Review of Environmental Factors

January 2022

Prepared by JJ Ryan Consulting Pty Ltd for Muswellbrook Shire Council

www.jjryan.com.au

ABN: 69 145 797 726

JJR-2210915F

Version History

Version Number	Prepared By	Revision Date	Approved By	Approval Date	Description
0.1	Dr Leanne Sparrow	17-Jan-22	Dr Leanne Sparrow	28-Jan-22	Draft REF Report
1.0	Dr Leanne Sparrow	18-Feb-22	Dr Leanne Sparrow	18-Feb-22	Final REF Report

Important Notice

This report is confidential and is provided solely for the purposes of Muswellbrook Shire Council ("Council"). This report is provided pursuant to a Consultancy Agreement between JJ Ryan Consulting Pty Ltd ("JJR") and Council under which JJR undertook to perform a specific and limited task. This report is strictly limited to the matters stated in it and subject to the various assumptions, qualifications and limitations in it and does not apply by implication to other matters. JJR makes no representation that the scope, assumptions, qualifications and exclusions set out in this report will be suitable or sufficient for other purposes nor that the content of the report covers all matters which you may regard as material for your purposes.

The report supersedes all previous draft or interim reports, whether written or presented orally, before the date of this report. This report has not and will not be updated for events or transactions occurring after the date of the report or any other matters which might have a material effect on its contents, or which come to light after the date of the report. JJR is not obliged to inform you of any such event, transaction or matter nor to update the report for anything that occurs, or of which JJR becomes aware, after the date of this report.

Unless expressly agreed otherwise in writing JJR does not accept a duty of care or any other legal responsibility whatsoever in relation to this report, or any related enquiries, advice or other work, nor make any representation in connection with this report, to any person other than the Council. Any other person who receives a draft or a copy of this report (or any part of it) or discusses it (or any part of it) or any related matter with JJR, does so on the basis that he or she acknowledges and accepts that he or she may not rely on this report nor on any related information or advice given by JJR for any purpose whatsoever.

Contents

IMPORTANT NOTICE II

1 INTRODUCTION 1

1.1 Purpose of Report 1
1.2 Background 1
1.3 Existing Environment 1
1.3.1 Location *1*
1.3.2 Site Description *2*
1.3.3 Surrounding Development *2*
1.3.4 Bushfire *2*

2 PROPOSED DEVELOPMENT 3

2.1 Development Description 3

3 ENVIRONMENT 3

3.1 Environmental Desktop Assessment 3
3.2 Ecological Assessment 4
3.3 Heritage Assessment 4

4 PLANNING CONTEXT 6

4.1 Commonwealth Legislation 6
4.1.1 Environmental Protection and Biodiversity Conservation Act 1999 (EPBC) *6*
4.2 NSW Legislation 6
4.2.1 Environmental Planning and Assessment Act 1979 ..... *6*
4.2.2 Biodiversity Conservation Act 2016 ..... *7*
4.2.3 Fisheries Management Act 1994 ..... *7*
4.2.4 Heritage Act 1977 ..... *7*
4.2.5 National Parks and Wildlife Act 1974 ..... *7*
4.2.6 Protection of the Environment Operations Act 1997 ..... *7*
4.2.7 Roads Act 1993 ..... *8*
4.2.8 Water Management Act 2000 ..... *8*
4.3 Environmental Planning Instruments 8
4.3.1 State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017 ..... *8*
4.3.2 State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007 ..... *9*
4.4 Muswellbrook Shire Local Environmental Plan 2009 9
4.5 Muswellbrook Shire Development Control Plan 2009 10
4.5.1 Environmental Matters *10*
4.5.2 Flooding Prone Land *10*
4.5.3 Heritage Conservation *10*
4.5.4 Erosion and Sediment Control *10*
4.5.5 Contaminated Land *10*

5 CONSIDERATION OF ENVIRONMENTAL FACTORS 11

5.1 Part 5 of the EP&A Act 11

6 RECOMMENDATION 11

6.1 Approvals 11
6.2 Mitigation Measures 11

APPENDICES 1

APPENDIX A: ENVIRONMENTAL PROTECTION AND CONSERVATION BIODIVERSITY ACT 1999 PMST REPORT 2

APPENDIX B: ECOLOGICAL REPORT PREPARED BY AME ECOLOGY 3

APPENDIX C: ABORIGINAL DUE DILIGENCE HERITAGE ASSESSMENT REPORT PREPARED BY HERITAGE NOW 4

Tables

Table 6.1 Review of environmental factors listed in clause 228 of the EP&A Regulation 2000 12

Figures

Figure 1.1 Muswellbrook LGA Location 1
Figure 1.2 Site Location 2
Figure 1.3 Overlays affecting subject site: (A) bushfire prone land; (B) SEPP 3
Figure 4.1 Location of Heritage sites and SEPP (Mining, Petroleum, and Extractive Industries) 2007 . 8

1 Introduction

1.1 Purpose of Report

The purpose of this report is to undertake a Review of Environmental Factors (REF) on behalf of Muswellbrook Shire Council (the Council) as part of an investigation for replacement of a concrete bridge over Rosebrook Creek at Muswellbrook, under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

According to the EP&A Act, Muswellbrook Shire Council, for this activity is both a public authority and proponent (EP&A Act s.5.3) and determining authority (EP&A Act s.5.1). The REF has been provided in line with Clause 228 of the EP&A Regulation 2000.

1.2 Background

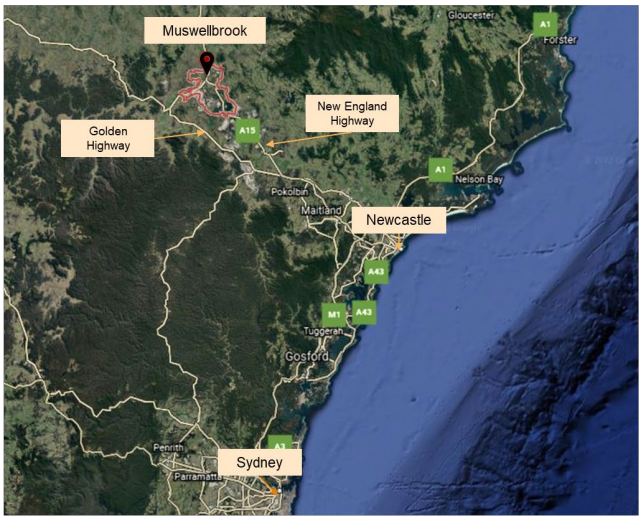
The Council has identified that the existing bridge over Rosebrook Creek along Wybong Road, Muswellbrook has insufficient carrying capacity for all vehicle types. JJ Ryan Consulting (JJR) was appointed by the Council to undertake relevant investigations and concept design for a replacement concrete bridge that has a carrying capacity capable of supporting all vehicle types.

This REF has been provided to inform the determining authority (Muswellbrook Shire Council) of environmental matters that are likely to influence or affect the concept design for the replacement bridge.

1.3 Existing Environment

1.3.1 Location

The subject site is located within the Muswellbrook Local Government Area (LGA), and the land of the Wanaruah Local Aboriginal Land Council. Muswellbrook LGA is centrally located in the Upper Hunter Valley, approximately 130km north-west of Newcastle and about 243km north of Sydney (Figure 1.1).



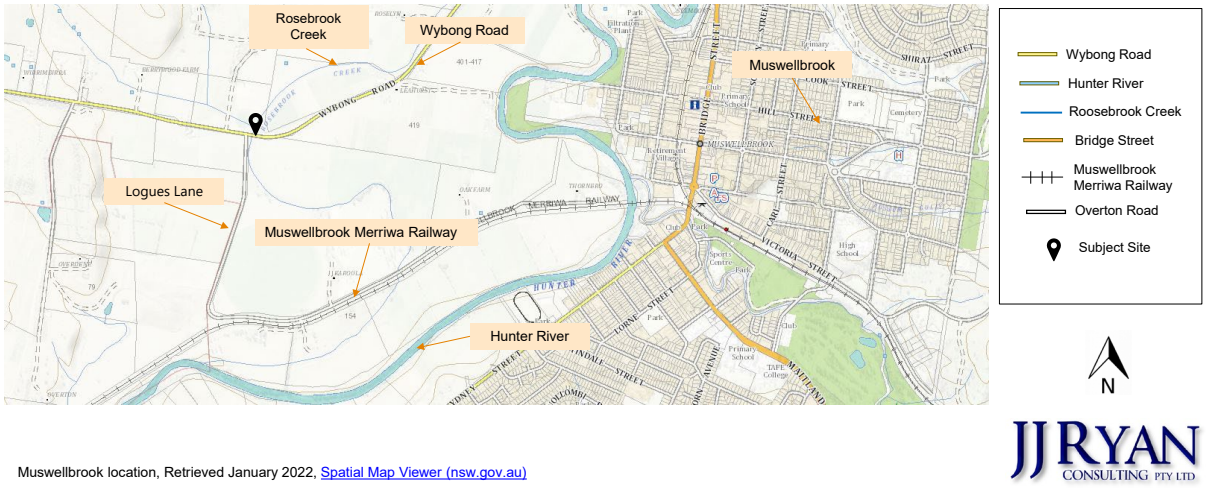
Muswellbrook location, Retrieved January 2022 Google Earth

Wybong Road connects regional towns, including Sandy Hollow and Wybong as well as adjoining agricultural and mining landuses to the regional arterial road network and to regional facilities located within the Muswellbrook regional centre.

1.3.2 Site Description

Rosebrook Creek in the vicinity of Wybong Road, where it crosses Rosebrook Creek is defined as the subject site. The Geographical location of Rosebrook bridge is located at approximately 298714.116E, 6428420.123N and is about 2.5 km west of the Muswellbrook regional centre. (Figure 1.2)

The subject site is located within a RU1 Primary Production zone under the Muswellbrook Local Environmental Plan (LEP) 2009.



Muswellbrook location, Retrieved January 2022, Spatial Map Viewer (nsw.gov.au)

JJ RYAN CONSULTING PTY LTD

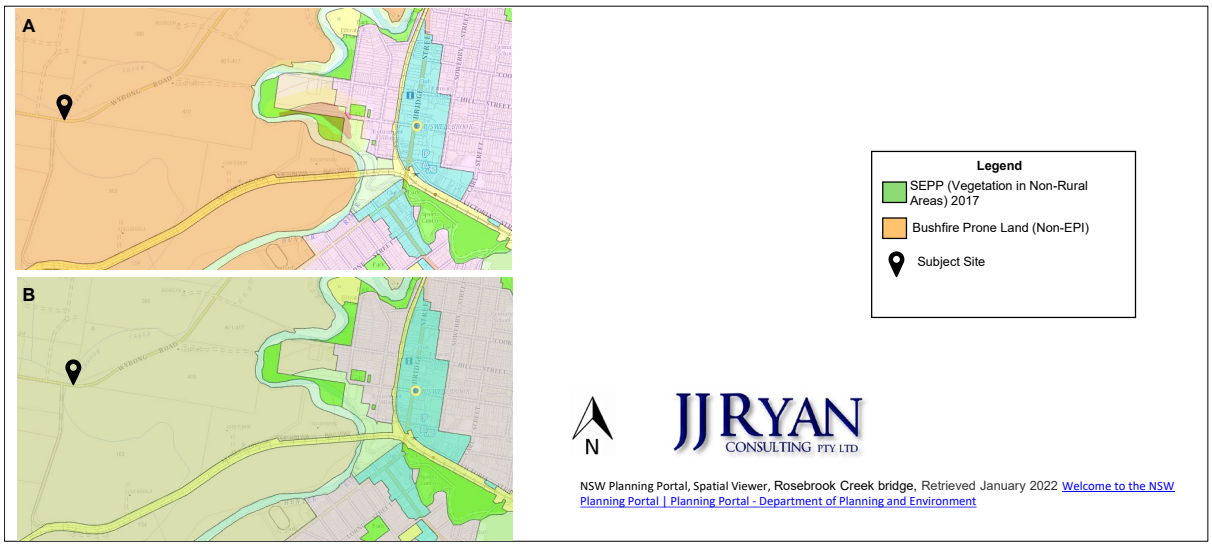
1.3.3 Surrounding Development

The subject site is surrounded by rural lands that are zoned for primary production (RU1) under the Muswellbrook LEP. Mining is the predominate landuse adjoining Wybong Road, with other primary production landuses adjoining Wybong Road including a farm stay tourist site and Yarraman Estate winery.

1.3.4 Bushfire

The subject site is located within the bushfire prone area (Figure 1.3A), however the proposed works for the design and construction of a new bridge along Wybong Road, Muswellbrook are not subject to an approval by the NSW Rural Fire Service.

It is recommended that any Construction Environmental Management Plan (CEMP) ensure all workers are aware of exit points in case of a bushfire emergency and that contractor liaise with the NSW Rural Fire Service prior to undertaking any construction works that may increase the risk of bushfire, especially on days of high or extreme risk of bushfire.



2 Proposed Development

2.1 Development Description

The existing bridge is a two-span timber bridge with a concrete substructure, which has an overall length of 18.8m and width of 7.2m. A recent bridge assessment for the Council determined that the bridge does not have enough carrying capacity for all vehicle types. The bridge provides essential access to several mines, including the Bengalla coal mine, about 1.5km west of the bridge as well as access between regional towns and the Muswellbrook regional centre.

Rosebrook Creek is an intermittent, tributary stream of the Hunter River system. The creek is frequently a dry bed, only flowing after sufficient rain has occurred in the locality.

3 Environment

Protection of significant biodiversity and environmental values within New South Wales (NSW) incorporate matters of national significance listed under the federal *Environmental Protection and Conservation Biodiversity Act 1999* (EPBC) and matters of state significance is managed under the NSW *Biodiversity Conservation Act 2016* (BC Act). Significant biodiversity and environmental values including monitoring the occurrence and management of threatened or significant species and/or ecological habitats.

3.1 Environmental Desktop Assessment

An environmental desktop assessment was undertaken by JJR to evaluate likely occurrence of threatened or significant species and/or ecological habitats within the vicinity of the subject site.

Assessment of the likely occurrence of national significant biodiversity values at the subject site was undertaken by a search of the EPBC Protected Matters Search Tool (PMST) in November 2021. The search result identified a total of 28 threatened species (23 fauna and 5 flora species) and two ecological communities known or likely to occur within the wider study area (5km radius of the subject site). The PMST report is attached to this report (Appendix A).

A review of state significant biodiversity values was undertaken in November 2021 and identified 19 fauna and 6 flora species that are likely to occur within the wider study area.

3.2 Ecological Assessment

A report was prepared by AME Ecology, which presented the findings from an ecological survey undertaken by AME Ecology on 7 and 8 December 2021.

A rapid desktop analysis using Bionet Atlas was undertaken to evaluate threatened species likely to occur within a 10km radius of the subject site. A review of the listed species identified 12 threatened fauna species, including nine microbat species to have potential habitat within the subject site area. No threatened flora species were identified to likely to occur within the subject site area. The field survey focussed on the 12 identified fauna species with potential habitat within the subject site area.

The survey recorded 29 plant species within the subject site, which were predominately noxious weeds, including 11 species listed under the *Biosecurity Act 2015* as High Threat Weeds and/or Weeds of National Significance. No threatened fauna or native vegetation species were recorded during the surveys. A total of 21 fauna species were recorded during the survey and comprised of amphibians, birds and terrestrial mammals, All recorded fauna species were common species associated with disturbed lands and farmland, including swallows (*Hirundo neoxena*) that were observed roosting under the bridge however, there was no evidence that nocturnal birds, flying foxes or bat species used the bridge to roost.

It was noted that although there was evidence of potential roosting habitats for microbats under the Rosebrook Creek Bridge, however, none were recorded or observed during the survey.

The full report and recommendations are attached to this report (Appendix B).

3.3 Heritage Assessment

An Aboriginal Due Diligence Heritage Assessment report was prepared by Heritage Now, which included a desktop assessment and a field survey.

A field survey was undertaken by Heritage Now on 9 December 2021 and observed an elevated, flat creek bank along both sides of Rosebrook Creek, which was located approximately 15m south of the existing bridge. This topography was considered to have archaeological potential based on previous archaeological findings in the area and knowledge that creeks and rivers in the Hunter Valley are known to have a sensitivity for archaeological items.

The report prepared by Heritage Now indicates that the location of the proposed bridge is not considered to be sensitive based on previous disturbances related to construction of the existing bridge and roadways, subject to construction works associated with the new bridge do not disturb or impact the identified area of sensitivity located 15 m south of the existing.

The area of archaeological sensitivity is to be avoided, if it cannot be avoided then further archaeological testing will be required before ground disturbance works take place.

Four recommendations are detailed in the report, including that the area of archaeological sensitivity is avoided during constructions works. The full report and recommendations are attached to this report (Appendix C).

Table 3.1 Threatened Species

Scientific Name	Common Name	NSW BC Act	EPBC Act	Type of Presence Species or species habitat occurrence within area is…
Birds				
Anthochaera phrygia	Regent honeyeater	CE	CE	Known
Botaurus poiciloptilus	Australasian bittern	V	-	Likely
Calidris ferruginea*	Curlew sandpiper	-	CE	May
Erythrotriorchis radiatus	Red goshawk	E	-	Likely
Falco hypoleucos	Grey falcon	V	-	Likely
Grantiella picta	Painted honeyeater	V	V	Likely
Hirundapus caudacutus	White-throated needletail	-	-	Known
Lathamus discolor*	Swift parrot	V	CE	Likely
Numenius madagascariensis	Eastern curlew, Far eastern curlew	-	-	May
Polytelis swainsonii*	Superb parrot	V	-	May
Rostratula australis	Australian painted snipe	E	E	May
Frogs				
Heleioporus australiacus	Giant burrowing frog	V	V	May
Litoria aurea	Green and golden bell frog	E	-	May
Litoria booroolongensis	Booroolong frog	E	E	May
Mammals				
Chalinolobus dwyeri	Large-eared pied bat, Large pied bat	V	V	Known
Dasyurus maculatus maculatus (SE mainland population)	Spot-tailed quoll, Spotted-tail quoll, Tiger quoll (SE mainland population)	V	V	Known
Nyctophilus corbeni	Corben's long-eared bat, South-eastern long-eared bat	V	V	Known
Petrogale penicillata	Brush-tailed rock-wallaby	V	V	Known
Phascolarctos cinereus	Koala	V	V	Known
Pteropus poliocephalus	Grey-headed flying-fox	-	V	Likely
Plants				
Cynanchum elegans	White-flowered wax plant	E	-	May
Eucalyptus glaucina	Slaty red gum	V	-	Known
Euphrasia arguta	-	E	E	May
Pomaderris brunnea	Rufous pomaderris, Brown pomaderris	E	V	Likely
Prasophyllum sp. Wybong	a leek-orchid	-	CE	May
Pterostylis gibbosa	Illawarra greenhood, Rufa greenhood, Pouched greenhood	E	E	May
Thesium australe	Austral toadflax, Toadflax	V	V	Likely
Reptiles				
Aprasia parapulchella	Pink-tailed worm-lizard, Pink-tailed legless lizard	V	V	May
Delma impar	Striped legless lizard, Striped snake-lizard	V	-	May
Migratory Terrestrial Species				
Monarcha melanopsis	Black-faced Monarch	-	T CAMBA, JAMBA, ROKAMBA	Known
Motacilla flava	Yellow Wagtail	-	T CAMBA, JAMBA, ROKAMBA	May
Myiagra cyanoleuca	Satin Flycatcher	-	V	Known
Rhipidura rufifrons	Rufous Fantail	-	Bonn	Likely
Migratory Wetlands Species				
Actitis hypoleucos	Common Sandpiper	-	V	May
Calidris acuminata	Sharp-tailed Sandpiper	-	V	May
Calidris melanotos	Pectoral Sandpiper	-	CE	May
Gallinago hardwickii	Latham's Snipe, Japanese Snipe	-	Bonn, JAMBA, ROKAMBA	Likely
Pandion haliaetus	Osprey	V	Bonn	May

Table 2.2 Ecological Communities

Ecological Communities	BC Act	EPBC Act	Type of Presence
Central Hunter Valley eucalypt forest and woodland	E\V	CE	Likely
Hunter Valley Weeping Myall (*Acacia pendula*) Woodland	CE	CE	May
River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria	-	-	May

4 Planning Context

4.1 Commonwealth Legislation

4.1.1 Environmental Protection and Biodiversity Conservation Act 1999 (EPBC)

The Commonwealth EPBC Act 1999 provides legislative protection for Matters of National Environmental Significance (MNES), including all nationally threatened fauna and flora species, and ecological communities.

Australia's Commonwealth and National heritage databases were accessed from the Federal Department of Agriculture, Water and Environment (https://www.environment.gov.au/heritage/places/national-heritage-list) on 27 January 2022 and no historically significant places or locations were identified within 2km radius of the project site. It is noted that the Muswellbrook Post Office is listed on the Commonwealth heritage places and is located within the Muswellbrook central business district, approximately 19km from the subject site.

A search of the EPBC databases for matters of national significance was undertaken using the Protected Matters Search Tool (PMST), which generated a report of threatened fauna, vegetation, and ecological communities likely to occur within the wider study area (5km radius from the subject site). The PMST report identified 28 threatened species and two ecological communities known or likely to occur within the wider study area, with the full results of the PMST report attached to this report (Appendix A).

4.2 NSW Legislation

4.2.1 Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment Act 1979* (EP&A Act) provides the primary planning legislation in NSW, with any type of development assessed in accordance with the provisions of Part 4 or 5 of the EP&A Act.

As Council is the proponent and determining authority, under Part 5 of the EP&A Act, the Council has a statutory responsibility to consider the environmental impacts of the proposed works, being the design and construction of a new bridge along Wybong Road, Muswellbrook. This report provides consideration of the likely environmental impacts of the proposed works, which are defined as *activity* under section 5.1, as the proposed works means *carrying out work* (section 5.1, (1) (d)).

The factors that must be considered are defined in the *Environmental Planning & Assessment Regulation 2000*, under section 228. These factors have been addressed in section 5 of this report.

4.2.2 Biodiversity Conservation Act 2016

A search of the NSW Bionet Atlas was undertaken as part of the desktop assessment detailed in section 3.1 above. A rapid desktop assessment using the NSW Bionet Atlas was completed prior to a field survey undertaken by AME Ecology on 7 and 8 December 2021. A review of the listed species identified 12 threatened fauna species, including nine microbat species to have potential habitat within the subject site area and were the focus of the survey. The full report and recommendations are attached to this report (Appendix B).

4.2.3 Fisheries Management Act 1994

Rosebrook Creek is an intermittent tributary of the Hunter River system, which is frequently a dry bed, only flowing after sufficient rain has occurred in the locality. Section 219 and 220 of the *Fisheries Management Act 1994* states that a permit is required where proposed works may create a barrier or block the passage of fish.

The proposed design and construction of a new bridge across Rosebrook Creek as part of Wybong Road is considered a lawful obstruction of the waters under the *Roads Act 1993*. The proposed new bridge will be designed to minimise any barrier to fish movement. There is potential that temporary barriers may be required in the event that Rosebrook Creek has flowing water during the construction period for the replacement bridge. A search of the federal and state biodiversity databases did not identify any threatened aquatic species however, it is recommended that Council liaise with the Department of Primary Industries prior to the commencement of any construction works.

4.2.4 Heritage Act 1977

The Heritage Act 1977 is managed by the NSW Heritage Office and protects European or non-Indigenous heritage. A search of the State Heritage Inventory (https://www.heritage.nsw.gov.au/search-for-heritage/state-heritage-inventory) in January 2022 identified several heritage items listed under State heritage and the Muswellbrook Local Environmental Plan. The listed items were not located within a 2km radius of the subject site and the proposed works are unlikely to impact on any listed heritage items within the area.

4.2.5 National Parks and Wildlife Act 1974

The *National Parks and Wildlife Act 1974* provides for the management and regulation of natural and cultural heritage within NSW.

An Aboriginal Due Diligence Heritage Assessment report was prepared by Heritage Now in December 2021 and no registered Aboriginal cultural heritage items or places were found within the area of the subject site. The report observed a flat embankment on both sides of Rosebrook Creek, located approximately 15m south of the existing bridge, which was considered to have archaeological potential.

The report recommended that the area not to be disturbed during construction works for the replacement bridge. The full report and recommendations are attached to this report (Appendix C).

4.2.6 Protection of the Environment Operations Act 1997

The provisions of the Protection of the Environment Operations Act 1997 include ‘to protect, restore and enhance the quality of the environment in New South Wales, having regard to the need to maintain ecologically sustainable development’. Schedule 1 of the Act lists scheduled activities that require an Environment Protection licence to be obtained from the Office of Environment and Heritage. The proposed works, being the design and construction of a new bridge along Wybong Road, Muswellbrook

is not within the definition of road construction as described in Schedule 1 and therefore a licence is not required for the proposed works.

4.2.7 Roads Act 1993

The proposed design and construction of a new bridge across Rosebrook Creek as part of Wybong Road is considered a lawful obstruction of the waters under the *Roads Act 1993*. Council as the proponent for the proposed road works is required to obtain approval from Transport for NSW prior to the commencement of any construction works.

4.2.8 Water Management Act 2000

The State's water resources are managed under the Water Management Act 2000. The proposed works, being the design and construction of a new bridge along Wybong Road, Muswellbrook is defined as a controlled activity. Approval is required to carry out a controlled activity in, on, or under waterfront land, unless it is exempt under Subdivision 4 of the Water Management (General) Regulation 2018. Controlled activities carried out by public authorities are exempt under section 41 of the Regulation and therefore, approval under the *Water Management Act 2000* is not required.

4.3 Environmental Planning Instruments

Review of environmental planning instruments via NSW planning portal to identify any State Environmental Planning Policy (SEPP) that may impact the subject site. SEPP (Vegetation in Non-Rural Areas) 2017 (Figure 1.3A) and SEPP (Mining, Petroleum, and Extractive Industries) 2007 (Figure 4.1) were identified as may impact the proposed works at the subject site. State heritage sites were identified within and surrounding the Muswellbrook regional centre, but not in vicinity of the subject site (Figure 4.1).

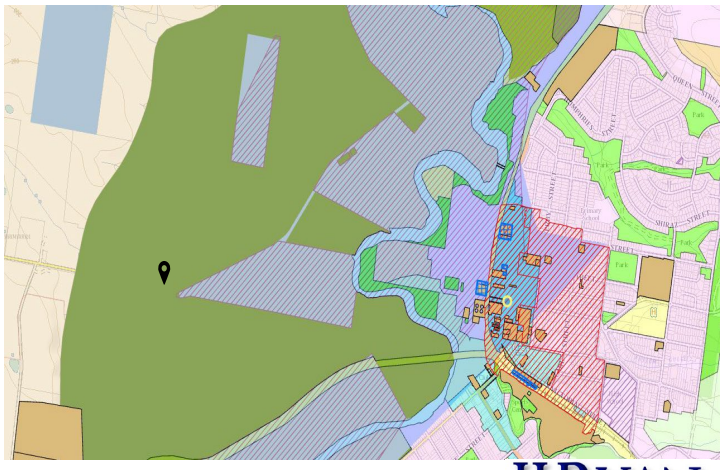


Figure 4.1 Location of Heritage sites and SEPP (Mining, Petroleum, and Extractive Industries) 2007

4.3.1 State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017

The SEPP (Vegetation in Non-Rural Areas) 2017 aims to preserve the amenity of non-rural areas of the State through the protection of biodiversity values of trees and other vegetation in non-rural areas of the State.

Field survey of vegetation within the subject site reported the area directly adjoining the existing bridge consisted almost completely of noxious weeds. The area surrounding the subject site mainly consists of overgrown exotic small trees or shrubs and other exotic or noxious weeds, with a small component of native grasses. The full report for the AME Ecology survey is attached to this report (Appendix B).

Should the design and construction of the new bridge need to remove vegetation, a permit will need to be granted by the Council. Council may need to consider mitigation measures if native vegetation is identified to be removed for construction of the new bridge, with consideration for protection of the identified native grasses and any other identified native vegetation.

4.3.2 State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007

The SEPP (Mining, Petroleum Production and Extractive Industries) 2007 contains maps that identify land evaluated as critical industry cluster land for Viticulture and Equine landuses as well as biophysical strategic agricultural land. Any state significant mining or coal seam gas proposals on lands identified as significant agricultural lands under this SEPP will require further assessment by the State.

The subject site is located within the biophysical strategic agricultural land provisions. As the proposed works is not for the purposes of mining or coal seam gas developments, certification under this SEPP is not required.

4.4 Muswellbrook Shire Local Environmental Plan 2009

The subject site is located within Zone RU1 Primary Production under the Muswellbrook LEP 2009.

The objectives of the zone are to:

- Encourage sustainable primary industry production by maintaining and enhancing the natural resource base;
- Encourage diversity in primary industry enterprises and systems appropriate for the area;
- Minimise the fragmentation and alienation of resource lands;
- Minimise conflict between land uses within this zone and land uses within adjoining zones;
- Protect the agricultural potential of rural land not identified for alternative land use, and to minimise the cost to the community of providing, extending and maintaining public amenities and services;
- Maintain the rural landscape character of the land in the long term;
- Ensure that development for the purpose of extractive industries, underground mines or open cut mines will not:
  (a) Destroy or impair the agricultural production potential of the land or, in the case of underground mining, unreasonably restrict or otherwise affect any other development on the surface, or
  (b) Detrimentally affect in any way the quantity, flow and quality of water in either subterranean or surface water systems, or
  (c) Visually intrude into its surroundings, except by way of suitable screening.
- Protect or conserve (or both):
  (a) Soil stability by controlling development in accordance with land capability, and
  (b) Trees and other vegetation, and
  (c) Water resources, water quality and wetland areas, and their catchments and buffer areas, and
  (d) Valuable deposits of minerals and extractive materials by restricting development that would compromise the efficient extraction of those deposits.

The proposed works are within the road reserve in rural zoned land and is consistent with the objectives for this zone.

4.5 Muswellbrook Shire Development Control Plan 2009

The Muswellbrook Shire Development Control Plan 2009 (DCP) provides detailed provisions for any development and are required to be considered as part of any planning or building application to Council.

4.5.1 Environmental Matters

The subject site is located in the RU1 Primary Production Zone of the Muswellbrook LEP, and any development is required to consider section 8 of the DCP for Rural and Environmental Zone Development. Provisions for protection and management of significant remnant vegetation is detailed in Section 8.3 for Environmental Matters.

The proposed works, being the design and construction of a new bridge along Wybong Road, Muswellbrook are consistent with the relevant objectives under section 8.3 for Environmental Matters.

An ecological report was prepared by AME Ecology in December 2021, and no significant remnant vegetation was identified within the area of the subject site. The full report is attached to this report (Appendix B).

4.5.2 Flooding Prone Land

The subject site is not located within flood prone land identified under section 13 of the DCP for Flood Prone Land.

4.5.3 Heritage Conservation

The proposed works for the design and construction of a new bridge along Wybong Road, Muswellbrook is consistent with the objectives under section 15 of the DCP for Heritage Conservation.

There are no registered heritage items within 2km of the subject site. An Aboriginal Due Diligence Heritage Assessment report was prepared by Heritage Now in December 2021 and no registered Aboriginal cultural heritage items or places were found within the area of the subject site, with the full report and recommendations are attached to this report (Appendix C).

4.5.4 Erosion and Sediment Control

Erosion and sediment control measures are detailed in section 20 of the DCP. An Erosion and Sediment Control Plan and schedule of works is required to be submitted with development application for areas of disturbance less than 250m^2 that are within 100m of a water course and on steep sites, being a gradient greater than 20°.

The proposed works for the design and construction of a new bridge along Wybong Road, Muswellbrook involves works within 100m of a water course with steep embankments within the area of the subject site. An Erosion and Sediment Control Plan and schedule of works will be required to be submitted to Council and approved prior to the commencement of any construction works.

4.5.5 Contaminated Land

The subject site is not impacted by contaminated land as described under section 21 of the DCP for Contaminated Land.

5 Consideration of Environmental Factors

5.1 Part 5 of the EP&A Act

The Council as the determining authority has a duty of care to consider the environmental impact of an activity under section 5.5 of the EP&A Act. The factors that must be considered by the Council are described in clause 228 of the EP&A Regulation 2000.

The environmental factors listed in clause 228 have been assessed against the proposed activity, being the design and construction of a new bridge along Wybong Road, Muswellbrook in Table 5.1 below.

6 Recommendation

It is recommended that a Construction Environmental Management Plan (CEMP) be developed and approved by Council prior to the commencement of any construction works. The CEMP will ensure that all relevant approvals and mitigation measures are managed during the works, including but not limited to the following listed here.

6.1 Approvals

A permit may be required under The SEPP (Vegetation in Non-Rural Areas) 2017.

Approval will be required from Transport for NSW for road works under Roads Act 1993.

Council is to liaise with the Department of Primary Industries prior to the commencement of any construction works to determine if an approval is required under the Fisheries Management Act 1994.

Approval of a development application is required under the EP&A Act 1979.

An Erosion and Sediment Control Plan and schedule of works will be required to be submitted to Council and approved prior to the commencement of any construction works.

6.2 Mitigation Measures

Mitigation measures to reduce risk of:

- Erosion on the creek embankments;
- Threatened microbat species being harmed during removal of the existing bridge. A suitably qualified ecologist or fauna spotter/catcher present on site during removal of the existing bridge would mitigate potential impact;
- Animals harmed during removal of vegetation within the subject site. A suitably qualified ecologist or fauna spotter/catcher present on site during vegetation removal would mitigate potential impact;
- Harm to a potential cultural archaeological site, located 15m south of the subject site;
- Environmental problems associated with waste disposal to be managed with waste disposal detailed in a CEMP, including location of suitable waste and recycling facilities, contractor(s) to remove waste, and any appropriate mitigation measures; and
- Dust generated during construction works.

Table 6.1 Review of environmental factors listed in clause 228 of the EP&A Regulation 2000

	Clause 228 Factor	Comments	Impact
Is the activity of a kind for which specific guidelines are in force? If so, the factors to be taken into account when considering the likely impact of the activity on the environment are those referred		The Director-General has not established any additional specific guidelines for the factors to be considered pursuant to this clause.	N/A
Is the activity of any other kind for which general guidelines are in force? If so, the factors to be taken into account when considering the likely impact of the activity on the environment are		The Director-General has not established any additional specific guidelines for the factors to be considered pursuant to this clause.	N/A
If no guidelines are in force, will the activity cause any:			
a	Environmental impact on the community;	A new bridge across Rosebrook Creek will likely have a minor, short term environmental impact on the community, which is predominantly occupied by mining landuse. The subject site is located in a rural area and any potential noise or dust during construction works is likely to have a limited impact on any residents surrounding the subject site. Appropriate mitigation measures can be applied during construction works to minimise any impacts.	Minor/ Short Time
b	Transformation of a locality;	The new bridge will be designed to fit within the alignment of the existing bridge and will increase the carrying capacity to cater for all vehicles. This may increase the use of Wybong road as an alternative route to regional towns located north-west of Muswellbrook, however, it is unlikely to result in a signifcant transformation on the locality.	N/A
c	Environmental impact on the ecosystems of the locality;	There is potential short term impact on the ecosystems associated with Rosebrook Creek that can be mitigated with appropriate measures during construction works. Removal of any listed noxious or invasive weeds would be beneficial for the local ecosystem.	Minor/ Short Time
d	Reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality;	The proposed works or activity will not result in a reduction of aesthetics, recreational, scientific or other local environmental quality or value.	N/A
e	Effect on a locality, place or building having aesthetic, anthropological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations;	The activity will not have any adverse effect on local heritage listed items. A potential cultural archaeological site has been identified 15m south of the subject site, however, it is unlikely to be impacted by construction activities. Mitigation measures can be applied to ensure that the site is not affected during the proposed works.	Minor/ Short Time
f	Impact on the habitat of protected animals (within the meaning of the Biodiversity Conservation Act 2016);	There are no trees within the area of the subject site as potential habitat of protected animals. The underside of the existing bridge has potential habitat for protected microbats known to occur in the area. A suitably qualified ecologist or fauna spotter/catcher present on site during removal of the existing bridge would mitigate potential impact.	Minor/ Short Time
g	Endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air;	During construction works, there may be minor impacts on aquatic and terrestrial environments that can be managed by a suitably qualified ecologist or fauna spotter/catcher present on site during works such as vegetation removal.	Minor/ Short Time
h	Long-term effects on the environment;	The proposed works are unlikely to result in any long-term negative effects on the environment.	N/A
i	Degradation of the quality of the environment;	The proposed works are likely to have a short-term impact on the quality of the environment, with potential to improve the quality with removal of noxious weeds within the subject site.	Minor/ Short Time
j	Risk to the safety of the environment;	The proposed works are likely to involve activities in or adjoining the creek bed, that may impact erosion of the embankment. Appropriate mitigation measures will be able to reduce the risk. A potential cultural archaeological site is located 15m south of the subject site and there is risk of pollution or damage to this site. Appropriate mitigation measures will ensure the safety of the site during the construction works.	Minor/ Short Time
k	Reduction in the range of beneficial uses of the environment;	The proposed works would not reduce the range of beneficial uses of the environment.	N/A
l	Pollution of the environment;	The proposed works are likely to involve activities in or adjoining the creek bed, that may result in pollution of the site from dust or debris, which may increase if water is flowing at the time of construction works. Appropriate mitigation measures will be able to reduce the risk.	Minor/ Short Time
m	Environmental problems associated with the disposal of waste;	The proposed works are likely to generate waste during removal of the existing bridge and use of construction materials. To reduce the risk of environmental problems associated with the disposal of waste, management of waste disposal should be detailed in a CEMP, including location of suitable waste and recycling facilities, contractor(s) to remove waste, and any appropriate mitigation measures.	Minor/ Short Time
n	Increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply;	The proposed works will not involve the use of rare resources and resources used are unlikely to become in short supply.	N/A
o	Cumulative environmental effect with other existing or likely future activities;	The proposed works will be designed to align with the existing bridge and is unlikely to contribute to cumulative environmental effects with existing or future activities in the locality	N/A
p	Impact on coastal process and coastal hazards, including those under projected climate change conditions.	The subject site is not located within vicinity of a coastal area.	N/A

Appendices

Appendix A: Environmental Protection and Conservation Biodiversity Act 1999 PMST 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.

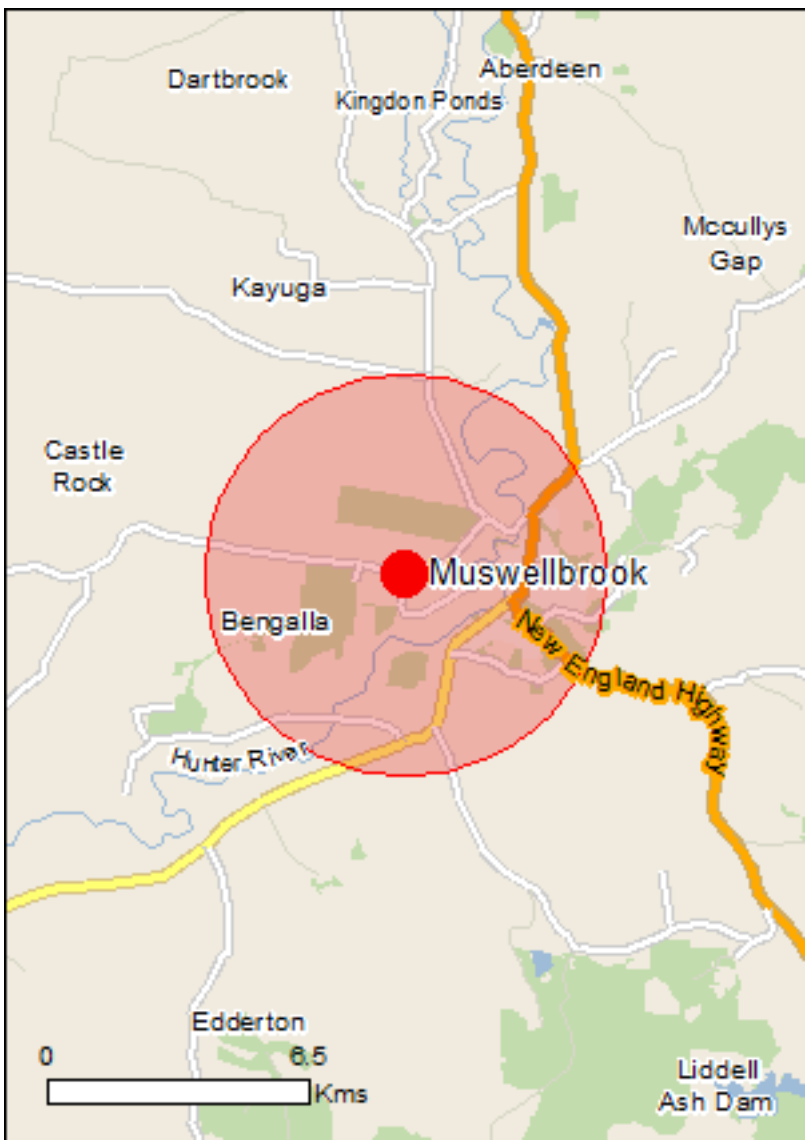
Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

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

Report created: 25/10/21 18:48:35

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

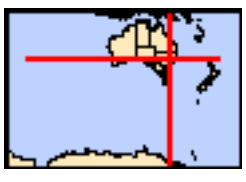
Caveat
Acknowledgements



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

Coordinates

Buffer: 5.0Km



Summary

Matters of National Environmental Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	4
Listed Threatened Species:	29
Listed Migratory Species:	13

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Land:	7
Commonwealth Heritage Places:	1
Listed Marine Species:	20
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:	None
Regional Forest Agreements:	1
Invasive Species:	30
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar) [Resource Information]

Name	Proximity
Hunter estuary wetlands	50 - 100km 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	Foraging, feeding or related behaviour likely to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat likely to occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within

Name	Status	Type of Presence
		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 aurea Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat may occur within area
Litoria booroolongensis Booroolong Frog [1844]	Endangered	Species or species habitat may occur within area
Mammals		
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat known to occur within area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat 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
Petrogale penicillata Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat likely to occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat known to occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Plants		
Cynanchum elegans White-flowered Wax Plant [12533]	Endangered	Species or species habitat may occur within area
Eucalyptus glaucina Slaty Red Gum [5670]	Vulnerable	Species or species habitat known to occur within area
Euphrasia arguta [4325]	Critically Endangered	Species or species habitat may occur within area
Pomaderris brunnea Rufous Pomaderris, Brown Pomaderris [16845]	Vulnerable	Species or species habitat may occur within area
Prasophyllum sp. Wybong (C.Phelps ORG 5269) a leek-orchid [81964]	Critically Endangered	Species or species habitat may occur within area
Pterostylis gibbosa Illawarra Greenhood, Rufa Greenhood, Pouched Greenhood [4562]	Endangered	Species or species habitat may occur within area

Name	Status	Type of Presence
[Thesium australe](#) Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat may 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 known to occur within area

Listed Migratory Species [Resource Information]

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

Name	Threatened	Type of Presence
Migratory Marine Birds		
[Apus pacificus](#) Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
[Hirundapus caudacutus](#) White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
[Monarcha melanopsis](#) Black-faced Monarch [609]		Species or species habitat may occur within area
[Motacilla flava](#) Yellow Wagtail [644]		Species or species habitat may occur within area
[Myiagra cyanoleuca](#) Satin Flycatcher [612]		Species or species habitat known to occur within area
[Rhipidura rufifrons](#) Rufous Fantail [592]		Species or species habitat 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
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat may occur within area
[Gallinago hardwickii](#) Latham's Snipe, Japanese Snipe [863]		Species or species habitat 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

Other Matters Protected by the EPBC Act

Commonwealth Land [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Name
Commonwealth Land -
Commonwealth Land - Australian Postal Commission
Commonwealth Land - Australian Telecommunications Commission
Commonwealth Land - Commonwealth Bank of Australia
Commonwealth Land - Commonwealth Trading Bank of Australia
Commonwealth Land - Defence Housing Authority
Defence - MUSWELLBROOK GRES DEPOT

Commonwealth Heritage Places [Resource Information]

Name	State	Status
Historic		
Muswellbrook Post Office	NSW	Listed place

Listed Marine Species [Resource Information]

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

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
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 likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat likely to occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species

Name	Threatened	Type of Presence
		habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Neophema chrysostoma Blue-winged Parrot [726]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area
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

Extra Information

Regional Forest Agreements [Resource Information]

Note that all areas with completed RFAs have 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 within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
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
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Feral deer Feral deer species in Australia [85733]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus norvegicus Brown Rat, Norway Rat [83]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		

Name	Status	Type of Presence
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat may 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
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.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Senecio madagascariensis Fireweed, Madagascar Ragwort, Madagascar Groundsel [2624]		Species or species habitat likely to occur within area
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

-32.26304 150.86276

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.

Department of Agriculture Water and the Environment
GPO Box 858
Canberra City ACT 2601 Australia
+61 2 6274 1111

Appendix B: Ecological Report prepared by AME Ecology

AME ECOLOGY
ABN: 19 326 253 325

14th December 2021

Att: Leanne Sparrow
JJ Ryan Consulting Pty Ltd
Nerang Street
Nerang QLD 4211
Leanne.sparrow@jjryan.com.au

Re: Ecological Surveys, Rosebrook Creek at Wybong Road, Muswellbrook NSW 2333.

Dear Leanne,

This letter is provided in response to ecological surveys requested to be undertaken at the Rosebrook Bridge on Wybong Road, Muswellbrook NSW 2333. The findings of the ecological surveys are provided below along with recommendations to be considered for any future works associated with the bridge.

Rosebrook Bridge is located at approximately 298714.116E, 6428420.123N (GDA94-MGA56) on the Muswellbrook 1:25,000 topographic map sheet and is surrounded by rural lands zoned RU1 Primary Production under the Muswellbrook Local Environmental Plan (LEP) 2009. At the point where Rosebrook Creek crosses Wybong Road, it is identified as a third order stream under the Strahler system.

The bridge provides crucial access to the Bengalla Coal Mine, approximately 1.5 kilometres west of the bridge.

The site is illustrated in Appendix 1 of this response.

Desktop Analysis

Prior to undertaking surveys, a rapid desktop analysis was undertaken through the BioNet Atlas[1] to ascertain a list of threatened species likely to occur within the survey area and wider study area (being 10-kilometres radius from the site). A comprehensive list of threatened flora and fauna recorded within the wider study area is provided in Appendix 2 of this response.

Of the listed species within the wider study area, no threatened flora species were considered likely to occur within the survey area. A total of 12 threatened fauna species, including nine (9) microbat species were considered to have potential habitat within the survey area that were considered as part of survey efforts:

- Speckled Warbler (*Chthonicola sagittata*)
- Spotted-tailed Quoll (*Dasyurus maculatus*)
- Grey-headed Flying-fox (*Pteropus poliocephalus*)
- Yellow-bellied Sheathtail-bat (*Saccolaimus flaviventris*)
- Eastern Coastal Free-tailed Bat (*Micronomus norfolkensis*)

[1] BioNet Atlas (2021) Threatened Species Database Search, accessed 8th December 2021 (https://www.environment.nsw.gov.au/atlaspublicapp/UI_Modules/ATLAS_/AtlasSearch.aspx)

- Large-eared Pied Bat (*Chalinolobus dwyeri*)
- Eastern False Pipistrelle (*Falsistrellus tasmaniensis*)
- Southern Myotis (*Myotis macropus*)
- Greater Broad-nosed Bat (*Scoteanax rueppellii*)
- Eastern Cave Bat (*Vespadelus troughtoni*)
- Little Bent-winged Bat (*Miniopterus australis*)
- Large Bent-winged Bat (*Miniopterus orianae oceanensis*)

Surveys

Surveys were undertaken on the 7th December and 8th December 2021 in accordance with best-practice techniques to determine the extent and condition of vegetation (native and non-native) and to identify fauna species present and likely habitats supported by the existing structure.

Surveys inherently have a number of limitations associated with the preparation of ecological reports, including but not limited to weather, seasonality of survey, restriction to site access and data accuracy and availability. As a consequence, limitations may include surveys being undertaken at times where threatened species may be absent from such habitats. In this instance, a precautionary approach has been explored.

Weather data collected from the Australian Bureau of Meteorology[2] Scone bureau station (Station 061363) for the survey period is below.

Weather during surveys.							
Date	Temp (°c)		Rain (mm)	Relative Humidity (%)		Wind Speed/Direction	
	Min	Max		9am	3pm	9am	3pm
07.12.21	16.3	29.1	11.4	99	61	Calm	20km/h - SSW
08.12.21	16.0	28.6	23.8	83	51	15km/h – SSE	9km/h - ENE

The surveyed area consisted of the bridge and all land within a 5-metre buffer of the existing structure (see Figure 1-1), totalling approximately 1,130 square metres (0.11 hectares).

Floristic surveys undertaken included random meander across the survey area, identification of native vegetation communities and identification of hollow-bearing trees.

Floristic surveys undertaken saturated the survey area and as are result are not illustrated. Surveys are considered appropriate and comprehensive due to the constrained nature of the survey area.

Fauna surveys undertaken included diurnal and nocturnal surveys, as well as incidental aquatic surveys as a result of the creek line being inundated with water due to the recent high rainfall within the local area.

Fauna survey effort undertaken is detailed in Tables 1 and 2 below.

[2] Bureau of Meteorology Climate Data Online, Scone Bureau Station, December 2021, accessed 10th December 2021 (http://www.bom.gov.au/climate/data/)

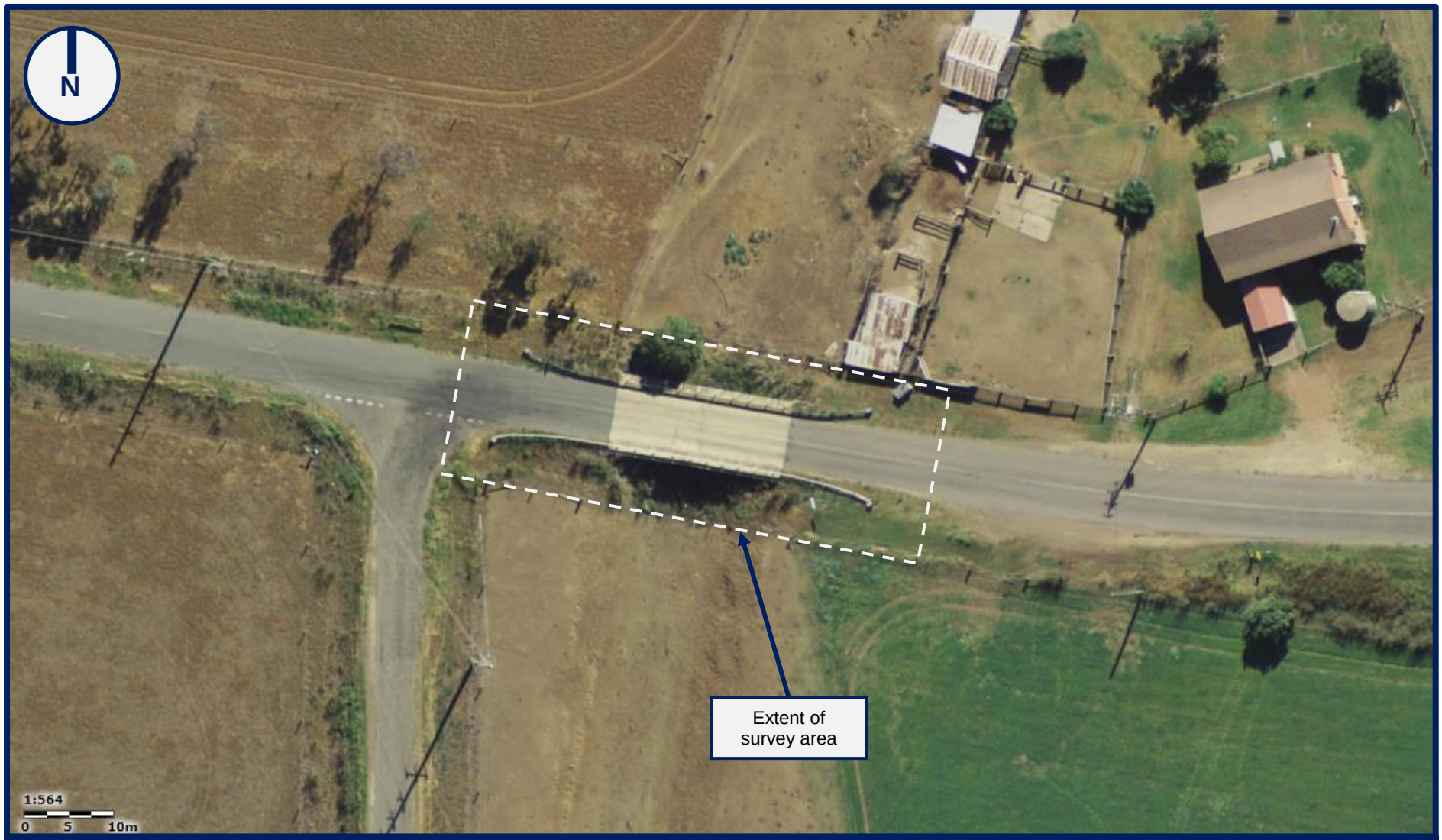


Figure 1-1: Extent of ecological surveys associated with Rosebrook Bridge (outlined). Note: incidental surveys of surrounding vegetation were conducted.

Table 1: Diurnal Fauna Survey Effort undertaken at Rosebrook Creek, Muswellbrook NSW.				
Date	**Activity**	**Survey hours**	**Total Survey Hours**	**Survey comments**
07.12.2021	Diurnal Bird Observations	1 person for 4 hours	4 Hours	-
07.12.2021	Diurnal Amphibian Searches	1 person for 4 hours	4.5 Hours	Searches occurred on either side of Rosebrook Creek within the vegetated banks and along the waters' edge.
08.12.2021		1 person for 0.5 hours		
07.12.2021	Diurnal Reptile Searches	1 person for 3.5 hours	3.5 Hours	Searches occurred on either side of Rosebrook Creek within the vegetated banks and along the waters' edge.
08.12.2021		1 person for 0.5 hours		
07.12.2021	Hollow Bearing Tree Identification	1 person for 0.5 hours	0.5 Hours	Searches and identification of hollow bearing trees within the vicinity of Rosebrook Bridge.
07.12.2021	Searches of fauna evidence (scats, tracks, scratches)	1 person for 1 hour	1.5 Hours	Searches occurred within the vegetated lands of the survey area.
08.12.2021		1 person for 0.5 Hours		
08.12.2021	Acoustic Audio Recording – Dawn Chorus	0.5 hour intervals over 3.5 hours	2 Hours	Recorded from 30 minutes before sunrise (5:30am) at 30-minute intervals until 9am.
07.12.2021	Aquatic Surveys	1 person for 0.5 hours	0.5 hours	Incidental survey of the waterway to identify activity within the shallow (<0.5m deep) waters.
07.12.2021	Active Listening	1 person for 2 hours	2 Hours	-
07.12.2021	Incidental Surveys	1 person for 4 hours	4.5 Hours	Undertaken at all times on site.
08.12.2021		1 person for 0.5 hours		

Table 2: Nocturnal Fauna Survey Effort undertaken at Rosebrook Creek, Muswellbrook NSW.				
Date	**Activity**	**Survey hours**	**Total Survey Hours**	**Survey comments**
07.12.2021	Active Listening - Dusk	1 person for 0.5 hours	0.5 Hours	-
07.12.2021	Call Broadcast – Arboreal Mammals	-	-	Call Broadcast was proposed to survey for threatened species Squirrel Glider and Koala. Available habitats were assessed along with records of species within 10 kilometres of the site. It was determined that call broadcast was unnecessary due to the very limited habitat available for these species and available habitats being significant isolated from connecting vegetation.
07.12.2021	Spotlighting	1 person for 0.5 hours	0.5 hours	Surveys focused on searches for: • Amphibians within survey area and along the waters' edge; • Megachiropteran Bats (Flying-fox) and Arboreal Mammals within surrounding canopy vegetation. • Identification of roosting fauna. • Spotlighting within the waterway to identify any aquatic fauna.
07.12.2021	Megachiropteran Bat Surveys	1 person for 0.5 hours	0.5 hours	Targeted spotlighting within survey area and nearby flowering canopy trees. Targeted Active Listening for chatter.
07.12.2021	Acoustic Audio Recording – Nocturnal surveys	0.5 Hour intervals from 7:30pm to 5:30am	5 Recorded Hours	Acoustic audio recorded at 30-minute intervals from 7:30pm on the 7 December 2021 through until 5:30am on the 8 December 2021, totalling 5 recorded survey hours.
07.12.2021	Ultrasonic recording (microbats)	0.5 Hour intervals from 8pm to 5am	5 recorded hours	Ultrasonic recordings scheduled every 30 minutes from 8pm on the 7 December 2021 through until 5am on the 8 December 2021, totalling 5 recorded survey hours.
08.12.2021				

Survey Results

Flora

Surveys revealed a total of 29 flora species within the survey area and nearby vicinity of Rosebrook Creek made up of 14 families with the most dominant families being Asteraceae (8 species) and Poaceae (8 species).

Flora species immediately surrounding Rosebrook Creek consisted almost entirely of noxious weeds with 23 species, or 79% of flora recorded were identified as exotic, including at least 11 species identified as High Threat Weeds, weeds listed under the Biosecurity Act 2015 and / or Weeds of National Significance (WONS).

A full list of flora species recorded during survey is provided in Table 3 below.

No threatened flora species were recorded during survey.

Table 3: Flora species recorded during survey

* = exotic species; HT = High Threat Weed; BS = Listed under the Biosecurity Act 2015; WONS = Weeds of National Significance.

Family	*Scientific Name*	Common Name
Amaranthaceae	*Alternanthera philoxeroides* **HT; BS; WONS**	Alligator Weed
Apiaceae	*Foeniculum vulgare**	Fennel
Asteraceae	*Ageratina adenophora* **HT; BS**	Crofton Weed
Asteraceae	*Bidens pilosa* **HT**	Cobbler's Pegs
Asteraceae	*Chrysanthemoides monilifera* **HT; WONS**	Bitou Bush
Asteraceae	*Cirsium vulgare* **BS**	Spear Thistle
Asteraceae	*Sonchus oleraceus* **BS**	Common Sowthistle
Asteraceae	*Tagetes minuta**	Stinking Roger
Asteraceae	*Taraxacum officinale**	Dandelion
Asteraceae	*Tragopogon porrifolius**	Salsify
Brassicaceae	*Rapistrum rugosum**	Turnip Weed
Commelinaceae	*Tradescantia fluminensis* **HT; BS**	Trad
Fabaceae	*Trifolium repens**	White Clover
Geraniaceae	*Geranium molle**	Geranium
Lamiaceae	*Mentha* sp.*	-
Myrtaceae	*Eucalyptus crebra* (nearby)	Narrow-leaved Ironbark
Myrtaceae	*Eucalyptus tereticornis* (nearby)	Forest Red Gum
Oleaceae	*Ligustrum lucidum* **HT; BS**	Large-leaved Privet
Oxalidaceae	*Oxalis perennans*	-
Plantaginaceae	*Plantago lanceolata**	Ribwort
Poaceae	*Avena sativa**	Oats
Poaceae	*Bromus* sp.*	-
Poaceae	*Cenchrus clandestinus* **HT**	Kikuyu
Poaceae	*Chloris gayana* **HT**	Rhodes Grass

Table 3: Flora species recorded during survey		
* = exotic species; HT = High Threat Weed; BS = Listed under the Biosecurity Act 2015; WONS = Weeds of National Significance.		
Family	***Scientific Name***	**Common Name**
Poaceae	*Entolasia marginata*	Bordered Panic
Poaceae	*Oplismenus aemulus*	Basket Grass
Poaceae	*Paspalum dilatatum* HT	Paspalum
Poaceae	*Themeda australis*	Kangaroo Grass
Polygonaceae	*Persicaria* sp.*	-

Due to the survey area being dominated by exotic species, it was determined that the survey area was not representative of any native vegetation community. Similarly, adjoining vegetation within the road reserve continued this trend with very little native vegetation observed within the road reserve.

The extent of vegetation within the survey area is shown in Figure 1-2 below.

Although no native vegetation community occurs within the survey area, nearby canopy trees, including Narrow-leaved Ironbark (*Eucalyptus crebra*) and Forest Red Gum (*Eucalyptus tereticornis*) were identified as being likely associated with the Plant Community Type (PCT) 1691 - Narrow-leaved Ironbark - Grey Box grassy woodland of the central and upper Hunter identified on the Upper Hunter vegetation mapping project.

This PCT is associated with several Threatened Ecological Communities (TEC) under the *Biodiversity Conservation Act 2016* and further investigations may be required if any future bridge works occur outside of the survey area.

Fauna

A total of 21 fauna species were recorded during surveys made up of 3 fauna groups, including:

- 4 amphibians
- 14 Diurnal Birds
- 3 Terrestrial Mammals

Fauna species recorded were limited to common species associated with disturbed lands and farmland. Table 4 below provides a list of fauna species recorded during surveys.

Welcome Swallows (*Hirundo neoxena*) were observed roosting under the bridge and settling in to the small openings under the bridge at dusk and evidence of their roost was apparent with dense scats along the concrete structure.

No reptiles, nocturnal birds, arboreal mammals, megachiropteran bats or microchiropteran bats were recorded during surveys. Species recorded are all considered common and associated with disturbed land and farm lands.

No threatened fauna species were recorded during surveys.

No hollow bearing trees were recorded within the survey area or within adjoining lands.

Table 4: Fauna species recorded during survey			
* = invasive species; threatened species are shown in bold.			
Fauna Group	**Scientific Name**	**Common Name**	**Record**
Amphibian	*Litoria peronii*	Peron's Tree Frog	Heard
	Litoria caerulea	Green Tree Frog	Heard
	Litoria tyleri	Tyler's Tree Frog	Heard
	Limnodynastes tasmaniensis	Spotted Marsh Frog	Recorded – Acoustic Audio Recording
Diurnal Bird	*Chenonetta jubata*	Australian Wood Duck	Observed
	Vanellus miles	Masked Lapwing	Heard
	Ocyphaps lophotes	Crested Pigeon	Observed
	Cacatua roseicapilla	Galah	Observed
	Platycercus eximius	Eastern Rosella	Observed
	Hirundo neoxena	Welcome Swallow	Observed
	Rhipidura leucophrys	Willie Wagtail	Observed
	Malurus cyaneus	Superb Fairy-wren	Observed
	Sericornis frontalis	White-browed Scrubwren	Observed
	*Acridotheres tristis**	Common Myna	Observed
	*Sturnus vulgaris**	Common Starling	Observed
	Grallina cyanoleuca	Australian Magpie-Lark	Observed
	Cracticus tibicen	Australian Magpie	Observed
	Corvus coronoides	Australian Raven	Observed
Mammal	*Oryctolagus cuniculus**	Rabbit	Observed
	*Equus caballus**	Horse	Observed
	*Bos taurus**	Cow	Heard

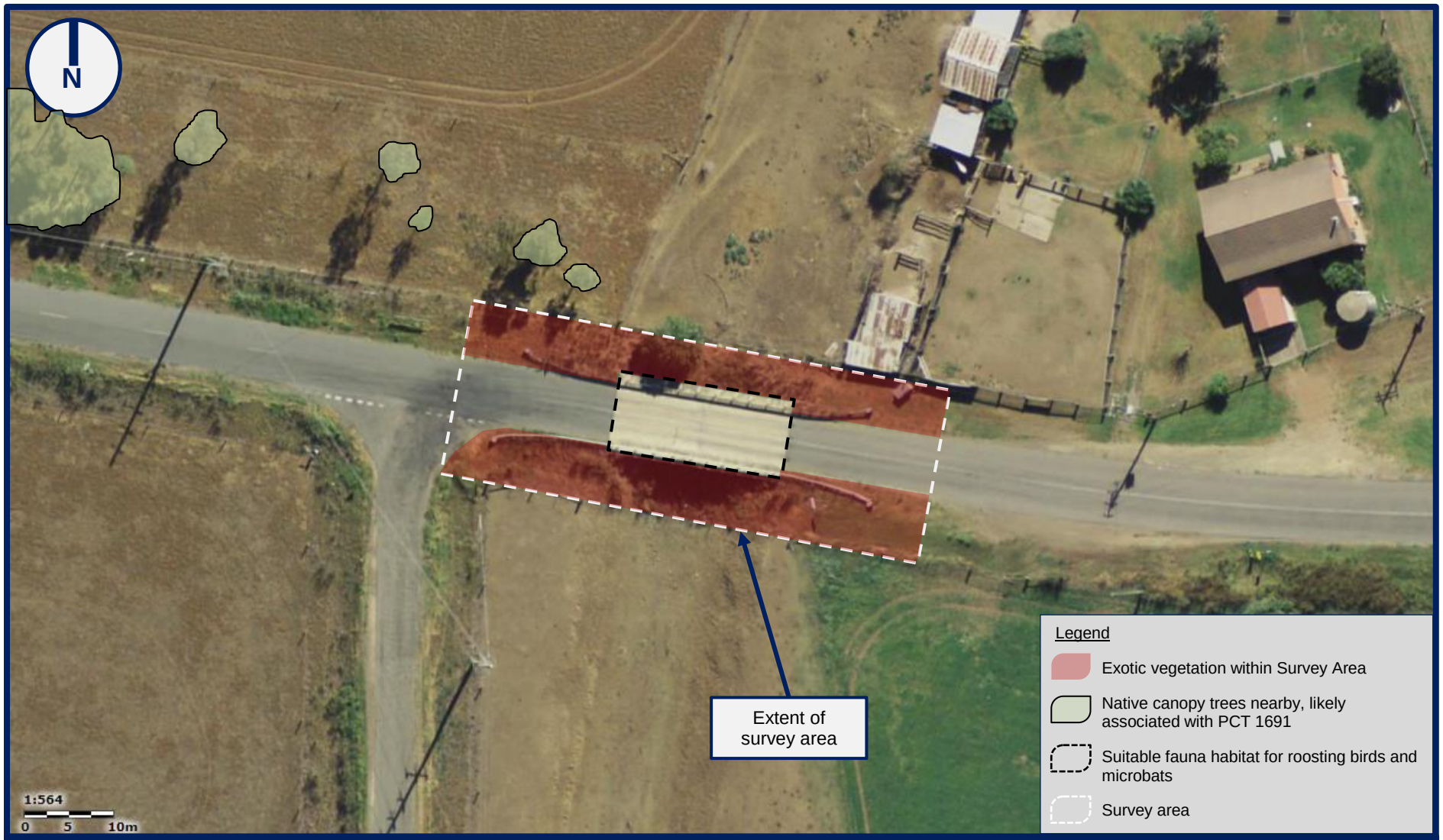


Figure 1-2: Flora and Fauna survey results, including vegetation delineation.

Summary

Overall, surveys revealed a lack of native vegetation present within the survey area of Rosebrook Bridge and a high exotic weed cover, surrounded by rural farmlands.

No threatened species were recorded on site during surveys and no hollow bearing trees occur within the survey area or adjacent lands.

Habitat for a number of fauna species occurs within the survey area due to the suitable roosting habitat provided by the bridge and suitable foraging habitat surrounding the site. Habitat for amphibians occurs across the survey area within the temporarily inundated waterway of Rosebrook Creek whilst habitat for reptiles occurs along the weedy vegetated banks of the creek.

For nocturnal birds, arboreal mammals, terrestrial mammals and megachiropteran bats (Flying-foxes) habitat is restricted to marginal foraging habitat only due to the lack of canopy vegetation and isolation from connecting habitat with few scattered paddock trees occurring within farmlands dominating the local area. Foraging resources for Flying-foxes are very restricted within the survey area to one exotic flowering Large-leaved Privet (*Ligustrum lucidum*).

Of particular interest is the potential habitat for microbats. Suitable roosting habitat for microbats, including several threatened microbat species occurs under the Rosebrook Bridge with foraging habitat available within the survey area.

As part of any future works associated with the Rosebrook Bridge, it is recommended that the following threatened species are targeted during any pre-construction / pre-clearing surveys:

- Yellow-bellied Sheathtail-bat (*Saccolaimus flaviventris*)
- Eastern Coastal Free-tailed Bat (*Micronomus norfolkensis*)
- Southern Myotis (*Myotis macropus*)
- Greater Broad-nosed Bat (*Scoteanax rueppellii*)

It is considered that the Bridge and surrounding vegetation provides suitable although marginal habitat for a number of threatened species, largely restricted to microbats.

Given the isolated nature of the site, it is unlikely that the site is utilised by any threatened species as a long-term roost and has the potential to be utilised as a temporary roost during foraging activities. However targeted surveys for the above threatened species should be considered as part of any future bridge activities.

If you require any further information, please feel free to contact me.

Regards,

Ashleigh McTackett
Director

AME ECOLOGY

Appendix 1 – Site Photographs

Photograph 1: Looking from the top of bank to the west. Recent inundation of the creek is apparent with the bent over vegetation.

Photograph 2: Debris and bent-over vegetation within Rosebrook Creek.

Photograph 3: View under Rosebrook Bridge.

Photograph 4: Looking under Rosebrook Bridge. Note potential habitat within the gap in concrete structures.

Photograph 5: Looking downstream (south-west) of Rosebrook Creek. No native riparian vegetation apparent.

Photograph 6: Looking upstream (north-east) of Rosebrook Creek. Banks vegetated with noxious weeds and tracks visible leading down to the creek from the neighbouring dwelling.

Appendix 2 – Desktop Analysis

Threatened Flora species recorded within 10 kilometres of the site. Source: BioNet Atlas, accessed December 2021.					
Family	**Scientific Name**	**Common Name**	**NSW status**	**Comm. status**	**Records**
Fabaceae	*Acacia pendula*	Acacia pendula population in the Hunter catchment	Endangered Population	-	41
Myrtaceae	*Eucalyptus camaldulensis*	Eucalyptus camaldulensis population in the Hunter catchment	Endangered Population	-	528
Myrtaceae	*Eucalyptus glaucina*	Slaty Red Gum	Vulnerable	Vulnerable	9
Myrtaceae	*Eucalyptus nicholii*	Narrow-leaved Black Peppermint	Vulnerable	Vulnerable	1
Orchidaceae	*Cymbidium canaliculatum*	Cymbidium canaliculatum population in the Hunter Catchment	Endangered Population	-	23
Orchidaceae	*Diuris tricolor*	Pine Donkey Orchid population in the Muswellbrook local government area	Vulnerable; Endangered Population	-	329
Orchidaceae	*Diuris tricolor*	Pine Donkey Orchid	Vulnerable	-	329
Orchidaceae	*Prasophyllum petilum*	Tarengo Leek Orchid	Endangered	Endangered	2
Santalaceae	*Thesium australe*	Austral Toadflax	Vulnerable	Vulnerable	1

Threatened Fauna species recorded within 10 kilometres of the site. Source: BioNet Atlas, accessed December 2021.					
Family	**Scientific Name**	**Common Name**	**NSW status**	**Comm. status**	**Records**
Pygopodidae	*Delma impar*	Striped Legless Lizard	Vulnerable	Vulnerable	11
Anseranatidae	*Anseranas semipalmata*	Magpie Goose	Vulnerable	-	1
Apodidae	*Hirundapus caudacutus*	White-throated Needletail	-	Vulnerable	9
Ciconiidae	*Ephippiorhynchus asiaticus*	Black-necked Stork	Endangered	-	1
Accipitridae	*Circus assimilis*	Spotted Harrier	Vulnerable	-	4
Accipitridae	*Haliaeetus leucogaster*	White-bellied Sea-Eagle	Vulnerable	-	4
Accipitridae	*Hieraaetus morphnoides*	Little Eagle	Vulnerable	-	4
Falconidae	*Falco subniger*	Black Falcon	Vulnerable	-	2
Cacatuidae	*Calyptorhynchus lathami*	Glossy Black-Cockatoo	Vulnerable	-	3
Psittacidae	*Glossopsitta pusilla*	Little Lorikeet	Vulnerable	-	20
Climacteridae	*Climacteris picumnus victoriae*	Brown Treecreeper (eastern subspecies)	Vulnerable	-	34
Acanthizidae	*Chthonicola sagittata*	Speckled Warbler	Vulnerable	-	47
Meliphagidae	*Anthochaera phrygia*	Regent Honeyeater	Critically Endangered	Critically Endangered	1
Meliphagidae	*Melithreptus gularis gularis*	Black-chinned Honeyeater (eastern subspecies)	Vulnerable	-	1
Pomatostomidae	*Pomatostomus temporalis temporalis*	Grey-crowned Babbler (eastern subspecies)	Vulnerable	-	33
Neosittidae	*Daphoenositta chrysoptera*	Varied Sittella	Vulnerable	-	6
Artamidae	*Artamus cyanopterus cyanopterus*	Dusky Woodswallow	Vulnerable	-	11
Petroicidae	*Petroica boodang*	Scarlet Robin	Vulnerable	-	2
Petroicidae	*Petroica phoenicea*	Flame Robin	Vulnerable	-	1
Estrildidae	*Stagonopleura guttata*	Diamond Firetail	Vulnerable	-	5
Dasyuridae	*Dasyurus maculatus*	Spotted-tailed Quoll	Vulnerable	Endangered	7
Dasyuridae	*Phascogale tapoatafa*	Brush-tailed Phascogale	Vulnerable	-	1
Phascolarctidae	*Phascolarctos cinereus*	Koala	Vulnerable	Vulnerable	11
Petauridae	*Petaurus norfolcensis*	Squirrel Glider	Vulnerable	-	34
Pteropodidae	*Pteropus poliocephalus*	Grey-headed Flying-fox	Vulnerable	Vulnerable	36

Threatened Fauna species recorded within 10 kilometres of the site. Source: BioNet Atlas, accessed December 2021.					
Family	**Scientific Name**	**Common Name**	**NSW status**	**Comm. status**	**Records**
Emballonuridae	*Saccolaimus flaviventris*	Yellow-bellied Sheathtail-bat	Vulnerable	-	10
Molossidae	*Micronomus norfolkensis*	Eastern Coastal Free-tailed Bat	Vulnerable	-	11
Vespertilionidae	*Chalinolobus dwyeri*	Large-eared Pied Bat	Vulnerable	Vulnerable	5
Vespertilionidae	*Falsistrellus tasmaniensis*	Eastern False Pipistrelle	Vulnerable	-	8
Vespertilionidae	*Myotis macropus*	Southern Myotis	Vulnerable	-	10
Vespertilionidae	*Scoteanax rueppellii*	Greater Broad-nosed Bat	Vulnerable	-	5
Vespertilionidae	*Vespadelus troughtoni*	Eastern Cave Bat	Vulnerable	-	7
Miniopteridae	*Miniopterus australis*	Little Bent-winged Bat	Vulnerable	-	6
Miniopteridae	*Miniopterus orianae oceanensis*	Large Bent-winged Bat	Vulnerable	-	30

Appendix C: Aboriginal Due Diligence Heritage Assessment Report prepared by Heritage Now

HERITAGE NOW
VALUING OUR PAST - CREATING OUR FUTURE

Project Number: HN000356-A

ABORIGINAL HERITAGE DUE DILIGENCE ASSESSMENT REPORT – ROSEBROOK CREEK BRIDGE

FINAL 21 / 12 / 2021

REPORT TO: JJ RYAN CONSULTING PTY LTD
Level 5, 203-233 New South Head Road, Edgecliff NSW 2027

REPORT BY: HERITAGE NOW PTY LTD
projects@heritagenow.com.au
(02) 8318 9770
www.heritagenow.com.au

Executive Summary

Heritage Now Pty Ltd has been engaged by JJ Ryan on behalf of Muswellbrook Shire Council to conduct an Aboriginal Heritage Due Diligence Assessment report for the replacement of the Rosebrook Bridge.

The bridge is located on Wybong Road where the road crosses Rosebrook Creek, 2.5 km west of Muswellbrook. The Project Area is within the Muswellbrook Local Government Area and the Wanaruah Local Aboriginal Land Council boundaries.The Project Area was surveyed by Crystal Phillips, Heritage Consultant at Heritage Now on 9 December 2021.

The elevated creek bank of Rosebrook Creek was assessed as having archaeological potential based on previous archaeological results in the area and the known sensitivity of creeks and rivers in the Hunter Valley. The location of the proposed bridge is not considered to be sensitive based on previous disturbances related to the construction of the existing bridge and roadways, but there is an area of archaeological sensitivity 15 m south of the current bridge and is to be avoided or further archaeological investigation will be required.

Works may proceed subject to the following recommendations:

Recommendation 1

The area of archaeological sensitivity is to be avoided, if it cannot be avoided then further archaeological testing will be required before ground disturbance works take place.

Recommendation 2

All on-site personnel are to be made aware of their obligations under the *National Parks and Wildlife Act*. This includes protection of Aboriginal sites and the reporting of any new Aboriginal, or suspected Aboriginal heritage sites. This may be done through an on-site induction or other suitable format.

Recommendation 3

In the unlikely event that Aboriginal, or suspected Aboriginal archaeological material is uncovered during the development, then works in that area are to stop and the area is to be cordoned off. The project manager is to contact the heritage consultant to make an assessment as to whether the material is classed as Aboriginal object/s under the *National Parks and Wildlife Act 1974* and advise on the required management and mitigation measures. Works are not to recommence in the cordoned off area until heritage clearance has been given and/or the required management and mitigation measures have been implemented.

Recommendation 4

In the very unlikely event that human remains, or suspected human remains are uncovered during the development, then works in that area are to stop and the area is to be cordoned off. The project manager is to contact the NSW Police to establish whether the area is a crime scene. If it is not a crime scene, then Heritage NSW is to be notified via the Environment Line on 131 555 and management measures are to be devised in consultation with the local Aboriginal community. Works are not to recommence in the area until the management measures have been implemented.

Acronyms and Definitions

Acronym	Definition
AHIMS	Aboriginal Heritage Information Management System – register for Aboriginal sites in NSW
AHIP	Aboriginal Heritage Impact Permit
DECCW	Department of Environment, Climate Change and Water, NSW (became the Office of Environment and Heritage in 2011)
DPIE	Department of Planning, Industry, and Environment
EP&A Act	Environmental Planning and Assessment Act 1979
GDA	Geocentric Datum Australia
km/s	Kilometre/Kilometres
LALC	Local Aboriginal Land Council (Land Council under the Aboriginal Land Rights Act 1983)
LEP	Local Environmental Plan
OEH	Office of Environment and Heritage, NSW (Now Heritage NSW)
m	Metric metres

Contents

1 Introduction 1
1.1 Project Area 1
1.2 Overview of Project Proposal 2
1.3 Methodology 2
1.4 Authorship and Acknowledgements 3
2 Legislative Context 4
2.1 National Parks and Wildlife Act 1974 4
2.2 National Parks and Wildlife Regulations 2009 4
2.3 Aboriginal Land Rights Act 1983 4
2.4 Environmental Planning and Assessment Act 1979 5
2.5 Muswellbrook Local Environmental Plan (LEP) 2009 5
3 Environmental Context 6
3.1 Soils and Geology 6
3.2 Topography and Hydrology 6
3.3 Flora and Fauna 6
3.4 Land Use 7
3.5 Synthesis 8
4 Heritage Context 9
4.1 Aboriginal Occupation of the Hunter Valley – Ethnohistorical Context 9
4.2 Aboriginal Occupation of the Hunter Valley – Archaeological Background 9
4.3 Aboriginal Heritage Information Management System (AHIMS) 11
4.4 Heritage Report Summaries 13
4.5 Synthesis 14
5 Archaeological Survey 15
5.1 Survey Results 15
5.2 Summary 16
6 Impact Assessment 17
6.1 Proposed Works 17
6.2 Impact Assessment 17
6.3 Mitigation 17
6.4 Summary 17
7 Conclusions and Recommendations 18
8 References 19

9 Plates 20
Attachment 1 AHIMS Search ..... A

Tables

Table 1. Steps in the DECCW 2010 Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales, and corresponding report section. 3
Table 2. AHIMS site types. 11
Table 3. AHIMS site status. 11

Figures

Figure 1. Project Area Location Overview. (Source: SIX Maps base plan with DCDB cadastral boundaries and Heritage Now additions) 1
Figure 2. Project Area. (Source: SIX Maps aerial with DCDB cadastral boundaries and Heritage Now additions) 2
Figure 3. Project Area in 1958. (Source: NSW Spatial Portal) 7
Figure 4 . Project Area and AHIMS Sites. (Source: SIX Maps aerial with Heritage Now and AHIMS additions) 12
Figure 5. Map of archaeological sensitivity. (Source: SIX Maps aerial with DCDB cadastral boundaries and Heritage Now additions) 15

Plates

Plate 1. Wybong Road, view to west towards Rosebrook Bridge, areas of exposure on either side of road 20
Plate 2. Gravels along road 20
Plate 3. Rosebrook Creek, view to north 21
Plate 4. Rosebrook Creek, north of bridge, view to north 21
Plate 5 Exposed alluvial creek bank on western creek bank, view to west 22
Plate 6. Exposed silty clay on western bank, view to south 22
Plate 7. Rosebrook Bridge, view to west side of bridge, showing stablilisation works and cut into creek bank 23

1 Introduction

Heritage Now Pty Ltd has been engaged by JJ Ryan on behalf of Muswellbrook Shire Council to conduct an Aboriginal Heritage Due Diligence Assessment for a proposed bridge replacement.

The aim of this report is to assess the likelihood of Aboriginal objects being harmed by the proposed activity, whether further investigation is warranted, and whether the activity requires an Aboriginal Heritage Impact Permit (AHIP) application (DECCW 2010, 2).

1.1 Project Area

The Project Area is located on Wybong Road where the road crosses Rosebrook Creek, approximately 2.5 km west of Muswellbrook. It is located in the Muswellbrook Local Government Area and the Wanaruah Local Aboriginal Land Council boundaries (Figure 1, Figure 2).

Figure 1. Project Area Location Overview. (Source: SIX Maps base plan with DCDB cadastral boundaries and Heritage Now additions)

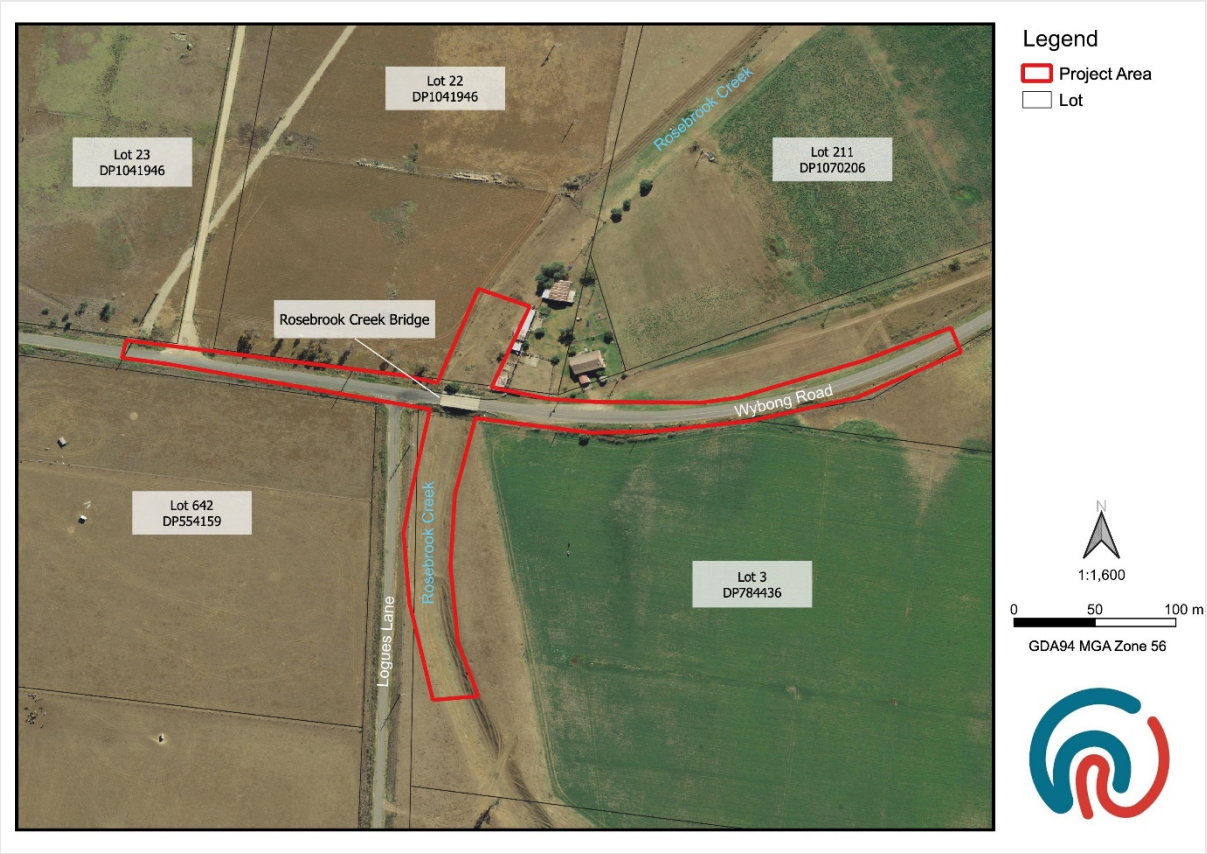


Figure 2. Project Area. (Source: SIX Maps aerial with DCDB cadastral boundaries and Heritage Now additions)

1.2 Overview of Project Proposal

The Project Proposal is to replace the existing timber bridge and replace with a concrete bridge to increase the carrying capacity of the bridge to include all vehicle types.

1.3 Methodology

This assessment has been written in accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW* (DECCW 2010). This guideline outlines steps required to:

1. Identify whether or not Aboriginal objects are, or are likely to be, present in an area;
2. Determine whether or not the activities they propose are likely to harm Aboriginal objects (if present); and
3. Determine whether an Aboriginal Heritage Impact Permit (AHIP) application is required.

The five steps of the due diligence process, and where they are outlined within this report, are shown in Table 1.

Table 1. Steps in the DECCW 2010 Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales, *and corresponding report section.*

Aboriginal Due Diligence Requirements	Report Section
Step 1— Project Proposal. Assess whether the activity will disturb the ground surface.	Section 1.2 and 6.1
Step 2a—Heritage Context. Search the Aboriginal Heritage Information Management System (AHIMS) database (and other relevant sources of information) to check whether any Aboriginal sites have been recorded in the area, or whether or not Aboriginal objects are likely to be in the present area.	Section 4
Step 2b—Environmental Context. Consider whether Aboriginal objects are likely to be in the area of the proposed activity based on landscape features, and whether the land is disturbed.	Section 3
Step 3—Impact Assessment. Assess whether you can avoid harm to the object or disturbance of the landscape feature.	Section 6.2
Step 4—Visual Inspection. Undertake desktop assessment and visual inspection.	Section 5 (and throughout report)
Step 5—Conclusions and Recommendations. Specify whether further investigations and a formal impact assessment (AHIP) is required.	Section 6.3 and 7

1.4 Authorship and Acknowledgements

This report has been produced by the Heritage Now Team. The report was written by Crystal Phillips (Heritage Consultant) with support from Trishia Palconit (Heritage Officer). Technical input and quality review has been provided by Tessa Boer-Mah Principal Heritage Consultant at Heritage Now.

2 Legislative Context

This section provides an outline of the Acts, Regulations and guidelines under which this assessment has been undertaken. It is for information purposes only and should not be taken as legal advice.

2.1 National Parks and Wildlife Act 1974

This Act contains the provisions for protecting Aboriginal objects in NSW. Aboriginal objects are protected regardless of whether they are in their original context (location) or not, and it is an offence to harm an Aboriginal object regardless of whether you know it is an Aboriginal object or not. Protection under Section 86 of the Act is as follows:

- s86(1) A person must not harm or desecrate an object that the person knows is an Aboriginal object.
- s86(2) A person must not harm an Aboriginal object.
- s86(3) A person must not harm or desecrate an Aboriginal place.

Penalties for harming Aboriginal objects or places range from $80,000–$800,000 for individuals and $330,000–$1,650,000 for corporations and may also include imprisonment. Under Section 87, there are certain defences from prosecution. These include that harm was authorised under an Aboriginal Heritage Impact Permit (AHIP) and actions were in accordance with the AHIP; that due diligence was exercised in relation to Aboriginal object/s; and/or that the activity was classified as low impact.

Under Section 89A, an Aboriginal object must be reported to Heritage NSW within a reasonable timeframe unless they have previously been recorded and submitted to the Aboriginal Heritage Information Management System (AHIMS). Penalties for failure to report an Aboriginal object start from $16,500 for individuals and $33,000 for corporations.

2.2 National Parks and Wildlife Regulations 2009

This Regulation provides a framework for exercising due diligence and outlines codes of practice in respect to Aboriginal objects (Section 80A), as well as defences for carrying out certain low-impact activities (Section 80B). The Regulation also outlines requirements for Aboriginal consultation (Section 80C), particularly in relation to an Aboriginal Heritage Impact Permit. Under the Regulation, the following codes of practice are recognised, amongst others:

- Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW (DECCW 2010)
- NSW Minerals Industry Due Diligence Code of Practice for the Protection of Aboriginal Objects (NSW Minerals Council 2010)

2.3 Aboriginal Land Rights Act 1983

This Act provides land rights to Aboriginal people through the Local Aboriginal Land Councils. It details a process for claiming unused Crown Land in NSW and for enabling land use. It also allows for agreements to permit traditional hunting, fishing, and gathering.

2.4 Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment Act 1979* (EP&A Act) provides triggers for undertaking environmental and heritage assessments as part of the wider land use planning framework. Part 4 details how authorities are to determine development applications, as well as identifying whether projects require an Environmental Impact Statement. Part 9 outlines the implementation and enforcement of the EP&A Act.

2.5 Muswellbrook Local Environmental Plan (LEP) 2009.

The Muswellbrook LEP 2009 requires development consent to demolish, disturb, excavate or develop land on which an Aboriginal object is located or that is within an Aboriginal place of significance. Council must consider the effect of a proposal on an Aboriginal Place and any Aboriginal object located within an area of works. Council must inform the local Aboriginal community about the application where impacts to Aboriginal cultural heritage may occur. Protected heritage under the LEP is listed in Schedule 5.

There are no Aboriginal sites in the Project Area listed on the LEP.

3 Environmental Context

This section provides the environmental context for the assessment of past Aboriginal occupation in the Project Area.

The likelihood of Aboriginal objects surviving in the landscape depend upon the following: the characteristics of occupation by Aboriginal people, environmental factors which provide distinctive sets of constraints that influences land use patterns (Kuskie 2015, 8), land use patterns post 1788 and the soil conditions and environmental factors which would influence the preservation of archaeological material.

3.1 Soils and Geology

The Project Area is located within Quaternary Alluvium and the Hunter Soil Landscape (DPIE 2020). Based on soil profile report near the Project Area on a similar landform adjacent to Rosebrook Creek, soils consist of a dark brown silty clay loam A Horizon from 0-15 cm, a brown to greyish brown B2 Horizon from 0.15 to 40 cm and a brown to greyish brown clay B2 Horizon from 0.40 to 80 cm (Young 2016).

3.2 Topography and Hydrology

The Project Area is located on a flood plain adjacent to Rosebrook Creek, a third order creek and tributary of the Hunter River. The Hunter River is 1.3 km west of the Project Area. The creek could have provided a freshwater drinking source as well as freshwater fish and shellfish species.

3.3 Flora and Fauna

This section is intended to give a general overview of the flora and fauna that may have been used by Aboriginal people in the past. The information has been supplied for understanding the past Aboriginal use of the landscape and is not intended for ecological assessment purposes.

Past Aboriginal people are likely to have encountered vegetation similar to the Eastern Riverine Forests in the Project Area

Eastern Riverine forests are characterised by Open Casuarina Forest, 10-40 m tall, with a variable non-sclerophyll shrub stratum and patchy groundcover of sedges and herbs, interspersed with leaf litter, cobbles and open sand. Common shrubs include *Acacia floribunda* (white sally), *Acacia mearnsii* (black wattle), *Glochidion ferdinandi* (cheese tree), *Hymenanthera dentata* (tree violet), *Tristaniopsis laurina* (water gum). Common Forbs includes *Hydrocotyle tripartite* (pennywort), *Persicaria hydropiper* (water pepper), *Carex appressa* (tussock sedge), *Entolasia marginate* (bordered panic), *Lomandra longifolia* (spiny-headed mat-rush), *Microlaena stipoides* var. *stipoides* (weeping grass), *Oplismenus aemulus.*

Further from the river and creek lines on vegetation was most likely similar to Western Slopes Grasslands, which grow on alluvial outwash plains and deeply weathered basalt slopes with dark grey-brown clay soils. They comprise closed tussock grassland with sporadic shrubs and herbs. The dominant tussock grass, *Austrostipa aristiglumis* (plains grass), may grow in dense swards as tall as 1.5 m, often to the exclusion of other grass species.

Common Shrubs include occasional *Sclerolaena muricata* (black rolypoly) and the introduced *Acacia farnesiana* (mimosa bush). Rare occurrences of *Acacia pendula* (myall),*Casuarina cristata*(belah) or *Geijera parviflora* (wilga), and *Pimelea microcephala* (shrubby rice flower) may signify secondary grasslands derived from woodland communities.

Common forbs include *Abutilon oxycarpum* (flannel weed), *Boerhavia domini* (tarvine), *Calotis scabiosifolia* (rough burr-daisy), *Cullen tenax* (emu-foot), *Oxalis perennans, Sida trichopoda* (high sida), *Solanum esuriale* (quena), *Aristida leptopoda* (white speargrass), *Austrodanthonia bipartite* (bandicoot grass), *Austrostipa aristiglumis* (plains grass), *Chloris acicularis, C. truncate* (windmill grass), *Dichanthium sericeum* (Queensland bluegrass), *Paspalidium constrictum* (knottybutt grass), *Sporobolus caroli* (fairy grass), *S. elongatus* (slender rats tail grass).

The leaves of *Lomandra longifolia* could be eaten or used in weaving, including to make fish traps (Nash 2004, 13–14). The seeds could also be ground to make flour. Casuarina needles were chewed for their water content. The hard wood of gums could be used for making tools and shields as well as coolamons.

3.4 Land Use

The land includes the current bridge and roadway with cleared paddocks either side of Wybong Road. Historical imagery indicates that the land has been cleared and used as a paddock for many decades (Figure 3).

Figure 3. Project Area in 1958. (Source: NSW Spatial Portal)

3.5 Synthesis

The Project Area is located along a creek line that could have provided a freshwater drinking source and variety of floral and faunal resources. However, it is expected that the nearby resource rich Hunter River would have been a more favoured place to camp. If there is evidence of Aboriginal occupation it is expected to be lower density artefact scatters than along the banks of the Hunter.

4 Heritage Context

This section outlines the Aboriginal heritage context of the Project Area. It includes a general outline of Aboriginal occupation in Australia and the region, an analysis of search results from the Aboriginal Heritage Information Management System (AHIMS), as well as relevant heritage studies.

4.1 Aboriginal Occupation of the Hunter Valley – Ethnohistorical Context

Aboriginal people have occupied Australia for at least 50,000 years, with potential evidence for earlier occupation. The traditional owners of the land within the Project Area are the Wonnarua (also Wanaruah) people. The traditional lands of the Wonnarua people have been documented as extending to the Upper Hunter River from a few miles above Maitland, west to the Dividing Range (Tindale 1974). According to the Dreaming of the Wonnarua people, the Hunter Valley region; the mountains, plains and all living things were created be the great spirit Baiame (Miller 1985).

According to Wood (1972, 44) Wonnarua people left heaps of mussel shells on the banks of Muscle Brook, hence its name and also of the town of Muswellbrook.

J W Fawcett wrote about the Wonnarua people and how they chose camp sites near the turn of the century – “In choosing the site for their camps, proximity to fresh water was one essential, some food supply a second, whilst a vantage ground in case of attack from an enemy was a third (Fawcett 1898, 152).

4.2 Aboriginal Occupation of the Hunter Valley – Archaeological Background

Aboriginal occupation in the Hunter Valley has been dated to 11,050 years before present which precedes the rise of sea levels around 6,000 years before present (Attenbrow 2006). However, evidence for earlier occupation is limited by the lower preservation of archaeological deposits extending back in time but is also limited by the types of scientific dating techniques available.

The nature, distribution, and potential for archaeological sites across the landscape depends upon environmental factors, such as geology, landforms, vegetation, proximity to water etc; the durability of the raw materials used in manufacturing; and the land use history, particularly post occupation disturbance and development.

Aboriginal people made everything they need to survive from their local environment or traded with other groups from where the resource could be found. Shelter, fire, tools, weapons, implements, apparel and ceremonial equipment were sourced from the surrounding stone, trees, plants and animals, clays, shells and grasses. The following is a broad summary of some of the material culture items, but there are many more examples in the literature and from oral histories.

Stone Tools

Artefacts related to stone tool manufacture are one of the most common finds in the Australian archaeological record. They usually dominate the archaeological record because they preserve well compared to other materials such as bone implements, clothing, ornamentation, medicinal supplies,

woven goods, and wooden weapons used by Aboriginal people. Such artefacts include the tools themselves, such as axes, blades and microliths, as well as remnants of their production such as cores, flakes and flake pieces. The presence of stone artefacts in the archaeological record is dependent on the location of stone outcrops and quarries. Common stone types in the Hunter Valley include mudstone, silcrete, and tuff. Other materials such as quartz, quartzite, and chert may also be found, albeit at lower frequencies.

Spears and Spear Throwers

Spears for hunting, fishing and battle were made from slightly different materials. The shaft of most spears was made using grass-tree stem, gigantic lily, ironbark hardwood prongs and grass tree gum. Hunting spears had bone points. Battle spears had quartz or chert pieces added, while fishing spears often had four hardwood prongs attached with bark thread and tipped with bone or stone barbs. Throwing sticks or wommera, used in conjunction with spears, were made from hardwood Eucalyptus species.

Shields and Weapons

The historic records indicate shields were often made from the buttress of the giant nettle tree (*Dendrocnide excelsa*) or fig tree (*ficus spp*). Usually about 1 m long and 0.5 m wide, with a handle on the inner side and soft paperbark padding. The shields were often painted with white pipe clay and a red ochre border and cross pattern (Brayshaw 1987, 63–64). The removal of bark to create such shields often left a distinctive scar on the tree and occasionally old trees known as scarred trees (sometimes also referred to as modified trees) bear the evidence of such uses. Hunting sticks, throwing sticks, digging sticks, boomerangs and clubs were all crafted from hardwood Eucalyptus species.

Containers – Coolamons, Nets, Baskets

Bark containers, woven bags, coolamons, netting and wooden bowls were essential parts of the toolkits of Aboriginal women, who used them for gathering and collecting food, water and other resources. While they were common items used by local people, the direct survival of these objects archaeologically is unlikely unless buried in an anaerobic condition such as peat. The wooden bowls and coolamons; however, would leave evidence of scarring on the tree. The wooden bowls were often made from protuberance of a tree and sometimes from insect galls. Coolamons were ovate shaped and would leave oval-shaped scarring on the tree.

Art Sites

Art sites may take the form of rock engravings or pigment drawings. Engravings were usually made on flat sandstone sheets. The engravings represented hundreds of spiritual figures including ancestral beings (sky heroes) and a wide range of animals and objects and normal-sized human beings. There is very little historical account of their use, as it appears, they were often/mainly used for ceremonial activities and thus under Aboriginal custom their use was not openly discussed. However, from the few accounts given to white settlers from the mid-late 1800s suggests they had an important place in Aboriginal ceremony (Attenbrow 2002, 134–35). Art sites created from pigment may include representations of animals or humans as well as hand stencils. They often occur in rock shelters as these formations protect the paintings from the elements. A significant art site in Wonnarua country is Baiame Cave (Heritage NSW 2016), located approximately 60km south of the current Project Area.

Grinding Grooves

Grinding grooves were important to stone tool maintenance and food preparation. Grinding grooves are commonly found in sandstone sheets associated with creeks and water holes. Water was needed to be able to sharpen stone tools on the sandstone.

4.3 Aboriginal Heritage Information Management System (AHIMS)

The Aboriginal Heritage Information Management System was searched on the 7th of December 2021 from -32.277764, 150.843143 (Lat, Long) to -32.246574, 150.881484 (Lat, Long). The search produced a result of 94 sites. Majority of these have been recorded in surveys and archaeological salvage related to the Bengalla and Mt Pleasant mining operations.

Table 2. AHIMS site types.

Site Types	Count	Per cent
Isolated Find	1	1.06%
Modified Tree	3	3.19%
Artefact/s	90	95.74%
Total	**94**	**100%**

The majority of the sites identified in the search are salvaged, meaning they have been subject to an AHIP. Three sites are also not a site, indicating that further investigation revealed that the trees were not the result of cultural modification. The status of sites is summarised in Table 3.

Table 3. AHIMS site status.

Site Types	Salvaged/ Destroyed	Not a site	Valid
Isolated Find	1	0	0
Modified Tree	0	3	0
Artefact/s	88	0	2
Total	**89**	**3**	**2**
Percent	**94.62%**	**3.19%**	**2.13%**

Figure 4 . Project Area and AHIMS Sites. (Source: SIX Maps aerial with Heritage Now and AHIMS additions)

4.4 Heritage Report Summaries

Heritage reports relevant to the Project Area have been summarised in this section to provide an understanding of the previous assessments that have been undertaken and the implications for Aboriginal site patterning.

Rich (1993) Proposed Bengalla Coal Mine, Muswellbrook NSW Survey

An archaeological survey was completed as part of an assessment for a proposed open cut coal mine 1.3 km west of the Project Area. The survey identified 39 scatters and 17 isolated finds, with over 1,000 artefacts recorded. Artefacts were identified across all land units, with the highest densities of artefacts around the creek line and low rises in the Hunter flats. The land use history of the area includes extensive ploughing and farming, therefore the sites were not considered to be in situ. The most common raw material was silcrete, accounting for 60% of all artefacts observed (Rich 1993, 24). This raw material occurs naturally in the Project Area, with an extraction site observed during survey (site B10). Other materials observed included indurated mudstone, quartz, petrified wood, and other igneous material. A range of artefacts were observed: flakes, cores, and debitage associated with the extraction and initial reduction of material; larger tools such as axes, and hammerstones; smaller flakes and tools; and microblade assemblages (Rich 1993, 27–29). Different assemblages were associated with different parts of the landscape and was interpreted as behavioural use of the landscape. These sites would be impacted by the proposal. It was recommended for an archaeological salvage program and management plan be developed prior to the commencement of the mine and associated infrastructure. Additionally, it was recommended that the boundaries and extent of development be clearly marked to allow particular sites to be protected where possible (Rich 1993, 45). The B10 site was assessed as locally and potentially regionally significant with only one other silcrete extraction site being previously studied. It was recommended for this site to be protected (Rich 1993, 101).

White (1998) Archaeological Salvage of Sites B10 & B33, Bengalla Mine

Two of the sites previously identified by Rich, B10 and B33 were subject to archaeological testing. B10 is a silcrete quarry site located on a paleo Hunter Riverbank, and B33 is an artefact scatter located 2 km upstream of B10.

Two testing areas were excavated in association with B10 (B10-1 and B10-2) and an additional two areas associated with B33 (B33-1 and B33-2) (White 1998, 4–6). B10-1 was located around outcropping silcrete boulders and a total of 4, 454 artefacts were uncovered in this area. Some artefacts were the results of removal of material from embedded boulders that were then worked, others showed evidence of heat treating before being used as cores. In addition to silcrete knapping there was evidence of systematic knapping of petrified wood. B10-1 was interpreted as a major area of silcrete reduction. The density of artefacts a B10-2 was lower with 222 artefacts recovered. B10-2 was located further up the hill from the silcrete outcrops and contained a greater variety of raw material than B10-1, with silcrete accounting for 93% of artefacts in B10-1 and 55% in B10-2 (White 1998, 41). B10-2 also had a higher frequency of cores and tools, with the interpretation that people likely carried material up to this location, resulting in occasional flakes from a variety of materials. It was noted that the test excavation only included a small proportion of B10 and does not necessarily provide a representative sample of the whole site(White 1998, 52).

B33 was tested partly to provide a comparison with B10. It was located on a colluvial footslope east of the creek. B33-1 was a randomly selected 5 x 10 m square at the site. It contained 142 artefacts in total. It represented a low density scatter of a range of artefacts, of note was a broken ground edge axe (White 1998, 74). B33-2 involved the excavation of a 3 x 5 m square associated with a partly eroded silcrete knapping floor. The excavation uncovered with 523 heat treated and flaked artefacts. A total of 92 surface artefacts were also collected from an erosion scour at the site. The site was described as a tool processing location rather than a tool manufacturing location, with evidence that silcrete was flaked, heated, and the heat shatters flaked (White 1998, 90). A core of silicified tuff was also knapped there, with a series of flakes that conjoined uncovered at the site showing core rotation and made use of asymmetric alternating and perhaps bifacial flaking (White 1998, 85). Overall, the B33 assemblage was interpreted as more transient use of the landscape.

This excavation and research is locally significant as limited research on quarry sites had been previously undertaken in the Upper Hunter Valley.

4.5 Synthesis

Silcrete and petrified wood has been documented to occur within the Muswellbrook local geology and was extracted, treated, and worked by Aboriginal people to create tools. Previous archaeological studies in the area have demonstrated that artefacts are a common site type in the area as well as the archaeological sensitivity of the Hunter and its tributaries, including Rosebrook Creek. This suggests the potential for artefact sites to be present in the Project Area with silcrete being the most likely raw material.

5 Archaeological Survey

The Project Area was surveyed by Crystal Phillips, Heritage Consultant at Heritage Now on 9 December 2021.

5.1 Survey Results

The length of both sides of Wybong Road within the Project Area was walked along. There were many areas of exposure, however this mostly consisted of imported gravels (Plate 1, Plate 2). The archaeological sensitivity was considered low due to past construction and ongoing use of the road.

Both sides of Rosebrook Creek were inspected (Plate 3, Plate 4). The elevated creek bank was mostly covered in grasses with occasional exposures showing brown silty clay alluvial deposit (Plate 5, Plate 6). Although no artefacts were observed during survey, the flat elevated land either side of Rosebrook Creek 15 m south of the current bridge is identified as archaeologically sensitive (Figure 5). The creek bank at the site of the bridge itself has been impacted previously by the construction of the existing bridge and is not considered to be sensitive (Plate 7).

The creek bank on the northern side of the bridge was less elevated and appeared to be partly disturbed by cattle.

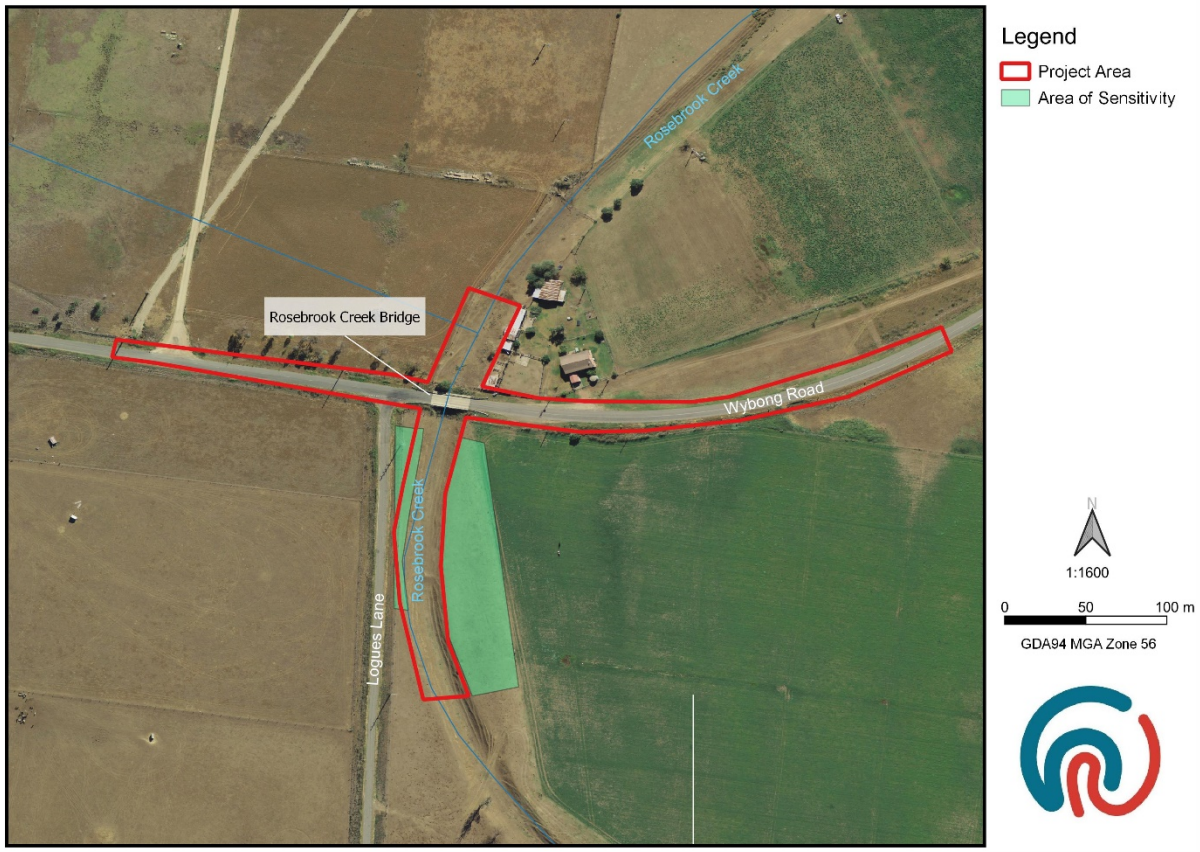


Figure 5. Map of archaeological sensitivity. (Source: SIX Maps aerial with DCDB cadastral boundaries and Heritage Now additions)

5.2 Summary

No surface artefacts were identified during survey; however, the elevated area on either side of Rosebrook Creek 15m south of the existing bridge is assessed as being archaeologically sensitive.

6 Impact Assessment

This section assesses the potential impact of the proposed works in relation to Aboriginal heritage values in the Project Area.

6.1 Proposed Works

The Project Proposal is to replace the existing timber bridge and replace with a concrete bridge to increase the carrying capacity of the bridge to include all vehicle types. The Final Concept has not yet been finalised.

6.2 Impact Assessment

The area 15 m south of the bridge is identified as being archaeologically sensitive. While the final concept for the bridge replacement has not been finalised, it is anticipated that this area will be outside the works zone. This area is to be avoided.

6.3 Mitigation

The below strategies have been developed to mitigate harm and/or loss of Aboriginal cultural values as a result of the proposed works.

The area of archaeological sensitivity is to be avoided, if it cannot be avoided then further archaeological testing will be required before ground disturbance works take place.

All on-site personnel are to be made aware of their obligations under the National Parks and Wildlife Act 1974, this includes protection of Aboriginal sites and the reporting of any new Aboriginal, or suspected Aboriginal, heritage sites. This may be done through an onsite induction or other suitable format.

In the unlikely event that Aboriginal, or suspected Aboriginal archaeological material is uncovered during the development, then works in that area are to stop and the area is to be cordoned off. The project manager is to contact the heritage consultant to make an assessment as to whether the material is classed as Aboriginal object/s under the *National Parks and Wildlife Act 1974* and advise on the required management and mitigation measures. Works are not to recommence in the cordoned off area until heritage clearance has been given and/or the required management and mitigation measures have been implemented.

In the very unlikely event that human remains, or suspected human remains are uncovered during the development, then works in that area are to stop and the area is to be cordoned off. The project manager is to contact the NSW Police to establish whether the area is a crime scene. If it is not a crime scene, then Heritage NSW is to be notified via the Environment Line on 131 555 and management measures are to be devised in consultation with the local Aboriginal community. Works are not to recommence in the area until the management measures have been implemented.

6.4 Summary

The groundworks associated with the proposal are confined to the existing road corridor. There are no proposed impacts to any known archaeological sites or areas of sensitivity.

7 Conclusions and Recommendations

The elevated creek bank of Rosebrook Creek has archaeological potential based on previous archaeological results in the area and the known sensitivity of creeks and rivers in the Hunter Valley. The location of the proposed bridge is not considered to be sensitive based on previous disturbances related to the construction of the existing bridge and roadways, but there is an area of archaeological sensitivity 15 m south of the current bridge and is to be avoided, or further archaeological investigation will be required.

Works may proceed subject to the following recommendations:

Recommendation 1

The area of archaeological sensitivity is to be avoided, if it cannot be avoided then further archaeological testing will be required before ground disturbance works take place.

Recommendation 2

All on-site personnel are to be made aware of their obligations under the *National Parks and Wildlife Act*. This includes protection of Aboriginal sites and the reporting of any new Aboriginal, or suspected Aboriginal heritage sites. This may be done through an on-site induction or other suitable format.

Recommendation 3

In the unlikely event that Aboriginal, or suspected Aboriginal archaeological material is uncovered during the development, then works in that area are to stop and the area is to be cordoned off. The project manager is to contact the heritage consultant to make an assessment as to whether the material is classed as Aboriginal object/s under the *National Parks and Wildlife Act 1974* and advise on the required management and mitigation measures. Works are not to recommence in the cordoned off area until heritage clearance has been given and/or the required management and mitigation measures have been implemented.

Recommendation 4

In the very unlikely event that human remains, or suspected human remains are uncovered during the development, then works in that area are to stop and the area is to be cordoned off. The project manager is to contact the NSW Police to establish whether the area is a crime scene. If it is not a crime scene, then Heritage NSW is to be notified via the Environment Line on 131 555 and management measures are to be devised in consultation with the local Aboriginal community. Works are not to recommence in the area until the management measures have been implemented.

8 References

Attenbrow, Val. 2002. *Sydney's Aboriginal Past*. Sydney, NSW: UNSW Press.

———. 2006. *What's Changing: Population Size or Land-Use Patterns? The Archaeology of Upper Mangrove Creek, Sydney Basin*. Canberra: Australian National University Press.

Brayshaw, Helen. 1987. *Aborigines of the Hunter Valley*. Scone, NSW: Scone and Upper Hunter Historical Society.

DECCW. 2010. "Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales." Sydney, NSW: Department of Environment, Climate Change and Water.

DPIE. 2020. "Hunter Soil Landscape." A-hu.

Fawcett, JW. 1898. "Notes on the Customs and Dialect of the Wonah-Ruah Tribe." *Science Of Man*, August, 152–54.

Heritage NSW. 2016. "Baiame Cave." State Heritage Inventory. 2016. https://apps.environment.nsw.gov.au/dpcheritageapp/ViewHeritageItemDetails.aspx?id=5063430.

Kuskie, PJ. 2015. "Waterford County Eastern Sector (Part Lot 812 DP 1171131, Part Lot 7270 DP 1187087, Lot 1 DP1020710 and Lot 43 DP 1009594, Chisholm, Lower Hunter Valley, New South Wales: Aboriginal Cultural Heritage Assessment." Aboriginal Cultural Heritage Assessment 103380. Hughes, ACT: Report to Waterford County Pty Ltd.

Miller, J. 1985. *Koori: A Will to Win*. Angus and Robertson.

Nash, Daphne. 2004. *Aboriginal Plant Use in South-Eastern Australia*. Australian National Botanical Gardens. https://parksaustralia.gov.au/botanic-gardens/pub/aboriginal-plantuse.pdf.

NSW Minerals Council. 2010. "NSW Minerals Industry Due Diligence Code of Practice for the Protection of Aboriginal Objects." NSW Minerals Council Ltd.

Rich, Elizabeth. 1993. "Proposed Bengalla Coal Mine, Muswellbrook NSW: Archaeological Survey for Aboriginal Sites." AHIMS Report 2687. Muswellbrook, NSW: Report for Envirosciences Pty Ltd & Bengalla Joint Venture.

Tindale, N. 1974. *Aboriginal Tribes of Australia. Their Terrain, Environmental Controls, Distribution, Limits and Proper Names.* Canberra: ANU Press.

White, Elizabeth. 1998. "Archaeological Salvage of Sites B10 & B33, Bengalla Mine, Hunter Valley, NSW." AHIMS Report 100681. Hunter Valley, NSW: Report for Bengalla Mining Company.

Wood, WA. 1972. *Dawn in the Valley: The Story of the Settlement in the Hunter River Valley to 1833.* Sydney NSW: Wentworth Books.

Young, Mark. 2016. "Soil Profile Report: Kayuga Road." Soil Report 96168. Sydney, NSW: NSW Soil and Land Information System. https://www.environment.nsw.gov.au/espade2webapp/report/profile/96168.

9 Plates

Plate 1. Wybong Road, view to west towards Rosebrook Bridge, areas of exposure on either side of road

Plate 2. Gravels along road

Plate 3. Rosebrook Creek, view to north

Plate 4. Rosebrook Creek, north of bridge, view to north

Plate 5 Exposed alluvial creek bank on western creek bank, view to west

Plate 6. Exposed silty clay on western bank, view to south

Plate 7. Rosebrook Bridge, view to west side of bridge, showing stablilisation works and cut into creek bank

Attachment 1 AHIMS Search

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : HN356-A Wybong

Client Service ID : 645302

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
37-2-3490	MTP-912	GDA	56	297350	6428945	Open site	Destroyed	Artefact : -		
Contact	Recorders	Mr.Lennard Roberts						Permits	4005	
37-2-4067	MTP-1696	GDA	56	297578	6430107	Open site	Destroyed	Artefact : -		
Contact	Recorders	Ms.Helen Selimiotis						Permits		
37-2-6316	ERM-C33	GDA	56	297605	6429069	Open site	Destroyed	Artefact : -		
Contact	Recorders	Elizabeth Rich,Niche Environment and Heritage,Mr.Wade Goldwayer						Permits		
37-2-3037	MTP-456	GDA	56	297744	6429040	Open site	Destroyed	Artefact : -		
Contact	Recorders	Mr.Lennard Roberts						Permits	4005	
37-2-4073	MTP-1702	GDA	56	298137	6429830	Open site	Destroyed	Artefact : -		
Contact	Recorders	Ms.Helen Selimiotis						Permits		
37-2-4092	MTP-1736	GDA	56	298213	6429965	Open site	Destroyed	Artefact : -		
Contact	Recorders	Ms.Helen Selimiotis						Permits	4005	
37-2-6091	A02-5876	GDA	56	298856	6427368	Open site	Valid	Artefact : -		
Contact	Recorders	Niche Environment and Heritage,Mr.Wade Goldwayer						Permits		
33-2-0025	MPO 2017/3	GDA	56	298826	6428879	Open site	Destroyed	Artefact : -		
Contact	Recorders	Niche Environment and Heritage,Niche Environment and Heritage,Mr.Balazs Hans						Permits		
37-2-4090	MTP-1732	GDA	56	298622	6430003	Open site	Not a Site	Modified Tree (Carved or Scarred) : -		103689,103690
Contact	Recorders	Ms.Helen Selimiotis						Permits	4005	
37-2-4084	MTP-1726	GDA	56	298502	6429856	Open site	Destroyed	Artefact : -		
Contact	Recorders	Ms.Helen Selimiotis						Permits	4005	
37-2-6261	ERM-C3	GDA	56	296905	6429509	Open site	Destroyed	Artefact : -		
Contact	Recorders	Elizabeth Rich,Niche Environment and Heritage,Mr.Wade Goldwayer						Permits		
37-2-2855	MTP-51	GDA	56	296942	6428777	Open site	Not a Site	Modified Tree (Carved or Scarred) : -		103653
Contact	Recorders	Mr.Lennard Roberts						Permits	4005	
37-2-0571	B2 ;	AGD	56	297105	6427689	Open site	Destroyed	Artefact : -	Open Camp Site	2687,100681,100765
Contact	Recorders	Bobbie Oakley,K Calley						Permits	851	
37-2-6310	ERM-C27	GDA	56	297215	6429239	Open site	Destroyed	Artefact : -		
Contact	Recorders	Elizabeth Rich,Niche Environment and Heritage,Mr.Wade Goldwayer						Permits		
37-2-6309	ERM-C26	GDA	56	297215	6429379	Open site	Destroyed	Artefact : -		
Contact	Recorders	Elizabeth Rich,Niche Environment and Heritage,Mr.Wade Goldwayer						Permits		
37-2-6311	ERM-C28	GDA	56	297305	6429189	Open site	Destroyed	Artefact : -		
Contact	Recorders	Elizabeth Rich,Niche Environment and Heritage,Mr.Wade Goldwayer						Permits		
37-2-3033	MTP-452	GDA	56	298338	6429178	Open site	Destroyed	Artefact : -		

Report generated by AHIMS Web Service on 07/12/2021 for Trishia Palconit for the following area at Lat, Long From : -32.277764, 150.843143 - Lat, Long To : -32.246574, 150.881484.

Number of Aboriginal sites and Aboriginal objects found is 94

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
	Contact	**Recorders**	Mr.Lennard Roberts					**Permits**	4005	
37-2-4096	MTP-1740	GDA	56	298344	6430027	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Ms.Helen Selimiotis					**Permits**	4005	
37-2-4095	MTP-1739	GDA	56	298389	6430018	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Ms.Helen Selimiotis					**Permits**	4005	
37-2-3038	MTP-458	GDA	56	297796	6428926	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Mr.Lennard Roberts					**Permits**	4005	
37-2-6336	ERM-D20	GDA	56	298495	6430109	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Elizabeth Rich,Niche Environment and Heritage,Mr.Wade Goldwayer					**Permits**		
37-2-4074	MTP-1715	GDA	56	298540	6429493	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Ms.Helen Selimiotis					**Permits**		
37-2-3485	MTP-907	GDA	56	297572	6429096	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Mr.Lennard Roberts					**Permits**	4005	
37-2-6262	ERM-C4	GDA	56	296895	6429569	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Elizabeth Rich,Niche Environment and Heritage,Mr.Wade Goldwayer					**Permits**		
37-2-0576	B7 ;	AGD	56	296845	6426709	Open site	Destroyed	Artefact : -	Open Camp Site	2687,100681,100765
	Contact	**Recorders**	Elizabeth Rich					**Permits**	851	
37-2-6276	ERM-C16	GDA	56	297055	6429239	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Elizabeth Rich,Niche Environment and Heritage,Mr.Wade Goldwayer					**Permits**		
37-2-2886	MTP-82	GDA	56	297087	6429413	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Mr.Lennard Roberts					**Permits**	4005	
37-2-2854	MTP-50	GDA	56	297272	6429211	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Mr.Lennard Roberts					**Permits**	4005	
37-2-3492	MTP-914	GDA	56	297358	6428682	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Mr.Lennard Roberts					**Permits**	4005	
37-2-2850	MTP-46	GDA	56	297418	6429033	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Mr.Lennard Roberts					**Permits**	4005	
37-2-3488	MTP-910	GDA	56	297431	6429027	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Mr.Lennard Roberts					**Permits**	4005	
37-2-6315	ERM-C32	GDA	56	297445	6429069	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Elizabeth Rich,Niche Environment and Heritage,Mr.Wade Goldwayer					**Permits**		
37-2-2856	MTP-52	GDA	56	297435	6429623	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Mr.Lennard Roberts					**Permits**	4005	
37-2-2859	MTP-55	GDA	56	297669	6430086	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Mr.Lennard Roberts					**Permits**	4005	
37-2-4077	MTP-1719	GDA	56	298330	6429364	Open site	Destroyed	Artefact : -		

Report generated by AHIMS Web Service on 07/12/2021 for Trishia Palconit for the following area at Lat, Long From : -32.277764, 150.843143 - Lat, Long To : -32.246574, 150.881484.
Number of Aboriginal sites and Aboriginal objects found is 94

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : HN356-A Wybong

Client Service ID : 645302

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
	Contact	**Recorders**	Ms.Helen Selimiotis					**Permits**	4005	
37-2-4079	MTP-1721	GDA	56	298230	6429635	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Ms.Helen Selimiotis					**Permits**		
37-2-4081	MTP-1723	GDA	56	298490	6429745	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Ms.Helen Selimiotis					**Permits**	4005	
37-2-4071	MTP-1700	GDA	56	297832	6429796	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Ms.Helen Selimiotis					**Permits**		
37-2-3040	MTP-460	GDA	56	297725	6428964	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Mr.Lennard Roberts					**Permits**	4005	
37-2-3489	MTP-911	GDA	56	297488	6429030	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Mr.Lennard Roberts					**Permits**	4005	
37-2-4069	MTP-1698	GDA	56	297470	6430090	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Ms.Helen Selimiotis					**Permits**		
37-2-3481	MTP-903	GDA	56	296889	6429268	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Mr.Lennard Roberts					**Permits**	4005	
37-2-2884	MTP-80	GDA	56	296960	6429503	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Mr.Lennard Roberts					**Permits**	4005	
37-2-3491	MTP-913	GDA	56	297393	6428807	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Mr.Lennard Roberts					**Permits**	4005	
37-2-4078	MTP-1720	GDA	56	298305	6429617	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Ms.Helen Selimiotis					**Permits**		
37-2-4085	MTP-1727	GDA	56	298399	6429822	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Ms.Helen Selimiotis					**Permits**	4005	
37-2-4072	MTP-1701	GDA	56	298144	6429847	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Ms.Helen Selimiotis					**Permits**		
37-2-4064	MTP-1693	GDA	56	298169	6430121	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Ms.Helen Selimiotis					**Permits**		
37-2-3036	MTP-455	GDA	56	298208	6429075	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Mr.Lennard Roberts					**Permits**	4005	
37-2-4087	MTP-1729	GDA	56	298441	6429942	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Ms.Helen Selimiotis					**Permits**	4005	
37-2-4083	MTP-1725	GDA	56	298465	6429817	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Ms.Helen Selimiotis					**Permits**	4005	
37-2-6337	ERM-D21	GDA	56	298595	6430219	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Elizabeth Rich,Niche Environment and Heritage,Mr.Wade Goldwayer					**Permits**		
37-2-2861	MTP-57	GDA	56	298825	6429977	Open site	Destroyed	Artefact : -		

Report generated by AHIMS Web Service on 07/12/2021 for Trishia Palconit for the following area at Lat, Long From : -32.277764, 150.843143 - Lat, Long To : -32.246574, 150.881484.

Number of Aboriginal sites and Aboriginal objects found is 94

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : HN356-A Wybong

Client Service ID : 645302

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
	Contact	**Recorders**	Mr.Lennard Roberts					**Permits**	4005	
37-2-4082	MTP-1724	GDA	56	298634	6429823	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Ms.Helen Selimiotis					**Permits**	4005	
37-2-4089	MTP-1731	GDA	56	298567	6429998	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Ms.Helen Selimiotis					**Permits**	4005	
37-2-3486	MTP-908	GDA	56	297471	6429114	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Mr.Lennard Roberts					**Permits**	4005	
37-2-4070	MTP-1699	GDA	56	297496	6430075	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Ms.Helen Selimiotis					**Permits**		
37-2-6260	ERM-C2	GDA	56	296935	6429469	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Elizabeth Rich,Niche Environment and Heritage,Mr.Wade Goldwayer					**Permits**		
37-2-2852	MTP-48	GDA	56	297291	6429202	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Mr.Lennard Roberts					**Permits**	4005	
37-2-6313	ERM-C30	GDA	56	297405	6428989	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Elizabeth Rich,Niche Environment and Heritage,Mr.Wade Goldwayer					**Permits**		
37-2-2851	MTP-47	GDA	56	297428	6429018	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Mr.Lennard Roberts					**Permits**	4005	
37-2-6092	A01-5876	GDA	56	298857	6427371	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Niche Environment and Heritage,Mr.Wade Goldwayer					**Permits**		
37-2-3228	MTP-649	GDA	56	299133	6430009	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Mr.Lennard Roberts					**Permits**	4005	
37-2-2858	MTP-54	GDA	56	297919	6429570	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Mr.Lennard Roberts					**Permits**	4005	
37-2-3494	MTP-916	GDA	56	297727	6428825	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Mr.Lennard Roberts					**Permits**	4005	
37-2-3482	MTP-904	GDA	56	297221	6429424	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Mr.Lennard Roberts					**Permits**	4005	
37-2-1464	C1;.	AGD	56	297145	6429379	Open site	Destroyed	Artefact : -	Open Camp Site	
	Contact	**Recorders**	P Saunders,R Stocks					**Permits**	3459,4005	
37-2-4094	MTP-1738	GDA	56	298354	6429894	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Ms.Helen Selimiotis					**Permits**		
37-2-3241	MTP-662	GDA	56	298838	6430113	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Mr.Lennard Roberts					**Permits**	4005	
37-2-4086	MTP-1728	GDA	56	298496	6429919	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Ms.Helen Selimiotis					**Permits**	4005	
37-2-4088	MTP-1730	GDA	56	298542	6429990	Open site	Destroyed	Artefact : -		

Report generated by AHIMS Web Service on 07/12/2021 for Trishia Palconit for the following area at Lat, Long From : -32.277764, 150.843143 - Lat, Long To : -32.246574, 150.881484.

Number of Aboriginal sites and Aboriginal objects found is 94

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : HN356-A Wybong

Client Service ID : 645302

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
	Contact	Recorders	Ms.Helen Selimiotis					Permits	4005	
37-2-4075	MTP-1717	GDA	56	298564	6429442	Open site	Destroyed	Artefact : -		
	Contact	Recorders	Ms.Helen Selimiotis					Permits		
37-2-4076	MTP-1718	GDA	56	298582	6429490	Open site	Destroyed	Artefact : -		
	Contact	Recorders	Ms.Helen Selimiotis					Permits		
37-2-0563	Denman Road	AGD	56	297105	6429439	Open site	Destroyed	Artefact : -	Isolated Find	2576
	Contact	Recorders	Sue Effenberger					Permits	3459,4005	
37-2-6312	ERM-C29	GDA	56	297355	6428989	Open site	Destroyed	Artefact : -		
	Contact	Recorders	Elizabeth Rich,Niche Environment and Heritage,Mr.Wade Goldwayer					Permits		
37-2-4066	MTP-1695	GDA	56	297600	6430094	Open site	Destroyed	Artefact : -		
	Contact	Recorders	Ms.Helen Selimiotis					Permits		
37-2-3034	MTP-453	GDA	56	297686	6429274	Open site	Destroyed	Artefact : -		
	Contact	Recorders	Mr.Lennard Roberts					Permits	4005	
37-2-4091	MTP-1733	GDA	56	298277	6430069	Open site	Destroyed	Artefact : -		
	Contact	Recorders	Ms.Helen Selimiotis					Permits	4005	
37-2-4093	MTP-1737	GDA	56	298326	6429991	Open site	Destroyed	Artefact : -		
	Contact	Recorders	Ms.Helen Selimiotis					Permits	4005	
37-2-3493	MTP-915	GDA	56	297742	6428750	Open site	Destroyed	Artefact : -		
	Contact	Recorders	Mr.Lennard Roberts					Permits	4005	
37-2-3039	MTP-459	GDA	56	297809	6428939	Open site	Destroyed	Artefact : -		
	Contact	Recorders	Mr.Lennard Roberts					Permits	4005	
37-2-3035	MTP-454	GDA	56	298230	6429116	Open site	Destroyed	Artefact : -		
	Contact	Recorders	Mr.Lennard Roberts					Permits	4005	
37-2-4080	MTP-1722	GDA	56	298496	6429739	Open site	Destroyed	Artefact : -		
	Contact	Recorders	Ms.Helen Selimiotis					Permits	4005	
37-2-3484	MTP-906	GDA	56	297446	6429246	Open site	Destroyed	Artefact : -		
	Contact	Recorders	Mr.Lennard Roberts					Permits	4005	
37-2-6307	ERM-C24	GDA	56	296915	6429029	Open site	Destroyed	Artefact : -		
	Contact	Recorders	Elizabeth Rich,Niche Environment and Heritage,Mr.Wade Goldwayer					Permits		
37-2-2885	MTP-81	GDA	56	296998	6429794	Open site	Not a Site	Modified Tree (Carved or Scarred) : -		103689,103690
	Contact	Recorders	Mr.Lennard Roberts					Permits		
37-2-2853	MTP-49	GDA	56	297235	6429248	Open site	Destroyed	Artefact : -		
	Contact	Recorders	Mr.Lennard Roberts					Permits	4005	
37-2-3483	MTP-905	GDA	56	297310	6429362	Open site	Destroyed	Artefact : -		
	Contact	Recorders	Mr.Lennard Roberts					Permits	4005	

Report generated by AHIMS Web Service on 07/12/2021 for Trishia Palconit for the following area at Lat, Long From : -32.277764, 150.843143 - Lat, Long To : -32.246574, 150.881484.

Number of Aboriginal sites and Aboriginal objects found is 94

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : HN356-A Wybong

Client Service ID : 645302

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
37-2-3487	MTP-909	GDA	56	297430	6429013	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Mr.Lennard Roberts					**Permits**	4005	
37-2-2857	MTP-53	GDA	56	297779	6429607	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Mr.Lennard Roberts					**Permits**	4005	
37-2-4065	MTP-1694	GDA	56	298123	6430143	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Ms.Helen Selimiotis					**Permits**		
37-2-3240	MTP-661	GDA	56	298846	6430170	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Mr.Lennard Roberts					**Permits**	4005	
37-2-3227	MTP-648	GDA	56	299183	6430229	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Mr.Lennard Roberts					**Permits**	4005	
37-2-6314	ERM-C31	GDA	56	297465	6429029	Open site	Destroyed	Artefact : -		
	Contact	**Recorders**	Elizabeth Rich,Niche Environment and Heritage,Mr.Wade Goldwayer					**Permits**		

**** Site Status**

Valid - The site has been recorded and accepted onto the system as valid

Destroyed - The site has been completely impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There is nothing left of the site on the ground but proponents should proceed with caution.

Partially Destroyed - The site has been only partially impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There might be parts or sections of the original site still present on the ground

Not a site - The site has been originally entered and accepted onto AHIMS as a valid site but after further investigations it was decided it is NOT an aboriginal site. Impact of this type of site does not require permit but Heritage NSW should be notified

Report generated by AHIMS Web Service on 07/12/2021 for Trishia Palconit for the following area at Lat, Long From : -32.277764, 150.843143 - Lat, Long To : -32.246574, 150.881484.

Number of Aboriginal sites and Aboriginal objects found is 94