diminuta</i> , and <i>A. gymnathera</i> . Belah (<i>Casuarina cristata</i>) is also utilised and may be a critical food source for some	V		Absent	Unlikely	No unlikely to be impacted

Species name	Habitat requirements	TSC Act	EPBC Act	Presence of habitat	Likelihood of occurrence	Potential impact
	populations. Feeds almost exclusively on the seeds of several species of she-oak (<i>Casuarina</i> and <i>Allocasuarina</i> species), shredding the cones with the massive bill. Dependent on large hollow-bearing eucalypts for nest sites.					
<i>Glossopsitta pusilla</i> Little Lorikeet	Forages primarily in the canopy of open <i>Eucalyptus</i> forest and woodland, yet also finds food in <i>Angophora</i> , <i>Melaleuca</i> and other tree species. Riparian habitats are particularly used, due to higher soil fertility and hence greater productivity. Isolated flowering trees in open country, e.g. paddocks, roadside remnants and urban trees also help sustain viable populations of the species. Feeds mostly on nectar and pollen, occasionally on native fruits such as mistletoe, and only rarely in orchards. Roosts in treetops, often distant from feeding areas. Nests in proximity to feeding areas if possible, most typically selecting hollows in the limb or trunk of smooth-barked Eucalypts. Entrance is small (3 cm) and usually high above the ground (2–15 m). Riparian trees often chosen, including species like <i>Allocasuarina</i> .	V		Present in landscape	Unlikely but may pass through site	No unlikely to be impacted Proposal will not significantly impact potential habitat
<i>Lathamus discolor</i> Swift Parrot	On the Australian mainland they occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations. Favoured feed trees include winter flowering species such as Swamp Mahogany <i>Eucalyptus robusta</i> , Spotted Gum <i>Corymbia maculata</i> , Red Bloodwood <i>C. gummifera</i> , Mugga Ironbark <i>E. sideroxylon</i> , and White Box <i>E. albens</i> . Commonly used lerp infested trees include Inland Grey Box <i>E. microcarpa</i> , Grey Box <i>E. moluccana</i> and Blackbutt <i>E. pilularis</i> . Return to some foraging sites on a cyclic basis depending on food availability.	E	CE	Absent	Unlikely, favoured feed trees absent	No
<i>Polytelis swainsonii</i> Superb Parrot	Inhabit Box-Gum, Box-Cypress-pine and Boree Woodlands and River Red Gum Forest. In the Riverina the birds nest in the hollows of large trees (dead or alive) mainly in tall riparian River Red Gum Forest or Woodland. On the South West Slopes nest trees can be in open Box-Gum Woodland or isolated paddock trees. Species known to be used are Blakely's Red Gum, Yellow Box, Apple Box and Red Box. May forage up to 10 km from nesting sites, primarily in grassy box woodland. Feed		V	Food source present in landscape	Unlikely but may pass through site	No - Potential impacts will not be to habitat present.

Species name	Habitat requirements	TSC Act	EPBC Act	Presence of habitat	Likelihood of occurrence	Potential impact
	in trees and understorey shrubs and on the ground and their diet consists mainly of grass seeds and herbaceous plants. Also eaten are fruits, berries, nectar, buds, flowers, insects and grain.					
<i>Chthonicola sagittata</i> Speckled Warbler	The Speckled Warbler lives in a wide range of <i>Eucalyptus</i> dominated communities that have a grassy understorey, often on rocky ridges or in gullies. Typical habitat would include scattered native tussock grasses, a sparse shrub layer, some eucalypt regrowth and an open canopy. Large, relatively undisturbed remnants are required for the species to persist in an area. The diet consists of seeds and insects, with most foraging taking place on the ground around tussocks and under bushes and trees. Pairs are sedentary and occupy a breeding territory of about ten hectares, with a slightly larger home-range when not breeding.	V		Absent	Unlikely	Unlikely to be impacted
<i>Climacteris picumnus victoriae</i> Brown Treecreeper (eastern subspecies)	Found in eucalypt woodlands (including Box-Gum Woodland) and dry open forest of the inland slopes and plains inland of the Great Dividing Range; mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey, sometimes with one or more shrub species; also found in mallee and River Red Gum (<i>Eucalyptus camaldulensis</i>) Forest bordering wetlands with an open understorey of acacias, saltbush, lignum, cumbungi and grasses; usually not found in woodlands with a dense shrub layer; fallen timber is an important habitat component for foraging; also recorded, though less commonly, in similar woodland habitats on the coastal ranges and plains.	V		Present in landscape	Unlikely, no suitable habitat on or near site	Unlikely to be impacted
<i>Daphoenositta chrysoptera</i> Varied Sittella	The varied sittella inhabits eucalypt forests and woodlands, especially those with rough-barked species and mature smooth-barked gums with dead branches, mallee and <i>Acacia</i> woodland. Feeds on arthropods gleaned from crevices in rough or decortivating bark, dead branches, standing dead trees and small branches and twigs in the tree canopy.	V		Not present	Unlikely	Unlikely to be impacted

Species name	Habitat requirements	TSC Act	EPBC Act	Presence of habitat	Likelihood of occurrence	Potential impact
<i>Artamus cyanopterus cyanopterus</i> Dusky Woodswallow	Dusky woodswallows are widespread in eastern, southern and south western Australia. The species occurs throughout most of New South Wales, but is sparsely scattered in, or largely absent from, much of the upper western region. Most breeding activity occurs on the western slopes of the Great Dividing Range. They inhabit dry, open eucalypt forests and woodlands, including mallee associations, with an open or sparse understorey of eucalypt saplings, acacias and other shrubs, and ground-cover of grasses or sedges and fallen woody debris. It has also been recorded in shrublands, heathlands and very occasionally in moist forest or rainforest. Also found in farmland, usually at the edges of forest or woodland. Dusky woodswallows eat invertebrates, mainly insects, which are captured whilst hovering or sallying above the canopy or over water. Also frequently hovers, sallies and pounces under the canopy, primarily over leaf litter and dead timber. Also occasionally take nectar, fruit and seed. Can be resident year round or migratory, depending on climatic conditions. In NSW, after breeding, birds migrate to the north of the state and to southeastern Queensland.	V		Present in landscape	Possible as stepping stone habitat	Unlikely to be impacted Proposal will not significantly impact potential habitat
<i>Melanodryas cucullata cucullata</i> Hooded Robin (south-eastern form)	Prefers lightly wooded country, usually open eucalypt woodland, acacia scrub and mallee, often in or near clearings or open areas. Requires structurally diverse habitats featuring mature eucalypts, saplings, some small shrubs and a ground layer of moderately tall native grasses. Often perches on low dead stumps and fallen timber or on low-hanging branches. Territories range from around 10 ha during the breeding season, to 30 ha in the non-breeding season.	V		Absent	Unlikely	Unlikely to be impacted Proposal will not significantly impact Potential habitat
<i>Hieraaetus morphnoides</i> Little Eagle	Occupies open eucalypt forest, woodland or open woodland. Sheoak or <i>Acacia</i> woodlands and riparian woodlands of interior NSW are also used. Nests in tall living trees within a remnant patch, where pairs build a large stick nest in winter. Lays two or three eggs during spring,	V		Small examples present, landscape habitat will	Possible, as stepping stone habitat	Unlikely to be impacted Proposal will not

Species name	Habitat requirements	TSC Act	EPBC Act	Presence of habitat	Likelihood of occurrence	Potential impact
	and young fledge in early summer. Preys on birds, reptiles and mammals, occasionally adding large insects and carrion.			support this species		significantly impact potential habitat
<i>Haliaeetus leucogaster</i> White Bellied Sea Eagle	The White-bellied Sea-Eagle is a large eagle that has long broad wings and a short, wedge-shaped tail, it is distributed around the Australian coastline, including Tasmania, and well inland along rivers and wetlands of the Murray Darling Basin. It is widespread along the east coast, and along all major inland rivers and waterways. Habitats require the presence of large areas of open water including larger rivers, swamps, lakes, and the sea. Occurs at sites near the sea such as around bays and inlets, beaches, reefs, lagoons, estuaries and mangroves; and at, or in the vicinity of freshwater swamps, lakes, reservoirs, billabongs and saltmarsh. Terrestrial habitats include coastal dunes, tidal flats, grassland, heathland, woodland, and forest (including rainforest). Breeding habitat consists of mature tall open forest, open forest, tall woodland, and swamp sclerophyll forest close to foraging habitat. Nest trees are typically large emergent eucalypts and often have emergent dead branches or large dead trees nearby which are used as 'guard roosts'. Nests are large structures built from sticks and lined with leaves or grass.	V		No specific habitat component for this species occur	Incidental occurrence is possible, unlikely to land on site	Unlikely to be impacted
<i>Falco hypoleucos</i> Grey Falcon	This falcon is sparsely distributed in NSW, chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range. The breeding range has contracted since the 1950s with most breeding now confined to arid parts of the range. Usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast. Also occurs near wetlands where surface water attracts prey. Preys primarily on birds, especially parrots and pigeons, using high-speed chases and stoops; reptiles and mammals are also taken. Like other falcons it utilises old nests of other birds of	E		No specific habitat component for this species occur	Incidental occurrence is possible	Unlikely to be impacted

Species name	Habitat requirements	TSC Act	EPBC Act	Presence of habitat	Likelihood of occurrence	Potential impact
	prey and ravens, usually high in a living eucalypt near water or a watercourse; peak laying season is in late winter and early spring; two or three eggs are laid.					
<i>Falco subniger</i> Black Falcon	Widely but sparsely distributed in New South Wales, mostly occurring in inland regions. Some reports of 'Black Falcons' on the tablelands and coast of New South Wales are likely to be referable to the Brown Falcon. In New South Wales there is assumed to be a single population that is continuous with a broader continental population, given that falcons are highly mobile, commonly travelling hundreds of kilometres. The Black Falcon occurs as solitary individuals, in pairs, or in family groups of parents and offspring.	V		Absent	Unlikely	Unlikely to be impacted
<i>Circus assimilis</i> Spotted Harrier	Occurs throughout the Australian mainland, except in densely forested or wooded habitats of the coast, escarpment and ranges, and rarely in Tasmania. Individuals disperse widely in NSW and comprise a single population. Occurs in grassy open woodland including Acacia and mallee remnants, inland riparian woodland, grassland and shrub steppe. It is found most commonly in native grassland, but also occurs in agricultural land, foraging over open habitats including edges of inland wetlands. Builds a stick nest in a tree and lays eggs in spring (or sometimes autumn), with young remaining in the nest for several months. Preys on terrestrial mammals (eg bandicoots, bettongs, and rodents), birds and reptile, occasionally insects and rarely carrion.	V		Absent	Unlikely	Unlikely to be impacted
<i>Ninox connivens</i> Barking Owl	Inhabits woodland and open forest, including fragmented remnants and partly cleared farmland. It is flexible in its habitat use, and hunting can extend in to closed forest and more open areas. Sometimes able to successfully breed along timbered watercourses in heavily cleared habitats (e.g. western NSW) due to the higher density of prey on these fertile soils. Roost in shaded portions of tree canopies, including tall midstorey trees with dense foliage such as <i>Acacia</i> and <i>Casuarina</i> species. Preferentially hunts small arboreal mammals such as Squirrel Gliders and Ringtail Possums, but when loss of tree hollows decreases these	V		Absent	Unlikely	Unlikely to be impacted

Species name	Habitat requirements	TSC Act	EPBC Act	Presence of habitat	Likelihood of occurrence	Potential impact
	prey populations the owl becomes more reliant on birds, invertebrates and terrestrial mammals such as rodents and rabbits. Requires very large permanent territories in most habitats due to sparse prey densities. Monogamous pairs hunt over as much as 6000 hectares, with 2000 hectares being more typical in NSW habitats.					
<i>Ninox strenua</i> Powerful Owl	The Powerful Owl inhabits a range of vegetation types, from woodland and open sclerophyll forest to tall open wet forest and rainforest. It requires large tracts of forest or woodland habitat but can occur in fragmented landscapes as well. It roosts by day in dense vegetation comprising species such as Turpentine <i>Syncarpia glomulifera</i> , Black She-oak <i>Allocasuarina littoralis</i> , Blackwood <i>Acacia melanoxylon</i> , Rough-barked Apple <i>Angophora floribunda</i> , Cherry Ballart <i>Exocarpus cupressiformis</i> and a number of eucalypt species. The main prey items are medium-sized arboreal marsupials, particularly the Greater Glider, Common Ringtail Possum and Sugar Glider. As most prey species require hollows and a shrub layer, these are important habitat components for the owl. In good habitats 400 ha can support a pair of Powerful Owls; where hollow trees and prey have been depleted the owls need up to 4000 ha. Powerful Owls nest in large tree hollows (at least 0.5 m deep), in large eucalypts (diameter at breast height of 80-240 cm) that are at least 150 years old.	V		Absent	Unlikely	Unlikely to be impacted
<i>Tyto novaehollandiae</i> Masked Owl	Lives in dry eucalypt forests and woodlands from sea level to 1100 m. A forest owl, but often hunts along the edges of forests, including roadsides. The typical diet consists of tree-dwelling and ground mammals, especially rats. Pairs have a large home-range of 500 to 1000 hectares. Roosts and breeds in moist eucalypt forested gullies, using large tree hollows or sometimes caves for nesting.	V		Absent	Unlikely	Unlikely to be impacted
<i>Numenius madagascariensis</i> Eastern Curlew	In Australia, the eastern curlew is most commonly associated with sheltered coasts, especially estuaries, bays, harbors, inlets and coastal lagoons, with large intertidal mudflats or sandflats, often with beds of seagrass.		CE, M	Absent	Unlikely	Unlikely to be impacted

Species name	Habitat requirements	TSC Act	EPBC Act	Presence of habitat	Likelihood of occurrence	Potential impact
<i>Petroica phoenicea</i> Flame Robin	Breeds in upland tall moist eucalypt forests and woodlands, often on ridges and slopes. Prefers clearings or areas with open understoreys. The groundlayer of the breeding habitat is dominated by native grasses and the shrub layer may be either sparse or dense. Occasionally occurs in temperate rainforest, and also in herbfields, heathlands, shrublands and sedgeland at high altitudes. In winter lives in dry forests, open woodlands and in pastures and native grasslands, with or without scattered trees.	V		Potential habitat in landscape	Possible occasional visitor	Unlikely to be impacted, no important habitat impacted
<i>Petroica boodang</i> Scarlet Robin	Found from south east Queensland to south east South Australia and in Tasmania and south west Western Australia. In NSW, it occurs from the coast to the inland slopes. After breeding, some Scarlet Robins disperse to the lower valleys and plains of the tablelands and slopes. Some birds may appear as far west as the eastern edges of the inland plains in autumn and winter. This robin lives in dry eucalypt forests and woodlands. The understorey is usually open and grassy with few scattered shrubs. This species lives in both mature and regrowth vegetation. It occasionally occurs in mallee or wet forest communities, or in wetlands and tea-tree swamps. Scarlet Robin habitat usually contains abundant logs and fallen timber: these are important components of its habitat. The Scarlet Robin breeds on ridges, hills and foothills of the western slopes, the Great Dividing Range and eastern coastal regions; this species is occasionally found up to 1000 metres in altitude. The Scarlet Robin is primarily a resident in forests and woodlands, but some adults and young birds disperse to more open habitats after breeding. In autumn and winter many Scarlet Robins live in open grassy woodlands, and grasslands or grazed paddocks with scattered trees.	V		Potential habitat in landscape	Possible occasional visitor	Unlikely to be impacted, no potential habitat impacted
<i>Stagonopleura guttata</i> Diamond Firetail	Found in grassy eucalypt woodlands, including Box-Gum Woodlands and Snow Gum <i>Eucalyptus pauciflora</i> Woodlands. Also occurs in open forest, mallee, Natural Temperate Grassland, and in secondary grassland derived from other communities. Often found in riparian areas (rivers and creeks), and sometimes in lightly wooded farmland.	V		Potential habitat in landscape	Possible occasional visitor	Unlikely to be impacted, no potential habitat impacted

Species name	Habitat requirements	TSC Act	EPBC Act	Presence of habitat	Likelihood of occurrence	Potential impact
	Feeds exclusively on the ground, on ripe and partly-ripe grass and herb seeds and green leaves, and on insects (especially in the breeding season).					
<i>Rostratula australis</i> Australian Painted Snipe	Prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber. Nests on the ground amongst tall vegetation, such as grasses, tussocks or reeds.	E	E	Absent	Unlikely	Unlikely to be impacted
Mammals						
<i>Pteropus poliocephalus</i> Grey-headed Flying-fox	Occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops. Roosting camps are generally located within 20 km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy. Can travel up to 50 km from the camp to forage; commuting distances are more often <20 km. Feed on the nectar and pollen of native trees, in particular <i>Eucalyptus</i> , <i>Melaleuca</i> and <i>Banksia</i> , and fruits of rainforest trees and vines.	V	V	Absent, suitable habitat absent.	Unlikely, may fly over site or forage on nearby tree	Unlikely to be impacted
<i>Myotis macropus</i> Southern Myotis	Generally roost in groups of 10 - 15 close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings, under bridges and in dense foliage. Forage over streams and pools catching insects and small fish by raking their feet across the water surface.	V		Potential habitat in nearby forests & bridge	Possible habitat in bridge structure	Unlikely to be impacted, no signs of microbat activity on existing bridge, to be inspected prior to demolition
<i>Chalinolobus dwyeri</i> Large-eared Pied Bat	It is generally rare with a very patchy distribution in NSW. Roosts in caves (near their entrances), crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the Fairy Martin, frequenting low to mid-elevation dry open forest and woodland close to these	V	V	Absent	Unlikely	Unlikely to be impacted

Species name	Habitat requirements	TSC Act	EPBC Act	Presence of habitat	Likelihood of occurrence	Potential impact
	features. Found in well-timbered areas containing gullies. This species probably forages for small, flying insects below the forest canopy.					
<i>Micronomus norfolkensis</i> Eastern Coastal Free-tailed Bat	Found along the east coast of Australia from south Queensland to southern NSW. Occurs in dry sclerophyll forest, woodland, swamp forests and mangrove forests east of the Great Dividing Range. It roosts mainly in tree hollows but will also roost under bark or in man-made structures. Usually solitary but also recorded roosting communally, probably insectivorous.	V		Very small component of habitat present in eucalypt trees.	Possible, rarely, recorded nearby in Bionet Atlas.	Unlikely to be impacted
<i>Falsistrellus tasmaniensis</i> Eastern False Pipistrelle	Prefers moist habitats, with trees taller than 20 m. Generally roosts in eucalypt hollows, but has also been found under loose bark on trees or in buildings. Hunts beetles, moths, weevils and other flying insects above or just below the tree canopy.	V		Absent, trees taller than 20 m absent.	Unlikely.	Unlikely to be impacted
<i>Miniopterus schreibersii oceanensis</i> Large Bentwing-bat	Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures. Form discrete populations centred on a maternity cave that is used annually in spring and summer for the birth and rearing of young. Maternity caves have very specific temperature and humidity regimes. Hunt in forested areas, catching moths and other flying insects above the tree top.	V		Potential habitat in nearby forests & bridge	Possible habitat in bridge structure	Unlikely to be impacted, no signs of microbat activity on existing bridge, to be inspected prior to demolition
<i>Miniopterus australis</i> Little Bentwing-bat	Occurs along east coast and ranges of Australia from Cape York in Queensland to Wollongong in NSW. Prefers Moist eucalypt forest, rainforest, vine thicket, wet and dry sclerophyll forest, Melaleuca swamps, dense coastal forests and banksia scrub. Generally found in well-timbered areas. Little Bentwing-bats roost in caves, tunnels, tree hollows, abandoned mines, stormwater drains, culverts, bridges and sometimes buildings during the day, and at night forage for small insects beneath the canopy of densely vegetated habitats. They often share roosting sites with the Common Bentwing-bat and, in winter, the	V		Potential habitat in nearby forests & bridge	Possible habitat in bridge structure	Unlikely to be impacted, no signs of microbat activity on existing bridge, to be inspected

Species name	Habitat requirements	TSC Act	EPBC Act	Presence of habitat	Likelihood of occurrence	Potential impact
	two species may form mixed clusters. Only five nursery sites /maternity colonies are known in Australia.					prior to demolition
<i>Scoteanax rueppellii</i> Greater Broad-nosed Bat	Utilises a variety of habitats from woodland through to moist and dry eucalypt forest and rainforest, though it is most commonly found in tall wet forest. Although this species usually roosts in tree hollows, it has also been found in buildings. Open woodland habitat and dry open forest suits the direct flight of this species as it searches for beetles and other large, slow-flying insects; this species has been known to eat other bat species.	V		Woodland habitat present in landscape	Possible	Unlikely, potential impacts will not be to habitat present.
<i>Saccolaimus flaviventris</i> Yellow-bellied Sheath-tail Bat	Occurs across northern and eastern Australia it is a rare visitor in late summer and autumn in the most southerly parts of its range, being most of Victoria, south-western NSW and adjacent South Australia. There are scattered records of this species across the New England Tablelands and North West Slopes. Forages in most habitats across its very wide range, with and without trees appears to defend an aerial territory. Seasonal movements are unknown; there is speculation about a migration to southern Australia in late summer and autumn.	V		Potential habitat present in landscape	It is possible this bat would pass through the site at times	No, this bat does not rely on habitats on the site
<i>Dasyurus maculatus</i> Spotted-tailed Quoll	Recorded across a range of habitat types, including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline. Individual animals use hollow-bearing trees, fallen logs, small caves, rock outcrops and rocky-cliff faces as den sites. A generalist predator with a preference for medium-sized (500g-5kg) mammals. Consumes a variety of prey, including gliders, possums, small wallabies, rats, birds, bandicoots, rabbits, reptiles and insects. Females occupy home ranges up to about 750 hectares and males up to 3500 hectares. Are known to traverse their home ranges along densely vegetated creeklines.	V	E	No caves, rock outcrops or densely vegetated creeklines.	Unlikely, this species requires a very large home range and while it may occur on the site from time to time this would be very rare.	No, no habitat affected
<i>Pseudomys novaehollandiae</i> New Holland Mouse	The New Holland Mouse has a fragmented distribution across Tasmania, Victoria, New South Wales and Queensland. It is known to inhabit open heathlands, woodlands and forests with a heathland understorey and vegetated sand dunes. It is a social animal, living		V	Potential poor examples of habitat	Unlikely, habitat is poor	Unlikely to be impacted

Species name	Habitat requirements	TSC Act	EPBC Act	Presence of habitat	Likelihood of occurrence	Potential impact
	predominantly in burrows shared with other individuals. Distribution is patchy in time and space, with peaks in abundance during early to mid stages of vegetation succession typically induced by fire.					
<i>Cercartetus nanus</i> Eastern Pygmy-possum	Found in a broad range of habitats from rainforest through sclerophyll (including Box-Ironbark) forest and woodland to heath, but in most areas woodlands and heath appear to be preferred, except in north-eastern NSW where they are most frequently encountered in rainforest. Feeds largely on nectar and pollen collected from banksias, eucalypts and bottlebrushes; soft fruits are eaten when flowers are unavailable. Also feeds on insects throughout the year; this feed source may be more important in habitats where flowers are less abundant such as wet forests. Shelters in tree hollows, rotten stumps, holes in the ground, abandoned bird-nests, Ringtail Possum dreys or thickets of vegetation, (e.g. grass-tree skirts).	V		Absent	Unlikely	No - Potential impacts will not be to habitat present.
<i>Petauroides volans</i> Greater Glider	The Greater Glider occurs in eucalypt forests and woodlands. Feeds exclusively on eucalypt leaves, buds, flowers and mistletoe. Shelter during the day in tree hollows and will use up to 18 hollows in their home range. Occupy a relatively small home range with an average size of 1 to 3 ha.		V	Habitat association and food source present however in poor quality.	Unlikely, habitats in landscape not likely to support this species	No - Potential impacts will not be to habitat present.
<i>Petaurus australis</i> Yellow-bellied Glider	Occur in tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils. It inhabits a wide range of forest types but prefers resource rich forests where mature trees provide nesting hollows and tree species composition provides year-round continuity of food resources. Forest type preferences vary with latitude and elevation; mixed coastal forests to dry escarpment forests in the north; moist coastal gullies and creek flats to tall montane forests in the south. Feed primarily on plant and insect exudates, including nectar, sap, honeydew and manna with pollen and insects providing protein. Den, often in family groups, in hollows of large trees. Very mobile and occupy large home ranges between 20 to 85 ha.	V		Absent	Unlikely	Unlikely to be impacted

Species name	Habitat requirements	TSC Act	EPBC Act	Presence of habitat	Likelihood of occurrence	Potential impact
<i>Petaurus norfolcensis</i> Squirrel Glider	Inhabits mature or old growth Box, Box-Ironbark woodlands and River Red Gum forest west of the Great Dividing Range and Blackbutt-Bloodwood forest with heath understorey in coastal areas. Prefers mixed species stands with a shrub or Acacia midstorey. Require abundant tree hollows for refuge and nest sites. Diet varies seasonally and consists of <i>Acacia</i> gum, eucalypt sap, nectar, honeydew and manna, with invertebrates and pollen providing protein.	V		Absent	Unlikely	Unlikely to be impacted
<i>Petrogale penicillata</i> Brush-tailed Rock-wallaby	Occupy rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures, caves and ledges, often facing north. Browse on vegetation in and adjacent to rocky areas eating grasses and forbs as well as the foliage and fruits of shrubs and trees. Highly territorial and have strong site fidelity with an average home range size of about 15 ha.	E	V	Absent, no rock escarpments in study area.	Unlikely	Unlikely to be impacted
<i>Phascolarctos cinereus</i> Koala	Inhabits a range of eucalypt forest and woodland communities, including coastal forests, the woodlands of the tablelands and western slopes, and the riparian communities of the western plains. Feed on the foliage of more than 70 eucalypt species and 30 non-eucalypt species, but in any one area will select preferred browse species. Inactive for most of the day, feeding and moving mostly at night. Spend most of their time in trees, but will descend and traverse open ground to move between trees. Home range size varies with quality of habitat, ranging from less than two ha to several hundred hectares in size.	V	V	Feed trees present however inadequate quantity to support local population.	Unlikely	Unlikely to be impacted
Amphibians						
<i>Litoria aurea</i> Green and Golden Bell Frog	There is only one known population on the NSW Southern Tablelands. Inhabits marshes, dams and stream-sides, particularly those containing bullrushes (<i>Typha</i> spp.) or spikerushes (<i>Eleocharis</i> spp.). Optimum habitat includes water-bodies that are unshaded, free of predatory fish such as Plague Minnow (<i>Gambusia holbrooki</i>), have a grassy area nearby and diurnal sheltering sites available. Some sites, particularly in the Greater Sydney region occur in highly disturbed areas.		V	Absent	Unlikely	Unlikely to be impacted

Species name	Habitat requirements	TSC Act	EPBC Act	Presence of habitat	Likelihood of occurrence	Potential impact
<i>Litoria booroolongensis</i> Booroolong Frog	Live along permanent streams with some fringing vegetation cover such as ferns, sedges or grasses. Adults occur on or near cobble banks and other rock structures within stream margins. Shelter under rocks or amongst vegetation near the ground on the stream edge.	E	E	Absent, no permanent streams.	Unlikely	Unlikely to be impacted
<i>Litoria littlejohni</i> Littlejohn's Tree Frog, Health Frog	The majority of records are from within the Sydney Basin Bioregion with only scattered records south to the Victorian border and this species has not been recorded in southern NSW within the last decade. Records are isolated and tend to be at high altitude. This species breeds in the upper reaches of permanent streams and in perched swamps. Non-breeding habitat is heath based forests and woodlands where it shelters under leaf litter and low vegetation, and hunts for invertebrate prey either in shrubs or on the ground.		V	Absent, no breeding habitat (permanent streams)	Unlikely	Unlikely to be impacted
Reptiles						
<i>Suta flagellum</i> Little Whip Snake	The Little Whip Snake is found within an area bounded by Crookwell in the north, Bombala in the south, Tumbarumba to the west and Braidwood to the east. Occurs in Natural Temperate Grasslands and grassy woodlands as well as in secondary grasslands derived from clearing of woodlands. Found on well drained hillsides, mostly associated with scattered loose rocks.	V		No suitable habitat in study area	Unlikely.	Unlikely to be impacted
<i>Aprasia parapulchella</i> Pink-tailed Legless Lizard	Inhabits sloping, open woodland areas with predominantly native grassy groundlayers, particularly those dominated by Kangaroo Grass (<i>Themeda australis</i>). Sites are typically well-drained, with rocky outcrops or scattered, partially-buried rocks. Commonly found beneath small, partially-embedded rocks and appear to spend considerable time in burrows below these rocks.	V	V	Absent	Unlikely	Unlikely to be impacted
<i>Delma impar</i> Striped Legless Lizard	Found mainly in Natural Temperate Grassland but has also been captured in grasslands that have a high exotic component. Also found in secondary grassland near Natural Temperate Grassland and occasionally in open Box-Gum Woodland. Habitat is where grassland is dominated by perennial, tussock-forming grasses such as Kangaroo Grass <i>Themeda australis</i> , spear-grasses <i>Austrostipa</i> spp. and poa tussocks <i>Poa</i> spp., and occasionally wallaby grasses <i>Rytidosperma</i> spp.		V	Absent	Unlikely	Unlikely to be impacted

Species name	Habitat requirements	TSC Act	EPBC Act	Presence of habitat	Likelihood of occurrence	Potential impact
	Sometimes found in grasslands with significant amounts of surface rocks, which are used for shelter.					
<i>Varanus rosenbergi</i> Rosenberg's Goanna	Found in heath, open forest and woodland. Associated with termites, the mounds of which this species nests in; termite mounds are a critical habitat component. Individuals require large areas of habitat. Feeds on carrion, birds, eggs, reptiles and small mammals. Shelters in hollow logs, rock crevices and in burrows, which they may dig for themselves, or they may use other species' burrows, such as rabbit warrens. Generally slow moving; on the tablelands likely only to be seen on the hottest days.	V		Absent	Unlikely	Unlikely to be impacted
Fish						
<i>Macquaria australasica</i> Macquarie Perch	While extant populations are still found across the Murray-Darling Basin and in an east coast catchment, populations are often small and geographically separated. In New South Wales, extant populations are known to occur in the upper reaches of the Lachlan, Murrumbidgee and Murray catchments in the Murray-Darling Basin, and in the Hawkesbury/Nepean catchment on the east coast. Macquarie perch spawn at sites located at the downstream end of pools, with eggs then drifting downstream to lodge amongst gravel in riffles.	E	E	Absent, no permanent waterways in study area.	No	No
Insects						
<i>Synemon plana</i> Golden Sun Moth	found in the area between Queanbeyan, Gunning, Young and Tumut. Occurs in Natural Temperate Grasslands and grassy Box-Gum Woodlands in which groundlayer is dominated by wallaby grasses <i>Austrodanthonia spp.</i> the bare ground between the tussocks is thought to be an important microhabitat feature for the Golden Sun Moth, as it is typically these areas on which the females are observed displaying to attract males. Adults are short-lived (one to four days) and do not feed - having no functional mouthparts; the larvae are thought to feed exclusively on the roots of wallaby grasses.	E	CE	Requires very specific habitat criteria, not present.	No	No

Species name	Habitat requirements	TSC Act	EPBC Act	Presence of habitat	Likelihood of occurrence	Potential impact
Flora						
<i>Bossiaea bombayensis</i> Bombay Bossiaea	Restricted to the Shoalhaven River valley between Warri and Bombay, Bombay Bossiaea grows in the steeply incised valley of the Shoalhaven River, near Braidwood on the Southern Tablelands. It is mainly found on sandy, rocky slopes and terraces above the frequent flood line in a shrubland of <i>Callitris endlicheri</i> , <i>Grevillea arenaria</i> , <i>Lomandra longifolia</i> , <i>Micrantheum hexandrum</i> , <i>Pomaderris andromedifolia</i> and <i>Leptospermum polygalifolium</i>	V	V	Absent	Not detected during field surveys – unlikely to occur	No
<i>Caladenia tessellate</i> Thick-lipped Spider-orchid	The Thick Lip Spider Orchid is known from the Sydney area, Wyong, Ulladulla and Braidwood in NSW. Populations in Kiama and Queanbeyan are presumed extinct. Generally found in grassy sclerophyll woodland on clay loam or sandy soils, though the population near Braidwood is in low woodland with stony soil. The single leaf regrows each year. Flowers appear between September and November.		V	Absent	Unlikely	No
<i>Diuris aequalis</i> Buttercup Doubletail	The Buttercup Doubletail has been recorded in Kanangra-Boyd National Park, Gurnang State Forest, towards Wombeyan Caves, the Taralga - Goulburn area, and the ranges between Braidwood, Tarago and Bungendore. Recorded in forest, low open woodland with grassy understorey and secondary grassland on the higher parts of the Southern and Central Tablelands (especially on the Great Dividing Range). Leaves die back each year and resprout just before flowering. Populations tend to contain few, scattered individuals; despite extensive surveys, only about 200 plants in total, from 20 populations are known.	E	V	Absent	Unlikely	No
<i>Eucalyptus aggregata</i> Black Gum	Black Gum is found in the NSW Central and Southern Tablelands, with small isolated populations in Victoria and the ACT. Black Gum has a moderately narrow distribution, occurring mainly in the wetter, cooler and higher parts of the tablelands, for example in the Blayney, Crookwell, Goulburn, Braidwood and Bungendore districts. Grows in the lowest parts of the landscape. Grows on alluvial soils, on cold, poorly-drained flats and hollows adjacent to creeks and small rivers.		V	Present	Does not occur, this is a distinct species that was not found on site despite	No

Species name	Habitat requirements	TSC Act	EPBC Act	Presence of habitat	Likelihood of occurrence	Potential impact
	Often grows with other cold-adapted eucalypts, such as Snow Gum (<i>Eucalyptus pauciflora</i>), Ribbon Gum (<i>E. viminalis</i>), Candlebark (<i>E. rubida</i>), Black Sallee (<i>E. stellulata</i>) and Swamp Gum (<i>E. ovata</i>). Black Gum usually occurs in an open woodland formation with a grassy groundlayer dominated either by River Tussock (<i>Poa labillardierei</i>) or Kangaroo Grass (<i>Themeda australis</i>), but with few shrubs.				targeted searches	
<i>Leucochrysum albicans</i> var. <i>tricolor</i> Hoary Sunray	In NSW and ACT, Hoary Sunray occurs in grasslands, grassy areas in woodlands and dry open forests, and modified habitats, on a variety of soil types including clays, clay loams, stony and gravelly soil. Plants can be found in natural or semi-natural vegetation and grazed or ungrazed habitat. The Hoary Sunray is a low tufted to mounding perennial straw daisy. It grows to 15 cm tall and flowers in spring and summer. After flowering it dries out to rootstock.		E	Present	Not recorded	Likely to be positively impacted – thrives in disturbed areas
<i>Rutidosis leptorrhynchoides</i> Button Wrinklewort	Local populations at Goulburn, the Canberra - Queanbeyan area and at Michelago. Other populations occur in Victoria. Occurs in Box-Gum Woodland, secondary grassland derived from Box-Gum Woodland or in Natural Temperate Grassland; and often in the ecotone between the two communities.	E	E	Absent	Unlikely	No
<i>Ammobium craspedioides</i> Yass Daisy	Found from near Crookwell on the Southern Tablelands to near Wagga Wagga on the South Western Slopes. Most populations are in the Yass region. Found in moist or dry forest communities, Box-Gum Woodland and secondary grassland derived from clearing of these communities. Grows in association with a large range of eucalypts (<i>Eucalyptus blakelyi</i> , <i>E. bridgesiana</i> , <i>E. dives</i> , <i>E. goniocalyx</i> , <i>E. macrorhyncha</i> , <i>E. mannifera</i> , <i>E. melliodora</i> , <i>E. polyanthemos</i> , <i>E. rubida</i>).	V	V	Absent	Unlikely	No
<i>Dodonea procumbens</i> Trailing Hop-bush	Creeping Hop-bush is found in the dry areas of the Monaro, between Michelago and Dalgety. Here it occurs mostly in Natural Temperate Grassland or Snow Gum Eucalyptus pauciflora Woodland. There is one population at Lake Bathurst (the northern-most occurrence of the species). Grows in Natural Temperate Grassland or fringing eucalypt woodland of Snow Gum (<i>Eucalyptus pauciflora</i>), in open bare patches where there is little competition from other species. It is found on			Absent	Unlikely	No

Species name	Habitat requirements	TSC Act	EPBC Act	Presence of habitat	Likelihood of occurrence	Potential impact
	sandy-clay soils, usually on or near vertically-tilted shale outcrops. Often occurs on roadside batters					
<i>Pomaderris delicata</i> Delicate Pomaderris	Delicate Pomaderris is known from only two sites; between Goulburn and Bungonia and south of Windellama. At both known sites the Delicate Pomaderris grows in dry open forest dominated by <i>Eucalyptus sieberi</i> with a dense she-oak understorey.	CE	CE	Absent	Unlikely	No
<i>Thesium australe</i> Austral Toadflax	Austral Toad-flax is found in very small populations scattered across eastern NSW, along the coast, and from the Northern to Southern Tablelands. Occurs in grassland on coastal headlands or grassland and grassy woodland away from the coast. Often found in association with Kangaroo Grass (<i>Themeda australis</i>).		V	Absent	Unlikely	No
<i>Dillwynia glauca</i> Michelago Parrot-pea	An erect shrub to 2.5 m tall. Its leaves are up to 7 mm long and very narrow; they are hairless, becoming bluish-green with age. Recorded from five areas on the NSW Southern Tablelands: near Windellama, where the species is locally abundant, near Mongarlowe, in Nadgigomar Nature Reserve near Braidwood, north-east of Michelago and at Numeralla. Occurs on exposed patches of clay or on rocky outcrops in eucalypt woodland often dominated by Scribbly Gum (<i>Eucalyptus rossii</i>), Snow Gum (<i>E. pauciflora</i>), Broad-leafed Peppermint (<i>E. dives</i>) and Red Stringybark (<i>E. macrorhyncha</i>).	E		Absent	Unlikely	No
<i>Swainsona sericea</i> Silky Swainson-pea	The Silky Swainson-pea is a prostrate or erect perennial, growing to 10 cm tall. It is found in Natural Temperate Grassland and Snow Gum <i>Eucalyptus pauciflora</i> Woodland on the Monaro and in Box-Gum Woodland in the Southern Tablelands and South West Slopes. Sometimes found in association with cypress-pines <i>Callitris</i> spp	V		Present	Unlikely, targeted searches failed to record this species	Unlikely
<i>Swainsona recta</i> Small Purple-pea	Small Purple-pea is a slender, erect perennial herb growing to 30 cm tall. Before European settlement Small Purple-pea occurred in the grassy understorey of woodlands and open-forests dominated by Blakely's Red Gum <i>Eucalyptus blakelyi</i> , Yellow Box <i>E. melliodora</i> , Candlebark Gum <i>E. rubida</i> and Long-leaf Box <i>E. goniocalyx</i> . Grows in association with understorey dominants that include Kangaroo Grass <i>Themeda australis</i> , poa tussocks <i>Poa</i> spp. and spear-grasses	E	E	Present	Unlikely, targeted searches failed to record this species	Unlikely

Species name	Habitat requirements	TSC Act	EPBC Act	Presence of habitat	Likelihood of occurrence	Potential impact
	<i>Austrostipa</i> spp. Plants die back in summer, surviving as a rootstocks until they shoot again in autumn. Flowers throughout spring, with a peak in October. Seeds ripen at the end of the year. Individual plants have been known to live for up to 20 years. Generally tolerant of fire, which also enhances germination by breaking the seed coat and reduces competition from other species.					
Ecological Communities						
<i>Natural Temperate Grassland of the Southern Tablelands of NSW and the Australian Capital Territory</i>	The ecological community is characterised by a dominance of native perennial tussock grasses. There is usually a second, lower stratum of shorter perennial and annual grasses and forbs growing between the taller tussocks, and there may be a third discontinuous stratum of even smaller forbs, grasses and cryptogams. Sedges and rushes may also occur, particularly in seasonally wet areas. A tree and shrub stratum may be present, but with only up to 10% projective foliage cover of each being present. Variation in the composition and structure of the ecological community occurs as a result of intrinsic site factors (e.g. drainage patterns, soil characteristics) and agricultural practices applied since post-1788 settlement. The major dominant or co-dominant grass species are: <i>Themeda triandra</i> (kangaroo grass), <i>Poa sieberiana</i> (snowgrass), <i>Poa labillardierei</i> (river tussock grass), <i>Austrostipa bigeniculata</i> (kneel speargrass), <i>Austrostipa scabra</i> (slender speargrass), <i>Bothriochloa macra</i> (red grass), various <i>Rytidosperma</i> species syn. <i>Austrodanthonia</i> species (wallaby grasses), <i>Lachnagrostis filiformis</i> (blowngrass) and <i>Sorghum leiocladum</i> (wild sorghum).		CE	Present	Occurs in landscape, not in impact area	No impact
<i>White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (Commonwealth)</i>	Box – Gum Grassy Woodlands and Derived Grasslands are characterised by a species-rich understorey of native tussock grasses, herbs and scattered shrubs, and the dominance, or prior dominance, of White Box, Yellow Box or Blakely's Red Gum trees. The tree-cover is generally discontinuous and consists of widely-spaced trees of medium height in which the canopies are clearly separated.	CEEC	CE	Absent	Absent	No impact

Species name	Habitat requirements	TSC Act	EPBC Act	Presence of habitat	Likelihood of occurrence	Potential impact
<i>Hirundapus caudacutus</i> White-throated Needle-tail	In Australia, the White-throated Needle-tail is almost exclusively aerial, from heights of less than 1 m up to more than 1000 m above the ground. Although they occur over most types of habitat, they are probably recorded most often above wooded areas, including open forest and rainforest, and may also fly between trees or in clearings, below the canopy, but they are less commonly recorded flying above woodland. When flying above farmland, they are more often recorded above partly cleared pasture, plantations or remnant vegetation at the edge of paddocks.		M	Absent.	Unlikely, aerial species, rarely lands in Australia.	No.
<i>Monarcha melanopsis</i> Black-faced Monarch	In NSW and the ACT, the species occurs around the eastern slopes and tablelands of the Great Dividing Range. The Black-faced Monarch mainly occurs in rainforest ecosystems, including semi-deciduous vine-thickets, complex notophyll vine-forest, tropical (mesophyll) rainforest, subtropical (notophyll) rainforest, mesophyll (broadleaf) thicket/shrubland, warm temperate rainforest, dry (monsoon) rainforest and (occasionally) cool temperate rainforest.		M	Absent, suitable ecosystems absent.	Unlikely.	No.
<i>Motacilla flava</i> Yellow Wagtail	This insectivorous bird inhabits open country near water, such as wet grassland. Has been recorded in short grass, bare ground, swamp margins, sewage ponds, saltmarshes, ploughed land, town lawns. It picks small invertebrates from the ground or water surface, but may also make short flights to take prey from the air or follow grazing livestock to take insects stirred up as they feed.		M	Absent, large water bodies absent.	Unlikely.	No.
<i>Myiagra cyanoleuca</i> Satin Flycatcher	Satin Flycatchers are mainly recorded in eucalypt forests, especially wet tall sclerophyll forest, often dominated by eucalypts such as Brown Barrel, <i>Eucalypt fastigata</i> , Mountain Gum, <i>E. dalrympleana</i> , Mountain Grey Gum, Narrow-leaved Peppermint, Ribbon Gum, or occasionally Mountain Ash, <i>E. regnans</i> . Such forests usually have a tall shrubby understorey of tall acacia. In higher altitude Black Sallee, <i>E. stellulata</i> , woodlands, they are often associated with tea-trees and tree-ferns. They sometimes also occur in dry sclerophyll forests and woodlands, usually dominated by eucalypts such as Blakely's Red Gum, <i>E. blakelyi</i> , Mugga Ironbark, <i>E. sideroxylon</i> , Yellow Box, White Box, <i>E. albens</i> ,		M	Present, dry sclerophyll forests and woodlands containing preferred species occur.	Possible.	No - Potential impacts will not be to habitat present.

Species name	Habitat requirements	TSC Act	EPBC Act	Presence of habitat	Likelihood of occurrence	Potential impact
	Manna Gum or stringybarks, including Red Stringybark, <i>E.macrorhyncha</i> and Broad-leaved Stringybark, usually with open grassy understorey					
<i>Rhipidura rufifrons</i> Rufous Fantail	The Rufous Fantail mainly inhabits wet sclerophyll forests, often in gullies dominated by eucalypts such as Tallow-wood (<i>Eucalyptus microcorys</i>), Mountain Grey Gum (<i>E. cypellocarpa</i>), Narrow-leaved Peppermint (<i>E. radiata</i>), Mountain Ash (<i>E. regnans</i>), Alpine Ash (<i>E. delegatensis</i>), Blackbutt (<i>E. pilularis</i>) or Red Mahogany (<i>E. resinifera</i>); usually with a dense shrubby understorey often including ferns. They also occur in subtropical and temperate rainforests; where they are recorded in temperate Lilly Pilly (<i>Acmena smithi</i>) rainforest, with Grey Myrtle (<i>Backhousia myrtifolia</i>), Sassafras (<i>Doryphora sassafras</i>) and Sweet Pittosporum (<i>Pittosporum undulatum</i>) subdominants. They occasionally occur in secondary regrowth, following logging or disturbance in forests or rainforests. Sometimes recorded in drier sclerophyll forests and woodlands, including Spotted Gum (<i>Eucalyptus maculata</i>), Yellow Box (<i>E. melliodora</i>), ironbarks or stringybarks, often with a shrubby or heath understorey.		M	Absent.	Unlikely.	No.
<i>Actitis hypoleucos</i> Common Sandpiper	The species utilises a wide range of coastal wetlands and some inland wetlands, with varying levels of salinity, and is mostly found around muddy margins or rocky shores and rarely on mudflats. Generally the species forages in shallow water and on bare soft mud at the edges of wetlands; often where obstacles project from substrate, e.g. rocks or mangrove roots. Birds sometimes venture into grassy areas adjoining wetlands.		M	Absent.	Unlikely.	No.
<i>Calidris acuminata</i> Sharp-tailed Sandpiper	The Sharp-tailed Sandpiper 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, salt pans and hypersaline salt lakes inland.		M	Absent.	Unlikely.	No.

Species name	Habitat requirements	TSC Act	EPBC Act	Presence of habitat	Likelihood of occurrence	Potential impact
	They use flooded paddocks, sedgelands and other ephemeral wetlands, but leave when they dry.					
<i>Calidris melanotos</i> Pectoral Sandpiper	In Australasia, the Pectoral Sandpiper prefers shallow fresh to saline wetlands. The species is found at coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands. The species is usually found in coastal or near coastal habitat but occasionally found further inland. It prefers wetlands that have open fringing mudflats and low, emergent or fringing vegetation, such as grass or samphire.		M	Absent.	Unlikely.	No.
<i>Gallinago hardwickii</i> Latham's Snipe	Latham's Snipe occurs in a wide variety of permanent and ephemeral wetlands. They usually occur in open, freshwater wetlands that have some form of shelter (usually low and dense vegetation) nearby. They generally occupy flooded meadows, seasonal or semi-permanent swamps, or open waters, but various other freshwater habitats can be used including bogs, waterholes, billabongs, lagoons, lakes, creek or river margins, river pools and floodplains. They may be found in a variety of vegetation types or communities including tussock grasslands with rushes, reeds and sedges, coastal and alpine heathlands, lignum or tea-tree scrub, button-grass plains, alpine herbfields and open forest.		M	Absent.	Unlikely.	No.
<i>Pandion haliaetus</i> Osprey	Eastern Ospreys occur in coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands. They are mostly found in coastal areas but occasionally travel inland along major rivers, particularly in northern Australia. They require extensive areas of open fresh, brackish or saline water for foraging. They frequent a variety of wetland habitats. They may occur over atypical habitats such as heath, woodland or forest when travelling to and from foraging sites.		M	Absent.	Unlikely.	No.