Department of Planning and Environment

Biodiversity Development Assessment Report, Proposed Residential Development, 29 Walla Walla Road, Walla Walla

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Final Report 22 January 2024

Document control

Version	Date	Author	Details
1	22/1/24	Steve Hamilton	For client review
2		Steve Hamilton	Revision
3		Steve Hamilton	Final to be issued with development application

Summary

- The landholder at 29 Walla Walla Road, Walla Walla, is seeking to establish a staged residential subdivision at the property, which has a proposed development footprint of 11.8 ha;
- The landholder only purchased the property in recent years. The property has been predominantly cleared of native woody vegetation other than some scattered and mostly mature Western Grey Box (*Eucalyptus microcarpa*) and Blakely's Red Gum (*E. blakelyi*), and for many decades has been utilised for stock grazing and/or fodder production;
- This BDAR has been developed because the Area Clearing Threshold for the site is 0.25 ha, and > 5 ha of native vegetation is proposed to be cleared, and according to the BMAT Report, entry into the BOS is required as a consequence of this trigger;
- Approximately 6.1 ha of the proposed development area is dominated by introduced ground layer species that are typical opportunistic pasture species. However, there are two large patches of derived native grassland, one in the northern half of the site, and one in the south-western corner, that maintain embedded 20 scattered mature, hollow-bearing Western Grey Box and Blakely's Red Gum. Furthermore, the northern road reserve of Walla Walla Road where a road access point is to be established, a more-or-less continuous cover of mixed-age Blakely's Red Gum can be found;
- The native vegetation to be cleared across the freehold property is modified PCT 76 - *Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregion,* while the Walla Walla Road reserve is modified PCT 278 - *Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion*. Both of these PCTs are associated with threatened ecological communities (TEC) under the *Biodiversity Conservation Act 2016*, but are not representative of the associated ecological communities (EC) listed under the Commonwealth *Environment Protection Biodiversity Conservation Act 1999* (EPBC Act);
- After an extensive targeted survey program for threatened flora and fauna, the only threatened species recorded on site was Gang-gang Cockatoo. This species credit species was confirmed for offset;
- Two vegetation zones of a combined 5.77 ha – including 20 old, hollow-bearing trees - will be cleared and is the only direct impact of the development. There were no prescribed and serious and irreversible impacts (SAII) identified. Two residual indirect impacts were identified;
- Mitigation measures of the delineation of native vegetation to be retained on the construction site, and the establishment of vehicle and equipment hygiene practices for vehicles entering the site, were prescribed to obviate the identified residual indirect impacts;
- The final offset requirements are summarised in Tables E1 and E2.

Table E1 Impacts that require an offset – ecosystem credits

Vegetation zone	PCT	TEC/EC	Impact area (ha)	Number of ecosystem credits required
1	PCT 76 - *Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions*	TEC	5.695	0
2	PCT 278 - Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion		0.084	0

Table E2 Impacts that require an offset – species credits

Common name	Scientific name	Loss of habitat (ha) or individuals	Number of species credits required
Gang-gang Cockatoo	*Callocephalon fimbriatum*	5.77	37

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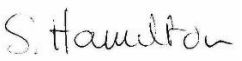
Shortened forms

APZ	asset protection zone
BAM	Biodiversity Assessment Method
BAM-C	Biodiversity Assessment Method Calculator
BC Act	*Biodiversity Conservation Act 2016* (NSW)
BC Regulation	Biodiversity Conservation Regulation 2017 (NSW)
BDAR	Biodiversity Development Assessment Report
BOAMS	Biodiversity Offsets and Agreement Management System
BOS	Biodiversity Offsets Scheme
CEEC	critically endangered ecological community
DBH	diameter at breast height over bark
EC	ecological community listed under the EPBC Act
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cwlth)
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW)
EEC	endangered ecological community
HTW	high threat weed
IBRA	Interim Biogeographic Regionalisation for Australia
LLS Act	*Local Land Services Act 2013* (NSW)
MNES	matters of national environmental significance
NPW Act	*National Parks and Wildlife Act 1974* (NSW)
NSW	New South Wales
PCT	plant community type
SAII	serious and irreversible impact
SEARs	Secretary's Environmental Assessment Requirements
TBDC	Threatened Biodiversity Data Collection
TEC	threatened ecological community
VEC	vulnerable ecological community
Vegetation SEPP	*State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017* (NSW)

Declarations

i. Certification under clause 6.15 *Biodiversity Conservation Act 2016*

I certify that this report has been prepared based on the requirements of, and information provided under, the Biodiversity Assessment Method and clause 6.15 of the *Biodiversity Conservation Act 2016* (BC Act).

Signature: 

Date: 22/1/24

BAM Assessor Accreditation no: BAAS18106

This BDAR has been prepared to meet the requirements of BAM 2020. Appendix A provides an assessment of compliance with the minimum information requirements outlined in BAM Appendix K.

ii. Details and experience of author/s and contributors

Author and contributor

Name	BAM Assessor Accreditation no. (if relevant)	Position/Role	Tasks performed	Relevant qualifications
Steve Hamilton	BAAS18105	Director/Principal Ecologist	- report preparation - document review - BAM-C data entry and analysis - figure preparation - BAM plot surveys	*AssocDipAppBiol, BAppSc(AppBiol), MAppSc (RMIT), PhD (University of Melbourne), BAM accredited Assessor (OEH NSW), Vegetation Quality Assessment Certified (DSE/DEPI/DELWP Victoria),Bush Broker Assessor (DELWP Victoria)*

iii. Conflict of interest

I declare that I have considered the circumstances and there is no actual, perceived or potential conflict of interest.

This declaration has been made in the interests of full disclosure to the decision-maker. Full disclosure has also been provided to the client.

Signature: 

Date: 22/1/24

BAM Assessor Accreditation no: BAAS18105

Stage 1: Biodiversity assessment

1. Introduction

1.1 Proposed development

1.1.1 Development overview

The landholder at 29 Walla Walla Road, Walla Walla, is seeking to establish staged residential subdivision on his property, which has a proposed development footprint of 11.9 ha.

The proposed development requires consent under Part 4 of the EP&A Act.

The landholder only purchased the property in recent years; the property has been predominantly cleared of native woody vegetation other than some scattered and mostly mature Western Grey Box (*Eucalyptus microcarpa*) and Blakely's Red Gum (*E. blakelyi*), and for many decades has been utilised for stock grazing and/or fodder production.

The property is on the south-eastern fringe of the township of Walla Walla, with public recreational land to the immediate north and residential blocks to the west, but does have similarly cleared agricultural land to the south and east.

1.1.2 Location

The proposed staged residential development is located on the property at 29 Walla Walla Road, Walla Walla, located on flat terrain on the corner of Walla Road (to the south) and Commercial Street (to the west)(see Figure 1 Site Map and Figure 2 Location Map), and approximately 900 m south of the centre of the Walla Walla township.

The proposed development footprint is found across three lots – all of Lot 2 DP1287711 (104 Commercial Street), Lot 3 DP1287711 (116 Commercial Street), and the western part of Lot 1 DP1287711 (29 Walla Walla Road)(see Figure 1 Site Map and Figure 2 Location Map); the area is included within the Greater Hume Shire Council LGA under the *Greater Hume Local Environment Plan 2012*, has a Minimum Lot Size of 100 ha (Lots 1 and 2 DP1287711), and is zoned *R5 – Village* (most of Lots 2 and 3 DP1287711), or *R5 – Large Lot Residential* (balance of Lots 2 and 3 DP1287711 and Lot 1 DP1287711).

1.1.3 Proposed development and the subject land

As indicated, the property has been predominantly cleared of native woody vegetation other than some scattered and mostly mature Western Grey Box (*Eucalyptus microcarpa*) and Blakely's Red Gum (*E. blakelyi*); there has been little regeneration emanating from these scattered trees and there is no native shrub layer.

Based on mapped PCTs and after ground-truthing, the proposed development area was likely a mixture of predominantly Plant Community Type (PCT) 76 - *Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions*, interspersed with areas of PCT 278 - *Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion* (DPE 2024h), with the dominant current presence of Western Grey Box likely to signify areas of former PCT 76, and the dominant current presence of Blakely's Red Gum likely to signify the former presence of PCT 278. PCT 278 is definitively present along the northern road

reserve of Walla Walla Road adjacent to the proposed development area; a small section at the eastern end of this corridor is a likely loss with the establishment of a road access point to Walla Walla Road for the development.

For many decades the property has been utilised for stock grazing and/or fodder production; this past and current land use is reflected in the composition; the assessed site has been divided into two similar sized paddocks with an east-west fence. The majority of the proposed development site is dominated by introduced ground layer species that are typical opportunistic pasture species, such as Wild Oat (*Avena fatua*), Soft Brome *(Bromus mollis*), Cat's Ear (*Hypochaeris radicata*), Onion-grass (*Romulea rosea*), Barley Grass (*Hordeum leporinum*), White Clover (*Trifolium repens*), Subterranean Clover (*T. subterraneum*), Great Brome (*Bromus diandrus*) and Wimmera Ryegrass (*Lolium rigidum*)(seasonally up to 90 % projective foliage cover); there are no indigenous native species present in these areas. In the southern paddock, there is a relatively high density of the self-sown pasture legume Lucerne (*Medicago sativa*) from past fodder cropping.

However, there are two large patches of derived native grassland, one in the northern half of the site, and one in the south-western corner, neither of which contain any native shrub individuals and these patches contain a relatively low diversity of indigenous species, such as Snowgrass (*Poa sieberiana*), Curly Windmill Grass (*Enteropogon acicularis*), Brown's Love Grass (*Eragrostis brownii*), Brown-back Wallaby Grass (*Rytidosperma duttonianum*), Ringed Wallaby Grass (*R. caespitosum*), Hairy Panic (*Panicum effusum*) and Blown Grass (*Lachnagrostis filiformis*) at a moderate abundance (up to 40 % projective foliage cover), with a variable abundance of Soft Brome, Cat's Ear, Barley Grass, White Clover, Subterranean Clover, Great Brome and Wimmera Ryegrass (seasonally up to 70 % projective foliage cover)(DPE 2024h).

These patches maintain embedded scattered mature Western Grey Box – and some Blakely's Red Gum, and are modified representatives of PCT 76..

Along the northern road reserve of Walla Walla Road, a more-or-less continuous cover of mixed-age Blakely's Red Gum can be found. There are also some recruits from the roadside vegetation found on the freehold land (the proposed development area), in close proximity to the fence line. There is no shrub layer along this road reserve, and the ground layer vegetation is wholly introduced species such as Paspalum (*Paspalum dilitatum*), Wild Oat, Soft Brome, Onion-grass, Great Brome, and Wimmera Ryegrass.

This roadside vegetation is a modified representative of PCT 278.

There are 32 trees assessed across the proposed development area, and the location and species of these trees is shown in Figure 14:

- Trees 2 to 10 and 20 to 26 are Western Grey Box individuals and all are found within the freehold property;
    - Trees 2 to 10 and 20 to 25 are all old, hollow-bearing trees;
    - Trees 3 and 4 are standing dead trees;
- Trees 11 to 19 and 27 to 32 are Blakely's Red Gum individuals;
    - Trees 11, 16, 18, 19, 27, 28 and 29 are all old, hollow-bearing trees;
    - Tree 19 is a standing dead tree;
    - Tree 28 is found outside of the proposed development area to the east;
    - Trees 29 to 32 are associated with the proposed road access point to Walla Walla Road on the southern boundary of the site;

- Tree 1 is a planted White Cedar (Melia azerdarach) in the north-western corner of the freehold property;
- In terms of loss:
    - Trees 1 to 27 on the freehold land are all proposed losses, with 19 of these being old, hollow-bearing trees;
    - Trees 29 to 32, associated with the proposed road access point to Walla Walla Road on the southern boundary of the site, are also losses, of which Tree 29 is a hollow-bearing tree;
- In summary, 31 of the 32 trees assessed are proposed removals, with 20 of these trees being old, hollow-bearing individuals.

A relatively small range of fauna were observed at the site over the extensive survey period from July to December 2023.

Introduced species observed/inferred were:

- Indian Mynah (*Acridotheres tristis*);
- Common Blackbird (*Turdus merula*);
- Brown Hare (*Lepus europaeus*);
- Red Fox (*Vulpes vulpes*);
- Stock (sheep).

Native species observed/inferred were:

- Common Eastern Froglet (*Crinia signifera*);
- Masked Lapwing (*Vanellus miles*);
- Magpie-lark (*Grallina cyanoleuca*);
- Australian Raven (*Corvus coronoides*);
- Little Raven (*Corvus mellori*);
- Galah (*Eolophus roseicapilla*);
- Sulphur-crested Cockatoo (*Cacatua galerita*);
- Little Corella (*Cacatua sanguinea*);
- Eastern Rosella (*Platycercus eximius*);
- Red-rumped Parrot (*Psephotus haematonotus*);
- Noisy Miner (*Manorina melanocephala*);
- Red Wattlebird (*Anthochaera carunculata*);
- Noisy Friarbird (*Philemon corniculatus*);
- Australian Magpie (*Gymnorhina tibicen*);
- Pied Butcherbird (*Cracticus nigrogularis*);
- Australian Wood Duck (*Chenonetta jubata*);
- Gang-gang Cockatoo (*Callocephalon fimbriatum*);
- Common Brushtail Possum (*Trichosurus vulpecula*);

- Little Forest Bat (*Vespadelus vulturnus*);
- White-striped Freetail-Bat (*Tadarida australis*);
- Gould's Wattled Bat (*Chalinolobus gouldii*).

The presence of the introduced species Indian Mynah, Common Blackbird, Red Fox and Brown Hare is not surprising given the nature of the site (paddock vegetation) combined with proximity to the Walla Walla urban area. Indian Mynah and Common Blackbird were more common along the western and northern boundary areas of the site.

The dominant native bird on the site was Noisy Miner, and this aggressive and highly territorial native species was observed roosting/nesting in the scattered trees, and on some occasions, chasing away other native birds such as Australian Magpie and Eastern Rosellas.

Most of the other birds listed were only observed/recorded fleetingly, often on the periphery of the site, and were not resident on the site.

The call Common Eastern Froglet was recorded a day after heavy rainfall, and was not recorded again.

A number of Common Brushtail Possums are resident in the hollow-bearing trees near the border with Commercial Street – no other arboreal mammals were observed.

The three microbat species were recorded frequently in the spring period by ultrasonic call detection, and it would seem as if these species are abundant at or near the site, possibly roosting in hollows of the scattered trees on the site.

Gang-gang Cockatoo is a State and Commonwealth listed threatened species that was recorded by audio recording for one 5 minute period early in the morning in late winter 2023, and was not recorded again and was not observed during diurnal surveys.

As indicated, the property is on the south-eastern fringe of the township of Walla Walla, with public recreational land to the immediate north and residential blocks to the west, but does have similarly cleared agricultural land to the south and east.

The Proposed Layout Plan for the proposed staged residential subdivision can be seen in Figure 13; 5 stages and an area for future stages are proposed across the area, with proposed road access for these stages to both Commercial Street to the west and Walla Walla Road to the south, and through the public land to the north. There will also be a further access road to the east with potential future residential subdivision.

The Walla Walla Road area where vegetation loss will occur for the road access will be covered in detail throughout the report as Vegetation Zone 2.

The Commercial Street road access point would result in a 30 m crossing of the eastern road reserve; the ground layer in this section of the road reserve is regularly mown Onion-grass, Cat's Ear, Paspalum, Wimmera Ryegrass, Plantain (*Plantago lanceolata*) and Water Couch (*Paspalum distichum*), with no native ground layer species present. Two Prunus trees, planted as street trees, would be likely losses with the establishment of this road access point.

The public land road access point in the north of the site would result in a 30 m crossing that would pass through an existing single row plantation of non-native tree species, including Desert Ash (*Fraxinus angustifolium*), River Red Gum (*Eucalyptus camaldulensis*) and Lemon-scented Gum (*Corymbia citriodora*); 2-3 of these planted individuals would need to be removed with the proposed road access point. The ground layer in this mown road access crossing area is wholly exotic, including species such as Paspalum, Water Couch, and Kikuyu Grass (*Cenchrus clandestinum*).

The proposed development will involve major ground disturbance – including excavation - with the use of heavy machinery within the area of the proposed development footprint, with the construction of dwellings, fences, roads, kerb and channel, and provision of services and drainage (see Figure 3 Development layout and Figure 13 Proposed Development Layout). This will almost certainly result in the loss of all native vegetation within the freehold section of the proposed development area, and with the road access area to the Walla Walla Road in the south of the proposed development.

Access to the proposed development area for all vehicles and machinery associated with the development will likely be through the proposed road access points from the existing entrance to the property on Walla Walla Road on the existing compacted track (20 m east of the south-eastern corner of the proposed development), and from the proposed access road area on Commercial Street will be through that runs from the south through the existing quarried areas (see Figure 3 Development layout). This existing track consists of rock, and retains no native vegetation, and Commercial Street eastern road reserve also contains no native vegetation. Therefore, based on the use of the existing access track and the Commercial Street frontage, there will not be any direct or indirect impact on areas outside of the proposed development area (see Figure 3 Development layout).

Consequently, a total of the 5.77 ha of native vegetation found as two vegetation zones of modified TECs within the development footprint – including 20 hollow-bearing trees - will be removed (Zone 1 is two patches of a total of 5.695 ha on the freehold land, and Zone 2 is an area of 0.084 ha across the southern boundary of the freehold land and the Walla Walla Road reserve); however, there will not be any direct impact on areas outside of the proposed development area, and the development avoids remnant tree cover along the remainder of Zone 2 along the Walla Walla Road reserve, and the continuation of Zone 1 in the north-eastern corner of the proposed development area (see Figure 8 Verified PCT map).

The subject land is located at within the *Culcairn* landscape at approximately 150 MASL, a stagnant alluvial system which is characterised by slopes < 1 %, extensive broad plains with sparse narrow drainage lines, and localised gilgai. The soils of this landscape typically are very deep Red and Brown Chromosols and Kurosols (Red and Brown Podzolic Soils), with Yellow and Grey Sodosols (Soloths) occurring on the higher, older terraces, with deep Grey and Brown Dermosols (Grey Podzolic Soils) occurring on the lower younger terraces; the area of the subject site is a Grey Sodosol (Australian Soil Resource Information System 2024).

There are no features of geological significance within the subject land; there are no steep escarpments or slopes associated with the subject land.

The geology of the subject land specifically consists of unconsolidated riverine deposits of the Shepparton Formation (Czsws) and Quaternary Alluvium (Qa), consisting of clay, silt, sand and gravel and including floodplains, ancient channel deposits and alluvial terraces (Australian Soil Resource Information System 2024).

The are no pertinent documents referenced in the completion of this BDAR.

1.2 Biodiversity Offsets Scheme entry

The proposed development site is not within an area of Biodiversity Value, and entry into the BOS is not required as a consequence of this trigger (see Figure 4 Biodiversity Values Map).

The Area Clearing Threshold for the site is 0.25 ha, and > 5 ha of native vegetation is likely to be cleared, and according to the BMAT Report, entry into the BOS is required as a consequence of this trigger (see Appendix B Biodiversity Values Map and Threshold tool report).

1.3 Excluded impacts

The transitional Native Vegetation Regulatory Map (updated 7/12/23)(DPE 2024f) indicates that all lots associated with the proposed development are land excluded from the *Local Land Services Act 2013*.

1.4 Matters of national environmental significance

The pertinent Matters of National Environmental Significance (MNES) Report for the proposed development area and a 10 km radius is shown in Appendix C.

There are no Wetlands of International Importance within or near the assessed area.

According to the MNES generated for a 10 km radius around the subject land (DCCEEW 2024; Appendix C), there are five ECs listed under the EPBC Act within the BioNet Vegetation Classification:

- Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia;
- Weeping Myall Woodlands;
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.

Given the evidence provided through Section 4.2.2, the PCTs within the subject land (PCTs 76 and 278) are associated with any two of these ECs; PCT 76 has clear associations with Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia and Poplar Box Grassy Woodland on Alluvial Plains EC, while PCT 278 has clear associations with White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland EC.

According to the decision-making flowchart to ascertain whether a site is a patch of potential *Grey Box Grassy Woodlands or derived native grasslands* of sufficient quality for national listing, the Department of Environment, Heritage, Water and the Arts (DEHWA)(2012), indicates that the site is no longer a viable part of this threatened ecological community based on the low tree cover, the lack of ground layer indigenous species diversity, and the abundance of ground layer exotic species. Although some indigenous species may remain, in most of these areas the indigenous understorey is effectively irretrievable, and in order for an area to be included in the listed ecological community, a patch must have a predominantly indigenous understorey (DEHWA 2012).

Therefore, according to the Commonwealth definition of this threatened community, Zone 1 within the proposed development area should not be included as part of this community.

The critically endangered Grassy Box Gum Woodland (formally referred to as the White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland) is characterised by a species-rich understorey of native tussock grasses, herbs and scattered shrubs, and the dominance, or prior dominance, of White Box, Yellow Box and Blakely's Red Gum trees (DEHWA 2006).

According to DEHWA (2006), areas in which an overstorey exists without a substantially native understorey are degraded and are no longer a viable part of the ecological community. Although some indigenous species may remain, in most of these areas the indigenous understorey is effectively irretrievable, and in order for an area to be included in the listed ecological community, a patch must have a predominantly indigenous understorey (DEHWA 2006).

Therefore, according to the Commonwealth definition of this threatened community, Zone 2 within the proposed development area should not be included as part of this community.

There were no Commonwealth Listed Threatened Species of flora or fauna recorded across the assessed area, while BioNet records indicates that the threatened Brown Treecreeper (eastern subspecies) has been recorded within 3 km of the proposed development area (i.e. the assessed area) – these records are associated with a large remnant and disconnected block to the north – Gum Swamp

The proposed development area containing 5.77 ha of native vegetation to be removed – including 20 hollow-bearing trees - is not suitable habitat for this listed species (DPE 2024c).

The proposed development is therefore deemed to not be a controlled action or needing referral to the DCCEEW under the EPBC Act.

1.5 Information sources

Key sources of information for this report included:

- BAM 2020 (DPIE 2020a);
- BioNet Atlas of NSW Wildlife (DPE 2024a);
- BioNet Vegetation Classification (DPE 2024h);
- State Vegetation Type Map (SVTM). Riverina Region version 1.2 – VIS_ID 4469 (DPE 2024d);
- The VIS Plant Community Type Identification Tool Version 1.0. (OEH 2013);
- Transitional Native Vegetation Regulatory Map (version 4)(DPE 2024f);
- Biodiversity Values Map and Threshold tool report (DPE 2024g);
- Matters of National Environmental Significance (MNES) Report (DCCEEW 2024);
- IBRA7 Regional and Subregional Map Viewer (SEED NSW);
- Mitchell Landscape v31 map layer;
- NSW Land Parcel Property map layer and Property Report;
- SIX Maps (Land and Property Information 2024).

2. Methods

2.1 Site context methods

2.1.1 Landscape features

In accordance with the BAM, a number of features were assessed within and surrounding the subject site. These features include the conformity of the assessed area and surrounds to the IBRA region and subregion and NSW landscape regions (Mitchell Landscapes), and the presence (or absence) of other features, such as rivers, streams, estuaries and wetlands, habitat connectivity, karst areas or areas of outstanding biodiversity value.

To assess for these features, a radius of 1.5 km within and around the subject land (as much as was practicable given permissions and access issues) was searched by vehicle and by foot over a period of 2 hours.

2.1.2 Native vegetation cover

A layer of native vegetation cover is required for a 1,500 m buffer around the study area to determine the context of the site. The extent of native vegetation on the subject site and immediate surrounds was mapped using the Riverina VTM (DPE 2024e), with edits made to the layer where obvious changes to native vegetation extent had occurred.

As indicated, a radius of 1.5 km within and around the subject land was searched to determine the native vegetation extent and PCT mapping. No access to the private land to the west and the north was available, and so native vegetation extent in these sections of the buffer area was inferred using aerial imagery.

The total area of the 1,500 m buffer around the study area is 707 ha, with the area of vegetation mapped within the buffer being 108 ha (see Figure 2 Location Map). This was determined to be a native vegetation cover of 15 %; this value was entered into the BAM-C.

2.2 Native vegetation, threatened ecological communities and vegetation integrity methods

2.2.1 Existing information

The following existing sources of information were utilised to identify PCTs and TECs on the subject land:

- BioNet Atlas of NSW Wildlife (DPE 2024a);
- BioNet Vegetation Classification (DPE 2024h);
- State Vegetation Type Map (SVTM). Riverina Region version 1.2 – VIS_ID 4469 (DPE 2024d);
- Threatened Ecological Community (TEC) listed in Schedule 2 of the *Biodiversity Conservation Act 2016*.

2.2.2 Mapping native vegetation extent

As indicated, a radius of 1.5 km within and around the subject land was searched to determine the native vegetation extent and PCT mapping by vehicle and by foot over a period of 2 hours on the 3rd July 2023. No access to the private land to the east or the north was available, and so native vegetation extent (and PCT) in this section of the buffer area was inferred using aerial imagery.

The extent of native vegetation and PCT on the subject site and immediate surrounds was mapped using the Riverina VTM (DPE 2024e) as a basis, with edits made to the layer where obvious changes to native vegetation extent had occurred, and where PCT determination differed to the existing mapping (see Figure 8 – Verified PCTs).

2.2.3 Plot-based vegetation survey

PCTs within the subject land were mapped according to the survey outlined in Section 2.2.2.

Based on these results, significant change was made to the mapped PCTs present on the site and their extents within and adjacent to the subject land (see Figure 6 Field survey locations and Figure 8 Verified Plant Community Types).

The only native vegetation mapped across the proposed development area is mapped as PCT 76 - *Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW*

South Western Slopes and Riverina Bioregions (see Figure 6 Field survey locations). However, ground truthing revealed that extent of this PCT was significantly underestimated in extent across the site, and further to this, the native vegetation along the southern boundary – associated with the northern Walla Walla Road reserve, was likely modified PCT 278 - *Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion* (DPE 2024h).

It was determined that a total of 5.77 ha of native vegetation is found as two vegetation zones of modified TECs within the development footprint – including 20 hollow-bearing trees - will be removed (Zone 1 is two patches of a total of 5.695 ha on the freehold land, and Zone 2 is an area of 0.084 ha across the southern boundary of the freehold land and the Walla Walla Road reserve).

In accordance with Table 3 of the BAM (DPE 2020) and the area of Zone 1 being between > 5 ha, and the area of Zone 2 being < 2 ha, three BAM plots were established in Zone 1, and one BAM plot was established in Zone 2 on the 16th August 2023.

Vegetation Zone 1 was distributed over two discrete areas of 4.30 and 1.40 ha separated by only 25 m; as these patches highly uniform in composition and structure, these areas were treated as one zone. Two BAM plots were placed within the larger area, and one BAM plot located centrally in the smaller area (see Figure 6 Field survey locations and Figure 8 Verified Plant Community Types).

Vegetation Zone 2 is effectively a narrow, linear tree corridor along the northern road reserve of Walla Walla Road with some trees in close proximity to the fence line that have recruited from the corridor, and a BAM plot was placed at the eastern end of this zone where the proposed road access point to Walla Walla Road is to be located (see Figure 6 Field survey locations and Figure 8 Verified Plant Community Types).

Neither vegetation zones are connected to any other remnant vegetation.

All plots were the typical rectangular dimensions of a BAM plot (50 x 20 m) that were aligned to fit within the defined proposed development footprint, and the Vegetation Integrity Survey plot (20 x 20 m) were located in either the southern portion within plots (if they were north-south orientation), or in the western portion within plots (if they were east-west orientation)(see Figure 6 Field survey locations and Figure 8 Verified Plant Community Types).

2.2.4 Vegetation integrity survey

Four Vegetation Integrity Survey plots were established within the four delineated BAM plots, and were assessed using the methodology outlined in Section 4.3.4 of the BAM (DPE 2020)(see Appendix D for the Vegetation integrity survey plot data).

The collected data from the plot was used to determine the Vegetation Integrity Scores for the vegetation zones upon entry of the data into the BAM-C.

2.3 Threatened flora survey methods

2.3.1 Review of existing information

Based on BioNet records and confirmed Predicted Threatened Species generated on BAM-C, there are nine threatened flora species that potentially may be found within the vegetation zones within the proposed development area (see Table 7 Predicted ecosystem credit species).

A search of the Threatened Species profile information (DPE 2024c) reveals the following pertinent information about these species:

- Australian Pillwort is a rhizomatous plant found in seasonally dry depressions and margins of marshes, and has the capacity to grow while submerged;
- Mossgiel Daisy is a perennial herb recorded primarily in clay soils on Bladder Saltbush and Leafless Bluebush plains, but also in grassland and in Western Grey Box-Cypress-pine woodland. The species flowers from June to December;
- *Austrostipa wakoolica* grows on floodplains of the Murray River tributaries, and in open woodland on grey, silty clay or sandy loam soils. Habitats include the edges of lignum swamps with box and mallee, creek banks in grey, silty clay, and mallee and lignum sandy-loam flats. Flowers from October to December in response to rain;
- Sand-hill Spider Orchid Occurs in woodland with sandy soil, especially that dominated by White Cypress-pine. Flowers between September and November;
- Pine Donkey Orchid. Found in Cypress-pine, Bimble Box and ironbark woodlands, usually with an abundant grassy understorey. Flowers from September to October;
- Spiny Peppercress is found on the ridges of gilgai clays dominated by Brigalow, Belah, Buloke and/or Western Grey Box woodlands, often areas with weedy understories. Responds positively in numbers to drought conditions. Flowers from spring to autumn;
- Slender Darling Pea an annual forb that grows in a variety of vegetation types including Bladder Saltbush, Black Box and grassland communities on level plains, floodplains and depressions and is often found with *Maireana* species. Plants have been found in remnant native grasslands or grassy woodlands that have been intermittently grazed or cultivated. Plants die back in summer, surviving as a rootstocks until they shoot again in autumn. Flowers in spring to early summer;
- Small Purple-pea is an annual forb that occurs in the understorey of woodlands dominated by Blakely's Red Gum, Yellow Box, Candlebark and Long-leaved Box. It grows in association with understorey dominants that include Kangaroo Grass, Poa spp. and spear-grasses. Plants die back in summer, surviving as a rootstocks until they shoot again in autumn. Flowers throughout spring, with a peak in October;
- Silky Swainson-pea is found in Box-Gum Woodland in the Southern Tablelands and South West Slopes. Plants die back in summer, surviving as a rootstocks until they shoot again in autumn. Flowers throughout spring.

2.3.2 Habitat constraints assessment

Habitat constraints assessment of the site on the 3rd July 2023 revealed that:

- There was no suitable marsh or shallow depression habitat for Australian Pillwort;
- The subject land lacks the sandy soil required for Sand-hill Spider Orchid;
- The PCTs of the subject land were unsuitable for Pine Donkey Orchid;
- The subject land lacks the ridges of gilgai clays dominated by Brigalow, Belah, Buloke and/or Western Grey Box woodlands required for Spiny Peppercress;
- There was potentially suitable habitat on the site for Mossgiel Daisy, *Austrostipa wakoolica*, Slender Darling Pea, Small Purple-pea and Silky Swainson-pea.

2.3.3 Field surveys

Department of Planning, Industry and Environment (DPIE)(2020a) recommends a parallel field traverse using transects for a survey for threatened plant species. On this basis, a 25 m east-west grid using 18 transects was imposed across the assessed area for the purposes of the survey to ascertain the presence of any of the target species – this equated to approximately 5 km of transects traversed across the 11.8 ha of assessed area.

This grid was mapped on ArcGIS, and then loaded onto a handheld GPS during the survey to ensure each transect could be accurately followed.

As the assessed area is flat, traverse of the site was easy, and a complete traverse of all transects – with continuous active searching - took approximately 1.5 hours.

The first traverse of all transects was conducted on the 16/8/23.

A second traverse was conducted on the 19/9/23, a third on the 17/10/23, a fourth on the 14/11/23 and a fifth on the 12/12/23; the starting transect for the second was 10 m south of that of the first, and the starting transect alternated over the remaining surveys. This was done to provide a more complete coverage of the site.

The surveys were done at least 3 weeks apart to allow for any delays in flowering in target plants, and variation between time of flowering between species (DPIE 2020a).

As indicated previously, the target threatened plant species were Mossgiel Daisy, *Austrostipa wakoolica*, Slender Darling Pea, Small Purple-pea and Silky Swainson-pea (see Sec. 2.3.2), and all of these should have been flowering during the period of survey (according to Harden 1990, 1991, 1992 and 1993, and Royal Botanic Gardens Sydney 2023), and would have been visible on this basis.

The observer (author) is familiar with the characteristics of all of these plants to ensure correct identification if observed.

No individuals of a threatened species were recorded during these surveys.

2.4 Threatened fauna survey methods

2.4.1 Review of existing information

Based on BioNet records and confirmed Predicted Threatened Species generated on BAM-C, there are thirty three threatened fauna species that potentially may utilise the vegetation zones within the proposed development area (see Table 7 Predicted ecosystem credit species).

A search of the Threatened Species profile information (DPE 2024c) reveals the following pertinent information about these species:

- Barking Owl, Black-chinned Honeyeater, Brown Treecreeper, Bush Stone-curlew, Dusky Woodswallow, Major Mitchell's Cockatoo, Flame Robin, Regent Honeyeater, Scarlet Robin, Hooded Robin, Speckled Warbler, Gang-gang Cockatoo, Masked Owl, Square-tail Kite, Diamond Firetail, Varied Sittella, Grey-crowned Babbler, Superb Parrot, Spotted Harrier, White-fronted Chat, and Little Eagle will utilise eucalypt open forests and woodlands – often of higher quality - dominated by box and ironbark eucalypts and all breed during the spring/summer;
- Sloane's Froglet prefers to breed in shallow ephemeral depressions and wetland with emergent and fringing vegetation between June and August;

- Glossy Black-Cockatoo (Riverina population and breeding) generally inhabits stands of *Allocasuarina* and *Casuarina* spp., and is dependent of large hollow-bearing eucalypts for nest sites between March and May;
- Superb Parrot, Masked Owl, Brown Treecreeper, Major Mitchell's Cockatoo, Barking Owl, Squirrel Glider breed in hollows in standing dead and live trees;
- Black-chinned Honeyeater, Dusky Woodswallow, Flame Robin, Scarlet Robin, Hooded Robin, Speckled Warbler, Gang-gang Cockatoo, Diamond Firetail, Varied Sittella, Grey-crowned Babbler, Little Eagle, Spotted Harrier, White-fronted Chat build nests in tree or shrub canopies;
- Major Mitchell's Cockatoo will also be found in treeless habitats;
- Regent Honeyeater will follow the spatial and temporal changes flowering of eucalypts across south-eastern Australia, and tends to breed in areas dominated by River Sheoak;
- Gang-gang Cockatoos and Flame Robin migrate from upland to lowland areas in winter;
- White-bellied Sea-eagle prefer the presence of large areas of open water including larger rivers, swamps, lakes, and the sea, and will be found in close proximity to these waterways;
- Brolga will feed in dry grassland and paddocks, but are dependent on shallow wetlands, and will breed in a nest created on an island in winter to autumn;
- Swift Parrot migrates to the Australian mainland from Tasmania between February and October, and while on the mainland favours winter-flowering species and lerp infested trees such as Western Grey Box. Breeds in Tasmania in late spring/summer. The subject land is not mapped as a Swift Parrot habitat of importance (DPE 2024d);
- Squirrel Glider (and Squirrel Glider in the Wagga Wagga LGA) prefer mixed eucalypt stands with a shrub or wattle understorey, and require abundant tree hollows for refuge and nest sites;
- Square-tailed Kite, White-fronted Chat, Major Mitchell's Cockatoo and Diamond Firetail prefer habitats within easy reach of water;
- Superb Parrot, Square-tail Kite, White-bellied Sea-eagle and Little Eagle nest in taller trees, usually near water or a watercourse;
- White-bellied Sea-eagle and Little Eagle will utilise standing dead trees as lookout post for prey;
- Bush Stone-curlew is nocturnal and requires significant fallen timber on the ground for refuge and concealment;
- Grey-headed Flying Fox occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops. A large number of individuals form roosting camps within 20 km of a regular food source generally in dense canopy vegetation close to water;
- Pink-tailed Legless Lizard prefers rocky landscapes;
- Yellow-bellied Sheathtail-bat, Little Pied Bat and Corben's Long-eared Bat roost variously in caves, rocky outcrops, mine shafts, tunnels, tree hollows and/or buildings with Little Pied Bat preferring access to open water.

2.4.2 Habitat constraints assessment

Habitat constraints assessment of the site on the 3rd July 2023 revealed that:

- There are no suitable shallow ephemeral depressions and wetland with emergent and fringing vegetation habitat for Sloane's Froglet and Brolga;
- The subject land lacks the proximity to large areas of open water including larger rivers, swamps, lakes, and the sea, required for White-bellied Sea-eagle;
- The subject land lacks the proximity to water or a watercourse that is required for nesting of Little Pied Bat, Superb Parrot, Square-tail Kite, White-bellied Sea-eagle and Little Eagle;
- The subject land lacks the proximity to water that is preferred habitat for White-fronted Chat, Major Mitchell's Cockatoo and Diamond Firetail;
- The subject land lacks the shrub or wattle understorey required for preferred Squirrel Glider habitat;
- The subject land lacks the intact woodland habitat required for Brown Treecreeper, Dusky Woodswallow, Speckled Warbler, Grey-crowned Babbler, Hooded Robin, Varied Sittella and White-fronted Chat;
- The subject land lacks the winter-flowering eucalypts that would result in the use of the site by Swift Parrot. The Western Grey Box on the site could still be used for foraging by the species if lerp infested;
- The subject land lacks the stands of *Allocasuarina* and *Casuarina* spp. preferred for Glossy Black-Cockatoo (Riverina population and breeding);
- The subject land lacks the significant fallen timber on the ground for refuge and concealment required for Bush Stone-curlew;
- The subject land lacks the rocky landscape required for Pink-tailed Legless Lizard;
- The subject land lacks the dense canopy vegetation close to water required for roosting camps for Grey-headed Flying-fox;
- The subject land lacks the landscape connectivity to provide for access to the site for Regent Honeyeater;
- There was potentially suitable habitat on the site for Barking Owl, Masked Owl, Major Mitchell's Cockatoo, Flame Robin, Scarlet Robin, Gang-gang Cockatoo, Squirrel Glider, Yellow-bellied Sheathtail-bat, Little Pied Bat and Corben's Long-eared Bat.

2.4.3 Field surveys

Continuous active searching for all fauna was occurring during the daytime plant surveys, and during any night surveys.

2.4.3.1 Audio capture

Ultrasonic and audible calls for all amphibians, birds and mammals were recorded using a Song Meter SM2 Bat Ultrasonic Detector in scheduled detection periods coinciding with maximal activity of fauna, around sunset and sunset, in the 3 hours after sunset, and for periods of time during the night to capture owl calls. These units allow detection of the echolocation calls of microchiropteran bats; it should be noted that many species of bats have reduced activity over the winter months, as they are in torpor, as the chances of audio capture of this taxa are significantly reduced, so this detection period was scheduled after this torpor period.

One hundred and seventeen nights and 118 days of audio capture was undertaken with the unit (16th August to 12th December 2023), which was located on Tree 20 within the proposed development area (see Figure 14).

SD cards and batteries were replaced at monthly survey times.

Collected audio files were analysed for detection of possible amphibian, birds and mammal calls using Song Scope Bioacoustics Software, using an established recogniser library previously that has been developed specifically for this project. Call analysis based on recognisers provides detection output with a quality rating; calls are rated as to their similarity to the recogniser on a percentage basis. Species detection calls that were under 60 % similarity were not included as taxa recognised.

2.4.3.2 Sloane's Froglet

The property was evaluated for potential habitat sites for Sloane's Froglet during the day on the 3rd July 2023; this assessment searched for and mapped any potential areas of habitats for the species.

The winter of 2023 at Walla Walla (Albury) had been average in terms of rainfall, with 205 mm recorded over June to August 2023, and should have provided good and typical conditions for potential breeding habitats for the species during its breeding season (Bureau of Meteorology 2024).

There were no potential habitat sites mapped; however, 3 slight depressions (which were muddy but did not retain surface water at any point) were mapped.

Targeted surveys were conducted for Sloane's Froglet across the property on the evenings of on the 8th August, 22nd August and 29th August 2023 (all dates within the likely breeding season for Sloane's Froglet) according to the survey guidelines outlined in Woolshed Thurgoona Landcare Group (2018); three surveys were conducted at each of the 3 mapped damp sites, and at least 10 minutes was spent at each identified potential habitat sites on each occasion.

Windy and wet conditions were avoided for these survey times (see Table 1).

Identification of any frog calls was confirmed from recorded calls on the FrogID app.

2.4.3.3 Squirrel Glider

There are a range of methods to survey for Squirrel Glider, including cage trapping, remote-sensor camera survey and spotlight (Royal Botanic Gardens Victoria 2016). Goldingay and Sharpe (2004) concluded that spotlighting under suitable conditions by experienced personnel was equally as effective as cage trapping or remote camera detection in detecting and providing a population estimate of Squirrel Gliders, and a review of published studies involving transect spotlighting for arboreal mammals found that most incorporated repeat traverses of transects to improve detection. On this basis, consideration of the Department of Sustainability, Environment, Water, Population and Communities (DSEWPC) *Survey guidelines for Australia's threatened mammals. Guidelines for detecting mammals listed as threatened under the Environment Protection and Biodiversity Conservation Act 1999* (DSEWPC 2011) provides more detailed advice on the optimal approach to spotlighting surveys:

- daytime searches for the presence of potentially suitable habitat resources for nest sites (mature hollow-bearing trees within a distribution to allow gliding);
- daytime searches for signs of the species' presence, such as scratches on tree trunks and scats beneath trees;

- placement of transects no further than 50 m from the target trees;
- use of spotlights (to a maximum of 75 watt strength) with a redlight adaptor and/or night-vision scopes to detect animals;
- the spotlight beam should be moved slowly at a consistent speed over the relevant habitat;
- spotlighting should be conducted as quietly as possible;
- avoidance of extreme temperatures, rainfall or wind which will reduce animal activity, and make it more difficult to observe animals;

Although not definitive, some arboreal species are less active on fuller moon periods due to their enhanced detectability to predators;

Given that survey conditions can be influenced by weather and moon phase, surveys should occur on at least 2 nights, and preferably on 3 or more nights in favourable environmental conditions; 5 survey nights in favourable conditions were undertaken.

Based on this advice, combined with the extensive experience with arboreal mammal survey of the author, surveys were conducted on the following basis:

- Diurnal surveys examined all mature trees across the survey area for their potential habitat for the species;
- A survey area of approximately 6 ha full extent, containing scattered trees;
- All mature trees within this survey area were surveyed on each night of survey by two people using an unstructured transect method, with each completed survey taking approximately 1 hour;
- Five night surveys were conducted (16/8/23, 19/9/23, 17/10/23, 14/11/23 and 12/12/23), with nights chosen based on low moon phase, and then selected/rejected based on the prevailing environmental conditions;
- Head-mounted 60 lumen LED spotlights with redlight adaptors, and a FLIR One Pro LT Thermal Imaging Camera were used to detect animals. Given the proximity to residential areas, the latter technique was used for the majority of the time of the survey to avoid impacting on local residents.

2.4.3.4 Barking Owl and Masked Owl

The survey design to ascertain the presence of both Barking and Masked Owl in the assessed area was determined with consideration of DEHWA (2010).

Continuous active searching for individuals and roost or nest sites was occurring during the daytime plant surveys, and during any night surveys. This involved the observer looking carefully for owls roosting among the foliage of densely foliaged trees, and also in the eucalypt canopy.

Call playback sessions were conducted at the completion of Squirrel Glider surveys for the night on the 16/8/23, 19/9/23, 17/10/23, 14/11/23 and 12/12/23. Call playback sessions were conducted with 5 minutes of continuous calls broadcast at approximately 100 % of natural volume interspersed with periods (5 minutes) of silence to listen (and watch) for a response from a Powerful Owl. Listening was continued after playback, whilst a spotlighting search in the immediate area of the call playback was conducted to search for owls that may have responded by flying quietly to the playback site (after Department of Sustainability and Environment [DSE] 2011). It should be noted that call playback effectively doubles the chances of hearing/observing an Owl relative to passive observation; however, a random

call playback has been found to only increases the detection likelihood to around 13 % of events (DSE 2011).

Audio capture data was used to ascertain the presence of the species at the site.

2.4.3.5 Woodland birds

The following threatened woodland bird species - Major Mitchell's Cockatoo, Flame Robin, Scarlet Robin, Gang-gang Cockatoo – were the specific targets of targeted fauna surveys (see Sec. 2.4.2) following habitat constraints assessment.

Notwithstanding this, searching also was seeking a range of other species that had been eliminated by habitat constraints assessment, such as Black-chinned Honeyeater, Brown Treecreeper, Bush Stone-curlew, Dusky Woodswallow, Regent Honeyeater, Hooded Robin, Speckled Warbler, Square-tail Kite, Diamond Firetail, Varied Sittella, Grey-crowned Babbler, Superb Parrot, Spotted Harrier, Swift Parrot, White-fronted Chat, and Little Eagle (see Sec. 2.4.2).

Surveys were conducted using the *Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities* (Department of Environment and Conservation 2004) as the major guide in development of an appropriate methodology.

Data on the presence of diurnal birds was collected by the gathering of visual and call evidence of species across each vegetation zone on the site by an observer.

A twenty minute survey in each vegetation zone was conducted on the 16/8/23, 19/9/23, 17/10/23, 14/11/23 and 12/12/23.

2.4.3.6 Microchiropteran bats

Audio capture, as described in Sec. 2.4.3.1, was the sole method utilised for species detection.

Audio capture data was used to ascertain the presence of the species at the site.

2.5 Weather conditions

The environmental conditions on the 9 days/nights of assessment are summarised in Table 1.

Table 1 Environmental conditions during threatened species surveys (from Bureau of Meteorology 2024).

Survey undertaken	**Date**	**Time**	**Temperature** (min. & max. °C)	**Wind** (light, mod…)	**Rainfall** (mm)	**Other conditions relevant to the species**
Opportunistic	3/7/23	10.00-13.40	5 to 13	Moderate	0	
Sloane's Froglet	8/8/23	18.20-19.20	5 to 7	Light	0	Waxing moon
Diurnal flora and fauna surveys[1]	16/8/23	15.25-17.00	11 to 15	Calm	0	Overcast
Nocturnal fauna surveys[2]	16/8/23	18.30-19.40	5 to 9	Calm	0	Overcast, No moon

Survey undertaken	**Date**	**Time**	**Temperature** (min. & max. °C)	**Wind** (light, mod…)	**Rainfall** (mm)	**Other conditions relevant to the species**
Sloane's Froglet	22/8/23	18.30-19.20	7 to 10	Light	0.2	Overcast, waning moon
Sloane's Froglet	29/8/23	18.40-19.30	14 to 18	Calm	0	Slight overcast, full moon
Diurnal flora and fauna surveys[1]	19/9/23	16.40-18.00	27 to 30	Calm	0	Slight overcast
Nocturnal fauna surveys[2]	19/9/23	19.05-20.00	20 to 25	Calm	0	Slight overcast, waning moon
Diurnal flora and fauna surveys[1]	17/10/23	16.50-18.10	15 to 17	Light	0.1	Slight overcast
Nocturnal fauna surveys[2]	17/10/23	20.15-21.15	10 to 12	Calm	0	Slight overcast, waxing moon
Diurnal flora and fauna surveys[1]	14/11/23	17.00-18.50	18 to 20	Moderate	0	Overcast
Nocturnal fauna surveys[2]	14/11/23	20.40-21.40	13 to 15	Light	0	Overcast, no moon
Diurnal flora and fauna surveys[1]	12/12/23	17.15-19.00	30 to 33	Light	0.1	Slightly overcast
Nocturnal fauna surveys[2]	12/12/23	21.10-22.05	26 to 28	Light	0	No moon

1. Mossgiel Daisy, *Austrostipa wakoolica*, Slender Darling Pea, Small Purple-pea and Silky Swainson-pea;
2. Barking Owl, Masked Owl, Major Mitchell's Cockatoo, Flame Robin, Scarlet Robin, Gang-gang Cockatoo, Squirrel Glider, Yellow-bellied Sheathtail-bat, Little Pied Bat and Corben's Long-eared Bat.

2.6 Limitations

The survey program developed is considered to have few limitations:

- Flora survey effort exceeds the guidelines in terms of number of survey occasions;
- Squirrel Glider, woodland bird and owl survey effort also exceeds the guidelines in terms of number of survey occasions;
- Notwithstanding that many bird species had been eliminated for targeted survey because of habitat constraint assessment, these species will also be surveyed for;
- Sloane's Froglet surveys were conducted despite there being no potential primary habitat;
- The use of audio capture should provide a considerable extension in data collection and the number of species detected at the site.

3. Site context

3.1 Assessment area

The assessment area, which includes the subject land and the area of land within the 1,500 metre buffer zone surrounding the subject land for site-based development, can be seen in Figure 2 (Location Map).

3.2 Landscape features

Landscape features identified within the subject land and assessment area are shown on Figure 1 Site Map and Figure 2 Location Map, respectively. A discussion of relevant landscape features is provided below.

3.2.1 IBRA bioregions and IBRA subregions

The assessment area is wholly within the *NSW South Western Slopes* IBRA Region and *Lower Slopes* IBRA Subregion (see Figure 1 Site Map and Figure 2 Location Map).

3.2.2 Rivers, streams, estuaries and wetlands

There are two defined 1st order streams and one defined 2nd order stream (Petries Creek to the west of the area) draining the flat plains adjacent to the proposed development area (see Figure 1 Site Map); these streams are terminal watercourses that all drain towards Gum Swamp, 4 km to the north.

There are no wetlands within 4 km upstream or downstream of the proposed development area.

3.2.3 Habitat connectivity

The two vegetation zones of the proposed development area are not directly connected to any other remnant vegetation. Zone 1 is within 100 m of remnant vegetation associated with the large remnant block on private land to the north-east; the areas in between are dominated by non-native vegetation.

Petries Creek to the east does connect with continuous native vegetation to the large Gum Swamp Reserve 4 km north of the site; however, this creek corridor is 1.5 km to the west of the site, and there is no vegetation connectivity to it (see Figure 2 Location Map, and Figure 7 Native vegetation extent).

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

There are no karst, caves, crevices, cliffs, rocks or other geological features of significance within the subject land and assessment area.

3.2.5 Areas of outstanding biodiversity value

There are no areas of outstanding biodiversity value, as identified under the BC Act, within proximity to the subject land and assessment area.

3.2.6 NSW (Mitchell) landscape

The proposed development area is wholly NSW (Mitchell) landscape *Brokong Plains*; however, there is a boundary with NSW (Mitchell) landscape *Burrumbuttock Hills and Footslopes* to the east of the proposed development area (see Figure 1 Site Map and Figure 2 Location Map).

3.3 Native vegetation cover

The majority of the native vegetation cover within the assessed area is wholly associated with two large remnant blocks on private land to the north-east and south-west of the proposed development area; the remainder of the buffer area has been predominantly cleared for residential development or agriculture.

Table 2 summarises the extent of native vegetation cover within the assessment area.

Figure 2 Location Map shows native vegetation cover within the assessment area.

The two vegetation zones of the proposed development area are not directly connected to any other remnant vegetation. Zone 1 is within 100 m of remnant vegetation associated with the large remnant block on private land to the north-east; the areas in between are dominated by non-native vegetation (see Figure 7 Native vegetation extent).

Table 2 Native vegetation cover in the assessment area

Assessment area (ha)	707
Total area of native vegetation cover (ha)	108
Percentage of native vegetation cover (%)	15
Class (0-10, >10-30, >30-70 or >70%)	>10-30

4. Native vegetation, threatened ecological communities and vegetation integrity

4.1 Native vegetation extent

The proposed development area of 11.8 ha maintains approximately 5.6 ha of native vegetation across two vegetation zones.

The extent of native vegetation and non-native (cleared) vegetation was determined by field assessment of the entire proposed development area on the 3rd July 2024 (see Figure 7 Native vegetation extent).

4.1.1 Changes to the mapped native vegetation extent

Based on mapped PCTs, the proposed development area contained patches of Plant Community Type (PCT) 76 - *Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions* (see Figure 6 Mapped PCTs; DPE 2024h).

However, ground-truthing revealed that while there were large areas of modified PCT 76, the presence of mature Blakely's Red Gum individuals in some sections of the site indicated that there were also areas of PCT 278 - *Riparian Blakely's Red Gum - box - shrub - sedge -*

grass tall open forest of the central NSW South Western Slopes Bioregion (DPE 2024h) interspersed with PCT 76, with the dominant current presence of Western Grey Box likely to signify areas of former PCT 76, and the dominant current presence of Blakely's Red Gum likely to signify the former presence of PCT 278 (see Figure 8 Verified PCTs).

PCT 278 is definitively present along the northern road reserve of Walla Walla Road adjacent to the proposed development area; a small section at the eastern end of this corridor is a likely loss with the establishment of a road access point to Walla Walla Road for the development (see Figure 8 Verified PCTs).

4.1.2 Areas that are not native vegetation

As indicated, an area of 5.77 ha of native vegetation is found within the proposed development area.

For many decades the property has been utilised for stock grazing and/or fodder production; this past and current land use is reflected in the composition; the assessed site has been divided into two similar sized paddocks with an east-west fence.

The balance of the proposed development site – an area of approximately 6.12 ha - is dominated by introduced ground layer species that are typical opportunistic pasture species, such as Wild Oat (*Avena fatua*), Soft Brome *(Bromus mollis*), Cat's Ear (*Hypochaeris radicata*), Onion-grass (*Romulea rosea*), Barley Grass (*Hordeum leporinum*), White Clover (*Trifolium repens*), Subterranean Clover (*T. subterraneum*), Great Brome (*Bromus diandrus*) and Wimmera Ryegrass (*Lolium rigidum*)(seasonally up to 90 % projective foliage cover); there are no indigenous native species present in these areas. In the southern paddock, there is a relatively high density of the self-sown pasture legume Lucerne (*Medicago sativa*) from past fodder cropping.

On this basis, the remainder of the proposed development area was determined to be non-native (cleared) vegetation (see Figure 9 Vegetation Zones), and is best considered as PCT 0.

4.2 Plant community types

4.2.1 Overview

Vegetation within the subject land has been assessed as aligning with the BioNet Vegetation Classification PCTs identified within Table 3 and its extent is shown in Figure 8 Plant community types. Detailed descriptions of each PCT are provided in the following subsections.

Table 3 PCTs identified within the subject land

PCT ID	PCT name	Subject land area (ha)
76	*Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions*	5.695
278	*Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion*	0.084
	Total area	**5.77**

4.2.2 PCT 76 - Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions

4.2.2.1 PCT overview

Table 4a outlines the BioNet Vegetation Classification for PCT ID, name, vegetation formation, vegetation class and per cent cleared value, and other data obtained for the subject land.

Table 4a ***PCT 76 - Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions***

PCT ID	76
PCT name	*Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions*
Vegetation formation	Grassy Woodlands
Vegetation class	Floodplain Transition Woodlands
Per cent cleared value (%)	92
Extent within subject land (ha)	5.695

There are two large patches of derived native grassland found across the proposed development area, one in the northern half of the site, and one in the south-western corner (see Figure 8 Verified PCTs and Figure 14 Location and species of assessed trees and native vegetation patches), neither of which contain any native shrub individuals and these patches contain a relatively low diversity of indigenous species, such as Snowgrass (*Poa sieberiana*), Curly Windmill Grass (*Enteropogon acicularis*), Brown's Love Grass (*Eragrostis brownii*), Brown-back Wallaby Grass (*Rytidosperma duttonianum*), Ringed Wallaby Grass (*R. caespitosum*), Hairy Panic (*Panicum effusum*) and Blown Grass (*Lachnagrostis filiformis*) at a moderate abundance (up to 40 % projective foliage cover), with a variable abundance of Soft Brome, Cat's Ear, Barley Grass, White Clover, Subterranean Clover, Great Brome and Wimmera Ryegrass (seasonally up to 70 % projective foliage cover)(DPE 2024h).

These patches maintain embedded scattered mature Western Grey Box – and some Blakely's Red Gum, and are modified representatives of PCT 76.

The patches within the proposed development area contain an indigenous litter layer of between 30 and 40 % cover, no fallen woody material or log material, a litter layer of around 15 % cover, and a seasonal exotic ground layer of around 50 to 60 % cover..

In summary, PCT 76 within the proposed development area retains a number scattered old, hollow-bearing trees, no tree recruits or shrub layer, embedded within a low diversity derived native grassland, that sustains an abundant seasonal exotic cover; the PCT within the area is a low quality example of the PCT.

Photo 1 **Modified *PCT 76 - Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions* at the proposed development area (Image taken by the author 3/7/23).**

4.2.3 PCT 278 - Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion

4.2.3.1 PCT overview

Table 4b outlines the BioNet Vegetation Classification for PCT ID, name, vegetation formation, vegetation class and per cent cleared value, and other data obtained for the subject land.

Table 5b ***PCT 278 - Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion***

PCT ID	278
PCT name	*Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion*
Vegetation formation	Grassy Woodlands
Vegetation class	Western Slopes Grassy Woodland
Per cent cleared value (%)	80
Extent within subject land (ha)	0.08

Along the northern road reserve of Walla Walla Road, a more-or-less continuous cover of mixed-age Blakely's Red Gum can be found. There are also some recruits from the roadside vegetation found on the freehold land (the proposed development area), in close proximity to the fence line. There is no shrub layer along this road reserve, and the ground layer vegetation is wholly introduced species such as Paspalum (*Paspalum dilitatum*), Wild Oat, Soft Brome, Onion-grass, Great Brome, and Wimmera Ryegrass.

This roadside vegetation is a modified representative of PCT 278.

Photo 2 **Modified *PCT 278 - Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion* along the Walla Walla Road reserve and the immediate adjacent areas on freehold land (Image taken by the author 3/7/23).**

4.2.4 Condition states

There is only one condition state of the native vegetation found across the two vegetation zones within the proposed development area – and that is of highly modified woodland.

4.2.5 Justification of PCT selection

PCT 76 is mapped across the site (DPE 2024h), and while the extent of this PCT across the site is greater than mapped, the PCT is still clearly present as derived native grassland with embedded scattered trees of Western Grey Box, and some Blakely's Red Gum.

PCT 278 is not mapped within several kilometres of the proposed development site (DPE 2024h); however, given the low-lying landscape position of the proposed development site and the structural and likely composition similarity of the area to the benchmark for PCT 278 (i.e. only Blakely's Red Gum present, and not in a mixed woodland of Yellow Box and/or White Box individuals), the selection of this PCT was both logical and appropriate.

4.2.6 Alignment with TECs

PCT 76 is associated with the TEC *Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions* (DPE 2024d).

PCT 278 is associated with the TEC *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland* (DPE 2024d).

4.2.7 Alignment with EPBC Act listed ECs

According to the MNES generated for a 10 km radius around the subject land (DCCEEW 2023; Appendix C), there are three ECs listed under the EPBC Act within the BioNet Vegetation Classification:

- Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia;
- Weeping Myall Woodlands;
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.

Given the evidence provided through Section 4.2.2, the PCTs within the subject land (PCTs 76 and 278) are associated with any two of these ECs; PCT 76 has clear associations with Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia and Poplar Box Grassy Woodland on Alluvial Plains EC, while PCT 278 has clear associations with White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland EC.

4.3 Threatened ecological communities

As indicated in Section 4.2.6, there are two PCTs with associations to TECs present within the subject land.

4.4 Vegetation zones

It was determined that a total of 5.77 ha of native vegetation is found as two vegetation zones of modified TECs within the development footprint – including 20 hollow-bearing trees

- will be removed (Zone 1 is two patches of a total of 5.695 ha on the freehold land, and Zone 2 is an area of 0.084 ha across the southern boundary of the freehold land and the Walla Walla Road reserve).

Vegetation Zone 1 was distributed over two discrete areas of 4.30 and 1.40 ha separated by only 25 m; as these patches highly uniform in composition and structure, these areas were treated as one zone. Two BAM plots were placed within the larger area, and one BAM plot located centrally in the smaller area (see Figure 6 Field survey locations, Figure 8 Verified Plant Community Types, and Figure 9 Vegetation Zones).

Vegetation Zone 2 is effectively a narrow, linear tree corridor along the northern road reserve of Walla Walla Road with some trees in close proximity to the fence line that have recruited from the corridor, and a BAM plot was placed at the eastern end of this zone where the proposed road access point to Walla Walla Road is to be located (see Figure 6 Field survey locations, Figure 8 Verified Plant Community Types, and Figure 9 Vegetation Zones).

Table 6 Vegetation zones and patch sizes

Vegetation zone ID	PCT ID number and name	Condition / other defining feature	Area (ha)	Patch size class	No. vegetation integrity plots required	No. vegetation integrity plots completed	No. vegetation integrity plots used in assessment	Plot IDs of vegetation integrity plots used in assessment
1	PCT 76 - Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	Modified	5.5	6-<25 ha	3	3	3	Modified_1, Modified_2, Modified_3
2	PCT 278 - Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion	Modified	0.08	<5 ha	1	1	1	Modified_4

4.5 Vegetation integrity (vegetation condition)

4.5.1 Vegetation integrity survey plots

In accordance with Table 3 of the BAM (DPE 2020) and the area of Zone 1 being between > 5 ha, and the area of Zone 2 being < 2 ha, three BAM plots were established in Zone 1, and one BAM plot was established in Zone 2 on the 16th August 2023.

Vegetation Zone 1 was distributed over two discrete areas of 4.30 and 1.40 ha separated by only 25 m; as these patches highly uniform in composition and structure, these areas were treated as one zone. Two BAM plots were placed within the larger area, and one BAM plot located centrally in the smaller area (see Figure 6 Field survey locations and Figure 8 Verified Plant Community Types).

Vegetation Zone 2 is effectively a narrow, linear tree corridor along the northern road reserve of Walla Walla Road with some trees in close proximity to the fence line that have recruited from the corridor, and a BAM plot was placed at the eastern end of this zone where the proposed road access point to Walla Walla Road is to be located (see Figure 6 Field survey locations and Figure 8 Verified Plant Community Types).

BAM plots were located to ensure representative assessment of vegetation zones, with two of the four plots including hollow-bearing trees to adequately represent the scattered trees and low density across the site, and to make sure all attributes relevant to the vegetation zones were captured, in accordance with the BAM (Sec. 4.3.4; DPE 2020).

4.5.2 Scores

The condition scores and Vegetation Integrity Score for the two vegetation zones within the subject land is shown in Table 4.

Table 7 Vegetation integrity scores

Vegetation zone ID	Composition condition score	Structure condition score	Function condition score	Vegetation integrity score	Hollow bearing trees present?
1	23.4	42.9	2.3	13.1	Yes
2	3.2	32.8	5.1	8.1	Yes

4.5.3 Use of benchmark data

The benchmark data for PCT 76 and 278 within the BioNet Vegetation Classification (DPE 2023h) were used to assess vegetation integrity attributes for the two vegetation zones.

5. Habitat suitability for threatened species

5.1 Identification of threatened species for assessment

5.1.1 Ecosystem credit species

Table 7 shows the twenty seven Ecosystem credit species likely to occur on or use the two vegetation zones within the subject land as automatically populated in BAM-C.

Twenty five threatened species have been retained for further assessment; White-bellied Sea-eagle was not confirmed as a Candidate Threatened Species in the BAM-C, because the subject land does not contain any suitable riparian habitat for the species, and there is at least 15 km to the closest suitable riparian habitat, and Glossy Black Cockatoo was also not confirmed as a Candidate Threatened Species in the BAM-C as the species prefers habitats with Casuarina and Allocasuarina species present.

Table 8 Predicted ecosystem credit species

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain class
		BC Act	EPBC Act						
Dusky Woodswallow	*Artamus cyanopterus cyanopterus*	V	Not listed	No	BAM-C	Yes	N/A	Vegetation Zone 1, PCT 76 Vegetation Zone 2, PCT 278	Moderate
Gang-gang Cockatoo	*Callocephalon fimbriatum*	V	E	Yes	BAM-C	Yes	N/A	Vegetation Zone 1, PCT 76 Vegetation Zone 2, PCT 278	Moderate
Glossy Black Cockatoo	*Calyptorhynchus latham*	V	V	Yes	BAM-C	No	Habitat constraint – absence of Allocasuarina and Casuarina species	Vegetation Zone 1, PCT 76 Vegetation Zone 2, PCT 278	High

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain class
		BC Act	EPBC Act						
Brown Treecreeper (eastern subspecies)	*Climacteris picumnus victoriae*	V	Not listed	No	BAM-C	Yes	N/A	Vegetation Zone 1, PCT 76 Vegetation Zone 2, PCT 278	High
Spotted Harrier	*Circus assimilis*	V	Not listed	No	BAM-C	Yes	N/A	Vegetation Zone 1, PCT 76 Vegetation Zone 2, PCT 278	Moderate
Little Pied Bat	*Chalinolobus picatus*	V	Not listed	No	BAM-C	Yes	N/A	Vegetation Zone 1, PCT 76 Vegetation Zone 2, PCT 278	High
Speckled Warbler	*Chthonicola sagittata*	V	Not listed	No	BAM-C	Yes	N/A	Vegetation Zone 1, PCT 76 Vegetation Zone 2, PCT 278	Moderate
Varied Sittella	*Daphnoenositta chrysoptera*	V	Not listed	No	BAM-C	Yes	N/A	Vegetation Zone 1, PCT 76 Vegetation Zone 2, PCT 278	Moderate
Spotted-tailed Quoll	*Dasyurus maculatus*	V	E	No	BAM-C	Yes	N/A	Vegetation Zone 1, PCT 76 Vegetation Zone 2, PCT 278	High

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain class
		BC Act	EPBC Act						
Painted Honeyeater	*Grantiella picta*	V	V	No	BAM-C	Yes	N/A	Vegetation Zone 1, PCT 76 Vegetation Zone 2, PCT 278	Moderate
Grey Falcon	*Falco hypoleucos*	V	V	No	BAM-C	Yes	N/A	Vegetation Zone 1, PCT 76 Vegetation Zone 2, PCT 278	Moderate
White-bellied Sea-eagle	*Haliaeetus leucogaster*	V	Not listed	Yes	BAM-C	No	Habitat constraints – not within proximity to a waterbody – not within 1 km of a river, lake, large dam or creek, wetland or coastline	Vegetation Zone 1, PCT 76 Vegetation Zone 2, PCT 278	High
Swift Parrot	*Lathamus discolor*	E	CE	Yes	BAM-C	Yes	N/A	Vegetation Zone 1, PCT 76 Vegetation Zone 2, PCT 278	Moderate
Major Mitchell's Cockatoo (foraging)	*Lophochroa leadbeateri*	V	Not listed	Yes	BAM-C	Yes	N/A	Vegetation Zone 1, PCT 76 Vegetation Zone 2, PCT 278	Moderate
Hooded Robin (south-eastern form)	*Melanodryas cucullata*	V	Not listed	No	BAM-C	Yes	N/A	Vegetation Zone 1, PCT 76 Vegetation Zone 2, PCT 278	Moderate

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain class
		BC Act	EPBC Act						
Turquoise Parrot	*Neophema pulchella*	V	Not listed	No	BAM-C	Yes	N/A	Vegetation Zone 1, PCT 76 Vegetation Zone 2, PCT 278	High
Square-tailed Kite	*Lophoictinia isura*	V	Not listed	Yes	BAM-C	Yes	N/A	Vegetation Zone 1, PCT 76 Vegetation Zone 2, PCT 278	Moderate
Black-chinned Honeyeater	*Melithreptus gularis gularis*	V	Not listed	No	BAM-C	Yes	N/A	Vegetation Zone 1, PCT 76 Vegetation Zone 2, PCT 278	Moderate
Barking Owl	*Ninox connivens*	V	Not listed	Yes	BAM-C	Yes	N/A	Vegetation Zone 1, PCT 76 Vegetation Zone 2, PCT 278	High
Scarlet Robin	*Pteroica phoenicea*	V	Not listed	No	BAM-C	Yes	N/A	Vegetation Zone 1, PCT 76 Vegetation Zone 2, PCT 278	Moderate
Superb Parrot	*Polytelis swainsonii*	V	V	Yes	BAM-C	Yes	N/A	Vegetation Zone 1, PCT 76 Vegetation Zone 2, PCT 278	Moderate

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain class
		BC Act	EPBC Act						
Grey-headed Flying-fox	*Pteropus poliocephalus*	V	V	Yes	BAM-C	Yes	N/A	Vegetation Zone 1, PCT 76 Vegetation Zone 2, PCT 278	High
Flame Robin	*Petroica phoenicea*	V	Not listed	No	BAM-C	Yes	N/A	Vegetation Zone 1, PCT 76 Vegetation Zone 2, PCT 278	Moderate
Masked Owl	*Tyto novaehollandiae*	V	Not listed	Yes	BAM-C	Yes	N/A	Vegetation Zone 1, PCT 76 Vegetation Zone 2, PCT 278	High
Grey-crowned Babbler (eastern subspecies)	*Pomatostomus temporalis temporalis*	V	Not listed	No	BAM-C	Yes	N/A	Vegetation Zone 1, PCT 76 Vegetation Zone 2, PCT 278	Moderate
Yellow-bellied Sheathtail-bat	*Saccolaimus flaviventris*	V	Not listed	No	BAM-C	Yes	N/A	Vegetation Zone 1, PCT 76 Vegetation Zone 2, PCT 278	Moderate
Diamond Firetail	*Stagonogleura guttata*	V	Not listed	No	BAM-C	Yes	N/A	Vegetation Zone 1, PCT 76 Vegetation Zone 2, PCT 278	Moderate

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain class
		BC Act	EPBC Act						
Black Falcon	*Falco subniger*	V	Not listed	No	BAM-C	Yes	N/A	Vegetation Zone 1, PCT 76 Vegetation Zone 2, PCT 278	Moderate
Little Eagle	*Haliaeetus morphonoides*	V	Not listed	Yes	BAM-C	Yes	N/A	Vegetation Zone 1, PCT 76 Vegetation Zone 2, PCT 278	Moderate
White-throated Needletail	*Hirundapus caudacutus*	Not listed	V	No	BAM-C	Yes	N/A	Vegetation Zone 1, PCT 76 Vegetation Zone 2, PCT 278	High

5.1.2 Species credit species

Table 9 (flora) or Table 10 (fauna) lists all predicted species credit species automatically populated by the BAM-C.

There are nine listed predicted flora species credit species.

Of the 9 listed threatened flora species in Table 10, five have been retained for further assessment; Mossgiel Daisy, Sand-hill Spider Orchid, Pine Donkey Orchid and Spike-rush were discarded for the reasons described.

Table 9 Predicted flora species credit species

Common name	Scientific name	Listing status		Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act				
A spear-grass	*Austrostipa wakoolica*	E	E	BAM-C	Yes	N/A	Vegetation Zone 1, PCT 76 Vegetation Zone 2, PCT 278
Mossgiel Daisy	*Brachsycome papillosa*	V	V	BAM-C	No	Geographic limitation – site is outside of known distribution	
Sand-hill Spider Orchid	*Caladenia arenaria*	E	E	BAM-C	No	Habitat constraint – site is a flat alluvial plain, not a sand-hill, which is the preferred habitat	
Pine Donkey Orchid	*Diuris tricolor*	V	Not listed	BAM-C	No	Habitat constraint – preferred habitat is Cypress-pine forests and woodlands	

Common name	Scientific name	Listing status		Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act				
Spike-rush	*Eleocharis obicis*	V	V	BAM-C	No	Habitat constraint – preferred habitat is semi-permanent/ephemeral wet areas or periodically waterlogged sites	
Spiny Peppercress	*Lepidium aschersonii*	V	V	BAM-C	Yes	N/A	Vegetation Zone 1, PCT 76 Vegetation Zone 2, PCT 278
Slender Darling Pea	*Swainsona murrayana*	V	V	BAM-C	Yes	N/A	Vegetation Zone 1, PCT 76 Vegetation Zone 2, PCT 278
Small Purple-pea	*Swainsona recta*	E	E	BAM-C	Yes	N/A	Vegetation Zone 1, PCT 76 Vegetation Zone 2, PCT 278
Silky Swainson-pea	*Swainsona sericea*	E	E	BAM-C	Yes	N/A	Vegetation Zone 1, PCT 76 Vegetation Zone 2, PCT 278

There are seventeen listed predicted fauna species credit species.

Of the 17 listed threatened fauna species in Table 9, 11 have been retained for further assessment, and Glossy Black Cockatoo Riverina population, Pink-tailed Legless Lizard, Bush-stone Curlew, Sloane's Froglet, White-bellied Sea-eagle and Squirrel Glider – endangered population in the Wagga Wagga LGA, have been discarded for the reasons described.

Table 10 Predicted fauna species credit species

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
Glossy Black-Cockatoo, Riverina population	*Calyptorhynchus lathami* - endangered population	V	V	Yes	BAM-C	No	Geographic limitation – site is found outside known LGAs of distribution	
Glossy Black-Cockatoo (breeding)	*Calyptorhynchus lathami* - endangered population	V	V	Yes	BAM-C	Yes	N/A	Vegetation Zone 1, PCT 76 Vegetation Zone 2, PCT 278
Pink-tailed Legless Lizard	*Aprasia parapulchella*	V	V	No	BAM-C	No	Habitat constraint – species prefers rocky areas	
Bush Stone-curlew	*Burhinus grallarius*	E	Not listed	No	BAM-C	No	Habitat constraint – species requires standing/fallen dead timber including logs	

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
Gang-gang Cockatoo	*Callocephalon fimbriatum*	V	E	Yes	BAM-C	Yes	N/A	Vegetation Zone 1, PCT 76 Vegetation Zone 2, PCT 278
Sloane's Froglet	*Crinia sloanei*	V	E	No	BAM-C	No	Habitat constraint – species prefers semi-permanent/ephemeral wet areas, and areas with relatively shallow sections with submergent and emergent vegetation, or within 500 m of wet area/swamp	
White-bellied Sea-eagle	*Haliaeetus leucogaster*	V	Not listed	Yes	BAM-C	No	Subject land does not contain any suitable habitat trees for the species, and there is at least 4 km to the closest suitable habitat.	
Little Eagle	*Haliaeetus morphonoides*	V	Not listed	Yes	BAM-C	Yes	N/A	Vegetation Zone 1, PCT 76 Vegetation Zone 2, PCT 278

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
Swift Parrot	*Lathamus discolor*	E	CE	No	BAM-C	Yes	N/A	Vegetation Zone 1, PCT 76 Vegetation Zone 2, PCT 278
Major Mitchell's Cockatoo (foraging)	*Lophochroa leadbeateri*	V	Not listed	Yes	BAM-C	Yes	N/A	Vegetation Zone 1, PCT 76 Vegetation Zone 2, PCT 278
Barking Owl (breeding)	*Ninox connivens*	V	Not listed	Yes	BAM-C	Yes	N/A	Vegetation Zone 1, PCT 76 Vegetation Zone 2, PCT 278
Squirrel Glider	*Petaurus norfolcensis*	V	Not listed	No	BAM-C	Yes	N/A	Vegetation Zone 1, PCT 76 Vegetation Zone 2, PCT 278
Squirrel Glider – endangered population in the Wagga Wagga LGA	*Petaurus norfolcensis*	Endangered population	Not listed	No	BAM-C	No	Geographic limitation – site not in Wagga Wagga LGA	

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
Koala	*Phascolarctus cinereus*	E	E	No	BAM-C	Yes	N/A	Vegetation Zone 1, PCT 76 Vegetation Zone 2, PCT 278
Superb Parrot	*Polytelis swainsonii*	V	V	Yes	BAM-C	Yes	N/A	Vegetation Zone 1, PCT 76 Vegetation Zone 2, PCT 278
Grey-headed Flying-fox	*Pteropus poliocephalus*	V	V	Yes	BAM-C	Yes	N/A	Vegetation Zone 1, PCT 76 Vegetation Zone 2, PCT 278
Masked Owl (breeding)	*Tyto novaehollandiae*	V	Not listed	Yes	BAM-C	Yes	N/A	Vegetation Zone 1, PCT 76 Vegetation Zone 2, PCT 278

5.2 Presence of candidate species credit species

Table 11 (flora) or Table 12 (fauna) identify the candidate threatened species assumed to be present within the subject land; no threatened species have been assumed to present at the site, as targeted threatened species surveys have been undertaken to evaluate the presence of all retained candidate threatened species.

Table 11 Determining the presence of candidate flora species credit species on the subject land

Common name	Scientific name	Listing status		Method used to determine presence	Present?	Further assessment required? (BAM Subsections 5.2.5 and 5.2.6)
		BC Act	EPBC Act			
None						

Table 12 Determining the presence of candidate fauna species credit species on the subject land

Common name	Scientific name	Listing status		Method used to determine presence	Present ?	Further assessment required?
		BC Act	EPBC Act			
None						

5.3 Threatened species surveys

The details of the targeted threatened species survey used to determine presence of the candidate threatened species can be seen in Table 12.

There were targeted threatened species surveys conducted to determine presence of five candidate threatened flora species and 11 candidate threatened fauna species.

There were also targeted threatened species surveys conducted simultaneously for a further 11 threatened fauna species that had been discarded due to geographic or habitat constraints based on the conservative principle.

The only threatened species recorded on-site was Gang-gang Cockatoo (detected by the audio capture device), which is a Candidate threatened species.

Table 13 Threatened species surveys for candidate species credit species on the subject land

Common name	Scientific name	Threatened flora species surveys			Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)
		Survey method (transects or grids)	**Timing of survey – within recommended period?** (BAM-C / TBDC)	**Effort** (hours & no. people)		
Retained Candidate threatened species						

Common name	Scientific name	Threatened flora species surveys				Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)
		Survey method (transects or grids)	**Timing of survey – within recommended period?** (BAM-C / TBDC)		**Effort** (hours & no. people)		
A spear-grass	*Austrostipa wakoolica*	Grid	Yes	Yes	9 hours with 1 person across 12 ha	No	No
Spiny Peppercress	*Lepidium aschersonii*	Grid	Yes	Yes	9 hours with 1 person across 12 ha	No	No
Slender Darling Pea	*Swainsona murrayana*	Grid	Yes	Yes	9 hours with 1 person across 12 ha	No	No
Small Purple-pea	*Swainsona recta*	Grid	Yes	Yes	9 hours with 1 person across 12 ha	No	No
Silky Swainson-pea	*Swainsona sericea*	Grid	Yes	Yes	9 hours with 1 person across 12 ha	No	No
Glossy Black-Cockatoo (breeding)	*Calyptorhynchus lathami* - endangered population	Diurnal survey plots, Diurnal call recording	Yes	Yes	2.5 hours of survey over 5 days, 118 days with one centrally located device	No	No
Gang-gang Cockatoo	*Callocephalon fimbriatum*	Diurnal survey plots, Diurnal call recording	Yes	Yes	2.5 hours of survey over 5 days, 118 days with one centrally located device	Yes	No
Little Eagle	*Haliaeetus morphonoides*	Diurnal survey plots, Diurnal call recording	Yes	Yes	2.5 hours of survey over 5 days, 118 days with one centrally located device	No	No
Swift Parrot	*Lathamus discolor*	Diurnal survey plots, Diurnal call recording	Yes	Yes	2.5 hours of survey over 5 days, 118 days with one centrally located device	Yes	No
Major Mitchell's Cockatoo (foraging)	*Lophochroa leadbeateri*	Diurnal survey plots, Diurnal call recording	Yes	Yes	2.5 hours of survey over 5 days, 118 days with one centrally located device	Yes	No
Barking Owl (breeding)	*Ninox connivens*	Nocturnal call recording, nocturnal survey of every tree on site, call playback	Yes	Yes	117 nights with one centrally located device, 4 hours of survey over 5 days, including call playback on 5 separate occasions	No	No

Common name	Scientific name	Threatened flora species surveys				Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)
		Survey method (transects or grids)	**Timing of survey – within recommended period?** (BAM-C / TBDC)		**Effort** (hours & no. people)		
Squirrel Glider	*Petaurus norfolcensis*	Nocturnal survey of every tree on site,	Yes	Yes	4 hours of survey over 5 days	No	No
Koala	*Phascolarctus cinereus*	Diurnal survey of every tree on site, nocturnal survey of every tree on site	Yes	Yes	8 hours of survey over 5 days	No	No
Superb Parrot	*Polytelis swainsonii*	Diurnal survey plots, Diurnal call recording	Yes	Yes	2.5 hours of survey over 5 days, 118 days with one centrally located device	Yes	No
Grey-headed Flying-fox	*Pteropus poliocephalus*	Diurnal survey of every tree on site, nocturnal survey of every tree on site	Yes	Yes	8 hours of survey over 5 days	No	No
Masked Owl (breeding)	*Tyto novaehollandiae*	Nocturnal call recording, nocturnal survey of every tree on site, call playback	Yes	Yes	117 nights with one centrally located device, 4 hours of survey over 5 days, including call playback on 5 separate occasions	No	No
Discarded threatened species							
Flame Robin	*Petroica phoenicea*	Diurnal survey plots, Diurnal call recording	Yes	Yes	2.5 hours of survey over 5 days, 118 days with one centrally located device	Yes	No
Scarlet Robin	*Petroica boodang*	Diurnal survey plots, Diurnal call recording	Yes	Yes	2.5 hours of survey over 5 days, 118 days with one centrally located device	Yes	No
Yellow-bellied Sheathtail-bat	*Saccolaimus flaviventris*	Ultrasonic nocturnal call recording	Yes	Yes	117 nights with one centrally located device	No	No
Little Pied Bat	*Chalinolobus picatus*	Ultrasonic nocturnal call recording	Yes	Yes	117 nights with one centrally located device	No	No
Corben's Long-eared Bat	*Nyctophilus corbeni*	Ultrasonic nocturnal call recording	Yes	Yes	117 nights with one centrally located device	No	No

Common name	Scientific name	Threatened flora species surveys				Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)
		Survey method (transects or grids)	**Timing of survey – within recommended period?** (BAM-C / TBDC)		**Effort** (hours & no. people)		
Sloane's Froglet	*Crinia sloanei*	ID of habitat sites/3 site visits after dusk during breeding period/call recording	Yes	Yes	2.5 hours with 1 person	No	No
Brown Treecreeper	*Climacteris picumnus victoriae*	Diurnal survey plots, Diurnal call recording	Yes	Yes	2.5 hours of survey over 5 days, 118 days with one centrally located device	Yes	No
Hooded Robin	*Melanodryas cucullata cucullata*	Diurnal survey plots, Diurnal call recording	Yes	Yes	2.5 hours of survey over 5 days, 118 days with one centrally located device	Yes	No
Square-tail Kite	*Lophoictinia isura*	Diurnal survey plots, Diurnal call recording	Yes	Yes	2.5 hours of survey over 5 days, 118 days with one centrally located device	Yes	No
Speckled Warbler	*Chthonicola sagittata*	Diurnal survey plots, Diurnal call recording	Yes	Yes	2.5 hours of survey over 5 days, 118 days with one centrally located device	Yes	No
Diamond Firetail	*Stagonopleura guttata*	Diurnal survey plots, Diurnal call recording	Yes	Yes	2.5 hours of survey over 5 days, 118 days with one centrally located device	Yes	No

5.4 Expert reports

No expert reports have been produced.

5.5 Area or count, and location of suitable habitat for a species credit species (a species polygon)

Gang-gang Cockatoo was the only Species Credit Species recorded across the assessed area.

No Species Credit Species have been assumed to be present, as it asserted that the site was lacking landscape connectivity, and that the micro-habitats on the site had been degraded to the stage where utilisation by threatened flora and fauna was highly unlikely.

Further to this, targeted survey only identified the one Species Credit Species at the site.

A Species Polygon has been mapped for this Species Credit Species, based on their known habitat preferences (DPE 2024c) and the assessed habitats of the study area (see Section 2.1 and 4).

The derived map for this species polygon can be seen in Figure 10 – Candidate species credit species polygons.

Figure 10 reflects the following (from DPE 2024c):

- Gang-gang Cockatoo can be found in eucalypt woodland forests of south-eastern Australia. It is a seasonal altitudinal migrant where it moves from mountain forests at higher altitudes to forests at lower altitudes and coastal areas during autumn and winter. Usually seen in small groups but can form large flocks when foraging. They nest in a hollow in a trunk, or limb, of large eucalypt trees; usually near water;
- Considered suitable habitat for Gang-gang Cockatoo foraging is the majority of the 1.5 km radius buffer area around the site, excluding 'built-up' urban areas dominated by non-native vegetation.

6. Identifying prescribed impacts

Table 14 outlines the potential prescribed impacts as a consequence of the proposed development, and the justification for the identification of them as an impact or not present.

No prescribed impacts have been identified as being present with the proposed development (Table 19).

Table 14 Prescribed impacts identified.

Feature	Present	Description of feature characteristics and location	Threatened entities that use, are likely to use, or are part of the habitat feature. Where relevant, threatened species or fauna that are part of a TEC or EC, that are at risk of vehicle strike
Karst, caves, crevices, cliffs, rocks or other geological features of significance	☒ No	N/A – None were identified within the assessed area after survey.	N/A
Human-made structures	☒ No	N/A – there are no human-made structures within the subject land.	N/A
Non-native vegetation	☒ Yes	The proposed development area maintains approximately 6.2 ha of non-native vegetation within the subject land or environs; this is mostly opportunistic pasture wholly composed of herbaceous exotic ground layer species. A planted non-native tree within the freehold land, and two planted non-native street trees on Commercial Street will also be likely losses.	The only threatened species recorded on-site – Gang-gang Cockatoo – is highly unlikely to utilise the exotic ground layer vegetation or the three non-native trees, and as a consequence, it is highly unlikely that the species would be impacted by potential vehicle strike.

Feature	Present	Description of feature characteristics and location	Threatened entities that use, are likely to use, or are part of the habitat feature. Where relevant, threatened species or fauna that are part of a TEC or EC, that are at risk of vehicle strike
Habitat connectivity	☒ No	N/A – the proposed development does not result in any direct or indirect impact on any area that has been described as a habitat connector or movement corridor within the study area (see Figure 1).	N/A
Waterbodies, water quality and hydrological processes	☒ No	N/A – The closest significant waterbody or watercourse is 4 km (Gum Swamp Reserve) and 1.5 km (Petries Creek), respectively, from the Subject land.	N/A
Vehicle strikes	☒ Yes	Subject land has frontage to two public roads.	The location of the proposed development- with frontage to two major throughfares - would be problematic for vehicle strike had ground-dwelling native fauna been observed. However, the extensive surveys undertaken across the proposed development area found no evidence of any such native fauna utilising the site or its immediate environs, and in this sense, vehicle strike is highly unlikely to be a prescribed impact in the absence of any ground-dwelling native fauna. The only threatened species identified at the site – Gang-gang Cockatoo – was only recorded by audio-capture on one occasion for a period of < 5 minutes, suggesting that over a 118 day period, it was a low frequency and opportunistic visitor to the site, and that such a frequency is highly unlikely to place the species at risk due to vehicle strike.

Stage 2: Impact assessment (biodiversity values and prescribed impacts)

7. Avoid and minimise impacts

7.1 Avoid and minimise direct and indirect impacts

7.1.1 Project location

The proposed development is on the south-eastern fringe of the township of Walla Walla, with public recreational land to the immediate north and residential blocks to the west, making the site highly desirable for the location of a new small-lot residential development.

The nature of a development such as a proposed residential development with only small lots will involve major ground disturbance – including excavation - with the use of heavy machinery within the area of the proposed development footprint, with the construction of dwellings, fences, roads, kerb and channel, and provision of services and drainage (see Figure 3 Development layout and Figure 13 Proposed Development Layout). This will almost certainly result in the loss of all native vegetation within the 11.8 ha freehold section of the proposed development area, and with the road access area to the Walla Walla Road in the south of the proposed development.

Access to the proposed development area for all vehicles and machinery associated with the development will likely be through the proposed road access points from the existing entrance to the property on Walla Walla Road on the existing compacted track (20 m east of the south-eastern corner of the proposed development), and from the proposed access road area on Commercial Street will be through that runs from the south through the existing quarried areas (see Figure 3 Development layout). This existing track consists of rock, and retains no native vegetation, and Commercial Street eastern road reserve also contains no native vegetation. Therefore, based on the use of the existing access track and the Commercial Street frontage, there will not be any direct or indirect impact on areas outside of the proposed development area (see Figure 3 Development layout).

Consequently, a total of the 5.77 ha of native vegetation found as two vegetation zones of modified TECs within the development footprint – including 20 hollow-bearing trees - will be removed (Zone 1 is two patches of a total of 5.695 ha on the freehold land, and Zone 2 is an area of 0.084 ha across the southern boundary of the freehold land and the Walla Walla Road reserve); however, there will not be any direct impact on areas outside of the proposed development area, and the development avoids remnant tree cover along the remainder of Zone 2 along the Walla Walla Road reserve, and the continuation of Zone 1 in the north-eastern corner of the proposed development area (see Figure 8 Verified PCT map).

7.1.2 Project design

As indicated in Sec. 7.11, it must be noted that the proposed area was selected because it is on the south-eastern fringe of the township of Walla Walla, with public recreational land to the immediate north and residential blocks to the west, making the site highly desirable for the location of a new small-lot residential development.

While any native vegetation within the proposed footprint has been considered a loss, there will not be any direct impact on areas outside of the proposed development area, and the development avoids remnant tree cover along the remainder of Zone 2 along the Walla

Walla Road reserve, and the continuation of Zone 1 in the north-eastern corner of the proposed development area (see Figure 8 Verified PCT map).

7.2 Avoid and minimise prescribed impacts

7.2.1 Project location

There are no karst, caves, crevices, cliffs, rocks or other geological features of significance or human-made structures within the subject land.

The location of the proposed development- with frontage to two major throughfares - would be problematic for vehicle strike had ground-dwelling native fauna been observed. However, the extensive surveys undertaken across the proposed development area found no evidence of any native fauna utilising the site or its immediate environs, and in this sense, vehicle strike is highly unlikely to be a prescribed impact in the absence of any ground-dwelling native fauna.

The only threatened species identified at the site – Gang-gang Cockatoo – was only recorded by audio-capture on one occasion for a period of < 5 minutes, suggesting that over a 118 day period, it was a low frequency and opportunistic visitor to the site, and that such a frequency is highly unlikely to place the species at risk due to vehicle strike.

The two vegetation zones of the proposed development area are not directly connected to any other remnant vegetation. Zone 1 is within 100 m of remnant vegetation associated with the large remnant block on private land to the north-east; the areas in between are dominated by non-native vegetation.

Petries Creek to the east does connect with continuous native vegetation to the large Gum Swamp Reserve 4 km north of the site; however, this creek corridor is 1.5 km to the west of the site, and there is no vegetation connectivity to it (see Figure 2 Location Map, and Figure 7 Native vegetation extent).

On this basis, the proposed development site is not a connecting landscape corridor within the district, and the removal of the native vegetation at the site will have negligible impact on habitat connectivity.

7.2.2 Project design

As indicated in Sec. 7.11, it must be noted that the proposed area was selected because it is on the south-eastern fringe of the township of Walla Walla, with public recreational land to the immediate north and residential blocks to the west, making the site highly desirable for the location of a new small-lot residential development.

Given the extent of clearing within and in close proximity to the site given its location on the fringe of Walla Walla suburban area, the proposed development site is not a connecting landscape corridor within the district, and the removal of the native vegetation at the site will have negligible impact on habitat connectivity.

7.3 Summary of measures to avoid and minimise impacts

Table 15 documents the measures to avoid and minimise direct impacts.

Table 15 Avoidance and minimisation measures for direct impacts

Action	Outcome	Timing	Responsibility
Design layout to select road access points to minimise loss of habitat and impact on landscape connectivity	Selection of non-native areas and and most disturbed section of native vegetation on the periphery of the site	Planning stage	Developer
Utilisation of existing access track to provide access for vehicles and machinery during construction	Obviation of the need to establish a new access track to provide access for vehicles and machinery during construction	Planning stage	Developer

8. Impact assessment

8.1 Direct impacts

8.1.1 Residual direct impacts

Table 16 documents impacts likely to occur on the subject land after steps taken to avoid and minimise impacts (refer to Figure 11).

Table 16 Summary of residual direct impacts

Direct impact	BC Act status	EPBC Act status	SAII entity	Project phase/timing of impact	Extent (ha)
Clearance of 5.77 ha of PCT 76 and PCT 278 – including 20 hollow-bearing trees	Both PCT 76 and 278 have associated TECs	Not listed	No	This loss will occur during construction	5.77

8.1.2 Change in vegetation integrity score

Table 17 documents the change in vegetation integrity for residual direct impacts on native vegetation that were identified on the subject land.

Table 17 Impacts to vegetation integrity

Vegetation zone	PCT ID	Management zone	Area (ha)	Before development			After development			Change		
				Composition	Structure	Function	VI score	Composition	Structure	Function	VI score	Change in VI score
1	PCT 76		5.695	23.4	42.9	2.3	13.1	0	0	0	0	-13.1
2	PCT 278		0.084	3.2	32.8	5.1	8.1	0	0	0	0	-8.1

8.2 Indirect impacts

Table 18 documents residual indirect impacts that may occur on native vegetation beyond the development footprint; it is considered that it is highly unlikely that there will be any residual indirect impacts as a consequence of this proposed development (Refer to Figure Final impacts likely to occur on the subject land if indirect impacts are mapped).

Table 18 Summary of residual indirect impacts

Indirect impact	Impacted entities	Extent	Frequency	Duration	Project phase/ timing of impact	Likelihood and consequences
Loss of unintended native vegetation as a consequence of development	PCT 76 and 278	Adjacent and contiguous native vegetation	Infrequent	Short-term	Construction	Highly unlikely if appropriate site delineation measures implemented
Transport of weeds and pathogens to site that may impact adjacent native vegetation	PCT 76 and 278	Adjacent and contiguous native vegetation	Infrequent	Short-term	Construction	Highly unlikely if appropriate vehicle and equipment hygiene methods implemented during construction

8.3 Prescribed impacts

There were no prescribed impacts identified.

Justifications for their identified absence is found below.

8.3.1 Human-made structures

There are no human-made structures within the subject land.

8.3.2 Non-native vegetation

The proposed development area maintains approximately 6.2 ha of non-native vegetation within the subject land or environs; this is mostly opportunistic pasture wholly composed of herbaceous exotic ground layer species. A planted non-native tree within the freehold land, and two planted non-native street trees on Commercial Street will also be likely losses.

The only threatened species recorded on-site – Gang-gang Cockatoo – is highly unlikely to utilise the exotic ground layer vegetation or the three non-native trees, and as a consequence, it is highly unlikely that the species would be impacted by potential vehicle strike.

8.3.3 Habitat connectivity

The two vegetation zones of the proposed development area are not directly connected to any other remnant vegetation. Zone 1 is within 100 m of remnant vegetation associated with the large remnant block on private land to the north-east; the areas in between are dominated by non-native vegetation.

Petries Creek to the east does connect with continuous native vegetation to the large Gum Swamp Reserve 4 km north of the site; however, this creek corridor is 1.5 km to the west of the site, and there is no vegetation connectivity to it (see Figure 2 Location Map, and Figure 7 Native vegetation extent).

On this basis, the proposed development site is not a connecting landscape corridor within the district, and the removal of the native vegetation at the site will have negligible impact on habitat connectivity, and there will be no prescribed impact as a consequence.

8.3.4 Waterbodies, water quality and hydrological processes

The closest significant waterbody or watercourse is 4 km (Gum Swamp Reserve) and 1.5 km (Petries Creek), respectively, from the Subject land, and there will be no impact on such habitats as a consequence of this proposed development.

8.3.5 Vehicle strikes

The location of the proposed development- with frontage to two major throughfares - would be problematic for vehicle strike had ground-dwelling native fauna been observed. However, the extensive surveys undertaken across the proposed development area found no evidence of any native fauna utilising the site or its immediate environs, and in this sense, vehicle strike is highly unlikely to be a prescribed impact in the absence of any ground-dwelling native fauna.

The only threatened species identified at the site – Gang-gang Cockatoo – was only recorded by audio-capture on one occasion for a period of < 5 minutes, suggesting that over a 118 day period, it was a low frequency and opportunistic visitor to the site, and that such a frequency is highly unlikely to place the species at risk due to vehicle strike.

8.4 Mitigating residual impacts – management measures and implementation

Table 19 details proposed mitigation and management measures for defined indirect residual impacts.

Table 19 Summary of proposed mitigation and management measures for residual indirect impacts

Mitigation measure	Method/technique	Timing	Frequency	Responsibility	Likely efficacy	MNES
Site delineation	Prior to clearance, all native vegetation to be retained in proximity to the development site must be clearly identified by marker tape to ensure that there is no confusion as to the approved clearance retained native vegetation	Before construction	Once	Site supervisor	Highly likely to succeed	N/A
Vehicle and equipment hygiene	All vehicles and equipment that will enter the site must have been cleaned for potential weed seed carry-over	Before and during construction	Every new vehicle entry	Site supervisor	Highly likely to succeed	N/A

Table 19 provides further details on implementation of proposed mitigation and management measures for defined residual impacts identified in Table 18.

Table 20 Measures for mitigation and management measures for residual indirect impacts implementation

Measure/action	Monitoring and evaluation strategy	Performance criteria	Adaptive management threshold	Adaptive management response
Site delineation	Daily monitoring to ensure that unintended loss of native vegetation is not occurring	No loss of any unintended native vegetation during construction	Loss of any unintended native vegetation during construction	Immediate re-check of site delineation measures and re-implementation if required
Vehicle and equipment hygiene	Checks and established processes to ensure vehicles entering the site are appropriate cleared prior to entry of the site	No new weed introductions	New weed introduced to site	Immediate check of the integrity of the established processes to ensure vehicles entering the site are appropriate cleared prior to entry of the site. Eradication of the introduced weed.

8.5 Adaptive management strategy for uncertain impacts (where relevant)

No adaptive management strategy has been developed as there are no uncertain impacts anticipated.

9. Serious and irreversible impacts

9.1 Assessment for serious and irreversible impacts on biodiversity values

There are no potential entities at risk for Serious and Irreversible Impacts of biodiversity values as a consequence of the proposed development, according to the BAM-C (See Appendix E).

10. Impact summary

10.1 Determine an offset requirement for impacts

10.1.1 Impacts on native vegetation and TECs or ECs (ecosystem credits)

Table 21 identifies impacts on native vegetation that do not require an offset (as per BAM Subsection 9.2.1(3.)).

Table 22 identifies impacts that require an offset (as per BAM Subsection 9.2.1(1.))(Refer to Figure 12 Thresholds for assessment and offsetting impacts).

BAM-C has not determined that there are ecosystem credits generated by the proposed development (Table 21).

Table 21 Impacts that do not require offset – ecosystem credits

Vegetation zone	PCT name	TEC	Impact area (ha)	TEC association	Entity at risk of an SAII?	Current VI score
1	PCT 76 - Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	Yes	0.393	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	No	13.1
2	PCT 278 - Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion	Yes	0.159	White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	No	8.1

Table 22 Impacts that require an offset – ecosystem credits

Vegetation zone	PCT name	TEC	Impact area (ha)	Current VI score	Future VI score	Change in VI score	Biodiversity risk weighting	Number of ecosystem credits required
1	PCT 76 - Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	Yes	5.695	13.1	0	-13.1	2.5	0
2	PCT 278 - Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion	Yes	0.084	8.1	0	-8.1	2	0
							Total credits	0

10.1.2 Impacts on threatened species and their habitat (species credits)

Table 23 identifies impacts on threatened species (species credits) that require an offset (as per BAM Subsection 9.2.2(2.)).

Table 23 Impacts that require an offset – species credits

Common name	Scientific name	BC Act status	EPBC Act status	Loss of habitat (ha)	Biodiversity risk weighting	Number of species credits required
Gang-gang Cockatoo	*Callocephalon fimbriatum*	V	E	5.77	2	37
					Total credits	37

10.1.3 Indirect and prescribed impacts

There are no assessed indirect and prescribed impacts that remain after measures to avoid, minimise and mitigate have been applied - that would require offset using additional biodiversity credits.

10.2 Impacts that do not need further assessment

There are no further assessments for ecosystem credits required (as per BAM Section 9.3(1–2.).

11. Biodiversity credit report

Information on the ecosystem and species credits and matching credit profiles are found in Tables 23 and 24 below (Refer to Appendix E Credit reports).

11.1 Ecosystem credits

Table 24 Ecosystem credit class and matching credit profile

Ecosystem credit	Attributes shared with matching credits						
	PCT name	**PCT vegetation class**	**PCT vegetation formation**	**Associated TEC or EC**	**Offset trading group** (BAM Section 10.2, Tables 4 & 5)	**Hollow bearing trees present?**	**IBRA subregion** (in which proposal is located)
0	PCT 76 - *Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions*	Floodplain Transition Woodlands	Grassy Woodlands	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	N/A	Yes	Lower Slopes

Ecosystem credit	Attributes shared with matching credits						
	PCT name	**PCT vegetation class**	**PCT vegetation formation**	**Associated TEC or EC**	**Offset trading group** (BAM Section 10.2, Tables 4 & 5)	**Hollow bearing trees present?**	**IBRA subregion** (in which proposal is located)
0	PCT 278 - *Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion*	Western Slopes Grassy Woodland	Grassy Woodlands	White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	N/A	Yes	Lower Slopes

11.2 Species credits

Table 25 Species credit class and matching credit profile

Species credit	Attributes shared with matching credits				
	Name of threatened species	**Kingdom**	**BC Act status**	**EPBC Act status**	**IBRA region**
37	Gang-gang Cockatoo	Fauna	V	E	NSW South Western Slopes

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13. Figures

Figure 1 **Site Map (Image for ESRI Australia 2024). Mitchell Landscape categories are shown with purple lettering, and IBRA categories are shown with black letters. Parcel numbers are also shown. Proposed development area is in red.**

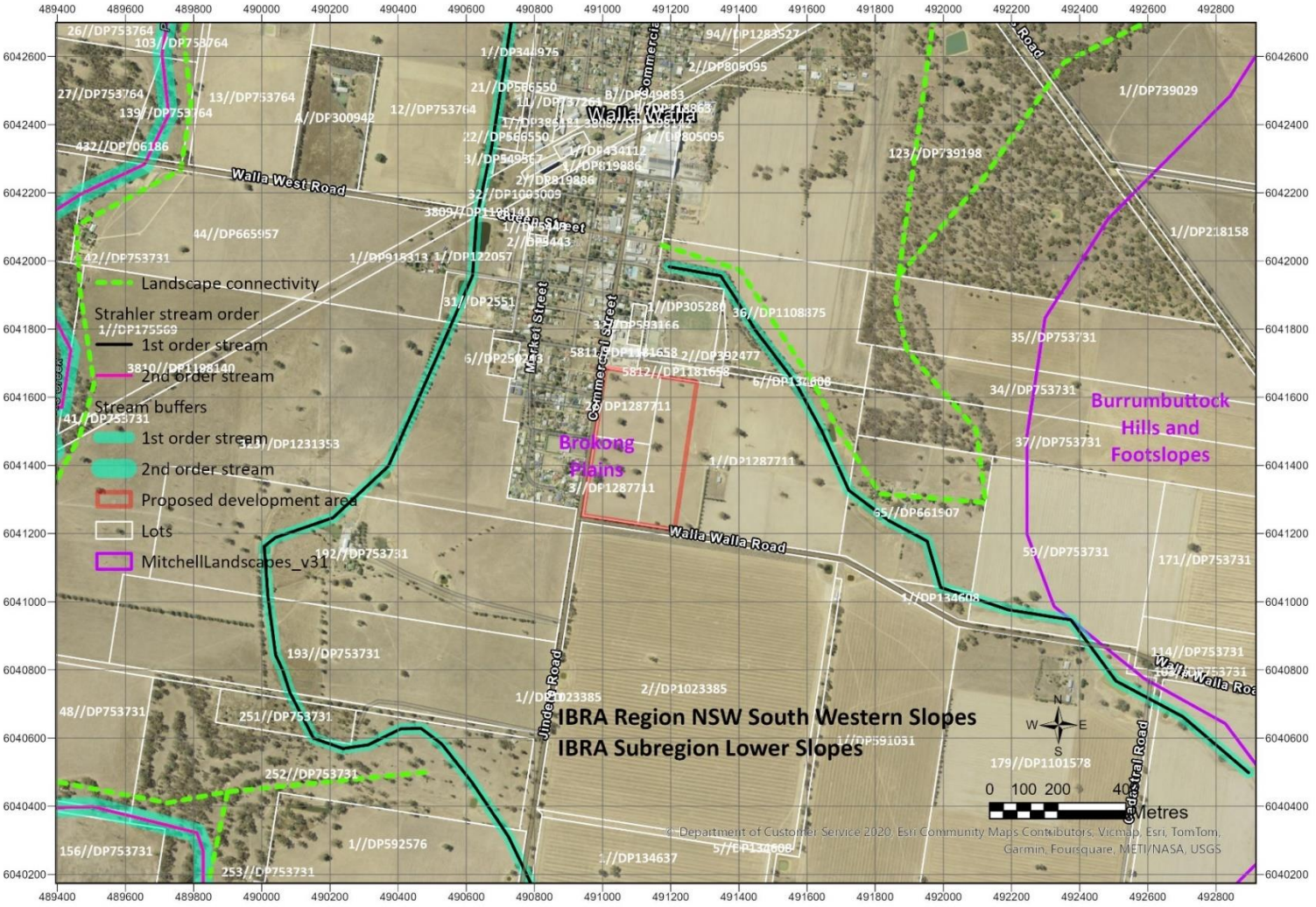


Figure 2 **Location Map, showing the 1,500 m buffer around the proposed development area (Image for ESRI Australia 2024). Mitchell Landscape categories are shown with purple lettering, and IBRA categories are shown with black letters.**

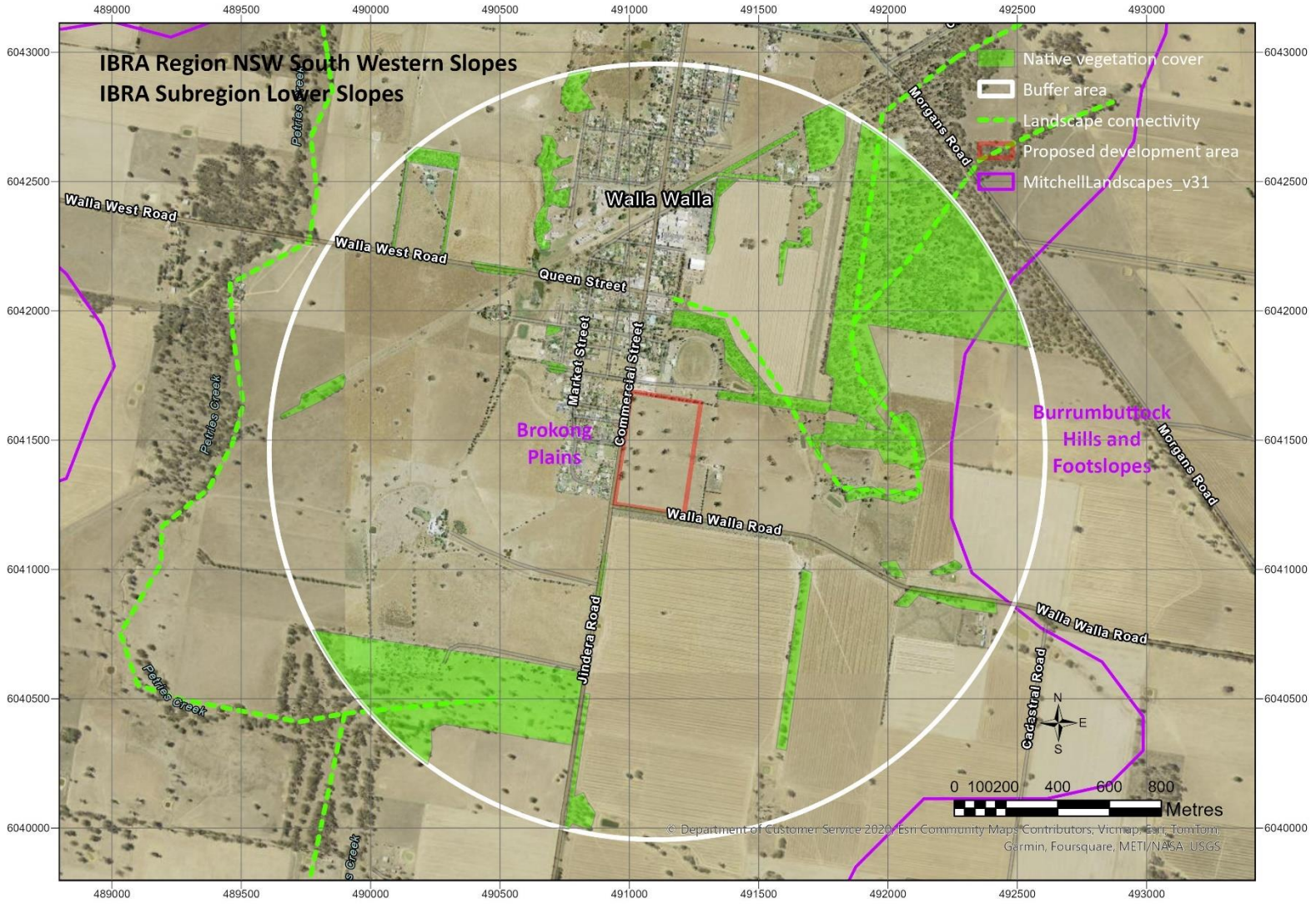


Figure 3 **Development layout. The proposed road access exits for the development are shown with black arrows (Image for ESRI Australia 2024).**

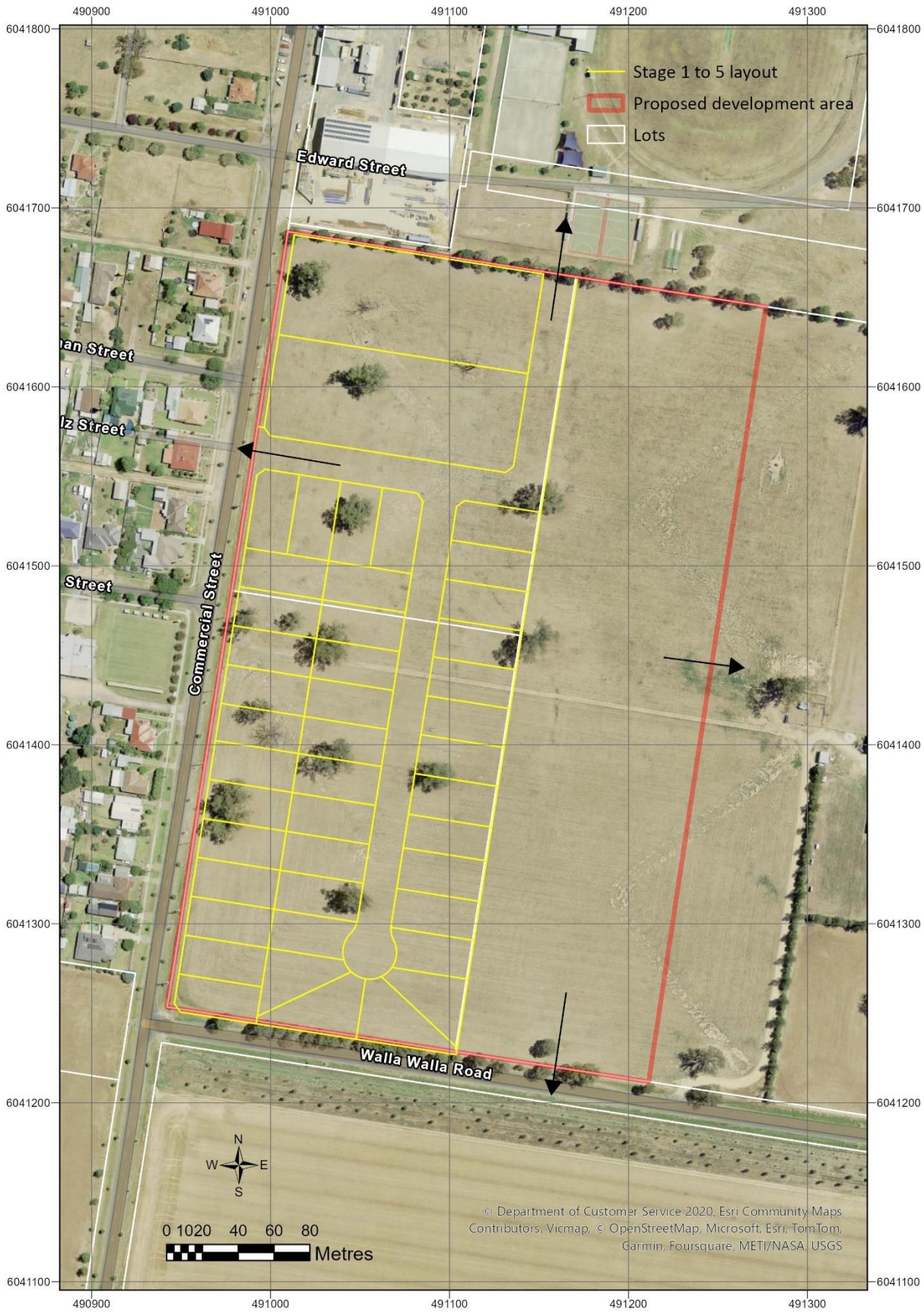


Figure 4 Biodiversity Values Map (from DPE 2024g; Image for ESRI Australia 2024).

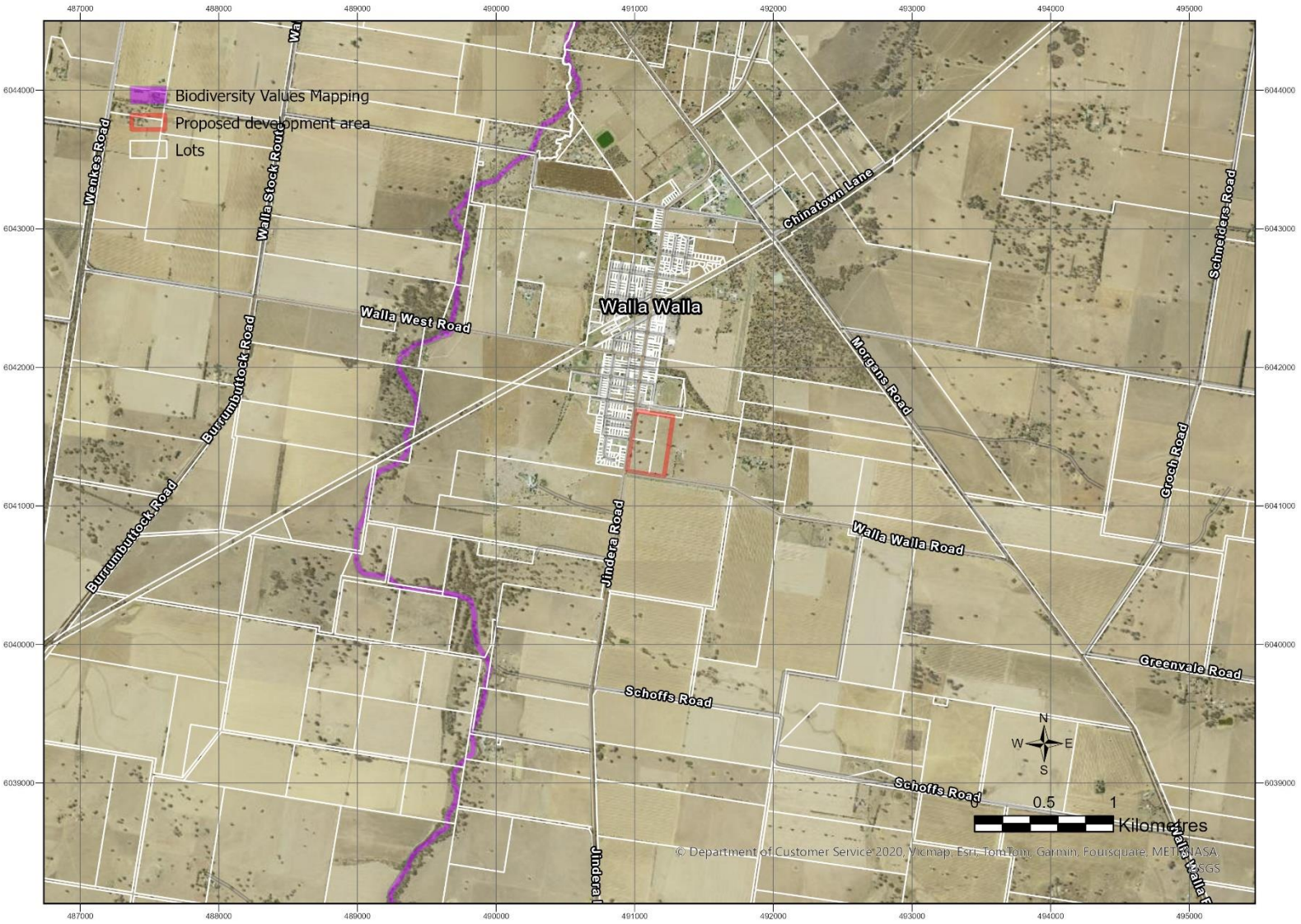


Figure 5 **Excluded impacts mapping. The proposed development area is outlined in red. Land Excluded from the LLS Act is shaded in grey, and Vulnerable Regulated Land is shaded in orange, Sensitive Regulated Land is shaded in pink, and Sensitive and Vulnerable Regulated Land is shaded in maroon (Image from DPE 2024f).**

Figure 6 **Field survey locations. Mapped PCTs (from DPE 2024d) are shown, relative to established BAM plots (Image for ESRI Australia 2024).**

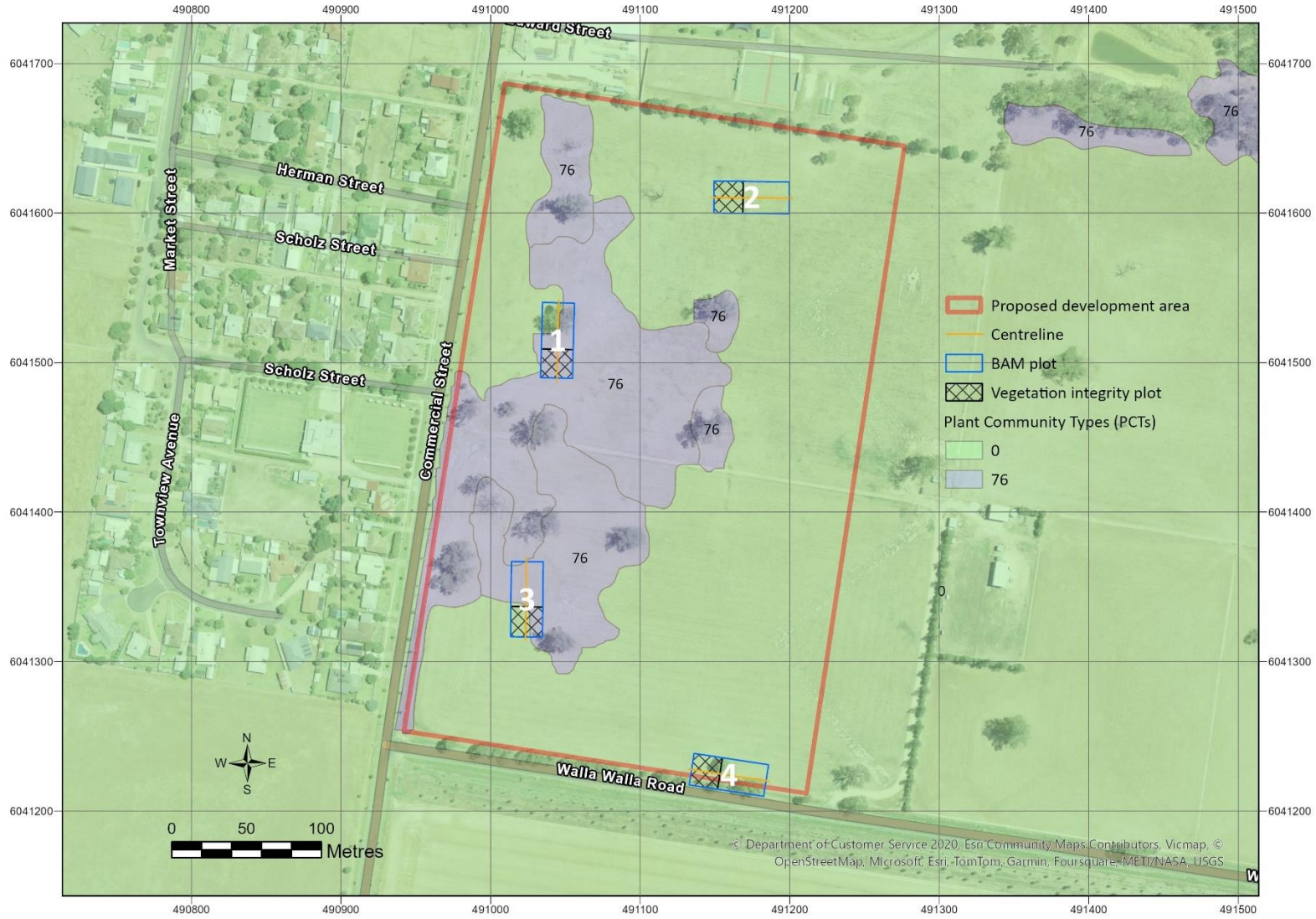


Figure 7 Native vegetation extent (Image for ESRI Australia 2024).

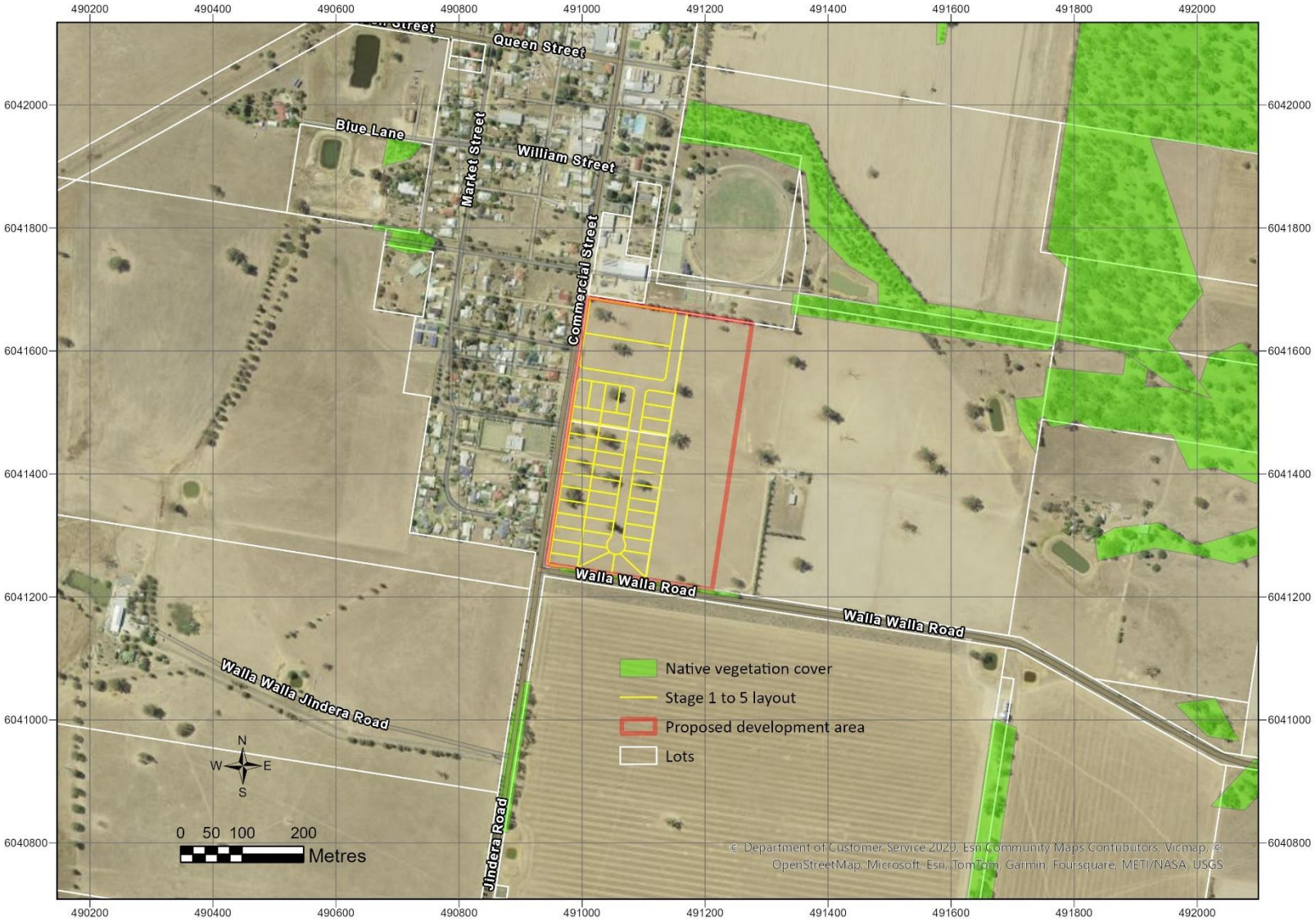


Figure 8 **Verified Plant community types on-site from ground truthing, relative to established BAM plots (after DPE 2024d; Image for ESRI Australia 2024).**

Figure 9 Location and extent of the Vegetation zones on the subject land (Image for ESRI Australia 2024).

Figure 10 **Candidate species credit species polygon denoting potential habitat across the assessed area for Gang-gang Cockatoo. Note that the species is listed as Vulnerable under the BC Act, and listed as Endangered under the EPBC Act (Image from ESRI Australia 2024).**

Figure 11 Final impacts likely to occur on the subject land (Image from ESRI Australia 2024).

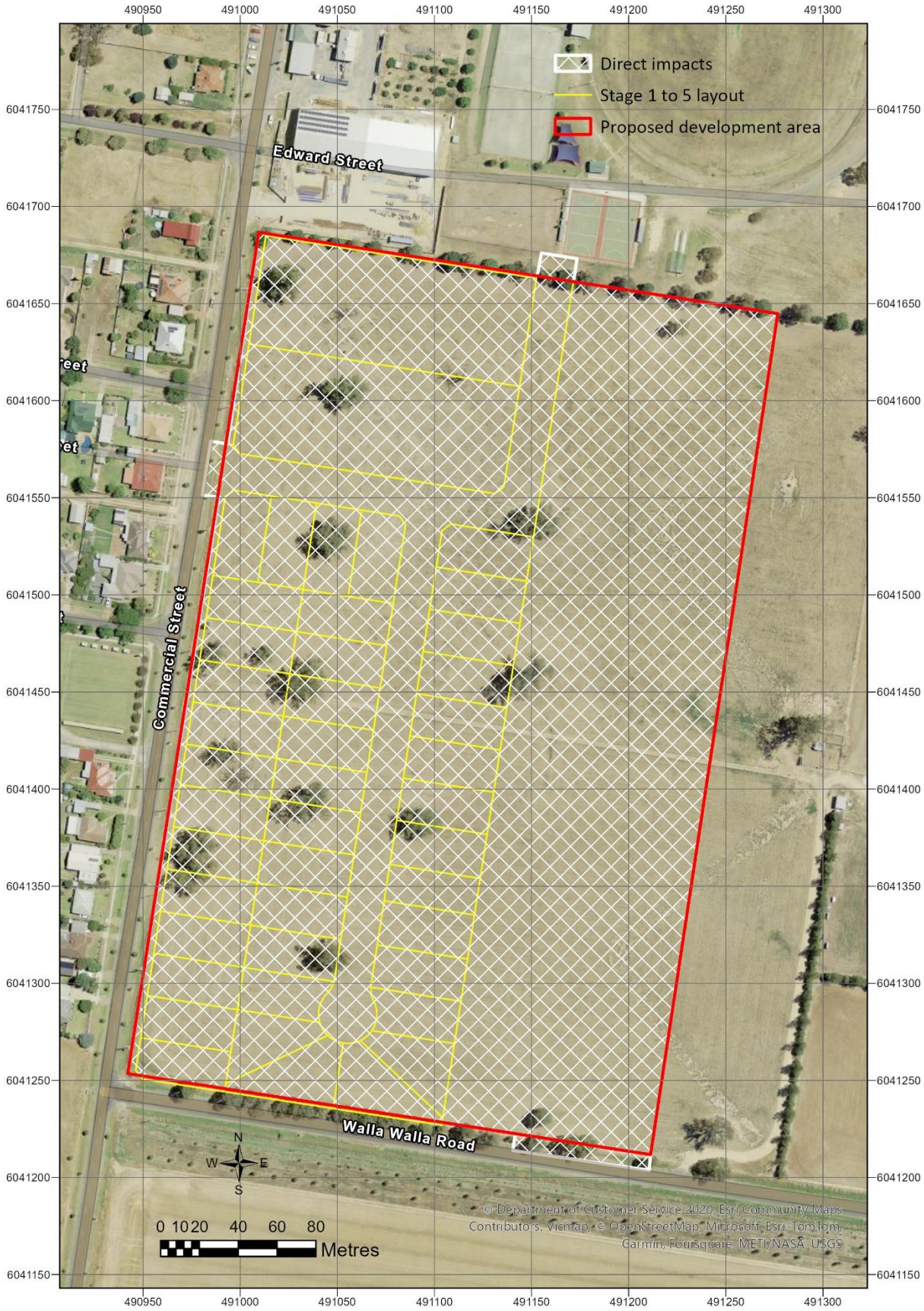


Figure 12 **Thresholds for assessing and offsetting impacts. There are no SAII entities to be impacted (Image from ESRI Australia 2024).**

Figure 13 **Proposed Layout Plan for the proposed staged residential subdivision at 29 Walla Walla Road, Walla Walla (from Eslers Land Consulting, dated 8/5/23).**

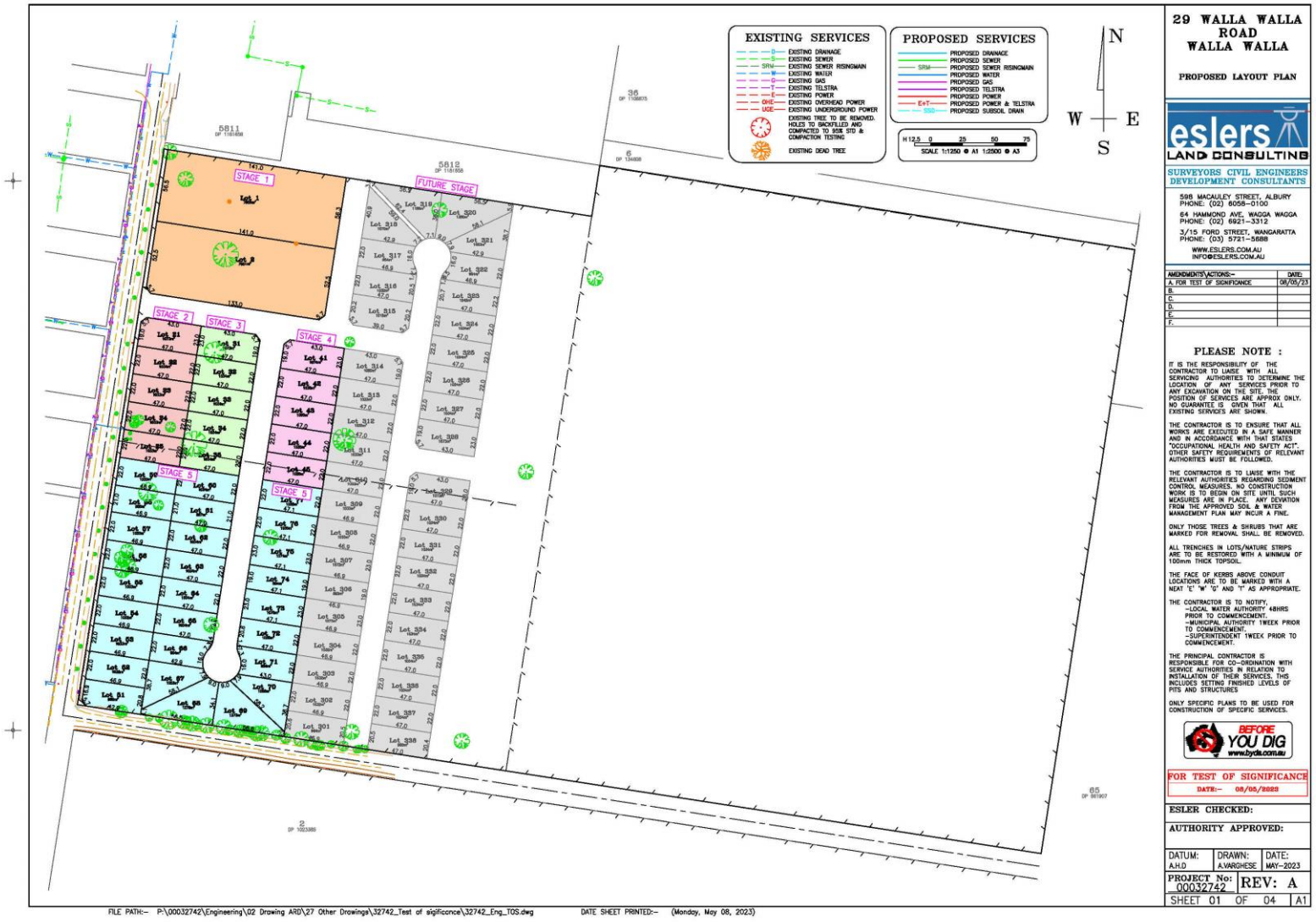
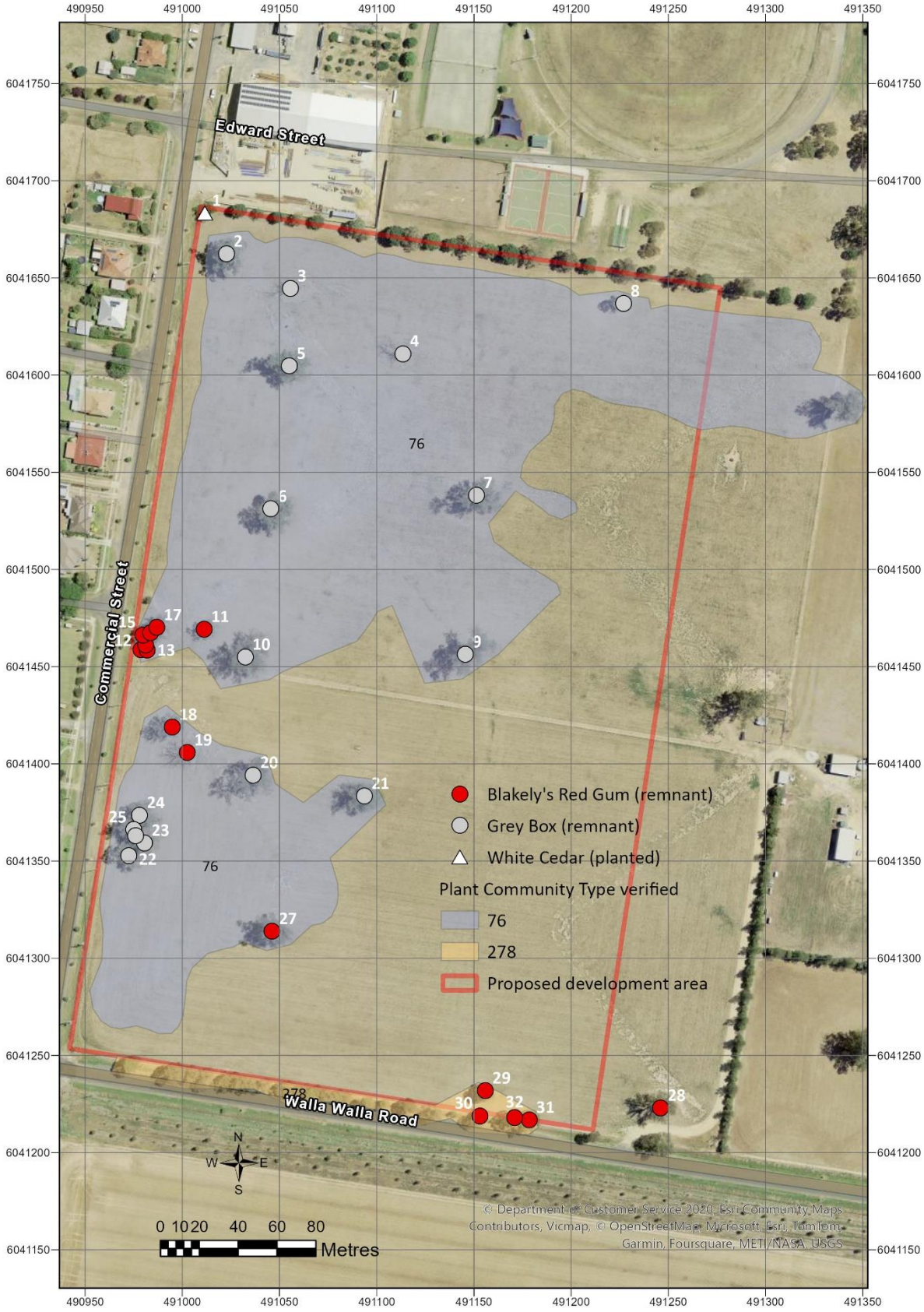


Figure 14 **Location and species of assessed trees and native vegetation patches across the proposed development site relative to verified PCTs across the subject land (Image from ESRI Australia 2024).**



Appendix A: BDAR requirements compliance

Table 26 specifies where each component of the BDAR minimum information requirements has been addressed in accordance with BAM Appendix K.

Table 26 Assessment of compliance with BDAR minimum information requirements

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
Introduction	Chapters 2 and 3	**Information**	
		Introduction to the biodiversity assessment including:	–
		X brief description of the proposal	<1.1.1>
		X identification of subject land boundary, including: X operational footprint N/A construction footprint indicating clearing associated with temporary/ancillary construction facilities and infrastructure	<1.1.3> <Figure 13>
		X general description of the subject land	<1.1.3> <Figures 13 and 14>
		X sources of information used in the assessment, including reports and spatial data	<1.5>
		X identification and justification for entering the BOS	<1.2>
		Maps and tables	
		X Map of the subject land boundary showing the final proposal footprint, including the construction footprint for any clearing associated with temporary/ancillary construction facilities and infrastructure	<Figure 1>

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
Landscape	Sections 3.1 and 3.2, Appendix E	**Information**	
		Identification of site context components and landscape features, including:	–
		X general description of subject land topographic and hydrological setting, geology and soils	<1.1.3>
		X per cent native vegetation cover in the assessment area (as described in BAM Section 3.2)	
		X IBRA bioregions and subregions (as described in BAM Subsection 3.1.3(2.))	<3.2.1>
		X rivers and streams classified according to stream order (as described in BAM Subsection 3.1.3(3.) and Appendix E)	<3.2.2>
		X wetlands within, adjacent to and downstream of the site (as described in BAM Subsection 3.1.3(3.))	<3.2.2>
		X connectivity of different areas of habitat (as described in BAM Subsection 3.1.3(5–6.))	<3.2.3>
		X karst, caves, crevices, cliffs, rocks and other geological features of significance and for vegetation clearing proposals, soil hazard features (as described in BAM Subsections 3.1.3(7.) and 3.1.3(12.))	<3.2.4>
		X areas of outstanding biodiversity value occurring on the subject land and assessment area (as described in BAM Subsection 3.1.3(8–9.))	<3.2.5>
		N/A any additional landscape features identified in any SEARs for the proposal	
		X NSW (Mitchell) landscape on which the subject land occurs	<3.2.6>
		X details of field reconnaissance undertaken to confirm the extent and condition of landscape features and native vegetation cover (as described in Operational Manual Stage 1 Section 2.4)	<2.1>
		Maps and tables	
		X Site Map X Property boundary X Boundary of subject land X Cadastre of subject land (including labelling of Lot and DP or section plan if relevant) X Landscape features identified in BAM Subsection 3.1.3	<Figure 1>
		X Location Map Not achievable with scale of site Digital aerial photography at 1:1,000 scale or finer X Boundary of subject land X Assessment area (i.e. the subject land and either 1500 m buffer area or 500 m buffer for linear development) X Landscape features identified in BAM Subsection 3.1.3	<Figure 2>

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		N/A Additional detail (e.g. local government area boundaries) relevant at this scale	
		Landscape features identified in BAM Subsection 3.1.3 and to be shown on the Site Map and/or Location Map include:	–
		X IBRA bioregions and subregions	<Figure 1 & Figure 2>
		X rivers, streams and estuaries	
		X wetlands and important wetlands	
		X connectivity of different areas of habitat	
		X karst, caves, crevices, cliffs, rocks and other geological features of significance and if required, soil hazard features	
		X areas of outstanding biodiversity value occurring on the subject land and assessment area	
		X any additional landscape features identified in any SEARs for the proposal	
		X NSW (Mitchell) landscape on which the subject land occurs	
		Data	
		X All report maps as separate jpeg files	–
		Individual digital shape files of:	–
		X subject land boundary	–
		X assessment area (i.e. subject land and 1500 m buffer area) boundary	–
		X cadastral boundary of subject land	–
		X areas of native vegetation cover	–
		X landscape features	–

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
Native vegetation	Chapter 4, Appendix A and Appendix H	**Information**	
		X Identify native vegetation extent within the subject land, including cleared areas and evidence to support differences between mapped vegetation extent and aerial imagery (as described in BAM Section 4.1(1–3.) and Subsection 4.1.1)	<4.1 >
		X Provide justification for all parts of the subject land that do not contain native vegetation (as described in BAM Subsection 4.1.2)	<4.1.2>
		X Review of existing information on native vegetation including references to previous vegetation maps of the subject land and assessment area (described in BAM Section 4.1(3.) and Subsection 4.1.1)	<2.2.2>
		X Describe the systematic field-based floristic vegetation survey undertaken in accordance with BAM Section 4.2	<2.2.3>
		N/A Where relevant, describe the use of more appropriate local data, provide reasons that support the use of more appropriate local data and include the written confirmation from the decision-maker that they support the use of more appropriate local data (as described in BAM Subsection 1.4.2 and Appendix A)	<Insert relevant reference & Appendix G>
		For each PCT within the subject land, describe:	–
		X PCT name and ID	<4.1 >
		X vegetation class	<4.1.2>
		X extent (ha) within subject land	<2.2.2>
		X evidence used to identify a PCT including any analyses undertaken, references/sources, existing vegetation maps (BAM Section 4.2(1–3.))	<2.2.3>
		X plant species relied upon for identification of the PCT and relative abundance of each species	<Insert relevant reference and Appendix G>
		X if relevant, TEC status including evidence used to determine vegetation is the TEC (BAM Subsection 4.2.2(1–2.))	<4.1 >
		X estimate of per cent cleared value of PCT (BAM Subsection 4.2.1(5.))	<4.1.2>
		Describe the vegetation integrity assessment of the subject land, including:	–
		X identification and mapping of vegetation zones (as described in BAM Subsection 4.3.1)	<4.4 & Figure >
		X description of vegetation zones within the subject land (as described in Operational Manual Stage 1 Table 2 and Subsection 3.3.2)	<4.4 & Figure >

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		X area (ha) of each vegetation zone	<4.4>
		X assessment of patch size (as described in BAM Subsection 4.3.2)	<4.4>
		X survey effort (i.e. number of vegetation integrity survey plots) as described in BAM Subsection 4.3.4(1–2.)	<4.5.1>
		X use of relevant benchmark data from BioNet Vegetation Classification (as described in BAM Subsection 4.3.3(5.))	<4.5.3>
		Where use of more appropriate local benchmark data is proposed (as described in BAM Subsection 1.4.2, BAM Subsection 4.3.3(5.) and BAM Appendix A):	–
		N/A identify the PCT or vegetation class for which local benchmark data will be applied N/A identify published sources of local benchmark data (if benchmarks obtained from published sources) N/A describe methods of local benchmark data collection (if reference plots used to determine local benchmark data)	<4.5.3>
		N/A provide justification for use of local data rather than BioNet Vegetation Classification benchmark values	<4.5.3>
		N/A provide written confirmation from the decision-maker that they support the use of local benchmark data	<Appendix G>
		Maps and tables	
		X Map of native vegetation extent within the subject land at scale not greater than 1:10,000 including identification of all areas of native vegetation including areas that are ground cover only, cleared areas (as described in BAM Section 4.1(1–3.)) and all parts of the subject land that do not contain native vegetation (BAM Subsection 4.1.2)	<**Error! Not a valid result for table.**>
		X Map of PCTs within the subject land (as described in BAM Section 4.2(1.))	<Figure 8>
		X Map of vegetation zones within the subject land (as described in BAM Subsection 4.3.1)	<Figure >
		X Map the location of floristic vegetation survey plots and vegetation integrity survey plots relative to PCT boundaries	<Figure 6>
		N/A Map of TEC distribution on the subject land and table of TEC listing, status and area (ha)	
		X Map of patch size locations for each native vegetation zone and table of patch size areas (as described in BAM Subsection 4.3.2)	<Figure & Table 6>
		Table of current vegetation integrity scores for each vegetation zone within the site and including:	–
		X composition condition score X structure condition score	<Table 7>

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		X function condition score	
		X presence of hollow bearing trees	
		Data	
		X All report maps as separate jpeg files	–
		X Plot field data (MS Excel format)	
		X Plot field datasheets	<Appendix F>
		Digital shape files of:	–
		X PCT boundaries within subject land	–
		N/A TEC boundaries within subject land	–
		X vegetation zone boundaries within subject land	–
		X floristic vegetation survey and vegetation integrity plot locations	–
Threatened species	Chapter 5	**Information**	
		Identify ecosystem credit species likely to occur on the subject land, including:	–
		X list of ecosystem credit species derived from the BAM-C (as described in BAM Subsection 5.1.1 and Section 5.2(1.))	< >
		X justification and supporting evidence for exclusion of any ecosystem credit species based on geographic limitations, habitat constraints or vagrancy (as described in BAM Subsections 5.2.1 and 5.2.2)	<5.1.1>
		N/A justification for addition of any ecosystem credit species to the list	<5.1.1>
		Identify species credit species likely to occur on the subject land, including:	–
		X list of species credit species derived from the BAM-C (as described in BAM Subsection 5.1.1)	<Table 9 & Table 10>
		X justification and supporting evidence for exclusions based on geographic limitations, habitat constraints or vagrancy (as described in BAM Subsections 5.2.1 and 5.2.2)	<5.1.2>
		X justification and supporting evidence for exclusions based on degraded habitat constraints and/or microhabitats on which the species depends (as described in BAM Subsection 5.2.2)	<5.1.2>
		N/A justification for addition of any species credit species to the list	<5.1.2>
		From the list of candidate species credit species, identify:	–
		N/A species assumed present within the subject land (if relevant) (as described in BAM Subsection 5.2.4(2.a.))	<Table 11 & Table 12>

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		X species present within the subject land on the basis of being identified on an important habitat map for a species (as described in BAM Subsection 5.2.4(2.d.))	
		X species for which targeted surveys are to be completed to determine species presence (BAM Subsection 5.2.4(2.b.))	
		N/A species for which an expert report is to be used to determine species presence (BAM Subsection 5.2.4(2.c.))	
		Present the outcomes of species credit species assessments from:	–
		X threatened species survey (as described in BAM Section 5.2.4)	<Table 13>
		N/A expert reports (if relevant) including justification for presence of the species and information used to make this determination (as described in BAM Subsection 5.2.4, Section 5.3, Box 3)	<5.4>
		Where survey has been undertaken include detailed information on:	–
		X survey method and effort (as described in BAM Section 5.3)	<Table 13 >
		X justification of survey method and effort (e.g. citation of peer-reviewed literature) if approach differs from the department's taxa-specific survey guides or where no relevant guideline has been published	<5.3>
		N/A timing of survey in relation to requirements in the TBDC or the department's taxa-specific survey guides. Where survey was undertaken outside these guides include justification for the timing of surveys	<Table 13 & & 5.3>
		X survey personnel and relevant experience	<Declarations ii>
		X describe any limitations to surveys and how these were addressed/overcome	<5.3>
		Where an expert report has been used in place of survey (as described in BAM Section 5.3, Box 3), include:	–
		N/A justification of the use of an expert report	<5.4>
		N/A identify the expert, provide evidence of their expert credentials and departmental approval of expert status	
		N/A all requirements of Box 3 have been addressed in the expert report	
		Where use of local data is proposed (BAM Subsection 1.4.2):	–
		N/A identify relevant species	
		N/A identify data to be amended	
		N/A identify source of information for local data, e.g. published literature, additional survey data, etc.	
		N/A justify use of local data in preference to VIS Classification or TBDC data	
		N/A provide written confirmation from the decision-maker that they support the use of local data	<Appendix G>

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		Species polygon completed for species credit species present within the subject land (assumed present or determined on the basis of survey, expert report or important habitat map) ensuring that:	–
		N/A the unit of measure for each species is documented	< >
		for species assessed by area:	–
		X the polygon includes the extent of suitable habitat for the target species within the subject land (as described in BAM Subsection 5.2.5)	<**Error! Not a v alid result for table.**>
		X a description of, and evidence-based justification for, the habitat constraints, features or microhabitats used to map the species polygon including reference to information in the TBDC for that species and any buffers applied	<5.5>
		for species assessed by counts of individuals:	–
		N/A the number of individual plants present on the subject land (as described in BAM Subsection 5.2.5(3.))	<5.5>
		N/A the method used to derive this number (i.e. threatened species survey or expert report) and evidence-based justification for the approach taken	<5.5>
		N/A the polygon includes all individuals located on the subject land with a buffer of 30 m around the individuals or groups of individuals on the subject land	
		X Identify the biodiversity risk weighting for each species credit species identified as present within the subject land (as described in BAM Section 5.4)	
		Maps and tables	
		X Table showing ecosystem credit species in accordance with BAM Subsection 5.1.1, and identifying:	
		X the ecosystem credit species removed from the list	<Table 8>
		X the sensitivity to gain class of each species	<Table 8>
		X Table detailing species credit species in accordance with BAM Section 5.2 and identifying:	<Table 9 & Table 10>
		X the species credit species removed from the list of species because the species is considered vagrant, out of geographic range or the habitat or microhabitat features are not present	<Table 9 & Table 10>
		X the candidate species credit species not recorded on the subject land as determined by targeted survey, expert report or important habitat map	<Table 11 & Table 12>
		X Table detailing species credit species recorded or assumed as present within the subject land, habitat constraints or microhabitats associated with the species, counts of individuals (flora)/extent of suitable	<5.5 >

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		habitat (flora and fauna) (as described in BAM Subsection 5.2.6) and biodiversity risk weighting (BAM Section 5.4)	
		N/A Map indicating the GPS coordinates of all individuals of each species recorded within the subject land and the species polygon for each species (as described in BAM Subsection 5.2.5)	<**Error! Not a v alid result for table.**>
		Data	
		X Digital shape files of suitable habitat identified for survey for each candidate species credit species	–
		N/A Survey locations including GPS coordinates of any plots, transects, grids	
		X Digital shape files of each species polygon including GPS coordinates of located individuals	–
		X Species polygon map in jpeg format	–
		N/A Expert reports and any supporting data used to support conclusions of the expert report	
		N/A Field datasheets detailing survey information including prevailing conditions, date, time, equipment used, etc.	

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
Prescribed impacts	Chapter 6	**Information**	
		Identify potential prescribed biodiversity impacts on threatened entities, including:	–
		X karst, caves, crevices, cliffs, rocks and other geological features of significance (as described in BAM Subsection 6.1.1) X occurrences of human-made structures and non-native vegetation (as described in BAM Subsection 6.1.2) X corridors or other areas of connectivity linking habitat for threatened entities (as described in BAM Subsection 6.1.3) X waterbodies or any hydrological processes that sustain threatened entities (as described in BAM Subsection 6.1.4)	<Table 14>
		N/A protected animals that may use the proposed wind farm development site as a flyway or migration route (as described in BAM Subsection 6.1.5)	< >
		X where the proposed development may result in vehicle strike on threatened fauna or on animals that are part of a threatened ecological community (as described in BAM Subsection 6.1.6)	<Table 14>
		N/A Identify a list of threatened entities that may be dependent upon or may use habitat features associated with any of the prescribed impacts	
		N/A Describe the importance of habitat features to the species including, where relevant, impacts on life cycle or movement patterns (e.g. Subsection 6.1.3)	<6>
		Where the proposed development is for a wind farm:	–
		N/A identify a candidate list of protected animals that may use the development site as a flyway or migration route, including: resident threatened aerial species, resident raptor species and nomadic and migratory species that are likely to fly over the proposal area (as described in BAM Subsection 6.1.5)	< >
		N/A provide details of targeted survey for candidate species of wind farm developments undertaken in accordance with BAM Subsection 6.1.5(2–3.)	< >
		N/A predict the habitual flight paths for nomadic and migratory species likely to fly over the subject land and map the likely habitat for resident threatened aerial and raptor species (BAM Subsection 6.1.5(4.))	<Figure 1 & Figure 2>

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		Where the proposal may result in vehicle strike:	–
		N/A identify a list of threatened fauna or protected fauna species that are part of a TEC and at risk of vehicle strike due to the proposal	<Table 14>
		Maps and tables	
		N/A Map showing location of any prescribed impact features (i.e. karst, caves, crevices, cliffs, rocks, human-made structures, etc.)	<Figure 1 & Figure 2>
		N/A Map showing location of potential vehicle strike locations	<Figure 1>
		N/A Maps of habitual flight paths for nomadic and migratory species likely to fly over the site and maps of likely habitat for threatened aerial species resident on the site (for wind farm developments only)	<Figure 1 & Figure 2>
		Data	
		N/A Digital shape files of prescribed impact feature locations	–
		N/A Prescribed impact features map in jpeg format	–
Avoid and minimise impacts	Chapter 7	**Information**	
		Demonstration of efforts to avoid and minimise impacts on biodiversity values (including prescribed impacts) associated with the proposal location in accordance with Chapter 7, including an analysis of alternative:	–
		N/A modes or technologies that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed mode or technology	<7.1.2 & 7.2.2>
		N/A routes that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed route	<7.1.1 & 7.2.1>
		N/A alternative locations that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed location	<7.1.1 & 7.2.1>
		N/A alternative sites within a property on which the proposal is located that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed site	<7.1.1 & 7.2.1>
		X Describe efforts to avoid and minimise impacts (including prescribed impacts) to biodiversity values through proposal design (as described in BAM Sections 7.1 and 7.2)	<7.1.2 & 7.2.2>
		X Identification of any other site constraints that the proponent has considered in determining the location and design of the proposal (as described in BAM Subsection 7.2.1(3.))	<7>
		N/A Detail measures or options considered but not implemented because they are not feasible and/or practical (e.g. due to site constraints)	< >
		Maps and tables	

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		X Table of measures to be implemented to avoid and minimise the impacts of the proposal, including action, outcome, timing and responsibility	<Table 15>
		N/A Map of alternative footprints considered to avoid or minimise impacts on biodiversity values; and of the final proposal footprint, including construction and operation	<**Error! Not a v alid result for table.**>
		N/A Maps demonstrating indirect impact zones where applicable	<Figure >
		Data	
		Digital shape files of:	–
		N/A alternative and final proposal footprint	–
		X direct and indirect impact zones	–
		X Maps in jpeg format	–
Assessment of impacts	Chapter 8, Sections 8.1 and 8.2	**Information**	
		X Determine the impacts on native vegetation and threatened species habitat, including a description of direct impacts of clearing of native vegetation, threatened ecological communities and threatened species habitat (as described in BAM Section 8.1)	<Table 16>
		Assessment of indirect impacts on vegetation and threatened species and their habitat including (as described in BAM Section 8.2):	–
		N/A description of the nature, extent, frequency, duration and timing of indirect impacts of the proposal	<Table 18>
		N/A documenting the consequences to vegetation and threatened species and their habitat including evidence-based justifications	<8.2>
		N/A reporting any limitations or assumptions, etc. made during the assessment	<8.2>
		N/A identification of the threatened entities and their habitat likely to be affected	<Table 18>
		Assessment of prescribed biodiversity impacts (as described in BAM Section 8.3) including:	–
		assessment of the nature, extent frequency, duration and timing of impacts on the habitat of threatened species or ecological communities associated with:	–
		N/A karst, caves, crevices, cliffs, rocks and other features of geological significance	< >
		N/A human-made structures	<8.3.1>
		X non-native vegetation	<8.3.2>

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		N/A connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range	<8.3.3>
		N/A movement of threatened species that maintains their life cycle	<8.3.3>
		N/A water quality, waterbodies and hydrological processes that sustain threatened species and threatened ecological communities	<8.3.4>
		N/A assessment of the impacts of wind turbine strikes on protected animals	<1.1.1>
		X assessment of the impacts of vehicle strikes on threatened species of animals or on animals that are part of a TEC	< >
		N/A evaluate the consequences of prescribed impacts	<1.1>
		X describe impacts that are uncertain	<8.2 & 1.1>
		X document limitations to data, assumptions and predictions	<8.2 & 1.1>
		Maps and tables	
		X Table showing change in vegetation integrity score for each vegetation zone as a result of identified impacts	<Table 17>
		Data	
		N/A	–
Mitigation and management of impacts	Chapter 8, Sections 8.4 and 8.5	**Information**	
		Identification of measures to mitigate or manage impacts in accordance with the recommendations in BAM Sections 8.4 and 8.5 including:	–
		X techniques, timing, frequency and responsibility X identify measures for which there is risk of failure X evaluate the risk and consequence of any residual impacts	<Table 19>
		X document any adaptive management strategy proposed	<1.1>
		Identification of measures for mitigating impacts related to:	–
		X displacement of resident fauna (as described in BAM Subsection 8.4.1(2.)) X indirect impacts on native vegetation and habitat (as described in BAM Subsection 8.4.1(3.)) X mitigating prescribed biodiversity impacts (as described in BAM Subsection 8.4.2)	<8.4>
		X Details of the adaptive management strategy proposed to monitor and respond to impacts on biodiversity values that are uncertain (BAM Section 8.5)	<1.1>

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		Maps and tables	
		X Table of measures to be implemented before, during and after construction to mitigate and manage impacts of the proposal, including action, outcome, timing and responsibility	<Table 19>
		Data	
		N/A	–
Impact summary	Chapter 9	**Information**	
		Identification and assessment of impacts on TECs and threatened species that are at risk of a serious and irreversible impacts (SAII, in accordance with BAM Section 9.1) including:	–
		N/A addressing all criteria in Subsection 9.1.1 for each TEC listed as at risk of an SAII present on the subject land	
		N/A for each TEC, report the extent of the TEC in NSW	
		N/A addressing all criteria in Subsection 9.1.2 for each threatened species at risk of an SAII present on the subject land	
		N/A for each threatened species, report the population size in NSW	
		N/A documenting assumptions made and/or limitations to information	
		N/A documenting all sources of data, information, references used or consulted	
		N/A clearly justifying why any criteria could not be addressed	
		X Identification of impacts requiring offset in accordance with BAM Section 9.2	<Table 22 & Table 23>
		X Identification of impacts not requiring offset in accordance with BAM Subsection 9.2.1(3.)	<Table 21>
		X Identification of areas not requiring assessment in accordance with BAM Section 9.3	< >
		Maps and tables	
		N/A Map showing the extent of TECs at risk of an SAII within the subject land	
		N/A Map showing location of threatened species at risk of an SAII within the subject land	
		Map showing location of:	–
		X impacts requiring offset	<Figure >
		X impacts not requiring offset	<Figure >
		X areas not requiring assessment	<Figure >
		Data	
		Digital shape files of:	–

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		N/A extent of TECs at risk of an SAII within the subject land	–
		N/A location of threatened species at risk of an SAII within the subject land	–
		X boundary of impacts requiring offset	–
		X boundary of impacts not requiring offset	–
		X boundary of areas not requiring assessment	–
		X Maps in jpeg format	–
Impact summary	Chapter 10	**Information**	
		Ecosystem credits and species credits that measure the impact of the development on biodiversity values, including:	–
		X future vegetation integrity score for each vegetation zone within the subject land (Equation 25 and Equation 26 in BAM Appendix H) X change in vegetation integrity score (BAM Subsection 8.1.1) X number of required ecosystem credits for the direct impacts of the proposal on each vegetation zone within the subject land (BAM Subsection 10.1.2)	<Table 22>
		X biodiversity risk weighting for each	<Table 22 & Table 23>
		X number of required species credits for each candidate threatened species that is directly impacted on by the proposal (BAM Subsection 10.1.3)	<Table 23>
		Maps and tables	
		X Table of PCTs requiring offset and the number of ecosystem credits required	<Table 22>
		X Table of threatened species requiring offset and the number of species credits required	<Table 23>
		Data	
		X Submitted proposal in the BAM Calculator	–
Biodiversity credit report	Chapter 10	**Information**	
		X Description of credit classes for ecosystem credits and species credits at the development or clearing site or land to be biodiversity certified (BAM Section 10.2)	<Table 24 & Table 25>
		X BAM credit report in pdf format	<Appendix H>
		Maps and tables	
		X Table of credit class and matching credit profile	<Table 25>

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		Data	
		X BAM credit report in pdf format	<Appendix H>

Appendix B: Biodiversity Values Map and Threshold tool report

Department of Planning and Environment

Biodiversity Values Map and Threshold Report

This report is generated using the Biodiversity Values Map and Threshold (BMAT) tool. The BMAT tool is used by proponents to supply evidence to your local council to determine whether or not a Biodiversity Development Assessment Report (BDAR) is required under the Biodiversity Conservation Regulation 2017 (Cl. 7.2 & 7.3).

The report provides results for the proposed development footprint area identified by the user and displayed within the blue boundary on the map.

There are two pathways for determining whether a BDAR is required for the proposed development:

1. Is there Biodiversity Values Mapping?
2. Is the 'clearing of native vegetation area threshold' exceeded?

Biodiversity Values Map and Threshold Report

Date of Report Generation		21/01/2024 10:37 AM
1. Biodiversity Values (BV) Map - Results Summary (Biodiversity Conservation Regulation Section 7.3)		
1.1	**Does the development Footprint intersect with BV mapping?**	no
1.2	**Was ALL BV Mapping within the development footprinted added in the last 90 days?** (dark purple mapping only, no light purple mapping present)	no
1.3	**Date of expiry of dark purple 90 day mapping**	N/A
1.4	**Is the Biodiversity Values Map threshold exceeded?**	no
2. Area Clearing Threshold - Results Summary (Biodiversity Conservation Regulation Section 7.2)		
2.1	**Size of the development or clearing footprint**	57,796.5 sqm
2.2	**Native Vegetation Area Clearing Estimate (NVACE)** (within development/clearing footprint)	7,709.8 sqm
2.3	**Method for determining Minimum Lot Size**	LEP
2.4	**Minimum Lot Size** (10,000sqm = 1ha)	600 sqm
2.5	**Area Clearing Threshold** (10,000sqm = 1ha)	2,500 sqm
2.6	**Does the estimate exceed the Area Clearing Threshold?** (NVACE results are an estimate and can be reviewed using the Guidance)	yes

REPORT RESULT: Is the Biodiversity Offset Scheme (BOS) Threshold exceeded for the proposed development footprint area? (Your local council will determine if a BDAR is required)	**yes**

What do I do with this report?

• If the result above indicates the BOS Threshold has been exceeded, your local council **may require** a Biodiversity Development Assessment Report with your development application. Seek further advice from Council. An accredited assessor can apply the Biodiversity Assessment Method and prepare a BDAR for you. For a list of accredited assessors go to: https://customer.lmbc.nsw.gov.au/assessment/AccreditedAssessor.

• If the result above indicates the BOS Threshold has not been exceeded, you may not require a Biodiversity Development Assessment Report. This BMAT report can be provided to Council to support your development application. Council can advise how the area clearing threshold results should be considered. Council will review these results and make a determination if a BDAR is required. Council may ask you to review the area clearing threshold results. You may also be required to assess whether the development is '"likely to significantly affect threatened species" as determined under the test in Section 7.3 of the *Biodiversity Conservation Act 2016*.

• If a BDAR is not required by Council, you may still require a permit to clear vegetation from your local council.

• If **all** Biodiversity Values mapping within your development footprint was less than 90 days old, i.e. areas are displayed as dark purple on the BV map, a BDAR may not be required if your Development Application is submitted within that 90 day period. Any BV mapping less than 90 days old on this report will expire on the date provided in Line item 1.3 above.

For more detailed advice about actions required, refer to the **Interpreting the evaluation report** section of the Biodiversity Values Map Threshold Tool User Guide .

Review Options:

• If you believe the Biodiversity Values mapping is incorrect please refer to our BV Map Review webpage for further information.

• If you or Council disagree with the area clearing threshold estimate results from the NVACE in Line Item 2.6 above (i.e. area of Native Vegetation within the Development footprint proposed to be cleared), review the results using the Guide for reviewing area clearing threshold results from the BMAT Tool.

Acknowledgement

I, as the applicant for this development, submit that I have correctly depicted the area that will be impacted or likely to be impacted as a result of the proposed development.

Signature: _____ Date: _____

(Typing your name in the signature field will be considered as your signature for the purposes of this form)

21/01/2024 10:37 AM

Biodiversity Values Map and Threshold Tool

The Biodiversity Values (BV) Map and Threshold Tool identifies land with high biodiversity value, particularly sensitive to impacts from development and clearing.

The BV map forms part of the Biodiversity Offsets Scheme threshold, which is one of the factors for determining whether the Scheme applies to a clearing or development proposal. You have used the Threshold Tool in the map viewer to generate this BV Threshold Report for your nominated area. This report calculates results for your proposed development footprint and indicates whether Council may require you to engage an accredited assessor to prepare a Biodiversity Development Assessment Report (BDAR) for your development.

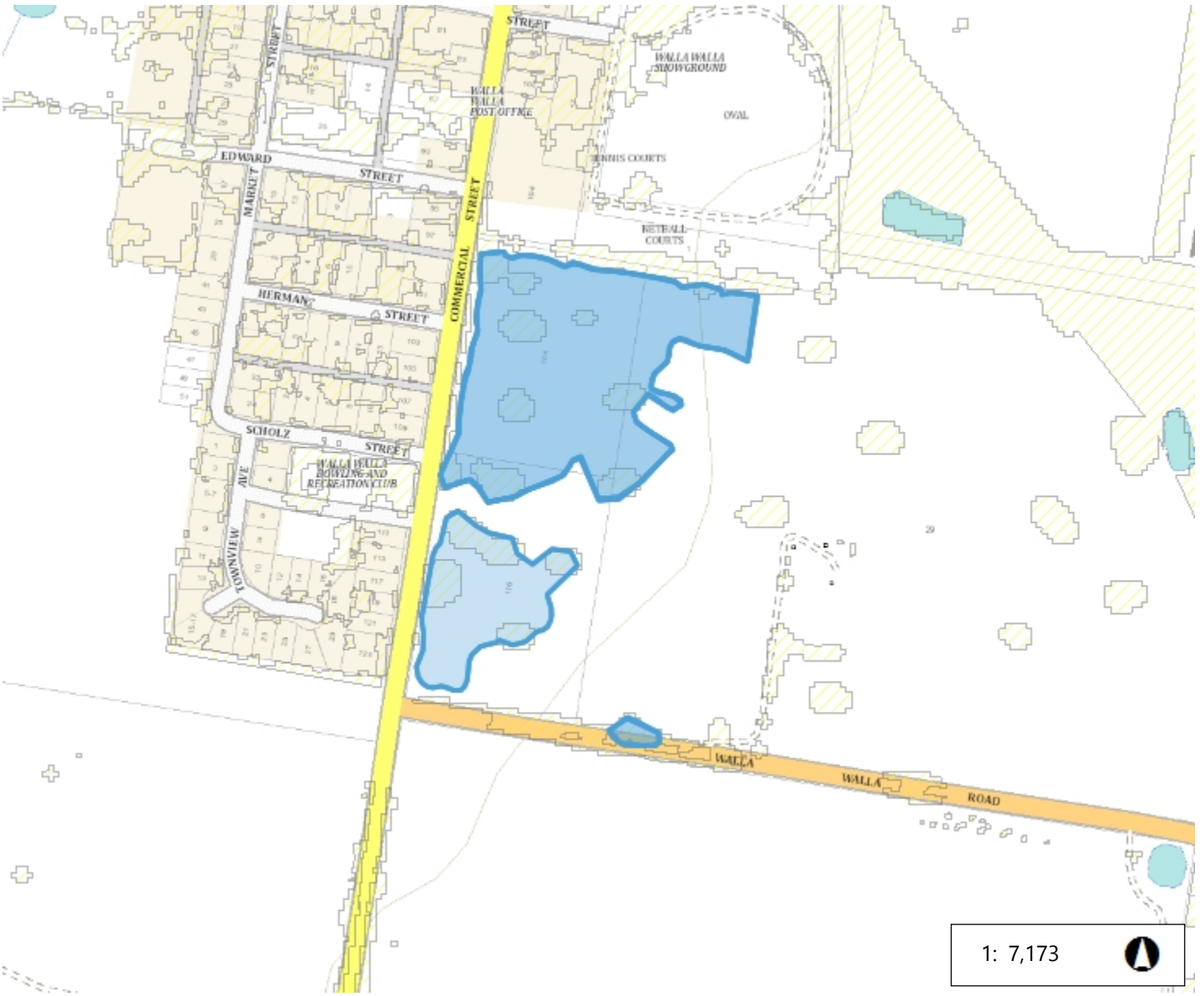
This report may be used as evidence for development applications submitted to councils. You may also use this report when considering native vegetation clearing under the State Environmental Planning Policy (Biodiversity and Conservation) 2021 - Chapter 2 vegetation in non-rural areas.

What's new? For more information about the latest updates to the Biodiversity Values Map and Threshold Tool go to the updates section on the Biodiversity Values Map webpage.

Map Review: Landholders can request a review of the BV Map where they consider there is an error in the mapping on their property. For more information about the map review process and an application form for a review go to the Biodiversity Values Map Review webpage.

If you need help using this map tool see our Biodiversity Values Map and Threshold Tool User Guide or contact the Map Review Team at map.review@environment.nsw.gov.au or on 1800 001 490.

Biodiversity Values Map



364.4 0 182.20 364.4 Metres

WGS_1984_Web_Mercator_Auxiliary_Sphere

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

Legend

- Biodiversity Values that have been mapped for more than 90 days
- Biodiversity Values added within last 90 days
- Native Vegetation Area Clearing Estimate (NVACE)
- Development area selected by proponent

21/01/2024 10:37 AM

The results provided in this tool are generated using the best available mapping and knowledge of species habitat requirements.

This map is valid as at the date the report was generated. Checking the Biodiversity Values Map viewer for mapping updates is recommended.

Appendix C: Matters of national environmental significance Report

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: 15-Jan-2024

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	7
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	3
Listed Threatened Species:	43
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:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	18
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:	1
EPBC Act Referrals:	3
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar Wetlands)		[Resource Information]
Ramsar Site Name	Proximity	Buffer Status
Banrock station wetland complex	600 - 700km upstream from Ramsar site	In feature area
Barmah forest	100 - 150km upstream from Ramsar site	In buffer area only
Gunbower forest	200 - 300km upstream from Ramsar site	In buffer area only
Hattah-kulkyne lakes	400 - 500km upstream from Ramsar site	In feature area
Nsw central murray state forests	100 - 150km upstream from Ramsar site	In buffer area only
Riverland	500 - 600km upstream from Ramsar site	In feature area
The coorong, and lakes alexandrina and albert wetland	600 - 700km upstream from Ramsar site	In feature area

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	Buffer Status
Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	Endangered	Community likely to occur within area	In feature area
Weeping Myall Woodlands	Endangered	Community may occur within area	In feature area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community likely to occur within area	In feature area

Community Name	Threatened Category	Presence Text	Buffer Status

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	Buffer Status
BIRD			
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Aphelocephala leucopsis Southern Whiteface [529]	Vulnerable	Species or species habitat known to occur within area	In feature area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Callocephalon fimbriatum Gang-gang Cockatoo [768]	Endangered	Species or species habitat may occur within area	In feature area
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat known to occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Melanodryas cucullata cucullata South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat likely to occur within area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Pedionomus torquatus Plains-wanderer [906]	Critically Endangered	Species or species habitat may occur within area	In feature area
Polytelis swainsonii Superb Parrot [738]	Vulnerable	Species or species habitat known to occur within area	In feature area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area	In feature area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat known to occur within area	In feature area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat may occur within area	In buffer area only
FISH			
Bidyanus bidyanus Silver Perch, Bidyan [76155]	Critically Endangered	Species or species habitat likely to occur within area	In buffer area only
Galaxias rostratus Flathead Galaxias, Beaked Minnow, Flat-headed Galaxias, Flat-headed Jollytail, Flat-headed Minnow [84745]	Critically Endangered	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Maccullochella macquariensis](#) Trout Cod [26171]	Endangered	Species or species habitat may occur within area	In buffer area only
[Maccullochella peelii](#) Murray Cod [66633]	Vulnerable	Species or species habitat may occur within area	In buffer area only
[Macquaria australasica](#) Macquarie Perch [66632]	Endangered	Species or species habitat may occur within area	In feature area
FROG			
[Crinia sloanei](#) Sloane's Froglet [59151]	Endangered	Species or species habitat likely to occur within area	In feature area
[Litoria raniformis](#) Southern Bell Frog,, Growling Grass Frog, Green and Golden Frog, Warty Swamp Frog, Golden Bell Frog [1828]	Vulnerable	Species or species habitat may occur within area	In feature area
INSECT			
[Keyacris scurra](#) Key's Matchstick Grasshopper [89739]	Endangered	Species or species habitat may occur within area	In buffer area only
[Synemon plana](#) Golden Sun Moth [25234]	Vulnerable	Species or species habitat may occur within area	In buffer area only
MAMMAL			
[Dasyurus maculatus maculatus (SE mainland population)](#) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat may occur within area	In feature area
[Nyctophilus corbeni](#) Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat may occur within area	In feature 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	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Pteropus poliocephalus](#) Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
PLANT			
[Amphibromus fluitans](#) River Swamp Wallaby-grass, Floating Swamp Wallaby-grass [19215]	Vulnerable	Species or species habitat may occur within area	In feature area
[Brachyscome muelleroides](#) Mueller Daisy [15572]	Vulnerable	Species or species habitat may occur within area	In buffer area only
[Caladenia arenaria](#) Sand-hill Spider-orchid [9275]	Endangered	Species or species habitat may occur within area	In feature area
[Lepidium monoplocoides](#) Winged Pepper-cress [9190]	Endangered	Species or species habitat may occur within area	In buffer area only
[Prasophyllum petilum](#) Tarengo Leek Orchid [55144]	Endangered	Species or species habitat may occur within area	In buffer area only
[Prasophyllum validum](#) Sturdy Leek-orchid, Mount Remarkable Leek-orchid [10268]	Vulnerable	Species or species habitat may occur within area	In buffer area only
[Senecio macrocarpus](#) Large-fruit Fireweed, Large-fruit Groundsel [16333]	Vulnerable	Species or species habitat may occur within area	In buffer area only
[Swainsona murrayana](#) Slender Darling-pea, Slender Swainson, Murray Swainson-pea [6765]	Vulnerable	Species or species habitat may occur within area	In feature area
[Swainsona recta](#) Small Purple-pea, Mountain Swainson-pea, Small Purple Pea [7580]	Endangered	Species or species habitat may occur within area	In buffer area only
REPTILE			
[Aprasia parapulchella](#) Pink-tailed Worm-lizard, Pink-tailed Legless Lizard [1665]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Delma impar			
Striped Legless Lizard, Striped Snake-lizard [1649]	Vulnerable	Species or species habitat may occur within area	In feature area

Listed Migratory Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			
Hirundapus caudacutus			
White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Motacilla flava			
Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area
Myiagra cyanoleuca			
Satin Flycatcher [612]		Species or species habitat likely to occur within area	In feature area
Rhipidura rufifrons			
Rufous Fantail [592]		Species or species habitat may occur within area	In buffer area only
Migratory Wetlands Species			
Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Calidris acuminata			
Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea			
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Calidris melanotos			
Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Gallinago hardwickii			
Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Tringa nebularia			
Common Greenshank, Greenshank [832]	Endangered	Species or species habitat may occur within area	In buffer area only

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

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

Commonwealth Land Name	State	Buffer Status
Communications, Information Technology and the Arts - Telstra Corporation Limited		
Commonwealth Land - Australian Telecommunications Commission [15286]	NSW	In buffer area only

Listed Marine Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Apus pacificus			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Bubulcus ibis as Ardea ibis			
Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata			
Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea			
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
[Chalcites osculans as Chrysococcyx osculans](#) Black-eared Cuckoo [83425]		Species or species habitat likely to occur within area overfly marine area	In feature area
[Gallinago hardwickii](#) Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat likely to occur within area overfly marine area	In feature area
[Haliaeetus leucogaster](#) White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area	In feature area
[Hirundapus caudacutus](#) White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area overfly marine area	In feature area
[Lathamus discolor](#) Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
[Merops ornatus](#) Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
[Motacilla flava](#) Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In feature area
[Myiagra cyanoleuca](#) Satin Flycatcher [612]		Species or species habitat likely to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat likely to occur within area overfly marine area	In feature area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat may occur within area overfly marine area	In buffer area only
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat may occur within area overfly marine area	In buffer area only

Extra Information

Nationally Important Wetlands		[Resource Information]
Wetland Name	State	Buffer Status
Walla Walla Swamp (Gum Swamp)	NSW	In buffer area only

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

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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Appendix D: Vegetation survey data

Table 27 Vegetation survey data and locations

plot	pct	area	patchsize	condition class	zone	easting	northing	bearing	compTree	compShrub	compGrass	compForbs	compFerns	compOther	strucTree	strucShrub	strucGrass	strucForbs	strucFerns	strucOther	funLargeTrees	funHollowtrees	funLitterCover	funLenFallenLogs	funTreeStem5to9	funTreeStem10to19	funTreeStem20to29	funTreeStem30to49	funTreeStem50to79	funTreeRegen	funHighThreatExotic	Plot-based vegetation survey2	Vegetation integrity survey2
1	76	4.27	1	Modified_1	55	491044	6041517	0	1	0	7	0	0	0	20.0	0.0	37.1	0.0	0.0	0.0	1	1	10.0	0.0	0	0	0	0	0	0	0.0	Yes	Yes
2	76	4.27	1	Modified_2	55	491175	6041609	0	0	0	5	0	0	0	0.0	0.0	30.2	0.0	0.0	0.0	0	0	16.0	0.0	0	0	0	0	0	0	0.0	Yes	Yes
3	76	1.40	1	Modified_3	55	491025	6041342	0	0	0	3	0	0	0	0.0	0.0	40.2	0.0	0.0	0.0	0	0	16.0	0.0	0	0	0	0	0	0	0.0	Yes	Yes
4	278	0.25	2	Modified_4	55	491158	6041225	0	1	0	0	0	0	0	25.0	0.0	0.0	0.0	0.0	0.0	1	1	2.0	0.0	0	0	0	0	0	0	0.0	Yes	Yes

BAM Plot – Field Survey Form

Site Sheet no: 1 of 2

Survey Name	Plot Identifier	Recorders
Walla Walla proposal	Plot 1	Steve Hamilton BAAS18106

Date	16/8/23	IBRA region	NSW South Western Slopes	Photo #	P1800330	Zone ID	1
Zone 55	Datum GDA 94						
Easting 491044	Northing 6041517	**Plot Dimensions**	20 x 20 in 20 x 50	**Orientation of midline from the 0 m point.**	0 degreesMagnetic °		

Likely Vegetation Class	Floodplain Transition Woodlands		Confidence: H
Plant Community Type	PCT 76 - Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	**TEC: No**	Confidence: H

BAM Attribute (400 m² plot)		Sum values
Count of **Native Richness**	**Trees**	1
	Shrubs	0
	Grasses etc.	7
	Forbs	0
	Ferns	0
	Other	0
Sum of **Cover** of native vascular plants by growth form group	**Trees**	20
	Shrubs	0
	Grasses etc.	37.1
	Forbs	0
	Ferns	0
	Other	0
High Threat Weed cover %		0

This table may be completed after entering data into available tools. It is not required while in the field.

BAM Attribute (20 x 50 m plot)	Stem Classes and Hollows		
dbh	Euc*	Non Euc	Hollow trees†
80 + cm	1		1
50 – 79 cm	0		
30 – 49 cm	0		
20 – 29 cm	0		
10 – 19 cm	0	tick	No Raptor Nests
5 – 9 cm	0	tick	
< 5 cm	0	tick	
Length of logs (m) (≥10 cm diameter, >50 cm in length)	0		Total 0

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*, *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)	15	10	5	10	10	10	5	10	5	10	0	0	0	0	0	0	0	0	0	0
Average of the 5 subplots	10					8					0					0				

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	

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

Free Text Section for brief site description

Previously cleared for grazing. Regrowth unmanaged since 1950's. Bush regeneration efforts present. At least a decade since a fire. Feral goats and rabbits.

Emergents heights (m)			Upper Stratum Heights (m)			Middle Stratum Heights (m)			Lower Stratum Heights (m)		
Top	Mode	Bottom	Top	Mode	Bottom	Top	Mode	Bottom	Top	Mode	Bottom

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

400 m² plot: Sheet 2 of 2		Survey Name	Plot Identifier	Recorders
Date	16/8/23	Walla Walla proposal	Plot 1	Steve Hamilton BAAS18106

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	*Panicum effusum*	N	5	10		
g	*Poa sieberiana*	N	1	5		
g	*Enteropogon acicularis*	N	10	100		
g	*Lachnagrostis filiformis*	N	10	100		
g	*Rytidosperma duttonianum*	N	10	10		
g	*Rytidosperma caespitosum*	N	1	10		
g	*Eragrostis brownii*	N	0.1	2		
t	*Eucalyptus microcarpa*	N	20	1		
e	*Bromus mollis*	E	1	50		
e	*Hypochaeris radicata*	E	0.1	20		
e	*Romulea rosea*	E	5	200		
e	*Hordeum leporinum*	E	10	500		
e	*Trifolium repens*	E	1	20		
e	*Lolium rigidum*	E	40	1000		

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.

BAM Plot – Field Survey Form

Site Sheet no: 1 of 2

Survey Name	Plot Identifier	Recorders
Walla Walla proposal	Plot 2	Steve Hamilton BAAS18106

Date	16/8/23	IBRA region	NSW South Western Slopes	Photo #	P1770718	Zone ID	1
Zone 55	Datum GDA 94						
Easting 491175	Northing 6041609	**Plot Dimensions**	20 x 20 in 20 x 50	**Orientation of midline from the 0 m point.**	90 degrees Magnetic		

Likely Vegetation Class	Floodplain Transition Woodlands	Confidence: H
Plant Community Type	PCT 76 - Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	**TEC: No** — Confidence: H

BAM Attribute (400 m² plot)		Sum values
Count of **Native Richness**	**Trees**	0
	Shrubs	0
	Grasses etc.	5
	Forbs	0
	Ferns	0
	Other	0
Sum of **Cover** of native vascular plants by growth form group	**Trees**	0
	Shrubs	0
	Grasses etc.	30.2
	Forbs	0
	Ferns	0
	Other	0
High Threat Weed cover %		0

This table may be completed after entering data into available tools. It is not required while in the field.

BAM Attribute (20 x 50 m plot)	Stem Classes and Hollows		
dbh	Euc*	Non Euc	Hollow trees†
80 + cm	0		0
50 – 79 cm	0		
30 – 49 cm	0		
20 – 29 cm	0		
10 – 19 cm	0	tick	No Raptor Nests
5 – 9 cm	0	tick	
< 5 cm	0	tick	
Length of logs (m) (≥10 cm diameter, >50 cm in length)	0		Total 0

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*, *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)	15	10	15	20	20	5	5	10	5	10	0	0	0	0	0	0	0	0	0	0
Average of the 5 subplots	16					7					0					0				

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	

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

Free Text Section for brief site description

Previously cleared for grazing. Regrowth unmanaged since 1950's. Bush regeneration efforts present. At least a decade since a fire. Feral goats and rabbits.

Emergents heights (m)			Upper Stratum Heights (m)			Middle Stratum Heights (m)			Lower Stratum Heights (m)		
Top	Mode	Bottom	Top	Mode	Bottom	Top	Mode	Bottom	Top	Mode	Bottom

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

400 m² plot: Sheet 2 of 2		Survey Name	Plot Identifier	Recorders
Date	16/8/23	Walla Walla proposal	Plot 2	Steve Hamilton BAAS18106

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	*Panicum effusum*	N	0.1	5		
g	*Enteropogon acicularis*	N	15	150		
g	*Lachnagrostis filiformis*	N	10	100		
g	*Rytidosperma duttonianum*	N	5	50		
g	*Eragrostis brownii*	N	0.1	5		
e	*Avena fatua*	E	0.1	20		
e	*Bromus mollis*	E	5	200		
e	*Hypochaeris radicata*	E	0.1	20		
e	*Romulea rosea*	E	5	200		
e	*Hordeum leporinum*	E	15	750		
e	*Trifolium repens*	E	1	20		
e	*Trifolium subterraneum*	E	1	20		
e	*Lolium rigidum*	E	30	750		

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.

BAM Plot – Field Survey Form

Site Sheet no: 1 of 2

Survey Name	Plot Identifier	Recorders
Walla Walla proposal	Plot 3	Steve Hamilton BAAS18106

Date	16/8/23	**IBRA region**	NSW South Western Slopes	**Photo #**	P1760919	**Zone ID**	1
Zone 55	Datum GDA 94						
Easting 491025	Northing 6041342	**Plot Dimensions**	20 x 20 in 20 x 50	**Orientation of midline from the 0 m point.**	0 degreesMagnetic		

Likely Vegetation Class	Floodplain Transition Woodlands		Confidence: H
Plant Community Type	PCT 76 - Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	**TEC: No**	Confidence: H

BAM Attribute (400 m² plot)		Sum values
Count of **Native Richness**	**Trees**	0
	Shrubs	0
	Grasses etc.	3
	Forbs	0
	Ferns	0
	Other	0
Sum of **Cover** of native vascular plants by growth form group	**Trees**	0
	Shrubs	0
	Grasses etc.	40.2
	Forbs	0
	Ferns	0
	Other	0
High Threat Weed cover %		0

This table may be completed after entering data into available tools. It is not required while in the field.

BAM Attribute (20 x 50 m plot)	Stem Classes and Hollows		
dbh	Euc*	Non Euc	Hollow trees†
80 + cm	0		0
50 – 79 cm	0		
30 – 49 cm	0		
20 – 29 cm	0		
10 – 19 cm	0	tick	No Raptor Nests
5 – 9 cm	0	tick	
< 5 cm	0	tick	
Length of logs (m) (≥10 cm diameter, >50 cm in length)	0		Total 0

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*, *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)	20	15	15	10	20	5	5	0	5	0	0	0	0	0	0	0	0	0	0	0
Average of the 5 subplots	16					3					0					0				

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	

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

Free Text Section for brief site description

Previously cleared for grazing. Regrowth unmanaged since 1950's. Bush regeneration efforts present. At least a decade since a fire. Feral goats and rabbits.

Emergents heights (m)			Upper Stratum Heights (m)			Middle Stratum Heights (m)			Lower Stratum Heights (m)		
Top	Mode	Bottom	Top	Mode	Bottom	Top	Mode	Bottom	Top	Mode	Bottom

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

400 m^2 plot: Sheet 2 of 2		Survey Name	Plot Identifier	Recorders
Date	16/8/23	Walla Walla proposal	Plot 3	Steve Hamilton BAAS18106

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	*Poa sieberiana*	N	40	400		
g	*Enteropogon acicularis*	N	0.1	10		
g	*Lachnagrostis filiformis*	N	0.1	10		
e	*Romulea rosea*	E	0.1	40		
e	*Bromus diandrus*	E	5	200		
e	*Lolium rigidum*	E	40	1000		
e	*Medicago sativa*	E	1	20		

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.

BAM Plot – Field Survey Form

Site Sheet no: 1 of 2

Survey Name	Plot Identifier	Recorders
Walla Walla proposal	Plot 4	Steve Hamilton BAAS18106

Date	16/8/23	**IBRA region**	NSW South Western Slopes	**Photo #**	P1760900	**Zone ID**	1
Zone 55	Datum GDA 94						
Easting 491158	Northing 6041225	**Plot Dimensions**	20 x 20 in 20 x 50	**Orientation of midline from the 0 m point.**	100 degrees Magnetic °		

Likely Vegetation Class	Western Slopes Grassy Woodlands		Confidence: H
Plant Community Type	PCT 278 - Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion	**TEC: No**	Confidence: H

BAM Attribute (400 m² plot)		Sum values
Count of **Native Richness**	**Trees**	1
	Shrubs	0
	Grasses etc.	0
	Forbs	0
	Ferns	0
	Other	0
Sum of **Cover** of native vascular plants by growth form group	**Trees**	25
	Shrubs	0
	Grasses etc.	0
	Forbs	0
	Ferns	0
	Other	0
High Threat Weed cover %		0

This table may be completed after entering data into available tools. It is not required while in the field.

BAM Attribute (20 x 50 m plot)	Stem Classes and Hollows		
dbh	Euc*	Non Euc	Hollow trees†
80 + cm	0		1
50 – 79 cm	1		
30 – 49 cm	2		
20 – 29 cm	1		
10 – 19 cm	0	tick	No Raptor Nests
5 – 9 cm	0	tick	
< 5 cm	0	tick	
Length of logs (m) (≥10 cm diameter, >50 cm in length)	0		Total 0

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*, *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	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Average of the 5 subplots	2					0					0					0				

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	

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

Free Text Section for brief site description

Previously cleared for grazing. Regrowth unmanaged since 1950's. Bush regeneration efforts present. At least a decade since a fire. Feral goats and rabbits.

Emergents heights (m)			Upper Stratum Heights (m)			Middle Stratum Heights (m)			Lower Stratum Heights (m)		
Top	Mode	Bottom	Top	Mode	Bottom	Top	Mode	Bottom	Top	Mode	Bottom

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

400 m² plot: Sheet 2 of 2		Survey Name	Plot Identifier	Recorders
Date	16/8/23	Walla Walla proposal	Plot 4	Steve Hamilton BAAS18106

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 blakelyi*	N	25	4		
e	*Avena fatua*	E	10	250		
e	*Bromus mollis*	E	5	100		
e	*Romulea rosea*	E	5	500		
e	*Trifolium subterraneum*	E	1	20		
e	*Bromus diandrus*	E	5	100		
e	*Lolium rigidum*	E	30	500		
e	*Paspalum dilitatum*	E	40	150		

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.

Appendix E: Credit reports

BAM Vegetation Zones Report

Proposal Details

Assessment Id	Assessment name	BAM data last updated *
00041731/BAAS18106/23/00041732	Walla Walla residential subdivision	22/06/2023
Assessor Name	**Report Created**	**BAM Data version ***
Steve Hamilton	21/01/2024	61
Assessor Number	**Assessment Type**	**BAM Case Status**
BAAS18106	Part 4 Developments (General)	Open
Assessment Revision	**Date Finalised**	**BOS entry trigger**
0	To be finalised	BOS Threshold: Biodiversity Values Map and area clearing threshold

* 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.

Vegetation Zones

#	Name	PCT	Condition	Area	Minimum number of plots	Management zones

1	76_Modified_1	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	Modified_1	5.7	3	
2	278_Modified_4	278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion	Modified_4	0.08	1	

BAM Predicted Species Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00041731/BAAS18106/23/00041732	Walla Walla residential subdivision	22/06/2023
Assessor Name	**Report Created**	**BAM Data version ***
Steve Hamilton	21/01/2024	61
Assessor Number	**Assessment Type**	**BAM Case Status**
BAAS18106	Part 4 Developments (General)	Open
Assessment Revision	**BOS entry trigger**	**Date Finalised**
0	BOS Threshold: Biodiversity Values Map and area clearing threshold	To be finalised

* 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)
Barking Owl	Ninox connivens	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
		278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion
Black Falcon	Falco subniger	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
Black-chinned Honeyeater (eastern subspecies)	Melithreptus gularis gularis	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
Brown Treecreeper (eastern subspecies)	Climacteris picumnus victoriae	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
		278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion
Diamond Firetail	Stagonopleura guttata	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions

Diamond Firetail	Stagonopleura guttata	278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion
Dusky Woodswallow	Artamus cyanopterus cyanopterus	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
		278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion
Flame Robin	Petroica phoenicea	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
		278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion
Gang-gang Cockatoo	Callocephalon fimbriatum	278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion
Grey Falcon	Falco hypoleucos	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
Grey-crowned Babbler (eastern subspecies)	Pomatostomus temporalis temporalis	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
		278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion
Grey-headed Flying-fox	Pteropus poliocephalus	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
Hooded Robin (south-eastern form)	Melanodryas cucullata cucullata	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
		278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion
Little Eagle	Hieraaetus morphnoides	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions

Little Eagle	Hieraaetus morphnoides	278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion
Little Pied Bat	Chalinolobus picatus	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
		278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion
Major Mitchell's Cockatoo	Lophochroa leadbeateri	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
Masked Owl	Tyto novaehollandiae	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
Painted Honeyeater	Grantiella picta	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
		278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion
Scarlet Robin	Petroica boodang	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
		278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion
Speckled Warbler	Chthonicola sagittata	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
		278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion
Spotted Harrier	Circus assimilis	278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion
Spotted-tailed Quoll	Dasyurus maculatus	278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion

Square-tailed Kite	Lophoictinia isura	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
		278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion
Superb Parrot	Polytelis swainsonii	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
		278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion
Swift Parrot	Lathamus discolor	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
		278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion
Turquoise Parrot	Neophema pulchella	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
		278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion
Varied Sittella	Daphoenositta chrysoptera	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
		278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion
White-throated Needletail	Hirundapus caudacutus	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
		278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion
Yellow-bellied Sheathtail-bat	Saccolaimus flaviventris	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions

Threatened species Manually Added

None added

BAM Predicted Species Report

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

Common Name	Scientific Name	Plant Community Type(s)
Glossy Black-Cockatoo	Calyptorhynchus lathami	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
White-bellied Sea-Eagle	Haliaeetus leucogaster	76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
		278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion

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
Glossy Black-Cockatoo	Calyptorhynchus lathami	Refer to BAR
White-bellied Sea-Eagle	Haliaeetus leucogaster	Refer to BAR

BAM Candidate Species Report

Proposal Details

Assessment Id 00041731/BAAS18106/23/00041732	Proposal Name Walla Walla residential subdivision	BAM data last updated * 22/06/2023
Assessor Name Steve Hamilton	Report Created 21/01/2024	BAM Data version * 61
Assessor Number BAAS18106	Assessment Type Part 4 Developments (General)	BAM Case Status Open
Assessment Revision 0	Date Finalised To be finalised	BOS entry trigger BOS Threshold: Biodiversity Values Map and area clearing threshold

* 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
Austrostipa wakoolica A spear-grass	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☑ Nov ☑ Dec ☐ Survey month outside the specified months?
Callocephalon fimbriatum Gang-gang Cockatoo	Yes (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☑ Nov ☑ Dec ☐ Survey month outside the specified months?

Calyptorhynchus lathami Glossy Black-Cockatoo	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☑ Jul ☑ Aug ☑ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Hieraaetus morphnoides Little Eagle	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☑ Aug ☑ Sep ☑ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
Lathamus discolor Swift Parrot	No (surveyed) *Survey months are outside of the months specified in Bionet.	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☑ Jul ☑ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☑ Survey month outside the specified months?
Lepidium aschersonii Spiny Peppercress	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☑ Nov ☑ Dec ☐ Survey month outside the specified months?
Lophochroa leadbeateri Major Mitchell's Cockatoo	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☑ Sep ☑ Oct ☑ Nov ☑ Dec ☐ Survey month outside the specified months?
Lophoictinia isura Square-tailed Kite	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☑ Sep ☑ Oct ☑ Nov ☑ Dec ☐ Survey month outside the specified months?

Ninox connivens Barking Owl	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☑ Jul ☑ Aug ☑ Sep ☑ Oct ☑ Nov ☑ Dec ☐ Survey month outside the specified months?
Petaurus norfolcensis Squirrel Glider	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☑ Aug ☐ Sep ☑ Oct ☐ Nov ☑ Dec ☐ Survey month outside the specified months?
Phascolarctos cinereus Koala	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☑ Jul ☑ Aug ☑ Sep ☑ Oct ☑ Nov ☑ Dec ☐ Survey month outside the specified months?
Polytelis swainsonii Superb Parrot	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☑ Nov ☐ Dec ☐ Survey month outside the specified months?
Pteropus poliocephalus Grey-headed Flying-fox	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☑ Oct ☑ Nov ☑ Dec ☐ Survey month outside the specified months?
Swainsona murrayana Slender Darling Pea	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☑ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?

Swainsona recta Small Purple-pea	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☑ Sep ☑ Oct ☑ Nov ☐ Dec ☐ Survey month outside the specified months?
Swainsona sericea Silky Swainson-pea	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☑ Sep ☑ Oct ☑ Nov ☐ Dec ☐ Survey month outside the specified months?
Tyto novaehollandiae Masked Owl	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☑ Jul ☑ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified 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
Bush Stone-curlew	Burhinus grallarius	Habitat constraints
Glossy Black-Cockatoo, Riverina population	Calyptorhynchus lathami - endangered population	Refer to BAR
Mossgiel Daisy	Brachyscome papillosa	Refer to BAR
Pine Donkey Orchid	Diuris tricolor	Refer to BAR
Pink-tailed Legless Lizard	Aprasia parapulchella	Habitat constraints
Sand-hill Spider Orchid	Caladenia arenaria	Refer to BAR
Sloane's Froglet	Crinia sloanei	Habitat constraints
Spike-Rush	Eleocharis obicis	Habitat constraints

Squirrel Glider in the Wagga Wagga Local Government Area	Petaurus norfolcensis - endangered population	Refer to BAR
White-bellied Sea-Eagle	Haliaeetus leucogaster	Habitat constraints

BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id
00041731/BAAS18106/23/00041732

Proposal Name
Walla Walla residential subdivision

BAM data last updated *
22/06/2023

Assessor Name
Steve Hamilton

Assessor Number
BAAS18106

BAM Data version *
61

Proponent Names

Report Created
21/01/2024

BAM Case Status
Open

Assessment Revision
0

Assessment Type
Part 4 Developments (General)

Date Finalised
To be finalised

BOS entry trigger
BOS Threshold: Biodiversity Values Map and area clearing threshold

* 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

PCT Outside Ibra Added

None added

PCTs With Customized Benchmarks

PCT
No Changes

Predicted Threatened Species Not On Site

Name
Calyptorhynchus lathami / Glossy Black-Cockatoo
Haliaeetus leucogaster / White-bellied Sea-Eagle

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
76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	5.7	0	0	0
278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion	White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	0.1	0	0	0

BAM Biodiversity Credit Report (Like for like)

76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions

Like-for-like credit retirement options

Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region
Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions This includes PCT's: 76, 80, 81, 82, 101, 110, 237, 248, 3405	-	76_Modified_1	Yes	0	Lower Slopes, Bogan-Macquarie, Inland Slopes, Lachlan Plains, Murray Fans, Murrumbidgee and Nymagee. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion

Like-for-like credit retirement options

Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland This includes PCT's:	-	278_Modified_4	Yes	0	Lower Slopes, Bogan-Macquarie, Inland Slopes, Lachlan Plains, Murray Fans, Murrumbidgee and Nymagee. or Any IBRA subregion that is within 100 kilometers of the outer edge of the

	74, 75, 83, 101, 250, 266, 267, 268, 270, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 298, 302, 312, 341, 342, 347, 350, 352, 356, 367, 381, 382, 395, 401, 403, 421, 433, 434, 435, 436, 437, 451, 483, 484, 488, 492, 496, 508, 509, 510, 511, 516, 528, 538, 544, 563, 567, 571, 589, 590, 597, 599, 618, 619, 622, 633, 654, 702, 703, 704, 705, 710, 711, 796, 797, 799, 847, 851, 921, 1099, 1303, 1304, 1324, 1329, 1330, 1332, 1383, 1606, 1608, 1611, 1693, 1695, 1698, 3314, 3359, 3363, 3373, 3376, 3387, 3388, 3394, 3395, 3396, 3397, 3398, 3399, 3406, 3415, 3533, 4147, 4149, 4150					impacted site.

BAM Biodiversity Credit Report (Like for like)

Species Credit Summary

Species	Vegetation Zone/s	Area / Count	Credits
Callocephalon fimbriatum / Gang-gang Cockatoo	**76_Modified_1, 278_Modified_4**	5.6	37.00

Credit Retirement Options

Like-for-like credit retirement options

	Spp	IBRA subregion
Callocephalon fimbriatum / Gang-gang Cockatoo	**Callocephalon fimbriatum /** Gang-gang Cockatoo	Any in NSW

BAM Biodiversity Credit Report (Variations)

Proposal Details

Assessment Id

00041731/BAAS18106/23/00041732

Proposal Name

Walla Walla residential subdivision

BAM data last updated *

22/06/2023

Assessor Name

Steve Hamilton

Assessor Number

BAAS18106

BAM Data version *

61

Proponent Name(s)

Report Created

21/01/2024

BAM Case Status

Open

Assessment Revision

0

Assessment Type

Part 4 Developments (General)

Date Finalised

To be finalised

BOS entry trigger

BOS Threshold: Biodiversity Values Map and area clearing threshold

* 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

PCT Outside Ibra Added

None added

PCTs With Customized Benchmarks

PCT
No Changes

Predicted Threatened Species Not On Site

Name
Calyptorhynchus lathami / Glossy Black-Cockatoo
Haliaeetus leucogaster / White-bellied Sea-Eagle

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
76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	5.7	0	0	0.00
278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion	White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	0.1	0	0	0.00

76-Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions

Like-for-like credit retirement options

Class	Trading group	Zone	HBT	Credits	IBRA region

	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions This includes PCT's: 76, 80, 81, 82, 101, 110, 237, 248, 3405	-	76_Modified_1	Yes	0	Lower Slopes,Bogan-Macquarie, Inland Slopes, Lachlan Plains, Murray Fans, Murrumbidgee and Nymagee. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
	Variation options					
	Formation	Trading group	Zone	HBT	Credits	IBRA region
	Grassy Woodlands	Tier 1	76_Modified_1	Yes (including artificial)	0	IBRA Region: NSW South Western Slopes, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion	**Like-for-like credit retirement options**					
	Class	Trading group	Zone	HBT	Credits	IBRA region

White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland This includes PCT's: 74, 75, 83, 101, 250, 266, 267, 268, 270, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 298, 302, 312, 341, 342, 347, 350, 352, 356, 367, 381, 382, 395, 401, 403, 421, 433, 434, 435, 436, 437, 451, 483, 484, 488, 492, 496, 508, 509, 510, 511, 516, 528, 538, 544, 563, 567, 571, 589, 590, 597, 599, 618, 619, 622, 633, 654, 702, 703, 704, 705, 710, 711, 796, 797, 799, 847, 851, 921, 1099, 1303, 1304, 1324, 1329, 1330, 1332, 1383, 1606, 1608, 1611, 1693, 1695, 1698, 3314, 3359, 3363, 3373, 3376, 3387, 3388, 3394, 3395, 3396, 3397, 3398, 3399, 3406, 3415, 3533, 4147, 4149, 4150	-	278_Modified_4	Yes	0	Lower Slopes,Bogan-Macquarie, Inland Slopes, Lachlan Plains, Murray Fans, Murrumbidgee and Nymagee. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Variation options

Formation	Trading group	Zone	HBT	Credits	IBRA region

	Grassy Woodlands	Tier 2 or higher threat status	278_Modified_4	Yes (including artificial)	0	IBRA Region: NSW South Western Slopes, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Species Credit Summary

Species	Vegetation Zone/s	Area / Count	Credits
Callocephalon fimbriatum / Gang-gang Cockatoo	**76_Modified_1, 278_Modified_4**	5.6	37.00

Credit Retirement Options

Like-for-like options

Callocephalon fimbriatum/ Gang-gang Cockatoo	Spp	IBRA region	
	Callocephalon fimbriatum/Gang-gang Cockatoo	Any in NSW	
	Variation options		
	Kingdom	Any species with same or higher category of listing under Part 4 of the BC Act shown below	IBRA region
	Fauna	Vulnerable	Lower Slopes, Bogan-Macquarie, Inland Slopes, Lachlan Plains, Murray Fans, Murrumbidgee and Nymagee. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

BAM Credit Summary Report

Proposal Details

Assessment Id 00041731/BAAS18106/23/00041732	Proposal Name Walla Walla residential subdivision	BAM data last updated * 22/06/2023
Assessor Name Steve Hamilton	Report Created 21/01/2024	BAM Data version * 61
Assessor Number BAAS18106	BAM Case Status Open	Date Finalised To be finalised
Assessment Revision 0	Assessment Type Part 4 Developments (General)	BOS entry trigger BOS Threshold: Biodiversity Values Map and area clearing threshold

* 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

Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion												
2	278_Modified_4	White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	8.1	8.1	0.08	Environment Protection and Conservation Act listing status	High Sensitivity to Gain	Not Listed	Critically Endangered	2.50		0
											Subtotal	**0**
Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions												
1	76_Modified_1	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	13.1	13.1	5.7	Biodiversity Conservation Act listing status	High Sensitivity to Gain	Endangered Ecological Community	Not Listed	2.00		0
											Subtotal	**0**
											Total	**0**

Species credits for threatened species

BAM Credit Summary Report

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
Callocephalon fimbriatum / Gang-gang Cockatoo (Fauna)									
76_Modified_1	13.1	13.1	5.5	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Endangered	False	36
278_Modified_4	8.1	8.1	0.08	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Endangered	False	1
								Subtotal	**37**