Bolger's Pit Quarry Ecological Assessment Report

Supporting the Environmental Impact Statement for EAR 1674

Prepared for Gunnedah Shire Council

3 March 2023

Bower Ecology
Survey | Planning | Strategy

Document Tracking

Project Name	Bolger's Pit Quarry Ecological Assessment Report
Project Number	0025
Version	1
Status	Final
Last saved on	03/03/2023

Citation: 'Bower Ecology Pty Ltd 2023. *Bolger's Pit Quarry Ecological Assessment Report, Supporting the Environmental Impact Statement for EAR 1674*. Prepared for Gunnedah Shire Council'

Disclaimer

This Report is prepared by Bower Ecology Pty Ltd, who was engaged by Gunnedah Shire Council (the Client). The Report is solely for the use of the Client and is not intended to and should not be used or relied upon by anyone else. Bower Ecology accepts no liability or responsibility whatsoever for or in respect of any use of or reliance upon this report and its supporting material by any third party. Information provided is not intended to be a substitute for other specific assessments, or legal advice in relation to any matter. Readers should consider that legislation changes from time to time. If changes have occurred, up to date information should be obtained.

Contents

List of Figures

List of Tables

Executive Summary

Gunnedah Shire Council proposes to regularise the use of, and laterally expand Bolgers Pit, a quarry at No. 809 Oakey Creek Road, Piallaway NSW 2342, Lots 139 DP751012 and B DP432415, south-east of Gunnedah. The proposed quarry development is designated development under s4.10 of the *Environmental Planning and Assessment Act* 1979 (EP&A Act), requiring the preparation of an Environmental Impact Statement (EIS). This Report provides an ecological assessment of the quarry expansion proposal for Bolger's Pit Quarry, and addresses Environmental Assessment Requirements (EAR 1674, dated 30 August 2022) and the associated response from the Biodiversity, Conservation and Science Directorate of the NSW Department of Planning and Environment (dated 9 September 2022) .

The proposed expansion includes clearing of a small area of native woodland (0.09 ha) amongst heavily disturbed lands / pasture areas that contain a mix of both native and exotic species.

To support the assessment both desktop studies and a site assessment was undertaken to understand ecological values of the site.

The assessment revealed that there is very little vegetation within the proposed expansion area. The small patches that do exist likely represent Plant Community Type (PCT) 101, which is described as "*Poplar Box - Yellow Box - **Western Grey Box** grassy woodland on cracking clay soils mainly in the Liverpool Plains, Brigalow Belt South Bioregion*". This PCT is also considered a Threatened Ecological Community (TEC) under both the NSW *Biodiversity Conservation Act 2016* (BC Act) and the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The likely local presence of this TEC, the single *Eucalyptus microcarpa* immediately to the north of the site, other matching floristics, and a precautionary approach is considered enough to classify the vegetation within the expansion area as this TEC.

With regards to threatened species, no threatened flora or fauna (or evidence of fauna) were observed during the site survey, and the site offers limited habitat value due to its size, isolation, history of disturbance, lack of habitat resources such as tree hollows and logs, and proximity to the existing quarry.

No wetlands, groundwater dependent ecosystems, or waterways are present in the proposed footprint; however waterways do exist to the north and south of the site. This includes a fourth order stream located 580m up-slope to the north of the quarry and an ephemeral unnamed second order stream approximately 130 m to south of the quarry.

As a result of the size of the vegetation proposed for clearing, as well as its low biodiversity value, it is considered unlikely that clearing and the associated quarry expansion will have a significant impact on either biodiversity regulated under the BC Act, or Matters of National Environmental Significance regulated under the EPBC Act. Further, the NSW Biodiveirsty Offset Scheme is not triggered by the proposal because:

1. Proposed vegetation clearing is less than the 1 ha native vegetation clearing threshold (as the minimum lot size associated with the property is 200 ha). The entire expansion area is only 0.8 ha;
2. the biodiversity values mapping is avoided; and
3. the project is very unlikely to result in a significant impact to threatened species or ecological communities pursuant to Section 7.3 of the BC Act (the test of significance).

With the report, Section 4 provides various mitigation and management measures required during vegetation clearing and subsequent operation of the quarry. This includes rehabilitation of part of the site (upon closure) with flora that can mimic the pre-existing PCT.

With regards to other relevant legislation:

- The project will satisfy the biosecurity duty under the NSW *Biosecurity Act 215* via the removal and appropriate disposal of weeds during clearing, as well as via the integration of the proposed footprint into any existing weed management programs. The rehabilitation plan to be enacted on closure of the quarry will also include ongoing weed management until the rehabilitation becomes self-sustaining.
- The development is not inconsistent with the provision of the *Gunnedah Local Environment Plan 2012* and associated *Development Control Plan 2012*. Further, the development, and associated rehabilitation upon closure will assist with meeting the aims of these plans.
- The koala assessment and survey undertaken as part of this ecological assessment revealed the proposed footprint does not constitute core koala habitat, and no evidence of koala was observed. Further, no Koala feed tree species listed in Schedule 2 of the Koala SEPP 2020 (within the *NSW State Environmental Planning Policy [Biodiversity and Conservation] 2021)* were recorded in the vegetation proposed for clearing. Hence, provision of the SEPP and the Gunnedah Koala Strategy are not triggered.
- All quarry operation activities are to be managed according to the *Protection of the Environment Operations Act (1997).*

1 Introduction

1.1. Background

Gunnedah Shire Council operates numerous quarries, known as "borrow pits", throughout the Gunnedah Local Government Area. These supply material for maintenance and upgrades to the local road network.

Bolgers Pit (Figure 1) is one of the Council's larger borrow pits, located at No. 809 Oakey Creek Road, Piallaway NSW 2342 (Lots 139 DP751012 and B DP432415), in the south-east portion of the Gunnedah Shire, located approximately 32km to the south-east of the Gunnedah township. Gunnedah Shire council propose to regularise the use of, and laterally expand, the quarry pit. The current disturbed area of the quarry is approximately 2.71 ha, and the Council proposes to expand operations to a further 0.8 ha of land. The proposed rate of extraction is up to 40,000 tonnes per annum, utilising an additional quarry resource of approximately 306,000 m^3, equivalent to approximately 734,000 tonnes per annum.

Due to the modest extraction rate, the quarry is proposed to operate on a campaign basis for short periods of time during any one year. At a maximum of 40 loaded trucks per day, and assuming trucks carrying loads of up to 32 tonnes, would mean that up to 1,280 tonnes of quarry product could be exported from the site on any one day. At that rate of truck movement the quarry could supply quarry material for a total of just over six weeks in any one year, with the quarry lying dormant for the remainder of that year. If smaller trucks are used this could extend the life of the quarry.

The proposed quarry development is designated development under s4.10 of the Environmental Planning and Assessment Act 1979 (EP&A Act), requiring the preparation of an Environmental Impact Statement (EIS) as it triggers at least one of the criteria listed in Schedule 3 of the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation): Item 19 Extractive Industries, namely, the quarry has an area in excess of 2 ha.

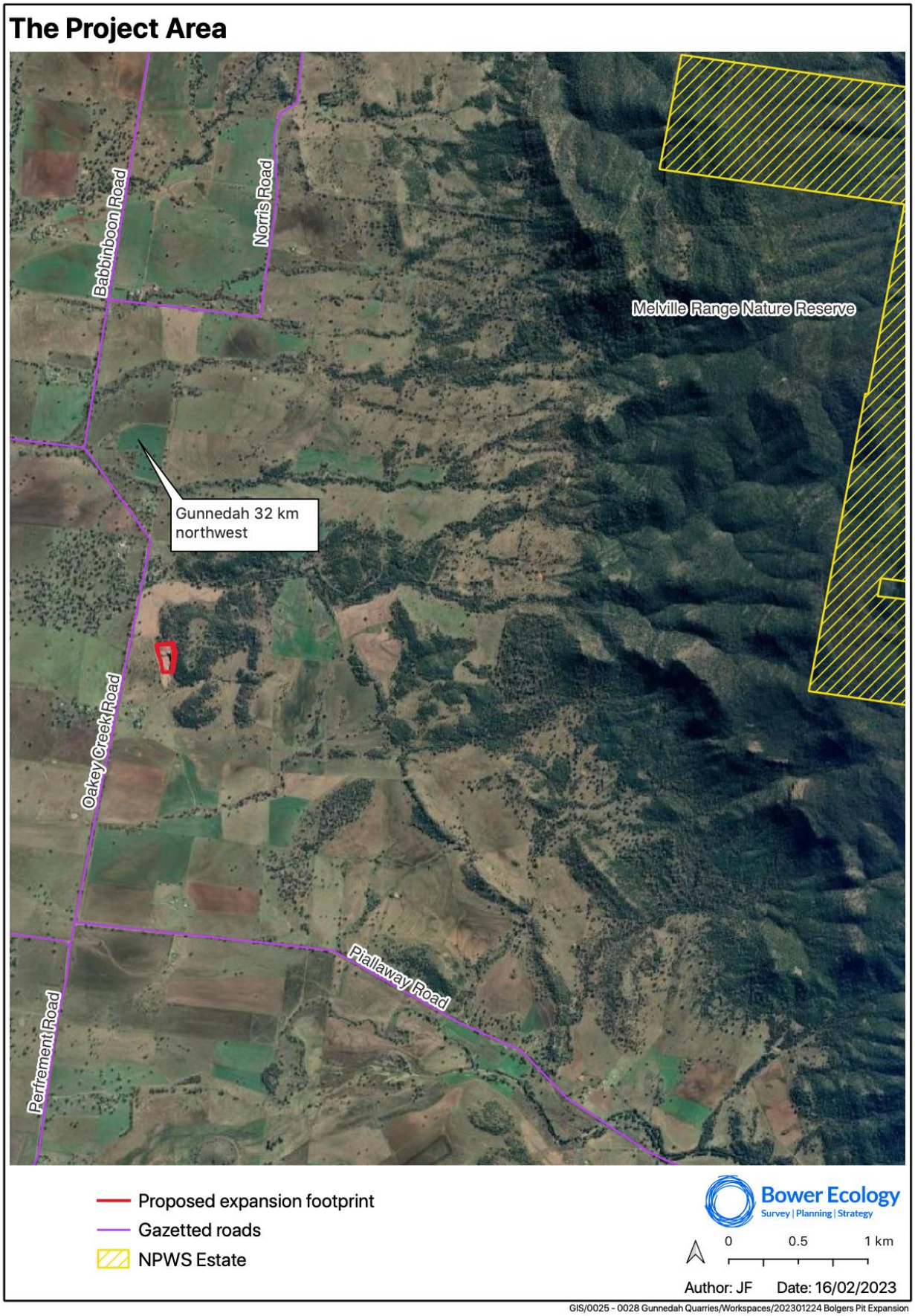

Figure 1: Bolger's Pit project context

1.2. Scope of this report

Bower Ecology has been engaged to prepare an ecological assessment of the quarry expansion proposal to assist with preparation of the EIS. This report specifically responds to the Environmental Assessment Requirements (EAR 1674, dated 30 August 2022) and the associated response from the Biodiversity, Conservation and Science Directorate of the NSW Department of Planning and Environment (dated 9 September 2022) (see Table 1).

Table 1: Assessment Requirements and how they are addressed.

Requirements	Section of this Report
Planning Secretary's Environmental Assessment Requirements	
• accurate predictions of any vegetation clearing on site;	Section 4
• a detailed assessment of the potential biodiversity impacts of the development, paying particular attention to threatened species, populations and ecological communities and groundwater dependent ecosystems undertaken in accordance with Sections 7.2 and 7.7 of the *Biodiversity Conservation Act 2016*;	Section 4
• a detailed description of the proposed measures to maintain or improve the biodiversity values of the site in the medium to long term, as relevant	Section 4
BCS's Recommended Environmental Assessment Requirements	
• an assessment of the likely impact of the development on biodiversity values, specifically to determine if it is "likely to significantly affect threatened species", in accordance with Section 7.2 of the *Biodiversity Conservation Act 2016*;	Section 4.2
• an assessment of the likely impacts on NPWS managed conservation estates in proximity to the site;	Section 3.4
• mapping of features relevant to water;	Section 3.5
• an assessment of potential impacts of the development on both water quality and hydrology, with specific reference to potential effects upon hydrological features (i.e. rivers, wetlands, estuaries, marine waters and floodplain areas) and the natural processes within them, and water-dependent flora and fauna and groundwater dependent ecosystems;	Section 4.3
• an assessment of the impacts of the proposed expansion on flood behaviour, including whether there will be a direct or indirect increase in erosion, siltation, destruction of riparian vegetation or a reduction in the stability of riverbanks or watercourses.	Section 4.3

1.3. Site Description

The quarry is situated on privately owned land, leased to the Gunnedah Shire Council. The site consists of undulating to moderately sloped terrain, with slopes of 11° or more (subject to survey) in places. There are areas of vegetation immediately adjacent to the site to the north and east (Figure 1). The site is located in the Liverpool Plains IBRA sub-region, within the Brigalow Belt South IBRA region. The site is also on the mapped boundary of the "Liverpool Alluvial Plans" and "Tamworth – Keepit Sloes and Plains" Mitchell Landscape.

2 Methodology

The methodology utilised to prepare this ecological assessment report is detailed below.

The NSW Department of Planning and Environment was also consulted via phone (24/2/2023) to discuss the assessment methods.

It is understood that Gunnedah Shire Council had recently undertaken clearing of the site prior to the site assessment conducted in May 2022. We have based our assessment on the vegetation present at the time of this site assessment.

2.1. Desktop Assessment

A desktop assessment has reviewed the following sources of information to understand the ecological values within the study area:

- NSW BioNet, Threatened Species records within approximately 5 km of the site (24 January 2023).
- NSW Department of Environment and Planning threatened species profiles.
- NSW Office of Environment and Heritage GeoHabitat database (24 January 2023).
- NSW State Vegetation Type Map, accessed via the NSW Government SEED Portal (Sharing and Enabling Environmental Data) (Release C1.1.M1.1, December 2022).
- NSW Trees Near Me (State Vegetation Type Mapping Version C1.1M1).

2.1.1. NSW Water Theme – Hydro Line mapping, accessed by the NSW Government Spatial Portal (23 January 2023).Threatened Species

A Significant Impact Test (as per Section 7.3 of the NSW *Biodiversity Conservation Act 2016* [BC Act]) was undertaken, to determine the likelihood of significant impacts to threatened species in the small area of vegetation proposed for clearing. This is provided in Section 4.2.

2.2. Ecological Survey Methodology

A brief site assessment was conducted on 5 May 2022 to:

- Understand water features across the impact area;
- Record dominant flora species to confirm Plant Community Types (PCTs) on site;
- Survey for threatened flora species;
- Record notes on threated fauna habitat, and record incidental sightings of threatened fauna;
- Survey for signs of koala in and under suitable feeding tree species.

2.3. Terminology in this report

Exotic species are marked with an asterisk (*) throughout this report.

The term "proposed project footprint" describes the proposed quarry expansion area. The term "study area" refers to the site as well as adjacent areas that may be indirectly impacted by potential future development (e.g. due to edge effects). The study area also includes an approximate 5 km buffer from the site to review local BioNet threatened species records.

3 Existing Environmental Values

3.1. Native Vegetation Communities

The NSW State Vegetation Type Map and NSW Government Trees Near Me website were reviewed to help identify the Plant Community Type (PCT) of the vegetation to the north and east of the site, including the areas proposed for clearing. PCT is a vegetation classification system used to describe patterns of species assemblages of native plants in relation to environmental conditions such as soil, temperature and moisture. This vegetation is mapped by the NSW State Government as PCT 589, described as "*White Box – White Cypress Pine – Silver-leaved Ironbark grassy woodland on mainly clay loam soils on hills mainly in the Nandewar Bioregion*".

Dominant flora species were recorded at seven assessment points (Figure 3) in and around the proposed project footprint. Table 2 lists the dominant flora species observed.

Table 2: Dominant flora species observed during field surveys

Observation Point (Figure 3)	Dominant Species	Photo Reference
1	*Eucalyptus chloroclada, Callitris glaucophylla., Sporobolus africanus, Chloris truncata., Bothriochloa decipiens.*	Figure 4
2	*Eucalyptus microcarpa*	Figure 5
3	Disturbed area (cleared to tree line)	Figure 6
4	*Acacia pendula* (single tree)	N/A
5	*Acacia pendula*, *Schinus molle**	Figure 8
6	*Schinus molle**	N/A
7	*A patch of Callitris* to the north-west of the site	Figure 7 and Figure 8

The topographic setting and the presence of some diagnostic species to the west (particularly *Callitris glaucophylla*) support the identification of the vegetation as PCT 589, however the lack of the other key diagnostic tree species (such as *Eucalyptus albens*) in the project footprint and history of disturbance prevents full classification of PCTs on site. That is, there are elements of other PCTs within the surveyed project footprint (*E. microcarpa* [Western Grey Box], *E. chloroclada* [Dirty Gum] and *Acacia pendula*) that may indicate different PCTs or perhaps ecotonal variation with PCT 101 or 433.

For information, PCT 101 is described as "*Poplar Box - Yellow Box - **Western Grey Box** grassy woodland on cracking clay soils mainly in the Liverpool Plains, Brigalow Belt South Bioregion*" whilst PCT 433 is described as "*White Box grassy woodland to open woodland on basalt flats and rises in the Liverpool Plains sub-region, BBS Bioregion*" (this PCT includes Acacia pendula as a key diagnostic species). These exists on lower ground/ low hills and are mapped as occurring to the east of the subject site (Figure 3).

The classification of PCT on site is further complicated by the fact that the geology of the Melville Ranges is complex and extremely variable (Geochempet Service Petrographic Report, 2021). Further, the quarry site is on the mapped boundary of two Mitchell landscapes (as described in Section 1.3). PCT presence and distribution is likely to be strongly influenced by the these factors.

With the above in mind, the broad classification of PCT 101 (not 589, as mapped by the State Government in Figure 2) has been used in this report due to the existence of diagnostic species[1], and topographical position of the proposed project footprint. However, this does not preclude the possibility of PCT 589 existing further to the west of the site, as the survey undertaken for this assessment did not encompass this area.

The soil landscape was found to be part of the extensive undulating to rolling hills and mountain hill slopes associated with the highly complex geology of the Melville Ranges (Geochempet Service Petrographic Report, 2021). It is noted that PCT 101 can exist on undulating slopes.

PCT 101 has several associated Threatened Ecological Communities (TEC); however only one is considered relevant to this site: "*Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions"* listed under the BC Act and the equivalent *Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-Eastern Australia*, listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

This TEC is listed as an Endangered Ecological Community under both Acts and likely exists in the broader area; however the vegetation within the proposed footprint would not *in and of itself* meet the determination of this TEC due to its size and lack of key floristic diagnostic features. Nonetheless, the likely local presence of this TEC, the single *Eucalyptus microcarpa* immediately to the north, and a precautionary approach is considered enough to classify the vegetation as this TEC. See Section 4 of this report for more information about the significance of impacts to this TEC.

3.2. Other Vegetation Communities

Surrounding the patches of forested vegetation within and immediately surrounding the quarry site are areas previously cleared. These are readily visible on aerial photography such as that shown in Figure 3. These areas are a mixture of native and exotic pasture grasses, and heavily disturbed lands. This land may meet the definition of Category 1 Exempt land under the *Local Land Services Act 2013*, however confirmation was not necessary as the clearing area associated with the expansion (0.8 ha) does not trigger the application of NSW *Biodiversity Assessment Method* (2020).

[1] I.e. *Eucalyptus microcarpa*, *Callitris glaucophylla* with *Chloris truncata* and *Bothriochloa decipiens*. For information, the exotic grass *Sporobolus africanus** was also common, as was the occasional scattered *Acacia pendula* and *Schinus molle**.

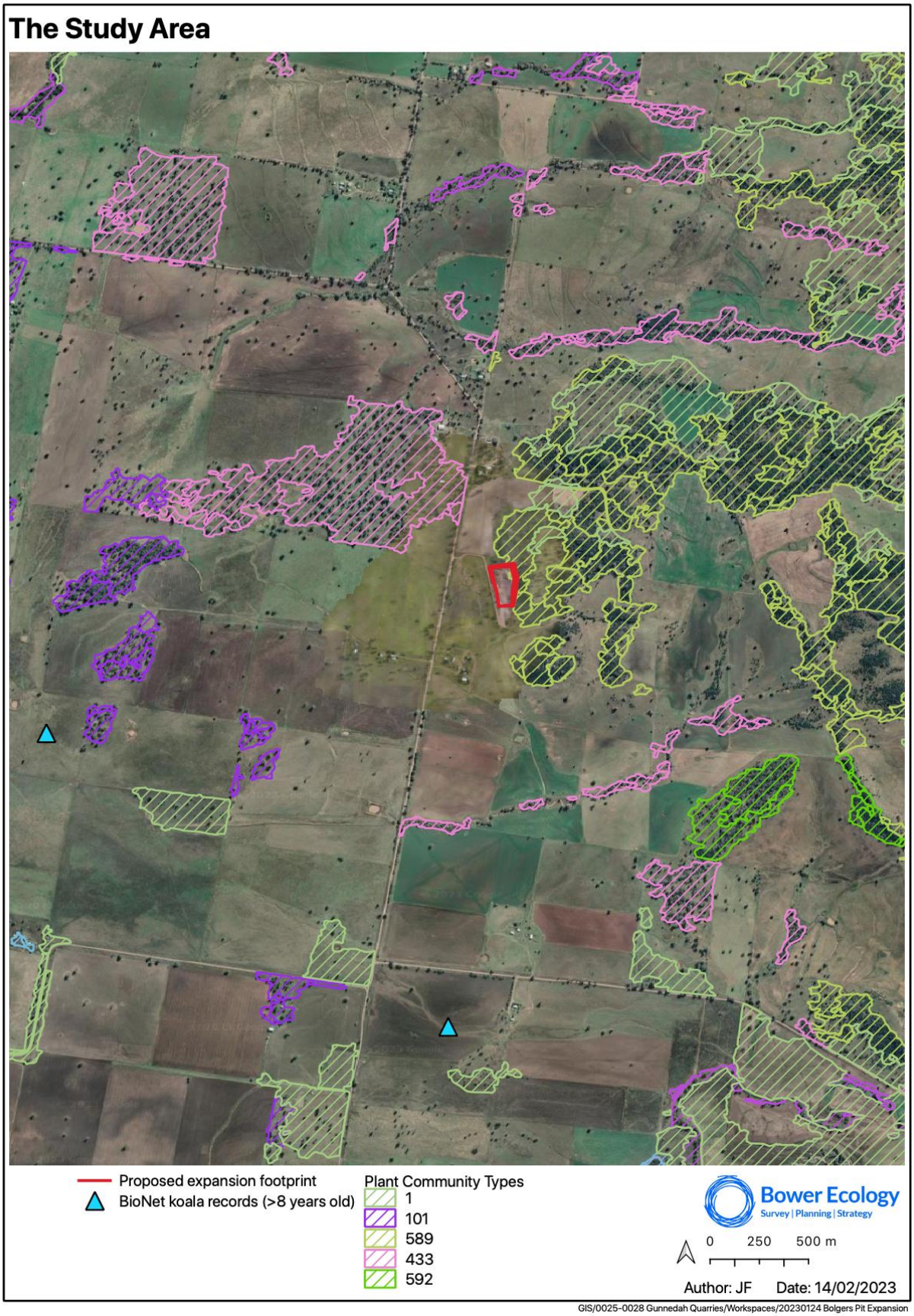

Figure 2: Area surrounding Bolger's Pit Quarry, including State-mapped PCTs and the two old (2006 and 2015) koala records within 5 km of the site.

Figure 3: Habitat assessment points and PCT

Figure 4: Small patch of vegetation consisting of several trees proposed to be cleared as part of the expansion (habitat assessment point 6).

Figure 5: Eucalyptus microcarpa to the north of the site

Figure 6: Vegetation to the east of the site. (photo looking south) (habitat assessment point 3)

Figure 7: Callitris to the north-west of the site (photo looking north) (habitat assessment point 7)

Figure 8: Schinus molle with patch of Callitris to the north-west of the site (photo looking north-west)*

3.3. Threatened Fauna

The NSW BioNet Threatened Species database found only two records of threatened species within 5 km of the site (Figure 2). Both these records were of koalas (*Phascolarctos cinereus*); one record was from 2006 and the other from 2015. The Gunnedah *Koala Conservation Plan for Landcare and Community Groups* (Koala Conservation Plan) shows koala records across the area surrounding the site up to 2015; no records are proximate to the quarry site. Considering the date of koala mapping in the aforementioned *Koala Conservation Plan* (5 August 2015), an up-to-date equivalent figure using contemporary BioNet records has been included in this report (Figure 9). It supports mapping in the Koala Conservation Plan, showing no recent koala records in proximity to the quarry site.

No recent observations of other threatened species have been recorded within the vicinity of the site, however the lack of records would mostly be related to lack of survey effort, as opposed to lack of presence of threatened species in the wider area. A search of the NSW Office of Environment and Heritage GeoHabitat database found 46 threatened fauna species that could potentially utilise suitable habitat (or travel through) areas within the proposed project footprint (see Appendix A). Nonetheless, the area of vegetation within the project footprint is small and not expected to represent important or core foraging, feeding or breeding habitat for any species. This is due to the small size and isolated nature of the forest fragments on site, the general lack of vegetative strata, and quarry disturbance areas in the area.

Further, no evidence of the following was observed during the survey of the site:

- threatened species
- large stick nests
- trees with hollows
- karst, caves, crevices, cliffs, rocky outcrops and other features of geological significance
- habitat associated with human made structures

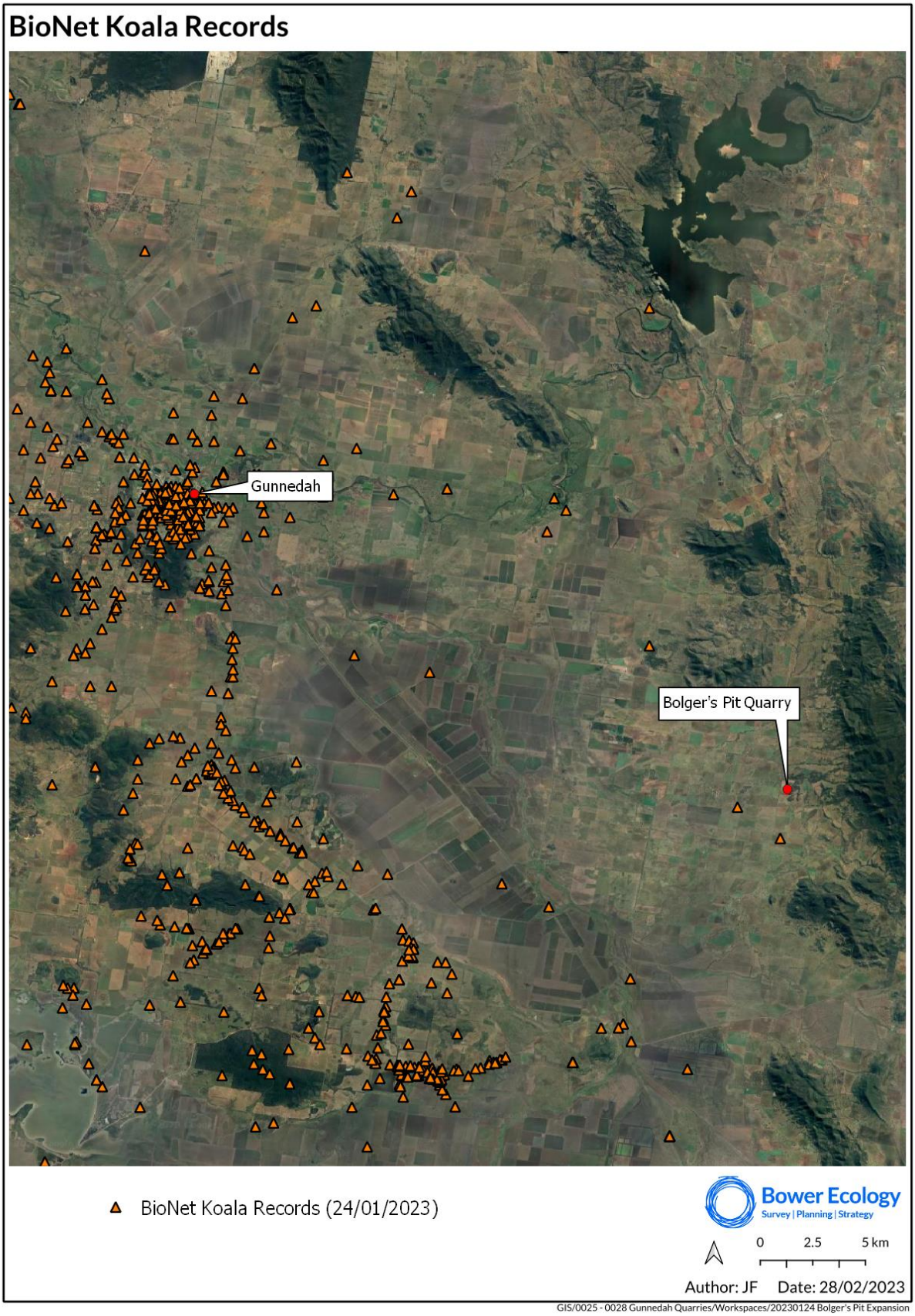

Figure 9: NSW BioNet records of koalas across the Gunnedah region

3.4. Protected Estate

The nearest National Parks and Wildlife Service Estate, Melville Range Nature Reserve, exists 4.6 km east of the site (Figure 1). The distance from this, the topography (sloping down away from the Nature Reserve to the site), and minimal contiguous vegetation between the two preclude the likelihood of significant impact to the nature reserve. Due to this, this impacts to the Nature Reserve are not further discussed.

3.5. Waterways and Wetlands

The closest permanent watercourse to the site is Figtree Creek, a fourth order stream located up-slope to the north of the quarry (approximately 580 m away). An ephemeral unnamed second order stream is located approximately 130 m to south of the quarry (Figure 10). The topography of the site, and constructed earthen bunds, drain the quarry site to the south. No wetlands or groundwater dependent ecosystems are within the vicinity of the quarry.

Figure 10: Water features mapping

4 Potential Impacts and Associated Mitigation

4.1. Vegetation Communities

Pasture and Woodland proposed to be impacted is shown on Figure 12. The clearing area will include vegetation directly under the proposed expansion area, whilst potentially vegetation immediately adjacent the expansion area, where structural root zones are impacted by the proposed quarry benches. Hence, clearing will be limited to:

- Clearing of woodlands (0.9 ha) as represented by the patch of vegetation shown in Figure 4, and the single *Eucalyptus microcarpa* shown in Figure 5,
- The single *Acacia pendula* in the south-east of the site (shown as point 4 on Figure 3)
- The cleared / disturbed pasture in and around this vegetation.

A few trees/shrubs shown in the foreground and background (a few *Callitris glaucophylla*) of Figure 8 may also be impacted where their root zones may be encroached upon by the quarry benches.

Generation of dust during quarry operation (e.g. blasting, truck movement) could also impact vegetation adjacent to quarry, affecting photosynthesis, respiration and transpiration. However, this impact on vegetation is expected to be negligible overall due to the small size of the expansion area and limited operational period (per Section 1.1). Further, dust monitoring, management and suppression are proposed as mitigation measures. All quarry operation activities are to be managed according to the *Protection of the Environment Operations Act (1997).*

The following measures will also be undertaken to minimise impacts to adjacent vegetation:

- Clearing will be minimised where possible, and trees to the north of the site will be further considered for retention where their structural root zones are within the top bench of the proposed quarry footprint. The quarry operator (vegetation clearing contractor) is to specifically evaluate vegetation along this boundary in order to minimise clearing. Trees for retention immediately adjacent the works should be marked with fluorescent flagging tape, and all staff shall be instructed as to the meaning of the flagging tape.
- The extent of the structural root zone of the single *Eucalyptus microcarpa* to the north of the site may prevent retention, and hence it is assumed it will be removed. Nonetheless, this tree will be further assessed for retention, as it exists on the very edge of the proposed footprint.
- Site clearing boundaries will be clearly delineated with the use of fluorescent bunting or similar fencing to avoid clearing areas beyond the proposed quarry footprint.
- On quarry completion, the area will be rehabilitated with native vegetation according to the rehabilitation plan. Refer to the EIS submitted for this project and Section 5 for more information.

Regarding residual impacts, desktop assessment and field surveys identified a potential Threatened Ecological Community that is proposed to be directly impacted by the proposed expansion. However, due to the small size of the area proposed to be cleared (0.09 ha of moderate condition woodland, and the surrounding poor condition pasture / disturbed areas), no significant impacted is expected per Section 7.3 of the BC Act. That is, the project is:

- Not likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction.
- Not likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.

- Not likely to represent a significant impact with regards to the extent to which habitat is likely to be removed or modified as a result of the proposed development.
- Will not result in fragmented or isolated vegetation.
- Is not likely to represent a significant impact with regards to importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the ecological community in the locality.

4.2. Threatened Species

No threatened flora species were observed during the survey undertaken to support this assessment; therefore no impacts are anticipated.

Nonetheless potential impacts to threatened fauna, and the associated mitigation measures proposed to be implemented throughout the life of the quarry are presented in Table 3.

Table 3: Mitigation measures proposed for issues with the potential to impact biodiversity

Environmental Aspect	Description of Potential Impact to Biodiversity	Proposed Mitigation
Noise and vibration	Noise and vibration during the quarry expansion, and during quarry operation (e.g. blasting, truck movement) could impact wildlife in the woodland adjacent to the site, affecting use of the area as habitat, particularly for nesting/breeding. However, as the quarry is already in operation, the minor increase in noise and vibration created as a result of the proposed expansion and limited timeframe of operations (I.e. potentially six weeks in any one year per Section 1.1) is unlikely to significantly increase the impact on wildlife.	Truck numbers and blasting intensity and frequency will be limited. All blasts will be monitored, and a report provided annually to the Council and the NSW Environmental Protection Authority.
Habitat clearing	The clearing of vegetation required for the proposed expansion will reduce habitat for fauna. However, the small area (0.09 ha) and relatively low ecological value of vegetation proposed for clearing preclude the likelihood that habitat clearing will have a significant impact on biodiversity.	Prior to clearing, all trees to be removed will be inspected for wildlife. Trees containing wildlife will be retained until fauna vacates. Although no hollow bearing trees were recorded in the proposed footprint during the field surveys, any observed hollows will be inspected prior to clearing. Any fauna will be removed in the season best suited to avoid potential disturbance to nesting/breeding or hibernation. An unexpected threatened species finds procedure shall be followed, as per Figure 11.
Risk of vehicular strike to wildlife	The increased resource availability means that more traffic movements will be required over the life of the quarry. Direct impacts to fauna by operating quarry machinery is unlikely. The limited number of additional truck movements due to the expansion (see Section 1.1) will result in an increased risk of vehicular strike to wildlife along the haul routes, however this is not anticipated to results in a significant impact to fauna.	Truck speeds will be limited (max 30 km/hr) to minimise the potential risk to fauna whilst on site. Traffic rules and speed limits on public roads will be obeyed.

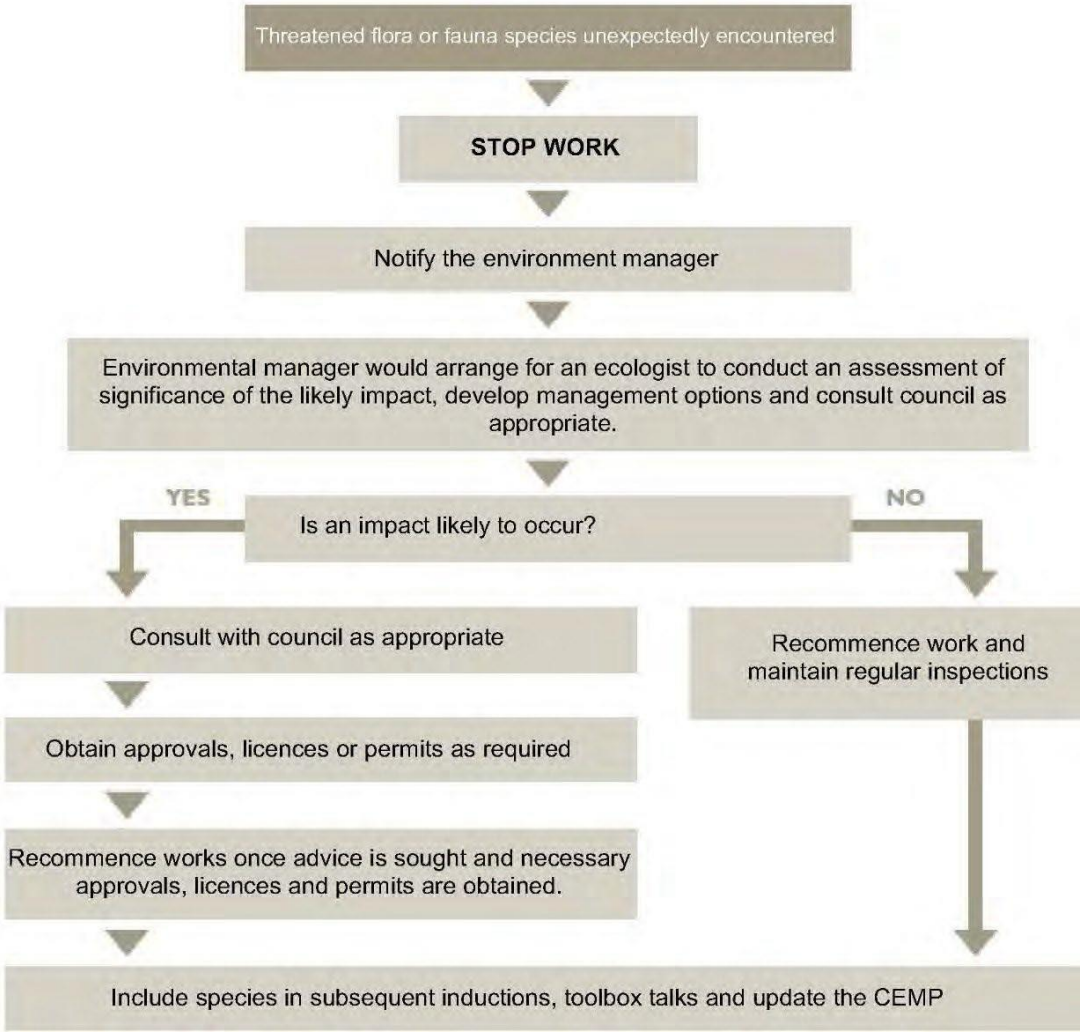

Figure 11: Stop work procedure for unexpected threatened fauna and flora finds

Table 4 includes the results of the Significant Impact Test that has been conducted on threatened fauna and fauna. No significant impacts to threatened flora, fauna, or their associated habitats are expected as a result of the proposed quarry expansion. Further, no Serious and Irreversible Impacts (SAII) are expected to occur due to the proposed development.

Table 4: Significant Impact Test, as per Section 7.3 of the BC Act 2016 (where relevant to threatened fauna).

Test Criteria	Impact	Comments
Is the proposed development or activity likely to have an adverse effect on the life cycle of a threatened species such that a viable local population of the species is likely to be placed at risk of extinction?	No significant impact expected.	Due to the small size of the clearing proposed, the absence of threatened flora, and the unlikely occurrence of threatened fauna in the vegetation proposed for clearing, no significant impact on the life cycle of any threatened species is expected.
Is the extent to which the habitat of a threatened species is likely to be removed or modified as a result on the proposed development or activity likely to significantly affect threatened species?	No significant impact expected.	As above.
Is an area of threatened species habitat likely to become fragmented or isolated from other areas of threatened species habitat as a result of the proposed development or activity?	No significant impact expected.	Due to the small size of the clearing proposed, the position of the patch of vegetation proposed to be cleared (on the margin of a broader area of the same PCT), the absence of threatened flora, and the unlikely occurrence of threatened fauna in the vegetation proposed for clearing, so significant habitat fragmentation or isolation is expected.
What is the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of threatened species in the locality?	No significant impact expected.	Due to the small size of the clearing proposed, the absence of threatened flora, and the unlikely occurrence of threatened fauna in the vegetation proposed for clearing, the importance of the habitat is considered low.
Is the proposed development or activity likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly)?	No significant impact expected.	No declared areas of outstanding biodiversity value are located within the vicinity of the site.
Is the proposed development of activity part of a key threatening process or is likely to increase the impact of a key threatening process.	No significant impact expected.	While the clearing of native vegetation is listed as a key threatened process, the proposed clearing is unlikely to cause loss of biodiversity, fragment populations of species, or permit the invasion and establishment of exotic species. Therefore, the proposed vegetation clearing is unlikely to have a significant impact on biodiversity.

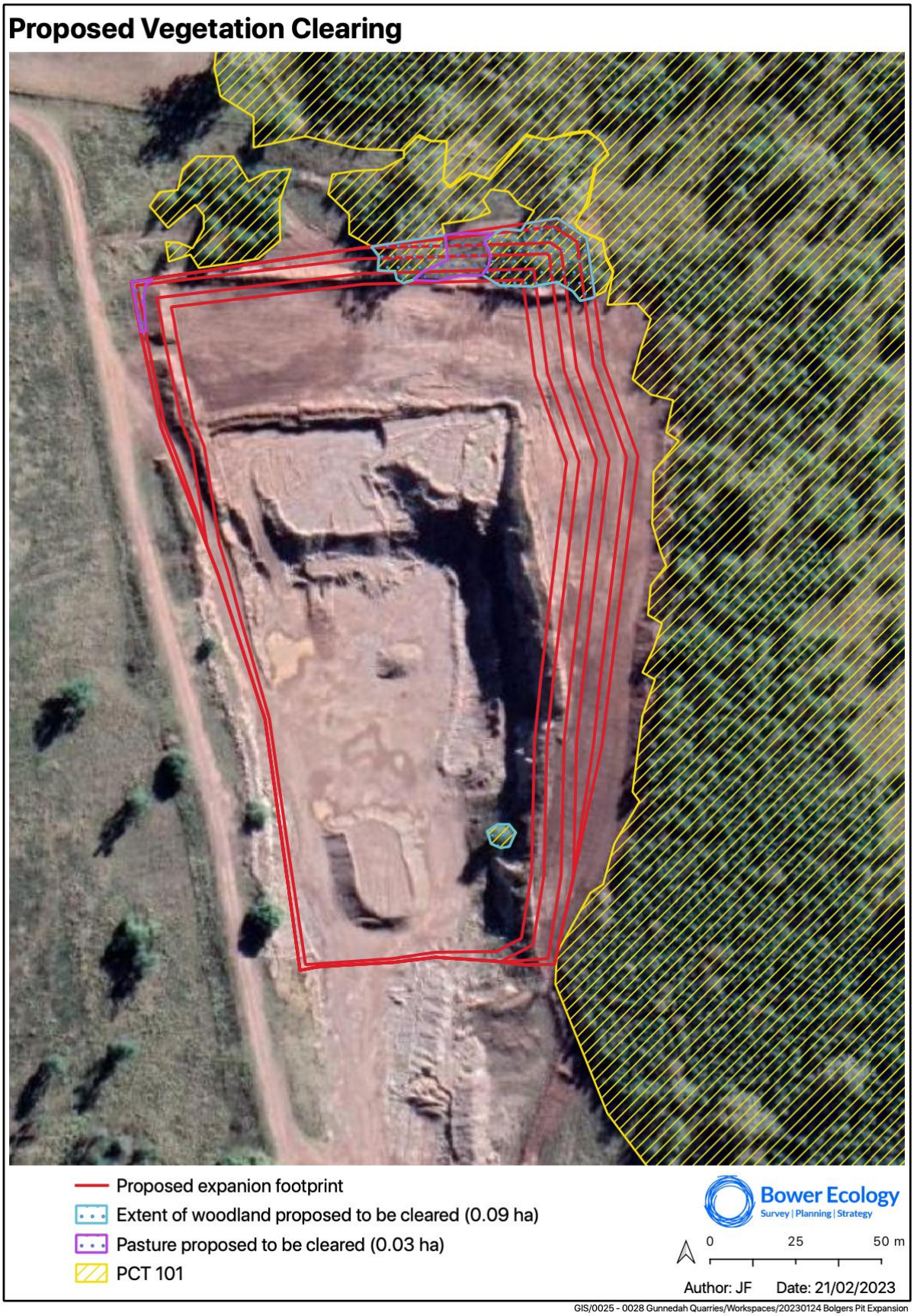

Figure 12: Proposed expansion footprint and native vegetation clearing extent.

4.3. Waterways and Wetland

Runoff and erosion during construction and operation has the potential to cause sedimentation within the ephemeral watercourse to the south (see Figure 1), potentially impacting biodiversity. However, as the quarry is already in operation, and the proposed expansion covers only a small area, the small increase in run off and risk of erosion is unlikely to significantly increase the impact on biodiversity.

Further, and according to the Gunnedah *Local Environment Plan 2012* Flood Planning Map, the quarry is not located in a flood prone area. With this in mind, as well as the small area proposed to be expanded into 0.8 ha) it is unlikely the proposed expansion will influence flood behaviour and subsequently cause additional impact to areas of biodiversity.

All runoff from the quarry site is to be management according to the *Protection of the Environment Operations Act (1997)*. Management processes including the maintenance of earthen bunds, as well as the topography of the site (as discussed in the EIS), preclude the likelihood of runoff from the quarry pit impacting the ecology of nearby watercourses.

Also, no groundwater dependent ecosystems or wetland will be affected by the expansion. Therefore, it is unlikely that the proposed expansion will have a significant impact on the aquatic habitats, hydrology or water quality of the area.

5 Proposed Rehabilitation

On closure of the site, the site is required to be rehabilitated to a stable condition with the primary aim of minimising long-term erosion via successful revegetation work. Works will be undertaken to create a sustainable and free draining landform that is as consistent as possible with the surrounding landforms, and will allow future use as grazing land. Revegetation planting will aim for "tall woodland to open forest with a sparse shrub layer" and be consistent with surrounding flora / PCTs.

Under the rehabilitation plan, the western berm and benches of the quarry are to be rehabilitated with trees (planting density of 5 m centres) and shrubs (planting density of 10 m centres) planted from tubestock. Species planted will reflect the PCTs in the local area, including species observed during site surveys, and subject to commercial availability. Target tree species will comprise a combination of *Callitris glaucophylla* (75%), *Eucalyptus microcarpa* (15%) and *Eucalyptus albens* (10%); target shrub species will comprise a combination of *Acacia pendula* and *Geijera parviflora*. Species used may be substituted or added depending on commercial availability at commencement of rehabilitation works, but must be consistent with the flora adjacent to the quarry.

It is expected that other strata (e.g. other shrubs, forbs and grasses) will naturally colonise the rehabilitation areas due to the stand of native vegetation to the east acting as a source of seed. The works will be supported by weed management until vegetation establishes. Ongoing weed management will be required by the landowner consistent with any biosecurity duties in legislation at the time of closure.

The quarry floor is to be rehabilitated with palatable grasses and other groundcovers to enable future agricultural use. The sediment basin will be retained for future use by stock.

Table 5 provides rehabilitation completion criteria, consistent with Table 3.3 of the EIS for this project.

Table 5: Project rehabilitation completion criteria, as per Table 3.3 in the EIS

Feature	Rehabilitation completion criteria
Decommissioning	All quarry plant and equipment and other infrastructure will be decommissioned and removed.
Landform	Achieve a stable landform, with no erosion, free of any hazardous materials associated with past use of site as a quarry.
Soil	Topsoil or a suitable alternative spread uniformly over the identified rehabilitation surfaces. Overburden and soil material to be placed over quarry floor making it suitable for agricultural use.
Water	Sediment basin retained for erosion control and as a water supply for stock. No runoff to pose a threat to downstream water quality.
Revegetation, control of feral pests	Progressive revegetation of quarry benches as quarrying proceeds on the site. Trees to be grown on quarry benches. Once quarrying is complete, revegetate quarry floor with open grassland, suitable for grazing/agricultural purposes. Weed control measures to be implemented. Control of pests to be undertaken by the landowner.
Bushfire hazard	Appropriate bushfire hazard controls to be implemented – refer Sections 3.9 and 4 of EIS.

6 Legislative Framework

A review of the following relevant legislation and planning instruments has been undertaken, to understand the approval processes and documentation that may be required I the context of biodiversity / ecology:

- The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
- The NSW *Biodiversity Conservation Act 2016* (BC Act) and subordinate regulations
- The NSW *Protection of the Environment Operations Act 1997*
- The NSW *Biosecurity Act 2015*
- The *Water Management Act 2000*
- The NSW *State Environmental Planning Policy (Biodiversity and Conservation) 2021*
- The Gunnedah *Local Environment Plan (LEP) 2012*
- The Gunnedah *Development Control Plan 2012*
- The Gunnedah *Koala Strategy*
- The Gunnedah *Koala Conservation Plan for the Landcare and Community Groups*

6.1. Commonwealth EPBC Act

The EPBC Act regulates actions that could lead to significant impacts to Matters of National Environmental Significance (MNES). Relevant MNES includes threatened and migratory species, and threatened ecological communities. Under the EPBC Act, proponents are required to 'refer' the project to the Department of Climate Change, Energy, the Environment and Water (DCCEEW) if the project is likely to result in significant impacts to MNES.

The Department of Planning and Environment Secretary's Environmental Assessment Requirements (SEARs) stated an Environmental Impact Statement (EIS) was necessary for the development. To inform the EIS, this Ecological Assessment Report found the proposed quarry expansion will involve clearing only 0.09 ha of extant native vegetation (a listed TEC, per Section 3.1 of this report), and no evidence of threatened or migratory species has been identified in ecological surveys. Therefore, it is suggested that the expansion is unlikely to result in a significant impact upon MNES, and referral to DCCEEW is not considered necessary.

6.2. BC Act

The BC Act provides a framework for the conservation of biodiversity in NSW. The Act establishes the Biodiversity Offset Scheme which requires impacts of development over a certain threshold to be offset through direct payment to the Biodiversity Conservation Trust, purchasing of offset credits on the open market, or creating a land-based biodiversity stewardship site to generate the required credits.

The project will not enter the Biodiversity Offsets Scheme if it avoids:

4. Impacting less than 1 ha of native vegetation (as the minimum lot size associated with the property is 200 ha);
5. Avoiding the biodiversity values mapping (which is possible as the biodiversity values mapping does not overlay the subject lot); and
6. Causing a significant impact to threatened species or ecological communities pursuant to Section 7.3 of the BC Act (the test of significance).

This project proposes to expand operations into a further 0.8 ha of land (which in and of itself is under the native vegetation clearing threshold), clear only 0.09 ha of 'native vegetation', and the subject lot isn't overlayed by Biodiversity Values Mapping.

Also, no threatened species were recorded within the impact area, and a Test of Significance found no significant impacts to threatened species or threatened ecological communities (Table 4) are likely to occur due to the project. Therefore, it is concluded that the Biodiversity Offset Scheme will not be triggered.

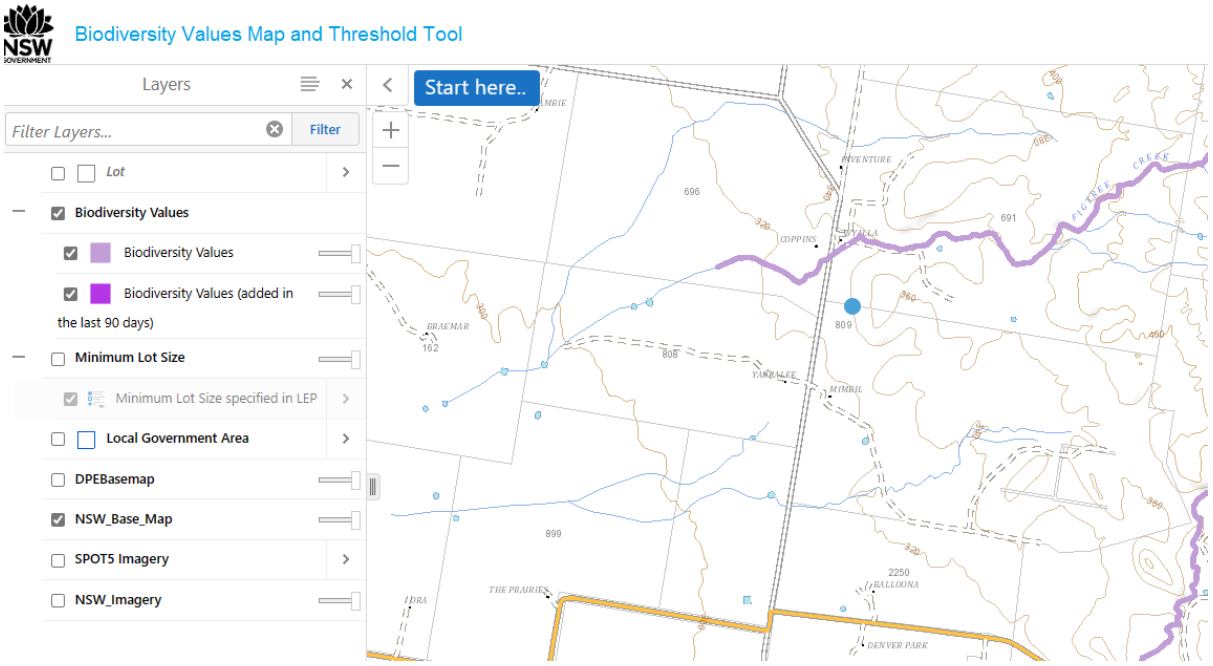

Figure 13: Biodiversity Values Mapping; the blue dot indicates the location of Bolger's Pit Quarry

6.3. Protection of the Environment Operations Act 1997

As more than 30,000 tonnes per annum of quarry material is to be extracted from the Project Site in any one year an environment protection licence (EPL) will be required once development consent is granted to the proposed quarry development. Further discussion and assessment is provided in the EIS associated with this project.

6.4. The NSW Biosecurity Act 2015

The *Biosecurity Act 2015* includes a general biosecurity duty for biosecurity matters such as the introduction, presence, spread or increase of a pest. This general biosecurity duty provides that any person who deals with biosecurity matter has a biosecurity duty to ensure that the biosecurity risk is prevented, eliminated, or minimised, so far as is reasonably practicable. The project will satisfy the biosecurity duty via the removal and appropriate disposal of weeds during clearing, as well as via the integration of the footprint into any existing weed management programs. The rehabilitation plan to be enacted on closure of the quarry will also include ongoing weed management until the rehabilitation becomes self-sustaining.

6.5. The Water Management Act 2000

The *Water Management Act 2000* governs the issue of new water licences and the trade of water licences and allocations for those water sources (rivers, lakes and groundwater) in NSW where water

sharing plans have commenced. The object of the Act is to provide for the sustainable and integrated management of the water sources of the State for the benefit of both present and future generations. It also regulates the use of land where there may be interference with groundwater or where it involves works within 40m of a watercourse.

In this regard the project site is more than 40m away from the nearest watercourse. Moreover, the Project is unlikely interfere with any groundwater. None of the preceding statutory triggers are thus activated by the proposed quarry development.

6.6. The NSW State Environmental Planning Policy (Biodiversity and Conservation) 2021

The 2021 Biodiversity and Conservation SEPP commenced on 1 March 2022. It consolidates, transfers and repeals provisions relating to:

1. SEPP (Vegetation in Non-Rural Areas) 2017 (Vegetation SEPP)
2. SEPP (Koala Habitat Protection) 2020 (Koala SEPP 2020)
3. SEPP (Koala Habitat Protection) 2021 (Koala SEPP 2021)
4. Murray Regional Environmental Plan No 2—Riverine Land (Murray REP)
5. SEPP No 19—Bushland in Urban Areas (SEPP 19)
6. SEPP No 50—Canal Estate Development (SEPP 50)
7. SEPP (Sydney Drinking Water Catchment) 2011 (Sydney Drinking Water SEPP)
8. Sydney Regional Environmental Plan No 20 – Hawkesbury – Nepean River (No 2 – 1997) (Hawkesbury–Nepean River SREP)
9. Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005 (Sydney Harbour Catchment SREP)
10. Greater Metropolitan Regional Environmental Plan No 2 – Georges River Catchment (Georges River REP)
11. Willandra Lakes Regional Environmental Plan No 1 – World Heritage Property (Willandra Lakes REP).

Of the above listed plans and policies, only the SEPP (Koala Habitat Protection) 2020 (Koala SEPP 2020) is relevant to this development. The Environmental Assessment Requirements report requests a SEPP Koala Habitat Protection Assessment. Step 1 in Section 3.2 of the Koala SEPP 2020 requires the identification of the land on which the development is located as either potential Koala habitat or not potential Koala habitat. As no Koala feed tree species listed in Schedule 2 of the Koala SEPP 2020 were recorded in the vegetation proposed for clearing, this area is considered not to be potential Koala habitat. Therefore, Step 2 (is the land core Koala habitat?) is not required for this proposed expansion, and no Koala Management Plan is required.

Regardless of the requirements under the SEPP, no evidence of koala was found on site, the expansion area offers very limited koala habitat.

6.7. Gunnedah Local Environment Plan 2012

The Gunnedah Local Environment Plan 2012 (LEP) aims to provide environmental planning provisions for land within the Gunnedah Local Government Area (LGA). The aims of the LEP relevant to this quarry expansion are:

- To conserve and enhance, for current and future generations, the ecological integrity, environmental heritage and environmental significance of Gunnedah;

- To seek the provision of adequate and appropriate infrastructure to meet the needs of future development;
- To allow development in a way that minimises risks due to environmental hazards.

The quarry site falls within land use zone RU1 (Primary Production). Under the LEP, extractive industries are permitted with consent in land use zone RU1. The development, and associated rehabilitation upon closure will assist with meeting the aims of the LEP.

Further discussion and assessment is provided in the EIS associated with this project.

6.8. Gunnedah Development Control Plan 2012

The Gunnedah Development Control Plan 2012 (DCP) aims to provide guidelines for development to complement the provisions provided in the aforementioned Gunnedah LEP.

Section 6.6 (Environmental Controls) of the DCP applies to this quarry expansion, however there is no relevance to biodiversity, and all other relevant environmental impacts mentioned in the DCP are addressed in other consultant reports as a part of the EIS.

Further discussion and assessment is provided in the EIS associated with this project.

6.9. Gunnedah Koala Strategy

The *Gunnedah Koala Strategy 2015* aims to provide guidelines for development and to encourage the conservation and management of Koala habitat through land use planning and other measures. The plan notes that an investigation into Koala habitat is to be undertaken for all development.

The koala assessment and survey undertaken as part of this ecological assessment revealed the proposed footprint does not constitute core koala habitat, and no evidence of koala was observed. Further, no Koala feed tree species listed in Schedule 2 of the Koala SEPP 2020 were recorded in the vegetation proposed for clearing.

Upon closure of the quarry, there is opportunity to rehabilitate the site and provide greater habitat value for koala; although it is acknowledged that the associated PCT is not one considered as primary habitat for koala.

6.10. Gunnedah Koala Conservation Plan for the Landcare and Community Groups

The Gunnedah Koala Conservation Plan identifies priority areas on crown land where habitat enhancement is recommended to be conducted to make those areas optimal Koala habitat. The area in which this quarry is located is not within one of these priority areas.

Conclusions

This Report provides an ecological assessment of the quarry expansion proposal for Bolger's Pit Quarry, and addresses Environmental Assessment Requirements (EAR 1674, dated 30 August 2022) and the associated response from the Biodiversity, Conservation and Science Directorate of the NSW Department of Planning and Environment (dated 9 September 2022) .

As a result of the size of the vegetation proposed for clearing, as well as its low biodiversity value, it is considered unlikely that clearing and the associated quarry expansion will have a significant impact on either biodiversity regulated under the BC Act, or Matters of National Environmental Significance regulated under the EPBC Act. Further, the NSW Biodiversity Offset Scheme is not triggered by the proposal.

The various mitigation and management measures required during vegetation clearing and subsequent operation of the quarry will assist to minimise impacts of the proposal. This includes rehabilitation of part of the site (upon closure) with flora that can mimic the pre-existing PCT.

7 References

Department of Planning and Environment, *Environmental Assessment Requirements (EARs) – EAR 1674*, Biodiversity, Conservation and Science Directorate, 9 September 2022.

Department of Planning and Environment, *Planning Secretary's Environmental Assessment Requirements (EAR 1674)*, 30 August 2022.

Geochempet Service Petrographic Report, 2021, Petrographic Report on a Gravel Sample from Bolgers Quarry Prepared for Gunnedah Shire Council Gunnedah NSW.".

Appendix A: Threatened Fauna Species with Potential to Utilise Vegetation in the Local Area and Project Footprint

Table 6: Threatened fauna list from NSW Office of Environment and Heritage GeoHabitat database

Scientific name	Common name	NSW status
Aepyprymnus rufescens	Rufous Bettong	Vulnerable
Anthochaera phrygia	Regent Honeyeater	Critically Endangered
Ardeotis australis	Australian Bustard	Endangered
Artamus cyanopterus cyanopterus	Dusky Woodswallow	Vulnerable
Burhinus grallarius	Bush Stone-curlew	Endangered
Calyptorhynchus lathami	Glossy Black-Cockatoo	Vulnerable
Cercartetus nanus	Eastern Pygmy-possum	Vulnerable
Chalinolobus dwyeri	Large-eared Pied Bat	Vulnerable
Chalinolobus picatus	Little Pied Bat	Vulnerable
Chthonicola sagittata	Speckled Warbler	Vulnerable
Circus assimilis	Spotted Harrier	Vulnerable
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	Vulnerable
Daphoenositta chrysoptera	Varied Sittella	Vulnerable
Dasyurus maculatus	Spotted-tailed Quoll	Vulnerable
Ephippiorhynchus asiaticus	Black-necked Stork	Endangered
Falco subniger	Black Falcon	Vulnerable
Glossopsitta pusilla	Little Lorikeet	Vulnerable
Grantiella picta	Painted Honeyeater	Vulnerable
Haliaeetus leucogaster	White-bellied Sea-eaglge	Vulnerable
Hamirostra melanosternon	Black-breasted Buzzard	Vulnerable
Hieraaetus morphnoides	Little Eagle	Vulnerable
Hirundapus caudacutus	White-throated Needletail	Not listed
Hoplocephalus bitorquatus	Pale-headed Snake	Vulnerable
Lathamus discolor	Swift Parrot	Endangered
Lophoictinia isura	Square-tailed Kite	Vulnerable
Macropus dorsalis	Black-striped Wallaby	Endangered
Melanodryas cucullata cucullata	Hooded Robin (south-eastern form)	Vulnerable
Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	Vulnerable
Neophema pulchella	Turquoise Parrot	Vulnerable
Ninox connivens	Barking Owl	Vulnerable
Ninox strenua	Powerful Owl	Vulnerable
Nyctophilus corbeni	Corben's Long-eared Bat	Vulnerable
Petaurus norfolcensis	Squirrel Glider	Vulnerable
Petrogale penicillata	Brush-tailed Rock-wallaby	Endangered
Petroica boodang	Scarlet Robin	Vulnerable
Petroica phoenicea	Flame Robin	Vulnerable
Phascolarctos cinereus	Koala	Endangered
Polytelis swainsonii	Superb Parrot	Vulnerable
Pomatostomus temporalis temporalis	Grey-crowned Babbler (eastern subspecies)	Vulnerable
Pseudomys pilligaensis	Pilliga Mouse	Vulnerable
Pteropus poliocephalus	Grey-headed Flying-fox	Vulnerable
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	Vulnerable
Stagonopleura guttata	Diamond Firetail	Vulnerable
Tyto novaehollandiae	Masked Owl	Vulnerable
Uvidicolus sphyrurus	Border Thick-tailed Gecko	Vulnerable
Vespadelus troughtoni	Eastern Cave Bat	Vulnerable