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BIODIVERSITY DEVELOPMENT ASSESSMENT REPORT

412 CESSNOCK ROAD, GILLIESTON HEIGHTS

May 2025

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Version Control

Version	Purpose	Author	Reviewed / approved by	Date
Rev 0.1	Draft Report	Andrew Ritchie	Kody Kemp	03/06/2025
Rev1.0	Final Draft Report	Kody Kemp	Lachlan Webster	03/06/2025
Rev 2.0	Final Report	Kody Kemp	Lachlan Webster	05/06/2025

Distribution Control

Copy	Purpose	Method	Issued to:	Name	Date
1	File Copy	Electronic/Email	Biodiversity Australia	Chantal Sargeant	05/06/2025
1	File Copy	Electronic/Email	stuart@exp.com.au	Stuart Quirk	05/06/2025

Accredited Assessor Authorisation

Assessor Name	Accreditation number	Signature	Date
Lachlan Webster	BAAS23020		05/06/2025

Project Number: ENS6765

Our Document Reference: ENS6765-BEC-REP-GilliestonHeights-BDAR-rev2.0

Executive Summary

This report has assessed the impact of a proposed development on the 4 ha Subject Land comprising Lot 21 and Lot 22 DP1092105, 412 Cessnock Road, Gillieston Heights, NSW. The proposed works are to occur over the Development Footprint of which the entirety of the Subject Land is included.

The property is zoned as R1 – General Residential and hence a 450m² minimum lot size applies. In accordance with the Biodiversity Assessment Method 2020 (BAM) this allows for a maximum clearing area of 0.25 ha of Native Vegetation and as such a BDAR is required. As the area of impact is less than 1 ha the application of the small area BDAR is considered appropriate. The proposed Development Footprint only impacts Native Vegetation in the form of scattered paddock trees totalling an area of 0.76 ha, less than the maximum clearing area. A standard BDAR assessment is not required in this case and instead, the Streamlined Assessment Module - small area method as described in Appendix C and L of the BAM (2020) has been applied.

One vegetation community (*PCT 3446 – Lower North Foothills Ironbark-Box-Gum Grassy Forest*) was identified within the Development Footprint. The condition of this vegetation was considered to be of low condition and is consistent throughout the Subject Land where it has been mapped, resulting in the application of a single vegetation zone. The total area of native vegetation that will require removal totals 0.76 ha. This impact is recommended to be offset through purchase and retirement of appropriate ecosystem credits as described in this report. The remaining vegetation present on the Subject Land is dominated by exotic species and is highly degraded to the point where it does not meet the threshold for offsetting. It is also not considered to provide critical habitat for threatened flora or fauna.

The Native Vegetation present within the Development Footprint was considered to conform to the EEC *Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions*. Site surveys identified these patches of EEC as low quality due to the absence of a developed understory, the history of land use within the region, the isolation and fragmentation from other EEC patches, and the growing anthropogenic encroachment in the landscape surrounding.

No threatened flora species were detected within the Development Footprint despite targeted survey by suitably qualified BAM accredited assessors.

No targeted fauna survey was required, and no threatened fauna species were detected while conducting surveys on the Subject Land.

No areas of Biodiversity Values are mapped within, or adjacent to the Subject Land.

The Development Footprint does not contain any entities associated with Serious and Irreversible Impacts.

The Subject Land does not occur within, or close to, any mapped SEPP Wetlands proximity area.

Vegetation on the Subject Land does not conform to potential Koala Habitat under Chapter 4 Koala Habitat protection (SEPP (Biodiversity and Conservation) 2021) and the Maitland City Council does not have an associated Koala Plan of Management (KPoM). An assessment of Chapter 4 Koala Habitat protection (SEPP (Biodiversity and Conservation) 2021) has been provided in A-2, detailing that the proposed development is unlikely to have a significant impact on koala habitat.

Direct impacts of the proposal include the removal of 0.76ha of vegetation consistent with Low Condition *PCT 3446 – Lower North Foothills Ironbark-Box-Gum Grassy Forest* consistent with the EEC *Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions.* Vegetation to be removed is primarily comprised of 61 trees including two hollow bearing trees. The removal of this vegetation will be offset through the purchase and retirement of credits, the loss of mature trees will be offset through the Street Tree Plan and the loss of hollow bearing trees will be offset through the installation of nest boxes.

Indirect impacts associated with the development are considered to be minor and will be mitigated through the measures described in this report.

Abbreviations

Table 1: List of abbreviations within report

BAM	Biodiversity Assessment Method
BC Act	*Biodiversity Conservation Act 2016*
BDAR	Biodiversity Development Assessment Report
Bio Aus.	Biodiversity Australia
BOS	Biodiversity Offset Scheme
DAWE	Department of Agriculture, Water and the Environment
DEC	Department of Environment and Conservation
DPE	Department of Planning and Environment
DSEWPC	Department of Sustainability, Environment, Water, Population and Communities
EEC	Endangered Ecological Community
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
GIS	Geographic Information System
HBT	Hollow-bearing Tree
KFT	Koala Food Tree
KPoM	Koala Plan of Management
KTP	Key Threatening Process
LGA	Local Government Area
MNES	Matter of National Environmental Significance
NSW	New South Wales
OEH	Office of Environment and Heritage
PCT	Plant Community Type
PIR	Passive Infrared Camera
SAII	Serious and Irreversibly Impacts
SAT	Spot Assessment Technique
SEPP	*State Environmental Protection Policy*
TBDC	Threatened Biodiversity Data Collection
TEC	Threatened Ecological Community
VMP	Vegetation Management Plan

STAGE 1 - BIODIVERSITY ASSESSMENT

1. Introduction

Biodiversity Australia (Bio Aus) was requested to undertake a Biodiversity Development Assessment Report (BDAR) for proposed development of Lot 21 and Lot 22 DP1092105, 412 Cessnock Road, Gillieston Heights, NSW.

1.1 Requirement for the BDAR

The property is zoned as R1 – General Residential and hence a 450m² minimum lot size applies. In accordance with the Biodiversity Assessment Method 2020 (BAM) this allows for a maximum clearing threshold of 0.25 ha. As the development footprint will remove less than 1 ha, the proposed development has been assessed under the Streamlined Assessment module – Small Area. The proposed Development Footprint impacts Native Vegetation in the form of scattered paddock trees totalling an area of 0.76 ha, less than the maximum clearing area. A standard BDAR assessment is not required in this case and instead, the Streamlined Assessment Module - small area method as described in Appendix C and L of the BAM (2020) has been applied.

The Subject Land does not contain any areas of mapped Biodiversity Values. The land in its current state is cleared exotic grassland with scattered paddock trees. Vegetation occurring on the Subject Land consists of several mature Eucalypts, a mostly absent understorey except for isolated Acacias, and a ground layer of largely exotic grasses and forbs, which is managed through slashing/mowing. The Development Footprint will require the removal of all vegetation on the Subject Land.

1.2 Definitions Used in the Report

This report uses the following key definitions:

- **Assessment Area:** includes the Subject Land and the area of land within the 1500 m buffer zone surrounding the Subject Land that is determined as per Subsection 3.1.2 of the BAM.
- **Subject Land:** Lot 21 and Lot 22 DP1092105, Gillieston Heights, NSW which is an area of 4 ha (Figure 1).
- **Development Footprint:** Refers to the entirety of the Subject Land as this is the extent of the required impact

These definitions are in line with the BAM Methodology, which provides further explanation of definitions and legal terms that may be used in this report.

1.3 Structure of the Report

This report has been structured using guidance provided in Appendix L of the BAM. It is structured as follows:

- Section 1 – Introduction, provides background information for the assessment.
- Section 2 – Site Context, describes the landscape features of the Subject Land and Assessment Area.
- Section 3 - Native Vegetation, describes the native vegetation features of the Subject Land.
- Section 4 – Threatened Species, describes the threatened species and habitat features associated with the Subject Land.
- Section 5 – Avoid and Minimise Impacts, details avoidance and minimisation measures for the proposal.
- Section 6 – Impact Summary and Biodiversity Credit Report, provides an impact summary and the number and type of credits required to offset impacts.

1.4 Description of the Subject Land

The location of the Subject Land is approximately 4 kilometres south of the Maitland CBD. The Subject Land comprises a 4-ha property located at 412 Cessnock Road, Gillieston Heights, NSW. It is described as Lot 21 and Lot 22 DP1092105. The entirety of the Subject Land is zoned R1 – General Residential. The context of the Subject Land is provided within Figure 1.

The Subject Land consists of one vegetation community, which has a single condition class. The majority of the Subject Land is derived grassland, however, contains several mature paddock trees. A highly disturbed drainage line occurs in the central northern portion. Infrastructure on the Subject Land once consisted of a large shed in the south and one residential dwelling in the central east, however both have recently been removed.

The Subject Land is surrounded by residential houses to the north and west, Cessnock Road to the east, and grassland to the south.

Figure 2 and the subsequent Photo Plate 1: Images of the Subject Land depict the condition of the Development Footprint.

1.5 Development Proposal

The proposed development requests the development of 50 residential lots within the existing property boundary (Figure 3). A drainage reserve exists within the property and has been considered in the initial development design.

Figure 1: Location of the Subject Land

This mapping is to be considered indicative only and all derivations (e.g., vegetation communities) are best approximations and subject to errors including individual interpretation and reliance on information provided to Bio Aus where were not independently verified. All information is intended to be indicative only and no reliance for extrapolation, mapping etc. should be placed upon this map without independent validation of the information by the user. Bio Aus takes no responsibility for any subsequent error losses etc. that may arise from the use of this data without independent verification.	Project Manager: L. Webster	Figure Name: Location of the Subject Land	Biodiversity AUSTRALIA	
	Drawn by: A. Ritchie	Location: 412 Cessnock Road, Gillieston heights, NSW		
	Date: June 2025	Client: EXP Capital	Job Number: ENS6765	Spatial Reference: WGS 84 / Pseudo-Mercator Scale: 1:30000

Figure 2: Development Footprint and Impact Area

Figure Name: Development Footprint	Location: 412 Cessnock Road, Gillieston Heights, NSW	Client: EXP Capital	Biodiversity Australia
This mapping is to be considered indicative only and all derivations (e.g., vegetation communities) are best approximations and subject to errors including individual interpretation and reliance on information provided to Bio Aus where were not independently verified. All information is intended to be indicative only and no reliance for extrapolation, mapping etc. should be placed upon this map without independent validation of the information by the user. Bio Aus takes no responsibility for any subsequent error losses etc. that may arise from the use of this data without independent verification.		Job Number: ENS6765	
		Date: June 2025	Project Manager: L. Webster / Drawn by: A. Ritchie
		Scale: 1:2250	Spatial Reference: WGS 84 / Pseudo-Mercator

Photo Plate 1: Images of the Subject Land

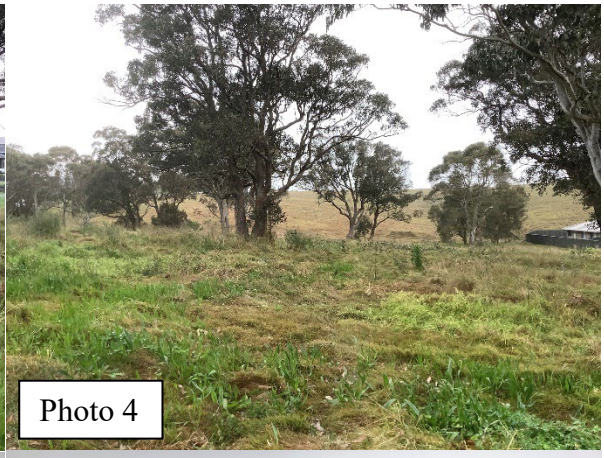


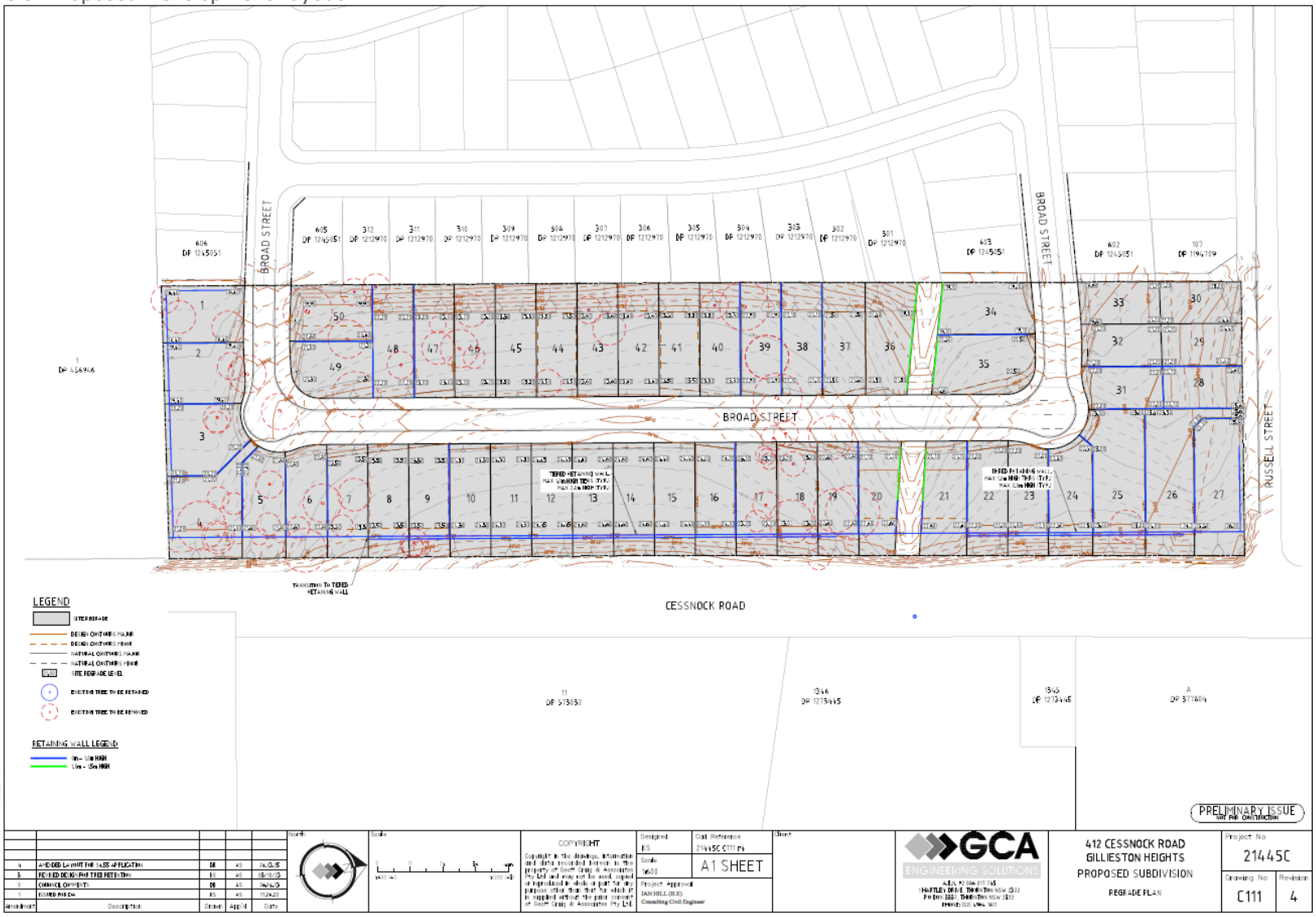
Photo 7

Photo 8

Photo 9

Photo 10

Figure 3: Proposed Development Layout



1.6 Information Sources

The following databases and Geographic Information System (GIS) layers were searched/obtained:

- Department of Climate Change, Energy, the Environment and Water - Protected Matters Search Tool (DCCEEW 2025a).
- Department of Climate Change, Energy, the Environment and Water - MNES SPRAT Profiles (DCCEEW 2025b).
- Office of Environment and Heritage Threatened Biodiversity Data Collection (OEH 2025).
- NSW Department of Planning and Environment - BioNet/Atlas of Wildlife (DPE 2025).
- NSW Department of Planning and Environment - Regional Corridors and Key Habitat Mapping (DPE 2025).
- NSW Department of Planning, Industry and Environment - Biodiversity Values Map and Threshold Tool and digital data layer (DPE 20225).
- NSW Department of Planning, Industry and Environment – BioNet Vegetation Classification (DPE 2025)
- NSW Department of Planning and Environment – NSW Mitchell Landscapes (DPE 2025d).
- NSW Department of Planning and Environment – State Vegetation Type Mapping (DPE 2025e).
- Coastal Quaternary Geology – North and South Coast of NSW digital data layer (Troedson & Hashimoto 2008).

2. Site Context

2.1.1 IBRA Bioregions and Subregions

The Subject Land is located in the Sydney Basin IBRA region and the Hunter subregion. The Subject Land is located on the Newcastle Coastal Ramp Mitchell Landscape.

2.1.2 Native Vegetation Extent in 1500m Buffer

As required under the BAM Methodology native vegetation present within the broader area must be determined to obtain a comparison between the native vegetation cover present with the broader area and the Subject Land.

As such, a 1500 m buffer was established around the Subject Land (Figure 5). Analysis with GIS has determined that there is approximately 11.31% native vegetation cover within 1500 m buffer.

2.1.3 Cleared Areas

Majority of the Subject Land is classified as non-native cleared land. Aside from the scattered trees and residential dwelling and shed, the Subject Land consists of a mostly non-native ground layer, which is often mown/slashed.

2.1.4 Landscape Features

The following table shows the presence of landscape features on the Subject Land and provides details of these features if present.

Table 2: Landscape features present

Feature	Present on site?	Present on adjoining land?	Description
Rivers and Streams	No	No	-
Important Local Wetlands	No	No	-
Connectivity Features	No	No	-
Areas of Geological Significance (e.g. karst, caves, crevices, cliffs)	No	No	-
Soil Hazard Features	No	No	-

2.1.5 Biodiversity Values

The Subject Land contains no areas of mapped Biodiversity Values, as can be seen below in Figure 4.

2.1.6 Soils, Topography and Geology

The Subject Land occurs on the Bolwarra heights soil landscape which is predominantly Branxton Formation of the Maitland Group (Sandstone, Siltstone, conglomerate, erratics).

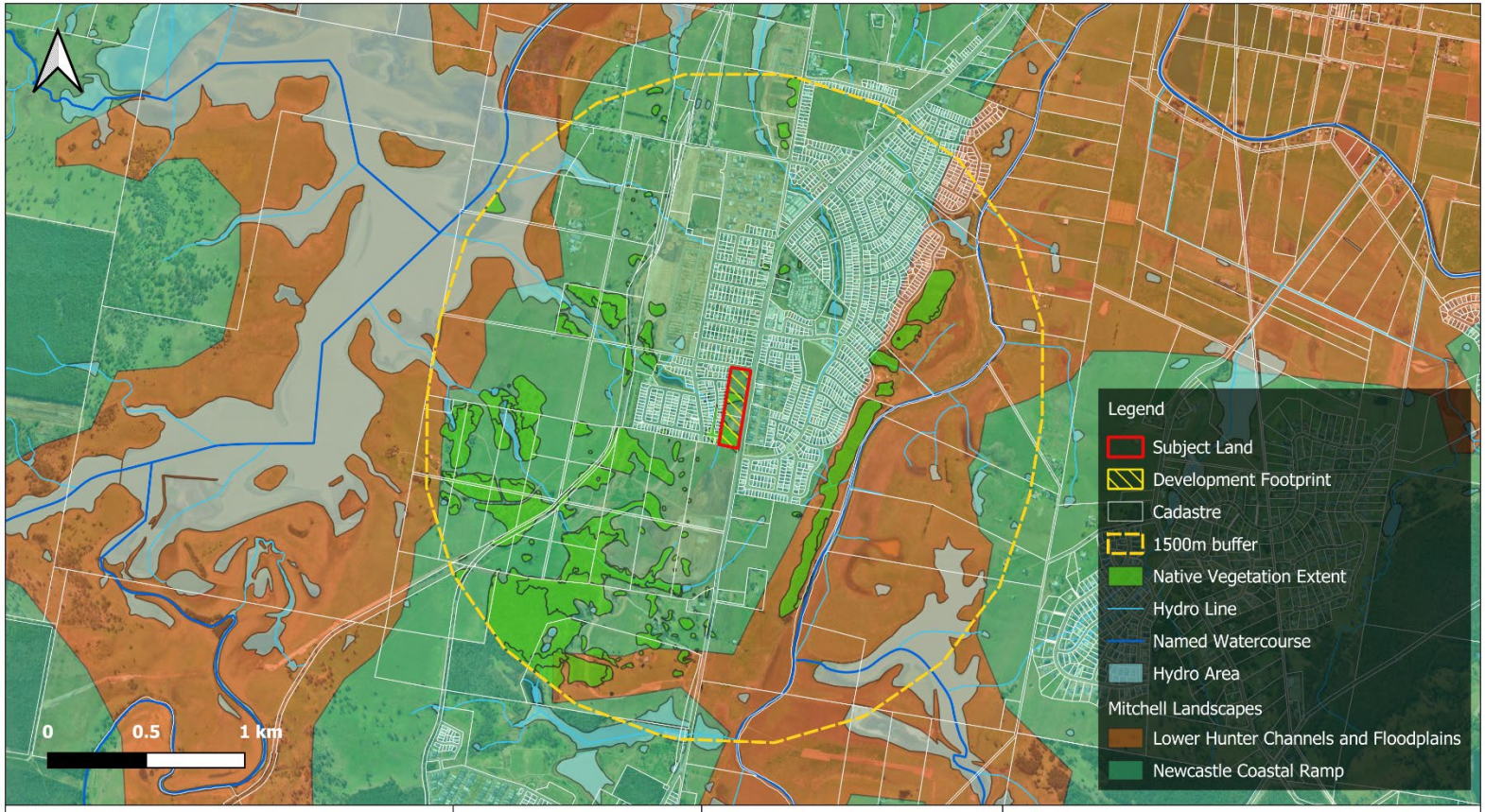
The landscape is described as low rolling hills on Permian sediments in the central west of the East Maitland Hills region (eSpade, 2025). The soil landscape occurs at 40 – 100 m metres elevation with broad hill crests and short convex side slopes with incised drainage lines. Rocky outcrops are localised.

The Subject Land occurs on the mid slope and a drainage line runs from east to west toward the north of the property (DPIE 2022). Other quaternary features including alluvial plains are beyond the Subject Land, over 10km from the site to the west (Figure 6).

Figure 4: Biodiversity Values map

This mapping is to be considered indicative only and all derivations (e.g., vegetation communities) are best approximations and subject to errors including individual interpretation and reliance on information provided to Bio Aus where were not independently verified. All information is intended to be indicative only and no reliance for extrapolation, mapping etc. should be placed upon this map without independent validation of the information by the user. Bio Aus takes no responsibility for any subsequent error losses etc. that may arise from the use of this data without independent verification.	Project Manager: L. Webster	Figure Name: Biodiversity Values	Biodiversity AUSTRALIA	
	Drawn by: A. Ritchie	Location: 412 Cessnock Road, Gillieston heights, NSW		
	Date: June 2025	Client: EXP Capital	Job Number: ENS6765	Spatial Reference: WGS 84 / Pseudo-Mercator Scale: 1:15000

Figure 5: Site Context



This mapping is to be considered indicative only and all derivations (e.g., vegetation communities) are best approximations and subject to errors including individual interpretation and reliance on information provided to Bio Aus where were not independently verified. All information is intended to be indicative only and no reliance for extrapolation, mapping etc. should be placed upon this map without independent validation of the information by the user. Bio Aus takes no responsibility for any subsequent error losses etc. that may arise from the use of this data without independent verification.

Project Manager: L. Webster	Figure Name: Site Context	Biodiversity AUSTRALIA	
Drawn by: A. Ritchie	Location: 412 Cessnock Road, Gillieston heights, NSW		
Date: June 2025	Client: EXP Capital	Job Number: ENS6765	Spatial Reference: WGS 84 / Pseudo-Mercator Scale: 1:30000

Figure 6: Quaternary Geology

This mapping is to be considered indicative only and all derivations (e.g., vegetation communities) are best approximations and subject to errors including individual interpretation and reliance on information provided to Bio Aus where were not independently verified. All information is intended to be indicative only and no reliance for extrapolation, mapping etc. should be placed upon this map without independent validation of the information by the user. Bio Aus takes no responsibility for any subsequent error losses etc. that may arise from the use of this data without independent verification.	Project Manager: L. Webster	Figure Name: Quaternary Geology	Biodiversity AUSTRALIA	
	Drawn by: A. Ritchie	Location: 412 Cessnock Road, Gillieston heights, NSW		
	Date: June 2025	Client: EXP Capital	Job Number: ENS6765	Spatial Reference: WGS 84 / Pseudo-Mercator Scale: 1:100000

3. Native Vegetation

3.1 Survey Methods

Vegetation surveys were undertaken by BAM accredited assessors Lachlan Webster and Botanist David Conder in September 2022.

3.1.1 Vegetation Integrity Survey

Vegetation Plots were undertaken within the Development Footprint as per the BAM methodology. Each consists of a 20x20 metre plot in which floristic composition and structural attributes are collected, and a 20x50 metre plot which collects ecosystem function attributes.

The Subject Land has seen extensive clearing as a product of its historical land use, likely for livestock grazing. As such, the vegetation that is present within the Development Footprint exists in a highly derived state.

Open areas within the Subject Land occurred in a highly degraded state with a high cover of exotic species. The open areas are therefore considered to be cleared exotic grassland and do not conform to any PCT.

The remaining vegetation within the Development Footprint conforms to *PCT 3446 Lower North Foothills Ironbark-Box-Gum Grassy Forest* and is of low condition. This low condition PCT 3446 is the only Vegetation Zone within the Development Footprint. Due to the relatively small area of direct impact within the Development Footprint (~0.76ha), randomly allocated locations and bearings were not considered appropriate as there was a high chance of misrepresenting the Vegetation Zone.

Plots were located to ensure they captured the attributes relevant to the Vegetation Zone as per Section 4.3.4 (3)(c) of the BAM 2020. Section 4.3.4 (5) was also fully considered and adopted in this process.

The following information was collected within each vegetation plot:

- Observer, location and date;
- Plot dimensions and orientation;
- Photographic record of vegetation;
- Vegetation Class and Plant Community Type (PCT);
- Physical features and disturbance history;
- Full flora list;
- Growth-form cover and abundance of each species;
- Exotic and High Threat Exotic (HTE) plant cover;
- Number of large trees;
- Recruitment;
- Presence of hollow-bearing trees;
- Length of logs; and
- Litter cover.

The field data collected was tallied and input into the BAM calculator to determine a vegetation integrity score for the Vegetation Zone.

3.1.2 Vegetation Classification and Mapping

Plant Community Types (PCTs) were sampled by Plots described above and through walking random meander transects. Due to the limited extent of vegetation within the Development Footprint this provided 100 % coverage. The random meander transects also allowed for a more comprehensive flora inventory on the Subject Land.

The PCTs were described from data collected during the Plots and random meander transect studies. The vegetation classification is based on the NSW Plant Community Type (PCT) Classification.

Plant species were identified to species or subspecies level and nomenclature conforms to that currently recognised by the Royal Botanic Gardens and follows Harden and PlantNET for changes since Harden.

3.2 Plant Community Type Descriptions

The Subject Land has seen extensive clearing as a product of its historical land use, likely for livestock grazing. As such, the vegetation that is present within the Development Footprint exists in a highly derived state.

There exists several mature *Eucalyptus acmenoides* and *E. tereticornis* in the south of the Subject Land extending north along the western boundary behind the shed. There is extensive regrowth in the understory in the vicinity of these mature eucalypt species The northern portion of the Subject Land is devoid of all canopy and shrub layer species.

The ground layer exists as a mixture of native and exotic grasses and forbs. The canopy species present in conjunction with landscape position, Permian sediment and previous vegetation mapping suggests that the vegetation is on the Subject Land is *PCT 3446 – Lower North Foothills Ironbark-Box-Gum Grassy Forest*. This PCT is associated with the *Hunter Lowland Redgum Forest in the Sydney Basin and NSW North Coast Bioregion Threatened Ecological Community* listed under the BioNet Vegetation Classification System.

The following provides a description of the native vegetation within the Subject Land that will be affected by the proposal.

A description of the Vegetation Community sampled is provided below, with photos following. A map of the Vegetation Communities is provided in Figure 7.

3.2.1 Community 1

Table 3: Vegetation community 1 description

Vegetation Community	PCT 3446 – Lower North Foothills Ironbark-Box-Gum Grassy Forest
Vegetation Formation	Dry Sclerophyll Forests (Shrub/grass sub-formation, KF_CH5A)
Vegetation Class	Hunter-Macleay Dry Sclerophyll Forests
Land Zones & Area	Low – 0.76 ha
EEC/TEC Status	PCT 3446 is associated with the *Hunter lowland redgum forest in the Sydney Basin and NSW North Coast bioregion EEC.* PCT 3446 is considered to conform to the EEC, though in a degraded state as the mapped extent meets the landscape position, gentle slopes rising from depressions and drainage flats, and occurs on Permian sediments as described in paragraph 1 and 5 of the Final Determination. The canopy was also dominated by *Eucalyptus tereticornis* which is listed as a characteristic species. The PCT is also recorded in the appropriate LGA (Maitland) as listed in paragraph 3. Though the PCT is degraded and contains only a small number of associated species listed in the Final Determination, it is considered appropriate that the PCT conforms to the EEC. PCT 3446 is also associated with the Central Hunter Valley Eucalypt Forest and Woodland TEC, however, the presence of *Eucalyptus acmenoides* on the Subject Land does not meet the key diagnostic characteristics (section 1.5.1) listed in the conservation advice for this TEC.
Clearing Extent	74.93
Vegetation Zones	1
Number of Plots	2
Location	Occurs in small patches across the Subject Land, mostly in the southern and central portions
Description	**Canopy:** Structure and Species: The canopy was open with White Mahogany (Eucalyptus acmenoides) and Forest Redgum (E. tereticornis) co-dominating. One isolated Rough-barked Apple (Angophora floribunda) was recorded in the south east of the property and a single large Melaleuca styphelioides in the north east corner. **Understory:** Structure and Species: Mostly absent within the site except for isolated Acacia decurrens in the south of the Subject Land. **Shrub layer:** Structure and Species: Shrub layer species were absent throughout the site. **Ground layer:** Structure and Species: The majority of the site is derived grassland that is managed through regular slashing/mowing and comprises a cover of grasses and forbs. The more common native species include Couch (Cynodon dactylon), Brown's lovegrass (Eragrostis brownii) and Kangraoo grass (Themeda triandra). Silvertop wallaby grass (Rytidosperma pallidum) and Shorthair plume grass (Dichelachne micrantha) were also recorded. The lower drainage line also saw bulrush (Typha orientalis), common rush (Juncus usitatus) and Cyperus polystachyos recorded. The exotic species African pigeon grass (Setaria sphacelata) was also common in disturbed areas. Common exotic species recorded in the derived grassland also included Kikuyu (Cenchrus clandestinus), Plantain (Plantago lanceolata) and farmers friend (Bidens pilosa). Blackberry (Rubus armeniacus) was recorded over much of the far northern portion of the property.
Condition	This community is fragmented across the Subject Land, and is only present where lies scattered mature paddock trees. The shrub layer is almost entirely absent, and highly disturbed and supressed where present, and the ground layer is a mix of native and exotic species and is supressed and disturbed via mowing. The general condition of the community is low.

Photo Plate 2: Community 1 at survey plot 1

Photo Plate 3: Vegetation Zone 2 – Cleared Exotic Land

3.2.2 Justification of PCT and Vegetation Zones

- PCT 3446 - This community has the necessary diagnostic features, substrate and landscape position to enable its identification at this Subject Land (Table 4. Justification of PCT 3446 selection). The area of PCT is present in a disturbed state, occurring in patches of large mature trees, and its shrub and ground layers are highly disturbed. The area;
  - Does not contain any fallen logs
  - Contains a high abundance of weed species,
  - Contains less than 5% litter cover,
  - Species diversity is low in the ground, shrub layer, and canopy layer, &
  - Weed coverage is low to moderate, and the ground layer is highly modified.

Table 4. Justification of PCT 3446 selection

PCT 3446 Lower North Foothills Ironbark-Box-Gum Grassy Forest - A tall sclerophyll open forest with a mid-stratum of dry and soft-leaved species and a grassy ground cover on the foothills of the lower north coast and lower Hunter valley, from Quorrobolong to Stratford.		
Justification of PCT selection	**Search Term**	**Selection**
	IBRA Bioregion	Sydney Basin
	IBRA Sub-region	Hunter
	Vegetation Formation	Dry Sclerophyll Forests (Shrub/grass sub-formation)
	Upper Stratum Species	*Eucalyptus tereticornis, E. acmenoides, Corymbia intermedia*
	Long List	Returned a long list of PCTs including: 3442, 3444, 3446, 3433, 3431, 3432, 3435, 3436
	Mid Stratum Species	*Acacia decurrens*
	Short List	Returned a short list of four PCTs: 3433, 3442, 3444, 3446
	Selection	PCT selection for this VZ was difficult as the VZ was largely missing its shrub layer, and the ground layer was highly disturbed. These four PCTs are acknowledged to form integrating mosaics of floristically similar communities. PCT 3442 was discarded as there was no Eucalyptus fibrosa recorded within the canopy, and no *Meleleuca nodosa* in the mid layer, both of which are almost always present in this PCT. PCT 3444 was discarded as there were no Ironbark's present which are considered almost always present. PCT 3444 also contains a diverse mid stratum. PCT 3433 was discarded as there were no Ironbark's present which are considered almost always present PCT 3446 was accepted due to the high frequency of the diagnostic species in the canopy, *Eucalyptus tereticornis*, *Eucalyptus acmenoides*, and *Corymbia intermedia.* PCT 3446 is mapped in the NSW SVTM Mapping (SEED 2024), covering approximately half of the Development Footprint. This supported confirming the community present as PCT 3446.

3.2.3 Vegetation Zones and Integrity Scores

Table 5: Vegetation zone and current integrity score presents vegetation integrity scores derived from field data form the BAM C. It should be noted that Plot 3 was undertaken in the cleared exotic grassland within the Development Footprint and returned a Vegetation Integrity score of 5.2. Because this score was less than 15.0, this area does not meet the threshold for offsetting. The location of the vegetation zone is presented in Figure 7.

Table 5: Vegetation zone and current Integrity score

Vegetation Community	Vegetation Zone	Condition Class	No. of plots	Patch Size Category	Area Impacted	Vegetation Integrity (VI) Score			
						Composition	Structure	Function	Total
PCT 3446 Lower North Foothills Ironbark-Box-Gum Grassy Forest	1	Low	2	0ha	0.76 ha	12.7	51.2	19.1	23.2
Cleared exotic grassland	2	Highly degraded	1	3ha	3.01 ha	4.5	30.2	0	5.2

Figure 7: Vegetation Zones and BAM Plot locations

Figure Name: Vegetation Zones and Survey Locations	Location: 412 Cessnock Road, Gillieston Heights, NSW	Client: EXP Capital	Biodiversity AUSTRALIA
This mapping is to be considered indicative only and all derivations (e.g., vegetation communities) are best approximations and subject to errors including individual interpretation and reliance on information provided to Bio Aus where were not independently verified. All information is intended to be indicative only and no reliance for extrapolation, mapping etc. should be placed upon this map without independent validation of the information by the user. Bio Aus takes no responsibility for any subsequent error losses etc. that may arise from the use of this data without independent verification.		Job Number: ENS6765	
		Date: June 2025	Project Manager: L. Webster / Drawn by: A. Ritchie
		Scale: 1:2250	Spatial Reference: WGS 84 / Pseudo-Mercator

4. Threatened Species

4.1 Predicted Species

Ecosystem credit species are threatened species which can be reliably predicted to occur by vegetation surrogates and landscape features. Targeted survey is not required for these species.

Some species which have specialised breeding requirements have dual credit classes to account for differences in foraging and breeding habitat. For example, Glossy Black Cockatoo foraging habitat can be reliably predicted through vegetation associations, however breeding habitat is specialised and requires hollow-bearing trees with hollows greater than 15 cm diameter and greater than five metres above the ground (OEH 2020a).

The BAM calculator produces a list of ecosystem credit species based on a number of attributes including Bioregion and subregion, patch size and the vegetation and habitat data collected in the field.

4.1.1 List of Species Derived

The threatened species derived from the BAM-C are presented in Table 6. Any additional species determined likely to be present by Bio Aus. were also added to the list and entered as an additional species in the BAM calculator.

These species have been predicted to occur based on the vegetation and habitat types present and are classed with ecosystem credits.

Table 6: Predicted Species potentially occurring

Common Name	Scientific Name	Vegetation Types(s)
Regent Honeyeater (Foraging)	*Anthochaera phrygia*	3446 - Lower North Foothills Ironbark-Box-Gum Grassy Forest
Gang-gang Cockatoo (Foraging)	*Callocephalon fimbriatum*	3446 - Lower North Foothills Ironbark-Box-Gum Grassy Forest
South-eastern Glossy Black-Cockatoo (Foraging)	*Calyptorhynchus lathami lathami*	3446 - Lower North Foothills Ironbark-Box-Gum Grassy Forest
Brown Treecreeper (eastern subspecies)	*Climacteris picumnus victoriae*	3446 - Lower North Foothills Ironbark-Box-Gum Grassy Forest
Black-necked Stork	*Ephippiorhynchus asiaticus*	3446 - Lower North Foothills Ironbark-Box-Gum Grassy Forest
Black Falcon	*Falco subniger*	3446 - Lower North Foothills Ironbark-Box-Gum Grassy Forest

Common Name	Scientific Name	Vegetation Types(s)
Black Bittern	*Ixobrychus flavicollis*	3446 - Lower North Foothills Ironbark-Box-Gum Grassy Forest
Broad-billed Sandpiper (Foraging)	*Limicola falcinellus*	3446 - Lower North Foothills Ironbark-Box-Gum Grassy Forest
Diamond Firetail	*Stagonopleura guttata*	3446 - Lower North Foothills Ironbark-Box-Gum Grassy Forest
Dusky Woodswallow	*Artamus cyanopterus cyanopterus*	3446 - Lower North Foothills Ironbark-Box-Gum Grassy Forest
Eastern Coastal Free-tailed Bat	*Micronomus norfolkensis*	3446 - Lower North Foothills Ironbark-Box-Gum Grassy Forest
Eastern Osprey	*Pandion cristatus*	3446 - Lower North Foothills Ironbark-Box-Gum Grassy Forest
Flame Robin	*Petroica phoenicea*	3446 - Lower North Foothills Ironbark-Box-Gum Grassy Forest
Grey-headed Flying- fox	*Pteropus poliocephalus*	3446 - Lower North Foothills Ironbark-Box-Gum Grassy Forest
Grey-crowned Babbler (eastern subspecies)	*Pomatostomus temporalis temporalis*	3446 - Lower North Foothills Ironbark-Box-Gum Grassy Forest
Large Bent-winged Bat	*Miniopterus orianae oceanensis*	3446 - Lower North Foothills Ironbark-Box-Gum Grassy Forest
Little Bent-winged Bat	*Miniopterus australis*	3446 - Lower North Foothills Ironbark-Box-Gum Grassy Forest
Little Eagle (Foraging)	*Hieraaetus morphnoides*	3446 - Lower North Foothills Ironbark-Box-Gum Grassy Forest
Little Lorikeet	*Glossopsitta pusilla*	3446 - Lower North Foothills Ironbark-Box-Gum Grassy Forest
New Holland Mouse	*Pseudomys novaehollandiae*	3446 - Lower North Foothills Ironbark-Box-Gum Grassy Forest
Scarlet Robin	*Petroica boodang*	3446 - Lower North Foothills Ironbark-Box-Gum Grassy Forest
Speckled Warbler	*Chthonicola sagittata*	3446 - Lower North Foothills Ironbark-Box-Gum Grassy Forest
Spotted Harrier	*Circus assimilis*	3446 - Lower North Foothills Ironbark-Box-Gum Grassy Forest
Spotted-tailed Quoll	*Dasyurus maculatus*	3446 - Lower North Foothills Ironbark-Box-Gum Grassy Forest
Square-tailed Kite	*Lophoictinia isura*	3446 - Lower North Foothills Ironbark-Box-Gum Grassy Forest
Swift Parrot	*Lathamus discolor*	3446 - Lower North Foothills Ironbark-Box-Gum Grassy Forest
Turquoise Parrot	*Neophema pulchella*	3446 - Lower North Foothills Ironbark-Box-Gum Grassy Forest

Common Name	Scientific Name	Vegetation Types(s)
Varied Sittella	*Daphoenositta chrysoptera*	3446 - Lower North Foothills Ironbark-Box-Gum Grassy Forest
White-bellied Sea-Eagle (Foraging	*Haliaeetus leucogaster*	3446 - Lower North Foothills Ironbark-Box-Gum Grassy Forest
White-throated Needletail	*Hirundapus caudacutus*	3446 - Lower North Foothills Ironbark-Box-Gum Grassy Forest
Yellow-bellied Sheathtail-bat	*Saccolaimus flaviventris*	3446 - Lower North Foothills Ironbark-Box-Gum Grassy Forest

Candidate Species – Streamlined assessment module - Small area

Candidate Species are threatened species or elements of their habitat that cannot be confidently predicted by vegetation surrogates and landscape features. In a Streamlined assessment module – small area, further assessment is required for these species if they are incidentally recorded on the Subject Land or the Subject Land contains suitable habitat and is within the predicted range of the species, and there is a risk of a Serious and Irreversible Impact (SAII).

4.1.2 List of Species Derived

The following table lists the Candidate Species (species credits) that have been derived from the BAM calculator. Any additional species determined likely to be present by Bio Aus. were also added to the list and entered as an additional species in the BAM calculator. An assessment has been undertaken to determine if the habitat and geographic requirements are met on the Subject Land, and if targeted survey is required.

The species with suitable habitat/geographic requirements, and at risk of a SAII on the Development Footprint requiring targeted survey are provided in Table 8: List of candidate species credit species at risk of SAII, along with the survey timing for each species (from the OEH Threatened Species profile database) in which targeted surveys should be undertaken. Targeted survey has been undertaken for these species using the survey methods described in Section 4.2.

As per the BAM, Appendix C Table 13, Candidate Species that are not at risk of an SAII and are not incidentally recorded on the Subject Land do not require further assessment.

Table 7: List of candidate species at risk of SAII

Common Name	Scientific Name	Survey Timing
Flora		
Singleton Mallee	*Eucalyptus castrensis*	All year
Pokolbin Mallee	*Eucalyptus pumila*	All year
Scrub Turpentine	*Rhodamnia rubescens*	All year

4.2 Targeted Survey Methods

Targeted surveys were undertaken for the Candidate Species identified in Table 7These were undertaken by a BAM Accredited Assessor. The surveys were conducted under Biodiversity Australia's Scientific Licence and Animal Research Authority. The assessment and all survey methodology adhered to the requirements listed in Appendix C of the BAM – Streamlined assessment module - small area. Table 13 in Appendix C of the BAM specifies the steps to assess a small area which are summarised here:

- Establish site context – BAM Chapter 3
- Assess native vegetation, threatened ecological communities and vegetation integrity – BAM Chapter 4
- Assess the habitat suitability for threatened species – BAM Chapter 5.
- Avoiding or minimising impacts on Biodiversity Values – BAM Chapter 7
- Assessing the impacts of the proposal on Biodiversity Values – BAM Chapter 8
- Thresholds for assessing and offsetting the impacts of development – BAM Chapter 9
- Applying the no net loss standard – Chapter 10

Assessing habitat suitability for threatened species in a streamlined assessment module – small area differs from the standard assessment process used in a Standard BDAR. All the candidate species credit species identified for the proposal (through the BAM-C or a likelihood of occurrence assessment) that are at risk of an SAII must be assessed further with targeted surveys. Candidate species which are not at risk of an SAII and not incidentally recorded within the Subject Land do not require further assessment under the streamline assessment module – small area of the BAM (Appendix C, Table 13 BAM 2020)

A detailed description of the survey methods used is provided in the following sections.

4.2.1 Threatened Flora Survey

A targeted survey for the following threatened flora species was undertaken over the Development Footprint on the 2nd of September 2022 by accredited assessor Lachlan Webster (BAAS23020) (CV within A-2) and botanist David Conder. The Singleton Mallee, Pokolbin Mallee, and Scrub Turpentine were the focus of these surveys however searches incorporated all threatened species.

Due to the small area of the Development Footprint, threatened plant searches consisted of undertaking threatened flora transects at 40m intervals as vegetation was open, which provided coverage of the whole site.

Opportunistic searches for threatened flora species were also undertaken during other activities on the Subject Land. Given the small site area, the combination of these methods allowed a thorough search of its entire extent.

The survey methodology consisted of field traverses as per the Surveying Threatened Plants and Their Habitats, NSW Survey guide for the Biodiversity Assessment Method 2020. This survey technique typically involves searches along a grid of parallel traverses within the Subject Land. The traverses are a set distance apart depending on the life form and type of vegetation and cover the entire extent of potential habitat for each target plant species. Accredited assessor Lachlan Webster and botanist David Conder conducted traverses along a grid of parallel transverses at a set distance of 40m, in line with compliant survey methodology for threatened plants (DPIE 2020a).

After completing these traverses' further flora survey was conducted via random meandering throughout the Development Footprint with particular attention paid to areas where regrowth of canopy trees was present. Opportunistic searches for threatened flora species were also undertaken during the vegetation plot surveys as well as during other activities on the Subject Land. Given the limited extent of the Development Footprint, this level of targeted threatened flora effort allowed for 100% coverage of the Development Footprint and went above and beyond the guidelines.

4.2.2 Fauna Survey

As no fauna species were returned from the Candidate Species list in the BAM C, due to habitat constraints not being met, no targeted fauna surveys were required. However, while on site, opportunistic fauna and habitat surveys, and a SAT survey were conducted as limited habitat for the Koala was present.

In consideration of any potentially occurring fauna species (DEC 2004, DECC 2007), the following survey methods were utilised:

- Habitat evaluation;
- Searches for secondary evidence e.g. scats and tracks;
- Diurnal bird survey
- Hollow-bearing Tree and Koala Use Tree Survey

The fauna surveys were undertaken on the 2nd of September by BAM Accredited Assessor Lachlan Webster under Biodiversity Australia's scientific license and animal research authority (CV's within Appendix 6). The methods per survey measure are detailed below.

4.2.2.1 Habitat Evaluation

This was the main survey method employed to assess the suitability of site habitats for threatened species recorded in the locality, or in broadly similar habitats in the region.

Habitats on and adjacent to the Subject Land were defined and assessed according to parameters such as:

- Structural and floristic characteristics of the vegetation e.g. understorey type and development, crown depth, groundcover density, etc.
- Degree and extent of disturbance e.g. fire, logging, weed invasion, modification to structure and diversity, etc.
- Presence of water in any form e.g. rivers, dams, creeks, drainage lines, soaks.
- Size and abundance of hollows and fallen timber.
- Availability of shelter e.g. rocks, logs, hollows, undergrowth.
- Wildlife corridors, refuges and proximate habitat types.
- Presence of mistletoe, nectar, gum, seed, sap, etc. sources.

This information is considered for evaluation of the potential occurrence of threatened species on or adjacent to the site based on cited ecology and personal experience/knowledge of the species.

4.2.2.2 Secondary Evidence Searches

Physical habitat searches involved lifting up of any timber, rocks and debris, and inspection of dense vegetation and leaf litter for frogs and reptiles; inspection of trees for Koalas and claw markings; binocular inspection of trees; searches for nests; and searches for scats, owl regurgitation pellets, tracks and scratches.

4.2.2.3 Diurnal Bird Survey

This involved passive surveys (e.g. listening for bird calls) and active observation/binocular searches while walking around the entire Development Footprint; and opportunistically during other activities.

4.2.2.4 Hollow-bearing Tree and Koala Use Tree Survey

All hollow-bearing trees (HBTs) within the proposed development footprint were located and recorded via a GPS enabled tablet. These were marked with red and white barrier tape and given an identifier number. Any potential hollows found were inspected for signs of usage e.g. chewed or worn edges and assessed for potential habitat value. Locations of hollow-bearing trees can be found in Figure 8.

The Subject Land does not fall under a current Comprehensive Koala Plan of Management. As the Subject Land is zoned R1 the proposed development was assessed under the Chapter 4 Koala Habitat protection (SEPP (Biodiversity and Conservation) 2021) .

Due to the small number of koala use trees on site the Spot Assessment Technique (Phillips and Callaghan 1995, 2011) was used on all potential koala use trees giving 100% coverage of potential koala habitat on the subject land.

4.2.3 Survey Timing and Limitations

The survey period fell within the BAM-C prescribed survey period for all target flora species.

No fauna species were required for targeted surveys.

4.2.4 Weather Conditions

The weather during the survey on 2nd September 2022 was overcast with a number of showers recorded. The temperature during the survey was 19.3°C. The minimum overnight temperature was 5.9°C and 0.4 mm of rain was recorded (BOM 2022).

4.3 Targeted Survey Results

4.3.1 Flora

Threatened flora surveys failed to detect the presence of any threatened flora species within the Subject Land.

4.3.2 Fauna

No targeted threatened survey required for any fauna species. No threatened fauna species were detected during field surveys.

4.3.2.1 Koala Habitat Assessment

The Development Footprint contains forest redgum (*Eucalyptus tereticornis*), white mahogany (*E. acmenoides*) and rough-barked apple (*Angophora floribunda*) which are all listed as koala food trees under the State Environmental Planning Policy (Koala Habitat Protection) 2021. Despite numerous koala food trees being present on the Development Footprint no koalas or koala scats were recorded during the survey. An assessment of Chapter 4 Koala Habitat protection (SEPP (Biodiversity and Conservation) 2021) has been provided in A-2.

4.3.2.2 Habitat Features

The Subject Land contains patches of Native Vegetation throughout. The cleared area was in a modified state, maintained via slashing/mowing.

A range of habitat features were recorded across the Subject Land which are described in the following table.

Table 8: Summary of site habitat values

Habitat/ Attribute Type	Vegetation Zone 1
	PCT 3446 – Low
Groundcover	Open groundcover layer
Leaf litter	Very low leaf litter – low leaf litter throughout entire Development Footprint
Logs and debris	No logs or woody debris is present throughout the Development Footprint
Hollows	2 hollow bearing trees were recorded within the Development Footprint
Nectar Sources	Eucalypt and Corymbia species present on the Subject Land would flower throughout the year.
Sap and gum sources	Eucalyptus and Corymbia species present on the Subject Land.
Primary preferred Koala browse trees	Few Koala browse tree comprising *E. tereticornis*
Allocasuarinas	No *Allocasuarinas* were recorded present within this Development Footprint
Aquatic/ wetland habitats	Absent
Fruiting species	No fruiting species present in the understory and ground layer
Forest bird habitat	Low quality. The Subject Land is predominantly cleared land, with few scattered mature trees. These mature trees are potential forest bird habitat. However the trees are mostly isolated, there is limited groundcover and often entirely absent shrub layers. The vegetation zone has low forest bird habitat quality, as the shrub and ground layer is largely absent, and the trees are sparse and fragmented.
Caves, cliffs, overhangs, culverts, bridges	Absent.
Small terrestrial prey	Likely to be low prey abundance over most of the Development Footprint due to limited vegetation cover and historic disturbances. Arboreal prey species such as possums and gliders would be rare due to the low abundance of hollow-bearing trees, within the Development Footprint.
Habitat Linkages	The Subject Land is surrounded by residential dwellings to the west and north, a residential development to the west, and disturbed open land to the south. No habitat linkages occur within the Subject land.

4.3.2.3 Observed/Detected Fauna

The surveys detected a limited range of fauna species due to the short survey period and the disturbed conditions within the site. Some of the recorded species were observed on the site while others were seen flying overhead or heard calling from adjacent habitats. No amphibian or native mammalian species were detected in or adjacent to the Subject Land during the field surveys.

Table 9 provides the total fauna list for the site and details the method of detection for each species. No threatened fauna species were detected on site during field surveys.

Table 9: Fauna species recorded

Common Name	Scientific Name	Detection Method
Australian magpie	*Gymnorhina tibicen*	Vis
Pied Butcherbird	*Cracticus nigrogularis*	Vis
Eastern rosella	*Platycercus eximius*	Vis
Noisy miner	*Manorina melanocephala*	Vis
King parrot	*Alisterus scapularis*	Vis
Superb fairy-wren	*Malurus cyaneus*	Vis
Observation Key: Heard Calling (HC), PIR Camera (Cam), Scats (SC), Visual Observation (VIS), Tracks or scratchings (TR) v		

4.3.2.4 Hollow Bearing Trees

Two hollow-bearing trees occur within the Subject Land. Both trees were Eucalyptus acmenoides. Locations of the hollow bearing trees are shown in Figure 8.

Figure 8: Hollow-bearing Tree locations

Figure Name: Hollow-bearing Tree Locations	Location: 412 Cessnock Road, Gillieston Heights, NSW	Client: EXP Capital	Biodiversity AUSTRALIA
This mapping is to be considered indicative only and all derivations (e.g., vegetation communities) are best approximations and subject to errors including individual interpretation and reliance on information provided to Bio Aus where were not independently verified. All information is intended to be indicative only and no reliance for extrapolation, mapping etc. should be placed upon this map without independent validation of the information by the user. Bio Aus takes no responsibility for any subsequent error losses etc. that may arise from the use of this data without independent verification.		Job Number: ENS6765	
		Date: June 2025	Project Manager: L. Webster / Drawn by: A. Ritchie
		Scale: 1:2250	Spatial Reference: WGS 84 / Pseudo-Mercator

Photo Plate 4: Hollow-bearing trees on the Subject Land

4.3.3 Species Credit Species

4.3.3.1 Species detected

No Candidate Species were detected resulting from the flora survey conducted.

STAGE 2 - IMPACT ASSESSMENT

5. Avoidance and Minimisation

5.1 Impact Avoidance

The Subject Land in its entirety is mapped as R1 – General Residential.

The Subject Land is largely cleared vegetation dominated by exotic forbs and grasses. The current proposed design has utilised these areas to their full extent. To make the development viable the removal of 0.76 ha of degraded PCT 3446 is necessary.

The proposed development intends to impact the entirety of the Subject Land and as such impact avoidance in unable to be undertaken throughout the Subject Land. As such the development must apply measures to minimise, mitigate and offset impacts of the proposed development, these measures are outlined in the Section 5.5.

5.2 Direct Impacts

5.2.1 Vegetation and Habitat Removal

The development proposal comprises land within Lot 21 and Lot 22 DP1092105. The total Development Footprint covers an area of 4 ha. The design of the development proposal will impact approximately 0.76ha of native vegetation (approximately 61 trees to be cleared), which is also listed as the EEC *Hunter Lowland Redgum forest in the Sydney Basin and NSW North Coast Bioregion* EEC under the NSW BC Act. The two hollow-bearing trees present within the Subject Land will be removed, as such nest boxes will be installed to offset the loss of these features as prescribed in Section 5.5.4.

Scattered patches of mature eucalypt canopy trees (*E. acmenoides* and *E. tereticornis*) occur throughout portions of the Subject Land. These areas constitute heavily degraded EEC under state legislation. A history of land-use, loss of undergrowth, habitat fragmentation and invasion from non-native plants has rendered the EEC within the Subject Land of low quality.

The area within the Subject Land surrounding the patches of TEC can be classified as cleared exotic grassland, with isolated occurrences of native grasses dominated primarily by naturalised and invasive grasses and herbs. As the site is historically cleared, with a history of rural management there is little understorey or shrub layer to support a diversity of flora and fauna species. The proposed design otherwise impacts on a highly derived grassland dominated by exotic species.

In summary, there will be direct impacts to the heavily degraded state listed EEC in the current project design. However, the current condition of the EEC vegetation remaining within the Subject Land, the history of land use, the isolation of the EEC to the surrounding landscape, and the ongoing developments within the region suggest there will likely be a negligible impact to the overall persistence and conservation of the EEC within the region.

5.3 Indirect Impacts

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

5.3.1 Erosion and Sedimentation

Sedimentation and erosion impacts can occur at both the construction and establishment phases. Erosion/sedimentation may occur via erosion of fill material and disturbed soils, scouring of exposed soil, earthen banks and habitats adjacent to the development area via directed flow (e.g. stormwater), or where runoff is concentrated. If unmitigated, these can lead to the reduction water quality of downstream waterways and cause siltation, having flow-on effect to flora and fauna (Queensland Government 2019). The Development Footprint does not occur within SEPP Coastal Wetland or Proximity area mapping.

Standard mechanisms and controls will be required to ensure the prevention of erosion and sedimentation during construction and post-development and such impacts do not extend beyond the Development Footprint.

5.3.2 Injury/mortality during clearing

Animals within hollows and fallen logs, as well as dense vegetation and leaf litter have the potential to be injured or killed during clearing operations. Such fauna may be placed under stress, injured or killed during tree felling via:

- Being nocturnal or in torpor, and unable to escape prior to the tree falling.
- Collapse of the hollow when it impacts the ground.
- Collision with internal walls or via being thrown out when the tree falls.
- Being present as young e.g. eggs.

This risk increases during breeding seasons (generally spring to late autumn) and in cooler seasons when mammals and reptiles enter torpor.

The two hollow bearing trees present within the Subject Land will be removed. The low presence of understorey, natural groundcover, logs and other debris on the ground suggests limited potential habitat for most terrestrial fauna species, and as such the likelihood for injury or mortality is low. The felling of trees will result in the loss of hollows and may result in the loss of bird nests which should be identified and flagged prior to clearing to mitigate potential injury or mortality of young (if present). The swamp habitat/drainage line present on the Development Footprint does provide habitat for amphibian species, and clearing methods to minimise injury or mortality should be considered.

Pre-clearing surveys by an ecologist to mitigate impacts during the removal of trees and vegetation within and adjacent to inundated areas is recommended. Additionally,

it is recommended that habitat features within trees to be removed are to be inspected by a climbing arborist immediately prior to removal. The presence of an ecologist during all clearing activities will mitigate the risk of injury to fauna.

Further detail of the mitigation measures proposed to reduce injury or mortality during clearing is provided in Section 5.5

5.3.3 Edge effects

Changes to the edges of vegetation communities has been attributed to a range of detrimental effects on different ecosystems. These changes have been linked to effects such as the alteration of environmental conditions, changes in species abundance and distributions and changes in species interactions (Murcia 1995).

The Subject Land is situated at an urban/agriculture/bushland interface; therefore edge effects are already a significant issue along the northern and western margins.

5.3.4 Weed invasion

The introduction of weeds can have a significant impact on native flora and fauna by altering the balance of natural ecosystems and outcompeting native flora when it comes to necessary sunlight, shade, nutrients and space (DPE 2020d). This can result in long-term effects unless appropriate mitigation and management measures are implemented.

Weeds are present across the Subject Land. The proposal has the potential to introduce new weed species through unintended seed deposit from machinery, planting of undesirable species or garden escapees invading the adjacent forest habitats.

5.3.5 Fauna Vehicle Strike

The proposed development will lead to increased vehicle activity on the Subject Land which has the potential to increase the incidence of fauna vehicle collisions. Studies have shown a significant increase in fauna vehicle strike incidents where road densities and vehicle speeds are high, which can result in the direct mortality of fauna (Clevenger *et al* 2002; Gurriga *et al* 2012). The proposed extension of Broad Street will be of low speeds and minimal traffic flow which are not anticipated to pose a risk to local fauna as they allow for increased fauna detection and greater likelihood of avoided collision.

5.3.6 Noise, vibration and anthropogenic disturbances

A significant/frequent increase in noise levels have been documented to impact on behavioural changes, population densities, community structure and breeding success of fauna (Barber *et al* 2009). These responses can result from the frequent disturbance

to daily activities via evoking anti-predatory responses as well as by blocking call signals between individuals (Barber *et al* 2009).

The clearing and construction phase of the proposed development is likely to result in increased levels of noise and vibration within and immediately surrounding the Subject Land. This increase in noise and vibration is however only expected to have a minimal effect on local fauna due to the following:

- Noise and vibration levels are unlikely to significantly increase beyond that which already occurs;
- Works will to be diurnal only; and
- The clearing and construction phase is temporary.

Once established, noise and vibration levels will return to levels typical of an isolated dwelling within native vegetation which is generally low to nil at night. As fauna occurring in and adjacent to the Subject Land are expected to have a substantial tolerance to the current level of anthropogenic noise in the area, long-term impacts are not anticipated.

5.3.7 Light Spill

The introduction of additional artificial light has the potential to effect fauna within and adjacent to the Subject Land. Studies have shown both and increase in orientation and increase in disorientation as a result of additional illumination to an area. This can have the potential to alter normal foraging, communication and reproductive behaviours (Longcore and Rich 2004; Chepesiuk 2009).

During the construction phase, no additional illumination is expected as all works are to be conducted diurnally. Operationally, the new residence may require artificial lighting for security and safety reasons. Artificial lighting is recommended to be kept to a minimum and strategically placed so as not to disturb fauna in adjacent habitats. These mitigation measures are further detailed in Section 5.5.

5.3.8 Introduction of feral and domestic predators

Urban, industrial and rural developments are often associated with the introduction of non-native species i.e. rodents, cats and dogs accidentally and intentionally e.g. via creating habitat for such species (e.g. rats, Indian Myna) as well as pets.

The proposed increase in human activity has the potential to introduce domestic pets to the Subject Land as well as to attract feral animals. Feral cats and foxes are significant predators of native species (NPWS 2001, Dickman 1996, May and Norton 1996, DPE 2020b), and domestic dogs are significant threats to species (Wilkes and Snowden 1998, Connell Wagner 2000). These species are known to have a negative impact on native fauna by competing for food and shelter, destroying habitat, predation and by spreading disease (DAWE 2020c) however the mere presence of

these predators alone has also been shown to affect fauna behaviour e.g. avoidance and range contraction. The impacts from the introduction of these species have been listed as key threatening processes under the *BC Act*.

The proposed development will see a minute increase in human activity in the broader area. The Subject Land is however located to the east of an existing residential area and situated amongst a number of broader residential areas. Based on the current human presence in the locality, the potential to attract increased numbers of feral animals to the Subject Land is likely to be minimal.

5.3.9 Movement obstruction

Fences have potential to obstruct the movement of threatened fauna across the Development Footprint. Some threatened fauna can be injured by collision with wire fences, particularly barbed wire e.g. the Yellow-bellied Glider, owls and Squirrel Glider have been recorded being injured by barbed wire fences (Lindenmayer 2002).

Temporary and permanent fencing to be constructed for the proposed development has the potential to restrict fauna movements (e.g. colorbond) or inflict injury (e.g. barbed wire fence). Mitigation measures to eliminate this risk have been outlined in Section 5.5.

5.3.10 Increased dust levels

The driveways proposed for the development are to be sealed, hence, dust levels are not anticipated to increase as a result of the proposed development.

There may be an increase in dust during the construction phase of the project, however this is only likely to be a minute increase and will be managed through a Construction Environmental Management Plan (CEMP).

5.3.11 Increased risk of starvation

The vegetation proposed for removal comprises scattered patches of vegetation and exotic pasture grassland. With the limited vegetation proposed to be removed and the vast areas of available vegetation within the study area / locality, food resources are not anticipated to decrease to a level that will pose a risk of starvation to fauna.

5.3.12 Critical loss of shade or shelter

Some tree loss will be required for the development. This is unlikely to lead to a critical loss of shade or shelter due to the limited extent of vegetation to be trimmed and relative vastness of adjoining habitats.

5.3.13 Increased soil salinity

An increase in soil salinity can be detrimental to native species with surfaced salts becoming toxic to a large majority of native flora. An increase in soil salinity has been linked to large-scale land clearing and is usually associated with agricultural clearing (Australian Bureau of Statistics 2013). The proposed development is considered too small to affect soil salinity and the development is not in use as agricultural land.

5.3.14 Rubbish dumping

The risk of rubbish dumping is not anticipated to increase as a result of the proposed development. Suitable waste disposal facilities will also be provided as part of the development.

5.3.15 Wood collection

All materials required for the development will be sourced externally and wood resources to remain on the Subject Land are considered too sparse to attract wood collection.

5.3.16 Bush rock removal and disturbance

No bush rock was recorded within the Subject Land.

5.3.17 Increased risk of fire

The proposed development will not increase the risk of fire in the area.

5.4 Prescribed Impacts

The following potential indirect impacts have been considered and determined to not be associated with the proposal:

5.4.1 Karst, Caves, Crevices, Cliffs, Rocks and Other Geological Features of Significance

The Subject Land does not contain features such as karst, caves, crevices, cliffs, rocks or other significant geological features of that kind.

5.4.2 Human-made Structure and Non-native Vegetation

A residential house and shed were previously present on the Subject Land, however, have since been removed. Therefore, the Subject Land does not contain human-made or non-native vegetation that provides meaningful habitat to threatened species.

5.4.3 Habitat Connectivity

The Subject Land does not fall within a mapped regional corridor and does not hold significant connectivity value.

5.4.4 Water Bodies, Water Quality and Hydrological Processes

The Subject Land contains a drainage line in the central northern portion. The drainage line is highly degraded and is unlikely to contain suitable habitat for native fauna. Clearing methods to minimise injury or mortality should be considered.

The risks of poor water quality, hydrological process on the adjoining landscape is low, appropriate mitigations should be outlined within the site-specific Soil Erosion and Sediment Control Plan.

5.4.5 Wind Farm Developments

The proposed development is not a wind farm development.

5.4.6 Vehicle Strike

The proposed development may lead to increased vehicle activity on the Subject Land which has the potential to increase the incidence of fauna vehicle collisions. Studies have shown a significant increase in fauna vehicle strike incidents where road densities and vehicle speeds are high, which can result in the direct mortality of fauna (Clevenger et al 2002; Gurriga et al 2012).

The new roads proposed for the development will be of low speeds which are not anticipated to pose a risk to local fauna as they allow for increased fauna detection and greater likelihood of avoided collision.

5.5 Measures to Minimise Impacts

The proposal would be subject to a number of mitigation measures and environmental controls to reduce the overall impact of the development on biodiversity and ensure potential offsite impacts are minimised. The conclusions of this assessment have assumed that these will be implemented.

5.5.1 Protection and Rehabilitation of the Biodiversity Values Area

The Subject Land does not contain any areas of Biodiversity Values. Although the proposal does not plan to retain any vegetation, the vegetation occurring on the Subject Land is mostly cleared exotic grassland, with some patches of low-quality native vegetation.

5.5.2 Vegetation Management Plan

A Vegetation Management Plan (VMP) is to be prepared to manage the offsetting/relocation of the hollow-bearing trees. This will detail the works required, timeframes, parties responsible for implementing the works and cost estimates to carry out the works. It will also detail future monitoring requirements for the site.

5.5.3 General Clearing Measures

The following measures are recommended to manage clearing:

- Site induction is to specify that no clearing is to occur. All vehicles are only to be parked in designated areas.
- Earthworks are to avoid damage to root zones of the retained trees.
- No materials or fill are to be placed under retained trees or within adjacent vegetation.
- Weeds are not to be mulched with native vegetation and should be taken to a licenced landfill facility.

5.5.4 Replacement Nest Boxes

To offset the removal of the two identified hollow bearing trees within the development footprint, nest boxes will be installed prior to vegetation clearing. Nest boxes are to either be placed on poles within the landscape buffer, and when some of the larger planted trees (Angophora costata, Corymbia maculata) are of sufficient height, or when the nest boxes are due to be replaced, the nest boxes are moved into these trees. Otherwise, the nest boxes could be placed within trees in a nearby reserve, conservation area, or riparian area, such as along Wallis Creek, which is approximately 500 metres to the east of the proposed development.

The type of required nest boxes should be determined by the size of the existing hollow and fauna witnessed on site following the BCT *Guideline for Artificial Hollows and Nest Boxes for wildlife: A Practical Guide by Alan and Stacey Franks.*

5.5.5 Offset Tree Planting

A Street Tree Plan has been prepared to offset the removal of the proposed 61 trees requiring removal. The trees will be planted in the landscape buffer area between the proposed development and Cessnock Road. Species to plant include those listed in the landscape plan, namely *Angophora costata, Corymbia maculata*, and *Tristaniopsis laurina.*

5.5.6 Soil Erosion and Sedimentation Control

Standard soil and sedimentation control measures will be required throughout the earthworks phase to ensure that habitats in the Subject Land, as well as subsequent

habitats nearby are not substantially affected. It is recommended that a Soil Erosion and Sediment Control Plan be developed by a Certified Practitioner in Sediment and Erosion Control to meet all standard compliance.

Proposed drainage systems need to be adequately designed and effectively established to prevent the risk of any substantial impacts (e.g. erosion and sedimentation, changed hydrology from stormwater runoff) as per statutory obligations.

5.5.7 Pre-clearing Survey and clearing/trimming Supervision

The clearing extent is to be inspected for fauna by a qualified ecologist immediately prior to commencement of any vegetation trimming involving machinery and/or tree-felling. This is to occur each morning if trimming spans over multiple days/weeks. Pre-clearing checks would include searches of habitat (e.g. lifting and destructive searches of logs) and searches for bird nests. If possible, any detected fauna is to be relocated off-site to nearby suitable areas (preferably within their natural home range) prior to clearing.

During the pre-inspection, any habitat features detected (e.g. logs, nests) are to be clearly marked with flagging tape to allow easy identification during clearing.

The ecologist is to be present on site to supervise all trimming works to retrieve any fauna detected during works and undertake appropriate action (e.g. humanely euthanise severely injured animals and/or relocate uninjured animals where possible). The fauna spotter must also be present during de-watering of any water bodies on the site to rescue and relocate and stranded aquatic fauna species.

A report detailing the results of the clearing monitoring is to be provided to the consent authority within 14 days of works completion.

5.5.8 Hollow-bearing Tree Removal Protocol

Hollow-bearing trees are to be felled in a manner that will minimise the risk of injury/mortality of denning/roosting fauna within the limitation of Work Health and Safety (WHS) Guidelines. This is suggested to be achieved by the following general procedure:

- The hollow-bearing trees are to be gently bumped several times prior to removal to encourage any fauna present to vacate.
- Trees are to be felled in a manner that minimises injury to fauna. This includes gently pushing or 'soft felling' with an excavator or gradual cut down by an arborist
- A qualified ecologist is to be present during felling and sectioning of the hollow-bearing tree (at the proponent's cost) in case of animal injury. Hollows are to be inspected for fauna once the tree is deposited. All uninjured animals are to be released in the retained habitat on site.

- If the hollow is determined to be occupied and fauna do not require assistance (e.g. roosting bats), the entrance is to be blocked and the log placed in a shaded and protected area on the edge of the site. The obstacle is to be removed just prior to dusk to allow passive escape of the fauna within. The log may then be removed if required.

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

5.5.9 Weed Control

Disturbance of the Subject Land's soils has potential to encourage weed invasion. Hence, it is recommended that:

- Disturbance of vegetation and soils on the site should be limited to the areas of the proposed work and should not extend into adjacent vegetation;
- All plant used for clearing and construction works is certified as weed free;
- Appropriate collection and disposal of all weed material removed via clearing;
- Any recent weed invasions within the development area should be removed, and
- Ongoing weed control in the development area.

5.5.10 Artificial Lighting

To ensure anthropogenic impacts are minimised, it is recommended that artificial lighting be kept to a minimum and be of a localised and low luminosity, with light directed to the ground and not onto retained trees/adjacent vegetation. Sufficient artificial lighting will likely be required for security reasons and in the event any evening works are required. Security lighting is preferred to be sensor-based to reduce energy consumption and contributions to Climate Change.

5.5.11 Fencing

Temporary and permanent fencing may be required upon construction of the residential dwellings. Fences have potential to obstruct the movement of fauna across the site. Ideally, dogs should be restricted within a fence which prevents fauna access but permits their escape (e.g. by a wooden post). No fencing that could pose a barrier or risk of entanglement to fauna (e.g. barbed wire) is to be used.

5.5.12 Domestic Animals

In order to reduce potential predation or attack to native fauna, it is recommended that domestic dogs are restricted to fenced yards and domestic cats are not allowed to roam in adjoining vegetation.

5.5.13 Landscaping

Any landscaping proposed as part of the development should give due consideration to the establishment of native plants as ornamental species to maintain and/or increase biodiversity, provide replacement habitat, and maximise water efficiency.

Recommended species for planting should include locally indigenous *Eucalypts*, *Angophoras*, *Grevilleas*, *Banksias*, *Melaleucas*, *Acacias*, *Allocasuarinas* and *Callistemons* (especially Winter-flowering species which are useful for the Little Lorikeet, gliders, honeyeaters and Grey-headed Flying Fox e.g. *Banksia integrifolia*); and fruiting rainforest species such as Brush Cherry (*Syzygium australe*), figs, *Acronychia spp*, *Cryptocarya spp*, etc.

Where possible, plantings should preferably not be in parkland style or isolated trees as this minimises their effectiveness to provide habitat to all but common medium sized species (e.g. Currawongs and Indian Mynahs) and may become detrimental to the presence of other species (Catterall 2004). Rather, plantings should be planned to recreate a natural structure (i.e. layered). Such plantings thus would consist of at least one or two canopy trees, underlain by scattered understorey trees, and finally a number of shrubby species. This multi-layered planting can provide effective aesthetics while supporting passerine birds (who depend on the lower stratums and structural complexity), microbats, and canopy species such as birds and arboreal mammals (Catterall 2004).

5.5.14 Mitigation Measure summary

The following table provides a summary of the mitigation measures and the timing and responsibility.

Table 10: Mitigation measure summary

Mitigation measure	Responsibility
Prior to clearing works	
Define clearing limits on site with bunting or temporary fencing	Clearing contractor / surveyor
Site inductions to clearing contractors re. ecology measures	Project ecologist
Preparation of VMP	Ecologist/Project coordinator/Bushfire Hazard Consultant
Installation of replacement nest boxes and report	Project ecologist
Preparation of Sediment and Erosion Control Plan	Suitably Qualified Contractor
Sediment and erosion control measures	Clearing contractor
Ensuring all plant is weed free	Clearing contractor
Pre-clearing survey and habitat tree mark-up	Project ecologist
During clearing works	
Pre-clearance inspection (each morning prior to trimming activities)	Project ecologist
Clearing supervision	Project ecologist
Hollow-bearing tree removal protocol	Clearing contractor/Project ecologist
Maintain sediment and erosion control measures	Clearing contractor
Removal of weeds and disposal at a licenced landfill facility	Clearing contractor
Monitoring of extent of trimming works i.e. no trimming beyond marked trees (continual)	Project coordinator
Post clearing works	
Implement VMP	Bush regenerator/ Ecologist/Caretaker
Domestic animals retained within yards	Project coordinator/Owner/Occupants
Restriction of exotic species in landscaping	Project coordinator

6. Impact Summary

6.1 Assessment of Serious and Irreversible Impacts

In accordance with Appendix C of the BAM 2020, Candidate Species that are not at risk of an SAII and are not incidentally recorded on the Subject Land do not require further assessment. 3 Candidate Species were returned from the BAM Calculator with the potential to occur on the Subject Land that also were at risk of SAII, including Singleton Mallee, Pokolbin Mallee, and Scrub Turpentine. These species were surveyed for and found to not occur on the Subject Land, and therefore no further assessment is required.

6.2 Ecosystem Credits

Table 12: Ecosystem credit requirements, details the credit requirement for the Vegetation Zones that will be impacted by the development. 9 credits are required to satisfy the offset requirements for PCT 3446. The full credit report is provided in A-1

6.3 Species Credits

No species credits species are required to be offset for this development.

Table 11: Ecosystem credit requirements

Zone	Vegetation zone name	Vegetation integrity loss	Area	Sensitivity to loss	Sensitivity to loss(Justification)	Species sensitivity to gain class	Biodiversity risk weighting	Potential SAII	Ecosystem credits
Lower North Foothills Ironbark-Box-Gum Grassy Forest									
1	3446_low	23.2	0.76 hectares	High Sensitivity to Loss	Biodiversity Conservation Act listing status	High Sensitivity to Gain	2	No	9
							Subtotal:		**9**

7. Conclusion

This report has assessed the impact of a proposed development on the 4 ha Subject Land comprising Lot 21 and Lot 22 DP1092105, 412 Cessnock Road, Gillieston Heights, NSW. The proposed works are to occur over the Development Footprint of which the entirety of the Subject Land is included.

The property is zoned as R1 – General Residential and hence a 450m² minimum lot size applies. In accordance with the Biodiversity Assessment Method 2020 (BAM) this allows for a maximum clearing area of 0.25 ha of Native Vegetation and as such a BDAR is required. As the area of impact is less than 1 ha the application of the small area BDAR is considered appropriate. The proposed Development Footprint only impacts Native Vegetation in the form of scattered paddock trees totalling an area of 0.76 ha, less than the maximum clearing area. A standard BDAR assessment is not required in this case and instead, the Streamlined Assessment Module - small area method as described in Appendix C and L of the BAM (2020) has been applied.

One vegetation community (*PCT 3446 – Lower North Foothills Ironbark-Box-Gum Grassy Forest*) was identified within the Development Footprint. The condition of this vegetation was considered to be of low condition and is consistent throughout the Subject Land where it has been mapped, resulting in the application of a single vegetation zone. The total area of native vegetation that will require removal totals 0.76 ha. This impact is recommended to be offset through purchase and retirement of appropriate ecosystem credits as described in this report. The remaining vegetation present on the Subject Land is dominated by exotic species and is highly degraded to the point where it does not meet the threshold for offsetting. It is also not considered to provide critical habitat for threatened flora or fauna.

The Native Vegetation present within the Development Footprint was considered to conform to the EEC *Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions*. Site surveys identified these patches of EEC as low quality due to the absence of a developed understory, the history of land use within the region, the isolation and fragmentation from other EEC patches, and the growing anthropogenic encroachment in the landscape surrounding.

No threatened flora species were detected within the Development Footprint despite targeted survey by suitably qualified BAM accredited assessors.

No targeted fauna survey was required, and no threatened fauna species were detected while conducting surveys on the Subject Land.

No areas of Biodiversity Values are mapped within, or adjacent to the Subject Land.

The Development Footprint does not contain any entities associated with Serious and Irreversible Impacts.

The Subject Land does not occur within, or close to, any mapped SEPP Wetlands proximity area.

Vegetation on the Subject Land does not conform to potential Koala Habitat under the Chapter 4 Koala Habitat protection (SEPP (Biodiversity and Conservation) 2021) and the Maitland City Council does not have an associated Koala Plan of Management (KPoM).

Direct impacts of the proposal include the removal of 0.76ha of vegetation consistent with Low Condition *PCT 3446 – Lower North Foothills Ironbark-Box-Gum Grassy Forest* consistent with the EEC *Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions.* Vegetation to be removed is primarily comprised of 61 trees including two hollow bearing trees. The removal of this vegetation will be offset through the purchase and retirement of ecosystem credits, the loss of mature trees will be offset through the Street Tree Plan and the loss of hollow bearing trees will be offset through the installation of nest boxes.

Indirect impacts associated with the development are considered to be minor and will be mitigated through the measures described in this report.

8. References

Barber, J.R., Fristrup, K.M., Brown, C.L., Hardy, A.R., Angeloni, L.M. and Crooks, K.R. (2009). Conserving the wild life therein-protecting park fauna from anthropogenic noise. *ParkScience*, Vol. 26:3.

Biodiversity Conservation Act. Website <https://www.legislation.nsw.gov.au/~/view/act/2016/63>.

Biodiversity Conservation Trust(BCT) 2020. Guidelines For Artificial Hollows. < https://www.bct.nsw.gov.au/sites/default/files/2020-8/BCT_Artificial%20Hollow%20Guidelines_Final%20for%20publication.pdf>

Bureau of Meteorology (2022). Forester Daily Weather Observations. Australian Government. Available at http://www.bom.gov.au/climate/dwo/

Catterall, C.P. (2004). Birds, garden plants and suburban bushlots: where good intentions meet unexpected outcomes. Urban Wildlife: more than meets the eye P21-31. Royal Zoological Society of NSW, Mosman.

Chepesiuk, R. (2009). Missing the dark: Health effects of light pollution. *Environmental Health Perspectives*, vol. 117:1.

Department of Agriculture, Water and the Environment (DAWE 2025a). Protected Matters Search Tool. Australian Government. Website <https://www.environment.gov.au/epbc/protected-matters-search-tool>.

DAWE (2025b). Species Profile and Threats Database: SPRAT Profile. Australian Government. Website <http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl>.

DAWE (2025c). Feral animals in Australia. Australian Government. Website <https://www.environment.gov.au/biodiversity/invasive-species/feral-animals-australia>.

Department of Environment and Conservation (DEC 2004). Threatened Biodiversity Survey and Assessment: Guidelines for Development and Activities. Working Draft. NSW DEC, Hurstville.

Department of Environment and Climate Change (DECC 2007). Threatened Species Assessment Guidelines: The Assessment of Significance. NSW DECC, Hurstville.

Department of Planning and Environment (DPE 2025a). Bionet/Atlas of Wildlife. Website <http://www.bionet.nsw.gov.au/>.

DPE (2025b). Regional Corridors and Key Habitats. Website <www.environment.nsw.gov.au>.

DPE (2025c). Biodiversity Values Map Viewer. Website <https://www.lmbc.nsw.gov.au/Maps/index.html?viewer=BVMap\>

DPE (2025d). Weeds. Website <https://www.environment.nsw.gov.au/topics/animals-and-plants/pest-animals-and-weeds/weeds>.

Department of Planning Industry and Environment (DPIE 2020). Biodiversity Assessment Method. Office of Environment and Heritage, Sydney.

DPIE (2020a) Surveying threatened plants and their habitats NSW survey guide for the Biodiversity Assessment Method, accessed via <https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Animals-and-plants/Biodiversity/surveying-threatened-plants-and-habitats-nsw-survey-guide-biodiversity-assessment-method-200146.pdf>

Department of Sustainability, Environment, Water, Population and Communities (2011). Survey Guidelines for Australia's Threatened Mammals. Australian Government. Available at <https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/ Animals-and-plants/Threatened-species/assessment-of-significance-guide-070393.pdf>.

Department of the Environment, Water, Heritage and the Arts (2013). Significant Impact Guidelines 1.1 - Matters of National Environmental Significance.

Environment Protection and Biodiversity Conservation Act (1999) Available at <https://www.legislation.gov.au/Series/C2004A00485>.

Franks, A. 2006. Nest Boxes for Wildlife: A Practical Guide

Harden, G.J. (Editor) (1990) Flora of NSW. Vols 1-4. NSW Press, Sydney.

Harden, G.J, McDonald, B. and Williams, J.B. (2007).Rainforest Climbing Plants – A field guide to their identification. Gwen Harden Publishing, Nambucca Heads.

Jurskis, V. and Potter, M. (1997). Koala Surveys, Ecology and Conservation at Eden. Research Paper No. 34. State Forests, Sydney.

Lindenmayer, D. (2002). Gliders of Australia–A Natural History. University of NSW Press, Sydney.

Longcore, T. and Rich, C. (2004). Ecological light pollution. *Frontiers in Ecology and the Environment*. vol. 2;4, pp. 191-198.

May, S.A. and Norton, T.W. (1996). Influence of fragmentation and disturbance on the potential impact of feral predators on native fauna in Australian forest ecosystems. *Australian Wildlife Research*, vol.23, pp. 387-400.

Murcia, C. (1995). Edge effects in fragmented forests: implications for conservation. *Tree*, vol. 10:2.

National Parks and Wildlife Service (NPWS) (2001). Threat Abatement Plan: Predation by the Red Fox (*Vulpes vulpes*). NSW NPWS, Hurstville.

NSW Department of Planning and Environment – NSW Mitchell Landscapes (DPE 2025d).

NSW Department of Planning and Environment – State Vegetation Type Mapping (DPE 2025e).

NSW Government (1995). Koala Habitat Protection SEPP 2021

Office of Environment and Heritage (2016). NSW Guide to Surveying Threatened Plants.

OEH (2025). Threatened Biodiversity Data Collection. Website <https://www.environment.nsw.gov.au/threatenedSpeciesApp/>.

Phillips, S, and Callaghan, J. (1995). The Spot Assessment Technique for determining the significance of habitat utilisation by Koalas. Addendum to *Proceedings of a conference on the status of the Koala in 1995*. Australian Koala Foundation. Brisbane.

Phillips, S. and Callaghan, J. (2011). The Spot Assessment Technique: a tool for determining levels of localised habitat use by Koalas *Phascolarctos cinereus*. *Australian Zoologist* **35**(3): 774-780.

Preston, B.J. and Adam, P. (2004a). Describing and listing threatened ecological communities under the *Threatened Species Conservation Act 1995* (NSW): Part 1 – the assemblage of species and the particular area. Environmental and Planning Law Journal, 21:250-263

Preston and Adams (2004b). Describing and listing threatened ecological communities under the *Threatened Species Conservation Act 1995* (NSW): Part 2 – the role of supplementary descriptors and the listing process. Environmental and Planning Law Journal, 21:372-390.

Queensland Government (2019). Impacts of erosion. Website <https://www.qld.gov.au/environment/land/management/soil/erosion/impacts>.

Royal Botanical Gardens (2020). Plantnet. Website <www.plantnet.rbgsyd.nsw.gov.au/search>.

Troedson, A.L. and Hashimoto, T.R. (2008). Coastal Quaternary Geology – north and south coast of NSW. Geological Survey of New South Wales, Bulletin 34.

Appendices

A-1 Biodiversity Credit Report

A-2 State Environmental Planning Policy (Biodiversity & Conservation) 2021

A-2-1 Chapter 4: Koala Habitat Protection

Chapter 4 aims to encourage the conservation and management of natural vegetation that provide habitat for koalas to support a permanent free-living population over their present range and reverse the current trend of koala population decline.

Table 12: Chapter 4 Section 4.4 of the State Environmental Planning Policy (Biodiversity & Conservation) 2021

Item	Description	Response
Part 4.4 subsection 4.3 (1) Land to which the chapter applies	This chapter applies to each local government area specified in Schedule 2	Yes, City of Maitland council is within the LGAs specified. It is within the Central Coast Koala Management Area
Part 4.1 subsection 4.4 (3) Land to which the chapter applies	Despite subsection (1), this Chapter does not apply to— (a) land dedicated or reserved under the National Parks and Wildlife Act 1974, or acquired under Part 11 of that Act, or (b) land dedicated under the Forestry Act 2012 as a State forest or a flora reserve, or (c) land on which biodiversity certification has been conferred, and is in force, under Part 8 of the Biodiversity Conservation Act 2016, or (d) land in the following land use zones, or an equivalent land use zone, unless the zone is in a local government area marked with an * in Schedule 2— (i) Zone RU1 Primary Production, (ii) Zone RU2 Rural Landscape, (iii) Zone RU3 Forestry.	This part does not apply to the subject land
Part 4.2 subsection 4.9 (1) Development assessment process – no approved Koala management plan for land	This section applies to land to which this Chapter applies if the land— (a) has an area of at least 1 hectare (including adjoining land within the same ownership), and (b) does not have an approved koala plan of management applying to the land.	No approved koala management plan has been prepared for the Subject Land
Part 4.2 subsection 4.9 (2) Development assessment process – no approved Koala management plan for land	Before a council may grant consent to a development application for consent to carry out development on the land, the council must assess whether the development is likely to have any impact on koalas or koala habitat.	This report has identified that the koala has minimal potential to occur on site due to the limited number of records (5) within a 5km radius and lack of habitat connectivity to nearby suitable habitat.

Item	Description	Response
Part 4.2 subsection 4.9 (3) Development assessment process – no approved Koala management plan for land	If the council is satisfied that the development is likely to have low or no impact on koalas or koala habitat, the council may grant consent to the development application.	This report has identified that the koala are highly unlikely to occur on site due to the limited number of records within a 5km radius and lack of habitat connectivity
Part 4.2 subsection 4.9 (4) Development assessment process – no approved Koala management plan for land	If the council is satisfied that the development is likely to have a higher level of impact on koalas or koala habitat, the council must, in deciding whether to grant consent to the development application, take into account a koala assessment report for the development.	This development will not have a high level of impact on koalas. There are only five (5) Koala records within a 5km radius of the Subject Land, with the closest being 2.4km to the south east.
Part 4.2 subsection 4.9 (5) Development assessment process – no approved Koala management plan for land	However, despite subsections (3) and (4), the council may grant development consent if the applicant provides to the council— (a) information, prepared by a suitably qualified and experienced person, the council is satisfied demonstrates that the land subject of the development application— (i) does not include any trees belonging to the koala use tree species listed in Schedule 3 for the relevant koala management area, or (ii) is not core koala habitat, or (b) information the council is satisfied demonstrates that the land subject of the development application— (i) does not include any trees with a diameter at breast height over bark of more than 10 centimetres, or (ii) includes only horticultural or agricultural plantations.	Schedule 3 of the SEPP Biodiversity and Conservation 2021 details the koala use tree species for the identified KMA (Appendix 5, Table 11). The development outlined within this report will offset the loss of listed koala use trees thus reducing the impacts associated with the removal of listed Koala use trees within the development impact area. There is no core koala habitat present within the subject site The site does not include plantations

In conclusion, the lack of habitat on the Subject Land whilst not completely absent is limited. Further to this, the limited habitat that does exist is highly fragmented in the landscape surrounded by residential developments and cleared agricultural land to the west and Cessnock Road and further residential developments to the east making access to the Subject Land to utilise the limited resources available. The likelihood of the species occurring on the Subject Land is highly unlikely and the removal of koala food trees would be highly unlikely to impact the species longevity in the locality.

A-3 Project Team CV's