# REVIEW OF ENVIRONMENTAL FACTORS, YARRAWA ROAD UPGRADE

YARRAWA ROAD, YARRAWA NSW

AUGUST 2021



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### FOREWORD AND CERTIFICATION

#### Foreword

The purpose of this Review of Environmental Factors (REF) is to assess all potential environmental impacts of upgrading a 2 km section of Yarrawa Road, just east of the intersection with Bylong Valley Way, in Yarrawa NSW (the proposed activity).

This REF has been prepared in accordance with section 5.5 of the Environmental Planning and Assessment Act 1979 (EP&A Act), clause 228 of the Environmental Planning and Assessment Regulation 2000 (EP&A Regulation) and the relevant provisions of State Environmental Planning Policy (Infrastructure) 2007 (ISEPP).

This REF concludes that the proposed activity will not result in any significant environmental impacts and therefore an Environmental Impact Statement (EIS) is not required.

#### Certification

I certify that to the best of my knowledge, this REF addresses to the fullest extent possible, all matters affecting or likely to affect the environment as a result of the proposed activity, is neither false or misleading and provides a true and fair assessment of the proposal.

REF prepared by	David Stubbs
Signed	Alla
Date	August 2021
Designation	Environmental Consultant
Organisation	WolfPeak
Qualification	BSc Applied Science and Management
REF Reviewed by	Steve Fermio
Designation	Managing Director - WolfPeak
Signed	Shi
Date	August 2021



#### **Determination**

I, as an authorised person on behalf of Muswellbrook Shire Council, have examined and considered this REF for the Yarrawa Road Upgrade project in accordance with section 5.5 of the EP&A Act. I am satisfied that the proposed activity is not likely to significantly affect the environment and therefore determine that an Environmental Impact Statement is not required.

On behalf of Muswellbrook Shire Council, I accept this REF and determine that the proposal may now proceed subject to the implementation of the mitigation measures detailed in Section 6 and Appendix A and the conditions of any required approvals, permits or licences.

REF APPROVED BY	
SIGNED	
DATE	
DESIGNATION	
ORGANISATION	





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# 1. **PROJECT OVERVIEW**

Project Title	Yarrawa Road Upgrade	
Proposed Activity	Yarrawa Road measures 17.25 km in length and is a two lane two-way rural local road within the Road Network of Muswellbrook Shire. A section of Yarrawa Road is currently unsealed. The road connects the Bylong Valley Way to the town of Denman at Virginia Street. The link that this road provides between the western area of the Shire to Denman, has increased in importance mostly due to the use of GPS navigational systems in vehicles which directs vehicles onto this road. This has resulted in increased traffic volumes using Yarrawa Road. It has become necessary to upgrade Yarrawa Road to cater for the increased traffic and improve safety. It is proposed that a 2 km unsealed section of Yarrawa Road, between ch 14.00 km and ch 16 km, is to be upgraded. This includes installation of new road pavement and supporting drainage structures. A minimum typical cross section of the road should provide two 3.5 m wide traffic lanes plus 1.0 m wide sealed shoulders, subject to property impact and geometric design, will be based on a road pavement.	
	Reference source not found, of this REF.	
Location	The works would start at ch 16 km, approximately 1.2 km east of Bylong Valley Way, and finish at ch 14 km, just west of the driveways for properties at 1410 and 1411 Yarrawa Road.	
	Refer to <b>Section</b> Error! Reference source not found., below, for further detail on the site location and context.	
Site Inspection	Date: 23 July 2021	
	Attendees: Will Steggall WolfPeak Senior Ecologist; Iris Bleach, WolfPeak Ecologist	
Information Relied Upon	<ul> <li>The following reports, plans, and technical information have informed the preparation of this REF and assessment of environmental impacts:</li> <li>Appendix B – Site location map</li> <li>Appendix C – Preliminary Design Drawings prepared by Local Government Engineering Services for Muswellbrook Shire Council</li> <li>Appendix D – AHIMS Report prepared by AHIMS Web Services – NSW Environment &amp; Heritage</li> <li>Appendix E – Ecological impact assessment report prepared by WolfPeak Pty Ltd</li> </ul>	



# 2. SITE CONTEXT

The site of the proposed activity is located on a section of Yarrawa Road, Yarrawa, passing through Kings Gap, approximately 15 km west of Denman, NSW. The road is a two lane two-way rural local road that connects the Bylong Valley Way to the town of Denman at Virginia Street.

The site is located in Wanaruah Country within the Muswellbrook local government area (LGA), on land zoned as E3 Environmental Management and RU1 Primary Production under the Muswellbrook LEP 2009. Land adjoining the site comprises agricultural grazing land and Council managed Crown land, with Wollemi National Park 2 km to the southwest.

The surrounding area is characterised by a steeply undulating landscape, rising in elevation from 180 m at the northern and eastern ends to 250 m at Kings Gap in the mid-section. Several drainage lines pass through the site. The nearest waterway is the Goulburn River, located about 2 km northwest of the proposed work area. Surrounding vegetation consists of a mix of exotic pasture grassland, riparian forest and dry sclerophyll open forest.

Figure 1 is an aerial image of the site, showing the indicative extent of the proposed works area. Figure 2 and Figure 3 are photographs of the existing roadway, captured during a site inspection conducted on 23 July 2021. A map showing the location and extent of the proposed worksite is included in Appendix B.



Figure 1- Aerial photograph indicating site location (source: NSW ePlanning Spatial Viewer)





Figure 2- Northern section of Yarrawa Road



Figure 3- Eastern section of Yarrawa Road



# 3. PROJECT DESCRIPTION AND JUSTIFICATION

#### 3.1 **Project Needs and Objectives**

**Project Need:** Upgrade of Yarrawa Road is required because there has been an increase in traffic volumes on this road, which links Bylong Valley Way to the two of Denman at Virginia Street. This has been largely attributable to the increased use of GPS navigational systems in vehicles which directs vehicles onto this road. Given that sections of Yarrawa Road are currently unsealed, it has become necessary to upgrade Yarrawa Road to cater for the increased traffic and improve safety.

**Project Objective:** The key objective of the proposed activity is to upgrade Yarrawa Road, including sealing a currently unsealed section, to improve safety for the increased number of drivers utilising this road.

#### **3.2 Project Alternatives and Preferred Option**

As identified in **Table 1**, a number of options were considered for the project. The preferred option is to upgrade Yarrawa Road due to the need to ensure road user safety along this increasingly utilised link road.

Option	Assessment	Preferred Option
'Do Nothing'	Do not perform the road upgrades and other safety improvements. This would save money in the short term, but road conditions would continue to deteriorate increasing the likelihood of road trauma and associated health and human costs over the long term.	No
Undertake road upgrade	Undertake road surfacing and associated drainage upgrade works, signage installation, and line marking to improve safety and reduce the likelihood of road trauma and associated health and human costs.	Yes

#### Table 1- Options Assessment

#### 3.3 **Proposed Activity Scope**

The proposed activity scope of works is outlined below and shown in the Preliminary Design Drawings in **Appendix C.** 



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### 3.4 Construction Activities

#### **Construction Methodology:**

The road upgrade would comprise the following indicative scope of works:

- Locate existing utilities
- Install works signs and WHS signs
- Install traffic control to manage traffic, minor delays
- Locate temporary site compound and stockpile area in a cleared area on the road reserve
- Install temporary erosion and sediment control measures prior to works commencing and maintain throughout project
- Site and vegetation clearing including removal of trees through the road reserve
- Chip trees on site and retain woodchips for site stabilisation, and transport remainder to depot stockpile location for offset planting site
- Stabilise the existing pavement, shoulder reconstruction, pavement overlay prior to primer seal and two coat bitumen seal
- Stockpile waste materials on the road reserve for reuse on site or transport to approved landfill site
- Extend existing culverts which have been identified, which are not located within a waterway
- Reinstate private driveways to match the new pavement
- Provide batters on either side and stabilise to prevent erosion
- Recycle and/or transport waste material to an approved landfill facility
- Apply bitumen seal
- Install permanent erosion and sediment control measures, stabilising site following completion of ground works, and
- Complete line marking and reinstate signs.

#### **Ancillary Facilities:**

A temporary site compound/laydown area will be established within currently cleared areas either in the road reserve or adjoining private land, for example on the eastern side of Yarrawa Road at ch 11.20 km as shown in sheet 7 of the Preliminary Design Drawings in Appendix C. The compound/laydown would be demobilised following completion of works and the area reinstated to its pre-existing condition.

#### **Construction Schedule:**

Construction of the proposed activity is expected to commence in late 2021 and take approximately 2 months to complete. The proposed activity start date may alter, although the duration of the construction activities would remain the same.





Note: This REF is valid for a period of 12 months. If the proposed activity is delayed by more than 12 months (i.e. not commenced before late 2022), a new or revised assessment should be conducted.

#### 3.5 **Operation and Maintenance**

Once completed the works would be integrated into and maintained in accordance with Council's existing road maintenance schedule for Yarrawa Road. This would mainly involve periodic inspection and maintenance to repair potholes that have formed in the road surface due to wear and tear or wet weather and desilting of drainage channels and culverts as needed.

### 4. PLANNING AND LEGISLATIVE CONTEXT

As part of the REF process, it is necessary to determine whether the proposed activity is permissible under current planning legislation and in accordance with other relevant legislative requirements.

#### 4.1 Environmental Planning and Assessment Act 1979

*The Environmental Planning and Assessment Act 1979* (EP&A Act) and Environmental Planning and Assessment Regulation 2000 (EP&A Regulation) regulate development carried out in NSW. Under the EP&A Act, this is managed through two primary planning approval pathways:

- Part 4: Development applications; or
- **Part 5:** Activity approvals.

As identified in **Section 4.2**, the proposed activity is permissible without consent and therefore Part 4 of the EP&A Act does not apply. Therefore, the proposed activity is subject to the assessment requirements defined under Part 5 of the EP&A Act and Muswellbrook Shire Council is required to consider the potential environmental impacts of the proposed activity to the fullest extent possible (clause 5.5 of the EP&A Act). In addition, clause 228 of the EP&A Regulation identifies factors which must be taken into account when considering the likely impacts of an activity on the environment. These factors have been considered in **Section 6** of this report.

Under the EP&A Act, Muswellbrook Shire Council meets the definition of a 'public authority' as it is a local authority constituted under the *Local Government Act 1993*. In accordance with clause 5.2 of the EP&A Act, Muswellbrook Shire Council is the proponent and determining authority for the proposed activity.

# 4.2 State Environmental Planning Policy (Infrastructure) 2007

State Environmental Planning Policy (*Infrastructure*) 2007 (ISEPP) aims to streamline the delivery of necessary services and infrastructure to communities through establishing alternate approval pathways for the undertaking of work by public authorities.





Several clauses under the ISEPP allow public authorities to undertake development without consent on any land or in prescribed circumstances.

As identified in Table 2, the proposed activity is permitted without consent in accordance with the relevant provisions of the ISEPP.

Table 2- ISEPP Assessment

ISEPP Division and Clause	Works permitted without consent	Activity proposed (ü)	Relevance to proposed activity
<u>Division 17 Roads and traffic</u> <u><i>cl.</i> 94 (1A)</u> Development for any of the following purposes may be carried out by or on behalf of a public authority without consent in a prescribed zone:			
cl 94 (1A)(a)	Bus depots	N/A	N/A
cl 94 (1A)(b)	Permanent road maintenance depots and associated infrastructure (such as garages, sheds, tool houses, storage yards, training facilities and workers amenities)	N/A	N/A
<u>cl 94 (1)</u> Development for the purpose of road infrastructure facilities may be carried out by or behalf of a public authority without consent on any land. <u>cl 94 (2)</u> Development for the purposes of road infrastructure facilities includes reference to development for any of the following purposes if the development is in connection with a road or road infrastructure facilities:			
cl 94 (2)(a)(i)- (v)	Construction works (whether or not in a heritage conservation area) including: (i)Temporary buildings or facilities for the management of construction, if they are in or adjacent to a road corridor (ii) Creation of embankments (iii) Extraction of extractive materials and stockpiling of those materials if they are	N/A	N/A

or used solely for road

ISEPP Division and Clause	Works permitted without consent	Activity proposed (ü)	Relevance to proposed activity
	construction and the extraction and stockpiling take place in or adjacent to a road corridor		
	(iv)Temporary crushing or concrete batching plants, if they are used solely for road construction and are on or adjacent to a road corridor		
	(v)Temporary roads that are used solely during road construction		
cl 94 (2)(b)	Emergency works	N/A	N/A
cl 94 (2)(c)	Alterations or additions to an existing road (such as widening, narrowing, duplication or reconstruction of lanes, changing the alignment or strengthening the road)	*	Yes, the proposed works are permitted under this clause of the ISEPP without consent.
cl 94 (2)(d)	Environmental management works, if the works are in or adjacent to a road corridor	N/A	N/A

#### 4.3 Other Relevant Legislative Requirements and Permits/Approvals

Other environmental planning instruments and legislation that are relevant to the assessment of the proposed activity are considered in **Table 3**.

Table 3- Relevant NSW Legislation

Legislation considered	Potential approval and/or assessment requirements	Applicable to the proposed activity
Protection of the Environment Operations Act 1997	Is the proposed activity a scheduled activity or scheduled	No



Legislation considered	Potential approval and/or assessment requirements	Applicable to the proposed activity
	development work identified in Schedule 1?	
State Environmental Planning Policy (Coastal Management) 2018	Is the proposed activity within a coastal wetlands or littoral rainforests area identified under the Coastal SEPP?	No
	Is the proposed activity within a coastal vulnerability (cl 12), coastal environment (cl 13) or coastal use (cl 14) area?	No
Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)	Is the proposed activity likely to have a significant impact on any matters of National environmental significance? These include:	No; refer to <b>Section</b> Error! Reference source not found. and the Ecological Assessment in <b>Appendix E</b> for further detail.
	RAMSAR wetlands.	
	<ul> <li>Commonwealth listed threatened species and ecological communities.</li> </ul>	
	<ul> <li>Commonwealth migratory species protected under international agreements.</li> </ul>	
	<ul> <li>World heritage properties.</li> </ul>	
	<ul> <li>National heritage places.</li> </ul>	
	<ul> <li>Commonwealth land or marine areas.</li> </ul>	
	Nuclear actions.	

Legislation considered	Potential approval and/or assessment requirements	Applicable to the proposed activity
<i>Biodiversity Conservation Act 2016 (BC Act)</i>	Will the proposed activity affect any threatened species, populations or ecological communities (or their habitat) listed under the BC Act?	One threatened fauna species was identified on site (Little Lorikeet), and 16 threatened fauna species were identified as having potential to use the site as a small part of a larger range. Assessment of these species concluded they were unlikely to be significantly impacted by the proposal – refer to <b>Section</b> Error! Reference source not found. and the Ecological Assessment in <b>Appendix E</b> for further detail.
Rural Fires Act 1997	Will the proposed activity affect bushfire prone land, conflict with or hinder the operation of a Bush Fire Management Plan or involve use of flames during a Total Fire Ban?	The site of the proposed activity is located on land mapped as bush fire prone, specifically comprising Category 1 and Category 2 vegetation. However, the works proposed will improve the roadway in this area, making it safer and more accessible.
Crown Land Management Act 2016	Is the proposed activity on Crown Land?	A section of the roadway being upgraded is directly adjacent to council managed Crown land/Crown reserve. The NSW ePlanning Portal shows that there is an existing Crown licence for this area of land. Muswellbrook Council should consult with the Native Tittle Manager Advice as to Native Title status of this land.



Legislation considered	Potential approval and/or assessment requirements	Applicable to the proposed activity
Contaminated Land Management Act 1997	Is the proposed activity likely to be undertaken on land or water that is degraded or contaminated?	No
Water Management Act 2000	Does the proposed activity relate to carrying out a controlled activity in, on, or under waterfront land (within 40 m from the edge of a bank or watercourse)? Controlled activities include: Constructing a building or carrying out works Removing material or vegetation by excavation or any other means Depositing material on land Any other activity that affects the quantity or flow of water in a water source.	No
	Does the proposed activity involve intercepting groundwater for dewatering expected to be greater than 3 megalitres per year?	No
<i>Marine Services Act</i> 1935	Does the proposed activity involve works comprising a fixed or floating structure in or over navigable waters?	No



Legislation considered	Potential approval and/or assessment requirements	Applicable to the proposed activity
Roads Act 1993	<ul> <li>Does the proposed activity involve any of the following?</li> <li>Erect a structure or carry out work in, on, or over a classified road.</li> <li>Dig up or disturb the surface of a classified road.</li> <li>Remove or interfere with a structure, work or tree on a classified road.</li> <li>Pump water into a classified road from any land adjoining the road.</li> <li>Connect a road (whether public or private) to a classified road.</li> </ul>	No
Heritage Act 1977	Does the proposed activity include works to a place, building, work, relic, moveable object, precinct or land listed on the State Heritage Register? Does the proposed activity involve excavation or disturbance of land containing, or likely to contain a relic?	No
National Parks and Wildlife Act 1974	Will the proposed activity harm or desecrate an Aboriginal heritage object?	No
	Is the proposed activity located in land reserved under the	No; the proposed activity is located approximately 1.5 km north of the Wollemi National

Legislation considered	Potential approval and/or assessment requirements	Applicable to the proposed activity
	NP&W Act (e.g. National Park or State Conservation Area)?	Park and is not anticipated to impact land within this National Park.
Environmentally Hazardous Chemicals Act 1985	Does the proposed activity involve handling or disposal of chemicals subject to a Chemical Control Order (CCO)?	No
Fisheries Management Act 1995	<ul> <li>Does the proposed activity involve the following works?</li> <li>Dredging or reclamation work on key fish habitat waterways as per section 201.</li> <li>Any works that would block or obstruct fish passage on key fish habitat waterways as per section 219</li> </ul>	No
Other	Are there any other known approvals, licenses or permits required for the proposed activity?	No

### 5. CONSULTATION

The below outlines key stakeholder consultation activities that have and should occur prior to commencement of the proposed activity.

### 5.1 Community Consultation

During site establishment, consultation with nearby residences along the alignment would be undertaken to advise them of the nature, start date, and duration of the works. This would be undertaken by Council via letterbox drop and works notices on the Council website.



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### 5.2 NSW Rural Fire Service

As noted above, the site of the proposed activity is located on land mapped as bush fire prone, specifically comprising Category 1 and Category 2 vegetation. As such, the Hunter Valley Rural Fire Service (RFS) has been notified of the proposed activity via phone and email on 9 August 2021. No concerns were raised by RFS and overall the response was positive given the proposed activity will result in an overall improvement to access and safety for drivers along Yarrawa Road.

A request was made by RFS for Council to notify the Hunter Valley RFS team prior to commencement of construction works onsite, particularly in terms of any traffic and access arrangements and restrictions that will occur during the work. RFS also request that the contact details for key personnel onsite be provided. RFS has requested a notification be sent to the following email address: <u>huntervalley.team@rfs.nsw.gov.au</u>

#### 5.3 Crown Land

Given that a proportion of the works would occur directly adjacent to an area of Crown land/Crown reserve, Muswellbrook Shire Council should also consult with the Native Tittle Manager for advice as to Native Title status of this area of Crown land.

### 6. ENVIRONMENTAL IMPACT ASSESSMENT

#### 6.1 Environmental Assessment and Mitigation Measures

Table 4- Environmental Assessment and Mitigation Measures

CONSIDERATION	ASSESSMENT
Land Use	Existing Environment
	The site of the proposed activity is located within the existing roadway of Yarrawa Road, Yarrawa. It is on land zoned as E3 Environmental Management and RU1 Primary Production under the Muswellbrook LEP 2009. A section of the roadway being upgraded is directly adjacent to council managed Crown land/Crown reserve. The NSW ePlanning portal also shows that there is an existing Crown licence for this area of land.
	The site is located on land mapped as bush fire prone, specifically comprising Category 1 and Category 2 vegetation, and is situated about 1.5 km north of the Wollemi National Park. The nearest waterway is the Goulburn River, located about 2 km northwest of the proposed work area. There are some ephemeral drainage lines located in the agricultural land adjacent to the site.

CONSIDERATION	ASSESSMENT
	Six rural/residential properties are located within 1 km of the eastern extent of the works, all of which are set back from the road. Access to these properties is via driveways off Yarrawa Road.
	There are no other known sensitive receivers located in proximity to the site.
	Impact Assessment
	The works involve refurbishment of existing road infrastructure and do not change the existing land use or require any additional easement or restrictions to that which are already in existence.
	For works planned to take place adjacent to the identified areas of Crown land, Muswellbrook Shire Council is to consult with the Native Tittle Manager Advice as to Native Title status of this land.
	As the works are located on bushfire prone land, the local Hunter Valley RFS team should be notified prior to the commencement of construction, specifically regarding traffic and access impacts. It is noted that, ultimately, the proposed works will result in improved access and increased safety for drivers travelling along Yarrawa Road, which includes better access for RFS in the event of a bushfire.
	Impact Rating:
	Based on the above assessment, land use impacts associated with the proposal are considered to have an impact rating of 1 – Low impact.
	Mitigation Measures
	The following mitigation measures would be implemented to minimise land use impacts:
	<ul> <li>Muswellbrook Shire Council are to ensure that the Hunter Valley RFS office is notified prior to commencement of construction works, particularly in terms of any traffic and access arrangements and restrictions that will occur during the work, and the provision of contact details for key personnel onsite.</li> </ul>
	<ul> <li>Muswellbrook Shire Council should consult with the Native Tittle Manager Advice as to Native Title status of the area of Crown land located directly adjacent to the northern extent of the works site.</li> </ul>

CONSIDERATION	ASSESSMENT
Geology and Soils	Existing Environment
	The site is located within a steeply undulating landscape, rising in elevation from 180 m at the northern and eastern ends to 250 m at Kings Gap in the mid-section. Several drainage lines pass through the site.
	The underlying soils within the road corridor will be a modified soil landscape associated with the existing road. Soil landscapes in the vicinity of the site comprise the Benjang Erosional, Benjang Variant A Erosional, Benjang Variant B Colluvial and Sandy Hollow Transferral along the road, comprising deep Red and Brown Solodic soils, deep Red-brown Earths, shallow-moderately deep Non-calcic Brown soils and Red-brown Earths, and moderately deep to deep Earthy Sands and Siliceous Sands respectively. Lees Pinch Colluvial occurs on the hilltops either side of Kings Gap, comprising very shallow to shallow Siliceous Sands and Lithosols. The site is predominately underlain by Tertiary to Pleistocene high-level terrace and some Holocene floodplain.
	There are no known contaminated sites or areas of naturally occurring asbestos in proximity to the proposed works. The site is not mapped as having potential for acid sulphate soils (ASS).
	Impact Assessment
	Minor excavation works are required to remove existing road base, level areas of road widening and replace with road base material and asphalt. This may lead to some minor erosion impacts if not appropriately controlled. Sediment and control measures will be established and maintained throughout the construction phase.
	Due to the excavation required, there is a potential risk of encountering unidentified contaminated soils. However, given the minimal amount of excavation required (which is limited to previously disturbed areas) and the absence of known contaminated sites in proximity to the works, it is considered that the proposed activity would not disturb contaminated sites. The risk of encountering contaminated soil during construction can be managed with the implementation of an unexpected finds procedure.
	Impact Rating:
	Based on the above assessment, geology and soil impacts associated with the proposal are considered to have an impact rating of 1 – Low impact.

CONSIDERATION	ASSESSMENT
	Mitigation Measures
	The following mitigation measures would be implemented to minimise geology and soil impacts:
	<ul> <li>Prepare and implement an Erosion and Sediment Control Plan in accordance with the Landcom Guideline Managing Urban Stormwater: Soils and Construction (the 'Blue Book').</li> </ul>
	<ul> <li>Erosion and sediment control measures are not to be removed until the works are complete, and disturbed areas are stabilised.</li> </ul>
	<ul> <li>Site watering shall be undertaken to suppress dust, as required.</li> </ul>
	<ul> <li>An unexpected finds procedure must be prepared prior to the commencement of ground disturbance works and is to be implemented if contaminated material is encountered onsite.</li> </ul>
Hydrology and	Existing Environment
Water Quality	While there are some ephemeral drainage lines in the agricultural land adjacent to the site, the nearest waterway is the Goulburn River, located about 2 km northwest of the proposed work area.
	The site is not mapped as flood prone land.
	Impact Assessment
	Minor excavations works are required which could lead to erosion and mobilised sediments entering stormwater or adjacent lands. In addition, there is potential for spills to occur onsite from the plant and equipment to be used during the proposed activity. However, given the distance of the proposed works from the nearest waterway (Goulburn River), it is not anticipated that the works would have an impact on waterways. The potential for impacts to waterways can be effectively managed with standard mitigation measures.
	Impact Rating
	Based on the above assessment, impacts on hydrology and water quality associated with the proposal are considered to have an impact rating of 1 – Low impact.
	Mitigation Measures

CONSIDERATION	ASSESSMENT
	The following mitigation measures would be implemented to minimise hydrology and water quality impacts:
	<ul> <li>Prepare and implement an Erosion and Sediment Control Plan in accordance with the Landcom Guideline Managing Urban Stormwater: Soils and Construction (the 'Blue Book').</li> </ul>
	<ul> <li>Erosion and sediment control measures are not to be removed until the works are complete, and disturbed areas are stabilised.</li> </ul>
	<ul> <li>Site watering shall be minimised and only undertaken to suppress dust if required.</li> </ul>
	<ul> <li>Any material stockpiled onsite is to be covered (e.g. with geofabric) to prevent erosion and sedimentation impacts.</li> </ul>
	<ul> <li>A spill kit must be available onsite during construction and any spills and leaks are to be contained within the worksite.</li> </ul>
Ecology	Existing Environment
	A site survey was conducted by WolfPeak on 23 July 2021 and an Ecological Assessment has been prepared for the proposed activity, included in <b>Appendix E</b> . A summary of the existing environment of the site is provided below.
	The subject site consists of strips of land contained within and immediately adjacent to the road reserve on Yarrawa Road. The area is predominately vegetated with dense patches of roadside vegetation and cleared grasslands. Exotic grass and roadside weeds also occur throughout.
	None of the vegetation communities on the site qualify as a Threatened Ecological Community under the BC Act or the EPBC Act. No threatened flora and one threatened fauna species (Little Lorikeet) was found during surveys. A total of 16 threatened fauna species were found to have at least a low potential to occur within the study area and have been assessed in the Test of Significance.
	Weeds species recorded on the site which are priority weeds for the North Coast Region and have obligations under the Biosecurity Act and/or are Weeds of National Environmental Significance (WoNS) are - Fireweed ( <i>Senecio madagascariensis</i> ) and <i>Asparagus</i> <i>asparagoides</i> . A number of common environmental weeds such as Gomphrena Weed, Red Natal Grass, Paddy's Lucerne, White Clover and Stinking Roger were recorded within the site.

CONSIDERATION	ASSESSMENT
	Impact Assessment
	As noted above, an Ecological Assessment has been prepared for the proposed activity by WolfPeak, included in <b>Appendix E</b> .
	Up to 96 native roadside trees will require removal for the road upgrade, including one hollow bearing tree. The removal of this vegetation will reduce the extent of foraging habitat for a number of potentially occurring threatened species, including nectar and sap sources, prey habitat and preferred food trees for the Koala. Several of the trees to be removed contain hollows, hence there will be a reduction in potential denning habitat for hollow-obligate fauna species. Removing areas of roadside vegetation in a modified agricultural landscape will also lead to reduced connectivity for less mobile and gap shy fauna species.
	There is potential for the works to result in indirect impacts on adjoining vegetation or faunal species utilising the site. These largely relate to mortality during clearing, weed invasion, edge effects, road strike, and increased noise at the time of works. Specific mitigation measures are recommended to reduce the potential for indirect impacts, as detailed below.
	Impact Rating
	Based on the above assessment, impacts on ecology associated with the proposal are considered to have an impact rating of 2 – Medium impact.
	Mitigation Measures
	The following mitigation measures would be implemented to minimise ecological impacts:
	<ul> <li>The clearing footprint is to be clearly marked (e.g. with stakes and bunting) before clearing in order to prevent inadvertent clearance beyond what is required and has been assessed. Trees to be removed should be clearly marked with flagging tape or spray paint. No clearing is to occur beyond the marked area, and vehicles are only to be parked in designated areas.</li> </ul>
	<ul> <li>Protection zones are to be established around retained trees and vegetation. Clearing and earthworks is to avoid damage or compaction to root zones of the retained trees.</li> </ul>
	<ul> <li>Trees are not to be felled into adjoining retained vegetation. Vegetation clearing should be undertaken in a sequential manner that does not isolate patches of</li> </ul>

CONSIDERATION	ASSESSMENT
	habitat and gives fauna an opportunity to escape into adjacent habitat.
	• The project ecologist is to conduct a pre-start briefing to clearing and civil contractors prior to the commencement of clearing works. All in attendance are to be informed of the required clearing measures to ensure compliance.
	<ul> <li>The clearing extent is to be inspected for fauna by a qualified ecologist immediately prior to commencement of any vegetation removal involving machinery and/or tree-felling. This is to occur each morning if clearing spans over multiple days/weeks. The ecologist is to flag any habitat features which may contain fauna and trees which contain hollows, nests or dreys.</li> </ul>
	<ul> <li>If a Koala is present in an area subject to vegetation removal/modification, works must be suspended until the Koala moves along on its own volition. If the Koala is located in a position that a 50 metre buffer may be established, works may proceed outside this buffer. In this event, the ecologist is to remain on site to monitor the Koala for signs of distress. If the ecologist determines that the Koala is in distress, works must be suspended within this area until a larger buffer is created or the Koala moves along on its own volition.</li> </ul>
	• The ecologist is to remain on site to supervise removal of all vegetation and manage any fauna interactions. Other than Koalas, any detected fauna is to be relocated off-site. Any bird nest considered active is to be removed in a manner that allows retrieval of eggs/young, and these are to be taken into care by FAWNA.
	<ul> <li>Upon completion of clearing, a post clearance fauna management report (with photos) is to be submitted to Council within 14 days of the removal of the vegetation and hollow-bearing trees. The post clearance report must detail the methods and results of the pre-clear surveys and clearing supervision, including the details and outcome of all fauna interactions during clearing works. The report must also provide evidence that the clearing and habitat removal procedures were adhered to.</li> </ul>
	<ul> <li>Hollow-bearing trees are to be gently bumped several times prior to removal to encourage any fauna present to vacate. They are then to be removed via 'soft felling' methods with machinery or gradual cut-down by an arborist to minimise injury to fauna. Habitat trees with a high likelihood of containing fauna are to be removed</li> </ul>

CONSIDERATION	ASSESSMENT	
	last and should be removed with a crane or other method.	
	• A qualified ecologist is to be present during felling and sectioning of the hollow-bearing tree (at the proponent's cost) in case of animal injury. Hollows are to be inspected for fauna once the tree is deposited. All uninjured animals are to be released in the retained habitat on the subject site.	
	• If the hollow is determined to be occupied and fauna do not require assistance (e.g. roosting bats), the entrance is to be blocked and the sectioned log placed in a shaded and protected area on the edge of the subject site. The obstacle is to be removed just prior to dusk to allow passive escape of the fauna within. The log may then be removed if required.	
	<ul> <li>Nest boxes are to be installed and maintained to offset the loss of hollow-bearing trees at two nest boxes per observed hollow. The one hollow-bearing tree impacted contains 11 hollows; thus it is recommended that 22 nest boxes are installed to offset the loss of these habitat trees. These are to be constructed of ACQ treated timber and mounted by an ecologist prior to clearing of the subject site's hollow-bearing trees. It is recommended that the following nest boxes are installed:</li> </ul>	
	<ul> <li>Six microbat boxes</li> </ul>	
	• Four small parrot boxes.	
	<ul> <li>A Nest Box Report is to be prepared and submitted to within 14 days of mounting, detailing the following:</li> </ul>	
	<ul> <li>GPS coordinates of the nest boxes (with nest boxes numbered consecutively)</li> </ul>	
	<ul> <li>Host tree species, trunk diameter at breast height (DBH), and height</li> </ul>	
	<ul> <li>Mounting height and aspect of each nest box.</li> </ul>	
	<ul> <li>The nest boxes are to be monitored and maintained annually for a period of ten years. Any damaged boxes are to be replaced or repaired and any exotic species such as European bees are to be removed.</li> </ul>	
	<ul> <li>Site compounds are to be located in currently cleared areas either in the road reserve or adjoining private land.</li> </ul>	

CONSIDERATION	ASSESSMENT	
	<ul> <li>To assist in reducing the spread of exotic species, all vehicles and machinery are to be inspected for the presence of weeds prior to entering the site;</li> </ul>	
	<ul> <li>Invasive Biosecurity Act listed weeds (i.e. Lantana, Fireweed) within the clearing footprint are appropriately treated and collected prior to clearing and are disposed of within a landfill facility.</li> </ul>	
	<ul> <li>Any new weed infestations that arise within the works area during construction are to be treated and removed.</li> </ul>	
Aboriginal	Existing Environment	
Heritage	A search of the Aboriginal Heritage Information Management System (AHIMS) database in the vicinity of the site identified no Aboriginal heritage sites and no Aboriginal heritage places within a 1 km radius of the site (refer to AHIMS Results in <b>Appendix D</b> ).	
	Impact Assessment	
	While there are no known Aboriginal heritage sites in proximity to the proposed works, the works will involve ground disturbance, which means there is some potential to encounter unexpected Aboriginal heritage finds.	
	The proposed activity would be carried out on an existing roadway, which is currently unsealed in the area where works are to take place. The ground in this area is therefore considered previously disturbed and unlikely to contain in situ Aboriginal artefacts.	
	Impact Rating	
	Based on the above assessment, impacts on Aboriginal heritage associated with the proposal are considered to have an impact rating of 1 – Low impact.	
	Mitigation Measures	
	The following mitigation measures would be implemented to minimise Aboriginal heritage impacts:	
	<ul> <li>All work is to cease immediately, on detection of Aboriginal artefacts. Items will be recorded &amp; suitable storage arrangements undertaken in consultation with Wanaruah Local Aboriginal Land Council (LALC). Wanaruah LALC &amp; NPWS must be notified immediately and in the event of bones, NSW Police is to be notified.</li> </ul>	

CONSIDERATION	ASSESSMENT
	Wanaruah LALC & NPWS will manage the processing of artefacts as per mutual agreement.
Historic Heritage	Existing Environment
	Searches of relevant heritage databases found no known World, National, Commonwealth, State, or local heritage items or heritage conservation areas in proximity to the site of the proposed works.
	Impact Assessment
	The proposed activity is not anticipated to impact any World, National, Commonwealth, State or local heritage items or heritage conservation areas.
	Impact Rating
	Based on the above assessment, impacts on historic heritage associated with the proposal are considered to have an impact rating of 0 – Negligible impact.
	Mitigation Measures
	The following mitigation measures would be implemented to minimise historic heritage impacts:
Traffic and	Existing Environment
Access	Yarrawa Road measures 17.25 km in length and is a two lane two- way rural local road within the Road Network of Muswellbrook Shire. The road connects the Bylong Valley Way to the town of Denman at Virginia Street. The link that this road provides between the western area of the Shire to Denman has increased in importance mostly due to the use of GPS navigational systems in vehicles which directs vehicles onto this road. This has resulted in increased traffic volumes using Yarrawa Road.
	The proposed works would be undertaken on a 2 km unsealed section of Yarrawa Road, between ch 14.00 km and ch 16.00 km, passing through Kings Gap.
	Six rural/residential properties are located within 1 km of the eastern extent of the works, all of which are set back from the road. Access to these properties is via driveways off Yarrawa Road.
	Impact Assessment



CONSIDERATION		
	This includes installation of new road pavement and supporting drainage structures. A minimum typical cross section of the road should provide two 3.5 m wide traffic lanes plus 1.0 m wide sealed shoulders, subject to property impact and geometric design, will be based on a road pavement. The proposed activity will result in an overall improvement in accessibility and safety of Yarrawa Road.	
	The proposed activity will result in temporary impacts to users of Yarrawa Road during construction. Yarrawa Road will remain in use during the proposed works. It is expected that some minor delays to traffic will occur and contra flow traffic control will be in place during construction over for a period of about 8 weeks. Impacts would be managed via a traffic control plan and the appropriate notifications would be distributed to local residents on Yarrawa Road. Appropriate notifications and signage would be employed to manage the change to existing traffic conditions.	
	A temporary site compound/laydown area will be established within currently cleared areas either in the road reserve or adjoining private land, for example on the eastern side of Yarrawa Road at ch 11.20 km as shown in sheet 7 of the Preliminary Design Drawings in <b>Appendix C</b> . <b>Impact Rating</b> Based on the above assessment, impacts on traffic and access associated with the proposal are considered to have an impact rating of 1 – Low impact. <b>Mitigation Measures</b> The following mitigation measures would be implemented to minimise traffic and access impacts:	
	<ul> <li>A Traffic Control Plan must be prepared for construction prior to the commencement of works.</li> </ul>	
	<ul> <li>Affected stakeholders are to be notified of potential impacts on traffic and access along Yarrawa Road, including nearby residents on Yarrawa Road and the Hunter Valley RFS branch.</li> </ul>	
	<ul> <li>Site compounds are to be located in currently cleared areas either in the road reserve or adjoining private land.</li> </ul>	
Air Quality	Existing Environment	
	Six rural/residential properties are located within 1 km of the eastern extent of the works, all of which are set back from the road. Access	



CONSIDERATION	ASSESSMENT	
	to these properties is via driveways off Yarrawa Road. There are no other known sensitive receivers located in proximity to the site. There are no polluting industries in the vicinity of the works.	
	Impact Assessment	
	The proposed works would require ground disturbance activities to prepare the road for surfacing and install required drainage structures to support the operation of the road. This has the potential to result in some localised air quality impacts associated with dust generation.	
	The operation of plant and equipment during construction would require burning of petroleum fuels, resulting in greenhouse gas emissions. This would also generate some additional exhaust emissions and associated local air quality impacts. Further to this, bitumen sealing works will likely generate some odour impacts.	
	Despite these potential impacts, the site of the proposed activity is situated in a relatively remote locale, approximately 1 km from the nearest sensitive receivers (rural/residential properties to the east of the worksite), as outlined above.	
	<b>Impact Rating</b> Based on the above assessment, impacts on air quality associated with the proposal are considered to have an impact rating of 1 – Low impact.	
	Mitigation Measures	
	The following mitigation measures would be implemented to minimise air quality impacts:	
	<ul> <li>A water cart must be deployed during any works that are likely to cause dust emissions.</li> </ul>	
	<ul> <li>Any material stockpiled onsite is to be covered (e.g. with geofabric) to prevent the generation of dust.</li> </ul>	
	<ul> <li>The nearest residential premises are to be notified of the proposed works and kept informed of any potential impacts on local air quality.</li> </ul>	
	<ul> <li>Plant and equipment is to be switch off when not in use to prevent unnecessary exhaust emissions from idling.</li> </ul>	
	Existing Environment	



Noise and Vibration	Currently, noise in the area of the proposed activity is derived from traffic and nearby rural areas. Six rural/residential properties are located within 1 km of the eastern extent of the works, all of which are set back from the road. Access to these properties is via driveways off Yarrawa Road. There are no other known sensitive receivers located in proximity to the site.	
	Impact Assessment Potential Noise Impacts	
	Construction of the proposed activity is expected to commence in late 2021 and take approximately 2 months to complete. The proposed activity start date may alter, although the duration of the construction activities would remain the same. Works will be undertaken during normal working hours and accordingly there is a negligible risk of sleep disturbance.	
	The equipment proposed to be used during the works includes:	
	• Grader	
	Roller	
	Water cart	
	Rigid Trucks	
	Excavator	
	Light vehicles	
	Bitumen plant (provided by contractor)	
	As there is no high noise works, such as rock-breaking or concrete cutting involved, there is a low risk of impulsive or tonal noise generation.	
	As noted above, six rural/residential properties are located within 1 km of the eastern extent of the works, all of which are set back from the road. These properties may experience minor impacts associated with noise generated during construction. Notifications are to be sent to these residents regarding the timing and nature of works prior to commencement, including detail of any potential or planned noisy works.	
	In terms of impacts to local fauna, as noise is currently derived from traffic and nearby rural areas, fauna are likely to have some tolerance to anthropogenic noise. During the development's establishment, noise would be highest during construction, but	

CONSIDERATION	ASSESSMENT	
	limited to daytime hence would only impact diurnal birds and mammals.	
	Post-development, noise levels are expected to return to levels which occurred prior to construction.	
	Potential Vibration Impacts	
	Vibration impacts related to construction activities are considered unlikely however the proposed works would be undertaken in accordance with the minimum working distances for vibration intensive activities in accordance with the British Standard, BS7385- 2:1993 Evaluation and measurement for vibration in buildings.	
	Impact Rating	
	Based on the above assessment, noise and vibration impacts associated with the proposal are considered to have an impact rating of 1 – Low impact.	
	Mitigation Measures The following mitigation measures would be implemented to minimise noise and vibration impacts:	
	<ul> <li>Noise generating works would be limited to the recommended standard hours for construction work outlined in the Interim Construction Noise Guideline (DECC, 2009) which are:</li> </ul>	
	<ul> <li>Monday to Friday 7:00am to 6:00pm.</li> </ul>	
	<ul> <li>Saturday 8:00am to 1:00pm.</li> </ul>	
	<ul> <li>No works on Sundays or Public Holidays.</li> </ul>	
	<ul> <li>Work outside standard hours would only comprise:</li> </ul>	
	<ul> <li>The delivery of materials outside standard hours requested by police or other authorities for safety reasons.</li> </ul>	
	<ul> <li>Emergency work to avoid the loss of lives and/or property.</li> </ul>	
	<ul> <li>Works timed to reduce disruption to essential services.</li> </ul>	
	<ul> <li>The nearest residential premises are to be notified of the proposed works and kept informed of any potential or planned noisy works.</li> </ul>	

CONSIDERATION	ASSESSMENT	
Visual Amenity	Existing Environment	
	The works will take place within the existing road corridor in a relatively remote section of the rural Yarrawa Road. Land adjoining the site comprises agricultural grazing land and Crown land/Crown reserve, with Wollemi National Park 2 km to the southwest.	
	Surrounding vegetation consists of a mix of exotic pasture grassland, riparian forest and dry sclerophyll open forest. Photographs of the site are shown in Error! Reference source not found. and Error! Reference source not found., above.	
	Six rural/residential properties are located within 1 km of the eastern extent of the works, all of which are set back from the road. Access to these properties is via driveways off Yarrawa Road. There are no other known sensitive receivers located in proximity to the site.	
	Impact Assessment	
	The construction site will be typical of a road maintenance site and will only be present for a limited duration (approximately 2 months). The area of road being upgraded is currently unsealed and following completion of works this area of road will be asphalted.	
	Vegetation clearing will be required as part of the proposed activity, including removal of up to 96 native roadside trees. Given the highly vegetated nature of the surrounding area and the lack of sensitive receivers, this vegetation removal is not anticipated to have a significant impact on visual amenity.	
	A temporary site compound/laydown area will be established within currently cleared areas either in the road reserve or adjoining private land, for example on the eastern side of Yarrawa Road at ch 11.20 km as shown in sheet 7 of the Preliminary Design Drawings in <b>Appendix C</b> . The compound/laydown would not be visible from nearby residences.	
	Impact Rating	
	Based on the above assessment, impacts on visual amenity associated with the proposal are considered to have an impact rating of 0 – Negligible impact.	
	Mitigation Measures	
	The following mitigation measures would be implemented to minimise visual impacts:	



CONSIDERATION	ASSESSMENT	
	<ul> <li>Worksites are to be kept tidy and good housekeeping practices are to be implemented throughout the duration of construction.</li> </ul>	
	<ul> <li>The temporary compound/laydown area would be demobilised following completion of works and the area reinstated to its pre-existing condition.</li> </ul>	
Waste Generation	Existing Environment	
and Management	The site does not currently produce any waste as it is an operational road.	
	Impact Assessment	
	The proposed activity will result in the generation of waste during construction, predominately green waste from vegetation clearing and excess spoil from excavation works.	
	Soil/road formation excavated during the works will be stockpiled nearby to the works area and reused where possible. No hazardous wastes will be generated. Any excess excavated material will be classified in accordance with the <i>NSW Waste Classification</i> <i>Guidelines Part 1: Classifying Waste</i> (EPA 2014) and disposed of/recycled at an appropriately licensed facility.	
Green waste will be produced from vegetation clearing work will either be mulched and reused on site (excluding weeds) erosion and sediment control or site reinstatement works, or otherwise disposed of/recycled at an appropriately licensed		
	There would be a small amount of waste generated from the temporary site compound, such as minor consumables and putrescible waste, which will be disposed of within Council's waste management infrastructure.	
	Impact Rating	
	Based on the above assessment, impacts associated with waste generation and management during the proposal are considered to have an impact rating of 1 – Low impact.	
	Mitigation Measures	
	The following mitigation measures would be implemented to minimise waste impacts:	
	<ul> <li>All waste removed from site is to be classified in accordance with the NSW Waste Classification</li> </ul>	

CONSIDERATION	ASSESSMENT	
	<i>Guidelines Part 1: Classifying Waste</i> (EPA 2014) and disposed of/recycled at an appropriately licensed facility.	
	<ul> <li>Appropriate waste storage facilities will be available onsite, including at the site compound/laydown area.</li> </ul>	
	• If spoil is not reused within the proposal site, it would be classified in accordance <i>NSW Waste Classification Guidelines Part 1: Classifying Waste</i> (EPA 2014) and disposed of/recycled at an appropriately licensed facility.	
	<ul> <li>Reuse and recycling of materials would be prioritised, where possible.</li> </ul>	
Social and	Existing Environment	
Economic	Yarrawa Road connects the Bylong Valley Way to the town of Denman at Virginia Street. The link that this road provides between the western area of the Shire to Denman has increased in importance mostly due to the use of GPS navigational systems in vehicles which directs vehicles onto this road. This has resulted in increased traffic volumes using Yarrawa Road.	
	The proposed works would be undertaken on a 2 km unsealed section of Yarrawa Road, between ch 14.00 km and ch 16.00 km, passing through Kings Gap.	
	Impact Assessment	
	The works will provide a safer road (improved surface) for road users travelling between Bylong Valley Road and the town of Denham, ultimately benefiting the local community. This will address the issue of increased usage of this road that has occurred mostly due to the use of GPS navigational systems in vehicles which directs vehicles onto Yararwa Road. Improvement of this road will also benefit the local RFS, improving access for emergency vehicles through this area of bushfire prone land.	
	Impact Rating	
	Based on the above assessment, social and economic impacts associated with the proposal are considered to have an impact rating of 0 – Positive impact.	
	Mitigation Measures	
	As no negative socio-economic impacts are anticipated, no mitigation measures are proposed.	



CONSIDERATION	ASSESSMENT
Cumulative Impacts	<b>Existing Environment</b> There are no other significant construction projects in the area known to be scheduled for the same period as these works.
	Impact Assessment
	The are no cumulative impacts expected to result from the proposed activity. The proposed works would not result in a reduction in the range of beneficial uses of the land on which they will be carried out or the surrounding environment.
	Impact Rating
	Based on the above assessment, cumulative impacts associated with the proposal are considered to have an impact rating of 0 – Negligible impact.
	<b>Mitigation Measures</b> As no cumulative impacts are anticipated, no mitigation measures are proposed.

#### 6.2 Environmental Impact Ratings

A summary of the impact ratings for environmental factors is provided in Table 5.

Table 5- Environmental Impact Ratings

Consideration	Impact Rating
Land Use	Low impact – 1
Geology and Soils	Low impact – 1
Hydrology and Water Quality	Low impact – 1
Ecology	Medium impact – 2
Aboriginal Heritage	Low impact – 1
Historic Heritage	Negligible impact – 0
Consideration	Impact Rating
------------------------------------	-----------------------
Traffic and Access	Low impact – 1
Air Quality	Low impact – 1
Noise and Vibration	Low impact – 1
Visual Amenity	Negligible impact – 0
Waste Generation and Management	Low impact – 1
Social and Economic	Positive impact – 0
Cumulative Impacts	Negligible impact – 0

## 7. CONSISTENCY WITH PLANNING FRAMWORK

### 7.1 Clause 5.5 of the Environmental Planning and Assessment Act

Under clause 5.5 of the EP&A Act, Muswellbrook Shire Council has a duty to consider the effect of the proposed activity on the environment and the effects on any wilderness areas. **Table 6** provides a summary of how each of the factors has been considered.

Table 6- Clause 5.5 EP&A Act Assessment

Consideration	Response
cl 5.5 (1) Examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of that activity.	All potential environmental impacts have been considered and assessed in <b>Section</b> Error! Reference source not found. of this REF.
cl 5.5 (3) Consider the effect of an activity on any wilderness area (within the meaning of the <i>Wilderness Act 1987</i> ) in the locality in which the activity is intended to be carried on.	The proposed activity would not affect any wilderness areas.



# 7.2 Clause 7.2 of the Biodiversity Conservation Act 2016

Under clause 7.3 of the BC Act, Council has a duty to take into account whether there is likely to be a significant effect on threatened species, ecological communities, or their habitats. The Ecological Impact Assessment provided in **Appendix E** provides a summary of how each of the factors has been considered.

### 7.3 Clause 228 of the EP&A Regulation

In accordance with considerations under clause 228 of the EP&A Regulation, an assessment of potential environmental impacts of the proposed activity is summarised in **Table 7**.

Table	7- F	P&A	Regulation	Clause	228	Assessment
rabic	/ - L	ГОЛ	regulation	Olduse	220	A3363311611

Consideration	Response	Compliance
(a) any environmental impact on a community,	Refer Socio Economic assessment in Chapter 6.	Yes
(b) any transformation of a locality	Refer Land Use and Visual Amenity assessment in Chapter 6.	Yes
(c) any environmental impact on the ecosystems of the locality	Refer Ecological Assessment in Chapter 6.	Yes
(d) any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality	Refer relevant assessments in Chapter 6.	Yes
(e) any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations	Refer Aboriginal and Historic Heritage Assessments in Chapter 6.	Yes
(f) any impact on the habitat of protected animals	Refer Ecological Assessment in Chapter 6.	Yes



(g) any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air	Refer Ecological Assessment in Chapter 6.	Yes
(h) any long-term effects on the environment	No long-term effects on the environment are likely.	Yes
(i) any degradation of the quality of the environment	No degradation in the quality of the environment is likely to occur.	Yes
(j) any risk to the safety of the environment	The proposal is not considered to pose a risk to the safety of the environment.	Yes
(k) any reduction in the range of beneficial uses of the environment	No impact.	Yes
(I) any pollution of the environment	Minor and temporary impacts may occur as described in the relevant assessments in Chapter 6.	Yes
(m) any environmental problems associated with the disposal of waste	Refer Waste Assessment in Chapter 6.	Yes
(n) any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply	Existing resources to be reused during works, where possible.	Yes
(o) any cumulative environmental effect with other existing or likely future activities	No cumulative impacts.	Yes
(p) any impact on coastal processes and coastal hazards, including those under projected climate change conditions	No impact on coastal processes and hazards is considered likely.	Yes

## 8. SUMMARY AND CONCLUSION

The Yarrawa Road Upgrade project has been assessed under Part 5 of the EP&A Act 1979 and this REF has been prepared in accordance with the relevant legislation, including but not limited to, section 5.5 of the EP&A Act and clause 228 of the EP&A Regulation.





Potential and likely impacts associated with the proposed activity have been comprehensively assessed throughout this REF. Actions to mitigate these impacts have been documented in **Appendix A** and shall be implemented in the undertaking of the proposed activity and the preparation of any relevant environmental management plan associated with the proposed activity.

Considering the assessment of impacts detailed in this REF, it is concluded that the Yarrawa Road Upgrade is **not likely to have a significant impact on the environment**, and as such an EIS is not required.

This REF is limited to the assessment of the activity described in Section 3 Supplementary assessment and determination in accordance with EP&A Act 1979 would be required for:

- Works outside of the scope of work assessed in this environmental impact assessment, for which the environmental impact has not been considered; or
- Modifications to the activity scope, methodology or recommended mitigation measures, that alter the environmental impact assessed in this environmental impact assessment



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## LIMITATIONS

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# APPENDIX A – SUMMARY OF MITIGATION MEASURES

Factor	Mitigation Measure
General	<ul> <li>Prepare a CEMP, incorporating and addressing all of the mitigation measures listed below, prior to works commencing.</li> </ul>
Land Use	<ul> <li>Muswellbrook Shire Council are to ensure that the Hunter Valley RFS office is notified prior to commencement of construction works, particularly in terms of any traffic and access arrangements and restrictions that will occur during the work, and the provision of contact details for key personnel onsite.</li> </ul>
	<ul> <li>Muswellbrook Shire Council should consult with the Native Tittle Manager Advice as to Native Title status of the area of Crown land located directly adjacent to the northern extent of the works site.</li> </ul>
Geology and Soils	<ul> <li>Prepare and implement an Erosion and Sediment Control Plan in accordance with the Landcom Guideline Managing Urban Stormwater: Soils and Construction (the 'Blue Book').</li> </ul>
	<ul> <li>Erosion and sediment control measures are not to be removed until the works are complete, and disturbed areas are stabilised.</li> </ul>
	<ul> <li>Site watering shall be undertaken to suppress dust, as required.</li> </ul>
	<ul> <li>An unexpected finds procedure must be prepared prior to the commencement of ground disturbance works and is to be implemented if contaminated material is encountered onsite.</li> </ul>
Hydrology and Water Quality	<ul> <li>Prepare and implement an Erosion and Sediment Control Plan in accordance with the Landcom Guideline Managing Urban Stormwater: Soils and Construction (the 'Blue Book').</li> </ul>
	<ul> <li>Erosion and sediment control measures are not to be removed until the works are complete, and disturbed areas are stabilised.</li> </ul>
	<ul> <li>Site watering shall be minimised and only undertaken to suppress dust if required.</li> </ul>

Factor	Mitigation Measure
	<ul> <li>Any material stockpiled onsite is to be covered (e.g. with geofabric) to prevent erosion and sedimentation impacts.</li> </ul>
	<ul> <li>A spill kit must be available onsite during construction and any spills and leaks are to be contained within the worksite.</li> </ul>
Ecology	The clearing footprint is to be clearly marked (e.g. with stakes and bunting) before clearing in order to prevent inadvertent clearance beyond what is required and has been assessed. Trees to be removed should be clearly marked with flagging tape or spray paint. No clearing is to occur beyond the marked area, and vehicles are only to be parked in designated areas.
	<ul> <li>Protection zones are to be established around retained trees and vegetation. Clearing and earthworks is to avoid damage or compaction to root zones of the retained trees.</li> </ul>
	<ul> <li>Trees are not to be felled into adjoining retained vegetation. Vegetation clearing should be undertaken in a sequential manner that does not isolate patches of habitat and gives fauna an opportunity to escape into adjacent habitat.</li> </ul>
	• The project ecologist is to conduct a pre-start briefing to clearing and civil contractors prior to the commencement of clearing works. All in attendance are to be informed of the required clearing measures to ensure compliance.
	• The clearing extent is to be inspected for fauna by a qualified ecologist immediately prior to commencement of any vegetation removal involving machinery and/or tree-felling. This is to occur each morning if clearing spans over multiple days/weeks. The ecologist is to flag any habitat features which may contain fauna and trees which contain hollows, nests or dreys.
	• If a Koala is present in an area subject to vegetation removal/modification, works must be suspended until the Koala moves along on its own volition. If the Koala is located in a position that a 50 metre buffer may be established, works may proceed outside this buffer. In this event, the ecologist is to remain on site to monitor the Koala for signs of distress. If the ecologist determines that the Koala is in distress, works must be suspended within this area until a larger buffer is created or the Koala moves along on its own volition.

Factor	Mitigation Measure
	<ul> <li>The ecologist is to remain on site to supervise removal of all vegetation and manage any fauna interactions. Other than Koalas, any detected fauna is to be relocated off-site. Any bird nest considered active is to be removed in a manner that allows retrieval of eggs/young, and these are to be taken into care by FAWNA.</li> </ul>
	• Upon completion of clearing, a post clearance fauna management report (with photos) is to be submitted to Council within 14 days of the removal of the vegetation and hollow-bearing trees. The post clearance report must detail the methods and results of the pre-clear surveys and clearing supervision, including the details and outcome of all fauna interactions during clearing works. The report must also provide evidence that the clearing and habitat removal procedures were adhered to.
	<ul> <li>Hollow-bearing trees are to be gently bumped several times prior to removal to encourage any fauna present to vacate. They are then to be removed via 'soft felling' methods with machinery or gradual cut-down by an arborist to minimise injury to fauna. Habitat trees with a high likelihood of containing fauna are to be removed last and should be removed with a crane or other method.</li> </ul>
	<ul> <li>A qualified ecologist is to be present during felling and sectioning of the hollow-bearing tree (at the proponent's cost) in case of animal injury. Hollows are to be inspected for fauna once the tree is deposited. All uninjured animals are to be released in the retained habitat on the subject site.</li> </ul>
	<ul> <li>If the hollow is determined to be occupied and fauna do not require assistance (e.g. roosting bats), the entrance is to be blocked and the sectioned log placed in a shaded and protected area on the edge of the subject site. The obstacle is to be removed just prior to dusk to allow passive escape of the fauna within. The log may then be removed if required.</li> </ul>
	• Nest boxes are to be installed and maintained to offset the loss of hollow-bearing trees at two nest boxes per observed hollow. The one hollow-bearing tree impacted contains 11 hollows; thus it is recommended that 22 nest boxes are installed to offset the loss of these habitat trees. These are to be constructed of ACQ treated timber and mounted by an ecologist prior to clearing of the subject site's hollow-bearing trees. It

Factor	Mitigation Measure
	is recommended that the following nest boxes are installed:
	<ul> <li>Six microbat boxes</li> </ul>
	• Four small parrot boxes.
	<ul> <li>A Nest Box Report is to be prepared and submitted to within 14 days of mounting, detailing the following:</li> </ul>
	<ul> <li>GPS coordinates of the nest boxes (with nest boxes numbered consecutively)</li> </ul>
	<ul> <li>Host tree species, trunk diameter at breast height (DBH), and height</li> </ul>
	<ul> <li>Mounting height and aspect of each nest box.</li> </ul>
	<ul> <li>The nest boxes are to be monitored and maintained annually for a period of ten years. Any damaged boxes are to be replaced or repaired and any exotic species such as European bees are to be removed.</li> </ul>
	<ul> <li>Site compounds are to be located in currently cleared areas either in the road reserve or adjoining private land.</li> </ul>
	<ul> <li>To assist in reducing the spread of exotic species, all vehicles and machinery are to be inspected for the presence of weeds prior to entering the site;</li> </ul>
	<ul> <li>Invasive Biosecurity Act listed weeds (i.e. Lantana, Fireweed) within the clearing footprint are appropriately treated and collected prior to clearing and are disposed of within a landfill facility.</li> </ul>
	<ul> <li>Any new weed infestations that arise within the works area during construction are to be treated and removed.</li> </ul>
Aboriginal Heritage	<ul> <li>All work is to cease immediately, on detection of Aboriginal artefacts. Items will be recorded &amp; suitable storage arrangements undertaken in consultation with Wanaruah Local Aboriginal Land Council (LALC). Wanaruah LALC &amp; NPWS must be notified immediately and in the event of bones, NSW Police is to be notified. Wanaruah LALC &amp; NPWS will manage the processing of artefacts as per mutual agreement.</li> </ul>
Historic Heritage	N/A



Factor	Mitigation Measure
Traffic and Access	<ul> <li>A Traffic Control Plan must be prepared for construction prior to the commencement of works.</li> </ul>
	<ul> <li>Affected stakeholders are to be notified of potential impacts on traffic and access along Yarrawa Road, including nearby residents on Yarrawa Road and the Hunter Valley RFS branch.</li> </ul>
	<ul> <li>Site compounds are to be located in currently cleared areas either in the road reserve or adjoining private land.</li> </ul>
Air Quality	<ul> <li>A water cart must be deployed during any works that are likely to cause dust emissions.</li> </ul>
	<ul> <li>Any material stockpiled onsite is to be covered (e.g. with geofabric) to prevent the generation of dust.</li> </ul>
	<ul> <li>The nearest residential premises are to be notified of the proposed works and kept informed of any potential impacts on local air quality.</li> </ul>
	<ul> <li>Plant and equipment is to be switch off when not in use to prevent unnecessary exhaust emissions from idling.</li> </ul>
Noise and Vibration	<ul> <li>Noise generating works would be limited to the recommended standard hours for construction work outlined in the Interim Construction Noise Guideline (DECC, 2009) which are:</li> </ul>
	<ul> <li>Monday to Friday 7:00am to 6:00pm.</li> </ul>
	<ul> <li>Saturday 8:00am to 1:00pm.</li> </ul>
	<ul> <li>No works on Sundays or Public Holidays.</li> </ul>
	<ul> <li>Work outside standard hours would only comprise:</li> </ul>
	<ul> <li>The delivery of materials outside standard hours requested by police or other authorities for safety reasons.</li> </ul>
	<ul> <li>Emergency work to avoid the loss of lives and/or property.</li> </ul>
	<ul> <li>Works timed to reduce disruption to essential services.</li> </ul>



Factor	Mitigation Measure	
	<ul> <li>Nearest residential pre- proposed works and ke planned noisy works.</li> </ul>	mises to be notified of the ept informed of any potential or
Visual Amenity	<ul> <li>Worksites are to be kep practices are to be imp duration of construction</li> </ul>	pt tidy and good housekeeping lemented throughout the n.
	<ul> <li>The temporary compound demobilised following carea reinstated to its presented to its presented</li></ul>	und/laydown area would be completion of works and the re-existing condition.
Waste Generation and Management	<ul> <li>All waste removed from accordance with the NS Guidelines Part 1: Clas disposed of/recycled at facility.</li> </ul>	n site is to be classified in SW Waste Classification ssifying Waste (EPA 2014) and t an appropriately licensed
	<ul> <li>Appropriate waste stora onsite, including at the</li> </ul>	age facilities will be available site compound/laydown area.
	<ul> <li>If spoil is not reused wi be classified in accorda <i>Guidelines Part 1: Clas</i> disposed of/recycled at facility.</li> </ul>	thin the proposal site, it would ance <i>NSW Waste Classification</i> <i>sifying Waste</i> (EPA 2014) and t an appropriately licensed
	<ul> <li>Reuse and recycling of where possible.</li> </ul>	f materials would be prioritised,
Social and Economic	N/A	
Cumulative Impacts	N/A	





## **APPENDIX B – SITE LOCATION MAP**





### Legend

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Subject Site

Figure 1 | Site Location

1:50,000 @ A4

Muswellbrook Shire Council | Yarrawa Road



Yarrawa Road Upgrade



## **APPENDIX C – PRELIMINARY DESIGN DRAWINGS**



# MUSWELLBROOK SHIRE COUNCIL YARRAWA ROAD UPGRADE (CH14km - CH16km)

## INDEX

SHEET No.	DESCRIPTION
1	COVER SHEET
2	GENERAL ARRANGEMENT PLAN
3	TYPICAL PAVEMENT DETAILS
4	PLAN AND LONGITUDINAL SECTION, SHEET 1 OF 5
5	PLAN AND LONGITUDINAL SECTION, SHEET 2 OF 5
6	PLAN AND LONGITUDINAL SECTION, SHEET 3 OF 5
7	PLAN AND LONGITUDINAL SECTION, SHEET 4 OF 5
8	PLAN AND LONGITUDINAL SECTION, SHEET 5 OF 5
9	CROSS SECTIONS, SHEET 1 OF 10
10	CROSS SECTIONS, SHEET 2 OF 10
11	CROSS SECTIONS, SHEET 3 OF 10
12	CROSS SECTIONS, SHEET 4 OF 10
13	CROSS SECTIONS, SHEET 5 OF 10
14	CROSS SECTIONS, SHEET 6 OF 10
15	CROSS SECTIONS, SHEET 7 OF 10
16	CROSS SECTIONS, SHEET 8 OF 10
17	CROSS SECTIONS, SHEET 9 OF 10
18	CROSS SECTIONS, SHEET 10 OF 10

## LOCALITY MAP



Α	ISSUED TO CLIENT FOR REVIEW	Z.C	15/06/21
ISSUE	REVISION	AUTH	DATE

# **G** LOCAL GOVERNMENT ENGINEERING SERVICES

Port Macquarie 71 Lord St, Port Macquarie NSW 2444 Ph: 02-65843888 Email: john@legs.com.au

Pty Ltd ABN 64 055 099 557 Web: www.legs.com.au

Inverell 17 Byron Street, Inverell NSW 2360 Ph: 02-67225110 Email: andrew@legs.com.au



### **GENERAL NOTES:**

IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE AND LEVEL ALL SERVICES ADJACENT TO OR OTHERWISE AFFECTING THE WORKS PRIOR TO THE COMMENCEMENT OF WORKS, WHETHER OR NOT THEY ARE INDICATED ON THE DRAWINGS. WHERE SERVICES CONFLICT WITH PROJECT WORKS THEY ARE TO BE RELOCATED ON APPROVAL FROM THE 'PRINCIPAL'S AUTHORISED PERSONNEL' (P.A.P.). THE CONTRACTOR, ON APPROVAL FROM THE P.A.P., SHALL MAKE ALL NECESSARY ARRANGEMENTS WITH THE RELEVANT AUTHORITY TO RELOCATE OR ADJUST AS FOUND NECESSARY.

EXISTING SIGNS TO BE REUSED PROVIDED THEY ARE IN A GOOD AND SERVICEABLE CONDITION TO THE SATISFACTION OF THE P.A.P.. OTHERWISE, REPLACE WITH A NEW, EQUIVALENT SIGN.

IT IS THE CONTRACTOR'S RESPONSIBILITY TO SUPPLY AND IMPLEMENT CONTEMPORARY SITE-SPECIFIC EROSION AND SEDIMENT CONTROL MEASURES AS PART OF THEIR ENVIRONMENTAL MANAGEMENT PLAN FOR THE PROJECT. THE CONTROL MEASURES SHALL BE IN ACCORDANCE WITH COUNCIL SPECIFICATIONS AND 'THE BLUE BOOK'. THE CONTRACTOR SHALL, PRIOR TO COMMENCEMENT OF WORKS, PREPARE AND SUBMIT TO COUNCIL AN EROSION AND SEDIMENT CONTROL PLAN.

ALL DISTURBED AREAS ARE TO BE REGENERATED AND RESTORED TO PRE-EXISTING CONDITION.

THE CONTRACTOR SHALL NOT ENTER UPON OR DO ANY WORK WITHIN ADJACENT LANDS WITHOUT PRIOR WRITTEN PERMISSION OF THE LAND OWNER AND COUNCIL.

THE CONTRACTOR SHALL AT ALL TIMES MAINTAIN IN A SAFE CONDITION AN ALL WEATHER ACCESS TO THE ROADWAYS AND PROPERTIES ADJACENT TO THE SITE TO THE SATISFACTION OF COUNCIL.

THE CONTRACTOR SHALL UNDERTAKE TRAFFIC CONTROL MEASURES IN ACCORDANCE WITH THE WORK HEALTH AND SAFETY ACT 2011

THE CONTRACTOR SHALL CLEAR AND DISPOSE OF THOSE TREES THAT ARE LOCATED WITHIN 1m OF EARTHWORKS, SERVICE LINES AND/OR AS IDENTIFIED BY THE P.A.P. CLEARING AND GRUBBING SHALL BE UNDERTAKEN IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION. TREES TO BE RETAINED ON SITE SHALL BE PROTECTED BY THE ERECTION OF PROTECTIVE FENCING PRIOR TO COMMENCEMENT OF SITE WORKS.

CLEARING IS DEFINED AS: CUTTING DOWN, FELLING, THINNING, LOGGING OR REMOVING NATIVE VEGETATION; KILLING, DESTROYING, POISONING, RING BARKING, UPROOTING, OF NATIVE VEGETATION; SEVERING TOPPING OR LOPPING BRANCHES, LIMBS, STEMS OR TRUNKS OF NATIVE VEGETATION; OR SUBSTANTIALLY DAMAGING OR INJURING NATIVE VEGETATION IN ANY OTHER WAY.

ALL EXISTING CULVERTS ARE TO BE CLEANED AND VEGETATION TO BE REMOVED FROM INLET AND OUTLET TO RE-ESTABLISH A CLEAR WATERWAY.

ALL EXISTING CULVERTS ARE TO BE INSPECTED DURING CONSTRUCTION TO ENSURE THEY ARE STRUCTURALLY SOUND. DAMAGED SECTIONS OF CULVERTS MAY BE REPLACED UPON APPROVAL FROM THE P.A.P..

SUB-SOIL DRAINAGE TO BE CONSTRUCTED USING LEVEL EQUIPMENT AND TO BE INCLUDED IN WORK AS EXECUTED PLANS.

LEGS IN NO WAY CERTIFY THE STRUCTURAL INTEGRITY NOR STRUCTURAL CAPACITY OF EXISTING STRUCTURES WITHIN THE WORKS. IF THE CONTRACTOR DEEMS AN EXISTING STRUCTURE TO BE STRUCTURALLY UNSOUND, CONTACT THE PRINCIPAL'S REP. (P.A.P.)

## **SURVEY NOTES:**

SURVEY NOTES - 25.02.21

SURVEY IS ON MGA2020 ZONE 56 COORDINATES AND APPROXIMATE AHD71 LEVELS OBTAINED VIA GNSS CONNECTION. ORIGIN OF COORDINATES: SSM 20789 CLASS A (SOURCE: SCIMS 02.02.21). MEAN COMBINED SCALE FACTOR ADOPTED: 1.000242. ORIGIN OF LEVELS SSM 20789, CLASS LC, RL 148.632m AHD (SOURCE: SCIMS 02.02.21).

CADASTRAL BOUNDARIES HAVE NOT BEEN SURVEYED, AS PER EXCLUSIONS IN THE CLIENT BRIEF. CADASTRAL SURVEY INFRASTRUCTURE INVESTIGATIONS TO SATISFY THE "SURVEYOR - GENERAL'S DIRECTION NO. 11 - PRESERVATION OF SURVEY INFRASTRUCTURE" REQUIREMENTS HAVE NOT BEEN UNDERTAKEN. A STATE SURVEY MARK (E.G. PM, SS ETC) OR BOUNDARY REFERENCE MARK MUST NOT BE DESTROYED OR DAMAGED UNLESS AUTHORISATION HAS BEEN GIVEN BY THE SURVEYOR GENERAL AND THE MARKS ARE ASSESSED BY A REGISTERED SURVEYOR OR PERSON AUTHORISED BY THE SURVEYOR GENERAL'S DEPARTMENT. ALL OTHER SURVEY MARKS ARE NOT TO BE DISTURBED OR DESTROYED UNTIL ASSESSED BY THE SITE SURVEYOR. IT IS RECOMMENDED THAT SUCH INVESTIGATIONS BE UNDERTAKEN PRIOR TO CONSTRUCTION.

UNDERGROUND SERVICE LOCATIONS ARE APPROXIMATE ONLY AND BASED ON A COMBINATION OF DIAL BEFORE YOU DIG SKETCHES AND SURVEYED GROUND FEATURES. LINE WORK IS NOT TO BE USED FOR DESIGN PURPOSES AND UNDERGROUND SERVICES MUST BE POTHOLED AND LOCATED FOR ACCURATE LOCATIONS. IT IS THE CONTRACTORS RESPONSIBILITY TO PHYSICALLY LOCATE ALL UTILITIES PRIOR TO CONSTRUCTION.

muswellbrook	CLIENT MUSWELLBROOK SHIRE COUNCIL PROJECT YARRAWA ROAD UPGRADE (CH14km - CH16km)	SCALES
	COVER SHEET	FILE NAME: PM742_D.dwg

A1 ORIGINAL	DRAWN	DATE	JOB No.:	ISSUE	SHEET No.
	Z.C	10/06/21	PM742	Λ	1
	DESIGNED	DATE	DOCUMENT No.:	A	
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shire council		SCALE 1:2000	@A1	APPROVED	DATE			,
				J.C	10/06/21			
	GENERAL ARRANGEMENT PLAN	FILE NAME: PM742_D.dwg	ME: PM742_D.dwg DATUM: AHD		)		-	







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SCALE 1:250 0 10 20 SCALE 1:500

PLAN AND LONGITUDINAL SECTION SHEET 2 OF 5

FILE NAME: PM742\_D.dwg

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-INSTALL NEW W1-3(L) CURVE SIGN AND W8-2 ADVISORY SPEED SIGN (55km/h) S/S -50m VC VERTICAL GEOMETRY 4.95% 5.1% 55m SPIRAL 87.418m HORIZONTAL ALIGNMENT Datum RL = 201 LINEMARKING & GUIDE POST 219.979 220.141 419 151 DESIGN 137 915 179 688 838 EXISTING 218. <u>1</u>9. 219. 219. 216. 217 G CUT/FILL 0.291 0.304 0.281 0.277 0.236 o' Ö o. Ö o. 439 CHAINAGE 790.67 774. 8 61 720 HS 1:500 VS 1:250 • DEPICTS POSITION OF GUIDEPOST LOCAL GOVERNMENT Engineering Services Pty Ltd ABN 64 055 099 557 Web: www.legs.com.au Port Macquarie Inverell 17 Byron Street, Inverell NSW 2360 71 Lord St, Port Macquarie NSW 2444 Ph: 02-65843888 Ph: 02-67225110 
 Z.C
 15/06/21

 AUTH
 DATE
 A ISSUED TO CLIENT FOR REVIEW Email: andrew@legs.com.au Email: john@legs.com.au ISSUE REVISION





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PROJECT

MUSWELLBROOK SHIRE COUNCIL

YARRAWA ROAD UPGRADE (CH14km - CH16km)

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## **APPENDIX D – AIHMS SEARCH RESULTS**





Wolf Peak Pty Ltd - Sydney Level 10 189 Kent Street Sydney New South Wales 2000 Attention: David Stubbs Email: dstubbs@wolfpeak.com.au

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lat, Long From : -32.41, 150.52 - Lat, Long To : -32.39, 150.55, conducted by David Stubbs on 09 August 2021.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of Heritage NSW AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0 Aboriginal sites are recorded in or near the above location.
0 Aboriginal places have been declared in or near the above location. \*

Date: 09 August 2021

### If your search shows Aboriginal sites or places what should you do?

- You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.
- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the NSW Government Gazette (https://www.legislation.nsw.gov.au/gazette) website. Gazettal notices published prior to 2001 can be obtained from Heritage NSW upon request

### Important information about your AHIMS search

- The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not be made available to the public.
- AHIMS records information about Aboriginal sites that have been provided to Heritage NSW and Aboriginal places that have been declared by the Minister;
- Information recorded on AHIMS may vary in its accuracy and may not be up to date. Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.



## APPENDIX E – ECOLOGICAL ASSESSMENT REPORT


# Ecological Assessment for Yarrawa Road Upgrade

**AUGUST 2021** 

wolfpeak.com.au



#### **Revision History**

Revision	Date	Prepared By	Reviewed By	Description
1	17/08/2021	Will Steggall	David Stubbs	Completed Report

#### Authorisation

Author name	Will Steggall	Reviewer / approver name	David Stubbs
Author position	Senior Ecologist	Review position	Environmental Consultant
Author signature	Will \$3581	Reviewer / approver signature	Pallas
Date	17/08/2021	Date	17/08/2021

#### Disclaimer

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# **Executive Summary**

The site was assessed in accordance with the requirements of the NSW *Biodiversity Conservation Act 2016*, Biodiversity Conservation Regulation 2017 and the *Commonwealth Environment Protection and Biodiversity Conservation (EPBCA) Act 1999* - Matters of National Environmental Significance (MNES).

#### **Proposed Works**

The proposal is for the upgrade of a 2 km unsealed section of Yarrawa Road, 15 km west of Denman NSW. This will be assessed under Part 5 of the *Environmental Planning and Assessment Act 1979* and this report forms part of a Review of Environmental Factors prepared for the project.

#### **Survey Results**

A site survey was carried out in July 2021. The subject site consists of strips of land contained within and immediately adjacent to the Yarrawa Road reserve. The area is predominately vegetated with dense open forest vegetation. Exotic grass and roadside weeds also occur throughout.

One of the vegetation communities on the site qualifies as a Threatened Ecological Community under the *BC Act.* No threatened flora were detected during surveys. Four threatened fauna species (Varied Sittella, Grey-Crowned Babbler (eastern subspecies), Gang-gang Cockatoo and Speckled Warbler) were observed on survey. A total of 17 threatened fauna species were found to have at least a low potential to occur within the study area and have been assessed in the Test of Significance.

#### Impact of the Proposal

The works will require the removal of 96 trees from several open forest communities, along with areas of native shrubs and groundcover. One large hollow-bearing tree will require removal, and replacement nest boxes are recommended.

There is potential for the works to result in indirect impacts on adjoining vegetation or faunal species utilising the site. These largely relate to mortality during clearing, weed invasion, edge effects, road strike and increased noise at the time of works. Specific mitigation measures are recommended to reduce the potential for indirect impacts.

#### Legislative Compliance

#### State

<u>Koala Habitat Protection SEPP 2020</u>: Assessment of the proposal as per the Koala Habitat Protection SEPP is not required for Part 5 assessments.

<u>Coastal Management SEPP 2018</u>: No area of Littoral Rainforest or Coastal Wetland is mapped within or adjacent to the site.



<u>Biodiversity Conservation Act and Regulation</u>: The potentially occurring species have been assessed as per the Test of Significance. This has determined that the proposal will not result in a significant effect on listed species or ecological communities, or their habitats.

#### Federal

Assessment under the EPBC Act Matters of National Environmental Significance (MNES) determined that the impact of the proposal on MNES was unlikely to be significant. Hence referral to Department of Agriculture, Water and the Environment (DAWE) for approval is not required.

# 1. BACKGROUND INFORMATION

# 1.1 Key Definitions

The subject site is defined as the area of land directly affected by the works (the impact footprint). The study area is land within ten metres of the subject site. The locality is land within a tenkilometre radius of the site.

# 1.2 Site Description

## 1.2.1 Location

The subject site is located on a section of Yarrawa Road, Yarrawa, passing through Kings Gap, approximately 15 km west of Denman, NSW (Figure 1). Land adjoining the site comprises agricultural grazing land and crown land, with Wollemi National Park 2 km to the southwest. Photos of the subject site are displayed in Photos 1-3.

## 1.2.2 Soils, Geology and Topography

The site is located within a steeply undulating landscape, rising in elevation from 180m at the northern and eastern ends to 250m at Kings Gap in the mid-section. Several minor ephemeral drainage lines pass through the site.

The underlying soils within the road corridor will be a modified soil landscape associated with the existing road. Soil landscapes in the vicinity of the site comprise the Benjang Erosional, Benjang Variant A Erosional, Benjang Variant B Colluvial and Sandy Hollow Transferral along the road, comprising deep Red and Brown Solodic soils, deep Red-brown Earths, shallow-moderately deep Non-calcic Brown soils and Red-brown Earths, and moderately deep to deep Earthy Sands and Siliceous Sands respectively (eSapde 2021). Lees Pinch Colluvial occurs on the hilltops either side of Kings Gap, comprising very shallow to shallow Siliceous Sands and Lithosols.

# 1.3 The Proposed Activity

The proposal is for the upgrade of a 2 km unsealed section of Yarrawa Road. This will be assessed under Part 5 of the *Environmental Planning and Assessment Act 1979*.

The works comprise the following activities:

- Locate existing utilities.
- Install works signs and WHS signs.
- Install traffic control to manage traffic, minor delays.
- Locate temporary site compound and stockpile area in a cleared area on the road reserve.
- Install temporary erosion and sediment control measures (E&SC) measures prior to works commencing and maintain throughout project.
- Site and vegetation clearing including removal of trees through the road reserve.
- Chip trees on site and retain woodchips for site stabilisation, and transport remainder to depot stockpile location for offset planting site.
- Stabilise the existing pavement, shoulder reconstruction, pavement overlay prior to primer seal and two coat bitumen seal.



- Stockpile waste materials on the road reserve for reuse on site or transport to approved landfill site.
- Extend existing culverts which have been identified, which are not located within a waterway.
- Reinstate private driveways to match the new pavement.
- Provide batters on either side and stabilise to prevent erosion.
- Recycle and/or transport waste material to an approved landfill facility.
- Apply bitumen seal.
- Install permanent E&SC measures, stabilising site following completion of ground works.
- Complete line marking and reinstate signs.

#### Photo 1: Northern section of Yarrawa Road







Photo 2: Mid-section of Yarrawa Road (crest of hill)

Photo 3: Eastern section of Yarrawa Road





Figure 1: Location of the subject site

# 2. METHODS

# 2.1 Desktop Study and Literature Review

A desktop study was carried out prior to the field survey to gather relevant information and data. The following databases and Geographic Information System (GIS) layers were searched/obtained:

- Department of Agriculture, Water and Environment Protected Matters Search Tool (DAWE 2021).
- NSW BioNet/Atlas of Wildlife (DPIE 2021a).
- NSW Threatened Biodiversity Data Collection (OEH 2019b).
- Coastal Management SEPP Map Viewer (DPE 2021).
- Coastal Quaternary Geology North and South Coast of NSW digital data layer (Troedson & Hashimoto 2008).

# 2.2 Flora Survey

The flora survey consisted of the following:

- Identification, description and mapping of the vegetation communities on the site.
- Searches for threatened species listed under the *Biodiversity Conservation Act 2016 (BC Act) and Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)* undertaken in accordance with the NSW Guide to Surveying Threatened Plants (OEH 2016).
- Identification, mapping and condition assessment of any Endangered Ecological Communities listed under the *BC Act*, and *EPBC Act*.

Flora surveys were carried out by WolfPeak's Senior Ecologist and Ecologist on the 22<sup>nd</sup> July 2021.

#### 2.2.1 Vegetation Classification and Mapping

Vegetation was sampled by walking transects over the total extent of the site as per Cropper (1993). Due to the limited extent of vegetation, the entire site was sampled. Other transects and meanders undertaken during threatened flora searches, general site traverses and fauna survey also informed the vegetation community mapping and allowed a more comprehensive inventory of the flora species present.

The vegetation communities were described from data collected during transect surveys. The site vegetation communities are classified as per the NSW Plant Community Type (PCT) Classification.

Identification of possible EECs was based on the data collected in the survey and review of the relevant listings on the Department of Planning, Industry and Environment (DPIE) website

(www.environment.nsw.gov.au) and Department of Agriculture, Water and Environment MNES SPRAT website (DAWE 2021).

Plant species were identified to species or subspecies level and nomenclature conforms to that currently recognised by the Royal Botanic Gardens via PlantNET (Royal Botanic Gardens 2021).

## 2.2.2 Threatened Flora Species

#### 2.2.2.1 Searches

Searches for the locally recorded threatened flora were carried out over the survey period.

Threatened plant searches consisted of undertaking walking transects throughout the study area targeting habitat most likely to support threatened flora. Opportunistic searches for threatened flora species were also undertaken during other activities. Given the small site area, the combination of these methods allowed a thorough search of its entire extent.

### 2.2.3 Potential Occurrence Assessment

Potential occurrence assessment of threatened flora species is provided in Appendix 2. This section assesses threatened species for their potential to occur on site.

# 2.3 Fauna Survey

#### 2.3.1 Habitat Evaluation

Habitats on and adjacent to the subject site were defined and assessed according to parameters such as:

- Structural and floristic characteristics of the vegetation
- Degree and extent of disturbance
- Presence of aquatic and riparian habitat
- Size and abundance of tree hollows and fallen timber
- Surface rocks and outcrops
- Vegetation connectivity
- Presence of mistletoe, nectar, gum, seed and sap sources.

#### 2.3.2 Secondary Evidence Searches

Habitat searches involved inspection and assessment of potentially suitable habits for potentially occurring threatened species: Searches generally involved:

- Inspection under fallen timber, rocks and debris
- Inspection of dense vegetation, aquatic habitats and leaf litter for frogs and reptiles
- Inspection of trees for Koalas and claw markings



- Searches for Glider sap incisions
- Searches for nests and dreys
- Searches for scats, owl regurgitation pellets, tracks and feeding signs

#### 2.3.3 Direct Observation

This involved passive and active observation of any fauna on or directly adjacent to the subject site during survey activities. Birds and reptiles were the focus of the surveys. Searches for Koalas in the crowns of trees over the site were also undertaken. A total of three hours was spent on this activity over one day in conjunction with the overall site survey.

### 2.3.4 Hollow-bearing Tree Survey

All hollow-bearing trees (HBTs) within and adjoining the subject site were located and recorded via a GPS enabled tablet. These were marked with flagging tape and given an identifier number. Any potential hollows found were inspected for signs of usage and assessed for potential habitat value.

### 2.3.5 Survey Limitations

Given the limited timeframe of the site survey, it can only provide a snapshot of the full species assemblages that may be present on the site throughout the year. Some species only occur in particular seasons or climatic conditions and the detection on such species is recognised as a limitation.

The survey was undertaken in winter which a period of declining fauna activity. Winter migrants such as the Swift Parrot and Regent Honeyeater may be present at this time of year. The survey timing could be a limitation on the detection of terrestrial orchids such as the Pine Donkey Orchid which flowers in September.

To counter any limitations, qualitative and quantitative habitat evaluation was used as well as a standard ecological field survey to assess the site's significance to threatened species.

#### 2.3.6 Weather Conditions

The weather during the survey period was overcast with sporadic rainfall. The nearest weather station (Scone Airport) recorded 0.2mm of rainfall on the day of the survey. The Bureau of Meteorology recorded the maximum temperature on the day as 17.8°C and minimum temperature as 2.7°C.

# 3. RESULTS

# 3.1 Desktop Search Results

## 3.1.1 Locally Recorded Threatened Species

The following table lists the threatened flora and fauna species identified in database and literature searches of the locality.

Table 1:	Locally	recorded	threatened	species

Common Name	Scientific Name	BC Act	EPBC Act	Source
	Flora			
White-flowered Wax Plant	Cynanchum elegans	E	Е	NSW Bionet
-	Ozothamnus tesselatus	V	V	NSW Bionet
-	Senecio linearifolius var. dangarensis	E	-	NSW Bionet
-	Kennedia retrorsa	V	V	NSW Bionet
-	Acacia dangarensis	CE	-	NSW Bionet
Acacia pendula population in the Hunter catchment	Acacia pendula	E	-	NSW Bionet
Wollemi Mint-bush	Prostanthera cryptandroides subsp. cryptandroides	v	V	NSW Bionet
Mount Vincent Mint-bush	Prostanthera stricta	V	V	NSW Bionet
-	Commersonia rosea	E	E	NSW Bionet
-	Lasiopetalum longistamineum	V	V	NSW Bionet
Eucalyptus camaldulensis population in the Hunter	Eucaluntus camaldulensis	F		NSW Bionet
Pokolbin Mallee	Eucalyptus cumula	V	V	NSW Bionet
Fairy Bells	Homoranthus darwinioides	V	V	NSW Bionet
Cymbidium canaliculatum		•		NSW Bionet
population in the Hunter Catchment	Cymbidium canaliculatum	E	-	
Pine Donkey Orchid population in the Muswellbrook local government area	Diuris tricolor	F	_	NSW Bionet
Pine Donkey Orchid	Diuris tricolor	V		NSW Bionet
Scant Pomaderris	Pomaderris queenslandica	F		NSW Bionet
Denman Pomaderris	Pomaderris reperta	CE	CE	NSW Bionet

Common Name	Scientific Name	BC Act	EPBC Act	Source
	Birds			
Gang-gang Cockatoo	Callocephalon fimbriatum	V	-	NSW Bionet
Glossy Black-Cockatoo	Calyptorhynchus lathami	V	-	NSW Bionet
Little Lorikeet	Glossopsitta pusilla	V	-	NSW Bionet
Turquoise Parrot	Neophema pulchella	V	-	NSW Bionet
Powerful Owl	Ninox strenua	V	-	NSW Bionet,
Brown Treecreeper (eastern subspecies)	Climacteris picumnus victoriae	V	-	NSW Bionet
Speckled Warbler	Chthonicola sagittata	V	-	NSW Bionet
Regent Honeyeater	Anthochaera phrygia	CE	CE	NSW Bionet
Black-chinned Honeyeater (eastern subspecies)	Melithreptus gularis gularis	V	-	NSW Bionet
Grey-crowned Babbler (eastern subspecies)	Pomatostomus temporalis temporalis	V	-	NSW Bionet
Varied Sittella	Daphoenositta chrysoptera	V	-	NSW Bionet
Dusky Woodswallow	Artamus cyanopterus cyanopterus	V	-	NSW Bionet
Hooded Robin (south-eastern form)	Melanodryas cucullata cucullata	V	-	NSW Bionet
Painted Honeyeater	Grantiella picta	V	-	NSW Bionet
Diamond Firetail	Stagonopleura guttata	V	-	NSW Bionet
	Mammals			
Spotted-tailed Quoll	Dasyurus maculatus	V	Е	NSW Bionet
Koala	Phascolarctos cinereus	V	V	NSW Bionet
Squirrel Glider	Petaurus norfolcensis	V	-	NSW Bionet
Brush-tailed Rock-wallaby	Petrogale penicillata	E	V	NSW Bionet
Yellow-bellied Sheathtail-bat	Saccolaimus flaviventris	V	-	NSW Bionet
Eastern Coastal Free-tailed Bat	Micronomus norfolkensis	V	-	NSW Bionet
Large-eared Pied Bat	Chalinolobus dwyeri	V	V	NSW Bionet
Eastern False Pipistrelle	Falsistrellus tasmaniensis	V	-	NSW Bionet
Corben's Long-eared Bat	Nyctophilus corbeni	V	V	NSW Bionet
Greater Broad-nosed Bat	Scoteanax rueppellii	V	-	NSW Bionet
Eastern Cave Bat	Vespadelus troughtoni	V	-	NSW Bionet

Common Name	Scientific Name	BC Act	EPBC Act	Source
	Miniopterus orianae	V		NSW Bionet
Large Bent-winged Bat	oceanensis		-	
New Holland Mouse	Pseudomys novaehollandiae	Р	V	NSW Bionet
Key: Critically Endangered (CE), Endangered (E), Vulnerable (V), Migratory (M).				

## 3.1.2 Matters of National Environmental Significance

The results of the MNES search are provided in Section 6. The search was undertaken using a ten-kilometre search radius from the subject site. See Appendix 3 for the full report.

# 3.2 Flora Survey Results

## 3.2.1 Site Vegetation Communities

Vegetation within the study area is generally in good condition, and is mostly remnant vegetarian. Areas of exotic grassland and roadside weeds also occur in the eastern and western ends of the site.

A flora species list is provided in Appendix 1.

Tables 2-4 provide detailed descriptions of the vegetation communities identified on site. See photos following.

#### 3.2.1.1 Dry Sclerophyll Open Forest

#### Table 2: Vegetation community description

Vegetation Community	Grey Gum – Rough-barked Apple – Narrow-leaved Stringybark – Grey Box – Slaty Gum Dry Sclerophyll Open Forest
NSW Plant Community Type (PCT)	Available PCT mapping shows the following PCTS mapped in the study area No 1607: Blakely's Red Gum - Narrow-leaved Ironbark - Rough-barked Apple shrubby woodland of the upper Hunter No 1629: Narrow-leaved Stringybark - Grey Gum shrubby open forest on sandstone ranges of the Sydney Basin No 1691: Narrow-leaved Ironbark - Grey Box grassy woodland of the central and upper Hunter No 1854: Hunter Escarpment Slaty Gum-Box Forest No 1878: Capertee Escarpment Slaty Gum Forest
EEC Status	Areas dominated by Slaty Gum may qualify as <i>Hunter Valley Footslopes Slaty Gum</i> Woodland in the Sydney Basin Bioregion
Location and Area	No 1607: Far eastern lowland section on southern side of the road No 1629: Eastern side of crest No 1691: Far eastern lowland section on northern side of the road No 1854: Lowland and lower slopes of northern and eastern areas of the site No 1878: Upper slopes north and south of the crest
Description	Composition structure varies with topography across the site: Canopy: Structure and Species:

	- On the low elevation areas at the northern and eastern ends of the site, dominant species are Slaty Gum, Grey Box, Narrow-leaved Ironbark and Rough-barked Apple.
	<ul> <li>On the slopes and crest in the middle of the site, dominant species are Grey Gum, Grey Box and Narrow-leaved Ironbark.</li> </ul>
	Height ranges from 15-23 metres with an approximate cover of 40%.
	Understory:
	Structure and Species:
	<ul> <li>On the low elevation areas at the northern and eastern ends of the site, dominant species include Bulloak and Native Olive.</li> </ul>
	<ul> <li>On the slopes and crest in the middle of the site, dominant species are Native Olive, and canopy juveniles.</li> </ul>
	Shrub layer:
	Structure and Species:
	<ul> <li>On the low elevation areas at the northern and eastern ends of the site, dominant species include Knife-leaf Wattle, Broad-leaf Hopbush, Native Blackthorn and Shiny- leaved Canthium</li> </ul>
	<ul> <li>On the slopes and crest in the middle of the site, dominant species are Narrow-leaved Geebung and Coffee Bush</li> </ul>
	Cround layers
	Structure and Species:
	On the low elevation errors at the parthern and elevators and af the site dominant
	<ul> <li>On the low elevation areas at the normern and eastern ends of the site, dominant species include Many-flowered Mat-rush, Red Natal Grass, Barbed-wire Grass, Rock Fern, Corrugated Sida and Kidney Weed.</li> </ul>
	<ul> <li>On the slopes and crest in the middle of the site, ground cover is fairly sparse, with the dominant species including Blueberry Lilly, Purple Burr-Daisy and Yellow Burr-Daisy.</li> </ul>
Condition	Generally in good condition with weed only occurring along the disturbed edges.



Photo 4: Open Forest with Slaty Gum



Photo 5: Open forest with Grey Gum and Grey Box





#### Photo 6: Open Forest in Kings Gap



## 3.2.1.2 Bulloak – Black Cypress Forest

#### Table 3: Vegetation community description

Vegetation Community	Bulloak – Black Cypress Pine Open Forest
NSW Plant Community Type (PCT)	No 1603: Narrow-leaved Ironbark - Bull Oak - Grey Box shrub - grass open forest of the central and lower Hunter
EEC Status	Not an EEC
Location and Area	Occurs on the lower elevation eastern end of the site.
Description	<ul> <li>Canopy:</li> <li>Structure and Species: Dominant species are Bulloak, Black Cypress Pine and Narrow-leaved Ironbark. Height ranges from 10 - 17 metres with approximately 40% cover.</li> <li>Understory:</li> <li>Structure and Species: The understorey layer is generally sparse and is dominated by canopy juveniles and Red Ash. Height ranges from 4-8 metres.</li> <li>Shrub layer:</li> <li>Structure and Species: Consists of Native Blackthorn, Coffee Bush and Headache Vine. Height ranges from 1-3 metres.</li> </ul>



#### Ground layer:

Structure and Species: The dominant species throughout the community are Many-flowered Mat-rush, Hairy Panic, Wiry Panic, Basket Grass and Red Natal Grass.

Condition

Has been partially cleared and modified in the past and has a patchy canopy. Moderate level of weed over in the ground layer.

#### Photo 7: Bulloak Forest Community



#### 3.2.1.3 Exotic Grassland and Roadside weeds

#### Table 4: Vegetation community description

Vegetation Community	Exotic Grassland
NSW Plant Community Type (PCT)	NA
EEC Status	Not an EEC
Location and Area	Occurs on disturbed roadsides and adjoining cleared grazing land on the lower elevation eastern end on the southern side of the road.
Description	<ul> <li>a) Canopy: Absent</li> <li>b) Understory: Absent</li> </ul>

	c) Shrub layer:
	<i>Structure and species:</i> Occasional regrowth shrubs and trees are present and range in height from 0.5-3 metres.
	d) Ground layer:
	Structure and Species: Consists mainly of exotic grasses and forbs with Rhodes Grass ( <i>Chloris gayana</i> ), Wiry Panic ( <i>Entolasia stricta</i> ) and Australian Basket Grass ( <i>Oplismenus aemulus</i> ) being the dominant species. Couch ( <i>Cynodon dactylon</i> ), Brown's Lovegrass ( <i>Eragrostis brownii</i> ), Paddy's Lucerne ( <i>Sida rhombifolia</i> ), White Clover ( <i>Trifolium repens</i> ) and Crofton Weed ( <i>Ageratina adenophora</i> ) are also common.
Condition	This community is in a highly modified state as a result of historical clearing for grazing and road construction. Only a few native species are present.

## Photo 8: Exotic grassland





Figure 2: Veg mapping



#### 3.2.2 Threatened Flora

#### 3.2.2.1 Site Survey and Potential Occurrences

No threatened flora species were detected on site during the field survey.

Searches of relevant literature and databases (DPIE 2021) found records of five threatened flora species in the locality. Several of these records fall in close proximity to the subject site (within 2km of the site). The Protected Matters Search Tool also produced a list of additional potential occurrences in the locality. These are assessed for their potential to occur on site in Appendix 2.

### 3.2.3 Endangered Ecological Communities and Populations

#### 3.2.3.1 Biodiversity Conservation Act 2016

Review of the site vegetation communities has determined that one EEC is likely to occur on the site.

The open forest dominated by Slaty Gum and Grey Box in the lower elevation sections and upper slopes of the site qualifies as the EEC *Hunter Valley Footslopes Slaty Gum Woodland in the Sydney Basin Bioregion.* Characteristic species present include Slaty Gum, Grey Box, Bulloak, Narrow-leaved Ironbark, Knife-leaved Wattle, Native Olive, Barbed Wire Grass, Many-flowered Mat-rush and Corrugated Sida. It occurs as a thin strip within the road reserve with crown land and pasture grassland occurring in adjacent land (Figure 3).



Fig 3: EEC mapping



#### 3.2.3.2 Environment Protection and Biodiversity Conservation Act 1999

Review of the site vegetation communities has determined that they do not qualify as an EEC listed under the EPBC Act.

### 3.2.4 Biosecurity Act Weeds

Weeds species recorded on the site which are priority weeds for the North Coast Region and have obligations under the Biosecurity Act and/or are Weeds of National Environmental Significance (WoNS) are listed within Table 5. These weeds are recommended to be treated with herbicide and removed separately prior to clearing works on the site.

A number of common environmental weeds such as Gomphrena Weed, Red Natal Grass, Paddy's Lucerne, White Clover and Stinking Roger were recorded within the site.

#### Table 5: Biosecurity Act listed weeds

Species	Biosecurity Duty	WoNS listed?	Location and relative abundance
Fireweed (Senecio madagascariensis)	General Biosecurity Duty Prohibition on dealings - Must not be imported into the State or sold	Yes	Occasional plants in areas of exotic grassland.
Asparagus asparagoidesGeneral Biosecurity DutyProhibition on dealings - Must not be imported into the State or sold		Yes	Occasional plants in the eastern end of the site.

# 3.3 Fauna and Habitat Survey Results

#### 3.3.1 Habitat Evaluation

The following table summarises the survey findings for habitat within the study site and the constraints/opportunities it provides for potentially occurring threatened species.

#### Table 6: Habitat constraints/opportunities for threatened species

Habitat component	Site values	Threatened species values
Aquatic	Several ephemeral drainage lines pass under the road, but were dry during the survey.	No suitable habitat for threatened amphibians and waterbirds in the surrounding areas.
Groundcover	Open to moderately dense cover throughout the site consisting of a mix of native and exotic grasses and herbs. Occurs in a partly exposed environment next to a major road.	No potential habitat for Long-nosed Potoroo, Common Planigale, New Holland Mouse or Eastern Chestnut Mouse. No suitable foraging habitat for granivorous parrots.



Logs and debris	Some large logs with hollows present. Some fallen timber and decaying logs present.	Some prey refuge or den options for Phascogale and Quoll.			
Hollows	One hollow-bearing tree was recorded in the clearing footprint, containing small to medium hollows.	Study area has potential dens, roosts and nests for small to medium arboreal mammals, bats, and hollow obligate passerines.			
Flowering trees	A range of eucalypt and wattle species occur on site and in the wider area. This includes winter and summer flowering species. Many of the wattles were in flower during survey.	Wider area contains potential nectar foraging sources for bird and mammal species.			
Sap sources	Most Eucalypt species on site could provide potential sap sources for gliders.	Suitable foraging habitat for Yellow-bellied Glider and Squirrel Glider. No sap incisions noted.			
Primary preferred Koala browse species	Site contains a fair abundance of Grey Gum and Slaty Gum which are preferred species.	Site contains foraging habitat for the Koala. Not recorded during field surveys but is considered to be a potential occurrence.			
Allocasuarinas	Large patches of Bulloak present.	High potential foraging habitat for Glossy Black Cockatoo and Gang Gang Cockatoo.			
Caves, cliffs, overhangs,	Site has some small culverts. Cliffs and overhangs occur nearby outside of the site.	Drains have low potential to provide a roosting site for microbats as they are likely to be too small.			
culverts, bridges		Cliffs and overhangs upslope from the site have potential to provide roosts for cave- roosting bats such as Little Bent-wing Bat and Eastern Cave Bat.			
Corridors and habitat links	The site directly adjoins large forested areas of Crown Land which connects to Wollemi National Park. The roadside vegetation is more important for local fauna movements where it is surrounded by cleared grazing land, and removal of this vegetation will narrow the habitat corridor.	Site vegetation provides connectivity for a variety of fauna species including birds, macropods and potentially arboreal species such as Gliders, Phascogales and Koalas.			

## 3.3.2 Hollow-bearing Trees

The survey recorded one hollow-bearing tree (Photo 10) within the subject site which will require removal. Table 7 summarises the tree species and hollow characteristics and Figure 4 maps the location.



#### Table 7: Hollow-bearing tree data

Tree No.	Tree Species	Tree height (m)*	Tree DBH <sup>1</sup> (cm)*	# and size of hollows	Remove/ retain
HBT1	Grey Box	23	98	4 small 6 medium 1 large	Remove

Key: \* heights are approximate; <sup>1</sup> Diameter at breast height.

#### Photo 9: HBT 1





Figure 4: HBTs

## 3.3.3 Observed Fauna

The main fauna species detected during the survey consisted of common bird species including Red Wattlebird, Scarlet Honeyeater, Double-barred Finch, Striated Pardalote, Pied Butcherbird, Spiny-cheeked Honeyeater and Straw-necked Ibis. Wallaby scats were also detected on survey.

Four threatened species were detected during the survey: Varied Sittella, Grey-Crowned Babbler (eastern subspecies), Gang-gang Cockatoo and Speckled Warbler.

The following table provides a list of the species detected during the survey.

#### Table 8: Fauna species detected

Common Name	Scientific Name	Method of Detection			
Birds					
Torresian Crow	Corvus orru	HC			
Mistletoebird	Dicaeum hirundinaceum	Vis, HC			
Red Wattlebird	Anthochaera carunculata	Vis			
Magpie-lark	Grallina cyanoleuca	HC			
Scarlet Honeyeater	Myzomela sanguinolenta	Vis			
Striated Pardalote	Pardalotus striatus	Vis			
Weebill	Smicrornis brevirostris	HC			
Black-faced Cuckoo-shrike	Coracina novaehollandiae	HC			
Noisy Miner	Manorina melanocephala	HC			
Eastern Whipbird	Psophodes olivaceus	HC			
Crimson Rosella	Platycercus elegans	Vis			
Pied Currawong	Strepera graculina	HC			
Lewin's Honeyeater	Meliphaga lewinii	HC			
Grey Shrike-thrush	Colluricincla harmonica	HC			
Australian Wood Duck	Chenonetta jubata	HC			
Sulphur-crested Cockatoo	Cacatua galerita	HC			
Varied Sittella	Daphoenositta chrysoptera	Vis, HC			
Grey-crowned Babbler (eastern subspecies)	Pomatostomus temporalis temporalis	Vis, HC			
Galah	Eolophus roseicapilla	HC			
Variegated Fairy-wren	Malurus lamberti	Vis			
Yellow Thornbill	Acanthiza nana	Vis HC			
Yellow-faced Honeyeater	Caligavis chrysops	Vis			

Common Name	Scientific Name	Method of Detection		
Double-barred Finch	Stizoptera bichenovii	Vis		
Eastern Rosella	Platycercus eximius	Vis		
Pied Butcherbird	Cracticus nigrogularis	HC		
Straw-necked Ibis	Threskiornis spinicollis	Vis		
Spiny-cheeked Honeyeater	Acanthagenys rufogularis	Vis, HC		
Gang-gang Cockatoo	Callocephalon fimbriatum	Vis, HC		
Speckled Warbler	Chthonicola sagittata	Vis, HC		
	Mammals			
Wallaby sp.Macropus sp.SC				
Key: Vulnerable under BC Act (bold), Vulnerable under EPBC Act (^), Introduced species (*) Observation Key: PIR Camera (Cam), Drey (Dr), Heard Calling (HC), Feeding Signs (FS), Scats (SC), Visual Observation (Vis).				

## 3.3.4 Threatened Species

Four threatened birds were observed during the survey comprising Varied Sittella, Grey-Crowned Babbler (eastern subspecies), Gang-gang Cockatoo and Speckled Warbler. A brief description of the sighting details are provided below and these species are assessed for potential impacts in the Five Part Test.

A small flock of Varied Sittella were observed moving through the northern portion of the site. They were not observed foraging within the site, however the site habitat may provide potential foraging resources. This species would be unlikely to best on the site as it is too open and exposed.

A family group of Grey-crowned Babblers were observed near the centre of the site on adjoining private land to the west. No dreys were observed on any trees within the site, and they would be unlikely to nest on site, however may use habitat on the site for foraging. A few possible dreys were observed on trees adjoining the site (Photo 12).

A small group of approximately four Gang-gang Cockatoos were observed feeding on White Cypress in the southeast of the site (Photo 11). The site contains one large habitat tree that this species could potentially use for breeding.

The Speckled Warbler was briefly observed flying over the site and landing in a tree on adjacent farmland in the southeast of the site. This species may use the site habitat for foraging but is unlikely to nest in any trees in the road reserve due to the presence of higher quality and less exposed habitat on adjoining land.



# Photo 10: Gang-gang Cockatoos foraging in White Cypress







## Photo 11: Grey-crowned Babbler dreys on adjoining land

# 4. IMPACT ASSESSMENT

# 4.1 Direct Impacts

The proposal is to upgrade a 2 km unsealed section of Yarrawa road. Up to 96 native roadside trees will require removal for the road upgrade, including one hollo-bearing tree. Table 9 provides details of the trees requiring removal.

The removal of this vegetation will reduce the extent of foraging habitat for a number of potentially occurring threatened species, including nectar and sap sources, prey habitat and preferred food trees for the Koala. Several of the trees to be removed contain hollows, hence there will be a reduction in potential denning habitat for hollow-obligate fauna species. Removing areas of roadside vegetation in a modified agricultural landscape will also lead to reduced connectivity for less mobile and gap shy fauna species.

No.	Common Name	Scientific Name	Tree height (m)*	Tree DBH <sup>1</sup> (cm)*	Comments
1	Bulloak	Allocasuarina luehmannii	17	20-40	
2	Bulloak	Allocasuarina luehmannii	17	20-40	
3	Bulloak	Allocasuarina luehmannii	17	20-40	
4	Bulloak	Allocasuarina luehmannii	17	20-40	
5	Bulloak	Allocasuarina luehmannii	17	20-40	
6	Bulloak	Allocasuarina luehmannii	17	20-40	
7	Bulloak	Allocasuarina luehmannii	17	20-40	
8	Bulloak	Allocasuarina luehmannii	17	20-40	
9	Bulloak	Allocasuarina luehmannii	17	20-40	
10	Bulloak	Allocasuarina luehmannii	6	5, 6, 5	
11	Bulloak	Allocasuarina luehmannii	11	19	
12	Black Cypress Pine	Callitris endlicheri	15	30	
13	Bulloak	Allocasuarina luehmannii	18	38, 35	
14	Bulloak	Allocasuarina luehmannii	12	22	
15	Bulloak	Allocasuarina Iuehmannii	9	17	

#### Table 9: Details of trees to be removed (in order south-east to north-west)

No.	Common Name	Scientific Name	Tree height (m)*	Tree DBH <sup>1</sup> (cm)*	Comments
16	Bulloak	Allocasuarina luehmannii	12	20	
17	Narrow-leaved Wattle	Acacia linearifolia	13	19	
18	Curracabah	Acacia crassa	11	14	
19	Narrow-leaved Wattle	Acacia linearifolia	8	15	
20	Narrow-leaved Wattle	Acacia linearifolia	9	22	
21	Narrow-leaved Wattle	Acacia linearifolia	10	24	
22	Narrow-leaved Wattle	Acacia linearifolia	10	17, 15	
23	Narrow-leaved Wattle	Acacia linearifolia	9	16	
24	Grey Box	Eucalyptus moluccana	10	13	
25	Grey Box	Eucalyptus moluccana	18	59	
26	Narrow-leaved Wattle	Acacia linearifolia	10	22	
27	Grey Box	Eucalyptus moluccana	13	16, 12	
28	Grey Box	Eucalyptus moluccana	13	20	
29	Grey Box	Eucalyptus moluccana	17	30	
30	Grey Box	Eucalyptus moluccana	12	27	
31	Narrow-leaved Wattle	Acacia linearifolia	12	22	
32	Bulloak	Allocasuarina luehmannii	9	20	
33	Native Olive	Notelaea microcarpa	4	15	
34	Curracabah	Acacia crassa	11	20	
35	Curracabah	Acacia crassa	10	24	
36	Native Olive	Notelaea microcarpa	8	11, 13	
37	Curracabah	Acacia crassa	11	17	
38	Curracabah	Acacia crassa	11	17	
39	Rough-barked Apple	Angophora floribunda	12	18, 18, 16	
40	Narrow-leaved Wattle	Acacia linearifolia	10	20	
41	Acacia sp.		12	29, 19	
42	Black Cypress Pine	Callitris endlicheri	12	15, 5, 13	
43	Red Gum	Eucalyptus blakleyi	13	23	
44	Black Cypress Pine	Callitris endlicheri	11	25, 15	
45	Black Cypress Pine	Callitris endlicheri	9	23	
46	Rough-barked Apple	Angophora floribunda	15	36	
47	Narrow-leaved Wattle	Acacia linearifolia	10	21	
48	Acacia sp.		12	17	
49	Red Ash	Alphintonia excelsa	10	23	
50	Rough-barked Apple	Angophora floribunda	12	21	
51	Rough-barked Apple	Angophora floribunda	9	18	

No.	Common Name	Scientific Name	Tree height (m)*	Tree DBH <sup>1</sup> (cm)*	Comments
52	Rough-barked Apple	Angophora floribunda	8	9	
53	Rough-barked Apple	Angophora floribunda	6	10	
54	Rough-barked Apple	Angophora floribunda	15	42	
55	Rough-barked Apple	Angophora floribunda	12	20	
56	Curracabah	Acacia crassa	8	20	
57	Curracabah	Acacia crassa	10	17	
58	Rough-barked Apple	Angophora floribunda	15	28	
59	Rough-barked Apple	Angophora floribunda	15	30	
60	Rough-barked Apple	Angophora floribunda	6	17	
61	Rough-barked Apple	Angophora floribunda	20	28, 30	
62	Rough-barked Apple	Angophora floribunda	15	40	
63	Rough-barked Apple	Angophora floribunda	18	32	
64	Rough-barked Apple	Angophora floribunda	22	38	
65	Rough-barked Apple	Angophora floribunda	18	33	
66	Red Ash	Alphintonia excelsa	10	15	
67	Rough-barked Apple	Angophora floribunda	20	38, 22	
68	Narrow-leaved Ironbark	Eucalyptus crebra	15	37	
69	Narrow-leaved Wattle	Acacia linearifolia	8	11	
70	Grey Box	Eucalyptus moluccana	18	38	
71	Grey Box	Eucalyptus moluccana	17	28	
72	Narrow-leaved Ironbark	Eucalyptus crebra	18	32	
73	Grey Box	Eucalyptus moluccana	17	29	
74	Grey Box	Eucalyptus moluccana	15	20	
75	Grey Gum	Eucalyptus punctata	12	21	
76	Grey Box	Eucalyptus moluccana	12	29	
77	Bulloak	Allocasuarina luehmannii	6	13	
78	Grey Box	Eucalyptus moluccana	23	98, 49	HBT1
79	Bulloak	Allocasuarina luehmannii	6	12	
80	Grey Box	Eucalyptus moluccana	8	15	
81	Grey Box	Eucalyptus moluccana	8	29	
82	Bulloak	Allocasuarina luehmannii	13	20	
83	Narrow-leaved Ironbark	Eucalyptus crebra	15	30	
84	Red Gum	Eucalyptus blakleyi	5	10, 10, 10, 10, 10	coppiced
85	Bulloak	Allocasuarina luehmannii	8	20	
No.	Common Name	Scientific Name	Tree height (m)*	Tree DBH <sup>1</sup> (cm)*	Comments
-----	------------------------	----------------------	---------------------	--------------------------------	----------
86	Native Olive	Notelaea microcarpa	6	15, 18	
87	Native Olive	Notelaea microcarpa	6	25	
88	Narrow-leaved Ironbark	Eucalyptus crebra	12	18	
89	Black Cypress Pine	Callitris endlicheri	8	12	
90	Narrow-leaved Ironbark	Eucalyptus crebra	15	25, 25	
91	Narrow-leaved Wattle	Acacia linearifolia	8	15	
92	Narrow-leaved Ironbark	Eucalyptus crebra	23	50, 41	
93	Narrow-leaved Ironbark	Eucalyptus crebra	20	49	
94	Curracabah	Acacia crassa	10	27	
95	Curracabah	Acacia crassa	10	20	
96	Curracabah	Acacia crassa	10	23	

Key: \* heights are approximate; <sup>1</sup> Diameter at breast height.

### 4.2 Indirect Impacts

The following potential indirect impacts may be associated with the proposal:

- a) **Injury/mortality during clearing:** The presence of hollow-bearing trees indicates that there is a chance of fauna activity at the time of clearing. Pre-clear surveys and clearing monitoring will be required to reduce the risk of fauna injury during clearing.
- b) **Inadvertent impacts on retained or adjoining vegetation:** If not properly demarcated and protected, it is possible that retained trees and vegetation adjacent to the construction site could be impacted by clearing, earthworks and construction vehicle movements. Recommendations are provided to reduce this risk.
- c) Vegetation Fragmentation: The proposal will contribute local fragmentation as many roadside trees will require removal. This will widen the canopy gap created by the road in some locations which may affect local movements of glider species. Tree removal will also narrow the roadside vegetation community which could make species using this corridor more susceptible to threats, and the remaining vegetation will be susceptible to higher edge effects. The works will not lead to complete isolation of habitat and trees will remain in the road reserve that will continue to provide connectivity for fauna.
- d) Dust: Dust will be generated during construction and may lead to minor impacts on directly adjoining vegetation. Dust suppression will be undertaken on a regular basis to reduce this impact. Dust levels will be greatly reduced once the road is sealed.
- e) *Edge effects:* The removal of trees and vegetation has potential to expose areas of adjoining vegetation to higher edge effects such as wind, light penetration and weed invasion. Most of the vegetation on site is already fragmented and subject to high edge effects, and additional vegetation removal will marginally increase existing edge effects on remaining vegetation.
- f) Road Kill: Sealing the section of Yarrawa Road is likely to lead to increased vehicle speeds. This could lead to a higher incidence of roadkill, especially given the bushland areas occurring wither side of the road. Speeds are however unlikely to be excessive due to the winding road.



- g) **Erosion and sedimentation:** Standard mechanisms and controls should ensure the prevention of erosion and sedimentation during construction and post-development and such impacts do not extend beyond the development footprint.
- h) *Weed invasion:* Weeds currently occur throughout the site. The proposal is unlikely to introduce any new weed species, however may increase the potential for spread of weeds within the site through vegetation modification.
- i) **Noise and vibration:** Currently, noise is derived from traffic and nearby rural areas, hence fauna are likely to have some tolerance to anthropogenic noise. During the development's establishment, noise would be highest during construction, but limited to daytime hence would only impact diurnal birds and mammals.

Post-development, noise levels are expected to return to levels which occurred prior to construction.



## 5. BIODIVERSITY CONSERVATION ACT 2016 ASSESSMENT

#### 5.1 Assessment Pathway

Under the NSW *Biodiversity Conservation Act 2016* and *Biodiversity Conservation Regulation 2017*, Part 5 developments under the *Environmental Planning & Assessment Act 1979* are not required to enter into the Biodiversity Offset Scheme (BOS) as this is an optional assessment pathway.

Given that assessment under the BOS is not required for Part 5 proposals, a test of significance has been carried out to assess the potential impacts of the proposal on threatened species and ecological communities.

### 5.2 Test of Significance

The Test of Significance is prescribed in Part 7, Division 1, Section 7.2 of the *Biodiversity Conservation Act 2016*. The purpose of the Test of Significance is to determine whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats.

If it is determined that a development or activity will have a significant effect, a Biodiversity Development Assessment Report will be required.

The Test of Significance has been prepared in consideration of the *Threatened Species Test of Significance Guidelines* (OEH 2018).

#### 5.2.1 Entities to be Assessed

The Varied Sittella, Grey-Crowned Babbler (eastern subspecies), Gang-gang Cockatoo and Speckled Warbler were recorded in the study area and require assessment. The potential occurrence assessments in Appendix 2 have determined that the following species are considered to be potentially occurring in the study area and are subject to the Test of Significance:

- Scant Pomaderris
- Little Lorikeet
- Dusky Woodswallow
- Glossy Black Cockatoo
- Powerful Owl
- Turquoise Parrot
- Brown Treecreeper
- Hooded Robin
- Diamond Firetail

- Black-chinned Honeyeater
- Yellow-bellied Sheathtail Bat
- Greater Broad-nosed Bat
- Eastern Cave Bat
- Eastern Free-tail Bat
- Large Bent-wing Bat
- Koala
- Spotted-tailed Quoll

#### 5.2.2 Responses

# a) In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

The proposal is to upgrade a 2 km section of Yarrawa Road, Yarrawa. The upgrade will require the removal of up to 96 native trees from edges of several open forest communities. Areas of exotic grassland and weeds will also be removed. One hollow-bearing tree will require removal. There is some potential for minor indirect impacts such as noise, dust and further weed invasion.

While the habitats present on the subject site may provide foraging resources for a number of the subject fauna species, it would not comprise any significant extent of habitat. All the subject species have large home ranges which would be centred on adjacent habitat. Sufficient habitat to support the local populations of these species will remain in surrounding lands which include forested Crown Land and Wollemi National Park. The extent of known/potential foraging habitat for some species will however be reduced due to the extent of tree removal.

The proposed tree removal will reduce foraging habitat for nectar feeding birds and mammals such as the Little Lorikeet and Black-chinned Honeyeater, as well as *Allocasuarinas* and White Cypress for the Gang-gang Cockatoo and Glossy Black Cockatoo. In the context of these species home ranges and the extent of habitat remaining in the study area post works, the removal of roadside trees would be unlikely to affect their foraging success or disrupt breeding.

Several threatened plants have been recorded within 5km of the site and it is possible that some could occur in close proximity to the site or in the outer edges of the study. None are considered likely to occur in the works footprint as this area has been previously disturbed by road construction and maintenance. The road construction may result in indirect impacts on potential adjacent populations, however standard mitigation measures would reduce potential impacts such as dust and erosion and sedimentation.

The one hollow-bearing tree that will require removal contains numerous small to large hollows. This has the potential to provide nesting sites for the Gang-gang Cockatoo as well as hollow-obligate mammals. Removal of this tree would not be expected to substantially impact the lifecycle of hollow-obligate subject species as alternate denning/roosting sites would be available in the wider area and replacement roosting boxes are also proposed. Pre-clearing surveys and supervision of the tree removal by an ecologist will be required to mitigate fauna injury.

Provided the recommendations of this report are successfully implemented, removal of this habitat would be unlikely to place a viable population of the subject species at risk of extinction.

- b) In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:
  - (i) Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or
  - (ii) Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.

There is one endangered ecological community (EEC) located on the subject site comprising the Hunter Valley Footslopes Slaty Gum Woodland. This EEC exists as mature trees in good condition and has a large patch size.

A small extent of this EEC occurs within the footprint and several small patches (totalling approximately 0.8 ha) will require removal. Extensive areas of this EEC will remain adjacent to the site, and the works would not impact an entire local occurrence. The minor impact to the edge of this EEC would not be expected to place the local occurrence at risk of extinction provide mitigation measures to reduce indirect impacts are implemented.

- c) In relation to the habitat of a threatened species or ecological community:
  - (i) The extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and
  - (ii) Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and
  - (iii) The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality.

Habitat to be removed comprises 96 mature native trees from within several open forest communities. Shrubs and groundcover within the communities will also require removal. One hollow-bearing tree with high habitat value will require removal.

The vegetation on site may provide local connectivity for species such as the Spotted-tailed Quoll; and removal of these trees will lead to a minor reduction in connectivity for arboreal species, especially in the east of the site which adjoins cleared farmland. The remaining trees within the community will however allow connectivity to be maintained and no areas of habitat will become isolated as a result of the proposal.

The site offers known and potential habitat for several threatened fauna species however given the extent of modification and limitations of the site habitats, these species would be reliant on adjacent and nearby habitats to fulfil their lifecycle requirements and the site would not be of any key importance.

d) Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),

The proposed development will not directly or indirectly affect an area of outstanding biodiversity value.

## e) Whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.

A Key Threatening Process (KTP) is defined as a process that threatens, or may have the capability to threaten, the survival or evolutionary development of species, populations or ecological communities.

The following table lists the relevant KTP's listed under the BC Act and whether the proposed activity is recognised a threatening process.



#### Table 10: Key threatening processes

КТР	Extent/manner which proposal affects KTP	Mitigable?
Clearing of native vegetation	Loss of up to 96 native trees.	Vegetation removal will be minimised as much as practicable.
Loss of Hollow-bearing trees	One hollow-bearing tree will require removal.	Yes - replacement nest boxes recommended.
Human induced climate change	Use of fossil fuels in plant.	No options available.
Invasion of native plant communities by exotic perennial grasses	Currently present.	Neutral outcome – pasture will remain and roadside weeds will regenerate.

## 6. EPBC ACT MNES ASSESSMENT

### 6.1 Assessment Summary

The provisions of the EPBC Act require determination of whether the proposal has, will or is likely to have a significant impact on a Matter of National Environmental Significance (MNES). These matters are listed and addressed in summary as follows:

Category	Relevance	Significant Impact Likely?
World Heritage Properties	The site is not listed as a World Heritage area	N/A
National Heritage Places	The site is not listed as a National Heritage Place	N/A
Wetlands of International Importance	The site does not contain important wetlands	N/A
Great Barrier Reef Marine Park	The proposal does not affect the Great Barrier Reef Marine Park.	N/A
Commonwealth Marine Environment (CME)	The site is not within the CME.	N/A
Listed Threatened Ecological Communities	No TECs occur on the site.	No TEC is likely to be significantly affected by the proposal.
Listed Threatened Species	The Grey-headed Flying Fox (Vulnerable) is considered a potential occurrence in the study area.	No threatened species is likely to be significantly affected by the proposal as assessed below.
Listed Migratory Species	Several migratory birds are considered potential occurrences in the study area.	No Migratory species is likely to be significantly affected by the proposal.
Nuclear Actions	The proposal is not a nuclear action	N/A
A water resource, in relation to coal seam gas development and large coal mining development	The proposal is not a mining development.	N/A

#### Table 11: MNES Assessment summary

### 6.2 Koala Referral Assessment

Under the Act, proposed actions must be assessed under the Commonwealth Department of the Environment (2014) guidelines, and hence assessment is required. The assessment is three stages:

- 1. Qualification as Critical Koala Habitat assessment.
- 2. Impacts on Critical Koala Habitat.
- 3. Assessment of other threats.



The habitat on site has been assessed using the Koala habitat assessment tool from the EPBC Act Referral Guidelines (DotE 2014) to determine if the site contains habitat critical to the survival of the Koala. To qualify as critical habitat, it must score 5 or more. This is assessed in the following table:

Table 12:	Critical	Koala	Habitat	assessment
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Attribute	Score	Reason		
Koala occurrence	0	Desktop	Three koala records within 10km occur over 15 years ago.	
		On-ground	No evidence of Koala recorded on site.	
Vegetation structure and composition		Desktop	Site vegetation mapping identifies open forest vegetation in the study area.	
	I	On-ground Site contains one spe trees.	Site contains one species of preferred food trees.	
Habitat connectivity	2	Site occurs in a rural landscape directly connected to large forested areas greater than 500ha (Wollemi National Park).		
Key existing threats		Desktop	OEH Bionet contains no records of Koala road kill and dog kill in the locality.	
	1	On-ground	The subject site contains of a major road which would pose a fair risk of road strike. Domestic dogs in surrounding properties would also be a high threat to local Koalas.	
Recovery value		The value of the habitat to be removed to the recovery of the Koala is considered to be low due to:		
	0	• A low number of KFTs on site;		
		<ul> <li>Very few koala records</li> </ul>		
		0	Located in high threat environment	
Total	4	Site does not qualify as critical habitat.		

As per the Koala habitat assessment tool, the site does not qualify as critical habitat and no further assessment is required.

The Guidelines also require consideration of whether the proposed action may interfere with the recovery of the Koala, as follows:



#### Table 13: Impact on recovery assessment

Threat	Likely to increase Y/N	Reason
Increasing Koala fatalities in habitat critical to the survival of the Koala due to dog attacks to a level that is likely to result in multiple, ongoing mortalities.	Ν	Dogs currently present in the area associated with farming. Proposal does not increase this risk.
Increasing Koala fatalities in habitat critical to the survival of the Koala due to vehicle- strikes to a level that is likely to result in multiple, ongoing mortalities.	N	Existing threats posed by existing road in study area. Proposal has no addition to risk as no new road or speed changes.
Facilitating the introduction or spread of disease or pathogens for example Chlamydia or <i>Phytophthora cinnamomi</i> , to habitat critical to the survival of the Koala, that are likely to significantly reduce the reproductive output of Koalas or reduce the carrying capacity of the habitat.	N	No home range trees affected. Not an area of major activity. <i>Phytophthora cinnamomi</i> introduction is a low risk as not known to be key threat in the locality, but is a risk.
Creating a barrier to movement to, between or within habitat critical to the survival of the koala that is likely to result in a long-term reduction in genetic fitness or access to habitat critical to the survival of the Koala.	N	The roadside vegetation would currently provide connectivity for the Koala. The proposal would remove some trees, but many will remain and will continue to provide connectivity.
Changing hydrology which degrades habitat critical to the survival of the Koala to the extent that the carrying capacity of the habitat is reduced in the long-term.	N	No changes to hydrology of local catchment that may adversely affect the adjacent vegetation.
Outcome	Referral not required as	impact unlikely to be significant

### 6.3 Protected Species Assessments

The following EPBC Listed threatened species are considered to potentially occur on the site:

• Spotted-tailed Quoll

An assessment of significance of the proposal on this species is provided in the following section.

#### 6.3.1 Assessment of Significance – Spotted-tailed Quoll

#### Important Population Assessment

An *important population* is one that is necessary for a species' long-term recovery and survival. This includes such populations as:

• Key populations either for breeding or dispersal;



- Populations that are necessary for maintaining genetic diversity; and/or
- Populations that are near the limit of the species range.

The Quoll population potentially utilising the development site is not considered to represent an *important population* of this species due to the small extent habit and that the development site is also not located within the limit of this species' range.

#### Significant Impact Criteria

Table 14: Significant ir	npact assessment – S	potted-tailed Quoll
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Significant Impact Criteria	Details
a) Lead to a long- term decrease in the size of an important population of a species	The proposal will require the removal of a maximum of 96 roadside trees from an area of potential foraging habitat. This vegetation to be removed occurs in a fragmented area historically cleared for logging and agriculture. The study area may provide a small area of habitat for the population relative to its ecological requirements and local extent of potential habitat. This loss is unlikely to have a substantial negative impact on the Quoll populations as the site in total would only form a very minute fraction of this species wider foraging range. The study area has some potential den sites in hollow trees and rock cervices.
b) Reduce the area of occupancy of an important population	The proposal would not reduce the area of occupancy of the important population.
<ul> <li>c) Fragment an</li> <li>existing important</li> <li>population into two</li> <li>or more populations</li> </ul>	The works would remove some roadside vegetation and increase local fragmentation, however the Quoll would still be capable of moving freely through the site and would not become isolated.
d) Adversely affect habitat critical to the survival of a species	The habitat on site is not considered to be critical habitat for the Quoll.
e) Disrupt the breeding cycle of an important population	The works may remove suitable denning habitat for the quoll, but this species would be unlikely to den in close proximity to the road. Higher quality denning habitat exists in adjoining lands. Given that breeding is unlikely to occur on site, the works would not be capable of disrupting the breeding cycle.
f) Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The degree of possible vegetation loss imposed by the proposed development is not significant enough to affect a local population of the Spotted-tailed Quoll to the point that it could cause a decline of the species.
g) Result in invasive species, that are harmful (by competition, modification of habitat, or predation) to a Vulnerable species, becoming established in the Vulnerable species' habitat	No new species that affects the Quoll is likely to be introduced as a direct result of the proposal.



Significant Impact Criteria	Details
<ul> <li>h) Introduce a</li> <li>disease that may</li> <li>cause a species to</li> <li>decline</li> </ul>	No disease that poses a potential risk to this species is likely to be introduced to the site.
i) Interferes substantially with the recovery of the species	The proposal will result in the removal of a relatively minute area of foraging habitat for the Quoll that is not significant enough to interfere with its recovery.
Resulting Impact	No significant impact

The above assessment has determined that the proposal is not considered likely to have a significant impact on the Spotted-tailed Quoll. Referral to the Department of Agriculture, Water and the Environment is not required for this species.

## 6.4 Threatened Ecological Communities

No Threatened ecological communities occur within the study area.

## 7. RECOMMENDATIONS

### 7.1 Vegetation and Habitat Removal Procedures

#### 7.1.1 General

The clearing footprint is to be clearly marked (e.g. with stakes and bunting) before clearing in order to prevent inadvertent clearance beyond what is required and has been assessed. Trees to be removed should be clearly marked with flagging tape or spray paint. No clearing is to occur beyond the marked area, and vehicles are only to be parked in designated areas.

Protection zones are to be established around retained trees and vegetation. Clearing and earthworks is to avoid damage or compaction to root zones of the retained trees.

Trees are not to be felled into adjoining retained vegetation. Vegetation clearing should be undertaken in a sequential manner that does not isolate patches of habitat and gives fauna an opportunity to escape into adjacent habitat.

#### 7.1.2 Pre-Start Briefing

The project ecologist is to conduct a pre-start briefing to clearing and civil contractors prior to the commencement of clearing works. All in attendance are to be informed of the required clearing measures to ensure compliance.

#### 7.1.3 Pre-clearing Survey and Clearing Supervision

The following ameliorative measures should be carried out prior to and during clearing works on the site.

- 1. The clearing extent is to be inspected for fauna by a qualified ecologist immediately prior to commencement of any vegetation removal involving machinery and/or tree-felling. This is to occur each morning if clearing spans over multiple days/weeks. The ecologist is to flag any habitat features which may contain fauna and trees which contain hollows, nests or dreys.
- 2. If a Koala is present in an area subject to vegetation removal/modification, works must be suspended until the Koala moves along on its own volition. If the Koala is located in a position that a 50 metre buffer may be established, works may proceed outside this buffer. In this event, the ecologist is to remain on site to monitor the Koala for signs of distress. If the ecologist determines that the Koala is in distress, works must be suspended within this area until a larger buffer is created or the Koala moves along on its own volition.
- 3. The ecologist is to remain on site to supervise removal of all vegetation and manage any fauna interactions. Other than Koalas, any detected fauna is to be relocated off-site. Any bird nest considered active is to be removed in a manner that allows retrieval of eggs/young, and these are to be taken into care by FAWNA.

#### 7.1.4 Post Clearance Fauna Management Report

Upon completion of clearing, a post clearance fauna management report (with photos) is to be submitted to Council within 14 days of the removal of the vegetation and hollow-bearing trees. The post clearance report must detail the methods and results of the pre-clear surveys and clearing supervision, including

the details and outcome of all fauna interactions during clearing works. The report must also provide evidence that the clearing and habitat removal procedures were adhered to.

#### 7.1.5 Removal of Hollow-bearing Trees

Hollow-bearing trees to be removed are to be felled in a manner that will minimise the risk of injury/mortality of denning/roosting fauna. This is suggested to be achieved by the following general procedure:

- Hollow-bearing trees are to be gently bumped several times prior to removal to encourage any fauna present to vacate. They are then to be removed via 'soft felling' methods with machinery or gradual cut-down by an arborist to minimise injury to fauna. Habitat trees with a high likelihood of containing fauna are to be removed last and should be removed with a crane or other method.
- A qualified ecologist is to be present during felling and sectioning of the hollow-bearing tree (at the proponent's cost) in case of animal injury. Hollows are to be inspected for fauna once the tree is deposited. All uninjured animals are to be released in the retained habitat on the subject site.
- If the hollow is determined to be occupied and fauna do not require assistance (e.g. roosting bats), the entrance is to be blocked and the sectioned log placed in a shaded and protected area on the edge of the subject site. The obstacle is to be removed just prior to dusk to allow passive escape of the fauna within. The log may then be removed if required.

Upon completion of this exercise, a post clearance fauna management report (with photos) detailing the above is to be submitted to Council within 14 days of the removal of the hollow-bearing trees.

### 7.2 Replacement Nest Boxes

Nest boxes are to be installed and maintained to offset the loss of hollow-bearing trees at one nest boxes per observed hollow. The one hollow-bearing tree impacted contains 11 hollows; thus it is recommended that 11 nest boxes are installed to offset the loss of these habitat trees. These are to be constructed of ACQ treated timber and mounted by an ecologist prior to clearing of the subject site's hollow-bearing trees.

It is recommended that the following nest boxes are installed:

- Four microbat boxes
- Two small parrot boxes
- Three small glider/Phascogale boxes
- Two large glider/possum boxes



A brief report detailing the following is to be provided to Council within 14 days of mounting:

- GPS coordinates of the nest boxes (with nest boxes numbered consecutively).
- Host tree species, trunk DBH, and height.
- Mounting height and aspect of each nest box.

The nest boxes are to be monitored and maintained annually for a period of ten years. Any damaged boxes are to be replaced or repaired and any exotic species such as European bees are to be removed.

#### 7.3 Site Compounds

Site compounds are to be located in currently cleared areas either in the road reserve or adjoining private land. The REF prepared for the project provides potential locations for site compounds.

### 7.4 Sedimentation and Erosion Controls

Standard soil and sedimentation control measures will be required throughout the clearing and construction works to ensure that habitats on the site and in the study area, as well as any downstream aquatic habitats are not substantially affected by erosion and sedimentation.

### 7.5 Weed Control

Disturbance of the sites soils during vegetation removal and construction has potential to encourage weed invasion. Hence, it is recommended that:

- Disturbance of vegetation and soils on the site should be limited to the areas of the proposed work and should not extend into adjacent vegetation;
- To assist in reducing the spread of exotic species, all vehicles and machinery are to be inspected for the presence of weeds prior to entering the site;
- Invasive Biosecurity Act listed weeds (i.e. Lantana, Fireweed) within the clearing footprint are appropriately treated and collected prior to clearing and are disposed of within a landfill facility; and
- Any new weed infestations that arise within the works area during construction are to be treated and removed.

## 8. CONCLUSION

This report has assessed the impact of the upgrade of a section of Yarrawa Road, 15km west of Denman NSW. The site is located in a rural area and surrounding vegetation consists of a mix of exotic pasture grassland and dry sclerophyll open forest communities. Up to 96 trees will require removal for the proposal which includes one large hollow-bearing tree.

No threatened flora species were recorded on site during the survey. One vegetation community qualifies as an Endangered Ecological Community and a small extent will require removal.

Four threatened fauna species were identified on site comprising the comprising Varied Sittella, Grey-Crowned Babbler (eastern subspecies), Gang-gang Cockatoo and Speckled Warbler. A total of 17 threatened fauna species were also identified as having potential to use the site as a small part of a larger range. Assessment of these species concluded they were unlikely to be significantly impacted by the proposal due to their ecology, the historical disturbance of the site and the mitigation measures proposed. Hence neither a referral to the DAWE or a Biodiversity Development Assessment Report is required.

A number of mitigation measured have been developed to reduce the impacts of the proposal on flora, fauna and ecological communities. These include pre-clearing surveys and clearing supervision, weed control and offset plantings.

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## Appendix 1: Site Vegetation List

#### Table 15: Vegetation list for the site

Common Name	Scientific Name	Frequency		
Canopy Trees				
Curracabah	Acacia crassa	С		
Narrow-leaved Wattle	Acacia linearifolia			
Bulloak	Allocasuarina luehmannii	D		
Rough-barked Apple	Angophora floribunda	0		
Black Cypress Pine	Callitris endlicheri	С		
Blakely's Red Gum	Eucalyptus blakelyi	R		
Narrow-leaved Ironbark	Eucalyptus crebra	С		
Slaty Gum	Eucalyptus dawsonii	С		
Dwyer's Red Gum	Eucalyptus dwyeri			
Grey Box	Eucalyptus moluccana	С		
Understory Tr	ees, Shrubs and Vines			
Knife-leaf Wattle	Acacia cultriformis	С		
Cooba	Acacia salicina	U		
-	Allocasuarina gymnanthera			
Bulloak	Allocasuarina luehmannii	D		
Bridal Creeper	Asparagus asparagoides	0		
Coffee Bush	Breynia oblongifolia	С		
Native Blackthorn	Bursaria spinosa	0		
Black Cypress Pine	Callitris endlicheri	0		
Cough Bush	Cassinia laevis	0		
Broad-leaf Hopbush	Dodonaea viscosa subsp. spatulata	0		
Cherry Ballart	Exocarpos cupressiformis	U		
-	Grevillea arenaria	С		
Blunt Beard-heath	Leucopogon muticus			
Peach Heath	Lissanthe strigosa			
-	Monotoca spp.	0		
Native Olive	Notelaea microcarpa	D		
Narrow-leaved Geebung	Persoonia linearis			
-	Pomaderris elliptica	U		
Shiny-leaved Canthium	Psydrax odorata			
Bead bush	Teucrium junceum	U		
Grasses				
Speargrass	Austrostipa scabra	0		

Common Name	Scientific Name	Frequency
Slender Bamboo Grass	Austrostipa verticillata	0
Windmill Grass	Chloris truncata	0
Headache Vine	Clematis glycinoides	С
Common Couch	Cynodon dactylon	С
Wattle Matt-rush	Lomandra filiformis	С
Spiny-headed Mat-rush	Lomandra longifolia	0
Many-flowered Mat-rush	Lomandra multiflora subsp. multiflora	С
Red Natal Grass	Melinis repens	0
Native Millet	Panicum decompositum	С
Hairy Panic	Panicum effusum	0
Corrugated Sida	Sida corrugata	С
Paddy's Lucerne	Sida rhombifolia	С
Gr	oundcovers	
Woodruff	Asperula spp.	U
Purple Burr-Daisy	Calotis cuneifolia	0
Yellow Burr-daisy	Calotis lappulacea	0
Purple flower	Calotis spp.	0
Bristly Cloak Fern	Cheilanthes distans	U
Rock Fern	Cheilanthes sieberi	С
Common Everlasting	Chrysocephalum apiculatum	0
Blueberry Lily	Dianella revoluta	0
Kidney Weed	Dichondra repens	0
Fishweed	Einadia trigonos	0
Amulla	Eremophila debilis	U
Variable Glycine	Glycine tabacina	0
Gomphrena Weed	Gomphrena celosioides	С
Slender Wire Lily	Laxmannia gracilis	0
-	Lepidium sp	
Lamb's Tongues	Plantago lanceolata	0
-	Rhodanthe spp.	С
Fireweed	Senecio madagascariensis	С
Variable Groundsel	Senecio pinnatifolius	U
Stinking Roger	Tagetes minuta	С
White Clover	Trifolium repens	0
Purpletop	Verbena bonariensis	U
Sprawling Bluebell	Wahlenbergia gracilis	U

Common Name	Scientific Name	Frequency
Key: Introduced species (*), Dominar Uncommon (U), Rare (R).	nt (D), Common (C), Occasional (O	),



## Appendix 2: Potential Occurrence Assessment

#### A2.1 Flora

#### Table 16: Potential occurrence assessment – flora

Species	BC Act	EPBC Act	No. of Records	Link to Profile	Likelihood of Occurrence	Significance Assessment Required?
White-flowered Wax Plant Cynanchum elegans	Е	E	3	http://www.environment.nsw.gov.au/thr eatenedspeciesapp/profile.aspx?id=10 196	This species predominately occurs in dry rainforest and littoral rainforest communities. Site habitat is likely to be unsuitable and too disturbed to support this species.	No
Ozothamnus tesselatus	V	V	1	https://www.environment.nsw.gov.au/th reatenedSpeciesApp/profile.aspx?id=1 0581	Occurs in eucalypt woodland. Site likely to be too disturbed. Unlikely to occur.	No
Senecio linearifolius var. dangarensis	Е	-	9	https://www.environment.nsw.gov.au/th reatenedspeciesapp/profile.aspx?id=20 041	Grows on an open scree slope and in woodland and rainforest communities on basalt. Site does not contain suitable habitat, unlikely to occur.	No
Kennedia retrorsa	V	V	29	https://www.environment.nsw.gov.au/th reatenedSpeciesApp/profile.aspx?id=1 0442	Found in a variety of habitats from mountainsides to riparian zones, from sheltered forest to steep, exposed rocky ridgelines. Site has marginal potential habitat but not found during survey. Very low to unlikely chance of occurrence.	No
Acacia dangarensis	CE	-	22	https://www.environment.nsw.gov.au/th reatenedSpeciesApp/profile.aspx?id=2 0028	Occurs in sclerophyll woodland on the edge of dry rainforest on basalt and basalt colluvium. No suitable habitat and site is outside known distribution.	No
Acacia pendula population in the Hunter catchment Acacia pendula	Е	-	5	https://www.environment.nsw.gov.au/th reatenedspeciesapp/profile.aspx?id=10 967	Within the Hunter catchment the species typically occurs on heavy soils, sometimes on the margins of small floodplains, but also in more undulating locations. Np preferred habitat on site and not found during survey.	No

Species	BC Act	EPBC Act	No. of Records	Link to Profile	Likelihood of Occurrence	Significance Assessment Required?
Wollemi Mint-bush Prostanthera cryptandroides subsp. cryptandroides	V	V	3	https://www.environment.nsw.gov.au/th reatenedspeciesapp/profile.aspx?id=10 673	In the Denman-Gungal area, this species occurs on rocky ridgelines on Narrabeen Group Sandstones in association with a range of communities. Site habitat and topography unlikely to be suitable. Unlikely to occur.	No
Mount Vincent Mint-bush Prostanthera stricta	V	V	8	https://www.environment.nsw.gov.au/th reatenedspeciesapp/profile.aspx?id=10 681	Often a locally dominant undershrub in heath or scrub communities along cliff edges, or as an understorey species within a range of open forest or tall open forest types, or in adjacent transitional communities. Site habitats likely to be unsuitable and too disturbed. Unlikely to occur.	No
Commersonia rosea	E	E	8	https://www.environment.nsw.gov.au/th reatenedspeciesapp/profile.aspx?id=10 940	Occurs on skeletal sandy soils in scrub or heath vegetation with occasional emergents of Narrow-leaved Ironbark ( <i>Eucalyptus crebra</i> ), Black Cypress Pine ( <i>Callitris endlicheri</i> ) or <i>E. caleyi</i> subsp. <i>caleyi</i> . Site likely to be too disturbed and not found during survey.	No
Lasiopetalum longistamineum	V	v	97	https://www.environment.nsw.gov.au/th reatenedSpeciesApp/profile.aspx?id=1 0452	Grows in rich alluvial deposits. Site habitat unlikely to be suitable.	No
Eucalyptus camaldulensis population in the Hunter catchment Eucalyptus camaldulensis	E	-	3	https://www.environment.nsw.gov.au/th reatenedSpeciesApp/profile.aspx?id=1 0968	May occur with Eucalyptus tereticornis, Eucalyptus melliodora, Casuarina cunninghamiana subsp. cunninghamiana and Angophora floribunda. Most of the occurrences (19 known stands) are on private land and there are no known occurrences in conservation reserves. Site habitat is unsuitable and not found during survey. Unlikely to occur.	No
Pokolbin Mallee Eucalyptus pumila	V	V	1	https://www.environment.nsw.gov.au/th reatenedSpeciesApp/profile.aspx?id=1 0309	The single known population occupies north-west- facing slopes derived from sandstone. Present as a mid-canopy species to a height of 6 m within dry sclerophyll woodland which has a canopy comprising <i>Eucalyptus fibrosa, Callitris endlicheri</i>	No



Species	BC Act	EPBC Act	No. of Records	Link to Profile	Likelihood of Occurrence	Significance Assessment Required?
					and, to a lesser extent, <i>Corymbia maculata</i> . Site is located outside the known distribution. Unlikely to occur.	
Fairy Bells Homoranthus darwinioides	V	V	1	https://www.environment.nsw.gov.au/th reatenedspeciesapp/profile.aspx?id=10 409	Grows in in various woodland habitats with shrubby understoreys, usually in gravely sandy soils. Site may contain some suitable habitat but there are no proximate records and I was not found during survey. Unlikely to occur.	No
Cymbidium canaliculatum population in the Hunter Catchment Cymbidium canaliculatum	E	-	2	https://www.environment.nsw.gov.au/th reatenedSpeciesApp/profile.aspx?id=2 0049	Typically grows in the hollows, fissures, trunks and forks of trees in dry sclerophyll forest or woodland, where its host trees typically occur on Permian Sediments of the Hunter Valley floor. Site has suitable habitat but not found during survey. Unlikely to occur.	No
Pine Donkey Orchid population in the Muswellbrook local government area Diuris tricolor	E	-	9	https://www.environment.nsw.gov.au/th reatenedspeciesapp/profile.aspx?id=20 075	Found in sclerophyll woodland and derived grassland on flats or small rises, on a range of substrates including sandy or loamy soils. Site has some suitable habitat but is likely to be too disturbed from road construction and maintenance. Records within 3km of the site. Very low chance of occurrence.	No
Pine Donkey Orchid Diuris tricolor	V	-	9	https://www.environment.nsw.gov.au/th reatenedSpeciesApp/profile.aspx?id=1 0243	As above.	No
Scant Pomaderris Pomaderris queenslandica	Е	-	51	https://www.environment.nsw.gov.au/th reatenedspeciesapp/profile.aspx?id=10 656	Found in moist eucalypt forest or sheltered woodlands with a shrubby understorey, and occasionally along creeks. Site has suitable habitat but nearest records are over 6km away. Not found on site but low chance of occurrence of being present in study area.	Yes
Denman Pomaderris Pomaderris reperta	CE	CE	41	https://www.environment.nsw.gov.au/th reatenedspeciesapp/profile.aspx?id=10 657	Recorded from a small number of sites along a single ridgeline near Denman in the upper Hunter Valley.	No



Species	BC Act	EPBC Act	No. of Records	Link to Profile	Likelihood of Occurrence	Significance Assessment Required?
					Occupies woodland in association with Eucalyptus crebra, E. blakelyi, Notelaea microcarpa and Allocasuarina littoralis.	
					Site may have suitable habitat but is outside known distribution. Unlikely to occur.	
Key: Critically Endangered (CE), Endangered (E), Vulnerable (V).						

#### A2.2 Fauna

#### Table 17: Potential Occurrence Assessment - fauna

Species	BC Act	EPBC Act	No. of Records	Link to Profile	Likelihood of Occurrence	Significance Assessment Required?
				Birds		
Glossy Black Cockatoo Calyptorhynchus lathami	V	-	14	http://www.environment.nsw.gov. au/threatenedspeciesapp/profile.a spx?id=10140	This species occurs in woodlands and dry sclerophyll forest. <i>Allocasuarinas</i> are required as a food resource. Only a small potential foraging resource exists on site, with higher quality habitat occurring in nearby forests. Low potential to occur.	Yes
Little Lorikeet Glossopsitta pusilla	V	-	2	https://www.environment.nsw.gov. au/threatenedspeciesapp/profile.a spx?id=20111	This species usually occurs in riparian habitats and forages in the canopy of open eucalypt forest and woodland. Site has suitable foraging and nesting habitat, fair chance of occurrence.	Yes
Turquoise Parrot Neophema pulchella	V	-	1	https://www.environment.nsw.gov. au/threatenedSpeciesApp/profile. aspx?id=10555	Lives on the edges of eucalypt woodland adjoining clearings, timbered ridges and creeks in farmland. Site contains suitable habitat, fair chance of occurrence.	Yes



Powerful Owl Ninox strenua	v	-	1	http://www.environment.nsw.gov. au/threatenedspeciesapp/profile.a spx?id=10562	This species occurs in sclerophyll forests and requires an abundance and diversity of prey species Prey species are likely scarce across the study area, however there is some potential to forage over the site as part of a larger range. Low chance of occurrence.	Yes
Brown Treecreeper (eastern subspecies) Climacteris picumnus victoriae	v	-	9	https://www.environment.nsw.gov. au/threatenedspeciesapp/profile.a spx?id=10171	This species is found in eucalypt woodlands and dry open forest. Fallen timber is an important component for foraging. Site contains suitable habitat, fair chance of occurrence.	Yes
<b>Regent Honeyeater</b> Anthochaera phrygia	CE	CE	3	https://www.environment.nsw.gov. au/threatenedSpeciesApp/profile. aspx?id=10841	The species inhabits dry open forest and woodland, particularly Box-Ironbark woodland, and riparian forests of River Oak. Only a minor extent of suitable habitat on site with higher quality habitat occurring nearby offsite. Unlikely to occur.	No
Painted Honeyeater Grantiella picta	V	V	4	https://www.environment.nsw.gov. au/threatenedspeciesapp/profile.a spx?id=10357	Inhabits Boree/ Weeping Myall (Acacia pendula), Brigalow (A. harpophylla) and Box-Gum Woodlands and Box-Ironbark Forests. Site habitat unlikely to be suitable due to lack of preferred habitat associations. Unlikely to occur.	No
Black-chinned Honeyeater (eastern subspecies) Melithreptus gularis gularis	V	-	1	https://www.environment.nsw.gov. au/threatenedspeciesapp/profile.a spx?id=10523	Occupies mostly upper levels of drier open forests or woodlands dominated by box and ironbark eucalypts, especially Mugga Ironbark (Eucalyptus sideroxylon), White Box (E. albens), Inland Grey Box (E. microcarpa), Yellow Box (E. melliodora), Blakely's Red Gum (E. blakelyi) and Forest Red Gum (E. tereticornis). Also inhabits open forests of smooth-barked gums, stringybarks, ironbarks, river sheoaks (nesting habitat) and tea-trees. Fair chance of occurrence.	Yes
Dusky Woodswallow Artamus cyanopterus cyanopterus	V	-	2	https://www.environment.nsw.gov. au/threatenedSpeciesApp/profile. aspx?id=20303	This typically woodland species is very occasionally found in moist forest or rainforest. Site contains	Yes



					generic foraging habitat. Low to fair chance of occurrence.	
Hooded Robin (south-eastern form) Melanodryas cucullata cucullata	V	-	2	https://www.environment.nsw.gov. au/ThreatenedSpeciesApp/profile. aspx?id=10519	This species prefers lightly wooded country, usually open eucalypt, acacia scrub and mallee near open areas. Forest habitats on site are too dense and generally unsuitable for this species	No
Diamond Firetail Stagonopleura guttata	V	-	2	https://www.environment.nsw.gov. au/threatenedspeciesapp/profile.a spx?id=10768	Found in grassy eucalypt woodlands, including Box- Gum Woodlands. Broadly suitable habitat on site, low chance of occurrence.	Yes
				Mammals		
Spotted-tailed Quoll Dasyurus maculatus	V	E	5	http://www.environment.nsw.gov. au/threatenedspeciesapp/profile.a spx?id=10207	This species prefers forest habitats with dense vegetation. They require forest with suitable den sites such as rock crevices, caves, hollow logs, burrows and tree hollows. Study area has some potential habitat and adjoins areas of highly suitable habitat. Low chance of occurrene.	Yes
Koala Phascolarctos cinereus	V	V	3	https://www.environment.nsw.gov. au/threatenedSpeciesApp/profile. aspx?id=10616	A small extent of preferred food trees occur within the subject site and study area. No Koalas recorded and Koala scat searches failed to detect evidence of the Koala during the survey. Site has several referred food tree species and large areas of habitat adjoin the site. Numerous threats to Koalas also present. Low chance of occurrence.	Yes
Squirrel Glider Petaurus norfolcensis	V	-	1	http://www.environment.nsw.gov. au/threatenedspeciesapp/profile.a spx?id=10604	The Squirrel Glider has a preference for wet and dry sclerophyll forests and woodlands. This species requires abundant tree hollows for refuge and nest sites. Site habitat unlikely to be suitable. Unlikely to occur	No
Brush-tailed Rock-wallaby Petrogale penicillata	E	V	3	https://www.environment.nsw.gov. au/threatenedSpeciesApp/profile. aspx?id=10605	Occupy rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures, caves and ledges. Suitable habitat occurs nearby, but not on the site. Unlikely to occur.	No
Yellow-bellied Sheathtail-bat Saccolaimus flaviventris	V	-	3	http://www.environment.nsw.gov. au/threatenedspeciesapp/profile.a spx?id=10741	Wide-ranging species found across northern and eastern Australia. Roosts singly or in groups of up to six, in tree hollows and buildings. Forages in most	Yes



					habitats across its range. Potential of occurrence within site.	
Eastern Coastal Free-tailed Bat Micronomus norfolkensis	v	-	1	http://www.environment.nsw.gov. au/threatenedspeciesapp/profile.a spx?id=10544	This species is most commonly recorded in woodland habitats with available roosting habitat such as tree hollows, house eaves and roofs. Potential foraging habitat occurs on site, fair potential to occur.	Yes
Large-eared Pied Bat Chalinolobus dwyeri	V	V	6	http://www.environment.nsw.gov. au/threatenedSpeciesApp/profile. aspx?id=10157	Roosts in caves (near their entrances), crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the Fairy Martin. Found in well-timbered areas containing gullies. Unlikely to occur within site.	No
Eastern False Pipistrelle Falsistrellus tasmaniensis	v	-	1	https://www.environment.nsw.gov. au/threatenedspeciesapp/profile.a spx?id=10331	This species prefers moist habitats, with trees taller than 20 m. It generally roosts in eucalypt hollows but has also been found under loose bark on trees or in buildings. Low potential to occur.	Yes
<b>Corben's Long-eared Bat</b> Nyctophilus corbeni	V	V	1	https://www.environment.nsw.gov. au/threatenedspeciesapp/profile.a spx?id=10568	Inhabits a variety of vegetation types, including mallee, bulloke ( <i>Allocasuarina leuhmanni</i> ) and box eucalypt dominated communities, but it is distinctly more common in box/ironbark/cypress-pine vegetation that occurs in a north-south belt along the western slopes and plains of NSW. Roosts in tree hollows, crevices, and under loose back. Site habitats unlikely to be suitable	No
Greater Broad-nosed Bat Scoteanax rueppellii	V	-	1	https://www.environment.nsw.gov. au/threatenedSpeciesApp/profile. aspx?id=10748	This species is most commonly recorded in woodland habitats with available roosting habitat such as tree hollows, house eaves and roofs. Site offers potential foraging habitat. Low to fair likelihood of occurrence.	Yes
Eastern Cave Bat Vespadelus troughtoni	V	-	3	https://www.environment.nsw.gov. au/threatenedSpeciesApp/profile. aspx?id=10829	Preferred habitats are dry sclerophyll forest and woodland. This species roosts in caves, overhangs and disused mine shafts. Site has suitable habitat with potential roosting occurring near the site. Fair chance of occurrence.	Yes



Large Bent-winged Bat Miniopterus orianae oceanensis	V	-	5	http://www.environment.nsw.gov. au/threatenedspeciesapp/profile.a spx?id=10534	This species inhabits a range of community types however is most common in well-forested areas, often found roosting in caves, old mines and old buildings. The subject site may potentially provide a small extent of foraging habitat for this species. Moderate chance of occurrence.	Yes
<b>New Holland Mouse</b> Pseudomys novaehollandiae	-	V	1	http://www.environment.gov.au/cg i- bin/sprat/public/publicspecies.pl?t axon_id=96	This species requires heathlands with a dense understory. Suitable habitat for this species does not occur on site. Unlikely to occur.	No
Key: Critically Endangered (CE), Endangered (E), Vulnerable (V), Migratory (M).						



Appendix 3: EPBC Act Protected Matters Report



Australian Government

Department of Agriculture, Water and the Environment

# **EPBC** Act Protected Matters Report

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

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

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

Report created: 10/08/21 16:18:11

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



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2015

Coordinates Buffer: 10.0Km



## Summary

## Matters of National Environmental Significance

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

World Heritage Properties:	1
National Heritage Places:	1
Wetlands of International Importance:	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	4
Listed Threatened Species:	41
Listed Migratory Species:	15

## Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Land:	3
Commonwealth Heritage Places:	None
Listed Marine Species:	21
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

## **Extra Information**

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

State and Territory Reserves:	2
Regional Forest Agreements:	1
Invasive Species:	32
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

## Details

## Matters of National Environmental Significance

World Heritage Properties		[Resource Information]
Name	State	Status
Greater Blue Mountains Area	NSW	Declared property
National Heritage Properties		[Resource Information]
Name	State	Status
Natural		
The Greater Blue Mountains Area	NSW	Listed place
Wetlands of International Importance (Ramsar)		[Resource Information]
Name		Proximity
Hunter estuary wetlands		100 - 150km upstream

## Listed Threatened Ecological Communities

[Resource Information]

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

Name	Status	Type of Presence
Central Hunter Valley eucalypt forest and woodland	Critically Endangered	Community likely to occur within area
Hunter Valley Weeping Myall (Acacia pendula) Woodland	Critically Endangered	Community may occur within area
River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria	Critically Endangered	Community may occur within area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community likely to occur within area
Listed Threatened Species		[Resource Information]
Name	Status	Type of Presence
Birds		
Anthochaera phrygia		
Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area
Botaurus poiciloptilus		
Australasian Bittern [1001]	Endangered	Species or species habitat

	Lindangered	may occur within area
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Erythrotriorchis radiatus		
Red Goshawk [942]	Vulnerable	Species or species habitat may occur within area
Falco hypoleucos		
Grey Falcon [929]	Vulnerable	Species or species habitat known to occur within area
Grantiella picta		
Painted Honeyeater [470]	Vulnerable	Species or species habitat known to occur within area
Hirundapus caudacutus		
White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area

Name	Status	Type of Presence
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Polytelis swainsonii Superb Parrot [738]	Vulnerable	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
Frogs		
Heleioporus australiacus Giant Burrowing Frog [1973]	Vulnerable	Species or species habitat may occur within area
Litoria booroolongensis Booroolong Frog [1844]	Endangered	Species or species habitat may occur within area
Mammals		
<u>Chalinolobus dwyeri</u> Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat known to occur within area
Dasyurus maculatus maculatus (SE mainland population Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	<u>on)</u> Endangered	Species or species habitat known to occur within area
Nyctophilus corbeni Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat likely to occur within area
Petauroides volans Greater Glider [254]	Vulnerable	Species or species habitat may occur within area
Petrogale penicillata Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat known to occur within area
Phascolarctos cinereus (combined populations of Qld, Note Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	<u>NSW and the ACT)</u> Vulnerable	Species or species habitat known to occur within area
<u>Pseudomys novaehollandiae</u> New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat known to occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour may occur within area
Plants		
<u>Acacia dangarensis</u> [55214]	Critically Endangered	Species or species habitat known to occur within area
<u>Androcalva procumbens</u> [87153]	Vulnerable	Species or species habitat known to occur within area
Androcalva rosea Sandy Hollow Commersonia [86861]	Endangered	Species or species habitat known to occur within area
Cynanchum elegans White-flowered Wax Plant [12533]	Endangered	Species or species

Name	Status	Type of Presence
		habitat may occur within area
Eucalyptus pumila Pokolbin Mallee [16510]	Vulnerable	Species or species habitat known to occur within area
Euphrasia arguta [4325]	Critically Endangered	Species or species habitat may occur within area
Homoranthus darwinioides [12974]	Vulnerable	Species or species habitat known to occur within area
Kennedia retrorsa [19716]	Vulnerable	Species or species habitat likely to occur within area
<u>Lasiopetalum longistamineum</u> [19181]	Vulnerable	Species or species habitat known to occur within area
<u>Ozothamnus tesselatus</u> [56203]	Vulnerable	Species or species habitat likely to occur within area
Pomaderris brunnea Rufous Pomaderris, Brown Pomaderris [16845]	Vulnerable	Species or species habitat may occur within area
Pomaderris reperta Denman Pomaderris [77103]	Critically Endangered	Species or species habitat known to occur within area
Prasophyllum sp. Wybong (C.Phelps ORG 5269) a leek-orchid [81964]	Critically Endangered	Species or species habitat likely to occur within area
Prostanthera cryptandroides subsp. cryptandroides Wollemi Mint-bush [68496]	Vulnerable	Species or species habitat known to occur within area
Prostanthera discolor [17756]	Vulnerable	Species or species habitat likely to occur within area
Prostanthera stricta Mount Vincent Mintbush [17616]	Vulnerable	Species or species habitat known to occur within area
<u>Thesium australe</u> Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat may occur within area
<u>Wollemia nobilis</u> Wollemi Pine [64545]	Critically Endangered	Species or species habitat likely to occur within area
Reptiles		
Aprasia parapulchella Pink-tailed Worm-lizard, Pink-tailed Legless Lizard [1665]	Vulnerable	Species or species habitat likely to occur within area
Delma impar Striped Legless Lizard, Striped Snake-lizard [1649]	Vulnerable	Species or species habitat may occur within area
Listed Migratory Species		[Resource Information]
* Species is listed under a different scientific name on the	ne EPBC Act - Threatened	Species list.
Name Migratory Marine Birds	Threatened	Type of Presence

Name	Threatened	Type of Presence
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat may occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat known to occur within area
<u>Motacilla flava</u> Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat likely to occur within area
<u>Rhipidura rufifrons</u> Rufous Fantail [592]		Species or species habitat likely to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
<u>Calidris ferruginea</u> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
<u>Calidris melanotos</u> Pectoral Sandpiper [858]		Species or species habitat may occur within area

Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]

Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]

Pandion haliaetus Osprey [952]

Tringa nebularia Common Greenshank, Greenshank [832] Species or species habitat likely to occur within area

Critically Endangered

Species or species habitat may occur within area

Species or species habitat may occur within area

Species or species habitat may occur within area
#### Other Matters Protected by the EPBC Act

Commonwealth Land		[Resource Information]
The Commonwealth area listed below may the unreliability of the data source, all propo Commonwealth area, before making a defir department for further information.	indicate the presence of Commonwe osals should be checked as to whethe nitive decision. Contact the State or T	alth land in this vicinity. Due to er it impacts on a erritory government land
Name		
Commonwealth Land - Commonwealth Land - Australian Telecom Defence - Myambat Barracks	munications Commission	
Listed Marine Species		[Resource Information]
* Species is listed under a different scientifi	c name on the EPBC Act - Threatene	ed Species list.
Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos		
Common Sandpiper [59309]		Species or species habitat may occur within area
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea ibis		
Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata		
Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos		
Pectoral Sandpiper [858]		Species or species habitat may occur within area
Chrysococcyx osculans		
Black-eared Cuckoo [705]		Species or species habitat

Gallinago hardwickii

Latham's Snipe, Japanese Snipe [863]

Haliaeetus leucogaster White-bellied Sea-Eagle [943]

Hirundapus caudacutus White-throated Needletail [682]

Lathamus discolor Swift Parrot [744]

Merops ornatus Rainbow Bee-eater [670]

Monarcha melanopsis Black-faced Monarch [609]

Monarcha trivirgatus Spectacled Monarch [610] Species or species habitat likely to occur within area

known to occur within area

Species or species habitat likely to occur within area

Species or species habitat likely to occur within area

Critically Endangered Species or species habitat likely to occur within area

Vulnerable

Species or species habitat may occur within area

Species or species habitat may occur within area

Species or species

Name	Threatened	Type of Presence
Motacilla flava		habitat known to occur within area
Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca		
Satin Flycatcher [612]		Species or species habitat likely to occur within area
Numenius madagascariensis		
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus		
Osprey [952]		Species or species habitat may occur within area
Rhipidura rufifrons		
Rufous Fantail [592]		Species or species habitat likely to occur within area
Rostratula benghalensis (sensu lato)		
Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area
Tringa nebularia		
Common Greenshank, Greenshank [832]		Species or species habitat may occur within area

### Extra Information

State and Territory Reserves	[Resource Information]
Name	State
Goulburn River	NSW
Wollemi	NSW

Regional Forest Agreements		[Resource Information]	
Note that all areas with completed RFAs have	/e been included.		
Name		State	
North East NSW RFA		New South Wales	
Invasive Species		[Resource Information]	
Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.			
Name	Status	Type of Presence	
Birds			
Acridotheres tristis			
Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area	
Alauda arvensis			
Skylark [656]		Species or species habitat likely to occur within area	
Carduelis carduelis			
European Goldfinch [403]		Species or species habitat likely to occur	

Name	Status	Type of Presence
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		within area Species or species habitat
Passer domesticus		likely to occur within area
House Sparrow [405]		Species or species habitat likely to occur within area
Streptopelia chinensis		
Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat
		likely to occur within area
Turdus merula		
Common Blackbird, Eurasian Blackbird [596]		Species or species habitat
		likely to occur within area
Frogs		
Rhinella marina		
Cane Toad [83218]		Species or species habitat
		likely to occur within area
Mammals		
Bos taurus		
Domestic Cattle [16]		Species or species habitat likely to occur within area
Domestic Cattle [16] Canis lupus familiaris		Species or species habitat likely to occur within area
Domestic Cattle [16] Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area Species or species habitat likely to occur within area
Domestic Cattle [16] Canis lupus familiaris Domestic Dog [82654] Felis catus		Species or species habitat likely to occur within area Species or species habitat likely to occur within area
Domestic Cattle [16] Canis lupus familiaris Domestic Dog [82654] Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area Species or species habitat likely to occur within area Species or species habitat likely to occur within area
Domestic Cattle [16] Canis lupus familiaris Domestic Dog [82654] Felis catus Cat, House Cat, Domestic Cat [19] Feral deer		Species or species habitat likely to occur within area Species or species habitat likely to occur within area Species or species habitat likely to occur within area

Lepus capensis Brown Hare [127]

Species or species habitat likely to occur within area

Mus musculus House Mouse [120]

Oryctolagus cuniculus Rabbit, European Rabbit [128]

Rattus norvegicus Brown Rat, Norway Rat [83]

Rattus rattus Black Rat, Ship Rat [84]

Sus scrofa Pig [6]

Vulpes vulpes Red Fox, Fox [18] Species or species habitat likely to occur within area

Species or species habitat likely to occur within area

Species or species habitat likely to occur within area

Species or species habitat likely to occur within area

Species or species habitat likely to occur within area

Species or species habitat likely to occur within area

Plants

Name	Status	Type of Presence
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Cylindropuntia spp. Prickly Pears [85131]		Species or species habitat likely to occur within area
Genista sp. X Genista monspessulana Broom [67538]		Species or species habitat may occur within area
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat likely to occur within area
Nassella trichotoma Serrated Tussock, Yass River Tussock, Yass Tusso Nassella Tussock (NZ) [18884]	ock,	Species or species habitat likely to occur within area
Opuntia spp. Prickly Pears [82753]		Species or species habitat likely to occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]	S.x reichardtii	Species or species habitat likely to occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kari Weed [13665]	ba	Species or species habitat likely to occur within area
Senecio madagascariensis Fireweed, Madagascar Ragwort, Madagascar Groundsel [2624]		Species or species habitat likely to occur within area

Tamarix aphylla Athel Pine, Athel Tree, Tamarisk, Athel Tamarisk, Athel Tamarix, Desert Tamarisk, Flowering Cypress, Salt Cedar [16018]

Species or species habitat likely to occur within area

# Caveat

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

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

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

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

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

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

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

- migratory and
- marine

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

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

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

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

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

### Coordinates

-32.39545 150.53409

## Acknowledgements

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

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

-Australian Institute of Marine Science

-Reef Life Survey Australia

-American Museum of Natural History

-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania

-Tasmanian Museum and Art Gallery, Hobart, Tasmania

-Other groups and individuals

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

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

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