BIODIVERSITY DEVELOPMENT ASSESSMENT REPORT

Proposed two lot subdivision

Lot 40 DP 882293

698 Red Hills Road

Marulan

Prepared for

Fides Environmental Planning & Development

November 2024 V.1

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This assessment has been prepared by

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Accreditation Number
BAAS18053

22nd November 2024 V.1

Date

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Abbreviations

Abbreviation	Description
APZ	Asset Protection Zone
BAM	Biodiversity Assessment Method
BC Act	*NSW Biodiversity Conservation Act 2016*
BC Reg	*NSW Biodiversity Conservation Regulation 2017*
BCT	Biodiversity Conservation Trust
BDAR	Biodiversity Development Assessment Report
BOS	Biodiversity Offset Scheme
BSS	Biodiversity Stewardship Site
BSSAR	Biodiversity Stewardship Site Assessment Report
CAP	Community Association Property
DA	Development Application
DPIE	NSW Department of Planning, Industry and Environment
EEC	Endangered Ecological Community
EP&A Act	*Environmental Planning and Assessment Act 1979*
EPBC Act	*Environmental Protection and Biodiversity Conservation Act 1999*
GMC	Goulburn Mulwaree Council
IBRA	Interim Biogeographic Regionalisation of Australia
LEP	Local Environmental Plan
LGA	Local Government Area
LLS	NSW Local Land Services
PCT	Plant Community Type
RFS	Rural Fire Service
SAII	Serious and irreversible impacts
SEARs	Secretary's Environmental Assessment Requirements
SEED	Sharing and Enabling Environmental Data
SEPP	State Environmental Planning Policy
TEC	Threatened Ecological Community
VIS	Vegetation Integrity Score

1 INTRODUCTION

1.1 BACKGROUND

This Biodiversity Development Assessment Report (BDAR) has been prepared to accompany a Development Application (DA) to the Goulburn Mulwaree Council (GMC) for a proposed two lot subdivision at Lot 40 DP 882293 being 698 Red Hills Road in Marulan (hereafter referred to as the subject property). This report has been requested by the GMC as they believe the development impact area, a new dwelling and associated driveways, is likely to exceed the native vegetation clearing threshold as determined within Table 12 of Appendix C of the BAM. This report assesses whether entry into the Biodiversity Offset Scheme is necessary and if Serious and Irreversible Impacts (SAII) will occur as a result of this development. The layout of this report is in line with the requirements as stated within the 2020 Biodiversity Assessment Method Appendix L – Streamlined assessment modules.

Database records and information reviewed in the preparation of this report include:

- aerial photography of the subject property and of the local landscape obtained from the Department of Lands Spatial Information Exchange;
- NSW DPE Biodiversity Value Map;
- NSW Local Land Services (LLS) Native Vegetation Regulatory Map;
- vegetation maps of the region from the Sharing and Enabling Environmental Data portal (SEED);
- Goulburn Mulwaree Council Local Environmental Plan (LEP) 2009 was consulted to determine possible restraints;
- data on the NSW DPIE Bionet database of threatened species occurring within 10km of the study area;
- The Royal Botanic Gardens and Domain Trust plant database;
- final determinations, NSW DPE species profiles, and other available information pertaining to threatened species known to occur in the locality.

1.2 GOVERNMENT LEGISLATION AND POLICY

This study was undertaken with regards to the local, state and commonwealth legislative requirements addressing the ecological issues within the study area.

GMC LEP 2009 addressed issues concerning land usage, and biodiversity protection of lands identified as significant for biodiversity in the regional landscape.

The *EP&A Act 1979* provides framework for the planning and assessment of development proposals throughout NSW and ensures environmental issues are addressed and considered during the planning phase. Biodiversity of regional landscapes and threatened species protection are considerations under this Act.

The *BC Act 2016* requires that impacts to biodiversity are considered during the planning stage of development using a scientific method of assessing impacts to determine if significant effect is likely to occur and therefore a calculative value can be imposed for the offset of the lost biodiversity. Guidelines for reducing Serious and Irreversible Impacts (SAII) have been provided.

The *Biosecurity Act 2015*, in this instance, addresses any pest species which are likely to have an adverse effect upon the environment in the immediate local landscape.

The *EPBC Act 1999* applies to any action that is likely to have an impact to matters of national environmental significance during the course of, or outcome of, a development. This legislation refers to threatened species, populations and communities, migratory species and national heritage areas.

1.3 DESCRIPTION OF THE STUDY SITE AND ADJACENT LAND

The subject property is located at 698 Red Hills Road Marulan, Lot 40 DP 882293, within the Local Government Area of the Goulburn Mulwaree Council of the South East Catchment Area. The subject property is zoned as C3 – Environmental Management under the GMC LEP 2009. The subject property is mapped as AB2 with a minimum lot size of 20ha. Terrestrial biodiversity has been mapped within the LEP as being present on the subject property in a small area to the far west which is well away from the areas proposed for the development to be constructed. No other environmental constraints appear to be located on the property as per the LEP interactive maps.

The subject property has an established dwelling and some shedding present. There are currently sheep grazing the property. The subject property has a slope to the east of approximately 15 degrees with the lowest point being an unnamed drainage line which flows to the south. There was no running water during the survey period although the drainage line was wet. The subject property is a combination of remnant native forest and cleared pasture land. Google Earth Pro shows that native vegetation has been removed in the location of the proposed dwelling for the subdivided lot between 2009-2010 and has been managed as cleared land to the current date. An assessment of this area will be undertaken in its current condition as the land clearing took place before the implementation of the *BC Act* and it is unknown if the clearing was approved or not.

The subdivision has been positioned in such a way to make use of the current driveway, provide a building envelope which has views to the east and is positioned within an area which is reasonably flat and would require a minimal cut. The proposed building envelope represents the highest portion of land within the subject property with the lower elevations potentially being restrained due to flood impacts.

The study area for the purpose of this report has been restricted to the proposed secondary lot building envelope, associated APZ and driveways within both proposed lots of the subject property. The remaining area of the subject property did not undergo assessment as there is no proposal to disturb any further vegetation as part of this development proposal.

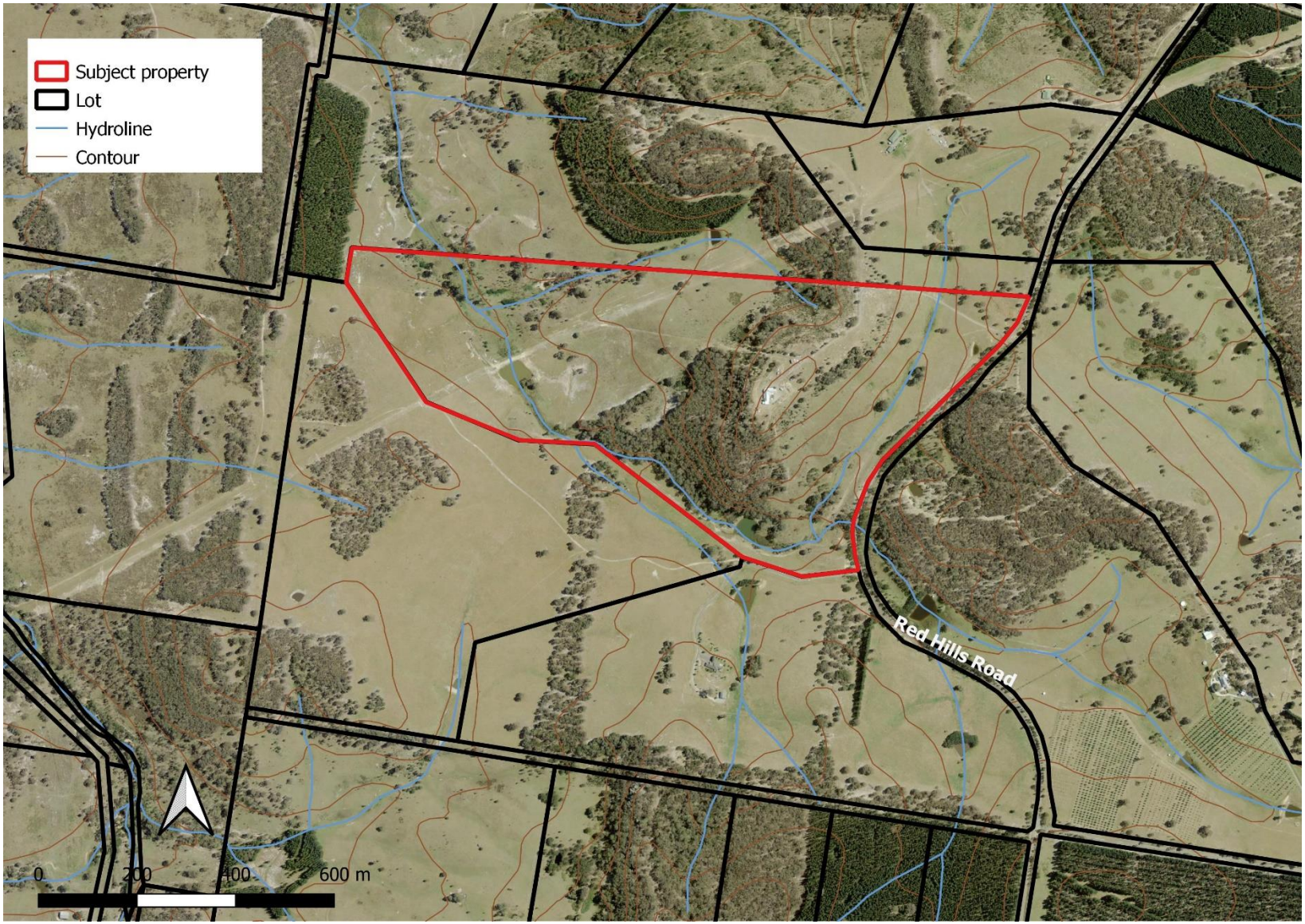

Figure 1. Aerial photo of the subject property (Sixmaps 2023)

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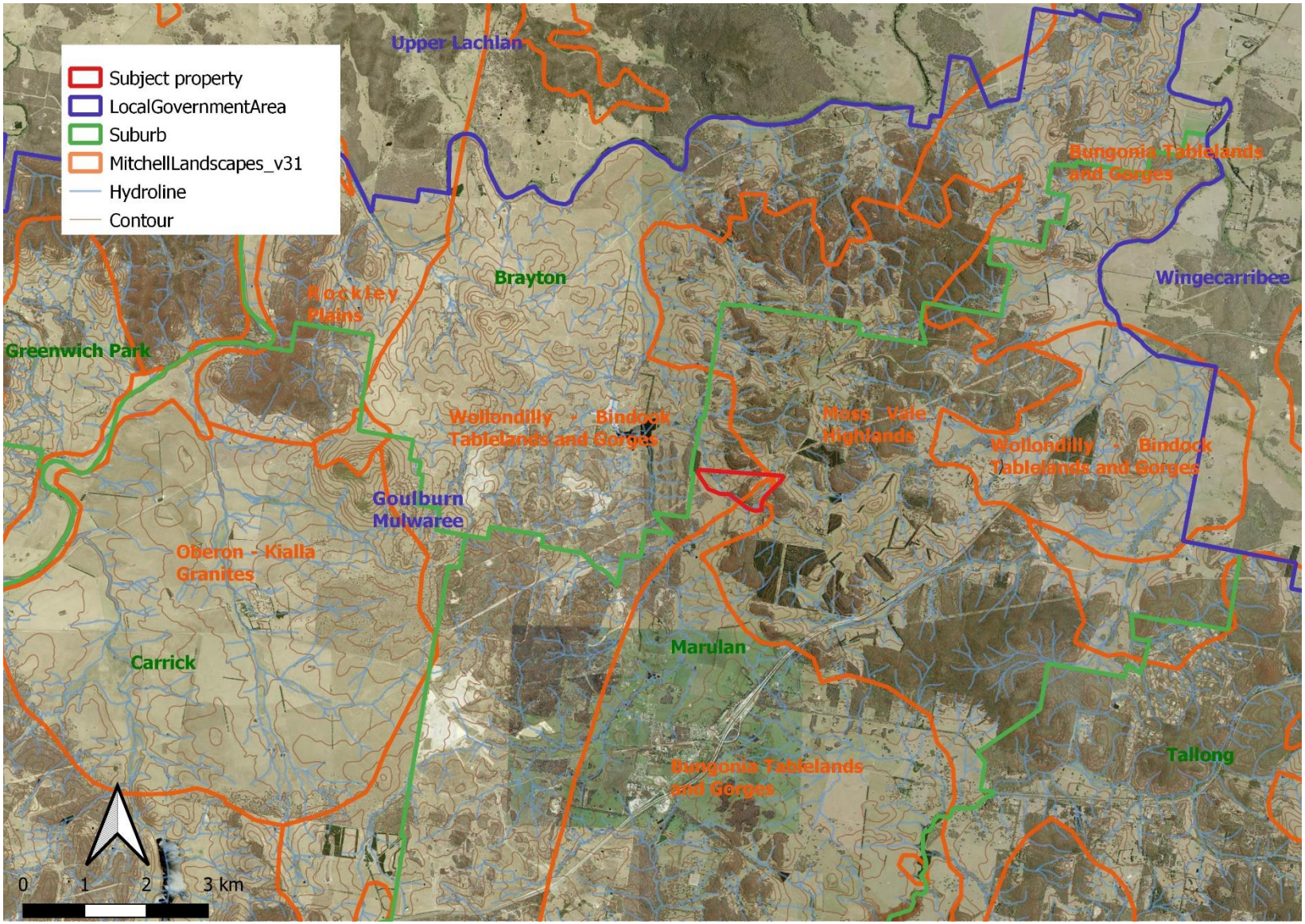

Figure 2. Landscape context of subject property

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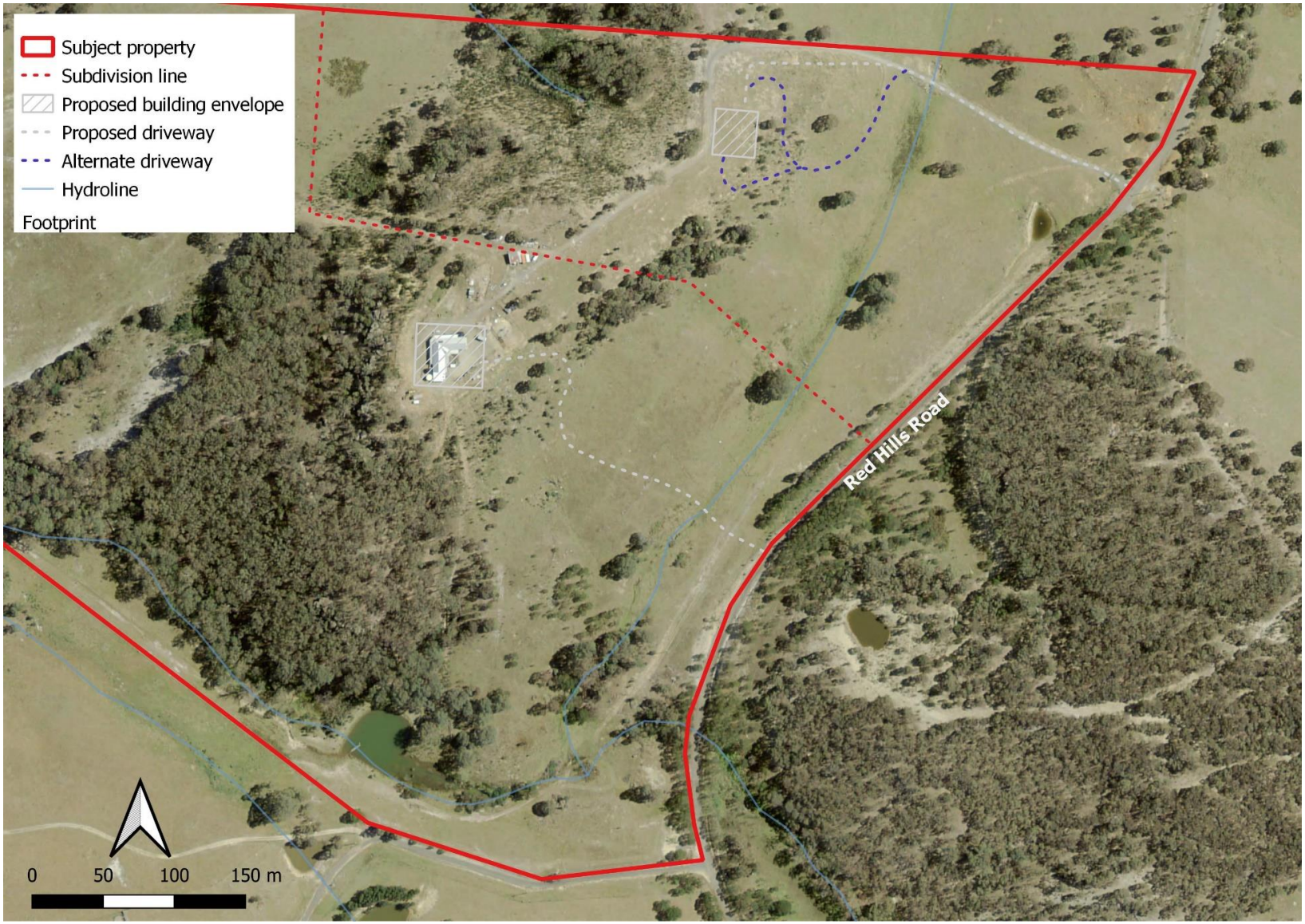

Figure 3. Proposed subdivision layout

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2 LANDSCAPE CONTEXT

The site is located within the Interim Biogeographic Regionalisation of Australia (IBRA) of the South East Highlands, Subregion Bungonia. The 50ha property is surrounded by various sized lots with mixed use from agriculture and rural lifestyle living.

The subject property has some broken connectivity to native vegetation with the nearest significant conservation reserve, Tarlo River National Park, being approximately 10km to the north west.

2.1 IDENTIFYING LANDSCAPE FEATURES

The overall size of the subject property is 50ha with the total proposed disturbance area being only 0.43ha. Approximately 0.35ha of the disturbance area is native vegetation and is likely to be permanently altered following the approval of this DA. The remaining land within the study area is pasture land currently used for sheep grazing which will continue to be managed as APZ.

2.1.1 Soil

The NSW DPE eSpade soil and land information mapping does not have any current mapping for soil on the subject property. The nearest mapped area is less than 2kms to the west and suggests soil is represented by the Bindook Road soil landscape which is described as porphyritic with quartz and feldspar set in a greenish to black groundmass. Acid yellow and red duplex soils with whole coloured B21 horizons and non-bleached or sporadically bleached A2 horizons predominate on crests and sideslopes. Similar to Red and Yellow Podzolic Soils. Red Podzolic Soils appear to be more dominant in the south. Other soil groups include Yellow and Red Earths and Yellow Podzolic Soils on footslopes. The soil is susceptible to moderate erosion with sheet erosion occurring during dry times and following bushfire. This soil landscape appears to match the soil and geology noted onsite.

2.1.2 Native vegetation cover

The subject property contains native vegetation which has some connectivity extending to the north and south. Native vegetation is mosaicked throughout the local landscape within pastured paddocks with several large stands of *Pinus radiata*, likely for timber harvesting, located within the 1500m buffer around the study area.

Figure 5 demonstrates the 1,500m buffer around the study area of approximately 575ha with up to 245ha within that buffer appearing as woody native vegetation, albeit much of this vegetation is scattered paddock trees which does not have a full vegetation structure. Full structure native vegetation is within the Tarla River National Park which is approximately 10km to the north of the subject property. The percentage of native vegetation cover present calculates at up to 42% which places the assessment area into a native vegetation cover class of between >30 - <70%.

2.1.3 Significant biodiversity value

There is no significant Biodiversity Value identified within the subject property via the NSW DPE Significant Biodiversity Mapping.

2.1.4 Bioregions

The subject property is located within the IBRA region of the South Eastern Highlands, subregion Bungonia. The subject property falls within three NSW Landscape boundaries being Bungonia Tablelands and Gorges, Wollondilly – Bindock Tablelands and Gorges and Moss Vale Highlands as shown in Figure 2. The study area is mostly comprised of Bungonia Tablelands and Gorges, therefore this assessment is undertaken using this landscape.

2.1.5 Rivers, streams and wetlands

There are no rivers, recognised wetlands or estuaries located within the study area. There is a first order drainage line immediately to the east of the study area which drains into Jaorimin Creek approximately 2km to the north west of the subject property. Disturbance from the development proposal will not have any significant impact upon the drainage line with most of the development not being within 40m of the drainage line. A new driveway will be established to cross the drainage line in a location which is currently being used to access areas of the property via Vehicle. A culvert will replace the current crossing which will not have any significant impacts on the drainage line or natural environment in the immediate surrounds.

2.1.6 Geological features

There are no areas of geological significance within the subject property or study area. There are no recorded karst, caves, crevices, cliffs or other areas of geological significance within the subject property. The subject property has a steep gradient to the east of more than 15 degrees in some areas.

2.1.7 Connectivity

The subject property does not form part of any recognised biodiversity corridors, flyways or significant habitat connectivity features.

There is some direct connectivity to native vegetation to the south and north from the study area with the nearest stand of significant native vegetation being 10km to the north in Tarlo River National Park.

2.1.8 Additional landscape features

There is no other additional features or landscape features on the subject property which could be subject to assessment by the Secretary's Environmental Assessment Requirements (SEARs).

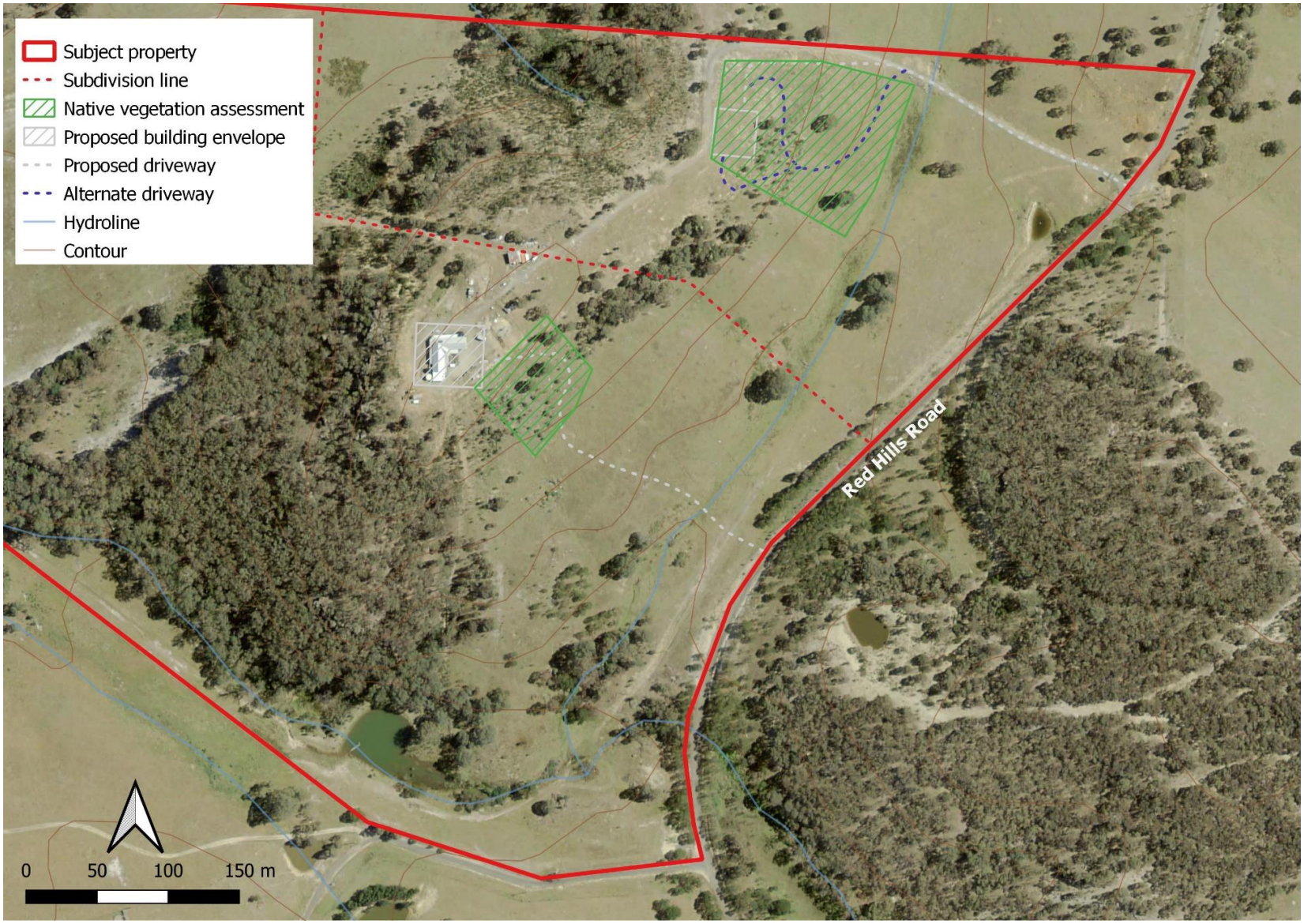

Figure 4. Native vegetation assessment area

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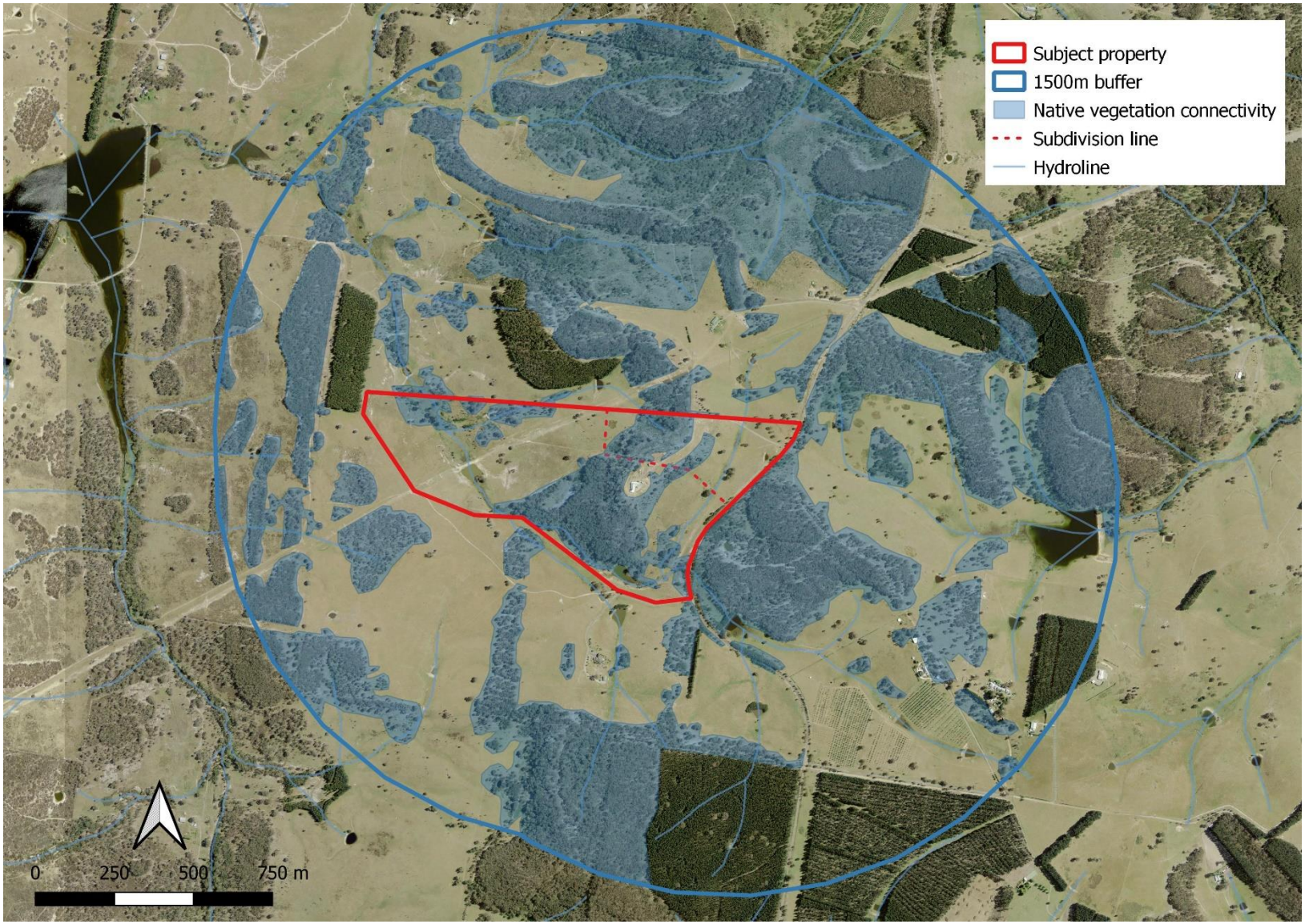

Figure 5. Connectivity of native vegetation within 1,500m surrounding proposed development footprint

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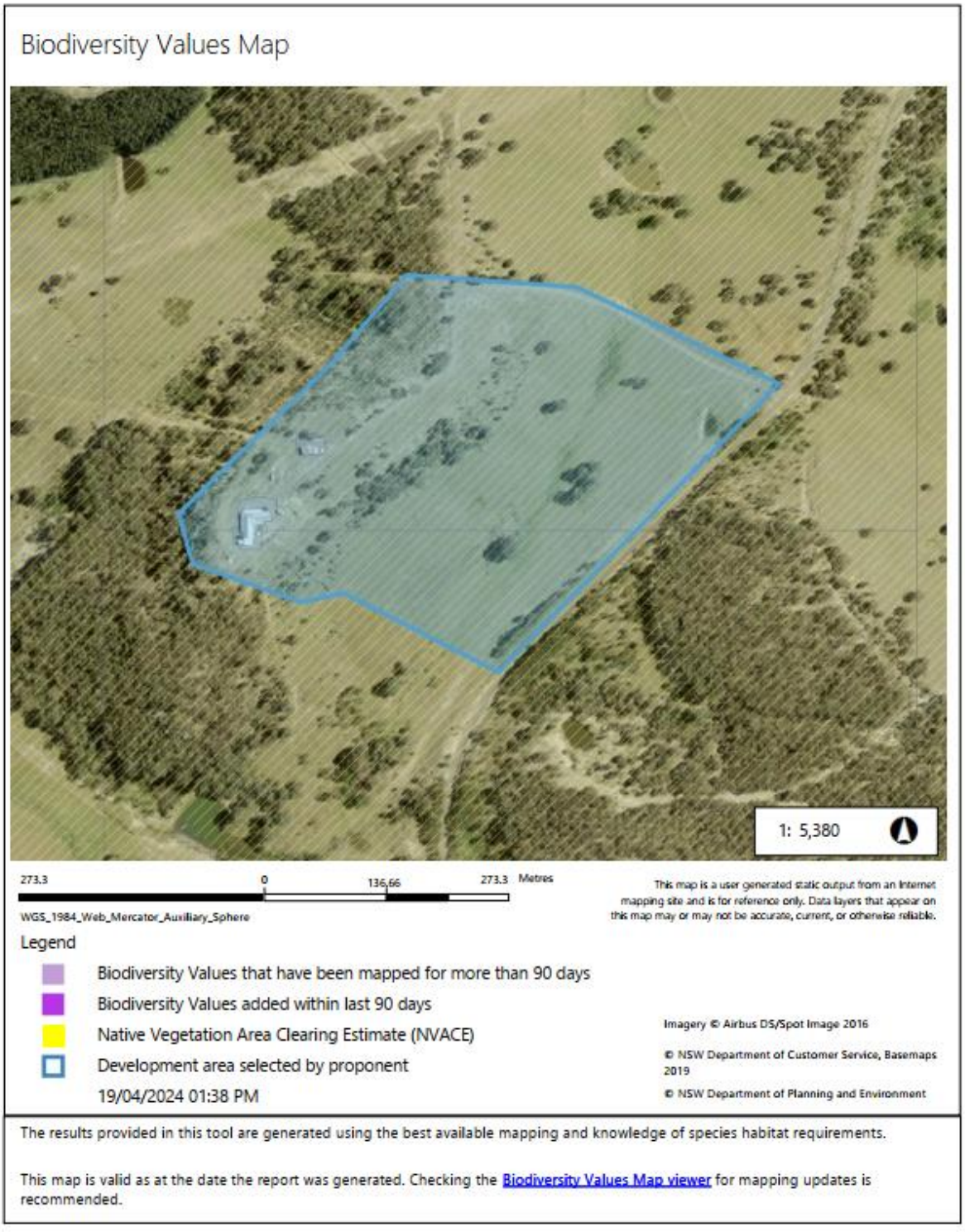
Figure 6. Biodiversity Value Map



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2.2 DETERMINING SITE CONTEXT

The subject property is located within a rural agricultural landscape setting surrounded by a diversity of lot sizes with varied use as rural lifestyle living and agricultural land use.

There is some native vegetation connectivity to the south and north with the north connectivity extending, via some brokenness, to Tarlo River National Park 10km to the northwest. There is no native vegetation connectivity to the west or east of the subject property.

Vegetation cover within a 1,500m buffer of the subject property proposed development footprint is considered to be approximately 42% therefore falling within the >30 - <70% category as determined by the BAM.

3 NATIVE VEGETATION

3.1 NATIVE VEGETATION EXTENT ON THE SUBJECT LAND

The proposed development seeks to make permanent changes to the 50ha subject property with the development area proposed to impact upon 0.35ha of native vegetation. This development proposal does not include areas within subject property which are outside of the study area. No mature trees are proposed to be removed with only shrubs and ground cover species likely to be impacted for this development proposal. The proposal seeks to disturb 0.35ha of native vegetation which is considered within this report for association with a Plant Community Type. The disturbance is less than the Biodiversity Offset Scheme (BOS) entry threshold of 1ha for a property sized between 40-1000ha.

3.1.1 Review of existing information

The NSW State Vegetation Type Map layer viewed via the Sharing and Enabling Environmental Data (SEED) portal identified vegetation within the study area as PCT 3643 Bungonia Tableland Silvertop Ash – Stringybark Forest. This PCT was supported following flora survey with a key species search within the Bionet Vegetation Information System also finding PCT 3643 as one of the most likely PCT's present.

The map layer of Critically Endangered Ecological Communities NSW Version 6.0 map viewed on the SEED portal did not identify any Critically Endangered Ecological Community on the subject property.

Figure 7. NSW State Vegetation Map Layer

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3.1.2 Field investigation of biological values

Botanical surveys of the study area were conducted on the 5th of March 2024, by Melissa Mass. Surveys included two BAM floristic survey quadrats which were conducted within the proposed development footprint of the building envelope and APZ area and within the areas of proposed driveway easement. Further botanical surveys were undertaken throughout the study area recording flora species present and assessing for habitat features. Approximately 2.5 hours were spent conducting botanical surveying throughout the study area.

The BAM floristic survey quadrat was 400m², 20m x 20m, as outlined within the BAM. Within the quadrat the following information was recorded:

- Flora species name – scientific and common;
- growth form of each species recorded;
- stratum layer each species occurs in;
- the estimated percentage of foliage cover each species created within the plot; and
- the abundance of each species within the plot.

Flora species recorded is listed in Appendix A of this report.

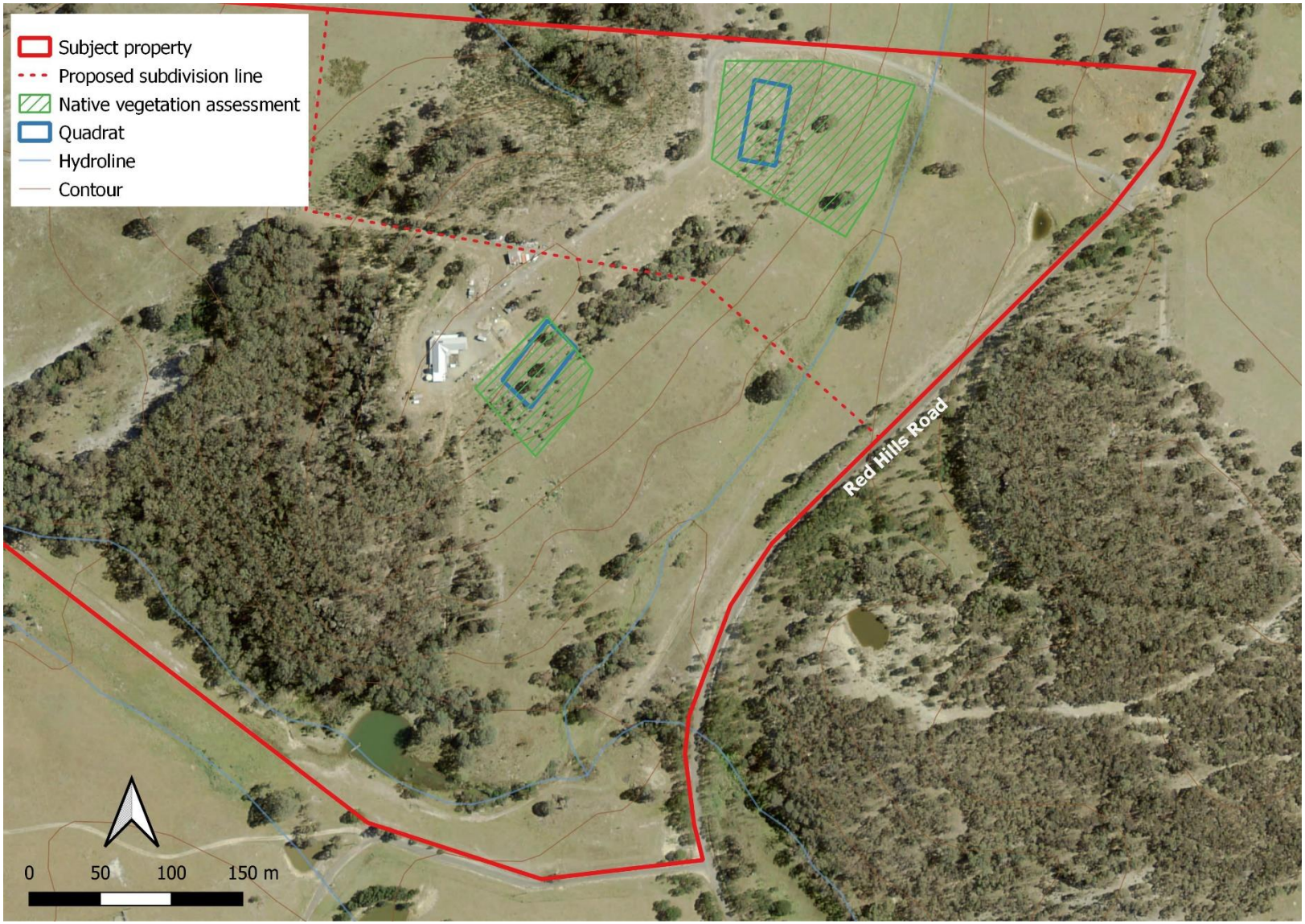

Figure 8. Location of BAM floristic survey plot

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3.1.3 Local data

No local data has been used for native vegetation assessment.

3.1.4 Non-native vegetation

There is some non-native vegetation found within the study area and subject property however it was not considered to be potential significant habitat for any threatened species listed within the BioNet 10km radius or the BAM-C as a predicted or candidate species.

3.1.5 Plant community types

Plant Community Type (PCT) was identified and described with reference to the vegetation maps viewed on the SEED portal, the descriptions as outlined in the NSW BioNet Vegetation Classification, the description from Keith 2012 and with reference to vegetation descriptions included by the Scientific Committee final determinations to list threatened communities under the *BC Act 2016* and the *EPBC Act 1999*.

The search for dominant native species within the NSW BioNet Vegetation Classification gave a result of two potential vegetation communities:

3643 – Bungonia Tableland Silvertop Ash – Stringybark Forest

3625 – Wingecarribee Sandstone Shrub Forest

Of the PCT's listed above, not all fit the community description, some were missing key species listed within the description and some were not located within the subregion or local government area. Therefore, based on species present and the detailed vegetation description, the following PCT was chosen as the best fit relevant community for this assessment:

3643 – Bungonia Tableland Silvertop Ash – Stringybark Forest

This PCT was selected over the other possible PCT's due to having the most representative species present and the location description detailed within the BioNet Vegetation Information System Community Profile Report matches the site description.

PCT 3643 - A dry shrubby sclerophyll open forest of rocky hills and ranges of the south-east Central Tablelands and adjacent north-east Southern Tablelands, from Joadja and Barrallier south to Durran Durra and Larbert in the catchments of the upper Wollondilly and Shoalhaven rivers. Non-standard plots also suggest a western outlier on Collector Hill. This PCT predominantly occurs on sedimentary and metasedimentary substrates of low to intermediate fertility, including margins of sandstone and shale, at elevations of 550-900 metres asl, in locations receiving 650-900 mm mean annual rainfall. A tall, sparse to mid-dense tree canopy is very frequently dominated by Eucalyptus sieberi, commonly with Eucalyptus agglomerata, with a small tree layer that very frequently includes patchy to scattered Allocasuarina littoralis. Smaller shrubs are sparse, with Persoonia linearis almost always present, Hibbertia obtusifolia very frequent, and Acacia terminalis, Podolobium ilicifolium, Melichrus urceolatus and Lomatia ilicifolia occasional. The ground layer often includes a high cover of rock and leaf litter, with sparse low plants almost always including Goodenia hederacea, very frequently with Lomandra obliqua and Pomax umbellata. Common species include Billardiera scandens, Lomandra filiformis, Entolasia stricta, Microlaena stipoides, Lomandra multiflora subsp. multiflora and Stypandra glauca, with occasional Xanthorrhoea concava. This PCT grades into a variety of other communities across its range, including PCT 3373 on adjacent footslopes in the Goulburn area, and PCT 3737 in the Mayfield area when moving from rocky hills to lower Cainozoic gravel deposits.

The extent of native vegetation located onsite can be considered as one zone: disturbed 3643. This zone has a history of past disturbance from timber removal, livestock grazing and agriculture. The zone supports many exotic species which include grasses and forbs although a full stratum of native species also occurs. Trees and shrubs are less represented in the location of the building envelope on proposed Lot 1 however the ground cover diversity is still in good condition.

The cleared percentage estimate for PCT 3643 is currently 47% as per the available information from the BioNet VIS.

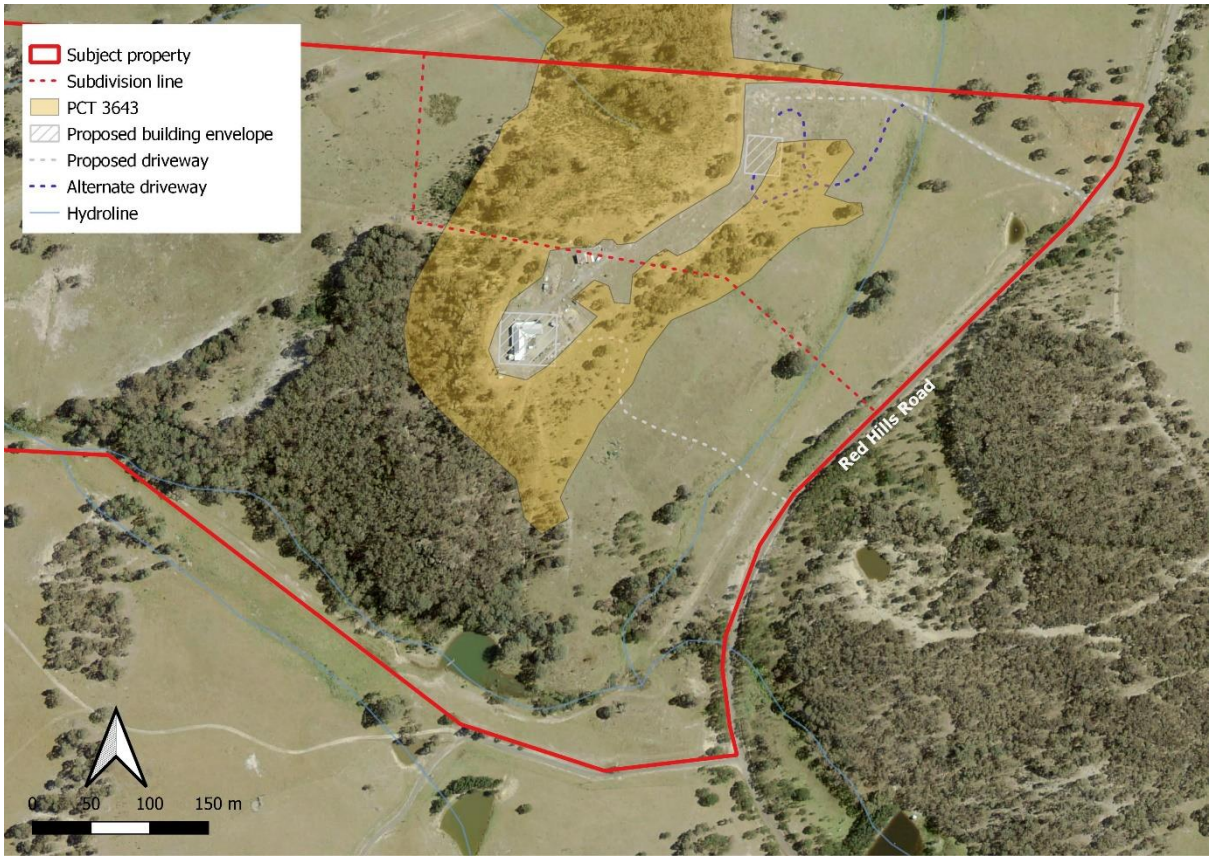

Figure 9. Location of PCT3643 within the study area and immediately surrounding

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Table 1. Quadrat summary

Vegetation Layer	Height Range (m)	% Native Foliage Cover	Dominant Species
Zone 1 Quadrat 1 – PCT 3643			
T1	15-25m	0	
S1	1-10m	0.8	*Leptospermum continentale, Dodenaea viscosa, Cassinia aculeata, Dillwynia phylicoides*
G1	0.1-0.5m	100	*Microlaena stipoides, Eragrostis brownii, Cynodon dactylon, Rytidosperma racemosum, Goodenia hederacea, Gonocarpus teucrioides*
Notes:	Sheep grazing		
Zone 1 Quadrat 2 – PCT 3643			
T1	15-25m	20	*Eucalyptus agglomerata, Eucalyptus seiberi*
S1	1-10m	5	*Acacia terminalis, Ozothamnus diosmifolius, Hibbertia empertifolia, Acacia melanoxylon*
G1	0.1-0.5m	100	*Microlaena stipoides, Echinopogon ovatus, Panicum simile, Eragrostis brownii, Gonocarpus teucrioides, Pteridium esculentum, oxalis perennans*
Notes:			

3.2 VEGETATION INTEGRITY ASSESSMENT

The native vegetation zone for the purpose of this BDAR has been considered as one area which has been distinguished by the PCT present within the areas proposed to be disturbed for the development. The zone is considered as disturbed remnant native vegetation which has undergone BAM floristic surveys to determine a Vegetation Integrity Score. The native species diversity throughout this zones is considered as fair. Exotic flora species were identified within the zone with densities being low.

3.2.1 Vegetation zones and patch sizes

The native vegetation on the study area has been categorised into a single distinct zone. Zone 1 contains disturbed native vegetation which has a moderate diversity of trees, shrubs, vines, forbs and native grass species.

The PCT 3643 has been assigned to the patch size class of 10ha given that this assemblage of native flora, while common within the area, is often found in small fragmented patches where topography and land usage allows. This PCT continues within the immediate surrounding landscape in small patches.

3.2.2 BAM survey

Further surveys were undertaken as 1000m² plots, 50m x 20m which were established as outlined in the BAM in each quadrat location. Within this plot, vegetation function attributes were recorded including: length of logs and tree regeneration.

Within the 1000m² plot, five 1m x 1m sub-plots were undertaken to assess litter cover and canopy cover to determine an average for the larger plot.

Vegetation structure was determined from the previously mentioned 400m² plots which were located within the 1000m² plot.

Together this information was used to determine a vegetation integrity score for the PCT's located within the study area.

Table 2. Summary of vegetation function attributes in 1000m² plots

Stem class			Hollows	
Zone 1 Quad 1 – PCT 3643				
Dbh	Eucalyptus	Non-Eucalypt	<20cm	>20cm
80cm+				
50-79cm				
30-49cm				
20-29cm				
10-19cm				
5-9cm				
<5cm				
Length of logs in total	3m	Litter cover	9%	
Zone 1 Quad 2 – PCT 3643				
Dbh	Eucalyptus	Non-Eucalypt	<20cm	>20cm
80cm+				
50-79cm	1			
30-49cm	✓			
20-29cm	✓			
10-19cm	✓			
5-9cm	✓			
<5cm	✓			
Length of logs in total	21m	Litter cover	37%	

Table 3. Summary of composition and structure attributes within 400m² plots

Composition and structure		
Zone 1 Quad 1 – PCT 3643		
Attribute	Class	Value
Composition Count	Trees	0
	Shrubs	4
	Grasses etc	12
	Forbs	7
	Ferns	0
	Other	0
	High Threat Weeds	0
Structure Cover %	Trees	0
	Shrubs	0.8
	Grasses etc	100
	Forbs	11.5
	Ferns	0
	Other	0
	High Threat Weeds	0
Zone 1 Quad 2 – PCT 3643		
Attribute	Class	Value

Composition Count	Trees	2
	Shrubs	4
	Grasses etc	14
	Forbs	12
	Ferns	1
	Other	1
	High Threat Weeds	2
Structure Cover %	Trees	20
	Shrubs	5
	Grasses etc	100
	Forbs	4.1
	Ferns	5
	Other	0.1
	High Threat Weeds	0.3

3.2.3 Vegetation integrity score

Based on the above information the BAM calculation for Vegetation Integrity Score (VIS) for the native vegetation which is subject to disturbance by the development application this BDAR refers to can be found within Table 4**.**

Table 4. BAM – C vegetation zone results

PCT ID	Composition condition score	Structure score	Function condition score	Current vegetation integrity score
PCT 3320	55	31	23.4	**34.2**

3.2.4 Scattered trees

There was no scattered tree assessment undertaken during this BAM vegetation survey.

4 ASSESSING HABITAT SUITABILITY FOR THREATENED SPECIES

4.1 ASSESSMENT OF THREATENED FLORA SPECIES

The BAM - C Candidate Species Report found five threatened flora species had potential to occur onsite based on IBRA and PCT identified onsite. A 10km radius search using the BioNet database found four flora species were identified as being threatened. The vegetation survey conducted on the 5th March 2024 throughout study area failed to identify any threatened flora species onsite. An assessment of likelihood for threatened species identified within 10kms of the subject property and considered as candidate species can be seen in Table 5.

4.1.1 Survey Effort

The survey effort undertaken for threatened flora species was in line with the following guidelines:

- Surveying threatened plants and their habitats (DPIE 2020);
- NSW Guide to surveying Threatened Plants (OEH 2016); and
- Threatened Species Test of Significance Guidelines (2018).

Assessment for threatened species was undertaken during March 2024.

The nearest threatened flora species recorded on the NSW BioNet is the Hoary Sunray. This species was found approximately 2.5kms to the south west of the subject property on a neighbouring property. The Hoary Sunray is known to occur throughout the grasslands and wooded grasslands of the southern highlands and tablelands of NSW, VIC and TAS. Suitable habitat preferences do occur within the study area however there were no individuals identified during the March 2024 survey period.

Table 5. BioNet 10km radius search for previously recorded threatened flora species and BAM C Candidate species – Assessment of likelihood to occur onsite

Botanical Name	Common Name	Candidate Species	Habitat constraints	Likely to occur onsite	Dedicated species survey undertaken	Identified Onsite	Included or excluded from credit assessment
Eucalyptus recurva	Mongarlowe Mallee	Yes	Found in shallow soils on gentle slopes in low heathland and in some cases at the margins of the heathland and adjacent low woodland; the woodlands are dominated by Brittle Gum (*Eucalyptus mannifera*) and Snow Gum (*E. pauciflora*), but scattered Candlebark (*E. rubida*) and Broad-leafed Peppermint (*E. dives*) trees are also nearby at some sites; in the Mongarlowe area the heathland is dominated by Stunted She-oak (*Allocasuarina nana*), with emergent shrubs of Finger Hakea (*Hakea dactyloides*).	Unlikely. The vegetation in the immediate area is not health.	BAM – floristic survey and line transect surveys across remaining area of proposed disturbance	No	Excluded
Genoplesium plumosum	Tallong Midge Orchid	No	The species required rocky areas, specifically heath on skeletal soils over Sydney Sandstone. Does not occur beneath tree canopies.	Unlikely. There is no suitable habitat for this species within the study area	BAM – floristic survey and line transect surveys across remaining area of proposed disturbance	No	Excluded
Genoplesium superbum	Superb Midge Orchid	Yes	The Superb Midge Orchid occurs predominantly in wet heathland on shallow soils above a sandstone cap but has also been found in open woodland interspersed with heath and dry open shrubby woodland.	Unlikely. There is no suitable habitat for this species within the study area	BAM – floristic survey and line transect surveys across remaining area of proposed disturbance	No	Excluded

Grevillea molyneuxii	Wingello Grevillea	No	The species requires rocky areas or is found within 50m of rocky areas. This species has only been recorded in low heathland on sandstone, where it grows in skeletal soil on flat, wet sandstone shelves above dissected valleys.	Unlikely. There is no suitable habitat for this species within the study area.	BAM – floristic survey and line transect surveys across remaining area of proposed disturbance	No	Excluded
Grevillea renwickiana	Nerriga Grevillea	Yes	G. renwickiana occurs in a range of plant communities: low woodland of one or more of *Eucalyptus mannifera, E. radiata, E. pauciflora, E. aggregata, E. dives, E. rossii* or *Allocasuarina nana* heath. Especially on sandy or loamy soils fringing damp heath/sedge dominated vegetation and occasionally on ridges in rocky soil	Unlikely. Whilst suitable habitat may be found within the study area, no individuals were identified during the survey period	BAM – floristic survey and line transect surveys across remaining area of proposed disturbance	No	Excluded
Leucochrysum albicans subso. tricolor	Hoary Sunray	No	Occurs in a wide variety of grassland, woodland and forest habitats, generally on relatively heavy soils.	Unlikely. Whilst suitable habitat may be found within the study area, no individuals were identified during the survey period	BAM – floristic survey and line transect surveys across remaining area of proposed disturbance	No	Excluded
Pimelea axiflora subsp. pubescens	Bungonia Rice-flower	Yes	The species requires rocky areas or is found within 50m of rocky areas. It specifically occurs on limestone cliff edges and outcrops	Unlikely. There is no suitable habitat for this species within the study area.	BAM – floristic survey and line transect surveys across remaining area of proposed disturbance	No	Excluded
Pomaderris cotoneaster	Cotoneaster Pomaderris	No	Cotoneaster Pomaderris has been recorded in a range of habitats in predominantly forested country. The habitats include forest with deep, friable soil, amongst rock	Unlikely. Whilst suitable habitat may be found within the study area, no individuals	BAM – floristic survey and line transect surveys across remaining area of	No	Excluded

			beside a creek, on rocky forested slopes and in steep gullies between sandstone cliffs	were identified during the survey period	proposed disturbance		
Pomaderris delicata	Delicate Pomaderris	Yes	At both known sites the Delicate Pomaderris grows in dry open forest dominated by Eucalyptus sieberi with a dense she-oak understorey. Soils are shallow and derived from sandstone and siltstone. Nothing is known about the response of the species to fire and other disturbance.	Unlikely. There is no *Allocasuarina* located within the study area therefore suitable habitat for this species is not available within the study area.	BAM – floristic survey and line transect surveys across remaining area of proposed disturbance	No	Excluded

4.2 ASSESSMENT OF THREATENED FAUNA HABITAT

4.2.1 Survey method

The site was assessed for suitability as habitat for native fauna, especially those listed on the *BC Act,* by Melissa Mass during the March 2024 survey period.

The study area is adjacent to an unnamed drainage line which flows, during high rainfall events, to the south where it enters into Jaorimin Creek approximately 2km to the north west of the subject property. Neither the unnamed drainage line nor Jaorimin Creek will be impacted by this development proposal.

Specific survey techniques employed for mammals included dedicated searches for indirect evidence (including scats, prints, scratches, dreys, burrows and diggings). There was no dedicated survey undertaken for any species as it was deemed unnecessary and unlikely to yield positive results.

Opportunistic sightings of bird species were recorded whilst undertaking flora surveys in March 2024.

There were no targeted surveys undertaken for reptiles within the subject property however incidental observations were recorded during the floristic survey period.

Overall the fauna habitat within the subject property study area is of poor value in its current state, although it is expected a diverse range of native fauna species could be expected to occur within the study area for foraging. Mobile species could be resident in surrounding areas and could potentially utilise vegetation within the proposed disturbance footprint for foraging. There is no requirement to remove any mature trees for this proposal therefore no nesting habitat for any bird species will be disturbed. Fauna species identified during the March 2024 survey period have been listed in Appendix B.

A 10km radius online search using the BioNet database was conducted to identify any threatened fauna species that may have historically occurred within the subject property or within the immediate local area. In total twenty one threatened species – sixteen birds and five mammals - were located within the 10km radius. There were no records of threatened species historically located within the subject property or study area. The BAM - C Predicted Species Report found twenty one threatened species were predicted to potentially occur on site based on the PCT present and location of the site within the IBRA. An assessment of habitat suitability for these species occurring within the study area is summarised in Table 6. Species identified as potentially having habitat onsite in which they could occur have been added to the predicted threatened species (ecosystem credits) within the BAM – C.

The BAM – C Candidate Species Report found there were five species which required assessment for species credit potential. The candidate species were not subjected to targeted survey as an assessment of likelihood found that it was unlikely that species credits would be generated. Two of the candidate species listed are cave dependant species, a feature which does not occur within the study area or immediate surrounding landscape. Another species

requires identification onsite or important area mapping over the study area to be considered for species credits. The remaining two species have habitat constraints which are not meet within the study area. An assessment of habitat suitability for these species occurring with the study area has still been considered in Table 7.

Table 6. Assessment of likelihood for BAM – C Predicted Species

Common name	Scientific name	Dual credit species	Species recorded on site via past surveys or incidentally observed	Constraints 1. Geographic limitations 2. Habitat constraints 3. Is the species vagrant to the IBRA subregion	Species likely to have suitable habitat onsite?	Reason for inclusion or exclusion
BIRDS						
Black-chinned Honeyeater (eastern subspecies)	*Melithreptus gularis gularis*	No	No	**Geographic limitations:** No **Habitat constraints in TBDC:** No **Species vagrant:** No **General notes:** None Information updated within the TBDC 01/11/2022	The Black-chinned Honeyeater has some suitable foraging habitat located within the study area	**Included** as an ecosystem credit species as some suitable habitat is located onsite.
Brown Treecreeper (eastern subspecies)	*Climacteris picumnus victoriae*	No	No	**Geographic limitations:** No **Habitat constraints in TBDC:** No **Species vagrant:** No **General notes:** The species is allocated to ecosystem credit species given that hollows are now on the credit profile, therefore likely to capture suitable breeding habitat for the species. Information updated within the TBDC 25/02/2024	The Brown Treecreeper has suitable foraging habitat located within the study area	**Included** as an ecosystem credit species as some suitable habitat is located onsite.
Diamond Firetail	*Stagonopleura guttata*	No	No	**Geographic limitations:** No **Habitat constraints in TBDC:** No **Species vagrant:** No **General comment:** None	The Diamond Firetail has suitable habitat located within the study area	**Included** as an ecosystem credit species as some suitable habitat is located onsite.

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				Information updated within the TBDC 25/02/2024		
Dusky Woodswallow	*Artamus cyanopterus cyanopterus*	No	No	**Geographic limitations:** No **Habitat constraints in TBDC:** No **Species vagrant:** No **General comment:** Data for this species is complicated by resident and migratory components of populations, with the greater tendency to migration in south of state. The species uses paddock trees for nesting. Information updated within the TBDC 01/12/2017	The Dusky Woodswallow has suitable habitat located within the study area	**Included** as an ecosystem credit species as some potential foraging habitat is located onsite.
Flame Robin	*Petroica phoenicea*	No	No	**Geographic limitations:** No **Habitat constraints in TBDC:** No **Species vagrant:** No **General notes:** Breeding and non-breeding habitat is very different, key should be protecting breeding habitat. The species will occupy smaller patches outside breeding season. Paddock trees are used for roosting and foraging. Information updated within the TBDC 1/12/2017	The Flame Robin has suitable habitat located within the study area	**Included** as an ecosystem credit species as some suitable habitat is located onsite.
Gang-gang Cockatoo	*Callocephalon fimbriatum*	Yes	No	**Geographic limitations:** No **Habitat constraints in TBDC:** Eucalyptus tree species with hollows	The Gang-gang Cockatoo has some suitable foraging habitat located within the study area. It nests in old	**Included** as an Ecosystem credit species as some suitable foraging habitat is located onsite.

				greater than 9cm diameter (Species credit constraint) **Species vagrant:** No **General notes:** This is a dual credit species. The identification of breeding habitat will require survey or an expert report. For clearing or development assessments, presence can be assumed. Information updated within the TBDC 9/03/2022	growth hollows which are not present within the study area	**Excluded** as a species credit species as no suitable nest trees identified within the development footprint.
Glossy Black-Cockatoo	*Calyptorhynchus lathami*	Yes	No	**Geographic limitations:** No **Habitat constraints in TBDC:** Presence of Allocasuarina and casuarina species (Ecosystem credit constraint) Living or dead tree with hollows greater than 15cm diameter and greater than 8m above ground (Species credit constraint) **Species vagrant:** No **General notes:** Species may need larger patches and more intact landscapes for breeding. Information updated within the TBDC 31/01/2024	The Glossy Black-cockatoo feeds exclusively on Allocasuarina and Casuarina species which are not present within the study area	**Excluded** as an ecosystem credit species as suitable foraging habitat is not present on site. **Excluded** as a species credit species as no suitable nest trees identified within the development footprint.
Little Eagle	*Hieraaetus morphnoides*	Yes	No	**Geographic limitations:** No **Habitat constraints in TBDC:** Nest trees – live (occasionally dead) large old trees within vegetation (Species credit constraint)	The Little Eagle occupies open eucalypt forest, woodland or open woodland. The vegetation within the study area could be considered as woodland therefore suitable habitat for this species could	**Included** as an ecosystem credit species as some suitable habitat is located onsite. **Excluded** as a species credit species as no stick nests identified onsite.

				Species vagrant: No **General notes:** Paddock trees can provide important breeding habitat (there are examples of nest trees in ACT). Information updated within the TBDC 30/08/2021	be found onsite. No stick nests were identified within the study area.	
Little Lorikeet	*Glossopsitta pusilla*	No	No	**Geographic limitations:** No **Habitat constraints in TBDC:** No **Species vagrant:** No **General notes:** The species is allocated to full ecosystem credit species given that hollows are now on the credit profile, therefore likely to capture suitable breeding habitat for the species (highly mobile and the small hollows required for breeding are relatively common). Information updated within the TBDC 29/06/2022	The Little Lorikeet occurs in eucalyptus forests and woodland. Suitable habitat is located within the study area	**Included** as an ecosystem credit species as some suitable habitat is located onsite.
Painted Honeyeater	*Grantiella picta*	No	No	**Geographic limitations:** No **Habitat constraints in TBDC:** Mistletoes present at a density of greater than five mistletoes per hectare **Species vagrant:** No **General notes:** None Information updated within the TBDC 28/03/2023	This species relies on mistletoe presence at a density of greater than five mistletoes per hectare. There were no mistletoes identified within the survey plots or noted within the study area.	**Excluded** as an ecosystem credit species as suitable habitat is not located onsite.

Scarlet Robin	*Petroica boodang*	No	No	**Geographic limitations:** No **Habitat constraints in TBDC:** No **Species vagrant:** No **General notes:** Paddock trees are used for roosting and foraging. Information updated within the TBDC 1/12/2017	The Scarlet Robin has suitable habitat present onsite.	**Included** as an Ecosystem credit species as some suitable foraging habitat is located onsite.
South-eastern Hooded Robin	*Melanodryas cucullata cucullata*	No	No	**Geographic limitations:** No **Habitat constraints in TBDC:** No **Species vagrant:** No **General notes:** Paddock trees can be important for this species as they can link remnant foraging habitat Information updated within the TBDC 01/12/2023	The Hooded Robin has suitable habitat present onsite.	**Included** as an Ecosystem credit species as some suitable foraging habitat is located onsite.
Speckled Warbler	*Chthonicola sagittata*	No	No	**Geographic limitations:** No **Habitat constraints in TBDC:** No **Species vagrant:** No **General notes:** Paddock trees can be important for this species as they can link remnant foraging habitat Information updated within the TBDC 1/12/2017	The Speckled Warbler has suitable habitat present onsite.	**Included** as an Ecosystem credit species as some suitable foraging habitat is located onsite.
Swift Parrot	*Lathamus discolor*	Yes	No	**Geographic limitations:** No **Habitat constraints in TBDC:** As per mapped areas (Species credit constraint)	The Swift Parrot does have suitable foraging habitat located onsite. The site is not mapped as an important area	**Included** as an Ecosystem credit species as some suitable foraging habitat is located onsite.

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				Species vagrant: No **General notes:** Only present in non-breeding season; present in northern NSW for a shorter period than southern NSW. The species is a dual credit species, with the species credit component mapped as an important area. These mapped areas do NOT require survey as it is presumed that the species is present. Any impact from development could potentially be serious and irreversible. Ecosystem credit areas are unlikely to have potential serious and irreversible impacts. Information updated within the TBDC 30/06/2021	on the DPE BAM Important Area Map.	**Excluded** as a species credit species as the site is not mapped as an important area on the DPE BAM Important Area Map.
Varied Sittella	*Daphoenositta chrysoptera*	No	No	**Geographic limitations:** No **Habitat constraints in TBDC:** No **Species vagrant:** No **General notes:** None Information updated within the TBDC 1/12/2017	The Varied Sittella has suitable habitat present onsite.	**Included** as an Ecosystem credit species as some suitable foraging habitat is located onsite.
White-bellied Sea-eagle	*Haliaeetus leucogaster*	Yes	No	**Geographic limitations:** No **Habitat constraints in TBDC:** Within 1km of a rivers, lakes, large dams or creeks, wetlands and coastlines (Ecosystem credit constraint) Living or dead mature trees within suitable vegetation within 1km of a rivers, lakes, large dams or creeks,	The White-bellied Sea-eagle has some suitable foraging habitat located onsite. No large stick nests were located within the study area.	**Included** as an Ecosystem credit species as some suitable foraging habitat is potentially located onsite. **Excluded** as a species credit species as no large stick nests identified onsite.

				wetlands and coastlines (Species credit constraint) **Species vagrant:** No **General notes:** The species is highly selective in nesting locations. Information updated within the TBDC 19/09/2019		
White-throated Needletail	*Hirundapus caudacutus*	No	No	**Geographic limitations:** No **Habitat constraints in TBDC:** No **Species vagrant:** Yes **General notes:** Strongly migratory, widespread and predominately aerial, while also occupying a large area while it over-winters during the Australian summer. Geo-locators show they often fly greater than 500 km per day and radiotracking shows they fly 20 to30 km after dark to reach their roost, usually on the edge of a forest, near the top of the tree, or on cliffs. Evidence suggests that they are higher in abundance in areas with a good covering of forest or woodland, though connectivity is unlikely to be important. While they prefer foraging over large forests, dune scrubs or woodlands, they have also been observed foraging over scattered trees, over which wind spirals can occur that the birds can use to lift and feed, as well as bare ground. Fresh, unpolluted water is required from smooth water (river/stream/dam). Wind turbines	The White-throated Needletail has some suitable habitat located onsite.	**Included** as an Ecosystem credit species as some suitable foraging habitat is located onsite.

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				are a key threat in certain locations. Locations selected for windfarms are usually also ideal roosting habitat for this species. They are often among the most impacted species. Carcasses are rarely found during post-strike survey due to predation overnight. For flocking species such as this, survey of adjacent turbines would assist in ascertaining the range of strike occurring. Contact DPE for a draft copy of the Bird and Bat Strike Guidelines. Information updated within the TBDC 14/04/2021		
MAMMALS						
Grey-headed Flying-fox	*Pteropus poliocephalus*	Yes	No	**Geographic limitations:** No **Habitat constraints in TBDC:** Breeding camps (Species credit constraints) **Species vagrant:** No **General notes:** This species is retained as dual credit because foraging habitat is broad ranging but breeding camps are localised and, if impacted, must be offset by protecting and enhancing another breeding camp (breeding camps will need to be identified by survey, as per OEH Guidelines). The initial search for camps should encompass any recorded camps and roosting habitat likely to occur on the subject land. If a camp is located the survey only needs to take place in the camp (that is the area occupied by the	Suitable foraging habitat for the Grey-headed Flying-fox is located onsite. There are no breeding camps on site presently, or previously recorded.	**Included** as an Ecosystem credit species as some suitable habitat is located onsite. **Excluded** as a species credit species as the site is not a breeding camp, nor has a breeding camp ever been recorded onsite.

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				target species) to identify breeding females. Camps used for breeding must be mapped. Use GPS to map outer perimeter of the camp to create the species polygon. Additionally, selected <1 for average number of offspring because females do not give birth every (often miscarry etc). Information updated within the TBDC 9/10/2020		
Large Bent-winged Bat	*Miniopterus orianae oceanensis*	Yes	No	**Geographic limitations:** No **Habitat constraints in TBDC:** Cave, tunnel, mine, culvert or other structure known or suspected to be used for breeding including species records with microhabitat code "IC - in cave;" observation type code "E nest-roost;" with numbers of individuals >500 (Species credit constraints) **Species vagrant:** No **General notes:** Any impacts on breeding habitat could be considered potentially serious and irreversible. This species is retained as dual credit because foraging habitat is broad ranging but breeding habitat is highly specific. At lower altitudes this species is usually more abundant during winter months, the lower numbers of individuals from October to February are due to females moving to maternity sites. Additionally, selected <1 for average number of offspring because females	Some suitable foraging habitat may be present in the immediate area for the Large Bent-winged Bat. No caves or other structure that could be used as roosting habitat located onsite.	**Included** as an Ecosystem credit species as some suitable foraging habitat is located onsite. **Excluded** as a species credit species as the site does not have a suitable roosting shelter.

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				do not give birth every (often miscarry etc). Information updated within the TBDC 9/09/2019		
Spotted-tailed Quoll	*Dasyurus maculatus*	No	No	**Geographic limitations:** No **Habitat constraints in TBDC:** No **Species vagrant:** No **General notes:** Ecology of the quoll is reasonably well documented but its response to management is less well known. Species regularly uses hollows for denning and is dependent on hollow-dependent prey in many parts of NSW. Males will disperse long distances, however females remain close to maternal home range and are unlikely to disperse more than 10km. Information updated within the TBDC 24/09/2020	Suitable eucalypt forest occurs within study area.	**Included** as an Ecosystem credit species as some suitable foraging habitat is located onsite.
Reptiles						
Rosenberg's Goanna	*Varanus rosenbergi*	No	No	**Geographic limitations:** No **Habitat constraints in TBDC:** No **Species vagrant:** No **General notes:** Broad-ranging species that is difficult to survey - very transient. It is potentially two species - Western & Highlands open woodland (without sandstone); and Sydney basin bioregion. Clutch size is about 10-14 eggs, but only breed every second year or so. Predation by	No suitable habitat for the species occurs within the development footprint. The species prefers large areas of intact habitat where termites are abundant, or at least present. The habitat onsite is disturbed, segmented and fragmented. There are no termite mounds within the development footprint.	**Excluded** as an Ecosystem credit species as no suitable foraging or breeding habitat is located onsite.

				foxes will likely reduce the number of eggs hatching. Information updated within the TBDC 18/03/2022		

Table 7. Assessment of likelihood for BAM - C candidate species

Common name	Scientific name	Species recorded onsite via past survey or incidentally observed	Constraints 1. Geographic limitations 2. Is the species vagrant to the IBRA subregion 3. Habitat constraints 4. Microhabitats	Candidate species likely to have suitable habitat?
Birds				
Swift Parrot	*Lathamus discolor*	No	**Geographic limitations:** No **Species vagrant:** No **Habitat constraints in TBDC:** As per mapped areas (Species credit constraint) **Microhabitats:** No **General notes:** Only present in non-breeding season; present in northern NSW for a shorter period than southern NSW. The species is a dual credit species, with the species credit component mapped as an important area. These mapped areas do NOT require survey as it is presumed that the species is present. Any impact from development could potentially be serious and irreversible. Ecosystem credit areas are unlikely to have potential serious and irreversible impacts. Information updated within the TBDC 30/06/2021	**No –** the site is not mapped as an important area

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Mammals				
Brush-tailed Rock Wallaby	*Petrogale penicillata*	No	**Geographic limitations:** No **Species vagrant:** No **Habitat constraints in TBDC:** Land within 1 km of rocky escarpments, gorges, steep slopes, boulder piles, rock outcrops or clifflines **Microhabitats:** No **General notes:** Any impacts on rocky habitat used by this species could be considered potentially serious and irreversible. Additionally, significant amounts of apparently suitable habitat remain unoccupied. Note that there is some seasonal variability expected in detection rates with cooler months making animals easier to detect as they are more mobile and sun themselves in exposed locations makes observations/detection easier than at other times of the year. Largest populations are on public land with smaller but important populations (for genetic variability and metapopulation dynamics) are located on private land. Management actions such as fire regimes, fox control can assist in population stability and recovery. Information updated within the TBDC 19/02/2024	**No –** There is no rocky escarpments, gorges, steep slopes, boulder piles, rock outcrops or clifflines within the study area or within 1km of the study area.
Large Bent-winged Bat **(Breeding)**	*Miniopterus orianae oceanensis*	No	**Geographic limitations:** No **Species vagrant:** No **Habitat constraints in TBDC:** Cave, tunnel, mine, culvert or other structure known or suspected to be used for breeding including species records with microhabitat code "IC - in cave;" observation type code "E nest-roost;" with numbers of individuals >500 (Species credit constraints)	**No –** Breeding habitat constraints present as there are no caves, tunnels, mines or other structure known or suspected to be used for breeding within the study area

			Microhabitats: Only as above **General notes:** Any impacts on breeding habitat could be considered potentially serious and irreversible. This species is retained as dual credit because foraging habitat is broad ranging but breeding habitat is highly specific. At lower altitudes this species is usually more abundant during winter months, the lower numbers of individuals from October to February are due to females moving to maternity sites. Additionally, selected <1 for average number of offspring because females do not give birth every (often miscarry etc). Information updated within the TBDC 9/09/2019	
Large-eared Pied Bat	*Chalinolobus dwyeri*	No	**Geographic Limitations:** No **Habitat constraints in TBDC:** Cliffs: Within two kilometres of rocky areas containing caves, overhangs, escarpments, outcrops, or crevices, or within two kilometres of old mines or tunnels. **Species vagrant:** No **General notes:** None Information updated within the TBDC 01/12/2017	**No –** The site is not located within two kilometres of rocky areas containing caves, overhangs, escarpments, outcrops, or crevices, Therefore suitable habitat is unlikely to occur nearby. Breeding habitat constraints present as there are no caves, tunnels, mines or other structure known or suspected to be used for breeding within the development site.
Amphibians				
Stuttering Frog	*Mixophyes balbus*	No	**Geographic Limitations:** No **Habitat constraints in TBDC:** No **Species vagrant:** No **General notes:** This species is comprised of two different genetic lineages. SAII: The populations from the southern lineage that are located south of the Hunter River generally appear to have been severely impacted by	**No –** The Stuttering Frog is known to occur in rainforest and tall open forest in the foothills and escarpment of the eastern side of the Great Divided Range. The habitat identified onsite would not support the Stuttering Frog.

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			chytridiomycosis and any impact on them could be considered potentially serious and irreversible. The populations north of the Hunter River are more robust and impacts on them are currently unlikely to be considered potentially serious and irreversible. Information updated within the TBDC 04/06/2018	

4.3 THREATENED SPECIES ASSESSMENT

4.3.1 Threatened species summary and polygons

There was no threatened flora or fauna species identified within the proposed development area during the survey period.

There is potential for fifteen threatened bird species and three threatened mammal species to use the vegetation within the study area as foraging habitat. It is highly unlikely that any threatened species uses the vegetation within the study area as an exclusive home range.

Ecosystem credits have been applied to the fifteen threatened bird species and three threatened mammal species which potentially use the study area for foraging however it is not necessary to apply species credits for any of these species.

Further threatened species assessment is therefore not required for this BDAR.

4.3.2 Local data

No local data has been used for threatened species assessment for this BDAR.

4.3.3 Expert reports

No expert reports have been used for threatened species assessment for this BDAR.

4.4 POTENTIAL PRESCRIBED BIODIVERSITY IMPACTS ON THREATENED SPECIES

There is a 0.35ha area of PCT 3643 which contains potential foraging habitat for fifteen threatened bird species and three threatened mammal species. The entire native vegetation removal footprint of 0.35ha potentially provides foraging habitat for some of these species.

This proposal will result in the modification of 0.35ha of disturbed native vegetation in total which is potential suitable foraging habitat for fifteen threatened bird species and three threatened mammal species. The impact to native vegetation is highly unlikely to cause a SAII to any threatened species potentially utilising the site. The quality of the vegetation within the 0.35ha of native vegetation is considered fair in its current state however not considered critical habitat for any other species which has been suspected of having potential foraging habitat onsite. The size of the area as habitat for any threatened species potentially using the site for foraging is not considered to be within an exclusive home range. Many of the threatened species predicted to be onsite are considered to be highly mobile species within a much larger home or migratory range.

The method of Avoid and Minimise has been effectively adopted via this proposal to reduce the impacts to the threatened species potentially located within the subject property. The proposal has been designed in an area where existing disturbance has occurred and minimal further disturbance is required. The vegetation disturbance and permanent removal will include shrubs, grasses and forbs only with no mature trees subject to disturbance. An APZ can be maintained following the current use of the property for sheep grazing with no additional clearing or alteration of vegetation required. Therefore, as this project proposes to disturb less than the native vegetation clearing threshold of 1ha for a property between 40ha and 1000ha and will not have a significant impact upon any threatened species which could generate species credits, the development does not require mitigation for biodiversity removal.

5 IMPACT ASSESSMENT

5.1 AVOIDING AND MINIMISING IMPACTS ON BIODIVERSITY

The proposed development would involve the construction of a two lot subdivision with a new dwelling building footprint on Lot 1. To achieve the outcomes for this development approximately 1876m² of driveway easement is required, a 400m² building envelope has been allowed for, an Asset Protection Zone (APZ) of 2500m² would require ongoing management and 135m of new internal fencing to separate the lots would be constructed (allowing 2m either side of the fence) totalling a disturbance footprint of 500m². While this figure equates to 5276m² of impact, the actual figure would be less as the building envelope and parts of the driveway would be within the APZ area of 2500m². Within the 5276m² impact zone, approximately 852m² of driveway easement, 500m² of new fence and 2500m² of APZ is likely to disturb native vegetation indefinitely, with some of that driveway easement being within the APZ. It is therefore estimated that approximately 3500m² of native vegetation is likely to be permanently modified for this development proposal. The modification would involve the removal of native flora species and habitat suitable for some native fauna. This would not impact significantly upon the native fauna within the local landscape given the disturbance from the proposal would be an alteration of an already modified landscaped site. No vegetation corridors would be impacted, no species is likely to be placed at risk of localised extinction and no critical habitat for any species is present within the proposed development footprint. This proposal does not impact upon any Threatened, Endangered or Critically Endangered Ecological Community. The current clearing percentage for the vegetation community identified onsite is 47%.

There are no prescribed impacts which require assessment as identified within Section 8.2.1.2 of the BAM. Details have been demonstrated in Table 9.

Table 8. Prescribed impact assessment

Prescribed Impacts	Avoid and Minimise	Outcome
a) Impacts of development on the habitat of threatened species or ecological communities associated with: ***(i) karst, caves, crevices, cliffs and other geological features of significance, or*** ***(ii) rocks, or*** ***(iii) human made structures, or*** ***(iv) non-native vegetation***	There is no karst, caves, crevices, cliffs or other geological features of significance within the development footprint. There are no rocks, human made structures or non-native vegetation within the development footprint which is considered as significant habitat for any threatened species.	No impact
b) Impacts of development on the connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range.	There will be no impact to connectivity of habitat areas as the native vegetation disturbance which will be required for this development proposal will be a further alteration of already cleared, disturbed and modified agricultural areas.	No impact

c) Impacts of development on movement of threatened species that maintains their life cycle.	There will be no impact to connectivity of habitat areas therefore there will be no impact to the movement of threatened species that maintains their life cycle.	No impact
d) Impacts of development on water quality, water bodies and hydrological processes that sustain threatened species and threatened ecological communities (including from subsidence or upsidence resulting from underground mining)	There is no water bodies or significant hydrological processes which sustain threatened species or threatened ecological communities within the development footprint. There is no risk to water bodies or hydrological processes downhill of the development footprint which is likely to impact on any threatened species or threatened ecological community.	No impact
e) Impacts of wind turbine strikes on protected animals	Not a wind turbine development.	No impact
(f) Impacts of vehicle strikes on threatened species or on animals that are part of a TEC.	There is no additional risk to threatened species or animals which are a part of a threatened ecological community from vehicle strikes from this proposed development.	No impact

5.1.1 Actions to avoid and minimise impacts

The proposed development has demonstrated the ability to avoid impacts to biodiversity values with the placement of the development footprint located within an area of highly modified landscape. However complete avoidance of impacts has not been possible due to the location of native flora species within site.

The project has demonstrated the ability to minimise impacts to biodiversity values with the proposed building envelope and driveways being located in areas which have minimal native vegetation when compared to other potentially suitable locations on the subject property. The vegetation community in which this disturbance will take place is currently in fair condition due to ongoing management and exotic species being present. No mature trees are proposed to be removed for this development.

Mitigation of disturbance is not required for this development as the native vegetation clearing threshold of 1ha for a property between 40ha and 1000ha in size is not being exceeded and no threatened species which incur species credits were identified or are likely to use the proposed development area.

5.2 IMPACTS THAT CAN NOT BE AVOIDED

5.2.1 Direct impacts

The indefinite modification of vegetation in the study area will have a significant impact upon a range of flora and fauna which does and could potentially occur within the site. Disturbance of the existing vegetation structure has historically occurred throughout this location. Further modification may influence the suitability of habitat for cryptic flora species such as those from the Orchidaceae family and fungus kingdom. Direct impacts on fauna species resulting from the permanent removal of this habitat could include the alteration of suitable habitat.

Direct impacts occurring as a result of this development include:

- Removal of 0.35ha of fair quality native vegetation identified as PCT 3643.

These impacts to native vegetation will be permanent and are expected to occur almost immediately following approval of the DA. A summary of these impacts can be seen in Table 9.

Table 9. Summary of direct impacts to vegetation

Zone	PCT	TEC	Area impacted	Offset required
Zone 1 Study area – native vegetation	3643	No	0.35ha	No

5.2.2 Indirect impacts

Indirect impacts on native fauna such as noise from the further development of the site would be slightly increased as a result of the proposed development. Further indirect impacts during construction such as sediment and pollutants may be increased as a result of the proposed development.

Potential indirect impacts resulting from the development are addressed in Table 10.

Table 10. Assessment of indirect impacts

Indirect impact	Assessment
Increase in noise due to increased use of the site	It is expected that adjacent habitat will be impacted in a minor way due to an increase in noise from the use of the site. It is not expected this noise pollution will be substantial nor will it impact any threatened species likely to occur in the area as it will be an extension of current operations.
Sediment impacts on adjacent vegetation	Impacts to adjacent vegetation during operations can be prevented or minimised through appropriate exclusion fencing and erosion control measures. Best practice environmental protection measures for managing stormwater runoff should be implemented, particularly during construction.
Edge effects to adjacent vegetation	Adjacent vegetation is likely to be impacted by edge effects without suitable management practices in place.
Transportation of weeds and pathogens into adjacent vegetation	Adjacent vegetation is likely to be impacted by weeds and pathogens without suitable management practices in place.
Rubbish dumping	Adjacent vegetation is likely to be impacted by rubbish dumping without suitable management practices in place.
Changes in hydrological runoff	Changes in hydrological run off is likely to occur due to rainwater catchment and hard stand areas. Where possible, rain water overflow should be encouraged

	to take a natural route downslope. Where possible hard stand areas should be surrounded with turf or gardens to avoid sediment transportation in periods of heavy rainfall.

A number of mitigation measures applicable to biodiversity have been developed for the proposed development as described in Table 11.

Table 11. Direct and indirect impacts likely to occur as a consequence of the development proposal

Measure	Description
Vegetation Removal	
Pre-clearance survey	Pre-clearance survey should be undertaken by suitably qualified person to ensure no nesting birds are present in the immediate area of the disturbance. Clearing should only take place when construction activities are set to follow immediately.
Vegetation clearing	There will be no removal of mature trees for the purpose of this development. Vegetation clearing will involve the removal of low lying shrubs, grasses and forbs only.
Post clearing	Cleared areas should be covered immediately with hardstand areas or a cover crop to minimise the risk of erosion and sediment movement.
Construction	
Pre-construction works	An Erosion and Sediment Control Plan should be in place before construction begins. All sediment control fences etc. should be built in the necessary locations. The restricted development areas should be clearly identified with temporary fencing to ensure construction activities do not enter and disturb neighbouring vegetation.
During Construction	Staff should be trained and made aware to reduce impacts where possible and to report any incidents which may contribute to environmental damage to the site supervisor immediately. Construction should follow engineering plans as approved by council
Post Construction	All construction waste material should be removed from site and disposed of correctly.
Hydrological Regime	
	The availability of water in areas which currently have surface water flows will be reduced following construction of the hard surface areas. The impacts on flora in these locations is expected to be minor as other environmental features such as aspect and geology will maintain the existing community
Asset Protection Zone	
	The removal of 0.35ha of vegetation is due to APZ distance being required to protect the dwelling from bushfire attack. This area shall be maintained to a suitable standard to achieve and maintain a Bushfire Attack Level of 29.
House construction	
Pre-construction	The building envelope layout should be clearly defined to prevent civil workers and associated trades people from entering vegetated areas unnecessarily. Erosion control measures, if needed, should be erected before construction begins.
During construction	Trades people should enter via designated roads and driveways only. Trades people should be trained and made aware to reduce impacts where possible and to report any incidents which may contribute to environmental damage to the site supervisor immediately. Construction should follow engineering plans as approved by council. Work should be undertaken within daylight hours to prevent impacts on resident nocturnal species.

Post Construction	Trades people should ensure they remove all rubbish an associated waste to prevent pollutants entering into the neighbouring vegetation areas.
Landscaping and Nutrient flow	
	Landscaping should be designed to reduce the surface water flow from wastewater outlets. This will prevent water with high nutrient levels from entering into nearby drainage lines. Landscaping will not include the planting of restricted exotic species as outlined within the *Biodiversity Act* 2015.
Noise and light	
	Before, during and after construction, noise and light impacts should be considered and minimised where possible. High-powered floodlights which radiate into the surrounding bushland areas should be avoided to minimise disturbance to resident fauna.

5.2.3 Summary of impacts

The proposed development will have direct impacts upon the biodiversity on the site, albeit a 0.35ha area. The native vegetation subject to assessment due to its association with a known PCT has generated a vegetation integrity loss of 34.2 for PCT 3643.

The removal of native vegetation in this location is not expected to have any adverse effects on any critical habitat for any species due to the small area and poor quality of the remnant native vegetation.

There was no threatened flora species identified within the development footprint.

Nineteen threatened fauna species may potentially occur within the site based on habitat availability and preference.

A summary of impacts on native vegetation, fauna and habitat has been shown in Table 12.

Table 12. Impact summary

Impact	Avoid and minimise	Extent	Risk assessment	Duration and timing	Consequence
Habitat clearance	The subdivision and new dwelling will require the clearing of native vegetation. An area of 0.35ha is proposed to be disturbed for the proposed development.	0.35ha	High	Construction and ongoing	Direct loss of flora and fauna habitat. Disturbance to 0.35ha of suitable habitat for several threatened species. Injury or mortality of fauna, particularly small ground dwelling invertebrates.
Displacement of resident fauna	The new construction may displace resident fauna throughout the entire development footprint area, particularly macropods who currently use the open areas for grazing. There will be no displacement of threatened species or removal of any critical habitat for any species.	0.35ha	High	Construction and ongoing	Less frequency of native fauna species within the study area.
Removal of habitat features	There will be no removal of any significant habitat features for this development.	0.35ha	Low	Construction	Unlikely to be loss of habitat features.
Introduction of invasive flora species	Introduction of weeds into areas surrounding the new construction is likely due to disturbance of the soil layer. Weeds shall be managed as per the current landscape maintenance. No restricted flora species should be planted within the study area.	Unknown	Moderate	Construction and ongoing	Possibility of invasive flora species entering into the remaining native vegetation and causing further biodiversity loss.
Increase in exotic fauna species	An increase in European Rabbit and European Red Fox is likely to occur due to the disturbance of native vegetation and the resulting modified landscape.	Unknown	Moderate	Construction and ongoing	Possibility of exotic fauna species preying upon resident native fauna within the remaining native vegetation.
Changes to hydrological and nutrient flows	There should be very little change to hydrological flows. Some diversion of surface water flow may	Unknown	Low	Construction and ongoing	Possibility of minor changes to surface water flow.

	occur due to the construction of hard stand areas however this is expected to be minimal.				
Increased noise	A slight increase in local noise levels will be expected from noise associated with the site usage.	Unknown	Low	Construction and ongoing	Slight increase to local noise levels.

The disturbance and/or removal of 0.35ha of disturbed native vegetation within the development footprint will be indefinite. Furthermore, following the construction of the new dwelling the site will be landscaped and managed within the PCT located on the site at the time of this assessment. It is highly recommended that native species endemic to the PCT identified on site are used for landscaping.

Recommendations to ensure impacts upon the site and surrounding areas are reduced, minimised or mitigated during construction and beyond are as follows:

- Sediment and erosion control measures need to be considered before, during and after any vegetation clearing or earthworks in the development footprint, in accordance with current standards;
- Rehabilitate the ground cover immediately following construction to preserve soil biodiversity;
- Landscaping take place using native species endemic to PCT 3643.

5.3 IDENTIFICATION OF IMPACTS REQUIRING OFFSET

5.3.1 Impacts to native vegetation

There is no offset requirement for this proposed development due to the native vegetation clearing threshold of 1ha for a property between 40ha and 1000ha in size not being exceeded.

Table 13. Summary of offset requirement for ecosystem credits

Vegetation zone	PCT	Area	Impact	VIS	TEC	HBTs	Offset required	Credit score
Zone 1 – Disturbed native vegetation	3643	0.35ha	Permanent clearing of vegetation for construction	34.2	No	No	No	**0**

5.3.2 Impacts to threatened species

There was no threatened flora species identified on site or predicted to occur onsite. There is nineteen threatened fauna species which could potentially occur within the study area. No species credits were required for any of these species.

5.4 IDENTIFICATION OF IMPACTS NOT REQUIRING OFFSET

There were no impacts not requiring offset for this development.

5.5 IDENTIFICATION OF AREAS NOT REQUIRING ASSESSMENT

There are no areas within the study area which do not require assessment.

5.6 SERIOUS AND IRREVERSIBLE IMPACTS (SAII)

The approach of Serious and Irreversible Impacts (SAII) in relation to the Biodiversity Offset Scheme is to ensure there is no contributing factors within a development proposal which will contribute to the extinction of a threatened species, threatened ecological community, threatened populations or critical habitat.

The four principles of determining SAII are as follows:

- will cause a further decline of the species or ecological community that is currently observed, estimated, inferred or reasonably suspected to be in a rapid rate of decline;
- will further reduce the population size of the species that is currently observed, estimated, inferred or reasonably suspected to have a very small population size, or will further degrade or disrupt an ecological community that is already observed, inferred or reasonably suspected to be severely degraded or disturbed;
- impact on the habitat of a species or ecological community that is currently observed, estimated, inferred or reasonably suspected to have a very limited geographic distribution;
- impact on a species or ecological community that is unlikely to respond to measures to improve habitat and vegetation integrity and is therefore irreplaceable.

There is no requirement to undertake a SAII assessment for the PCT identified onsite or any threatened species which may potentially use the study area.

6 BIODIVERSITY CREDIT REPORT

This development proposal will contribute to a direct impact which will result in the loss of 0.35ha of a PCT which is not associated with any threatened ecological community. Due to the proposed area of disturbance impacting on less than the native vegetation clearing threshold there is no requirement for ecosystem credit offset. Furthermore nineteen threatened species potentially occur within the study area and may be impacted upon due to the development taking place. The threatened species listed within Table 14 are those which are deemed likely to occur within the site, although none have generated species credits.

Table 14. BAM calculator summary of threatened species credit payment

Scientific name	Common name	BAM result	Credit value
FAUNA			
Artamus cyanopterus cyanopterus	Dusky Woodswallow	No payment generated – Ecosystem credit applies	
Callocephalon fimbriatum	Gang Gang Cockatoo	No payment generated – Ecosystem credit applies	
Chthonicola sagittata	Speckled Warbler	No payment generated – Ecosystem credit applies	
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	No payment generated – Ecosystem credit applies	
Daphoenositta chrysoptera	Varied Sittella	No payment generated – Ecosystem credit applies	
Dasyurus maculatus	Spotted-tailed Quoll	No payment generated – Ecosystem credit applies	
Glossopsitta pusilla	Little Lorikeet	No payment generated – Ecosystem credit applies	
Grantiella picta	Painted Honeyeater	No payment generated – Ecosystem credit applies	
Haliaeetus leucogaster	White-bellied Sea-eagle	No payment generated – Ecosystem credit applies	
Hieraaetus Morphnoides (foraging)	Little Eagle	No payment generated – Ecosystem credit applies	
Hirundapus caudacutus	White-throated Needletail	No payment generated – Ecosystem credit applies	
Lathamus discolor	Swift Parrot	No payment generated – Ecosystem credit applies	
Melanodryas cucullata cucullata	South-eastern Hooded Robin	No payment generated – Ecosystem credit applies	
Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	No payment generated – Ecosystem credit applies	
Miniopterus orianae oceanensis	Large Bent-wing Bat	No payment generated – Ecosystem credit applies	
Petroica boodang	Scarlet Robin	No payment generated – Ecosystem credit applies	
Petroica phoenicea	Flame Robin	No payment generated – Ecosystem credit applies	
Pteropus poliocephalus	Grey-headed Flying-fox	No payment generated – Ecosystem credit applies	
Stagonopleura guttata	Diamond Firetail	No payment generated – Ecosystem credit applies	

There is no requirement to offset ecosystem credits for this development proposal.

Table 15. BAM Calculator summary of offset obligations

PCT present	TEC name	Area of disturbance (ha)	Vegetation integrity score	BAM credits applied
PCT 3643 – Bungonia tablelands and gorges	N/A	0.34	34.2	**0**
Total offset obligation				**0**

6.1 OFFSET REQUIREMENT

The project has been calculated to require a biodiversity offset of 0 ecosystem credits based on the removal of 0.35ha of PCT 3643.

No threatened species credits were generated with all threatened species which potentially occur onsite being considered as ecosystem credits.

Part 6 of the *BC Act*, Biodiversity offset scheme, outlines the methods available to retire the calculated offset score which include the following:

- The establishment of a biodiversity stewardship site on land with same or better biodiversity value and type to the equivalent credit amount determine in accordance with the biodiversity offset calculation;
- Trading of biodiversity credits with land owners who have entered into a biodiversity stewardship agreement and have available biodiversity credits to retire on their property to the equivalent credit amount determine in accordance with the biodiversity offset calculator;
- Payment into the Biodiversity Conservation Fund of the amount equivalent to the cost of acquiring those credits determine in accordance with the offset payment calculator.

Part 7 of the *BC Act* 'Biodiversity assessment and approvals under Planning Act' requires that a Biodiversity Development Assessment Report is undertaken for a Part 4 Development (relevant in this case). Division 4 of Part 7, Biodiversity assessment and offsets, (7.13) states that the consent authority must require the applicant to retire biodiversity credit offset before the impacts to biodiversity occur. This would therefore require the applicant for development to retire their obligation by any of the three methods listed above before a construction certificate is issued. This will result in no net loss of native vegetation, habitat potential and therefore biodiversity from the impacts of the development.

7 CONCLUSION

The subject property has a history of disturbance from clearing, grazing, agriculture and its current use. The vegetation within the study area is disturbed which is reflected in the Vegetation Integrity Score achieved via the BAM survey data.

Threatened flora and fauna species are required to be assessed via the BAM-C with credits determined based on field surveys and habitat potential. The results of this Biodiversity Assessment has generated **0** ecosystem credits for the removal of up to 0.35ha of remnant native vegetation. Due to the condition of the vegetation subject to removal and its position within the landscape, it is highly unlikely that a Serious And Irreversible Impact will occur to the PCT which occurs onsite.

There were no species credits generated for offset via this assessment.

It is the opinion of South East Environmental that the long term ecological integrity as suitable habitat for species is severely impeded within the proposed development footprint of the site in its current situation and condition due to the ongoing disturbance from the current managed landscape usage. The proposed development has successfully avoided and minimised impacts to native vegetation by its placement in areas of the subject property which have already undergone historic disturbance.

7.1 RECOMMENDATIONS

The following environmental management measures are regarded as part of the proposed:

- installation of sediment and erosion control devices prior to clearing or earthmoving works;
- removal of any high threat weed species as listed in the *Biosecurity Act 2015* as determined by the NSW Department of Primary Industries for GMC local government area;
- landscaping should not use any exotic or non-indigenous species that are known to be invasive in areas of native bushland or grassland areas;
- Native species endemic to PCT 3643 are strongly recommended for landscaping use;
- development of a stormwater management plan for use during all stages of the construction to reduce the impacts of changed water quality and quantity.

8 LIMITATIONS AND ASSUMPTIONS

This study was limited by the timing and frequency of the survey. There may be flora and/or fauna species present at the site that were not recorded due to their seasonal, territorial or cryptic nature.

It can never be proven that threatened species have not, do not or will not use the site as habitat. The conclusions drawn in this report are a result of testing, observation and experience.

This report describes the habitat and vegetation of the site at the time of the field survey. Vegetation and habitat will change over time and therefore the findings of this report are only relevant for the current proposal and for the duration of the application.

This report does not take into account the cumulative impact of other developments on this property or on adjacent land.

This report does not include assessment of the ongoing impacts associated with the occupation of the current building that may cause additional disturbance as these are not known.

The impact assessment and conclusions are current with relevant legislation at the time of writing.

9 QUALIFICATIONS AND EXPERIENCE OF THE AUTHOR AND FIELD ECOLOGIST

The Author and Field Ecologist, Melissa Mass, has formal qualifications including a Bachelor of Applied Science (B. App. Sc.), majoring in Ecology, and a Certificate 3 in Horticulture. Her current Scientific Licence number issued from the NSW OEH is SL101441 with expiry date 31st Oct 2024. Furthermore an Animal Research Authority issued by the NSW Animal Care and Ethics Committee is current to undertake general survey work throughout NSW with expiry 23rd Mar 2024. Melissa is an accredited Biodiversity Assessor conforming to the requirements as imposed by OEH with Accreditation number being BAAS18053.

Melissa has been working as an Ecologist for 14 years. Her work has included targeted threatened species assessment and management, reviews of environmental factors, bush regeneration, environmental impact assessments, and environmental survey and monitoring.

Melissa has a strong focus on threatened species ecology and has actively contributed to the Long-nosed Potoroo National Recovery Plan.

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APPENDICES

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Appendix A - Flora species identified within the study area

Status	Botanical Name	Common Name	Zone 1 Quad 1 Cover %	Zone 1 Quad 2 Cover %
	Acacia melanoxylon	Blackwood		0.5
	Acacia terminalis	Sunshine Wattle		0.5
E	*Acetosella vulgaris*	Sorrel	1	0.5
	Aristida ramosa	Purple Wire Grass	0.5	
	Austrostipa pubescens	Spear Grass		2
	Austrostipa scabra	Spear Grass		0.5
	Billardiera scandens	Hairy Apple Berry		0.1
	Cassinia aculeata	Dolly Bush	0.2	
E	*Cerastium glomeratum*	Mouse-eared Chickweed		0.2
E	*Cirsium vulgare*	Spear Thistle		0.1
E	*Conyza bonariensis*	Flax-leaf Fleabane	0.1	
	Cyathochaeta diandra	Sheath Rush		0.1
	Cynodon dactylon	Couch Grass	20	
HTE	*Cyperus rotundus*	Nut Grass		0.1
	Dichelachne inaequiglumis	Loose Plumegrass	1	
	Dillwynia phylicoides	Small-leaf Parrot Pea	0.2	
	Dodonaea viscosa	Sticky Hop Bush	0.2	
	Echinopogon ovatus	Forest Hedgehog Grass		20
	Entolasia stricta	Wiry Panic		5
	Eragrostis brownii	Browns Lovegrass	30	30
	Erodium crinitum	Blue Storkbill	0.1	
	Eucalyptus agglomerata	Blue Stringybark		8
	Eucalyptus sieberi	Silver Top Ash		12
	Euchiton involucratus	Star Cudweed	0.1	0.1
	Gonocarpus teucrioides	Raspwort	1	2
	Goodenia hederacea	Forest Goodenia	10	
	Helichysum luteialbum	Jersey Cudweed		0.1
	Hibbertia empetrifolia	Trailing Guinea Flower		2
	Hydrocotyle laxiflora	Stinking Pennywort		0.1
HTE	*Hypericum gramineum*	Small St Johns Wort		0..2
E	*Hypochaeris glabra*	Smooth Leaved Cats-ear		1
E	*Hypochoeris radicata*	Flatweed	0.1	
	Hypoxis hygrometrica	Golden Weather Grass	0.1	
	Juncus filicaulis	Thread Rush	0.5	0.2
	Lepidosperma laterale	Variable Swordsedge		0.2
	Leptospermum continentale	Prickly Tea-tree	0.2	
	Lomandra longifolia	Spiny-headed Mat-rush		0.1
	Lomandra multiflora	Many-flowered Mat-rush	0.5	0.2
	Lomatia ilicifolia	Holly Lomatia		0.1
	Microlaena stipoides	Weeping Grass	50	50
	Oxalis perennans	Native Oxalis		1
	Ozothamnus diosmifolius	Rice Flower		2
	Panicum simile	Two-colour Panic	10	10
	Paspalidium distans	Spreading Panic grass	0.1	
E	*Petrorhagia dubia*	Velvet Pink	0.1	

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	Plantago varia	Variable Plantain		0.2
	Pteridium esculentum	Bracken Fern		5
	Ranunculus lappaceus	Common Buttercup	0.1	0.1
	Rytidosperma caespitosum	Wallaby Grass	1	
	Rytidosperma racemosum	Wallaby Grass	10	5
E	*Setaria gracilis*	Pigeon Grass		10
	Solanum prinophyllum	Forest Nightshade		0.1
E	*Sonchus oleraceus*	Common Sow Thistle		0.1
	Stypandra glauca	Nodding Blue Lily		0.1
	Tricoryne elatior	Yellow Rush-lily		0.1
E	*Trifolium repens*	White Clover		1
	Veronica calycina	Cup Speedwell		0.1
	Veronica subtilis	Veronica	0.1	

E – Exotic species, HTE – High Threat Exotic, WoNS – Weed of National Significance

Appendix B – Fauna species identified within the study area

	Scientific Name	Common name	Method of observation
BIRDS			
	Eopsaltria australis	Eastern Yellow Robin	Onsite observation
	Gymnorhina tibicen	Australian Magpie	Onsite observation
	Malurus cyaneus	Superb Fairy-wren	Onsite observation
	Sericornis frontalis	White-browed Scrubwren	Onsite observation
	Strepera graculina	Pied Currawong	Onsite observation
MAMMALS			
	Macropus giganteus	Eastern Grey Kangaroo	Onsite observation
	Ovis aries	Sheep	Onsite observation

Appendix C – Threatened species historically identified within 10km of the study area (BioNet)

FLORA

Threatened flora species historically located within 10km		
Botanical Name	**Common Name**	**Conservation Status**
Genoplesium plumosum	Tallong Midge Orchid	BC – Critically Endangered EPBC - Endangered
Grevillea molyneuxii	Wingello Grevillea	BC – Vulnerable EPBC - Endangered
Leucochrysum albicans subsp. tricolor	Hoary Sunray	BC – Endangered EPBC - Endangered
Pomaderris cotoneaster	Cotoneaster Pomaderris	BC – Endangered EPBC - Endangered

FAUNA

Threatened fauna species historically located within 10km		
Common name	**Scientific name**	**Conservation status**
Birds		
Black-chinned Honeyeater	*Melithreptus gularis gularis*	BC - Vulnerable
Brown Treecreeper	*Climacteris picumnus victoriae*	BC - Vulnerable
Diamond Firetail	*Stagonopleura guttata*	BC - Vulnerable
Dusky Woodswallow	*Artamus cyanopterus cyanopterus*	BC - Vulnerable
Flame Robin	*Petroica phoenicea*	BC - Vulnerable
Gang-gang Cockatoo	*Callocephalon fimbriatum*	BC – Vulnerable EPBC - Endangered
Glossy Black-Cockatoo	*Calyptorhynchus lathami*	BC – Vulnerable EPBC - Vulnerable
Little Eagle	*Hieraaetus morphnoides*	BC - Vulnerable
Little Lorikeet	*Glossopsitta pusilla*	BC - Vulnerable
Powerful Owl	*Ninox strenua*	BC - Vulnerable
Scarlet Robin	*Petroica boodang*	BC - Vulnerable
South-eastern Hooded Robin		
Southern Warbler		
Speckled Warbler	*Chthonicola sagittata*	BC - Vulnerable
Square-tailed Kite	*Lophoictinia isura*	BC - Vulnerable
Varied Sittella	*Daphoenositta chrysoptera*	BC - Vulnerable
Mammals		
Eastern False Pipistrelle	*Falsistrellus tasmaniensis*	BC - Vulnerable
Koala	*Phascolarctos cinereus*	BC – Endangered EPBC – Endangered
Large Bent-winged Bat	*Miniopterus orianae oceanensis*	BC - Vulnerable
Southern Myotis	*Myotis macropus*	BC - Vulnerable
Spotted-tailed Quoll	*Dasyurus maculatus*	BC – Vulnerable EPBC - Endangered

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Appendix D – BAM Predicted Species Report

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BAM Predicted Species Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00047605/BAAS18053/24/00047606	Red Hills Road	28/10/2024
Assessor Name	**Report Created**	**BAM Data version ***
Melissa Mass	22/11/2024	Current classification (live - default) (80)
Assessor Number	**Assessment Type**	**BAM Case Status**
BAAS18053	Part 4 Developments (Small Area)	Finalised
Assessment Revision	**BOS entry trigger**	**Date Finalised**
0	BOS Threshold: Area clearing threshold	22/11/2024

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Threatened species reliably predicted to utilise the site. No surveys are required for these species. Ecosystem credits apply to these species.

Common Name	Scientific Name	Vegetation Types(s)
Black-chinned Honeyeater (eastern subspecies)	Melithreptus gularis gularis	3643-Bungonia Tableland Silvertop Ash-Stringybark Forest
Brown Treecreeper (eastern subspecies)	Climacteris picumnus victoriae	3643-Bungonia Tableland Silvertop Ash-Stringybark Forest
Diamond Firetail	Stagonopleura guttata	3643-Bungonia Tableland Silvertop Ash-Stringybark Forest
Dusky Woodswallow	Artamus cyanopterus cyanopterus	3643-Bungonia Tableland Silvertop Ash-Stringybark Forest
Flame Robin	Petroica phoenicea	3643-Bungonia Tableland Silvertop Ash-Stringybark Forest
Gang-gang Cockatoo	Callocephalon fimbriatum	3643-Bungonia Tableland Silvertop Ash-Stringybark Forest
Grey-headed Flying-fox	Pteropus poliocephalus	3643-Bungonia Tableland Silvertop Ash-Stringybark Forest
Large Bent-winged Bat	Miniopterus orianae oceanensis	3643-Bungonia Tableland Silvertop Ash-Stringybark Forest

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BAM Predicted Species Report

Little Eagle	Hieraaetus morphnoides	3643-Bungonia Tableland Silvertop Ash-Stringybark Forest
Little Lorikeet	Glossopsitta pusilla	3643-Bungonia Tableland Silvertop Ash-Stringybark Forest
Pilotbird	Pycnoptilus floccosus	3643-Bungonia Tableland Silvertop Ash-Stringybark Forest
Rosenberg's Goanna	Varanus rosenbergi	3643-Bungonia Tableland Silvertop Ash-Stringybark Forest
Scarlet Robin	Petroica boodang	3643-Bungonia Tableland Silvertop Ash-Stringybark Forest
South-eastern Hooded Robin	Melanodryas cucullata cucullata	3643-Bungonia Tableland Silvertop Ash-Stringybark Forest
Southern Whiteface	Aphelocephala leucopsis	3643-Bungonia Tableland Silvertop Ash-Stringybark Forest
Speckled Warbler	Chthonicola sagittata	3643-Bungonia Tableland Silvertop Ash-Stringybark Forest
Spotted-tailed Quoll	Dasyurus maculatus	3643-Bungonia Tableland Silvertop Ash-Stringybark Forest
Swift Parrot	Lathamus discolor	3643-Bungonia Tableland Silvertop Ash-Stringybark Forest
Varied Sittella	Daphoenositta chrysoptera	3643-Bungonia Tableland Silvertop Ash-Stringybark Forest
White-bellied Sea-Eagle	Haliaeetus leucogaster	3643-Bungonia Tableland Silvertop Ash-Stringybark Forest
White-throated Needletail	Hirundapus caudacutus	3643-Bungonia Tableland Silvertop Ash-Stringybark Forest

Threatened species Manually Added

None added

Threatened species assessed as not within the vegetation zone(s) for the PCT(s)

Common Name	Scientific Name	Plant Community Type(s)
Painted Honeyeater	Grantiella picta	3643-Bungonia Tableland Silvertop Ash-Stringybark Forest
South-eastern Glossy Black-Cockatoo	Calyptorhynchus lathami lathami	3643-Bungonia Tableland Silvertop Ash-Stringybark Forest

Threatened species assessed as not within the vegetation zone(s) for the PCT(s)

Refer to BAR for detailed justification

Common Name	Scientific Name	Justification in the BAM-C
Painted Honeyeater	Grantiella picta	Habitat constraints
South-eastern Glossy Black-Cockatoo	Calyptorhynchus lathami lathami	Habitat constraints

Appendix E – BAM – C Candidate Species Report

NSW GOVERNMENT

BAM Candidate Species Report

Proposal Details

Assessment Id 00047605/BAAS18053/24/00047606	Proposal Name Red Hills Road	BAM data last updated * 28/10/2024
Assessor Name Melissa Mass	Report Created 22/11/2024	BAM Data version * Current classification (live - default) (80)
Assessor Number BAAS18053	Assessment Type Part 4 Developments (Small Area)	BAM Case Status Finalised
Assessment Revision 0	BOS entry trigger BOS Threshold: Area clearing threshold	Date Finalised 22/11/2024

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

List of Species Requiring Survey

Name	Presence	Survey Months

Threatened species Manually Added

None added

Threatened species assessed as not on site

Refer to BAR for detailed justification

Common name	Scientific name	Justification in the BAM-C
Brush-tailed Rock-wallaby	Petrogale penicillata	Habitat constraints
Bungonia Rice-flower	Pimelea axiflora subsp. pubescens	Habitat constraints
Delicate Pomaderris	Pomaderris delicata	Geographic limitations
Large Bent-winged Bat	Miniopterus orianae oceanensis	Habitat constraints
Large-eared Pied Bat	Chalinolobus dwyeri	Habitat constraints
Mongarlowe Mallee	Eucalyptus recurva	Refer to BAR
Nerriga Grevillea	Grevillea renwickiana	Refer to BAR

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NSW GOVERNMENT

BAM Candidate Species Report

Stuttering Frog	Mixophyes balbus	Refer to BAR
Superb Midge Orchid	Genoplesium superbum	Refer to BAR
Swift Parrot	Lathamus discolor	Habitat constraints

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Appendix F – Biodiversity Credit Report Summary

NSW GOVERNMENT

BAM Credit Summary Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00047605/BAAS18053/24/00047606	Red Hills Road	28/10/2024
Assessor Name	Report Created	BAM Data version *
Melissa Mass	22/11/2024	Current classification (live - default) (80)
Assessor Number	BAM Case Status	Date Finalised
BAAS18053	Finalised	22/11/2024
Assessment Revision	BOS entry trigger	Assessment Type
0	BOS Threshold: Area clearing threshold	Part 4 Developments (Small Area)

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Ecosystem credits for plant communities types (PCT), ecological communities & threatened species habitat

Zone	Vegetation zone name	TEC name	Current Vegetation integrity score	Change in Vegetation integrity (loss / gain)	Area (ha)	Sensitivity to loss (Justification)	Species sensitivity to gain class	BC Act Listing status	EPBC Act listing status	Biodiversity risk weighting	Potential SAII	Ecosystem credits

South East Environmental

BAM Credit Summary Report

Bungonia Tableland Silvertop Ash-Stringybark Forest											
1	3643_Disturbed	Not a TEC	34.2	34.2	0.2	PCT Cleared - 47%	Low Sensitivity to Gain			1.00	2
										Subtotal	**2**
										Total	**2**

Species credits for threatened species

Vegetation zone name	Habitat condition (Vegetation Integrity)	Change in habitat condition	Area (ha)/Count (no. individuals)	Sensitivity to loss (Justification)	Sensitivity to gain (Justification)	BC Act Listing status	EPBC Act listing status	Potential SAII	Species credits

Assessment Id
00047605/BAAS18053/24/00047606

Proposal Name
Red Hills Road

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South East Environmental

Appendix G - Biodiversity Credit Report (Like for like)

BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id 00047605/BAAS18053/24/00047606	Proposal Name Red Hills Road	BAM data last updated * 28/10/2024
Assessor Name Melissa Mass	Assessor Number BAAS18053	BAM Data version * Current classification (live - default) (80)
Proponent Names Abu Badar	Report Created 22/11/2024	BAM Case Status Finalised
Assessment Revision 0	BOS entry trigger BOS Threshold: Area clearing threshold	Assessment Type Part 4 Developments (Small Area)
Date Finalised 22/11/2024	* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.	

Potential Serious and Irreversible Impacts

Name of threatened ecological community	Listing status	Name of Plant Community Type/ID
Nil		

Species
Nil

Additional Information for Approval

BAM Biodiversity Credit Report (Like for like)

PCT Outside Ibra Added

None added

PCTs With Customized Benchmarks

PCT
No Changes

Predicted Threatened Species Not On Site

Name
Calyptorhynchus lathami lathami / South-eastern Glossy Black-Cockatoo
Grantiella picta / Painted Honeyeater

Ecosystem Credit Summary (Number and class of biodiversity credits to be retired)

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	HBT Cr	No HBT Cr	Total credits to be retired
3643-Bungonia Tableland Silvertop Ash-Stringybark Forest	Not a TEC	0.2	0	2	2

BAM Biodiversity Credit Report (Like for like)

3643-Bungonia Tableland Silvertop Ash-Stringybark Forest

Like-for-like credit retirement options

Class	Trading group	Zone	HBT	Credits	IBRA region
South East Dry Sclerophyll Forests This includes PCT's: 3300, 3492, 3642, 3643, 3644, 3645, 3646, 3648, 3649, 3650, 3651, 3652, 3653, 3654, 3655, 3656, 3657, 3658, 3659, 3660, 3661, 3662, 3663, 3664, 3665, 3666, 3667, 3668	South East Dry Sclerophyll Forests <50%	3643_Disturbed	No	2	Bungonia, Bateman, Burragorang, Crookwell, Ettrema, Kanangra, Kybeyan-Gourock, Monaro and South East Coastal Ranges. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Species Credit Summary

No Species Credit Data

Credit Retirement Options

Like-for-like credit retirement options

Assessment Id: 00047605/BAAS18053/24/00047606

Proposal Name: Red Hills Road

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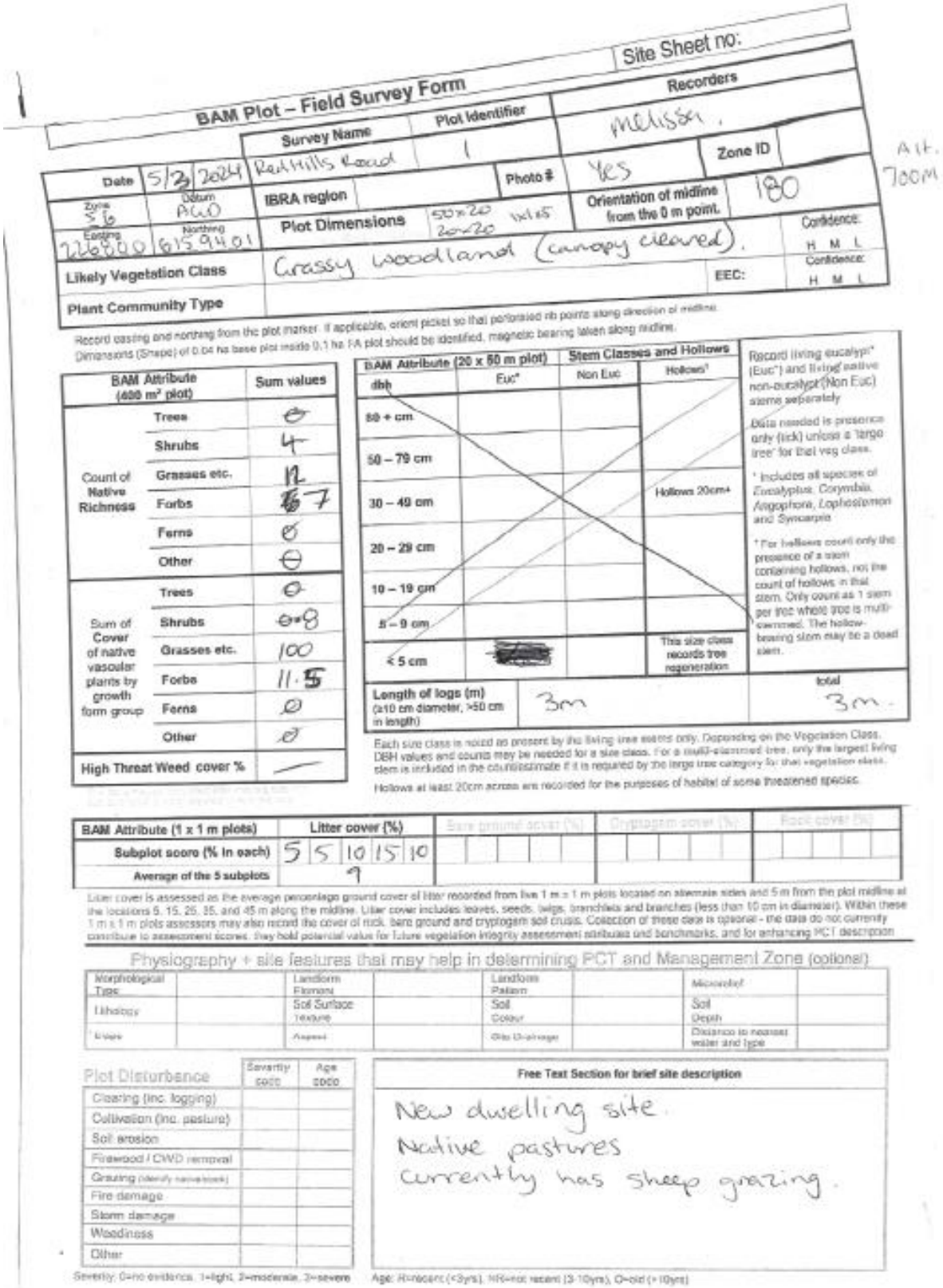
Appendix H – Field sheet for quadrat



BAM Plot – Field Survey Form

Site Sheet no:

Survey Name: Red Hills Road	Plot Identifier: 1	Recorders: Melissa.	
Date: 5/3/2024	IBRA region:	Photo #: Yes	Zone ID:
Zone: 56 Datum: GDA Northing: 6159401 Easting: 226800	Plot Dimensions: 50x20 20x20 1x1x5	Orientation of midline from the 0 m point: 180	
Likely Vegetation Class: Grassy woodland (canopy cleared).		EEC:	Confidence: H M L
Plant Community Type:			Confidence: H M L

Alt. 700m

Record easting and northing from the plot marker. If applicable, orient picket so that perforated rib points along direction of midline.
Dimensions (Shape) of 0.04 ha base plot inside 0.1 ha FA plot should be identified, magnetic bearing taken along midline.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	0
	Shrubs	4
	Grasses etc.	12
	Forbs	7
	Ferns	0
	Other	0
Sum of Cover of native vascular plants by growth form group	Trees	0
	Shrubs	0.8
	Grasses etc.	100
	Forbs	11.5
	Ferns	0
	Other	0
High Threat Weed cover %		—

BAM Attribute (20 x 50 m plot) dbh	Stem Classes and Hollows: Euc*	Non Euc	Hollows†
80 + cm			
50 – 79 cm			
30 – 49 cm			Hollows 20cm+
20 – 29 cm			
10 – 19 cm			
5 – 9 cm			
< 5 cm			This size class records tree regeneration
Length of logs (m) (≥10 cm diameter, >50 cm in length)	3m		total 3m

Record living eucalypt* (Euc*) and living native non-eucalypt (Non Euc) stems seperately

Data needed is presence only (tick) unless a 'large tree' for that veg class.

* Includes all species of Eucalyptus, Corymbia, Angophora, Lophostemon and Syncarpia

† For hollows count only the presence of a stem containing hollows, not the count of hollows in that stem. Only count as 1 stem per tree where tree is multi-stemmed. The hollow-bearing stem may be a dead stem.

Each size class is noted as present by the living tree stems only. Depending on the Vegetation Class, DBH values and counts may be needed for a size class. For a multi-stemmed tree, only the largest living stem is included in the count/estimate if it is required by the large tree category for that vegetation class.

Hollows at least 20cm across are recorded for the purposes of habitat of some threatened species.

BAM Attribute (1 x 1 m plots)	Litter cover (%)					Bare ground cover (%)					Cryptogam cover (%)					Rock cover (%)				
Subplot score (% in each)	5	5	10	15	10															
Average of the 5 subplots	9																			

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots located on alternate sides and 5 m from the plot midline at the locations 5, 15, 25, 35, and 45 m along the midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Within these 1 m x 1 m plots assessors may also record the cover of rock, bare ground and cryptogam soil crusts. Collection of these data is optional - the data do not currently contribute to assessment scores, they hold potential value for future vegetation integrity assessment attributes and benchmarks, and for enhancing PCT description.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element		Landform Pattern		Microrelief	
Lithology		Soil Surface Texture		Soil Colour		Soil Depth	
Slope		Aspect		Site Drainage		Distance to nearest water and type	

Plot Disturbance	Severity code	Age code
Clearing (inc. logging)		
Cultivation (inc. pasture)		
Soil erosion		
Firewood / CWD removal		
Grazing (identify native/exotic)		
Fire damage		
Storm damage		
Weediness		
Other		

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Free Text Section for brief site description

New dwelling site.
Native pastures
currently has sheep grazing.

Age: R=recent (<3yrs), MR=not recent (3-10yrs), O=old (>10yrs)

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400 m² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date			

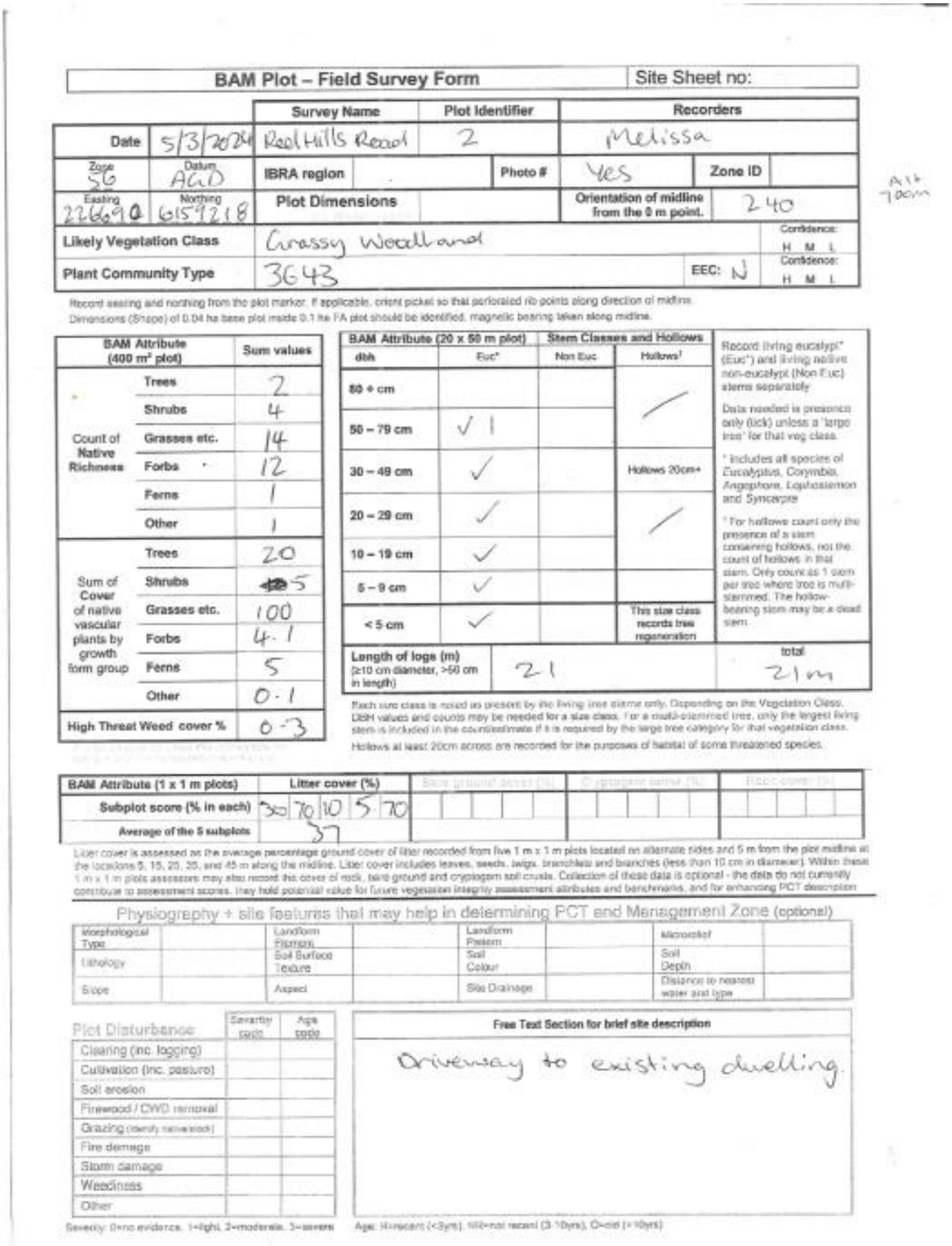
GF Code	Full species name mandatory, or a unique means of identifying separate taxa within a survey. Data from here will be used to assign growth form counts and covers.	N, E or HTE	Cover	Abund	Stratum	Voucher
G	Microlaena stipoides - Weeping Grass		50	100		
G	Eragrostis brownii - Brown's Lovegrass		30	80		
G	Cynodon dactylon - Couch Grass		20	50		
G	Rytidosperma racemosum - Wallaby Grass		10	20		
G	Panicum simile - 2 colour Panic		10	20		
F	Goodenia hederacea - Forest Goodenia		10	30		
F	Hypoxis hygrometrica - Golden Weather Grass		0.1	6		
F	Euchiton involucratus - Star Cudweed		0.1	10		
F	Gonocarpus teucrioides - Raspwort		1	20		
G	Aristida ramosa - Purple Wire Grass		0.5	10		
G	Dichelachne inaequiglumis - Plume Grass		1	10		
F	Veronica subtilis - Veronica		0.1	6		
G	Rhytidosperma caespitosum - Wallaby Grass		1	10		
G	Lomandra multiflora - Many flowered Mat Rush		0.5	8		
S	Leptospermum continentale - Prickly Tea Tree		0.2	1		
S	Dodonaea viscosa - Sticky Hop Bush		0.2	1		
S	Cassinia aculeata - Dolly Bush		0.2	8		
S	Dillwynia phylicoides - Small leaf Parrot Pea		0.2	2		
G	Juncus filicaulis - Thread Rush		0.5	6		
F	Ranunculus lappaceus - Common Buttercup		0.1	10		
G	Lepidosperma laterale - Variable Swordsedge		0.1	1		
F	Erodium crinitum - Blue Storksbill		0.1	1		
G	Paspalidium distans - Spreading Panic Grass		0.1	6		
	Petrorhagia dubia - Pink velvet					
	Conyza bonariensis - Fleabane					
	Acetosella vulgaris - Sorrel					
	Hypochoeris radicata - Flat weed					

GF Code: see Growth Form definitions in BAM Appendix 1. Identify top 3 dominants in the veg zone. **N:** native, **E:** exotic, **HTE:** high threat exotic.
Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); *Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*
Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

Print more copies of this sheet to allow for higher species counts at a plot. All species at a plot need to be recorded.

Form version designed 15 September 2017 Printed 11 October 2017

South East Environmental



BAM Plot – Field Survey Form — Site Sheet no:

Survey Name	Plot Identifier	Recorders
Red Hills Road	2	Melissa

Date	Zone	Datum	IBRA region	Photo #	Zone ID
5/3/2024	56	AGD		Yes	

Easting	Northing	Plot Dimensions	Orientation of midline from the 0 m point.
226690	6159218		240

		Confidence
Likely Vegetation Class	Grassy Woodland	H M L
Plant Community Type	3643 (EEC: N)	H M L

Record easting and northing from the plot marker. If applicable, orient picket so that perforated rib points along direction of midline.
Dimensions (Shape) of 0.04 ha base plot inside 0.1 ha FA plot should be identified, magnetic bearing taken along midline.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	2
	Shrubs	4
	Grasses etc.	14
	Forbs	12
	Ferns	1
	Other	1
Sum of Cover of native vascular plants by growth form group	Trees	20
	Shrubs	5
	Grasses etc.	100
	Forbs	4.1
	Ferns	5
	Other	0.1
High Threat Weed cover %		0.3

BAM Attribute (20 x 50 m plot) dbh	Stem Classes and Hollows: Euc*	Non Euc	Hollows†
80 + cm			✓
50 – 79 cm	✓ 1		
30 – 49 cm	✓		Hollows 20cm+
20 – 29 cm	✓		✓
10 – 19 cm	✓		
5 – 9 cm	✓		
< 5 cm	✓		This size class records tree regeneration
Length of logs (m) (≥10 cm diameter, >50 cm in length)	21		total 21m

Record living eucalypt* (Euc*) and living native non-eucalypt (Non Euc) stems separately.

Data needed is presence only (tick) unless a 'large tree' for that veg class.

* Includes all species of Eucalyptus, Corymbia, Angophora, Eucalyptoid and Syncarpia

† For hollows count only the presence of a stem containing hollows, not the count of hollows in that stem. Only count as 1 stem per tree where tree is multi-stemmed. The hollow-bearing stem may be a dead stem.

Each size class is noted as present by the living tree stems only. Depending on the Vegetation Class. DBH values and counts may be needed for a size class. For a multi-stemmed tree, only the largest living stem is included in the count/estimate if it is required by the large tree category for that vegetation class.

Hollows at least 20cm across are recorded for the purposes of habitat of some threatened species.

BAM Attribute (1 x 1 m plots)	Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)	30 70 10 5 70			
Average of the 5 subplots	37			

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots located on alternate sides and 5 m from the plot midline at the locations 5, 15, 25, 35, and 45 m along the midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Within these 1 m x 1 m plots assessors may also record the cover of rock, bare ground and cryptogam soil crusts. Collection of these data is optional - the data do not currently contribute to assessment scores. They hold potential value for future vegetation integrity assessment attributes and benchmarks, and for enhancing PCT description.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element		Landform Pattern		Microrelief	
Lithology		Soil Surface Texture		Soil Colour		Soil Depth	
Slope		Aspect		Site Drainage		Distance to nearest water and type	

Plot Disturbance	Severity (0-3)	Age (0-3)
Clearing (inc. logging)		
Cultivation (inc. pasture)		
Soil erosion		
Firewood / CWD removal		
Grazing (identify native/stock)		
Fire damage		
Storm damage		
Weediness		
Other		

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Free Text Section for brief site description

Driveway to existing dwelling.

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

South East Environmental

400 m² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date 5/3/24	RedHills Rd	2	Melissa

GF Code	Full species name mandatory, or a unique means of identifying separate taxa within a survey. Data from here will be used to assign growth form counts and covers.	N, E or HTE	Cover	Abund	stratum	voucher
T	Eucalyptus sieberi – Silvertop Ash		12	7		
T	Eucalyptus agglomerata – Blue Stringybark		8	2		
E	Pteridium esculentum – Bracken Fern		5	20		
G	Microlaena stipoides – Weeping Grass		50	200		
G	Eragrostis brownii – Brown's Lovegrass		30	100		
G	Echinopogon ovatus – Hedgehog Grass		20	50		
G	Rhytidosperma racemosum – Wallaby Grass		5	20		
G	Panicum simile – 2 colour Panic		10	30		
F	Solanum prinophyllum – Forest Nightshade		0.1	2		
G	Lepidosperma laterale – Variable Swordsedge		0.2	2		
G	Juncus filicaulis – Thread Rush		0.2	1		
G	Austrostipa pubescens – Spear Grass		2	20		
S	Acacia terminalis – Sunshine Wattle		0.5	2		
S	Hibbertia empetrifolia – Trailing Guinea flower		2	10		
F	Gonocarpus teucrioides – Raspwort		2	20		
G	Entolasia stricta – Wiry Panic		5	20		
G	Lomandra longifolia – Spiny headed Mat Rush		0.1	1		
F	Ranunculus lappaceus – Common Buttercup		0.1	6		
S	Ozothamnus diosmifolius – Rice Flower		2	20		
F	Tricoryne elatior – Yellow Rush lily		0.1	6		
F	Veronica calycina – Speedwell		0.1	6		
F	Stypandra glauca – Nodding Blue lily		0.1	6		
F	Oxalis perennans – Wood sorrel		1	20		
G	Lomandra multiflora – Many Flowered Mat Rush		0.2	6		
F	Hydrocotyle laxiflora – Stinking Pennywort		0.1	10		
F	Euchiton involucratus – Star Cudweed		0.1	10		
G	Echinopogon caespitosus – Bushy Hedgehog Grass		1	20		
S	Acacia melanoxylon – Blackwood		0.5	1		
G	Austrostipa scabra – Speargrass		0.5	10		
O	Billardiera scandens – Hairy Apple Berry		0.1	8		
F	Lomatia ilicifolia – Holly Lomatia		0.1	1		
F	Plantago varia – Variable Plaintain		0.2	10		
F	Helichrysum luteoalbum – Jersey Cudweed		0.1	10		
G	Cynatchaeta diandra – Sheath Rush		0.1	1		
	Cirsium vulgare – Spear thistle		0.1	10		
	Sonchus oleraceus – Sow thistle		0.1	10		
	Trifolium repens – White Clover		1	30		
	Acetosella vulgaris – Sorrel		0.5	30		
	Hypochaeris glabra – Smooth Flat weed		1	20		
	Setaria gracilis – Pigeon Grass		10	30		

GF Code: see Growth Form definitions in BAM Appendix 1. Identify top 3 dominants in the veg zone. **N:** native, **E:** exotic, **HTE:** high threat exotic.
Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*
Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

HTE Cyperus rotundus – Nutgrass 0.1 6

Print more copies of this sheet to allow for higher species counts at a plot. All species at a plot need to be recorded.

Form version designed 15 September 2017 Printed 11 October 2017

HTE Hypericum gramineum – Small St Johns Wort 0.2 6

Cerastium glomeratum – Sticky mouse-ear chickweed 0.2 10

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Appendix I – Photos of quadrat

Quad 1

View to the east from the proposed building envelope

South East Environmental

Quad 2

Location of proposed driveway access to existing dwelling

South East Environmental

Appendix J – EPBC Act Protected Matters Report

Australian Government

Department of Climate Change, Energy, the Environment and Water

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 22-Apr-2024

South East Environmental

Summary

Matters of National Environment Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	3
Listed Threatened Species:	41
Listed Migratory Species:	11

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	19
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

State and Territory Reserves:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	4
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	1
Geological and Bioregional Assessments:	None

South East Environmental

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text
Natural Temperate Grassland of the South Eastern Highlands	Critically Endangered	Community likely to occur within area
Upland Basalt Eucalypt Forests of the Sydney Basin Bioregion	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]

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

Scientific Name	Threatened Category	Presence Text
BIRD		
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Foraging, feeding or related behaviour likely to occur within area
Aphelocephala leucopsis Southern Whiteface [529]	Vulnerable	Species or species habitat likely to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Callocephalon fimbriatum Gang-gang Cockatoo [768]	Endangered	Species or species habitat likely to occur within area
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat likely to occur within area
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	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
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	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
Melanodryas cucullata cucullata South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat likely to occur within area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Polytelis swainsonii Superb Parrot [738]	Vulnerable	Species or species habitat may occur within area
Pycnoptilus floccosus Pilotbird [525]	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
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat likely to occur within area
FISH		
Macquaria australasica Macquarie Perch [66632]	Endangered	Species or species habitat may occur within area
MAMMAL		
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Endangered	Species or species habitat likely 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 likely to occur within area
Petauroides volans Greater Glider (southern and central) [254]	Endangered	Species or species habitat likely to occur within area
Petaurus australis australis Yellow-bellied Glider (south-eastern) [87600]	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]	Endangered	Species or species habitat likely to occur within area
Pseudomys novaehollandiae New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat may occur within area

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Scientific Name	Threatened Category	Presence Text
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
PLANT		
Acacia bynoeana Bynoe's Wattle, Tiny Wattle [8575]	Vulnerable	Species or species habitat may occur within area
Caladenia tessellata Thick-lipped Spider-orchid, Daddy Long-legs [2119]	Vulnerable	Species or species habitat may occur within area
Commersonia prostrata Dwarf Kerrawang [87152]	Endangered	Species or species habitat may occur within area
Dodonaea procumbens Trailing Hop-bush [12149]	Vulnerable	Species or species habitat may occur within area
Eucalyptus aggregata Black Gum [20890]	Vulnerable	Species or species habitat likely to occur within area
Genoplesium baueri Yellow Gnat-orchid, Bauer's Midge Orchid, Brittle Midge Orchid [7528]	Endangered	Species or species habitat may occur within area
Leucochrysum albicans subsp. tricolor Hoary Sunray, Grassland Paper-daisy [89104]	Endangered	Species or species habitat likely to occur within area
Persoonia oxycoccoides [16114]	Endangered	Species or species habitat may occur within area
Pomaderris cotoneaster Cotoneaster Pomaderris [2043]	Endangered	Species or species habitat likely to occur within area
Rhizanthella slateri Eastern Underground Orchid [11768]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Thelymitra kangaloonica		
Kangaloon Sun Orchid [81861]	Critically Endangered	Species or species habitat may occur within area
Thesium australe		
Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat may occur within area
REPTILE		
Aprasia parapulchella		
Pink-tailed Worm-lizard, Pink-tailed Legless Lizard [1665]	Vulnerable	Species or species habitat likely to occur within area
Delma impar		
Striped Legless Lizard, Striped Snake-lizard [1649]	Vulnerable	Species or species habitat may occur within area

Listed Migratory Species [Resource Information]

Scientific Name	Threatened Category	Presence Text
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		

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Scientific Name	Threatened Category	Presence Text
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	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]	Vulnerable	Species or species habitat likely to occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Bird		
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 overfly marine area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat likely to occur within area overfly marine area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat likely to occur within area overfly marine 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 overfly marine area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area overfly marine area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat may occur within area overfly marine area

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Scientific Name	Threatened Category	Presence Text
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat may occur within area overfly marine area
Pterodroma cervicalis White-necked Petrel [59642]		Species or species habitat may occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat likely to occur within area overfly marine area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area

Extra Information

EPBC Act Referrals			[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Highland Source Project	2010/5697	Not Controlled Action	Completed
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed
Not controlled action (particular manner)			
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action	Post-Approval

Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action (particular manner)			
		(Particular Manner)	

Bioregional Assessments		[Resource Information]
SubRegion	BioRegion	Website
Sydney	Sydney Basin	BA website

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Caveat

1 PURPOSE

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

The report contains the mapped locations of:

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

2 DISCLAIMER

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

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

3 DATA SOURCES

Threatened ecological communities

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

Threatened, migratory and marine species

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

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

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

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

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

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

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

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

Acknowledgements

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

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

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

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

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END

OF

REPORT

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