



Biodiversity Development Assessment Report

Proposed Englobo Subdivision DA/1295/2023

Doyalson Wyee RSL Club t/a Doyalson Lifestyle Group

49-65 Wentworth Avenue and
80-110 Pacific Highway
Doyalson NSW 2262

Prepared by:

SLR Consulting Australia

SLR Project No.: 630.30551.00000

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Revision: 4.0

Revision Record

Revision	Date	Prepared By	Authorised By	Detail
4.0	22 December 2025	F Iolini	J Pepper	Amended in response to Council comments
3.0	15 December 2023	F Iolini	J Pepper	Amended in response to Council comments
2.0	8 June 2023	F Iolini	J Pepper	Amended in response to Council comments
1.0	10 May 2023	F Iolini	J Pepper	Final issued with Development Application

Basis of Report

This report has been prepared by SLR Consulting Australia (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Doyalson Wyee RSL Club t/a Doyalson Lifestyle Group (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.



Executive Summary

This Biodiversity Development Assessment Report (BDAR) accompanies a Development Application (DA) to Central Coast Council (“Council”) for the proposed subdivision of the Doyalson Wyee RSL Club site (the “Subject Land”). The following is a summary of information required for decision-making:

- The Proposed Englobo Subdivision involves subdivision of the Subject Land of four lots (Lot 1 DP 503655; Lot 11 DP 240685; Lot 49 DP 707586 and Lot 7 DP 240685) into 14 super lots, one community title lot and the construction of the entry road off Pacific Highway
- A BDAR has been prepared due to clearing of native vegetation within areas of high biodiversity value mapped by the Biodiversity Values map
- A Planning Proposal, which was accompanied by a Biodiversity Assessment (ELA, 2018), was approved for the rezoning of the Subject Land for such purposes and involved measures to avoid and minimise impacts, including retaining native vegetation along an eastern Biodiversity Corridor
- The Subject Land contains the following Plant Community Types (PCTs) and Threatened Ecological Communities (TECs):
 - PCT 1636 Scribbly Gum - Red Bloodwood - *Angophora inopina* heathy woodland on lowlands of the Central Coast, which does not constitute a TEC
 - PCT 1638 Smooth-barked Apple - Red Bloodwood - Scribbly Gum grass - shrub woodland on lowlands of the Central Coast, which does not constitute a TEC
 - PCT 1717 Broad-leaved Paperbark - Swamp Mahogany - Swamp Oak - Saw Sedge swamp forest of the Central Coast and Lower North Coast, which also constitutes a TEC under the *Biodiversity Conservation Act 2016* (BC Act) and *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
- The Subject Land contains foraging habitat and potential breeding habitat for the Glossy Black Cockatoo which has been assumed present
- The Subject Land and adjoining areas are not considered to represent “core koala habitat” and a “koala assessment report” is not required
- The Englobo Subdivision will involve:
 - direct clearing of native vegetation and removal of threatened species habitats
 - indirect impacts, being potential impacts on downstream habitats including Swamp Sclerophyll Forest TEC/EC and waterbodies
 - prescribed impacts, being removal of human-made structures and non-native vegetation and potential impacts to hydrology
- Impacts will be minimised through the establishment and implementation of Biodiversity and Landscape Corridors in accordance with the Voluntary Planning Agreement (AS580574) (Central Coast Council, 2022a)
- Proposed mitigation measures include incorporating detailed wildlife and vegetation management protocols into project plans, such as pre-clearing surveys, staged clearing, fauna rescue, habitat mapping, seasonal monitoring, and environmental controls (noise, light, dust, speed, sediment), to protect threatened species and sensitive habitats throughout construction.



- Final offset requirements are included in Table E 1 and Table E 2 below.

Table E 1: Impacts that Require an Offset – Ecosystem Credits

Vegetation Zone	PCT	TEC/EC	Impact Area (ha)	No. Ecosystem Credits Required
1636_Mod-good	PCT 1636 - Scribbly Gum - Red Bloodwood - <i>Angophora inopina</i> heathy woodland on lowlands of the Central Coast	n/a	6.13	143
1638_Mod-good	PCT 1638 - Smooth-barked Apple - Red Bloodwood - Scribbly Gum grass - shrub woodland on lowlands of the Central Coast	n/a	1.96	38
1717_Mod-good	PCT 1717 - Broad-leaved Paperbark - Swamp Mahogany - Swamp Oak - Saw Sedge swamp forest of the Central Coast and Lower North Coast which is Swamp Sclerophyll Forest EEC	TEC: Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland EC: Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland (EPBC Act)	0.32	8

Table E 2: Impacts that Require an Offset – Species Credit

Common Name	Scientific Name	Loss of Habitat (ha) or Individuals	Number of Ecosystem Credits Required
Glossy Black Cockatoo	<i>Calyptorhynchus lathami</i>	7.93	205



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Acronyms, Abbreviations and Definitions

AABR	Australian Association of Bush Regenerators
Assessment Area	In accordance with the BAM (DPIE, 2020a), the Assessment Area includes the Subject Land and the area of land within the 1500m buffer zone surrounding the Subject Land (or 500m buffer zone for linear proposals) that is determined as per Subsection 3.1.2 (of BAM 2020).
APZ (s)	Asset Protection Zone (s)
BAM	NSW Biodiversity Assessment Method (DPIE, 2020a)
BAM-C	Biodiversity Assessment Method Calculator
BCAR	Biodiversity Certification Assessment Report
BC Act	Biodiversity Conservation Act 2016 (NSW)
BDAR	Biodiversity Development Assessment Report
Biodiversity Corridor (s)	Three Biodiversity Corridors set out by the VPA, including Corridor F which occurs within the Subject Land for the EVMP
BOS	Biodiversity Offsets Scheme
Bush Regeneration	Defined by the AABR as the practice of restoring bushland by focussing on reinstating and reinforcing the systems' ongoing natural regeneration processes.
Council	Central Coast Council
CEEC (s)	Critically Endangered Ecological Community (s)
Construction Footprint	As required by the BAM (DPIE, 2020a), this is defined as the proportion of the Development Footprint, including temporary and ancillary construction facilities. These areas are not yet delineated by the Englobo Subdivision but will be defined and must be accounted for in future planning.
Corridor (s)	Landscape and Biodiversity Corridors set out by the VPA
DA (s)	Development Application (s) prepared pursuant to the EP&A Act
DBH	Diameter at Breast Height
Development Footprint	In accordance with the BAM (DPIE, 2020a), this refers to the area of land directly impacted by the proposed development, including access roads and zones designated for storing construction materials
Easement Dealing	Pipeline Easement Dealing AE445647 (2009)
EC (s)	Ecological Community listed under the EPBC Act
EEC (s)	Endangered Ecological Community (s)
ELMP	Englobo Landscape Management Plan (an in-principle LMP to be updated at each stage of the future development)
Endangered Ecological Community	An ecological community specified in Schedule 2 of the BC Act
Englobo Subdivision	The Proposed Englobo Subdivision DA/1295/2023, being subdivision of the Subject Land (thirteen lots) into 14 lots, including stormwater and sewer, road upgrades at the Pacific Highway entrance and slip lane and Community Title subdivision.



EP&A Act	Environmental Planning and Assessment Act 1979 (NSW)
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)
EVMP	Englobo Vegetation Management Plan (an in-principle VMP to be updated at each stage of the future development)
EWMP	Englobo Wildlife Management Plan (an in-principle WMP to be updated at each stage of the future development)
HBT (s)	Hollow-bearing tree (s)
HCCRPP	Hunter and Central Coast Regional Planning Panel
Hollow-bearing tree	In accordance with the BAM (DPIE, 2020a), this refers to a living or dead tree that has at least one hollow. A tree is considered to contain a hollow if: (a) the entrance can be seen; (b) the entrance width is at least 5cm; (c) the hollow appears to have depth (i.e. solid wood cannot be seen beyond the entrance); and (d) the hollow is at least 1m above the ground. Trees must be examined from all angles.
HTW (s)	High Threat Weed (s)
IBRA	Interim Biogeographic Regionalisation for Australia
IPA (s)	Inner Protection Areas
Landscape Corridor (s)	Four Landscape Corridors set out by the VPA, including three (Landscape Corridors D, E, G) that occur within the Subject Land for the EVMP
LLS Act	Local Land Services Act 2013 (NSW)
LMP (s)	Landscape Management Plan (s)
MNES	Matters of National Environmental Significance
NPW Act	National Parks and Wildlife Act 1974 (NSW)
NSW	New South Wales
Operational Footprint	As required by the NSW BAM (DPIE, 2020a) this is defined as the proportion of the Development Footprint that will remain operational following construction. These areas are not yet defined by the Englobo Subdivision but will be defined and must be applied for future plans.
PCT (s)	Plant Community Type (s)
Proponent	Doyalson Wyee RSL Club Ltd
Regeneration	Where native vegetation can regenerate itself from an intact root zone and seed bank to a natural state, with associated management (e.g. weed control)
Rehabilitation	The vegetation rehabilitation is defined as the return of native vegetation within disturbed areas
Resilience	The ability of an ecosystem to regenerate naturally and to withstand, or recover from, disturbances such as weed invasion, clearing, or fire
Restoration	To restore pre-existing indigenous ecosystems and ecological processes, maintaining and developing the capacity of a natural system to self-perpetuate
RFI (s)	Request for Information (s)
SAIL	Serious and Irreversible Impact



SEARs	Secretary's Environmental Assessment Requirements
SRZ	Structural Root Zone
Subject Land	In accordance with the BAM (DPIE, 2020a), this refers to land subject to a development, activity, clearing, biodiversity certification or a biodiversity stewardship proposal. The Subject Land for the Proposed Englobo Subdivision is 49-65 Wentworth Avenue and 80-110 Pacific Highway, Doyalson NSW 2262 (formally described as Lot 1 DP 215875, Lot 2 DP 215875, Lot 3 DP 215875, Lot 4 DP 215875, Lot 5 DP 215875, Lot 6 DP 215875, Lot 7 DP 215875, Lot 8 DP 215875, Lot 9 DP 215875, Lot 1 DP 503655, Lot 11 DP 240685, Lot 49 DP 707586 and Lot 7 DP 240685).
TBDC	Threatened Biodiversity Data Collection
TEC (s)	Threatened Ecological Community (s)
Threatened Species	A species specified in Schedule 1 of the BC Act
Total Site	The Total Site is the total of all properties subject to the Planning Proposal and VPA, along with a recently acquired property at 118 Pacific Highway. It includes the addresses 49-65 Wentworth Avenue and 80, 90, 100, 110, 118, 120 Pacific Highway, Doyalson NSW 2262, formally described as Lot 1 DP 215875, Lot 2 DP 215875, Lot 3 DP 215875, Lot 4 DP 215875, Lot 5 DP 215875, Lot 6 DP 215875, Lot 7 DP 215875, Lot 8 DP 215875, Lot 9 DP 215875, Lot 1 DP 503655, Lot 11 DP 240685, Lot 49 DP 707586, Lot 7 DP 240685, Lot 62 DP 755266 and Lot 7340 DP1166918.
TPZ	Tree Protection Zone
VEC (s)	Vulnerable Ecological Community (s)
Vegetation SEPP	State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017 (NSW)
VMP (s)	Vegetation Management Plan (s)
VPA 2022	Voluntary Planning Agreement (Document Identification AS580574)
Weed infestation	An area considered to have a dominating weed population, or where rehabilitation would be significantly impacted by weed species
WMP (s)	Wildlife Management Plan (s)



Declarations

i. Certification under Clause 6.15 BC Act

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

Signature: *K. Iolini*

Date: 22 December 2025

BAM Assessor Accreditation no: BAAS19042

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

ii. Details and Experience of Author / s and Contributors

Table DC 1: Authors and Contributors

Name	Accredited Assessor No.	Position/ Role	Tasks Performed	Relevant Qualifications
Jeremy Pepper	BAAS17104	SLR Technical Director, Project Director	Document review, BAM plot surveys, targeted threatened flora surveys	Bachelor of Science (Hons Class 1) University of NSW 1996 Cert II Bushland Regeneration, TAFE NSW Cert III Horticulture (Arboriculture), TAFE NSW
Fiona Iolini	BAAS19042	SLR Associate Ecologist, Project Manager	Report preparation, BAM-C data entry and analysis, BAM plot surveys, targeted threatened flora surveys, targeted threatened fauna surveys	Bachelor of Environmental Science and Management, University of Newcastle 2007 Cert III Conservation and Land Management, TAFE NSW 2015
David Conder	n/a	SLR Associate Ecologist	BAM plot surveys, targeted threatened flora surveys	Bachelor of Applied Science (Coastal Management)
Jarrid Beeton	BAAS23018	SLR Project Ecologist	Targeted threatened flora surveys, targeted threatened fauna surveys	Bachelor of Environmental Science and Management, University of Newcastle 2018 Dip. Conservation and Land Management, TAFE NSW Cert III Horticulture, TAFE NSW
Hannah Centra	n/a	SLR Project Ecologist	Report preparation, targeted threatened fauna surveys	Bachelor of Environmental Science and Management, University of Newcastle 2021
James Hugo	n/a	SLR GIS Technician	Figure preparation	Master of Environmental Management and Sustainability, University of Newcastle (2020) Bachelor of Science (Hons), University of Newcastle (2016)



iii. Conflict to Interest

I declare that I have considered the circumstances and there is no actual, perceived or potential conflict of interest. This declaration has been made in the interests of full disclosure to the decision-maker. Full disclosure has also been provided to the client.

Signature: Hiolani

Date: 22 December 2025

BAM Assessor Accreditation no: BAAS19042



STAGE 1: BIODIVERSITY ASSESSMENT

1.0 Introduction

1.1 Planning Proposal Background

1.1.1 Voluntary Planning Agreement 2022

The Total Site covers approximately 49.51 hectares and includes 49-65 Wentworth Avenue and 80-110, 118 and 120 Pacific Highway, Doyalson NSW 2262. The proposed Landscape and Biodiversity Corridors including those identified in the VPA 2022 (the 'Corridors'), encompass approximately 11.99 hectares. Consequently, the remaining 37.52 hectares represent the Development Footprint.

As an outcome of a previous five-year planning proposal process for Planning Proposal (PP-2021-4334) (the "Planning Proposal"), a Voluntary Planning Agreement (VPA) - AS580574 (Central Coast Council, 2022a) (hereafter "VPA 2022") - was established between Central Coast Council (the "Council") and Doyalson Wyee RSL Club Ltd (the "Proponent"). The purpose of VPA 2022 is to facilitate the progressive development of the Proponent's property located at 49-65 Wentworth Avenue and 80-110 and 120 Pacific Highway, Doyalson NSW 2262. The VPA 2022 site area excludes 118 Pacific Highway, legally described as Lot 7340 DP1166918, which was acquired in 2023 and now forms part of the Total Site.

The majority part of the Total Site that is subject to Planning Proposal and VPA 2022 is legally described as the following 14 lots: Lots 1-9 DP 215875, Lot 1 DP 503655, Lot 11 DP 240685, Lot 49 DP 707586, Lot 7 DP 240685, and Lot 62 DP 755266. It comprises approximately 44.82 hectares. VPA 2022 proposed Landscape and Biodiversity Corridors (the "VPA 2022 Corridors") comprise 9.87 hectares and therefore 34.95 hectares represent the Development Footprint.

Over the five-year Planning Proposal period (2018-2022), the VPA 2022 land was subject to biodiversity studies and design reviews to determine potential development footprints, while aiming to avoid and minimise impacts on native vegetation and threatened species habitat. These assessments are detailed in the Biodiversity Development Assessment Report (ELA, 2018) which was submitted with the Planning Proposal. The Planning Proposal identified land suitable for development and ultimately led to an amendment of the *Central Coast Local Environmental Plan 2022*, resulting in the rezoning of the land.

Approved in December 2022, the Planning Proposal re-zoned the majority of the Total Site to support an integrated precinct comprising retail, recreation, community, and residential uses, centred around the Doyalson Wyee RSL Club. VPA 2022 is registered on the current land titles under dealing number AS580574, ensuring the protection of the VPA 2022 Corridors in perpetuity.

As part of the process, which balanced the principle of "avoid and minimise" with bushfire control obligations, the biodiversity corridors were rezoned to Conservation C2 and C3. Offset strategies, including biodiversity credit co-purchase, were incorporated to mitigate vegetation removal within the development footprint.

The east-west landscape corridors were developed in consultation with Council (Dr Chris McLean) to ensure functional wildlife movement pathways. Particular attention was given to maintaining connectivity for key species such as Squirrel Glider and Glossy Black-Cockatoo, facilitating movement between vegetated areas from the western side of the Pacific Highway to Colongra Lake.



For a full summary of the five-year process culminating in VPA 2022, refer to the letter from Eco Logical Australia Pty Ltd (2025a), dated 17 September 2025 ref: 24HUS8504.

1.1.2 VPA 2022 Landscape Corridor Delineations

Section 3, Schedule 2 of VPA 2022 outlines the following requirements for the preparation of Landscape Management Plans (LMPs):

- 1 *The Proponent must prepare one or more Landscape Plans for the following Landscape Corridors generally in accordance with the plan in Annexure B, the following descriptions, and the requirements set out in clauses 3.2 to 3.6:*
 - a) *An irregular shaped landscaped corridor (Corridor C) spanning east-west along the southern border of Lot 62 DP755266 (with minimum width of 16.3m) and connects with Biodiversity corridor B to the north;*
 - b) *a 20m wide linear landscaped corridor (Corridor D) along the alignment of the Gas Pipeline;*
 - c) *an irregular shaped east-west landscaped corridor (Corridor E) with a minimum width of 16m, retention of existing tree canopy, including the tress within the Central Park area; and*
 - d) *a triangular shaped landscaped corridor (Corridor G) with a maximum width of 51m located on the northern portion of Lot 7 DP 240685 adjacent to Corridor F.*
- 2 *A Landscape Plan must depict the locations of the road crossings as shown in indicative locations in the plan in Annexure B where relevant to the subject matter of the plan.*
- 3 *The Landscape Plan for Corridor E must identify a minimum of 31 hollow bearing trees (including their tree protection zones) and the requisite measures for retaining the hollow bearing trees. The parties acknowledge that Council may also impose a condition on any development consent relating to the land on which Corridor E is located to restrict the removal of hollow bearing trees.*
- 4 *Landscape Corridors C, D, E and G are to be managed in accordance with the requirements of 'Managed Land' in Planning for Bushfire Protection 2019.*
- 5 *Landscape Corridors C, D E and G are to comply with requirements for an Inner Protection Area as described in Planning for Bushfire Protection 2019. An Inner Protection Area will require retention and establishment of native canopy trees only in order to avoid a bushfire hazard.*
- 6 *The Landscape Plan for Corridor D shall provide for shallow soil planting. Due to the presence of the Jemena pipeline, deep soil planting cannot be implemented.*

1.1.3 VPA 2022 Biodiversity Corridor Delineations

Section 4, Schedule 2 of VPA 2022 outlines the following requirements for the preparation of Vegetation Management Plans (VMPs).

- 7 *The Proponent must prepare one or more VMPs for each of the Biodiversity Corridors, each of which:*
 - a) *provides for the re-establishment of native vegetation and incorporates the following matters:*
 - i. *description of the proposed vegetation community;*
 - ii. *description of the proposed works;*



- iii. *identification of VMP management zones;*
 - iv. *description of works, management and maintenance activities to be carried out in the zones, including targets for density of native vegetation and weed cover;*
 - v. *details of implementation, monitoring and reporting requirements; and*
 - vi. *an estimate of the costs of carrying out the works and actions required to be carried out or performed in each stage.*
- b) *is generally in accordance with the matters set out in pages 36 to 39 of 'Central Coast Council Flora and Fauna Guidelines 2019'; and*
 - c) *provides for an implementation period of no less than 10 years.*

Section 5, Schedule 2 of VPA 2022 outlines the following requirements for the implementation of VMPs:

- 1 *The Proponent must establish Biodiversity Corridors generally in accordance with the plan in Annexure B, the following description, and the requirements of clause 5.6:*
 - a) *a biodiversity corridor (Corridor A) of minimum 40m width along the northern boundary;*
 - b) *a biodiversity corridor (Corridor B) with a maximum width of 57m spanning north-south connecting Corridors A and C;*
 - c) *a north-south biodiversity corridor (Corridor F) along the eastern boundary, ranging between a minimum width of 41m at the southern portion of Lot 11 DP 240685 and a maximum width of 49m at the northern portion of Lot 7 DP 240685. The minimum widths applicable to each lot (from south to north of each lot) are:*
 - i. *41m to 43m for Lot 11 DP 240685 (Corridor F – South);*
 - ii. *43m to 46m for Lot 49 DP 707586 (Corridor F – Central); and*
 - iii. *46m to 49m for Lot 7 DP 240685 (Corridor F – North).*
 - d) *The second order stream associated with Corridor B must comply with the requirements of the Water Management Act 2000.*
- 2 *A separate VMP may be prepared and submitted in respect of Corridor F – South, Corridor F – Central and Corridor – North as described in clause 5.1(c) of Schedule 2.*
- 3 *If the Proponent intends to undertake Development in a staged manner on land immediately adjoining a Biodiversity Corridor, the parties are to negotiate in relation to the timing requirements for preparing a VMP.*
- 4 *Despite clause 5.1, the parties acknowledge that the Proponent will continue to investigate alternative locations to which it may relocate one or more of the Biodiversity Corridors outside of the Land.*
- 5 *If the Proponent identifies suitable alternative location(s) for one or more Biodiversity Corridor, the Proponent may request, and Council must, negotiate in good faith to accept the establishment of the corridors at the alternative locations on adjoining nearby land.*
- 6 *A Biodiversity Corridor must retain existing native vegetation and rehabilitate all vegetation strata (groundcover, mid and canopy) where absent.*



1.1.4 Biodiversity and Landscape Corridors

The VPA 2022 defined seven Corridors, comprising three Biodiversity Corridors and four Landscape Corridors. These Corridors collectively cover 9.87 hectares, representing 19.97 % of the Total Site. Table 1 provides a summary of the Corridors. The Planning Proposal aimed to balance the creation of net developable area within the Total Site with the following environmental considerations:

- Protecting existing high-value vegetation in Biodiversity Corridor F;
- Re-establishing native vegetation in the newly created Biodiversity Corridors A and B;
- Maintaining remnant vegetation in Corridor G; and
- Establishing east-west Landscape Corridors C, D and E to support wildlife habitat connectivity with adjacent Biodiversity Corridors.

Table 1: Corridor Summary[#]

Corridor Reference	Corridor Type	Corridor Current Lot and DP	Corridor Proposed Lot	Corridor Land Area (ha)	Corridor % of Total Site
A	Biodiversity	Lot 62 DP 755266	Lot 62 DP 755266	1.43	3.2%
B	Biodiversity	Lot 62 DP 755266	Lot 62 DP 755266	1.15	2.56%
C	Landscape	Lot 62 DP 755266	Lot 62 DP 755266	1.56	3.47%
D	Landscape	Lot 7 DP 240685	Lot 1, Lot 6, Lot 7, Lot 15	1.01	2.25%
E	Landscape	Lot 11 DP 240685, Lot 49 DP 707586	Lot 1, Lot 4, Lot 5	1.55	3.45%
F	Biodiversity	Lot 11 DP 240685	Lot 12	2.66	5.93%
G	Landscape	Lot 7 D.P. 240685	Lot 6	0.52	1.15%
Total Corridors				9.88	22.01%
# ADW Johnson, 2025a, p.2					

1.2 Englobo Subdivision Background

1.2.1 Response to Council Request for Information

This BDAR integrates responses and clarifications:

- Through Council Requests for Information (RFIs) since 2023
- The Peer Review prepared by de Witt (2023)
- Further RFIs through the Deferral Action required by the Hunter and Central Coast Regional Planning Panel (HCCRPP, 2025)

1.2.2 BDAR for Englobo Subdivision DA

This BDAR has been developed since 2023 to assess the Proposed Englobo Subdivision DA/1295/2023 (the “Englobo Subdivision”).

Pre-DA comments (Central Coast Council, 2022b, p15-21) refer to the BDAR requirements summarised as follows:



- The site is subject to ecological planning controls under the BC Act, requiring a BDAR for any subdivision or development. Although a Biodiversity Certification Assessment Report (BCAR) was prepared for the Planning Proposal, the site lacks formal Biodiversity Certification, necessitating a BDAR prepared by an accredited assessor using the Biodiversity Assessment Method (BAM).
- Key requirements include:
 - BDAR Submission: Must be certified, submitted within 14 days of finalised credit reports, and include vegetation mapping overlays.
 - Ecological Surveys: Must be current (within 5 years), follow *Council's Flora and Fauna Guidelines*, and include targeted surveys for threatened species identified via BioNet within 10km of the site.
 - Avoidance and Minimisation: Development must demonstrate avoidance of biodiversity values before minimisation or offsetting, including threatened species, vegetation, habitat connectivity, and water sustainability.
 - Landscape and Corridor Plans: Required under VPA 2022, including VMPs and Landscape Plans.
 - Wildlife Management Plan (WMP): Must include hollow-bearing tree mapping and a hollow replacement strategy.
 - Arborist Report: Required for tree protection and retention, cross-referenced with BDAR and BCAR.
 - *Water Management Act 2000*: Controlled activity approval needed for works within 40m of a watercourse.
 - Koala SEPP 2021: Assessment required for sites over 1 hectare, potentially included in the BDAR.
 - EPBC Act 1999: Separate federal assessment may be required for nationally listed species or communities; referral to the Commonwealth is advised if significant impact is possible.
- The BDAR must integrate with other reports including bushfire, stormwater, and landscape plans. The Development Footprint must include all direct and indirect impact areas, even those outside the property boundary.

1.2.3 Subject Land

The Subject Land is 34 hectares and is indicated in Figure 1.

The Subject Land is located within the Sydney Basin IBRA region and Wyong IBRA subregion. The site slopes to the east, with elevations 26 m at the southwest corner and 10 m along the eastern boundary. There is an unnamed watercourse mapped in the northwest of the Subject Land, but previous studies (ELA 2018) have determined that this feature does not contain a channel and as such is not a defined watercourse under the *Water Management Act 2000* (WM Act).

The Soil Landscapes of Central and Eastern NSW (DPE, 2023a) map the Subject Land as 'Doyalson' with a band of 'Wyong' soil landscape corresponding to the watercourse in the northwest corner.

Geologies of the Doyalson soil landscape are Narrabeen Group-Clifton Subgroup-Munmorah Conglomerate Formation, which are conglomerate, pebbly sandstone, grey green and grey siltstone and claystone. Soils are moderately deep yellow earths, yellow podzolic soils and



soloths occurring on sandstones and conglomerates; moderately deep yellow podzolic soils, soloths and some red podzolic soils occurring on fine-grained siltstones and claystone; moderately deep to deep yellow leached earths, grey earths, soloths and gleyed podzolic soils occurring along drainage lines.

Geologies of the Wyong soil landscape are Quaternary sediments, which are sand, silt, gravel, and clay. Soils are deep (>200cm) yellow podzolic soils, brown podzolic soils, soloths with some humus podzols around lake edges.

The Subject Land is privately owned and has been subject to past native vegetation clearing and ongoing disturbance, but several patches of native vegetation remain. The northern portion is used for an adventure course, and the existing Doyalson Wyee RSL Club located in the southwest corner.

1.2.4 Proposed Englobo Subdivision

The Proposed Englobo Subdivision DA/1295/2023 involves the subdivision of the Subject Land (thirteen lots) into 14 lots, including stormwater and sewer, road upgrades and slip lane at the Pacific Highway entrance.

The legislative pathway for the Englobo Subdivision is development that requires consent under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

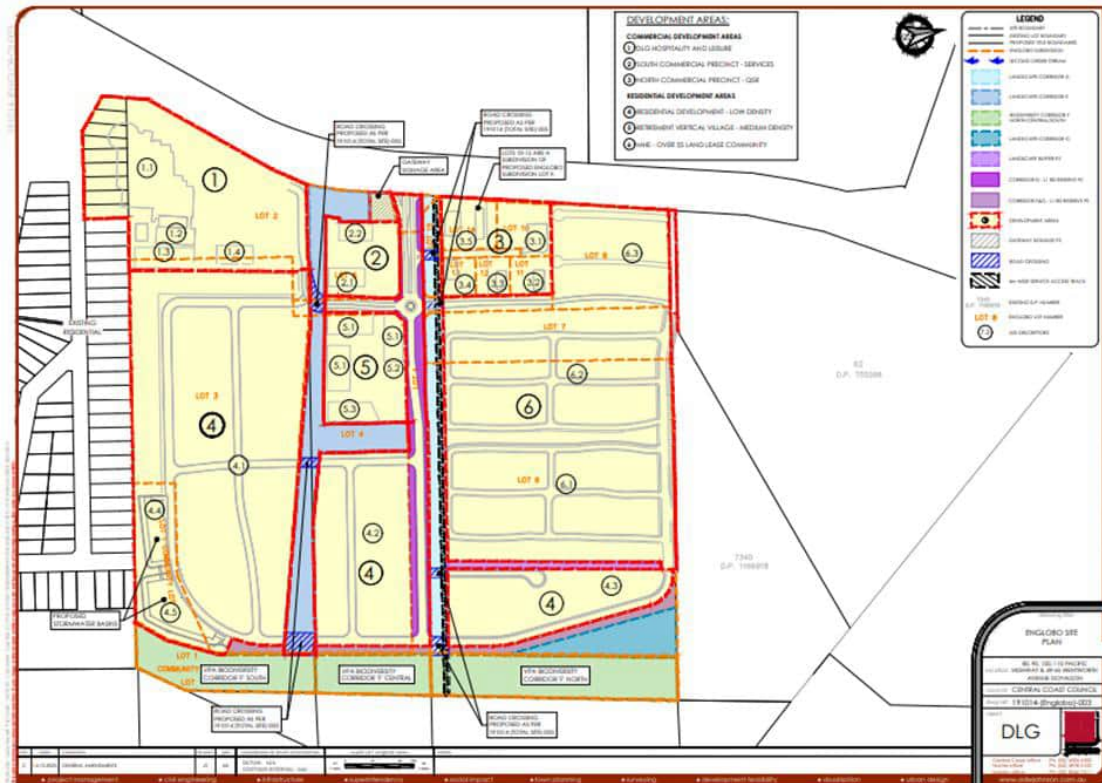
The Development Footprint for the Englobo Subdivision is depicted in Figure 3. The Development Footprint is approximately 30 hectares and is inclusive of the expected operational and construction footprint.

The following extracts (Plan Extract 1 and 2) are provided from the Englobo Site Plans (Version 1, 23 October 2025 - Englobo Plan Set) prepared by ADW Johnson (2025b).

Plan Extract 1: Total Site and Englobo Site (ADW Johnson, 2025b, p.1)



Plan Extract 2: Proposed Englobo Subdivision (ADW Johnson, 2025b, p.5)



The current vegetation condition of the VPA 2022 Corridors is summarised in Table 2 below.

Table 2: VPA 2022 Corridors and Vegetation Condition (ADW Johnson, 2025a)

Corridor Number	Corridor Type	Corridor Current Lot and DP	Corridor Proposed Lot	Corridor Land Area (ha)	Corridor % of Total Site	Current Condition
D - service access track	Landscape	Lot 7 DP 240685	Lot 6, Lot 7, Lot 15	0.20	0.59	Open cleared land
D	Landscape	Lot 7 DP 240685	Lot 6, Lot 7	0.81	2.37	Open cleared land with scattered trees
E	Landscape	Lot 49 DP 707586, Lot 11 DP 240685	Lot 1, Lot 4, Lot 5	1.55	4.53	Predominantly vegetated with some earth work areas. HBTs feature.
F (south)	Biodiversity	Lot 11 DP 240685	Lot 1	0.85	2.5	Significantly vegetated with EEC areas to north
F (central)	Biodiversity	Lot 49 DP 707586	Lot 1	0.55	1.62	Significantly vegetated
F (north) - services access track	Biodiversity	Lot 49 DP 707586	Lot 1	0.02	0.05	Open Cleared land



Corridor Number	Corridor Type	Corridor Current Lot and DP	Corridor Proposed Lot	Corridor Land Area (ha)	Corridor % of Total Site	Current Condition
F (north)	Biodiversity	Lot 7 DP 240685	Lot 1	1.23	3.61	Significantly vegetated
G	Landscape	Lot 7 DP 240685	Lot 6	0.52	1.52	Mixed vegetation. Significant proportion of exotic species
Total Approved Proposed Corridors				5.73	16.79	Sum of all approved proposed corridors

Table 3 below summarises the areas for each component of the Subject Land and the associated percentage of each area compared to the entirety of the Englobo Subdivision.

Table 3: Area Footprints

Proposed Area	Area Footprint (ha)	% of Subject Land
Landscape Corridor D	1.01	3.0%
Landscape Corridor E	1.55	4.5%
Landscape Corridor G	0.52	1.5%
Biodiversity Corridor F	2.66	7.8%
Corridor D – Lot 1 Road Reserve Planting Zone	0.47	1.4%
Corridors F and G – Lot 1 Road Reserve Planting Zone	0.46	1.3%
Gateway Signage Planting Zone	0.08	0.2%
Landscape Buffer Planting Zone	0.18	0.5%
Development Areas (roads, utility, subdivision infrastructure)	27.20	79.7%
Total Subject Land Area	34.13	99.90%

The Englobo Subdivision will facilitate further subdivision and future development for a range of permitted uses enabled by way of the Planning Proposal. This includes associated construction of the broader road network. These future developments will be in the subject of future DAs. Full infrastructure is not provided at this stage although it is on concept reflected in plans and will be dealt with in future DAs.

Following approval of the Englobo Subdivision, the Proponent will submit staged development applications to facilitate uses across the 14 super lots.

For the purposes of this BDAR:

- The Subject Land is a substantial part of the Total Site, comprising 49-65 Wentworth Avenue and 80-110 Pacific Highway, Doyalson NSW 2262 and is equivalent to the gross site area of the proposed development in the Englobo Subdivision including the areas of future Biodiversity and Landscape Corridors contemplated in VPA 2022.
- The Development Footprint encompasses all potential future impact areas including potential temporary infrastructure.
- The Development Footprint includes Landscape Corridors (D, E and G) within which partial vegetation clearing is proposed, and which will be subject to an Englobo Landscape Management Plan (ELMP) (SLR, 2025b).



- The Development Footprint excludes the area of the future Biodiversity Corridor F contemplated in VPA 2022 for which no subdivision works are proposed and within which the Proponent has prepared a separate Englobo Vegetation Management Plan (EVMP) (SLR, 2025c).
- An Englobo Wildlife Management Plan (EWMP) (SLR, 2025d) has been prepared to guide wildlife protection measures during clearing and demolition works within the Development Footprint.

As such this BDAR assesses:

- Demolition of all structures within the Development Footprint
- The partial removal of areas of vegetation within the Landscape Corridors (D, E and G)
- The removal of all areas of vegetation within the remainder of the subdivision footprint

1.3 Other Documentation

As part of the Planning Proposal process a biodiversity assessment, involving vegetation integrity assessment and targeted field work, was previously undertaken by Eco Logical (ELA, 2018). The current biodiversity assessment relies in part on information within the previous studies, supplemented by additional work by SLR in 2023.

Other key documents relied upon with respect to the Englobo Subdivision include:

- Central Coast Council. 2022a. Voluntary Planning Agreement, Under section 7.4 of the Environmental Planning and Assessment Act, 1979, Central Coast Council & Doyalson Wyee RSL Club Limited. Final Version. Central Coast Council, Wyong, NSW.
- SLR Consulting Australia Pty Ltd (SLR). 2023. Statement of Environmental Effects - Proposed Subdivision and Associated Works, 80-120 Pacific Highway, Doyalson, NSW 2262. 8 June 2023. Revision 2.0. New Lambton, NSW.
- Eco Logical Australia Pty Ltd (ELA). 2023. Bushfire Protection Assessment, Subdivision, 80-100 Pacific Highway, Doyalson. Version 2, 4 April 2023. Prepared for Doylo Lifestyle Group. Australia.
- EMM Consulting Pty Ltd. 2023, Doyalson Fuel Precinct Arborist Report, report prepared for Doylo Lifestyle Group, July, EMM Consulting Pty Ltd, Newcastle, NSW.
- Central Coast Council. 2022b. Record of Pre-Development Advice. Meeting minutes dated 10 November 2022. Wyong, NSW.
- Jones Nicholson. 2023a. Water Cycle Management Plan, Richmond + Ross Doyalson Wyee RSL Club, Pacific Highway, Doyalson, NSW 2262, Jones Nicholson, Sydney, NSW.
- Jones Nicholson. 2023b. Doyalson Wyee RSL Club – Stormwater Masterplan Concept, 80-120 Pacific Highway & 49-65 Wentworth Ave, Doyalson, NSW 2262, Jones Nicholson, Sydney, NSW.
- Eco Logical Australia Pty Ltd (ELA). 2025a. RE: Bushfire Landscape Advice – 90–120 Pacific Highway, Doyalson Landscape Corridor C, D, E and G. Letter to ADW Johnson, dated 24 June 2025. Australia.



- Eco Logical Australia Pty Ltd (ELA). 2025b. Avoid and Minimise - Doyalson Wyee Planning Proposal (PP-2021-4334). 80, 90, 100, 110 and 120 Pacific Highway and 49-65 Wentworth Ave Doyalson. Letter to Doyalson Wyee RSL Club t/a Doyalson Lifestyle Group, dated 17 September 2025.
- Rose Atkins Rimmer. 2025a. Doyalson R.S.L. Development Water Servicing Masterplan. Version 07, 26 March 2025. Minchinbury, NSW.
- Rose Atkins Rimmer. 2025b. Doyalson R.S.L. Development Waste Water Servicing Masterplan. Version 08, 26 March 2025, Minchinbury, NSW.
- Abacus Tree Services. 2025. Arborist report: Client: Doyalson Wyee RSL Club Ltd t/a Doyalson Lifestyle Group (DLG), Address: 80, 90, 100, 110 Pacific Highway, & 49-65 Wentworth Avenue, Doyalson N.S.W 2262. Newcastle, NSW: Abacus Tree Services.
- ADW Johnson 2025a. DLG Total Site Plans, 80, 90, 100, 110, 118, 120 Pacific Highway & 49-65 Wentworth Avenue, Doyalson. Plan set dated 24 October 2025.
- ADW Johnson 2025b. DLG Englobo DA Site Plans, 80, 90, 100, 110 Pacific Highway, Doyalson & 49-65 Wentworth Avenue, Doyalson. Plan set dated 24 October 2025.
- ADW Johnson. 2025c. VPA Corridor E Tree Retention Package, Pacific Highway, Doyalson, VPA Dealing AS580574 (VPA 2022). Plan set dated 24 October 2025.
- ADW Johnson. 2025d. VPA Corridor F & G Tree Retention Package, Pacific Highway, Doyalson, VPA Dealing AS580574 (VPA 2022). Plan set dated 24 October 2025.
- ADW Johnson. 2025e. Landscape Plan, Landscape Corridor D in accordance with AS580574 (VPA 2022) & Ancillary Planting Zones, 80, 90, 100, 110 Pacific Highway, & 49-65 Wentworth Avenue, Doyalson N.S.W 2262, (Englobo Subdivision DA/1295/2023). Plan set dated 24 October 2025.
- ADW Johnson. 2025f. Landscape Plan, Landscape Corridor E in accordance with AS580574 (VPA 2022), 80, 90, 100, 110 Pacific Highway, & 49-65 Wentworth Avenue, Doyalson N.S.W 2262, (Englobo Subdivision DA/1295/2023). Plan set dated 24 October 2025.
- ADW Johnson. 2025g. Landscape Plan, Landscape Corridors F & G in accordance with AS580574 (VPA 2022) & Ancillary Planting Zone, 80, 90, 100, 110 Pacific Highway, & 49-65 Wentworth Avenue, Doyalson N.S.W 2262, (Englobo Subdivision DA/1295/2023). Plan set dated: 24 October 2025.

1.4 Biodiversity Offsets Scheme Entry

The BOS applies to the Englobo Subdivision due to impacts on biodiversity values mapped by the Biodiversity Values map (see Figure 4 and Appendix B).

1.5 Excluded Impacts

There are no excluded impacts (see Figure 5) (for example category 1-exempt land as defined in Part 5A of the *Local Land Services Act 2013* (LLS Act) applicable to this biodiversity assessment.



1.6 Matters of National Environmental Significance

An assessment of EPBC Act matters and Protected Matters Search report is provided in Appendix E.

1.7 Information Sources

Existing information on the flora and fauna of the Subject Land and the locality, including relevant threatened biota, was obtained from the following resources:

- The NSW BioNet (DPE, 2023b) and Protected Matters Search Tool (Commonwealth DCCEE, 2023a) for previous records of threatened species, populations and ecological communities within a 10km radius centred on the centre of the Subject Land.
- The NSW BioNet 'Threatened Biodiversity Data Collection' (DPE, 2023b), Final Determinations (TSC, 2023) and Species Profile and Threats Database (Commonwealth DCCEE, 2023b) for information on threatened species, populations and ecological communities.
- The previous biodiversity assessment (ELA, 2018) and BioNet Vegetation Classification (DPE, 2023c) for information on the Plant Community Type (PCT).

A full list of resources is provided in Section 12.0



2.0 Methods

2.1 Site Context Methods

2.1.1 Landscape Features

Various field surveys enabling the identification of landscape features within the Subject Land were undertaken by ELA in 2018, supplemented by additional surveys by SLR in 2023. The key methods used to identify landscape features in the Assessment Area include review of:

- Recent Nearmap aerial imagery (Nearmap, 2023)
- Regional vegetation mapping (DPE, 2022a)
- Stream order mapping (ESRI, 2023)
- Other general GIS data (e.g. Wetland, cliff line, EPI protection layer) available on the SEED portal (DPE, 2023d)

2.1.2 Native Vegetation Cover

Various field surveys to assess the extent and condition of native vegetation cover on the Subject Land were undertaken by ELA in 2018. The ELA (2018) native vegetation mapping for the Subject Land was also compared to recent Nearmap (2023) aerial imagery dated March 2023 and subject to field reconnaissance by SLR in autumn 2023. Regional vegetation mapping (DPE, 2022a) and aerial image (Nearmap, 2023) review were used to confirm the native vegetation cover in the Assessment Area (Section 3.3).

2.2 Native Vegetation, Threatened Ecological Communities and Vegetation Integrity Methods

2.2.1 Existing Information

Existing information that was used to identify PCTs (Section 4.2) and TECs (Section 4.3) for the Subject Land included the previous biodiversity assessment prepared by ELA (2018) and the associated profiles available in the BioNet Vegetation Classification (DPE, 2023c), as well as relevant Scientific Determinations (TSC, 2023).

2.2.2 Mapping Native Vegetation Extent

Various field surveys to assess the extent of native vegetation within the Subject Land (see Section 4.1) were undertaken by ELA in 2018. The ELA (2018) native vegetation mapping for the Subject Land was compared to recent Nearmap (2023) aerial imagery dated March 2023 and subject to supplementary field reconnaissance by SLR in autumn 2023. A review of site aerial imagery (Nearmap, 2023) dated October 2023 was also undertaken in response to Council comments regarding a recently cleared patch of regrowth native vegetation. Historic aerial imagery included within the Preliminary Site Investigation (GHD, 2018) was also reviewed to assist in determining areas of regrowth and planted native vegetation across the site.

2.2.3 Plot-Based Vegetation Survey

Plot-based vegetation surveys in accordance with BAM Subsection 4.2.1 were undertaken by ELA in 2018 and resurveyed by SLR in 2023. One additional plot (BAM07) was sampled within the PCT 1717 vegetation, to replace the ELA BAM Plot 5 which is outside the current



Subject Land. The data from the current survey is presented in Appendix F and the location of the plots have also been presented in Figure 6. Sampling locations were generally selected randomly in proximity to the locations previously sampled and in accordance with the BAM requirements.

2.2.4 Vegetation Integrity Survey

The number of vegetation integrity plots sampled in each vegetation zone is in accordance with the following requirements of BAM 2020: <2ha (1 plot); >2-5ha (2 plots); >5-20ha (3 plots); >20-50ha (4 plots); >50-100ha (5 plots); >100-250 ha (6 plots); >250-1000ha (7 plots or more); >1000 (8 plots or more). Within the Subject Land, six 20m by 50m (1,000m²) plot/transect ('BAM plot') containing a nested 20m by 20m (400m²) floristic plot.

The number of vegetation integrity plots completed per vegetation zone within the Subject Land is presented in Table 4.

Table 4: Vegetation Integrity Plots

Vegetation Zone	Area (ha) (in Subject Land and Development Footprint)	BAM Category [#]	Plots Required	Plots Completed
1636_Mod-good	6.77 (6.13 impacted)	>5-20ha	3	3
1638_Mod-good	2.26 (1.96 impacted)	<2ha	1	1
1717_Mod-good	1.84 (0.32 impacted)	<2ha	1	2
# Based on BAM 2020				

2.3 Threatened Flora Survey Methods

2.3.1 Review of Existing Information

The BAM calculator and a BioNet Atlas search were used to create a list of threatened species of flora for consideration as target threatened species. The TBDC was used to identify habitat constraints and potential microhabitats (see Section 5.1) for each species likely to occur within the PCTs mapped for the Subject Land.

2.3.2 Habitat Constraints Assessment

Various field surveys to assess habitat constraints and microhabitats (see Section 5.1) were undertaken by ELA (2018). These were supplemented by surveys of the Subject Land by SLR in 2023 to verify these habitats.

Specific habitat assessment survey techniques for threatened species of flora include:

- Surveys of the Subject Land by ELA (2018) for the following habitat features: site condition, vegetation structure, presence of stock, evidence of feral animals, evidence of human disturbance, evidence of erosion, fire history, proximity to water, dominant canopy species and cover, dominant mid-storey species and cover, dominant ground species and cover, percent cover (of weeds, bare ground, leaf litter, rock cover), evidence of seedling recruitment, wetlands with emergent vegetation.
- Opportunistic and incidental observations during all field surveys.
- Inspection, notes, GPS point and photograph of waterbody, human-made structure and incidental habitat features detected during threatened flora transects by SLR in Autumn 2023 and Spring 2023.



2.3.3 Field Surveys

Field surveys undertaken by ELA (2018) to target threatened species of flora (see Section 5.3) include:

- Six floristic quadrats plus random meanders on 19 July 2018, 20 July 2018 and 2 August 2018, as well as approximately 9 km walking targeted searches in suitable habitat on 30 August 2018 targeting *Angophora inopina*, *Astrotricha crassifolia*, *Eucalyptus camfieldii*, *Eucalyptus parramattensis* subsp. *parramattensis* endangered population, *Grevillea parviflora* subsp. *parviflora*, *Diuris praecox*, *Dendrobium melaleucaphilum*, *Melaleuca biconvexa*, *Melaleuca groveana*, *Rutidosia heterogama*, *Tetratheca glandulosa* and *Tetratheca juncea*.
- Approximately 13 km walking targeted searches in suitable habitat on 8 November 2018 targeting *Cryptostylis hunteriana*, *Acacia bynoeana*, *Callistemon linearifolius*, *Prostanthera askania* and *Genoplesium insigne*.

Supplementary flora surveys by SLR include:

- Parallel transects across the Subject Land on 30 March 2023 and 4 April 2023 to target *Acacia bynoeana*, *Angophora inopina*, *Corunastylis* sp. Charmhaven (NSW896673), *Eucalyptus camfieldii*, *Eucalyptus parramattensis* subsp. *decadens*, *Eucalyptus parramattensis* subsp. *parramattensis*, *Melaleuca biconvexa*, *Melaleuca groveana*, *Persicaria elatior* and *Rutidosia heterogama*.
- Parallel transects across the Subject Land on 6-7 November 2023, 20 November 2023 and 23 November 2023 to target *Acacia bynoeana*, *Angophora inopina*, *Asperula asthenes*, *Astrotricha crassifolia*, *Callistemon linearifolius*, *Corunastylis* sp. Charmhaven (NSW896673), *Cryptostylis hunteriana*, *Eucalyptus camfieldii*, *Eucalyptus parramattensis* subsp. *decadens*, *Eucalyptus parramattensis* subsp. *parramattensis*, *Genoplesium insigne*, *Grevillea parviflora* subsp. *parviflora*, *Melaleuca biconvexa*, *Melaleuca groveana*, *Prostanthera askania*, *Rhizanthella slateri*, *Rutidosia heterogama* and *Tetratheca glandulosa*.
- Reference checks of Heath Wrinklewort *Rutidosia heterogama* near the rail line at Sparks Road, Wallarah showed specimens contained flower heads with floral bracts on 6 November 2023.

Targeted threatened flora survey locations are shown in Figure 6.

2.4 Threatened Fauna Survey Methods

2.4.1 Review of Existing Information

The BAM calculator and a BioNet Atlas search were used to create a list of threatened species of fauna for consideration as target threatened species. The TBDC was used to identify habitat constraints and potential microhabitats (see Section 5.1) for each species likely to occur within the PCTs mapped for the Subject Land.

2.4.2 Habitat Constraints Assessment

Various field surveys to assess habitat constraints and microhabitats (see Section 5.1) were undertaken by ELA (2018). These were supplemented by surveys of the Subject Land by SLR in 2023 to verify these habitats.

Specific habitat assessment survey techniques for threatened species of fauna include:



- Mapping of hollow-bearing trees (ELA, 2018)
- Surveys of the Subject Land by ELA (2018) for the following habitat features: site condition, vegetation structure, presence of stock, evidence of feral animals, evidence of human disturbance, evidence of erosion, fire history, nectar or fruit resources and perch sites, proximity to water, evidence of fauna occupation, dominant canopy species and cover, dominant mid-storey species and cover, dominant ground species and cover, percent cover (of weeds, bare ground, leaf litter, rock cover), evidence of seedling recruitment, hollow resources, wetlands with emergent vegetation, cliffs or caves
- Opportunistic and incidental observations of fauna species during field surveys, including opportunistic observation of fauna activity such as scats, tracks, burrows, or other traces
- Inspection of human-made structures as potential bat roost sites
- Acidity testing of soaks within swamp forest habitats
- Opportunistic searching for chewed cones beneath *Allocasuarina* and *Casuarina* tree species

2.4.3 Field Surveys

Field surveys undertaken by ELA (2018) to target threatened species of fauna (see Section 5.3) include:

- 16 hours spotlighting over 8 nights, on 20-23 August 2018, 13 November 2018, 25-26 March 2019 and 28 March 2019 to target Squirrel Glider, Brush-tailed Phascogale, Masked Owl, Barking Owl, Powerful Owl and Bush-stone Curlew
- 8 hours call playback over 8 nights on 20-23 August 2018, 13 November 2018, 25-26 March 2019 and 28 March 2019 to target Squirrel Glider, Masked Owl, Barking Owl, Powerful Owl and Bush-stone Curlew
- 10.75 km habitat searches on 20 June 2018 and 2 August 2018 for the Bush-stone Curlew, Regent Honeyeater, Gang-gang Cockatoo, Glossy Black Cockatoo, White-bellied Sea-eagle, Little Eagle, Swift Parrot, Square-tailed Kite, Eastern Osprey
- 110 nights of surveillance using arboreal remote cameras on 2 August to 23 August 2018 to target Squirrel Glider, Brush-tailed Phascogale and Koala
- 24 trap nights of arboreal Elliot traps from 12-16 November 2018 to target the Squirrel Glider
- Combination of tadpole surveys, call surveys and nocturnal searches on 25, 26, and 28 March 2019 to target Wallum Froglet, Giant Burrowing Frog, Green and Golden Bell Frog, Green-thighed Frog and Mahony's Toadlet
- 100 trap nights of small Elliot traps and 24 trap nights of pitfall traps from 12-16 November 2018 to target Eastern Pygmy-possum and Common Planigale
- 16 trap nights of harp trapping from 12-16 November 2018 to target Southern Myotis, Little Bentwing-bat and Eastern Bentwing-bat

Supplementary fauna surveys by SLR include:

- Four nights of aural visual surveys on 29-30 March 2023 and 3-4 April 2023 to target Wallum Froglet, Mahony's Toadlet, Green-thighed Frog and Green and Golden Bell



Frog, as well as a follow up tadpole search for the Green-thighed Frog on 28 April 2023

- Sixteen trap nights of funnel trapping on 29-30 March 2023 and 3-4 April 2023 to target the Pale-headed Snake
- Two nights spotlighting on 3-4 April 2023 to target Southern Greater Glider, Squirrel Glider, Eastern Pygmy-possum, Koala and Pale-headed Snake
- 336 nights of surveillance using arboreal remote cameras on 3 April to 1 May 2023 to target the Brush-tailed Phascogale
- Koala SAT surveys at four locations on 28 April 2023

Targeted threatened fauna survey locations are shown in Figure 6.

2.5 Weather Conditions

2.5.1 Overall Weather Conditions

Environmental conditions on the lead up to the 2018 surveys were generally dry drought conditions, whilst the 2023 surveys were undertaken following 2 years of La Nina weather patterns. Weather conditions during the surveys are summarised in Table 5.

With respect to weather conditions required for target threatened species:

- Frog surveys (for Wallum Froglet *Crinia tinnula*, Green-thighed Frog *Litoria brevipalmata*, Mahony's Toadlet *Uperoleia mahonyi*) require waterbodies to be suitably flooded, therefore periods of moderate rainfall are required prior to surveys – an assessment of rainfall leading up to the frog surveys is provided below the table
- Spotlighting surveys for the Pale-headed Snake *Hoplocephalus bitorquatus* requires ambient temperature above 18°C and ideally 1-2 days after rainfall and on humid nights (>70% humidity)
- Koala SAT surveys are required to be undertaken following 3 days of no rain

Table 5: Environmental Conditions During Threatened Species Survey

Survey Undertaken (e.g. Method / Targeted Species)	Date	Time	Temperature (min. & max.)	Wind (Light, Mod... or km/hr)	Rainfall (mm)	Other Conditions Relevant to the Species
Floristic quadrats and random meanders	19 July 2018	9am-3pm	9-22	Data not available	0	n/a
Floristic quadrats and random meanders	20 July 2018	9am-3pm	13.4-21.4	Data not available	0	n/a
Floristic quadrats and random meanders, targeted threatened fauna habitat searches (NB – detected Glossy Black Cockatoo), arboreal camera traps	2 August 2018	9am-3pm	9.8-19.4	Data not available	1.4	n/a



Survey Undertaken (e.g. Method / Targeted Species)	Date	Time	Temperature (min. & max.)	Wind (Light, Mod... or km/hr)	Rainfall (mm)	Other Conditions Relevant to the Species
Arboreal camera traps	3 August 2018	9am-3pm	10.9-20.1	Data not available	0	n/a
Arboreal camera traps	4 August 2018	9am-3pm	11.2-20.2	Data not available	0	n/a
Arboreal camera traps	5 August 2018	9am-3pm	9.3-22.3	Data not available	0	n/a
Arboreal camera traps	6 August 2018	9am-3pm	12.3-18.6	Data not available	0	n/a
Arboreal camera traps	7 August 2018	9am-3pm	10.5-18.1	Data not available	2	n/a
Arboreal camera traps	8 August 2018	9am-3pm	7.6-20.3	Data not available	0	n/a
Arboreal camera traps	9 August 2018	9am-3pm	9.9-19.1	Data not available	0	n/a
Arboreal camera traps	10 August 2018	9am-3pm	8.9-21.2	Data not available	0	n/a
Arboreal camera traps	11 August 2018	9am-3pm	13.1-23.1	Data not available	0.2	n/a
Arboreal camera traps	12 August 2018	9am-3pm	9.7-16.4	Data not available	0	n/a
Arboreal camera traps	13 August 2018	9am-3pm	6.5-20.2	Data not available	0	n/a
Arboreal camera traps	14 August 2018	9am-3pm	8.5-22.2	Data not available	0	n/a
Arboreal camera traps	15 August 2018	9am-3pm	11.6-24.2	Data not available	0	n/a
Arboreal camera traps	16 August 2018	9am-3pm	12.9-20.7	Data not available	0	n/a
Arboreal camera traps	17 August 2018	9am-3pm	8.7-18.2	Data not available	0	n/a
Arboreal camera traps	18 August 2018	9am-3pm	7.8-22.2	Data not available	0	n/a
Arboreal camera traps	19 August 2018	9am-3pm	10-17.2	Data not available	0	n/a
Arboreal camera traps, spotlighting, call playback	20 August 2018	9am-3pm	8.7-13.9	Data not available	0	n/a
Arboreal camera traps, spotlighting, call playback	21 August 2018	9am-3pm	6.9-18.9	Data not available	0	n/a



Survey Undertaken (e.g. Method / Targeted Species)	Date	Time	Temperature (min. & max.)	Wind (Light, Mod... or km/hr)	Rainfall (mm)	Other Conditions Relevant to the Species
Arboreal camera traps, spotlighting, call playback	22 August 2018	9am-3pm	8.6-16.5	Data not available	0	n/a
Arboreal camera traps, spotlighting, call playback	23 August 2018	9am-3pm	9.2-18.7	Data not available	0	n/a
Targeted searches for threatened flora	30 August 2018	9am-3pm	6.6-17.5	Data not available	0	n/a
Targeted searches for threatened flora	8 November 2018	9am-3pm	11.8-19.2	Data not available	19.2	n/a
Elliot traps, pitfall traps, harp traps	12 November 2018	9am-3pm	16.4-23.4	Data not available	0	n/a
Elliot traps, pitfall traps, harp traps, spotlighting, call playback	13 November 2018	9am-3pm	18.9-26.4	Data not available	0	n/a
Elliot traps, pitfall traps, harp traps	14 November 2018	9am-3pm	18-22.2	Data not available	0	n/a
Elliot traps, pitfall traps, harp traps	15 November 2018	9am-3pm	18.2-22.6	Data not available	0.2	n/a
Elliot traps, pitfall traps, harp traps	16 November 2018	9am-3pm	16.5-20.1	Data not available	9.6	n/a
Spotlighting, call playback	25 March 2019	9am-3pm	20.4-25	Data not available	7.6	n/a
Spotlighting, call playback	26 March 2019	9am-3pm	18.2-26	Data not available	2.8	n/a
Spotlighting, call playback	28 March 2019	9am-3pm	17.7-28.7	Data not available	0	n/a
Frog transects, funnel traps	29 March 2023	9am-3pm	19.5-28.3	11-13	6	n/a
Frog transects, funnel traps, threatened flora searches, habitat searches	30 March 2023	9am-3pm	16.7-25.2	7-11	4.2	n/a
Funnel traps	31 March 2023	9am-3pm	14.2-26.2	7-13	0	n/a
Frog transects, spotlighting, funnel traps, arboreal camera traps	3 April 2023	9am-3pm	16.1-24.7	9-15	10	n/a
Frog transects, spotlighting, funnel	4 April 2023	9am-3pm	17.7-24.3	Calm-9	14.4	n/a



Survey Undertaken (e.g. Method / Targeted Species)	Date	Time	Temperature (min. & max.)	Wind (Light, Mod... or km/hr)	Rainfall (mm)	Other Conditions Relevant to the Species
traps, arboreal camera traps, threatened flora searches, habitat searches						
Funnel traps, arboreal camera traps	5 April 2023	9am-3pm	17.7-22.8	7-26	3	n/a
Arboreal camera traps	6 April 2023	9am-3pm	17-24	7-9	17.6	n/a
Arboreal camera traps	7 April 2023	9am-3pm	17.7-23.3	19-30	0	n/a
Arboreal camera traps	8 April 2023	9am-3pm	16-24.9	9-15	0	n/a
Arboreal camera traps	9 April 2023	9am-3pm	15.2-22.7	11-15	0.2	n/a
Arboreal camera traps	10 April 2023	9am-3pm	11.9-20.4	13-9	0.2	n/a
Arboreal camera traps	11 April 2023	9am-3pm	11.2-21.4	13-22	0	n/a
Arboreal camera traps	12 April 2023	9am-3pm	14.4-data not available	9-2	0	n/a
Arboreal camera traps	13 April 2023	9am-3pm	Data not available	13-31	Data not available	n/a
Arboreal camera traps	14 April 2023	9am-3pm	Data not available	9-26	13.8	n/a
Arboreal camera traps	15 April 2023	9am-3pm	Data not available	4-28	4.4	n/a
Arboreal camera traps	16 April 2023	9am-3pm	Data not available	26-17	0	n/a
Arboreal camera traps	17 April 2023	9am-3pm	Data not available	11-20	0	n/a
Arboreal camera traps	18 April 2023	9am-3pm	Data not available	7 – 17	0	n/a
Arboreal camera traps	19 April 2023	9am-3pm	Data not available	Calm-17	0	n/a
Arboreal camera traps	20 April 2023	9am-3pm	Data not available	48-46	23.4	n/a
Arboreal camera traps	21 April 2023	9am-3pm	Data not available	11-24	5.2	n/a
Arboreal camera traps	22 April 2023	9am-3pm	Data not available	11-4	1.6	n/a



Survey Undertaken (e.g. Method / Targeted Species)	Date	Time	Temperature (min. & max.)	Wind (Light, Mod... or km/hr)	Rainfall (mm)	Other Conditions Relevant to the Species
Arboreal camera traps	23 April 2023	9am-3pm	Data not available	11-26	1.4	n/a
Arboreal camera traps	24 April 2023	9am-3pm	Data not available	20-22	0.8	n/a
Arboreal camera traps	25 April 2023	9am-3pm	Data not available	7-15	1	n/a
Arboreal camera traps	26 April 2023	9am-3pm	Data not available	9-15	0.4	n/a
Arboreal camera traps	27 April 2023	9am-3pm	Data not available	7-26	0	n/a
Arboreal camera traps, tadpole survey, Koala SAT survey	28 April 2023	9am-3pm	15.6-26.3	11-26	0	n/a
Arboreal camera traps	29 April 2023	9am-3pm	17.5-22.5	7	0	n/a
Arboreal camera traps	30 April 2023	9am-3pm	14.5-21.7	9-11	15.4	n/a
Arboreal camera traps	1 May 2023	9am-3pm	12.4-20.5	6-7	0.2	n/a
Targeted searches for threatened flora	6 November 2023	9am-3pm	16.1-22.2	9-13	12	n/a
Targeted searches for threatened flora	7 November 2023	9am-3pm	15-25.1	4-30	0	n/a
Targeted searches for threatened flora	20 November 2023	9am-3pm	18.8-25.2	2-35	0	n/a
Targeted searches for threatened flora	23 November 2023	9am-3pm	19-22.7	13-28	0	n/a
# Weather data sourced from ELA (2018) and BOM (2023). Temperature, wind and rainfall data sourced from Norah Heads AWS station (number 061366) located at Norah Head Lighthouse (i.e. approximately 10km southeast of the Subject Land).						

2.5.2 Weather Conditions for Frog Surveys

According to BOM (2023) there was a total of approximately 13mm of rainfall during and just prior to the initial March 2019 frog surveys (23-26 March 2019) and 3mm during and prior to the second March 2019 surveys (26-28 March 2019). In the two weeks leading up to the March 2019 surveys (11-24 March 2023) there was a total of 107mm rain with particularly heavy falls on 17 and 18 March 2019. Analysis of the 2018-2019 breeding season (September 2018-April 2019) shows that heavy falls also occurred at the following times:

- 32.6mm over 8 days from 1-8 September 2018
- 82.6mm over 5 days from 5-9 October 2018
- 134.4mm over 6 days from 11-16 October 2018



- 25.4mm over 4 days from 18-21 October 2018
- 92mm over 2 days from 28-29 November 2018
- 30.8mm over 5 days from 20-24 December 2018
- 61mm over 3 days from 6-8 January 2018
- 20.2mm over 2 days from 8-10 February 2019
- 29.8mm over 3 days from 19-21 February 2019
- 117.4mm over 14 days from 14-27 March 2019

According to BOM (2023), there was a total of approximately 30mm of rainfall during and just prior to the March 2023 frog surveys (27-30 March 2023) and 29.6mm during and just prior to the April 2023 frog surveys (1-4 April 2023). In the two weeks leading up to the 2023 frog surveys (13-26 March 2023) there was a total of 52mm rain with particularly heavy falls (approx. 20mm) on 14 and 24 March 2023. Analysis of the 2022-2023 breeding season (September 2022-April 2023) shows that moderate-heavy falls (>20mm) also occurred at the following times:

- 30.2mm over 5 days from 3-7 September 2022
- 37.8mm over 5 days from 22-26 September 2022
- 22mm over 5 days from 28 September to 2 October 2022
- 96.2mm over 6 days from 4-9 October 2022
- 43.6mm over 9 days from 17-25 October 2022
- 26.6mm on 14 October 2022
- 23.2mm over 5 days from 16-20 December 2022
- 25mm over 4 days from 5-8 January 2023
- 14mm over 4 days from 17-20 January 2023
- 28.2mm over two days from 30-31 January 2023

Based on the above rainfall data, it is likely that waterbodies were suitably flooded for all frog surveys.

2.6 Limitations

Given the duration and timing of the field surveys, it is likely that some of the species that may occur within the Subject Land (i.e. permanently, seasonally or transiently) were not detected. However, a detailed habitat assessment was conducted to inform the 'likelihood of occurrence' of threatened species known or predicted to occur within the locality. Limitations with respect to survey timing in relation to candidate species is covered in Section 5.3.

Surveys across the Subject Land were slightly limited by access due to areas of dense vegetation (thickets of impenetrable Lantana, Blackberry, Water Primrose, *Gleichenia dicarpa* and *Kunzea ambigua*) and areas of drainage; however, these access restrictions are not expected to affect the outcomes of this BDAR. These areas provide sub-optimal habitat for the threatened species targeted by this assessment.

The Koala BAM survey guidelines (DPE, 2022b) recommend 0mm rainfall within the 3 days prior to undertaking Koala SAT surveys. Given the project timeframe and the prevailing la Nina weather patterns it was difficult to time surveys with no rain in the days leading up to



the surveys. As such, Koala SAT surveys were undertaken following a very small amount of rainfall (approximately 2mm) in the day's prior. Given the low likelihood of Koala's occurring at the Subject Land and the very small amount of rainfall experienced these conditions are not likely to affect the outcomes with respect the overall assessment of the habitat quality of the Subject Land for the Koala.

Multiple threatened species of flora were surveyed simultaneously during targeted flora searches (see Section 2.3), and multiple species of fauna were also targeted during fauna surveys (see Section 2.4) but this is unlikely to affect the outcomes of the field work.

Site conditions (including the presence of threatened species of flora and fauna) may change after the date of this report. SLR does not accept responsibility arising from, or in connection with, any change to the site conditions. SLR is also not responsible for updating this report if the site conditions change.

The SLR ecology team operates under a Scientific Licence (licence number SL100176, issued under the BC Act), which authorises field staff to trap, capture, harm, hold and release plants and animals protected under the BC Act and *National Parks and Wildlife Act 1974* (NPW Act 1974), as well as Animal Research Authority (issued by the Secretary of the NSW Animal Care and Ethics Committee), which allows trapping of animals in NSW for the purposes of 'animal research'.

Soft copies of data files in relation to the SLR surveys have been filed on the SLR project server and printed copies will be held by the author.



3.0 Site Context

3.1 Assessment Area

The Assessment Area is the area of land within the 1500 metre buffer zone surrounding the Subject Land and is presented in Figure 2. The Assessment Area covers a total of 1,198 hectares (ha).

3.2 Landscape Features

Landscape features identified within the Subject Land and Assessment Area are shown on Figure 1 and Figure 2, respectively. A discussion of relevant landscape features is provided below.

3.2.1 IBRA Bioregions and IBRA Subregions

The Subject Land lies within the Sydney Basin IBRA Region on the central east coast of NSW. This region occupies 4.35% of NSW and extends from just north of Batemans Bay to Nelson Bay and almost as far west as Mudgee (NPWS, 2003). The region is dominated by temperate climate characterised by warm summers with no dry season.

The Subject Land lies wholly within the Wyong IBRA Subregion. This subregion is characterised by Triassic Hawkesbury Sandstone, Quaternary estuarine fills, and coastal barrier complexes. Soils are texture contrast soils on lithic sandstones and shales (NPWS, 2003), with loamy sands and alluvium along creeks, clean quartz sands on beaches/dunes, podzols on older hind dunes, and organic sands/mud in lagoons/swamps. According to NPWS (2003), the vegetation is typically composed of eucalypt forest and woodland on hills and slopes, swampy creek flats, barrier dunes of open heath and mangrove forest in entrances to coastal lakes.

3.2.2 Rivers, Streams, Estuaries and Wetlands

There are two main waterbodies within the Assessment Area, being Mannering Lake, which is located approximately 150 metres west of the Subject Land and Colongra Lake, which is situated approximately 700 metres east of the Subject Land. There is a network of rivers and streams within the Assessment Area that drains into these features.

The Subject Land lies within the Colongra/Tuggerah Lake catchment area. There is one mapped watercourse in the northwest corner of the Subject Land, and this feature is mapped by Water NSW (ESRI, 2023) as two small first order streams that feed into a second order stream. The second order stream is mapped as extending for 1.4 kilometres in a north and east direction from the Subject Land where it then drains into Colongra Lake, which feeds into Lake Munmorah, then Budgewoi Lake, then Tuggerah Lake before eventually discharging into the Tasman Sea/Pacific Ocean.

A review of the available wetland mapping on the SEED portal (DPE, 2023d) indicates that there are two identified NSW wetlands within the Assessment Area, being Mannering Lake and Colongra Lake as shown in Figure 2.

ELA (2018) ground-truthed the mapped watercourse on the Subject Land and determined that there were no formed bed or banks and as such determined that there was no watercourse as defined by the WM Act. The absence of a watercourse was also confirmed during the SLR 2023 habitat assessment surveys. Despite the absence of a formal watercourse the Subject Land contains one large dam with some aquatic vegetation and several small ponds that are associated with the Raw Challenge obstacles and are in a degraded condition.



3.2.3 Habitat Connectivity

A review of the available wildlife corridor mapping on the SEED portal (DPE, 2023d) indicates that no wildlife corridors are mapped in association with the Subject Land. An examination of aerial imagery and regional vegetation mapping (DPE, 2022a) for the Assessment Area suggest that the vegetation and habitats within the Subject Land are generally connected to vegetation and habitats in the broader landscape.

The central band of vegetation through the Subject Land could in theory provide some east-west linkage of habitats, but this is somewhat impeded by the Pacific Highway, which represents a 40-metre-wide hostile barrier to fauna movement. The patch of dry sclerophyll forest within the centre of the Subject Land is largely adjoined by wet swampy forests of the Colongra Lake system to the east and is therefore somewhat isolated from similar dry sclerophyll forest habitats. It is therefore unlikely that the patch of dry sclerophyll forest within the centre of the Subject Land provides important movement corridors for threatened species across their range. At best this area could provide 'stepping-stone habitat' for mobile species, such as the Glossy Black Cockatoo.

The Englobo Subdivision does not involve the construction of wind turbines therefore there are no relevant impacts to flyways for migratory species that pass over the Subject Land.

3.2.4 Karst, Caves, Crevices, Cliffs, Rocks or Other Geological Features of Significance

The Subject Land and Assessment Area do not contain any karst, caves, crevices, cliffs, rocks and areas of geological significance. This has been determined through examining karst, cave, cliff and geological mapping available on the SEED portal (DPE, 2023d), as well as review of lidar data and aerial imagery to detect potential cliff lines and rocky areas.

3.2.5 Areas of Outstanding Biodiversity Value

There are no areas of outstanding biodiversity value, as identified under the BC Act, within the Subject Land and Assessment Area.

3.2.6 NSW (Mitchell) Landscape

The Subject Land occurs predominately within the Gosford-Cooranbong Coastal Slopes Mitchell landscape but there is also a narrow band of Sydney-Newcastle Coastal Alluvial Plains along the eastern boundary.

The Gosford-Cooranbong Coastal Slopes Mitchell landscape is described by DECC (2002) as coastal fall of the Sydney Basin, rolling hills and sandstone plateau outliers of Triassic Narrabeen sandstones, extensive rock outcrop and low cliffs along ridge margins. General elevation ranges from 0 to 75m. Soils are texture-contrast soils on lithic sandstones and shales with loamy sand alluvium along creeks and organic sand and mud in lagoons and swamps. Vegetation on hills and slopes is typically composed of open forest and woodland of *Angophora costata*, *Corymbia gummifera*, *Eucalyptus capitellata*, *E. piperita*, *C. maculata*, *E. carnea*, *E. siderophloia* and *E. punctata*. Swampy creek flats contain *Melaleuca styphelioides* and other shrubs with *Eucalyptus robusta*, *Casuarina glauca*, sedges and *Phragmites australis*.

The Sydney-Newcastle Coastal Alluvial Plains Mitchell landscape is described by DECC (2002) as undulating plains and low rises on Quaternary sand or Permian/Triassic sandstone or shale with swampy valley floors. General elevation is 0 to 80 metres, with local relief of 20 metres. Soils are siliceous uniform sands, patches of deep podsol and yellow or brown texture-contrast soils on bedrock. Vegetation varies with soil and drainage. Sands and



podsoils are characterised by *Banksia aemula*, *Corymbia gummifera* and *Angophora costata*. Areas of bedrock contain *Allocasuarina torulosa*, *Eucalyptus punctata*, *E. tereticornis*, and *E. haemastoma*, with a shrubby understorey. Swamps are typically surrounded by *Melaleuca quinquenervia*, *Banksia integrifolia*, *Casuarina glauca* and *E. robusta*, with *Eleocharis* sp. and *Gahnia* sp. Open water supports a variety of aquatic plants including *Phragmites australis*, *Potamogeton tricarinatus*, *Ludwigia peploides*, *Lemna* sp., *Cotula coronopifolia* and *Azolla filiculoides*.

3.2.7 Additional Landscape Features Identified in SEARs

As the Englobo Subdivision is not a state significant development there are no State Environmental Assessment Requirements (SEARs) issued for the Englobo Subdivision.

3.2.8 Soil Hazard Features

As the Englobo Subdivision is not a vegetation clearing proposal (i.e. a development that requires approval from the Native Vegetation Panel under Part 5A of the LLS Act, or the Vegetation SEPP), soil hazard features are not relevant.

3.3 Native Vegetation Cover

Native vegetation cover for the Assessment Area has been mapped using regional vegetation mapping (DPE, 2022a) and review of aerial imagery (Nearmap, 2023). There are no areas of vegetation that have been excluded from the assessment.

Table 6 summarises the extent of native vegetation cover within the Assessment Area. Figure 2 shows native vegetation cover within the Assessment Area.

Table 6: Native Vegetation Cover in the Assessment Area

Assessment Area (ha)	1,198
Total area of native vegetation cover (ha)	509
Percentage of native vegetation cover (%)	43
Class (0-10, >10-30, >30-70 or >70%)	>30-70



4.0 Native Vegetation, Threatened Ecological Communities and Vegetation Integrity

4.1 Native Vegetation Extent

The Subject Land is approximately 34 hectares, and the native vegetation extent within the Subject Land is approximately 11 hectares or 30 percent. The native vegetation extent is mapped in Figure 7.

4.1.1 Changes to the Mapped Native Vegetation Extent

Differences between the actual native vegetation extent and vegetation extent shown on aerial imagery (Nearmap, October 2023) used in figures for this BDAR are due to the presence of exotic vegetation (areas of planted Radiata Pine, other weeds and exotic lawn). This is supported by field reconnaissance by ELA in 2018 and SLR in 2023. One small patch of regrowth native vegetation in the Raw Challenge portion of the Subject Land was cleared during the SLR survey work in 2023. The native vegetation extent is mapped in Figure 7.

4.1.2 Areas That Are Not Native Vegetation

Areas that are not native vegetation are indicated on Figure 7 and include:

- a patch of planted exotic Radiata Pine (see Photo 1) and thickets of exotic vegetation (such as Lantana)
- areas of cleared and maintained open exotic lawn associated with the Doyalson RSL oval (see Photo 2)
- areas of cleared and maintained open exotic lawn associated with the Raw Challenge obstacle course (see Photo 3)

These areas were reported by ELA (2018), have been excluded by regional mapping (DPE, 2022a) and have been verified by SLR in 2023.

Photo 1: Planted Exotic Pines



Photo 2: Cleared Open Exotic Lawn of the Doyalson RSL Oval



Photo 3: Cleared Open Exotic Lawn Across the Raw Challenge Obstacle Course



4.2 Plant Community Types

4.2.1 Overview

Vegetation within the Subject Land has been assessed as aligning with the BioNet Vegetation Classification PCTs identified within Table 7 and their extent is shown in Figure 8. Detailed descriptions of each PCT are provided in the following subsections.

Table 7: PCTs Identified within the Subject Land

PCT ID	PCT Name	Subject Land Area (ha)
1636	Scribbly Gum - Red Bloodwood – <i>Angophora inopina</i> heathy woodland on lowlands of the Central Coast	6.77
1638	Smooth-barked Apple - Red Bloodwood - Scribbly Gum grass - shrub woodland on lowlands of the Central Coast	2.26
1717	Broad-leaved Paperbark - Swamp Mahogany - Swamp Oak - Saw Sedge swamp forest of the Central Coast and Lower North Coast	1.84
Total area		10.87

4.2.2 PCT 1636: Scribbly Gum – Red Bloodwood – *Angophora inopina* Heathy Woodland on Lowlands of the Central Coast

4.2.2.1 PCT Overview

Table 8 provides an overview of PCT 1636 based on data contained within the BioNet Vegetation Classification, and the extent of this PCT within the Subject Land.

Table 8: PCT 1636: Scribbly Gum – Red Bloodwood – *Angophora inopina* Heathy Woodland on Lowlands of the Central Coast

PCT ID	1636
PCT Name	Scribbly Gum – Red Bloodwood – <i>Angophora inopina</i> heathy woodland on lowlands of the Central Coast
Vegetation Formation	Dry Sclerophyll Forests (Shrubby sub-formation)
Vegetation Class	Sydney Coastal Dry Sclerophyll Forests
Per cent Cleared Value (%)	58
Extent with Subject Land (ha)	6.77

PCT 1636 occurs as variously disturbed patches across the Subject Land, including areas subject to a history of clearing, under-scrubbing, weed invasion, and/or ongoing management. The vegetation is typically characterised by a canopy of *Eucalyptus racemosa* (syn *Eucalyptus haemastoma*), sometimes with *Corymbia gummifera* and dense areas of *Allocasuarina littoralis*.

In stands where an understorey is present, native shrubs include *Banksia oblongifolia*, *Hakea dactyloides*, *Lambertia formosa*, *Leptospermum trinervium*, *Xanthorrhoea latifolia* and *Petrophile pulchella*. There is usually a dense ground layer of sedges, grasses, and forbs, such as *Cyathochaeta diandra*, *Entolasia stricta*, *Lomandra obliqua* and *Patersonia sericea*.



Open managed areas contain a low grass cover including introduced lawn species and a diversity of grasses and forbs such as *Microlaena stipoides*, *Centella asiatica* and *Dichondra repens*. Some areas of regrowth occur as dense patches of *Kunzea ambigua*, with scattered trees and other shrubs.

Problematic weed species include *Cinnamomum camphora*, *Andropogon virginicus*, *Axonopus fissifolius*, *Pinus radiata* and *Lantana camara*. This vegetation is positioned in slightly more elevated portions of the Subject Land where the soils are sandy and grades into the swamp sclerophyll vegetation to the east (see Photo 4).

Photo 4: PCT 1636: Scribbly Gum – Red Bloodwood – *Angophora inopina* Heathy Woodland on Lowlands of the Central Coast



4.2.2.2 Condition States

Despite minor variations in condition overall the PCT 1636 vegetation is mapped as a moderate-good vegetation condition state.

4.2.2.3 Justification of PCT Selection

The evidence-based justification for PCT selection is provided in Table 9.



Table 9: PCT 1636 Selection

Search Term	Selection
IBRA Bioregion	Sydney Basin
IBRA Sub-region	Wyong
Vegetation Formation	Dry Sclerophyll Forests (Shrubby sub-formation)
Vegetation Class	Sydney Coastal Dry Sclerophyll Forests
Upper Stratum	<i>Eucalyptus haemastoma</i> (syn. <i>Eucalyptus racemosa</i>)
Short list	Returned a list of six PCTs: 1083, 1636, 1642, 1643, 1783, 1786
Selection	PCT 1083 was discarded due to landscape position; it occurs on coastal sandstone plateaux, which is typically flatter and higher ground than the Subject Land. 1642 was also discarded due to landscape positioning; it occurs the Central Coast hinterlands at elevations up to 350m. 1643 was discarded as it is typically characterised by a canopy of <i>Corymbia gummifera</i> and <i>Angophora costata</i> occurring on coastal ranges. 1783 was discarded as it includes <i>Banksia serrata</i> in the canopy and occurs in poor soils on crests, ridges and exposed gully slopes at elevations between 200 and 500 metres above sea level. 1786 was discarded as it occurs on steep sandstone slopes that overlook the Hawkesbury River and includes <i>Angophora costata</i>, <i>Eucalyptus umbra</i>, <i>Eucalyptus punctata</i>, <i>Corymbia eximia</i>. 1636 is the best fit PCT, being a eucalypt dominated woodland with a shrubby mid-stratum and a graminoid ground cover. It occurs on coastal lowlands from northern Tuggerah Lake to the northern end of Lake Macquarie. The substrate is sandstone with moist sandy soils and elevation is usually under 100m.

4.2.2.4 Alignment with TECs

PCT 1636 does not align with a TEC within the BioNet Vegetation Classification.

4.2.2.5 Alignment with EPBC Act Listed ECs

PCT 1636 does not align with an EC listed under the EPBC Act within the BioNet Vegetation Classification.

4.2.3 PCT 1638: Smooth-Barked Apple – Red Bloodwood – Scribbly Gum Grass – Shrub Woodland on Lowlands of the Central Coast

4.2.3.1 PCT Overview

Table 10 provides an overview of PCT 1638 based on data contained within the BioNet Vegetation Classification, and the extent of this PCT within the Subject Land.



Table 10: PCT 1638: Smooth-Barked Apple – Red Bloodwood – Scribbly Gum Grass – Shrub Woodland on Lowlands of the Central Coast

PCT ID	1638
PCT Name	Smooth-barked Apple - Red Bloodwood - Scribbly Gum grass - shrub woodland on lowlands of the Central Coast
Vegetation Formation	Dry Sclerophyll Forests (Shrubby sub-formation)
Vegetation Class	Sydney Coastal Dry Sclerophyll Forests
Per cent Cleared Value (%)	50
Extent within Subject Land (ha)	2.26

A dense canopy of *Allocasuarina littoralis*, with a low occurrence of *Glochidion ferdinandi* and *Parsonsia straminea*, this PCT is positioned on lower slopes and is influenced by wetter conditions and sandy clay soils. The area appears to have been historically cleared and does not contain large trees. Dominant species in the understorey include *Lambertia formosa*, *Banksia oblongifolia*, *Xanthorrhoea latifolia*, *Cyathochaeta diandra* and *Entolasia stricta*. Problematic weed species occur in low abundance and cover and include *Andropogon virginicus*. The typical nature of the PCT 1638 vegetation is shown in Photo 5.

Photo 5: PCT 1638: Smooth-Barked Apple – Red Bloodwood – Scribbly Gum Grass – Shrub Woodland on Lowlands of the Central Coast



4.2.3.2 Condition States

Despite minor variations in condition overall, the PCT 1638 vegetation across the Subject Land is mapped as a moderate-good vegetation condition state.



4.2.3.3 Justification of PCT Selection

The evidence-based justification for PCT selection is provided in Table 11 .

Table 11: PCT 1717 Selection

Search Term	Selection
IBRA Bioregion	Sydney Basin
IBRA Sub-region	Wyong
Vegetation Formation	Dry Sclerophyll Forests (Shrubby sub-formation)
Vegetation Class	Sydney Coastal Dry Sclerophyll Forests
Middle Stratum	<i>Allocasuarina littoralis</i>
Short list	Returned a list of four PCTs: 1181, 1619, 1638, 1776
Selection	1181 can be discarded as it is a hinterland sandstone gully forest occurring around the Cumberland Plain in Sydney. The vegetation lacks some key diagnostic species of 1619 in particular trees and grasses. Species lacking include <i>Angophora costata</i>, <i>Corymbia gummiifera</i>, <i>Eucalyptus capitellata</i>, <i>Banksia spinulosa</i>, <i>Acacia myrtifolia</i>, <i>Persoonia linearis</i>, <i>Themeda triandra</i>, <i>Panicum simile</i>, <i>Aristida vagans</i>, <i>Lepidosperma laterale</i>, <i>Lomandra obliqua</i> and <i>Goodenia heterophylla</i>. 1776 is a tall open eucalypt forest that occurs on upper slopes and dry gullies of Sydney urban areas, or hinterland parts of the Central Coast up to 200m. 1638 is the best fit PCT occurring on flats, rises and low hills below 100m elevation and within the area bounded by Norah Head and Catherine Hill Bay in the east, extending to about the Pacific Highway in the west. Matching key diagnostic species include <i>Allocasuarina littoralis</i>, <i>Lambertia formosa</i>, <i>Lepyrodis scariosa</i> and <i>Entolasia stricta</i>.

4.2.3.4 Alignment with TECs

PCT 1638 does not align with a TEC within the BioNet Vegetation Classification.

4.2.3.5 Alignment with EPBC Act Listed ECs

PCT 1638 does not align with an EC listed under the EPBC Act within the BioNet Vegetation Classification.

4.2.4 PCT 1717: Broad-Leaved Paperbark – Swamp Mahogany – Swamp Oak – Saw Sedge Swamp Forest of the Central Coast and Lower North Coast

4.2.4.1 PCT Overview

Table 12 provides an overview of PCT 1717 based on data contained within the BioNet Vegetation Classification, and the extent of this PCT within the Subject Land.



Table 12: PCT 1717: Broad-Leaved Paperbark – Swamp Mahogany – Swamp Oak – Saw Sedge Swamp Forest of the Central Coast and Lower North Coast

PCT ID	PCT 1717
PCT Name	Broad-leaved Paperbark - Swamp Mahogany - Swamp Oak - Saw Sedge swamp forest of the Central Coast and Lower North Coast
Vegetation Formation	Forested Wetlands
Vegetation Class	Coastal Swamp Forests
Per cent Cleared Value (%)	68
Extent within Subject Land (ha)	1.84

PCT 1717 is concentrated along the lower-lying eastern edge of the Subject Land where surface water drainage slows, and soils are sandy loams. Much of this vegetation has been historically cleared, with areas of suggested filling or quarrying activities (GHD, 2018, Figure 2, Appendix B). The vegetation has minor variations from north to south including an area in the northeast with dense tall mid-stratum of *Kunzea ambigua*, some ecotonal grading of PCT 1638 in the centre, and in the southeast of the site there are two dense impenetrable areas of vegetation, one being a thicket of tall *Gleichenia dicarpa* and the other a thicket of *Ludwigia peruviana*.

This vegetation is typically dominated by *Melaleuca quinquenervia*, *Casuarina glauca*, *Parsonia straminea*, *Glochidion ferdinandi*, *Gahnia clarkei*, *Calochlaena dubia*, *Cynodon dactylon*, *Oplismenus imbecillis*, *Entolasia marginata*, *Zoysia macrantha*, *Viola hederacea*, as well as ecotonal dry sclerophyll species such as *Allocasuarina littoralis* and *Kunzea ambigua*. Problematic weeds are common and include *Pinus radiata*, *Lantana camara*, *Ligustrum sinense*, *Rubus anglocandicans* and *Ludwigia peruviana*.

Photo 6: PCT 1717: Broad-Leaved Paperbark – Swamp Mahogany – Swamp Oak – Saw Sedge Swamp Forest of the Central Coast and Lower North Coast



4.2.4.2 Condition States

Despite minor variations in condition, overall PCT 1717 vegetation is mapped as a moderate-good vegetation condition state.

4.2.4.3 Justification of PCT Selection

The evidence-based justification for PCT selection is provided in Table 13.

Table 13: PCT 1717 Selection

Search Term	Selection
IBRA Bioregion	Sydney Basin
IBRA Sub-region	Wyong
Vegetation Formation	Forested Wetlands
Vegetation Class	Coastal Swamp Forests
Middle Stratum	<i>Melaleuca quinquenervia</i> and <i>Casuarina glauca</i>
Short list	Returned a list of three PCTs: 1232, 1717, 1730
Selection	PCT 1232 was discarded as it occurs on sandy saline sediments fringing the high tide mark in coastal estuaries below 5m. The vegetation on the Subject Land lacked many of the key diagnostic species of PCT 1730, including <i>Melaleuca ericifolia</i>, <i>Melaleuca linariifolia</i>, <i>Acacia longifolia</i>, <i>Baumea juncea</i>, <i>Baumea rubiginosa</i> and <i>Juncus kraussii</i>. PCT 1717 is the closest matching PCT with the following key diagnostic species <i>Casuarina glauca</i>, <i>Melaleuca quinquenervia</i>, <i>Livistona australis</i>, <i>Glochidion ferdinandi</i>, <i>Entolasia marginata</i>, <i>Gahnia clarkei</i> and <i>Dianella caerulea</i>.

4.2.4.4 Alignment with TECs

PCT 1717 is associated with a TEC within the BioNet Vegetation Classification, being Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions. This vegetation was identified based on the assemblage of species recorded and the landscape position of the Subject Land.

4.2.4.5 Alignment with EPBC Act Listed ECs

PCT 1717 is associated with an EC listed under the EPBC Act, being Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland. This EC was gazetted on 8 December 2021.

The ecological community is defined as patches of native vegetation that meet the following key diagnostic characteristics:

- Occurs on the mainland and islands near to the coast (within 20 km) from South East Queensland to south-eastern NSW specifically within these IBRA Bioregions: South Eastern Queensland (SEQ); NSW North Coast (NNC); Sydney Basin (SYB) and the Bateman sub-region of the South East Corner (SEC).
- Occurs in coastal catchments typically below 20m ASL, but occasionally up to 220m ASL.
- Occurs on hydric soils with inundation patterns ranging from intermittent to episodic.



- The vegetation structure varies from tall closed to open forest to woodland, to dense (closed) shrubland or scrub forest. Minimum crown cover (see footnote 5, p. 4) is at least 10%, but it is more typically in the range 50% to 70%.
- From South East Queensland to the Sydney Basin Bioregion, the canopy is typically dominated or co-dominated by *Melaleuca quinquenervia* and/or *Eucalyptus robusta*. In some areas, the canopy may be locally dominated by other *Melaleuca* species including *M. dealbata* (SEQ bioregion) (rarely); *M. biconvexa* (mid-NSW coast to south of Sydney); *M. decora* (north of Shoalhaven), frequently with *Parsonsia straminea* climbing on the trunks of canopy species. In the SEC bioregion, *M. ericifolia* may occur as a dominant canopy or sub-canopy species.
- Other tree species may occur in the canopy (or sub-canopy) in some areas, but they are not dominant across a patch, including *Casuarina glauca*, *Banksia* spp., *Callistemon salignus*, *Corymbia intermedia* (Pink Bloodwood), *E. tereticornis*, (Forest Red Gum/Queensland Blue Gum), *E. longifolia* (Woollybutt), *E. botryoides* (Southern Mahogany/Bangalay), *E. ovata* (Swamp Gum), *Livistona australis* and/or *Lophostemon* spp.
- The understorey typically includes a variable ground layer, depending on the canopy cover and inundation rate/period. Tall sedges (typically *Gahnia* spp.) and/or ferns often dominate the ground layer, mixed with graminoids and other herbs, especially *Imperata cylindrica* (Blady Grass).
- While they can occur regularly in the ground layer, the ecological community is not present if halophytic species, more typically associated with estuarine/saltmarsh areas, dominate the ground layer of a patch, for example, *Appium prostratum*, *Atriplex cinerea*, *Chenopodium glaucum*, *Rhagodia candolleaus* and *Samolus repens*.

The vegetation within the Subject Land meets these criteria and as such is considered to represent the Swamp Sclerophyll Forest EC listed under the EPBC Act.

4.3 Threatened Ecological Communities

Any TECs and where relevant, ECs identified within the Subject Land are listed in Table 14 and their extent is shown on Figure 9.

Table 14: TECs within the Subject Land

TEC Name	Profile ID (from TBDC)	BC Act Status	EPBC Act Status	Associated Vegetation Zones within the Subject Land	Area within Subject Land (ha)
Swamp Sclerophyll Forest	10786	Endangered	Endangered	PCT 1717	1.84

4.4 Vegetation Zones

Section 4.3.1 of BAM 2020 describes mapping of vegetation condition under “broad condition states” and suggests the following approach: “Disturbance to growth form groups for tree, shrub and ground cover or extent of exotics (or combinations of these) can be used to identify areas of similar condition”. Due to the mosaic of conditions across the Subject Land patches were grouped into a broad condition state of “moderate-good”. The moderate-good condition class typically incorporates areas with canopy or with sparse canopy, some



areas of dense shrubs or more open shrub layers including under-scrubbed patches, and some areas with patches of weedy understorey and ground layers.

As defined in Section 4.3.2 of BAM 2020 “A patch is an area of native vegetation that occurs on the subject land and includes native vegetation that has a gap of less than 100 m from the next area of native vegetation (or ≤ 30 m for non-woody ecosystems).” Patch size area was calculated for each vegetation zone and assigned to a class, being < 5 ha, 5-24 ha, 25-100 ha or ≥ 100 ha.

Refer to Table 15 and Figure 10 for vegetation zones and patch size assessments.

Table 15: Vegetation Zones and Patch Sizes

Veg Zone ID	PCT ID Number and Name	Condition / Other Defining Feature	Area (ha) (in Subject Land and Development Footprint)	Patch Size Class (< 5 ha, 5-24 ha, 25-100 ha or ≥ 100 ha)	No. VI Plots Needed	No. VI Plots Done	No. VI Plots Used	Plot IDs of VI Plots Used
1636_ Mod-good	PCT 1636 Scribbly Gum - Red Bloodwood – <i>Angophora inopina</i> heathy woodland on lowlands of the Central Coast	Disturbed with some patches under-scrubbed	6.77 (6.13 impacted)	≥ 100 ha	3	3	3	BAM01, BAM02 and BAM04
1638_ Mod-good	PCT 1638 Smooth-barked Apple - Red Bloodwood - Scribbly Gum grass - shrub woodland on lowlands of the Central Coast	Disturbed	2.26 (1.96 impacted)	≥ 100 ha	1	1	1	BAM03
1717_ Mod-good	PCT 1717 Broad-leaved Paperbark - Swamp Mahogany - Swamp Oak - Saw Sedge swamp forest of the Central Coast and Lower North Coast	Disturbed	1.84 (0.32 impacted)	≥ 100 ha	1	2	2	BAM06 and BAM07



4.5 Vegetation Integrity (Vegetation Condition)

4.5.1 Vegetation Integrity Survey Plots

The number of BAM plots sampled in each vegetation zone was based on the minimum number of plots required for the area of land subject to development in accordance with Table 3 of BAM 2020, being: <2ha (1 plot); >2-5ha (2 plots); >5-20ha (3 plots); >20-50ha (4 plots); >50-100ha (5 plots); >100-250ha (6 plots); >250-1000ha (7 plots or more); >1000 (8 plots or more).

4.5.2 Scores

The vegetation integrity scores for each vegetation zone are presented in Table 16.

Table 16: Vegetation Integrity Scores

Vegetation Zone ID	Composition Condition Score	Structure Condition Score	Function Condition Score (where relevant)	Vegetation Integrity Score	Hollow Bearing Trees Present?
1636_Mod-good	49.4	51.4	42.9	47.7	Yes
1638_Mod-good	16.9	45.4	31.2	28.8	Yes
1717_Mod-good	35.2	24.4	57.8	36.7	No

4.5.3 Use of Benchmark Data

Vegetation benchmarks used in the calculation of the Vegetation Integrity (VI) score were not amended and were adopted as per the BAM Calculator at the time of the assessment.



5.0 Habitat Suitability for Threatened Species

5.1 Identification of Threatened Species for Assessment

5.1.1 Ecosystem Credit Species

Table 17 lists all ecosystem credit species likely to occur on or use the Subject Land, and:

- Identifies the source of information (e.g. automatically populated in BAM-C, recently listed under the BC Act and not yet added to the TBDC, previous ecological reports)
- Justifies species added to the BAM-C auto-populated list or removed from the list in accordance with BAM Subsections 5.2.1 and 5.2.2
- Includes the sensitivity to gain class (from the TBDC)



Table 17: Predicted Ecosystem Credit Species

Common Name	Scientific Name	Listing Status		Dual Credit Sp (Yes/ No)	Source (BAM-C/ TBDC/ Previous Survey/ Current Survey)	Species Retained? (Yes/ No/ Partial)	Reason for Exclusion (Geographic Limitations/ Habitat Constraint/ Vagrant)	Veg Zone ID Species Retained within including PCT ID	Sensitivity to Gain Class (Very High/ High/ Moderate/ Low)
		BC Act	EPBC Act						
Regent Honeyeater	<i>Anthochaera phrygia</i>	CE	CE	Yes	BAM-C	Yes	n/a	PCT 1717	High
Gang-gang Cockatoo	<i>Callocephalon fimbriatum</i>	E	E	Yes	BAM-C	Yes	n/a	PCT 1636, PCT 1717	Moderate
Southern Glossy Black-Cockatoo	<i>Calyptorhynchus lathami lathami</i>	V	V	Yes	BAM-C/ Previous survey / Current survey	Yes	n/a	PCT 1636, PCT 1717	High
Speckled Warbler	<i>Chthonicola sagittata</i>	V	-	No	BAM-C	Yes	n/a	PCT 1636, PCT 1638	High
Brown Treecreeper (eastern subspecies)	<i>Climacteris picumnus victoriae</i>	V	V	No	BAM-C	Yes	n/a	PCT 1636, PCT 1638	High
Varied Sittella	<i>Daphoenositta chrysoptera</i>	V	-	No	BAM-C	Yes	n/a	PCT 1636, PCT 1638, PCT 1717	Moderate
Spotted-tailed Quoll	<i>Dasyurus maculatus</i>	V	E	No	BAM-C	Yes	n/a	PCT 1636, PCT 1638, PCT 1717	High
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>	E	-	No	BAM-C	No	Habitat constraint	n/a (PCT 1717)	n/a (Moderate)
Eastern False Pipistrelle	<i>Falsistrellus tasmaniensis</i>	V	-	No	BAM-C	Yes	n/a	PCT 1636, PCT 1717	High



Common Name	Scientific Name	Listing Status		Dual Credit Sp (Yes/ No)	Source (BAM-C/ TBDC/ Previous Survey/ Current Survey)	Species Retained? (Yes/ No/ Partial)	Reason for Exclusion (Geographic Limitations/ Habitat Constraint/ Vagrant)	Veg Zone ID Species Retained within including PCT ID	Sensitivity to Gain Class (Very High/ High/ Moderate/ Low)
		BC Act	EPBC Act						
Little Lorikeet	<i>Glossopsitta pusilla</i>	V	-	No	BAM-C	Yes	n/a	PCT 1636, PCT 1638, PCT 1717	High
Painted Honeyeater	<i>Grantiella picta</i>	V	V	No	BAM-C	Yes	n/a	PCT 1636	Moderate
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	V	-	Yes	BAM-C	Yes	n/a	PCT 1636, PCT 1638, PCT 1717	High
Little Eagle	<i>Hieraaetus morphnoides</i>	V	-	Yes	BAM-C	Yes	n/a	PCT 1636, PCT 1717	Moderate
White-throated Needletail	<i>Hirundapus caudacutus</i>	V	V	No	BAM-C	Yes	n/a	PCT 1636, PCT 1638, PCT 1717	High
Black Bittern	<i>Ixobrychus flavicollis</i>	V	-	No	BAM-C	Yes	n/a	PCT 1717	Moderate
Swift Parrot	<i>Lathamus discolor</i>	E	CE	Yes	BAM-C	Yes	n/a	PCT 1636, PCT 1717	Moderate
Square-tailed Kite	<i>Lophoictinia isura</i>	V	-	Yes	BAM-C	Yes	n/a	PCT 1636	Moderate
Black-chinned Honeyeater (eastern subspecies)	<i>Melithreptus gularis gularis</i>	V	-	No	BAM-C	Yes	n/a	PCT 1636	Moderate
Eastern Coastal Free-tailed Bat	<i>Micronomus norfolkensis</i>	V	-	No	BAM-C	Yes	n/a	PCT 1636, PCT 1717	High
Little Bent-winged Bat	<i>Miniopterus australis</i>	V	-	Yes	BAM-C	Yes	n/a	PCT 1636, PCT 1717	High



Common Name	Scientific Name	Listing Status		Dual Credit Sp (Yes/ No)	Source (BAM-C/ TBDC/ Previous Survey/ Current Survey)	Species Retained? (Yes/ No/ Partial)	Reason for Exclusion (Geographic Limitations/ Habitat Constraint/ Vagrant)	Veg Zone ID Species Retained within including PCT ID	Sensitivity to Gain Class (Very High/ High/ Moderate/ Low)
		BC Act	EPBC Act						
Large Bent-winged Bat	<i>Miniopterus orianae oceanensis</i>	V	-	Yes	BAM-C	Yes	n/a	PCT 1636, PCT 1717	High
Turquoise Parrot	<i>Neophema pulchella</i>	V	-	No	BAM-C	Yes	n/a	PCT 1636, PCT 1638	High
Barking Owl	<i>Ninox connivens</i>	V	-	Yes	BAM-C	Yes	n/a	PCT 1636, PCT 1638, PCT 1717	High
Powerful Owl	<i>Ninox strenua</i>	V	-	Yes	BAM-C	Yes	n/a	PCT 1636	High
Eastern Osprey	<i>Pandion cristatus</i>	V	-	Yes	BAM-C	Yes	n/a	PCT 1636, PCT 1717	Moderate
Yellow-bellied Glider	<i>Petaurus australis</i>	V	V	No	BAM-C	Yes	n/a	PCT 1636, PCT 1717	High
Scarlet Robin	<i>Petroica boodang</i>	V	-	No	BAM-C	Yes	n/a	PCT 1636	Moderate
Golden-tipped Bat	<i>Phoniscus papuensis</i>	V	-	No	BAM-C	Yes	n/a	PCT 1636, PCT 1717	High
Grey-crowned Babbler (eastern subspecies)	<i>Pomatostomus temporalis temporalis</i>	V	-	No	BAM-C	Yes	n/a	PCT 1636	Moderate
Eastern Chestnut Mouse	<i>Pseudomys gracilicaudatus</i>	V	-	No	BAM-C	Yes	n/a	PCT 1636, PCT 1717	High
Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	V	V	Yes	BAM-C	Yes	n/a	PCT 1636, PCT 1717	High
Yellow-bellied Sheath-tail bat	<i>Saccolaimus flaviventris</i>	V	-	No	BAM-C	Yes	n/a	PCT 1636, PCT 1717	High



Common Name	Scientific Name	Listing Status		Dual Credit Sp (Yes/ No)	Source (BAM-C/ TBDC/ Previous Survey/ Current Survey)	Species Retained? (Yes/ No/ Partial)	Reason for Exclusion (Geographic Limitations/ Habitat Constraint/ Vagrant)	Veg Zone ID Species Retained within including PCT ID	Sensitivity to Gain Class (Very High/ High/ Moderate/ Low)
		BC Act	EPBC Act						
Greater Broad-nosed Bat	<i>Scoteanax rueppellii</i>	V	-	No	BAM-C	Yes	n/a	PCT 1636, PCT 1717	High
Masked Owl	<i>Tyto novaehollandiae</i>	V	-	Yes	BAM-C	Yes	n/a		High
Listing status: V=vulnerable, E=endangered, CE=critically endangered									



The following ecosystem credit species have been excluded based on the TBDC habitat constraints at the time of the assessment:

- Black-necked Stork *Ephippiorhynchus asiaticus* has the following habitat constraints which are not met due to the absence of a permanent waterbody or wetland on the Subject Land (the small farm dam and obstacle ponds are not considered to represent a suitable wetland) “*Swamps: Shallow, open freshwater or saline wetlands or shallow edges of deeper wetlands within 300m of these swamps*” and “*Waterbodies: Shallow lakes, lake margins and estuaries within 300m of these waterbodies*”

As all plant community types (PCTs) have been grouped into the same vegetation zones, none of the predicted ecosystem credit species have been assessed differently in different vegetation zones.

5.1.2 Species Credit Species

All species credit species (e.g. those that are automatically populated in BAM-C, recently listed under the BC Act or not yet added to the TBDC) and the relevant source of information (e.g. previous ecological reports, environmental impact statements, scientific literature, Council reports, site survey etc.) are listed in Table 18 and Table 19. These tables also identify and justify species added to the BAM-C auto-populated list or removed from the list.



Table 18: Candidate Flora (Species Credit) Species

Common Name	Scientific Name	Listing Status		Sources (BAM-C/ TBDC/ Previous Survey/ Current Survey)	Species Retained? (Yes/ No / Partial)	Reason for Exclusion (Geographic Limitations/ Habitat Constraints/ Microhabitats)	Vege Zone ID Species Retained within (including PCT ID)
		BC Act	EPBC Act				
Bynoe's Wattle	<i>Acacia bynoeana</i>	E	V	BAM-C	Yes	n/a	PCT 1636
Charmhaven Apple	<i>Angophora inopina</i>	V	V	BAM-C	Yes	n/a	PCT 1636, PCT 1717
Trailing Woodruff	<i>Asperula asthenes</i>	V	V	BAM-C	Yes	n/a	PCT 1636, PCT 1717
Thick-leaf Star-hair	<i>Astrotricha crassifolia</i>	V	V	BAM-C	Yes	n/a	PCT 1636
Netted Bottle Brush	<i>Callistemon linearifolius</i>	V	-	BAM-C	Yes	n/a	PCT 1636
n/a	<i>Corunastylis</i> sp. Charmhaven (NSW896673)	CE	CE	BAM-C	Yes	n/a	PCT 1636
Leafless Tongue Orchid	<i>Cryptostylis hunteriana</i>	V	V	BAM-C	Yes	n/a	PCT 1636, PCT 1638
Rough Doubletail	<i>Diuris praecox</i>	V	V	BAM-C	Yes	n/a	PCT 1636, PCT 1717
Camfield's Stringybark	<i>Eucalyptus camfieldii</i>	V	V	BAM-C	Yes	n/a	PCT 1636
n/a	<i>Eucalyptus parramattensis</i> subsp. <i>decadens</i>	V	V	BAM-C	Yes	n/a	PCT 1717
<i>Eucalyptus parramattensis</i> C. Hall. subsp. <i>parramattensis</i> in Wyong and Lake Macquarie Local Government Areas (LGAs)	<i>Eucalyptus parramattensis</i> subsp. <i>parramattensis</i>	EP	-	BAM-C	Yes	n/a	PCT 1717



Common Name	Scientific Name	Listing Status		Sources (BAM-C/ TBDC/ Previous Survey/ Current Survey)	Species Retained? (Yes/ No / Partial)	Reason for Exclusion (Geographic Limitations/ Habitat Constraints/ Microhabitats)	Vege Zone ID Species Retained within (including PCT ID)
		BC Act	EPBC Act				
Variable Midge Orchid	<i>Genoplesium insigne</i>	CE	CE	BAM-C	Yes	n/a	PCT 1636, PCT 1638
Small-flower Grevillea	<i>Grevillea parviflora</i> subsp. <i>parviflora</i>	V	V	BAM-C	Yes	n/a	PCT 1636, PCT 1717
n/a	<i>Maundia triglochoides</i>	V	-	BAM-C	Yes	n/a	PCT 1717
Biconvex Paperbark	<i>Melaleuca biconvexa</i>	V	V	BAM-C	Yes	n/a	PCT 1717
Grove's Paperbark	<i>Melaleuca groveana</i>	V	-	BAM-C	Yes	n/a	PCT 1636
Tall Knotweed	<i>Persicaria elatior</i>	V	V	BAM-C	Yes	n/a	PCT 1717
Tranquility Mintbush	<i>Prostanthera askania</i>	E	E	BAM-C	Yes	n/a	PCT 1636
Eastern Australian Underground Orchid	<i>Rhizanthella slateri</i>	V	E	BAM-C	Yes	n/a	PCT 1636, PCT 1638
Heath Wrinklewort	<i>Rutidosis heterogama</i>	V	V	BAM-C	Yes	n/a	PCT 1636
n/a	<i>Tetradlea glandulosa</i>	V	-	BAM-C	Yes	n/a	PCT 1636
Black-eyed Susan	<i>Tetradlea juncea</i>	V	V	BAM-C	Yes	n/a	PCT 1636, PCT 1717
Listing status: V=vulnerable, E=endangered, CE=critically endangered, EP=endangered population							



No species were excluded based on geographic limitations as mapped by the Threatened Species Profile distribution mapping. No species were excluded based on the TBDC habitat constraints. As all PCTs have been grouped into the same vegetation zones, none of the predicted species credit species have been assessed differently in different vegetation zones.

Most threatened species of flora were subject to targeted searches as they were in their detection period during the site surveys. The mosaic of conditions across the Subject Land means that there are variations in habitat suitability across the site for some species. Habitat suitability and survey adequacy for relevant species at the time of the survey work is further described as follows:

- *Asperula asthenes* occurs in damp sites, often along riverbanks. There are no particularly suitable damp riverbank habitats present for this species. In any case, this species has been suitably surveyed and was not detected.
- *Astrotricha crassifolia* occurs in dry sclerophyll woodland on sandstone, typically on ridges. Much of the forested vegetation within the Subject Land is likely to be too dense for this species, and there are no suitable ridge habitats. In any case, this species has been suitably surveyed and was not detected.
- *Cryptostylis hunteriana* populations on the Central Coast have been recorded in woodland dominated by *Eucalyptus haemastoma*, *Eucalyptus capitellata*, *Corymbia gummifera*, often in association with other *Cryptostylis* spp. Much of the forested vegetation within the Subject Land is too dense and soils are too degraded for this species, however locations with open understorey contained *Cryptostylis subulata* and *Cryptostylis erecta* indicating some suitability in these locations. In any case, this species has been suitably surveyed and was not detected.
- *Diuris praecox* requires open forest with grassy to 'fairly dense' understorey. Much of the forested vegetation within the Subject Land is too dense and soils are too degraded for this species. The species also typically occurs on "hills and slopes of near-coastal districts"; therefore, the site topography is also not particularly suited. This species was surveyed in August 2018 by ELA (2018); however, the survey tracks appear to be randomly spaced, rather than parallel. Despite questionable survey adequacy, the Subject Land is considered to lack suitable habitat for this species and has therefore been excluded from further assessment for species credits.
- *Genoplesium insigne* grows in patches of *Themeda triandra* and is associated with wet heath plants (such as *Banksia spinulosa* and *Leptospermum juniperinum*). These specific habitat features do not occur within the Subject Land. It is also believed that the species may remain dormant for up to four years and has been known to emerge and swarm in dense and intact vegetation after fire. Based on the dense forested vegetation across most of the Subject Land, as well as past and ongoing disturbances the species is unlikely to occur. In any case, this species has been suitably surveyed and was not detected.
- *Grevillea parviflora* subsp. *parviflora* grows in sandy or light clay soils usually over thin shales, and often with lateritic ironstone gravels and nodules. These features were not detected during habitat surveys of the Subject Land, and it is unlikely that these specific habitat features occur within the Subject Land. The species often occurs in open, slightly disturbed sites such as along tracks. This species has been suitably surveyed and was not detected. It is believed that the species has previously



been confused with *Ricinocarpos pinifolius* which occurs around the dam in the centre of the Subject Land.

- *Persicaria elatior* normally grows in damp places, especially beside streams and lakes. Occasionally it will occur in swamp forest or areas associated with disturbance. Whilst the species survey months are summer to autumn an experienced botanist is readily able to identify the leaves of this species, compared to other *Persicaria* spp that occur on the Central Coast. Despite some of the target surveys being outside the survey season for this species and considering the low suitability of habitats it is considered unlikely that this species occurs on the Subject Land.
- *Prostanthera askania* occurs adjacent to, but not immediately in, drainage lines on flat to moderately steep slopes formed on Narrabeen sandstone and alluvial soils derived from it. The Subject Land is not considered particularly suitable habitat for this species. In any case, this species has been suitably surveyed and was not detected.
- *Rhizanthella slateri* has very little information known about its specific habitat requirements, and it is thought to have potential to occur in many eucalypt forest vegetation types. There are no records of this species on the Central Coast, and it is unlikely that it would occur within the Subject Land. In any case, this species has been suitably surveyed and was not detected.
- *Rutidosia heterogama* grows in heath on sandy soils and moist areas in open forest and has been recorded along disturbed roadsides. Most of the vegetation within the Subject Land is too dense for this species. In any case, this species has been suitably surveyed and was not detected.
- *Tetratheca glandulosa* typically occupies ridgetops and upper slopes within shallow yellow clay/sandy loam and stony lateritic soils. None of these microhabitat features occur within the Subject Land. In any case, this species has been suitably surveyed and was not detected.
- *Tetratheca juncea* typically prefers low open forest/woodland with a mixed shrub understorey and grassy groundcover. It usually occurs on low nutrient soil associated with the Awaba Soil Landscape. There are none of these microhabitat features within the Subject Land. Despite some surveys outside peak flowering for this species it is likely that *Tetratheca juncea* would have been detected based on the survey efforts just outside peak flowering. The species is highly unlikely to occur within the Subject Land.



Table 19: Predicted Fauna Species Credit Species

Common Name	Scientific Name	Listing Status		Dual Credit Species (Yes/ No)	Sources (BAM-C/ TBDC/ Previous Survey/ Current Survey)	Species Retained? (Yes/ No / Partial)	Reason for Exclusion (Geographic Limitations/ Habitat Constraints/ Vagrant Species/ Microhabitats)	Veg Zone ID Species Retained within (Including PCT ID)
		BC Act	EPBC Act					
Regent Honeyeater	<i>Anthochaera phrygia</i>	CE	CE	Yes	BAM-C	No	Habitat constraints	n/a (PCT 1717)
Bush Stone-curlew	<i>Burhinus grallarius</i>	E	-	No	BAM-C	Yes	n/a	PCT 1636, PCT 1717
Gang-gang Cockatoo	<i>Callocephalon fimbriatum</i>	E	E	Yes	BAM-C	Yes	n/a	PCT 1636, PCT 1717
South-eastern Glossy Black-Cockatoo	<i>Calyptorhynchus lathami lathami</i>	V	V	Yes	BAM-C/ Previous survey/ Current survey	Yes	n/a	PCT 1636, PCT 1717
Eastern Pygmy-possum	<i>Cercartetus nanus</i>	V	-	No	BAM-C	Yes	n/a	PCT 1636, PCT 1717
Large-eared Pied Bat	<i>Chalinolobus dwyeri</i>	E	E	No	BAM-C	No	Habitat constraints	n/a (PCT 1636, PCT 1717)
Wallum Froglet	<i>Crinia tinnula</i>	V	-	No	BAM-C	Yes	n/a	PCT 1636, PCT 1638, PCT 1717
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	V	-	Yes	BAM-C	Yes	n/a	PCT 1636, PCT 1638, PCT 1717



Common Name	Scientific Name	Listing Status		Dual Credit Species (Yes/ No)	Sources (BAM-C/ TBDC/ Previous Survey/ Current Survey)	Species Retained? (Yes/ No / Partial)	Reason for Exclusion (Geographic Limitations/ Habitat Constraints/ Vagrant Species/ Microhabitats)	Veg Zone ID Species Retained within (Including PCT ID)
		BC Act	EPBC Act					
Giant Burrowing Frog	<i>Heleioporus australiacus</i>	V	V	No	BAM-C	No	Microhabitats	PCT 1636
Little Eagle	<i>Hieraaetus morphnoides</i>	V	-	Yes	BAM-C	No	Habitat constraints	PCT 1636, PCT 1717
Pale-headed Snake	<i>Hoplocephalus bitorquatus</i>	V	-	No	BAM-C	Yes	n/a	PCT 1636, PCT 1717
Swift Parrot	<i>Lathamus discolor</i>	E	CE	Yes	BAM-C	No	Habitat constraints	n/a (PCT 1636, PCT 1717)
Green and Golden Bell Frog	<i>Litoria aurea</i>	E	V	No	BAM-C	Yes	n/a	PCT 1636, PCT 1638, PCT 1717
Green-thighed Frog	<i>Litoria brevipalmata</i>	V	-	No	BAM-C	Yes	n/a	PCT 1636, PCT 1638, PCT 1717
Square-tailed Kite	<i>Lophoictinia isura</i>	V	-	Yes	BAM-C	No	Habitat constraints	PCT 1636
Little Bent-winged Bat	<i>Miniopterus australis</i>	V	-	Yes	BAM-C	No	Habitat constraints	PCT 1636, PCT 1717
Large Bent-winged Bat	<i>Miniopterus orianae oceanensis</i>	V	-	Yes	BAM-C	No	Habitat constraints	PCT 1636, PCT 1717
Southern Myotis	<i>Myotis macropus</i>	V	-	No	BAM-C	Yes	n/a	PCT 1636, PCT 1717



Common Name	Scientific Name	Listing Status		Dual Credit Species (Yes/ No)	Sources (BAM-C/ TBDC/ Previous Survey/ Current Survey)	Species Retained? (Yes/ No / Partial)	Reason for Exclusion (Geographic Limitations/ Habitat Constraints/ Vagrant Species/ Microhabitats)	Veg Zone ID Species Retained within (Including PCT ID)
		BC Act	EPBC Act					
Barking Owl	<i>Ninox connivens</i>	V	-	Yes	BAM-C	Yes	n/a	PCT 1636, PCT 1638, PCT 1717
Powerful Owl	<i>Ninox strenua</i>	V	-	Yes	BAM-C	Yes	n/a	PCT 1636
Eastern Osprey	<i>Pandion cristatus</i>	V	-	Yes	BAM-C	No	Habitat constraints	PCT 1636, PCT 1717
Giant Dragonfly	<i>Petalura gigantea</i>	E	-	No	BAM-C	No	Habitat constraints	PCT 1717
Southern Greater Glider	<i>Petauroides volans</i>	E	E	No	BAM-C	Yes	n/a	PCT 1636, PCT 1717
Squirrel Glider	<i>Petaurus norfolcensis</i>	V	-	No	BAM-C	Yes	n/a	PCT 1636, PCT 1717
Brush-tailed Rock-wallaby	<i>Petrogale penicillata</i>	E	V	No	BAM-C	No	Habitat constraints	n/a (PCT 1636)
Brush-tailed Phascogale	<i>Phascogale tapoatafa</i>	V	-	No	BAM-C	Yes	n/a	PCT 1636, PCT 1717
Koala	<i>Phascolarctos cinereus</i>	E	E	No	BAM-C	Yes	n/a	PCT 1636, PCT 1638, PCT 1717
Common Planigale	<i>Planigale maculata</i>	V	-	No	BAM-C	Yes	n/a	PCT 1636, PCT 1717



Common Name	Scientific Name	Listing Status		Dual Credit Species (Yes/ No)	Sources (BAM-C/ TBDC/ Previous Survey/ Current Survey)	Species Retained? (Yes/ No / Partial)	Reason for Exclusion (Geographic Limitations/ Habitat Constraints/ Vagrant Species/ Microhabitats)	Veg Zone ID Species Retained within (Including PCT ID)
		BC Act	EPBC Act					
Long-nosed Potoroo	<i>Potorous tridactylus</i>	V	V	No	BAM-C	No	Habitat constraints	n/a (PCT 1636, PCT 1717)
Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	V	V	Yes	BAM-C	No	Habitat constraints	PCT 1636, PCT 1717
Masked Owl	<i>Tyto novaehollandiae</i>	V	-	Yes	BAM-C	Yes	n/a	PCT 1636
Mahony's Toadlet	<i>Uperoleia mahonyi</i>	E	E	No	BAM-C	Yes	n/a	PCT 1636, PCT 1638, PCT 1717
Listing status: V=vulnerable, E=endangered, CE=critically endangered								



No species have been excluded based on geographic limitations as mapped by the Threatened Species Profile distribution mapping. The following species have been excluded based on the TBDC habitat constraints at the time of the assessment:

- The TBDC habitat constraints for species credits for the Regent Honeyeater *Anthochaera phrygia* and Swift Parrot *Lathamus discolor* are “Other: As per Important Habitat Map”, which do not occur on the Subject Land
- The TBDC habitat constraints for the Large-eared Pied Bat *Chalinolobus dwyeri* are “Cliffs: Within two kilometres of rocky areas containing caves, overhangs, escarpments, outcrops, or crevices, or within two kilometres of old mines or tunnels”; there are no cliffs (or rocky areas containing caves, overhangs, escarpments, outcrops or crevices) or old mines or tunnels within 2km of the Subject Land
- The TBDC habitat constraints for the Little Eagle are “Other: Nest trees - live (occasionally dead) large old trees within vegetation”; no suitable nest trees have been located within the Subject Land
- The TBDC habitat constraints for the Square-tailed Kite are “Other: nest trees”; no suitable nest trees have been located within the Subject Land
- The TBDC habitat constraints for the Little Bent-winged Bat are “Caves: Cave, tunnel, mine, culvert or other structure known or suspected to be used for breeding including species records in BioNet with microhabitat code ‘IC - in cave’; observation type code ‘E nest-roost’; with numbers of individuals >500; or from the scientific literature”; all human-made structures within the Subject Land were searched in Autumn 2023 and no evidence of microbat roosting was found
- The TBDC habitat constraints for the Large Bent-winged Bat are “Caves: Cave, tunnel, mine, culvert or other structure known or suspected to be used for breeding including species records with microhabitat code “IC - in cave;” observation type code “E nest-roost;” with numbers of individuals >500”; all human-made structures within the Subject Land were searched in Autumn 2023 and no evidence of microbat roosting was found
- The TBDC habitat constraints for the Eastern Osprey are “Other: Presence of stick-nests in living and dead trees (>15m) or artificial structures within 100m of a floodplain for nesting”; no suitable nest trees have been located within the Subject Land
- The TBDC habitat constraints for the Giant Dragonfly are “Swamps: Within 500m of swamps”; whilst the Subject Land contains swamp vegetation, water quality is poor and there are no permanent swamps or bogs considered suitable habitat for the Giant Dragonfly
- The TBDC habitat constraints for the Brush-tailed Rock-wallaby *Petrogale penicillate* are “Other: Land within 1 km of rocky escarpments, gorges, steep slopes, boulder piles, rock outcrops or clifflines”; there are no suitable rocky areas within 1 km of the Subject Land
- The TBDC habitat constraints for the Long-nosed Potoroo *Potorous tridactylus* are “Other: Dense shrub layer or alternatively high canopy cover exceeding 70% (i.e. to capture populations inhabiting wet sclerophyll and rainforest)”; the vegetation within the Subject Land is considered too patchy and degraded for this species
- The TBDC habitat constraints for the Grey-headed Flying-fox are “Other: breeding camps”; breeding camps of the Grey-headed Flying-fox are easy to identify and if present would have been detected during surveys of the Subject Land



The habitat surveys of the Subject Land determined that the following microhabitats at the time of the surveys do not occur:

- Giant Burrowing Frog: *“Suitable breeding habitat consists of ephemeral flowing streams that have permanent pools, or in upland swamps, and are located within native vegetation. Most typically breeding occurs in streams with a bed width of up to five metres (e.g. 2nd order and 3rd order streams) and upland swamps located on suitable geologies. Non-breeding habitat is native vegetation adjacent to the breeding sites. Non-breeding habitat is any area of PCT on the subject land that is located within 300 metres of suitable breeding habitat as individuals can be expected to migrate up to 300 metres from breeding habitat to establish territories of essential non-breeding habitat.”*

As all PCTs have been grouped into the same vegetation zones, none of the species credit species have been assessed differently in different vegetation zones.

5.2 Presence of Candidate Species

In accordance with BAM Subsection 5.2.4 candidate species listed in Table 20 are determined to be present within the Subject Land based on:

- assumed presence within the Subject Land
- an important habitat map (for dual credit species)
- targeted threatened species surveys, or
- an expert report



Table 20: Determining the Presence of Candidate Flora Species Credit Species on the Subject Land

Common Name	Scientific Name	Listing Status		Method Used to Determine Presence (Target Survey/ Assumed Present/ Important Habitat Mapped Area/ Expert Report)	Present ? (Yes/ No/ Assumed Present)	Further Assessment Required? (BAM Subsections 5.2.5 And 5.2.6) (Yes/ No)
		BC Act	EPBC Act			
Bynoe's Wattle	<i>Acacia bynoeana</i>	E	V	Target survey	No	No
Charmhaven Apple	<i>Angophora inopina</i>	V	V	Target survey	No	No
Trailing Woodruff	<i>Asperula asthenes</i>	V	V	Target survey	No	No
Thick-leaf Star-hair	<i>Astrotricha crassifolia</i>	V	V	Target survey	No	No
Netted Bottle Brush	<i>Callistemon linearifolius</i>	V	-	Target survey	No	No
n/a	<i>Corunastylis</i> sp. Charmhaven (NSW896673)	CE	CE	Target survey	No	No
Leafless Tongue Orchid	<i>Cryptostylis hunteriana</i>	V	V	Target survey	No	No
Rough Doubletail	<i>Diuris praecox</i>	V	V	Target survey	No	No
Camfield's Stringybark	<i>Eucalyptus camfieldii</i>	V	V	Target survey	No	No
n/a	<i>Eucalyptus parramattensis</i> subsp. <i>decadens</i>	V	V	Target survey	No	No
<i>Eucalyptus parramattensis</i> C. Hall. subsp. <i>parramattensis</i> in Wyong and Lake Macquarie LGAs	<i>Eucalyptus parramattensis</i> subsp. <i>parramattensis</i>	EP	-	Target survey	No	No
Variable Midge Orchid	<i>Genoplesium insigne</i>	CE	CE	Target survey	No	No
Small-flower Grevillea	<i>Grevillea parviflora</i> subsp. <i>parviflora</i>	V	V	Target survey	No	No
n/a	<i>Maundia triglochoides</i>	V	-	Target survey	No	No
Biconvex Paperbark	<i>Melaleuca biconvexa</i>	V	V	Target survey	No	No



Common Name	Scientific Name	Listing Status		Method Used to Determine Presence (Target Survey/ Assumed Present/ Important Habitat Mapped Area/ Expert Report)	Present? (Yes/ No/ Assumed Present)	Further Assessment Required? (BAM Subsections 5.2.5 And 5.2.6) (Yes/ No)
		BC Act	EPBC Act			
Grove's Paperbark	<i>Melaleuca groveana</i>	V	-	Target survey	No	No
Tall Knotweed	<i>Persicaria elatior</i>	V	V	Target survey	No	No
Tranquility Mintbush	<i>Prostanthera askania</i>	E	E	Target survey	No	No
Eastern Australian Underground Orchid	<i>Rhizanthella slateri</i>	V	E	Target survey	No	No
Heath Wrinklewort	<i>Rutidosia heterogama</i>	V	V	Target survey	No	No
n/a	<i>Tetratheca glandulosa</i>	V	-	Target survey	No	No
Black-eyed Susan	<i>Tetratheca juncea</i>	V	V	Target survey	No	No
Listing status: V=vulnerable, E=endangered, CE=critically endangered, EP=endangered population						

Table 21: Determining the Presence of Candidate Fauna Species Credit Species on the Subject Land

Common Name	Scientific Name	Listing Status		Method Used to Determine Presence (Target Survey/ Assumed Present/ Important Habitat Mapped Area/ Expert Report)	Present? (Yes/ No/ Assumed Present)	Further Assessment Required? (BAM Subsections 5.2.5 And 5.2.6) (Yes/No)
		BC Act	EPBC Act			
Bush Stone-curlew	<i>Burhinus grallarius</i>	E	-	Target survey	No	No
Gang-gang Cockatoo	<i>Callocephalon fimbriatum</i>	E	E	Target survey	No	No
Glossy Black-Cockatoo	<i>Calyptorhynchus lathami</i>	V	V	Target survey / assumed present	Yes	Yes
Eastern Pygmy-possum	<i>Cercartetus nanus</i>	V	-	Target survey	No	No



Common Name	Scientific Name	Listing Status		Method Used to Determine Presence (Target Survey/ Assumed Present/ Important Habitat Mapped Area/ Expert Report)	Present? (Yes/ No/ Assumed Present)	Further Assessment Required? (BAM Subsections 5.2.5 And 5.2.6) (Yes/No)
		BC Act	EPBC Act			
Wallum Froglet	<i>Crinia tinnula</i>	V	-	Target survey	No	No
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	V	-	Target survey	No	No
Pale-headed Snake	<i>Hoplocephalus bitorquatus</i>	V	-	Target survey	No	No
Green and Golden Bell Frog	<i>Litoria aurea</i>	E	V	Target survey	No	No
Green-thighed Frog	<i>Litoria brevipalmata</i>	V	-	Target survey	No	No
Southern Myotis	<i>Myotis macropus</i>	V	-	Target survey	No	No
Barking Owl	<i>Ninox connivens</i>	V	-	Target survey	No	No
Powerful Owl	<i>Ninox strenua</i>	V	-	Target survey	No	No
Southern Greater Glider	<i>Petauroides volans</i>	E	E	Target survey	No	No
Squirrel Glider	<i>Petaurus norfolcensis</i>	V	-	Target survey	No	No
Brush-tailed Phascogale	<i>Phascogale tapoatafa</i>	V	-	Target survey	No	No
Koala	<i>Phascolarctos cinereus</i>	E	E	Target survey	No	No
Common Planigale	<i>Planigale maculata</i>	V	-	Target survey	No	No
Masked Owl	<i>Tyto novaehollandiae</i>	V	-	Target survey	No	No
Mahony's Toadlet	<i>Uperoleia mahonyi</i>	E	E	Target survey	No	No
Listing status: V=vulnerable, E=endangered						



5.3 Threatened Species Surveys

Table 22 and Table 23 have been completed for candidate species where targeted threatened species surveys were used to determine presence of the species.



Table 22: Threatened Species Surveys for Candidate Flora Species Credit Species on the Subject Land

Common Name	Scientific Name	Threatened Flora Species Surveys				Present (Yes/ No/ Assumed Present)	Assess Further? (BAM Subsections 5.2.5 And 5.2.6) (Yes/ No)
		Survey Method (Transects or Grids)	Timing Of Survey – Within Recommended Period? (BAM-C / TBDC)		Effort (Hours & No. People)		
Bynoe's Wattle	<i>Acacia bynoeana</i>	Transect	☒ Yes 8 Nov 2018, 30 Mar 2023, 4 Apr 2023, 6- 7 Nov 2023, 20 Nov 2023, 23 Nov 2023	☐ No	8 Nov 2018: 13 km, 2 staff 30 Mar 2023: 8 hr, 2 staff 4 Apr 2023: 8 hr, 1 staff 6 Nov 2023: 8 hr, 2 staff 7 Nov 2023: 6 hr, 2 staff 20 Nov 2023: 8 hr, 2 staff 23 Nov 2023: 5 hr, 2 staff	No	No
Charmhaven Apple	<i>Angophora inopina</i>	Transect	☒ Yes 30 Aug 2018, 30 Mar 2023, 4 Apr 2023, 6- 7 Nov 2023, 20 Nov 2023, 23 Nov 2023	☐ No	30 Aug 2018: 9 km, 2 staff 30 Mar 2023: 8 hr, 2 staff 4 Apr 2023: 8 hr, 1 staff 6 Nov 2023: 8 hr, 2 staff 7 Nov 2023: 6 hr, 2 staff 20 Nov 2023: 8 hr, 2 staff 23 Nov 2023: 5 hr, 2 staff	No	No
Thick-leaf Star- hair	<i>Astrotricha crassifolia</i>	Transect	☒ Yes 30 Aug 2018, 6- 7 Nov 2023, 20 Nov 2023, 23 Nov 2023	☐ No	30 Aug 2018: 9 km, 2 staff 6 Nov 2023: 8 hr, 2 staff 7 Nov 2023: 6 hr, 2 staff 20 Nov 2023: 8 hr, 2 staff 23 Nov 2023: 5 hr, 2 staff	No	No
Netted Bottle Brush	<i>Callistemon linearifolius</i>	Transect	☒ Yes	☐ No	8 Nov 2018: 13 km, 2 staff	No	No



Common Name	Scientific Name	Threatened Flora Species Surveys			Present (Yes/ No/ Assumed Present)	Assess Further? (BAM Subsections 5.2.5 And 5.2.6) (Yes/ No)	
		Survey Method (Transects or Grids)	Timing Of Survey – Within Recommended Period? (BAM-C / TBDC)				Effort (Hours & No. People)
			8 Nov 2018, 6- 7 Nov 2023, 20 Nov 2023, 23 Nov 2023		6 Nov 2023: 8 hr, 2 staff 7 Nov 2023: 6 hr, 2 staff 20 Nov 2023: 8 hr, 2 staff 23 Nov 2023: 5 hr, 2 staff		
n/a	<i>Corunastylis</i> sp. <i>Charmhaven</i> (NSW896673)	Transect	☒ Yes 30 Mar 2023, 4 Apr 2023, 6- 7 Nov 2023, 20 Nov 2023, 23 Nov 2023	☐ No	30 Mar 2023: 4 hr, 2 staff 4 Apr 2023: 8 hr, 1 staff 6 Nov 2023: 8 hr, 2 staff 7 Nov 2023: 6 hr, 2 staff 20 Nov 2023: 8 hr, 2 staff 23 Nov 2023: 5 hr, 2 staff	No	No
Leafless Tongue Orchid	<i>Cryptostylis</i> <i>hunteriana</i>	Transect	☒ Yes 8 Nov 2018, 6- 7 Nov 2023, 20 Nov 2023, 23 Nov 2023	☐ No	8 Nov 2018: 13 km, 2 staff 6 Nov 2023: 8 hr, 2 staff 7 Nov 2023: 6 hr, 2 staff 20 Nov 2023: 8 hr, 2 staff 23 Nov 2023: 5 hr, 2 staff	No	No
Rough Doubletail	<i>Diuris praecox</i>	Transect	☒ Yes 30 Aug 2018	☐ No	30 Aug 2018: 9 km, 2 staff	No	No
Camfield's Stringybark	<i>Eucalyptus</i> <i>camfieldii</i>	Transect	☒ Yes 30 Aug 2018, 30 Mar 2023, 4 Apr 2023, 6- 7 Nov 2023,	☐ No	30 Aug 2018: 9 km, 2 staff 30 Mar 2023: 8 hr, 2 staff 4 Apr 2023: 8 hr, 1 staff 6 Nov 2023: 8 hr, 2 staff 7 Nov 2023: 6 hr, 2 staff	No	No



Common Name	Scientific Name	Threatened Flora Species Surveys				Present (Yes/ No/ Assumed Present)	Assess Further? (BAM Subsections 5.2.5 And 5.2.6) (Yes/ No)
		Survey Method (Transects or Grids)	Timing Of Survey – Within Recommended Period? (BAM-C / TBDC)		Effort (Hours & No. People)		
			20 Nov 2023, 23 Nov 2023		20 Nov 2023: 8 hr, 2 staff 23 Nov 2023: 5 hr, 2 staff		
n/a	<i>Eucalyptus parramattensis</i> subsp. <i>decadens</i>	Transect	☒ Yes 30 Mar 2023, 4 Apr 2023, 6- 7 Nov 2023, 20 Nov 2023, 23 Nov 2023	☐ No	30 Mar 2023: 8 hr, 2 staff 4 Apr 2023: 8 hr, 1 staff 6 Nov 2023: 8 hr, 2 staff 7 Nov 2023: 6 hr, 2 staff 20 Nov 2023: 8 hr, 2 staff 23 Nov 2023: 5 hr, 2 staff	No	No
<i>Eucalyptus parramattensis</i> C. Hall. subsp. <i>parramattensis</i> in Wyong and Lake Macquarie LGAs	<i>Eucalyptus parramattensis</i> subsp. <i>parramattensis</i>	Transect	☒ Yes 30 Aug 2018, 30 Mar 2023, 4 Apr 2023, 6- 7 Nov 2023, 20 Nov 2023, 23 Nov 2023	☐ No	30 Aug 2018: 9 km, 2 staff 30 Mar 2023: 8 hr, 2 staff 4 Apr 2023: 8 hr, 1 staff 6 Nov 2023: 8 hr, 2 staff 7 Nov 2023: 6 hr, 2 staff 20 Nov 2023: 8 hr, 2 staff 23 Nov 2023: 5 hr, 2 staff	No	No
Variable Midge Orchid	<i>Genoplesium insigne</i>	Transect	☒ Yes 8 Nov 2018, 6- 7 Nov 2023, 20 Nov 2023, 23 Nov 2023	☒ No 30 Aug 2018 (reference population in flower)	8 Nov 2018: 13 km, 2 staff 30 Aug 2018: 9 km, 2 staff 6 Nov 2023: 8 hr, 2 staff 7 Nov 2023: 6 hr, 2 staff 20 Nov 2023: 8 hr, 2 staff 23 Nov 2023: 5 hr, 2 staff	No	No



Common Name	Scientific Name	Threatened Flora Species Surveys				Present (Yes/ No/ Assumed Present)	Assess Further? (BAM Subsections 5.2.5 And 5.2.6) (Yes/ No)
		Survey Method (Transects or Grids)	Timing Of Survey – Within Recommended Period? (BAM-C / TBDC)		Effort (Hours & No. People)		
Small-flower Grevillea	<i>Grevillea parviflora subsp. parviflora</i>	Transect	☒ Yes 30 Aug 2018, 6- 7 Nov 2023, 20 Nov 2023, 23 Nov 2023	☐ No	30 Aug 2018: 9 km, 2 staff 6 Nov 2023: 8 hr, 2 staff 7 Nov 2023: 6 hr, 2 staff 20 Nov 2023: 8 hr, 2 staff 23 Nov 2023: 5 hr, 2 staff	No	No
Biconvex Paperbark	<i>Melaleuca biconvexa</i>	Transect	☒ Yes 30 Aug 2018, 30 Mar 2023, 4 Apr 2023, 6- 7 Nov 2023, 20 Nov 2023, 23 Nov 2023	☐ No	30 Aug 2018: 9 km, 2 staff 30 Mar 2023: 8 hr, 2 staff 4 Apr 2023: 8 hr, 1 staff 6 Nov 2023: 8 hr, 2 staff 7 Nov 2023: 6 hr, 2 staff 20 Nov 2023: 8 hr, 2 staff 23 Nov 2023: 5 hr, 2 staff	No	No
Grove's Paperbark	<i>Melaleuca groveana</i>	Transect	☒ Yes 30 Aug 2018, 30 Mar 2023, 4 Apr 2023, 6- 7 Nov 2023, 20 Nov 2023, 23 Nov 2023	☐ No	30 Aug 2018: 9 km, 2 staff 30 Mar 2023: 8 hr, 2 staff 4 Apr 2023: 8 hr, 1 staff 6 Nov 2023: 8 hr, 2 staff 7 Nov 2023: 6 hr, 2 staff 20 Nov 2023: 8 hr, 2 staff 23 Nov 2023: 5 hr, 2 staff	No	No
Tall Knotweed	<i>Persicaria elatio</i>	Transect	☒ Yes 30 Mar 2023, 4 Apr 2023	☒ No	30 Mar 2023: 8 hr, 2 staff 4 Apr 2023: 8 hr, 1 staff 6 Nov 2023: 8 hr, 2 staff	No	No



Common Name	Scientific Name	Threatened Flora Species Surveys			Present (Yes/ No/ Assumed Present)	Assess Further? (BAM Subsections 5.2.5 And 5.2.6) (Yes/ No)
		Survey Method (Transects or Grids)	Timing Of Survey – Within Recommended Period? (BAM-C / TBDC)		Effort (Hours & No. People)	
				6-7 Nov 2023, 20 Nov 2023, 23 Nov 2023	7 Nov 2023: 6 hr, 2 staff 20 Nov 2023: 8 hr, 2 staff 23 Nov 2023: 5 hr, 2 staff	
Tranquility Mintbush	<i>Prostanthera askania</i>	Transect	☒ Yes 8 Nov 2018, 6- 7 Nov 2023, 20 Nov 2023, 23 Nov 2023	☐ No	8 Nov 2018: 13 km, 2 staff 6 Nov 2023: 8 hr, 2 staff 7 Nov 2023: 6 hr, 2 staff 20 Nov 2023: 8 hr, 2 staff 23 Nov 2023: 5 hr, 2 staff	No
Heath Wrinklewort	<i>Rutidosis heterogama</i>	Transect	☒ Yes 30 Aug 2018, 30 Mar 2023, 4 Apr 2023, 6-7 Nov 2023, 20 Nov 2023, 23 Nov 2023	☐ No	30 Aug 2018: 9 km, 2 staff 30 Mar 2023: 8 hr, 2 staff 4 Apr 2023: 8 hr, 1 staff 6 Nov 2023: 8 hr, 2 staff 7 Nov 2023: 6 hr, 2 staff 20 Nov 2023: 8 hr, 2 staff 23 Nov 2023: 5 hr, 2 staff	No
n/a	<i>Tetradthea glandulosa</i>	Transect	☒ Yes 30 Aug 2018, 6- 7 Nov 2023, 20 Nov 2023, 23 Nov 2023	☐ No	30 Aug 2018: 9 km, 2 staff 6 Nov 2023: 8 hr, 2 staff 7 Nov 2023: 6 hr, 2 staff 20 Nov 2023: 8 hr, 2 staff 23 Nov 2023: 5 hr, 2 staff	No
Black-eyed Susan	<i>Tetradthea juncea</i>	Transect	☐ Yes	☒ No	30 Aug 2018: 9 km, 2 staff 6 Nov 2023: 8 hr, 2 staff	No



Common Name	Scientific Name	Threatened Flora Species Surveys			Present (Yes/ No/ Assumed Present)	Assess Further? (BAM Subsections 5.2.5 And 5.2.6) (Yes/ No)
		Survey Method (Transects or Grids)	Timing Of Survey – Within Recommended Period? (BAM-C / TBDC)		Effort (Hours & No. People)	
				30 Aug 2018, 6- 7 Nov 2023, 20 Nov 2023, 23 Nov 2023	7 Nov 2023: 6 hr, 2 staff 20 Nov 2023: 8 hr, 2 staff 23 Nov 2023: 5 hr, 2 staff	



Threatened flora surveys as detailed in Section 2.3.3 were undertaken with reference to the BAM Surveying threatened plants and their habitats guide (DPIE, 2020a) and survey notes within the TBDC at the time. Survey requirements at the time of surveys are summarised below:

- Bynoe's Wattle *Acacia bynoeana*: 10-15m maximum width parallel transects in dry forest areas and cleared land (paddock tree) during any time of year
- Charmhaven Apple *Angophora inopina*: 20-40m maximum width parallel transects in dry and wet forest areas, as well as cleared land (paddock tree) during any time of year
- Trailing Woodruff *Asperula asthenes*: 5-10m maximum width parallel transects in dry and wet forest areas, as well as cleared land (paddock tree) from October to December
- Thick-leaf Star-hair *Astrotricha crassifolia*: 10-15m maximum width parallel transects in dry forest areas from July to December
- Netted Bottle Brush *Callistemon linearifolius*: 10-20m maximum width parallel transects in dry forest areas and cleared land (paddock tree) from October to January
- *Corunastylis* sp. Charmhaven (NSW896673): 5-10m maximum width parallel transects in dry forest areas, as well as cleared land (paddock tree) from November to April.
- Leafless Tongue Orchid *Cryptostylis hunteriana*: 5-10m maximum width parallel transects in dry forest areas from November to January
- Rough Doubletail *Diuris praecox*: 5-10m maximum width parallel transects in dry and wet forest areas, as well as cleared land (paddock tree) during August
- Camfield's Stringybark *Eucalyptus camfieldii*: 20-40m maximum width parallel transects in dry forest areas, as well as cleared land (paddock tree) during any time of year
- *Eucalyptus parramattensis* subsp. *decadens*: 20-40m maximum width parallel transects in wet forest areas, as well as cleared land (paddock tree) during any time of year
- *Eucalyptus parramattensis* C. Hall. subsp. *parramattensis* population in Wyong and Lake Macquarie LGAs: 20-40m maximum width parallel transects in wet forest areas, as well as cleared land (paddock tree) during any time of year
- Variable Midge Orchid *Genoplesium insigne*: 5-10m maximum width parallel transects in dry forest areas, as well as cleared land (paddock tree) from September to November. A reference site was noted by ELA (2018) as flowering during August 2018.
- Small-flower Grevillea *Grevillea parviflora* subsp. *parviflora*: 10-15m maximum width parallel transects in dry and wet forest areas, as well as cleared land (paddock tree) from August to November. Two specimens of previously suspected *Grevillea parviflora* subsp. *parviflora* were inspected during the November 2023 surveys and were not found to be in flower. Further review of the diagnostic features of these specimens indicates that they are *Ricinocarpos pinifolius*.
- Biconvex Paperbark *Melaleuca biconvexa*: 20-40m maximum width parallel transects in wet forest areas, as well as cleared land (paddock tree) during any time of year



- Grove's Paperbark *Melaleuca groveana*: 20-40m maximum width parallel transects in dry forest areas, as well as cleared land (paddock tree) during any time of year
- Tall Knotweed *Persicaria elatior*: 5-10m maximum width parallel transects in wet forest areas from December to May
- Tranquility Mintbush *Prostanthera askania*: 10-15m maximum width parallel transects in dry forest areas from September to November
- Eastern Australian Underground Orchid *Rhizanthella slateri*: 5-10m maximum width parallel transects in dry forest areas, as well as cleared land (paddock tree) from September to November
- Heath Wrinklewort *Rutidosis heterogama*: 5-10m maximum width parallel transects in dry forest areas, as well as cleared land (paddock tree) during any time of year. Reference checks of population near rail line at Sparks Road, Wallarah showed specimens contained flower heads with floral bracts on 6 November 2023.
- *Tetralthea glandulosa*: 10-15m maximum width parallel transects in dry forest areas from August to November
- Black-eyed Susan *Tetralthea juncea*: 10-15m maximum width parallel transects in wet and dry forest areas from September to October. In 2018 this species was surveyed one day outside of the recommended survey period and in 2023 it was surveyed 6-23 days outside of the recommended survey period. As the survey period is identified as the peak flowering period with sporadic flowering throughout the year this is considered sufficient.



Table 23: Threatened Species Surveys for Candidate Fauna Species Credit Species on the Subject Land

Common Name	Scientific Name	Survey Method (e.g. Harp Trap, Elliott Trap, Bioacoustics, etc.)	Threatened Flora Species Surveys			Present (Yes/ No/ Assumed Present)	Assess Further? (BAM Subsections 5.2.5 And 5.2.6) (Yes/ No)
			Timing of Survey – within Recommended Period? (BAM-C / TBDC)		Effort (Hours & No. People)		
Bush Stone-curlew	<i>Burhinus grallarius</i>	Day habitat searches	☒ Yes 20 June 2018 2 August 2018	☐ No	75km total habitat search	No	No
		Call Playback	☒ Yes 20-23 August 2018	☐ No	Call playback for 30 minutes with 2 observers. Total 8 hours of call playback over 8 nights.		
		Spotlighting	☒ Yes 13 November 2018 25, 26, 28 March 2019	☐ No	Spotlighting on foot for 1 hour with 2 observers. Total effort 16 hours overs 8 nights.		
Gang-gang Cockatoo	<i>Callocephalon fimbriatum</i>	Areas searched for breeding habitat	☒ Yes November 2018	☒ No 20 June 2018 2 August 2018	10.75km total habitat search.	No	No
Glossy Black-Cockatoo	<i>Calyptrorhynchus lathami</i>	Areas searched for breeding habitat	☒ Yes 20 June 2018 2 August 2018	☐ No	10.75km total habitat search.	Yes (four observed feeding)	Yes
Eastern Pygmy-possum	<i>Cercartetus nanus</i>	Small Elliot Traps	☒ Yes 12-16 November 2018	☐ No	100 trap nights over 3-4 consecutive nights.	No	No
		Pitfall Traps with drift nets	☒ Yes	☐ No	24 trap nights over 3-4 consecutive nights		



Common Name	Scientific Name	Survey Method (e.g. Harp Trap, Elliott Trap, Bioacoustics, etc.)	Threatened Flora Species Surveys		Present (Yes/ No/ Assumed Present)	Assess Further? (BAM Subsections 5.2.5 And 5.2.6) (Yes/ No)
			Timing of Survey – within Recommended Period? (BAM-C / TBDC)	Effort (Hours & No. People)		
			12-16 November 2018			
Wallum Froglet	<i>Crinia tinnula</i>	Combination; tadpole and call surveys, nocturnal searches	☒ Yes 25, 26 and 28 March 2019	☐ No	No	No
		Aura visual surveys 5 transects and one point	☒ Yes 29-30 March 2023, 3-4 April 2023	☐ No		
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	Areas searched for breeding habitat	☒ Yes 2 August 2018	☒ No 20 June 2018	No	No
Pale-headed Snake	<i>Hoplocephalus bitorquatus</i>	Spotlighting	☒ Yes 25, 26, and 28 March 2019 (during suitable weather conditions)	☐ No	No	No
		Funnel traps	☒ Yes 29-30 March 2023	☒ No 3-4 April 2023		
		Spotlighting	☐ Yes	☒ No 3-4 April 2023		
Green and Golden Bell Frog	<i>Litoria aurea</i>	Combination; tadpole and call surveys, nocturnal searches	☒ Yes 25, 26 and 28 March 2019	☐ No	No	No



Common Name	Scientific Name	Survey Method (e.g. Harp Trap, Elliott Trap, Bioacoustics, etc.)	Threatened Flora Species Surveys		Present (Yes/ No/ Assumed Present)	Assess Further? (BAM Subsections 5.2.5 And 5.2.6) (Yes/ No)
			Timing of Survey – within Recommended Period? (BAM-C / TBDC)	Effort (Hours & No. People)		
		Aura visual surveys 5 transects and one point	☒ Yes 29-30 March 2023	☒ No 3-4 April 2023	Total effort of 480 minutes over 250m habitat and four repeat surveys. 2 staff.	
Green- thighed Frog	<i>Litoria brevipalmata</i>	Combination; tadpole and call surveys, nocturnal searches	☒ Yes 25, 26 and 28 March 2019	☐ No	200 m transect per water body or inundated area, repeated on a minimum of 2 separate nights	No
		Aural visual surveys 5 transects and one point	☒ Yes 29-30 March 2023, 3- 4 April 2023	☐ No	Total effort of 480 minutes over 250m habitat and four repeat surveys. 2 staff.	
		Tadpole searches	☒ Yes 28 April 2023	☐ No	10 mins of tadpole surveys per 500m (total effort approx. 60 minutes 2 staff)	
Southern Myotis	<i>Myotis macropus</i>	Harp Trap	☒ Yes 12-16 November 2018	☒ No	4 trap nights over 4 consecutive nights, 16 trap nights in total	No
		Roost searches in human-made structures	☐ Yes	☒ No 4 April 2023	4 hours, 1 staff	
Barking Owl	<i>Ninox connivens</i>	Spotlighting	☒ Yes 20-23 August 2018, 13 November 2018	☒ No 25, 26 and 28 March 2019	16 hours spotlighting over 8 nights.	No
		Call Playback	☒ Yes 20-23 August 2018	☐ No	Call playback for 30 minutes with 2 observers.	



Common Name	Scientific Name	Survey Method (e.g. Harp Trap, Elliott Trap, Bioacoustics, etc.)	Threatened Flora Species Surveys		Present (Yes/ No/ Assumed Present)	Assess Further? (BAM Subsections 5.2.5 And 5.2.6) (Yes/ No)
			Timing of Survey – within Recommended Period? (BAM-C / TBDC)	Effort (Hours & No. People)		
					8 hours call playback over 8 nights.	
		Spotlighting	☐ Yes	☒ No 3-4 April 2023	480 minutes over two nights, 2 staff	
Powerful Owl	<i>Ninox strenua</i>	Spotlighting	☒ Yes 20-23 August 2018, 13 November 2018	☒ No 25, 26 and 28 March 2019	16 hours spotlighting over 8 nights.	No
		Call Playback	☒ Yes 20-23 August 2018	☐ No	Call playback for 30 minutes with 2 observers. 8 hours call playback over 8 nights.	
		Spotlighting	☐ Yes	☒ No 3-4 April 2023	480 minutes over two nights, 2 staff	
Southern Greater Glider	<i>Petauroides volans</i>	Spotlighting	☒ Yes 3-4 April 2023	☐ No	480 minutes over two nights, 2 staff	No
		Arboreal remote cameras	☒ Yes 3-30 April 2023	☐ No	12 infrared cameras, total 336 trap nights	No
Squirrel Glider	<i>Petaurus norfolcensis</i>	Spotlighting	☒ Yes 20-23 August 2018, 13 November 2018, 25, 26 and 28 March 2019	☐ No	16 hours spotlighting over 8 nights.	No
			☒ Yes	☐ No	480 minutes over two nights, 2 staff	



Common Name	Scientific Name	Survey Method (e.g. Harp Trap, Elliott Trap, Bioacoustics, etc.)	Threatened Flora Species Surveys		Present (Yes/ No/ Assumed Present)	Assess Further? (BAM Subsections 5.2.5 And 5.2.6) (Yes/ No)
			Timing of Survey – within Recommended Period? (BAM-C / TBDC)	Effort (Hours & No. People)		
			3-4 April 2023			
		Call Playback	☒ Yes 20-23 August 2018	☐ No Call playback for 30 minutes with 2 observers. 8 hours call playback over 8 nights.		
		Arboreal remote cameras	☒ Yes 2-23 August 2018	☐ No 5 Reconyx cameras set up, total 110 trapping nights		
			☒ Yes 3-30 April 2023	☐ No 12 infrared cameras, total 336 trap nights		
		Arboreal Elliot Traps	☒ Yes 12-16 November 2018	☐ No 24 trap nights over 3-4 consecutive nights		
Brush- tailed Phascogale	<i>Phascogale tapoatafa</i>	Spotlighting	☒ Yes 20-23 August 2018, 13 November 2018, 25, 26 and 28 March 2019	☐ No 16 hours spotlighting over 8 nights.	No	No
			☒ Yes 3-4 April 2023	☐ No 480 minutes over two nights, 2 staff		
		Arboreal remote cameras	☐ Yes 2-23 August 2018	☒ No 5 Reconyx cameras set up, total 110 trapping nights		
			☒ Yes 3-30 April 2023	☐ No 12 infrared cameras, total 336 trap nights		



Common Name	Scientific Name	Survey Method (e.g. Harp Trap, Elliott Trap, Bioacoustics, etc.)	Threatened Flora Species Surveys			Present (Yes/ No/ Assumed Present)	Assess Further? (BAM Subsections 5.2.5 And 5.2.6) (Yes/ No)
			Timing of Survey – within Recommended Period? (BAM-C / TBDC)		Effort (Hours & No. People)		
Koala	<i>Phascolarctos cinereus</i>	Spotlighting	☒ Yes 20-23 August 2018, 13 November 2018, 25, 26 and 28 March 2019	☐ No	16 hours spotlighting over 8 nights.	No	No
			☒ Yes 3-4 April 2023	☐ No	480 minutes over two nights, 2 staff		
		SAT surveys	☒ Yes 28 April 2023	☐ No	4 SAT survey sites over <10 hectares		
Common Planigale	<i>Planigale maculata</i>	Pitfall traps with drift nets	☒ Yes 12-16 November 2018	☐ No	24 trap nights over 3-4 consecutive nights	No	No
Masked Owl	<i>Tyto novaehollandiae</i>	Spotlighting	☒ Yes 20-23 August 2018	☒ No 13 November 2018, 25, 26 and 28 March 2019	16 hours spotlighting over 8 nights.	No	No
			☐ Yes	☒ No 3-4 April 2023	480 minutes over two nights, 2 staff		
		Call Playback	☒ Yes 20-23 August 2018	☐ No	Call playback for 30 minutes with 2 observers. 8 hours call playback over 8 nights.		
Mahony's Toadlet	<i>Uperoleia mahonyi</i>	Combination; tadpole and call surveys, nocturnal searches	☒ Yes 25, 26 and 28 March 2019	☐ No	200 m transect per water body or inundated area, repeated on	No	No



Common Name	Scientific Name	Survey Method (e.g. Harp Trap, Elliott Trap, Bioacoustics, etc.)	Threatened Flora Species Surveys			Present (Yes/ No/ Assumed Present)	Assess Further? (BAM Subsections 5.2.5 And 5.2.6) (Yes/ No)
			Timing of Survey – within Recommended Period? (BAM-C / TBDC)		Effort (Hours & No. People)		
					a minimum of 2 separate nights		
		Aura visual surveys 5 transects and one point	☒ Yes 29-30 March 2023	☒ No 3-4 April 2023	Total effort of 480 minutes over 250m habitat and four repeat surveys. 2 staff.		



Where available at the time of the survey, threatened fauna surveys as detailed in Section 2.4.3 were undertaken with reference to the survey notes within the TBDC, as well as the following BAM survey guidelines:

- NSW Survey Guide for Threatened Frogs (DPIE, 2020b)
- Koala BAM survey guide (DPE, 2022b)
- NSW Survey Guide for Threatened Reptiles (DPE, 2022c)
- 'Species credit' threatened bats and their habitats NSW survey guide for the Biodiversity Assessment Method (OEH, 2018a)

TBDC or BAM guideline survey requirements followed at the time of the SLR 2023 surveys are summarised below:

- Bush Stone-curlew *Burhinus grallarius*: May be surveyed all year. It may be easier to detect during breeding season, possibly calls all year, but it is unclear how well it responds to playback. It cannot be predicted to occur at a site based on vegetation surrogates but can be detected reliably from survey
- Gang-gang Cockatoo *Callocephalon fimbriatum*: survey months are October to January. Surveys involve looking for signs of breeding, identifying potential nest trees (at least 3m above the ground and with hollow diameter of 7cm or larger), then monitoring potential nest trees during breeding season (October to January).
- Glossy Black-Cockatoo *Calyptorhynchus lathami*: survey months are January to September. Surveys involve looking for signs of breeding, identifying potential nest trees (at least 8m above the ground, in stems with a diameter of at least 30cm and with hollow diameter of 15cm or larger, stem angle is at least 45 degrees and may be vertical), then monitoring potential nest trees during breeding season (April to August).
- Eastern Pygmy-possum *Cercartetus nanus*: Survey months are October to March. There are no survey guidelines for this species. Survey techniques may include spotlighting, passive traps, infrared cameras, pitfalls, Elliot trapping. The TBDC notes that the species is very difficult to detect, especially via spotlighting.
- Wallum Froglet *Crinia tinnula*: May be surveyed all year, but only after recent flooding of target waterbody. Surveys are as per frog survey guidelines. Surveys involve aural-visual surveys or acoustic recording that are completed using transects that run through (or if too deep, then around) available breeding habitat. Aural visual surveys involve 5-min listening and 4-min call playback every 50 metres along the transect, as well as 5-min spotlighting between each 50m. Effort requires 480 minutes per 500m and four repeat surveys. Suitable breeding and non-breeding habitat consist of still waterbodies located in acid swamplands (pH<5.5), wallum heaths, open vegetation on sand plains, and flooded areas of swamp forests within the PCTs associated with the species. The acidity of the water must be recorded in the BAR to demonstrate suitable breeding habitat.
- White-bellied Sea-Eagle *Haliaeetus leucogaster*: Survey months are July to December. Surveys involve searches for breeding habitat (nests) followed by surveys to confirmation presence. Breeding habitat is live large old trees within 1km of a rivers, lakes, large dams or creeks, wetlands and coastlines AND the presence of a large stick nest within tree canopy; or an adult with nest material; or adults observed duetting within breeding period.



- **Pale-headed Snake *Hoplocephalus bitorquatus*:** Survey months are November to March. Requires spotlight surveys (120 person-minutes, 4 surveys - per 50ha) and funnel traps (72 trap nights, 4 surveys - per 50ha). Spotlight surveys are undertaken in suitable habitat, focusing on riparian zones where present. Target large live trees with hollows and shedding bark. Search trunks to locate foraging snakes by eyeshine or body shape as they lay waiting to ambush prey (e.g. frogs, geckos). Commence spotlighting on transects 30 min after sunset. Ambient temperature must be >18°C for survey. Set funnel traps in suitable habitat for 4 nights. Where possible, undertake surveys 1-2 days after rainfall and on humid nights (>70% humidity).
- **Green and Golden Bell Frog *Litoria aurea*:** Survey months November to March. Suitable breeding and non-breeding shelter habitat consists of any waterbody with emergent aquatic vegetation and without the plague minnow (*Gambusia holbrooki*), although the green and golden bell frog will still occasionally breed in sites with this introduced pest fish. Foraging habitat and migratory habitat are areas of native and non-native vegetation. Aural-visual or acoustic recorder surveys can be completed along the edges of suitable breeding habitat or, if feasible, through shallow wetlands. Aural visual surveys involve 5-min listening and 4-min call playback every 50 metres along the transect, as well as 5-min spotlighting between each 50m. Effort requires 480 minutes per 500m and four repeat surveys.
- **Green-thighed Frog *Litoria brevipalmata*:** Survey months are September to April. Suitable breeding habitat is any semi-permanent or ephemeral waterbody of >25 square metres in surface area located within native vegetation or immediately adjacent to or within 10 metres of native vegetation. Non-breeding habitat is native vegetation adjacent to the breeding habitat. Surveys are required in Spring to Autumn after flooding rains and involve 2 surveys with 240-mins of aural visual survey and 10 mins of tadpole surveys per 500m. A combination of aural-visual surveys and tadpole searches are completed within or around the edges of potential breeding habitat. An aural-visual survey should be used when the frogs are expected to be calling; this is to be followed by a search of the breeding site for tadpoles and metamorphosing froglets approximately 30 to 60 days later. The calling period for this species is very short, usually lasting one or two nights during or immediately after (<24 hours) flooding, but with some ongoing precipitation. Flooding typically occurs as a result of heavy rainfall (>50mm in 24 hrs), but smaller combined rainfall events may inundate the site. The breeding site must be flooded at the time of the survey. If a breeding site has previously been flooded (within three months), frogs will not attempt a second breeding event. This typically leads to only one breeding event occurring within the breeding season. The species occurs in a range of habitats from rainforest and moist eucalypt forest to dry eucalypt forest and heath, typically in areas where surface water gathers after rain. Surveys should target larger depressions or flooding swamp areas (>5 metres X 10 metres in diameter), usually identifiable by flood tolerant vegetation. The call of the green-thighed frog is similar to that of rocket frogs (e.g. *Litoria latopalmata*) that can breed in the same habitats. Individuals heard will need to be checked to ensure correct identification.
- **Southern Myotis *Myotis macropus*:** Survey months are October to March. Potential habitat is the range of PCTs associated with the species (as per the TBDC) within 200 meters of any medium to large permanent creeks, rivers, lakes or other waterways (i.e. with pools/ stretches 3m or wider). Traps or nets should be set beside or preferably over pools of water along creeks or rivers, particularly in flat or areas of low relief if present. Traps can be set under bridges or culverts, or overhanging branches. The survey may use only mist nets, or a combination of harp traps and mist nets. Roost searches involve: any bridges, tunnels, culverts or other structures



identified as potential breeding habitat should be searched for bats or signs of bats (guano etc). A torch should be used and attention paid to inspecting cracks or seams in the roof. A handheld bat detector can alert the searcher to ultrasonic calls. If bats or signs of bats are observed, the bats may need to be captured to identify species and breeding status using traps, nets or other methods. Survey effort involves 16 trap nights over a minimum of four nights for harp trap or mist net and 30 minutes search per structure for roost searches.

- Barking Owl *Ninox connivens*: Survey months are May to December (recently updated to all year). Surveys involve looking for signs of breeding, identifying potential nest trees (living or dead trees with hollows greater than 20cm diameter and greater than 4m above the ground), then night monitoring at the identified potential nest locations for a minimum of 2 nights.
- Powerful Owl *Ninox strenua*: Survey months are May to August (recently updated to all year). Surveys involve looking for signs of breeding, identifying potential nest trees (living or dead trees with hollows greater than 20 cm diameter), then night monitoring at the identified potential nest locations for a minimum of 2 nights.
- Southern Greater Glider *Petauroides volans*: May be surveyed all year. The species occurs across a broad range of vegetation types and can be reliably detected from survey. No specific survey techniques provided for this species.
- Squirrel Glider *Petaurus norfolcensis*: Survey year-round but sites with bipinnate acacia, autumn winter flowering trees and shrubs such as *Eucalyptus robusta* and *Banksia* sp. (*integrifolia* etc) should be subject to a more retracted survey period of between March-August. Relies on large old trees with hollows for breeding and nesting. These trees are also critical for movement and typically need to be closely connected (i.e. no more than 50m apart). No specific survey techniques provided for this species.
- Brush-tailed Phascogale *Phascogale tapoatafa*: Survey months are December to June. Low population densities, large home range size, annual male die-off and fluctuating local abundance make Brush-tailed Phascogales difficult to detect reliably. It may be more appropriate to seek an expert report to determine presence or absence. Survey December to June, noting that December to February is the main juvenile dispersal period and May to June is the peak mating season, when males are most likely to be detected (particularly towards the end of the season, as deceased individuals). Survey must be undertaken using baited cameras. The bait type used must remain as an effective attractant until replaced. Cameras should be set at head height, or above, facing the branch or tree trunk where a honey-based bait has been placed. Cameras must remain in place for a minimum of 4 weeks with cameras checked and baits replaced after 2 weeks. A minimum of 4 cameras, independent of the size of the Subject Land, must be used for sites up to 1 ha, then an additional 2 cameras for every ha of suitable habitat thereafter. Cameras must be evenly spaced across the site. Where potential habitat is disconnected by gaps of 50 m or more, each habitat patch should have a minimum of 4 cameras for the first ha, and 2 cameras for every ha thereafter. Malfunctioning cameras must be replaced, and additional cameras and time must be invested to address the lost survey effort. That is, at least 22 working, baited, evenly spaced camera traps are required for the first 10 ha of suitable habitat.
- Koala *Phascolarctos cinereus*: Species may be surveyed all year-round. Surveys must be in accordance with the Koala Biodiversity Assessment Method Survey Guide. These 1. Spot Assessment Technique (SAT) 2. Conservation detection dogs



3. Spotlighting 4. Passive acoustic 5. Drones. A combination of SAT survey and spotlighting is required (or a combination of other techniques above). SAT surveys require: 3 SAT sites per <5ha; grid with 150m spacing over habitat; identify centre tree, move outward and identify 29 nearest trees, undertake radial search for koala scats within 1m of tree base, 2 mins per tree. Spotlighting involves two nights spotlighting with 100m spaced transects at 200m length per 5ha.

- Common Planigale *Planigale maculata*: Species may be surveyed all year-round; noting that males are more active during winter, and juvenile dispersal usually occurs from December to January. Surveys must be undertaken using pitfall traps where the substrate allows. Occasionally, the substrate may be too rocky, hard or inundated to allow the use of pitfall traps. In these circumstances, we strongly advise that an expert report should be obtained. Survey should be delayed if heavy precipitation is forecast, to prevent the drowning of this, and other species, caught in the traps. Ideally, each pitfall trap array should comprise 10m of drift-fence with a 20L or larger bucket with a lid at either end. The lid should be elevated 2 to 3cm (using sticks) above the lip of the bucket and be black in colour to encourage animals to move under it. Leaf litter and small twigs should be placed in the bottom of each bucket to provide shelter for trapped animals. Target the placement of traps in suitable habitat within about 200 m of the ecotonal boundary of adjoining PCTs, in or adjacent to dense grass cover, deep leaf litter and/or abundant logs where Planigales would be expected to be present under the prevailing conditions (upslope of the ecotone in wet conditions and downslope in dry conditions). Traps must remain in place for a minimum of four consecutive nights. A minimum of three pitfall trap arrays must be used for an area of suitable habitat up to 1ha. For suitable habitat >1ha – 10ha, one additional pitfall trap array must be used for every additional hectare, with a maximum of 10 pitfall trap arrays for any one patch of suitable habitat. Where suitable habitat patches are separated by 200m or greater, the same survey effort must be applied in each patch. If the combined mapped areas of suitable habitat on the Subject Land is >10ha, contact the Department for a modified survey approach.
- Masked Owl *Tyto novaehollandiae*: Survey months are May to August (recently updated to all year). Surveys involve looking for signs of breeding, identifying potential nest trees (living or dead trees with hollows greater than 20cm diameter and greater than 4m above the ground), then night monitoring at the identified potential nest locations for a minimum of 2 nights.
- Mahony's Toadlet *Uperoleia mahonyi*: Survey months are October to March. Suitable breeding habitat consists of ephemeral and semi-permanent swamps and swales that occur within areas of native vegetation. Aural-visual surveys are to be undertaken around potential breeding sites. Aural visual surveys involve 5-min listening and 4-min call playback every 50 metres along the transect, as well as 5-min spotlighting between each 50m. Effort requires 480 minutes per 500m and four repeat surveys. Calling individuals must be captured to confirm identity as calls are difficult to distinguished from other more common *Uperoleia* spp. Waterbodies must be at least 70% full prior to survey.

5.4 Expert Reports

No expert reports have been used to determine species presence/absence.

5.5 More Appropriate Local Data

More appropriate local data has not been adopted for this assessment.



5.6 Species Polygons (for Relevant Species Credit Species)

One species credit species has been assumed to be present within the native vegetation habitats on the Subject Land. This species is:

- Glossy Black Cockatoo *Calyptorhynchus lathami*

Species polygons are included in Figure 11. The species polygons for the Glossy Black Cockatoo have been created in accordance with the method identified in the TBDC, which includes buffering each hollow-bearing tree with diameter of 10cm by 200 metres and mapping the impacted PCTs associated with the species within the buffer area.

Results for present species are summarised in Table 24.



Table 24: Results for Present Species (Recorded within the Subject Land)

Common Name	Scientific Name	Biodiversity Risk Weighting (BAM-C & TBDC*)	SAIL Entity (BAM-C & TBDC)	Habitat Constraints / Microhabitats Present on the Subject Land / Vegetation Zone	Abundance – No. Individual Plants Present on Subject Land (Flora with Unit of Measure of Count)	Extent (ha) of Suitable Habitat Present on Site (Flora or Fauna with Unit of Measure of Area)	TBDC Info e.g. Buffers, General Comments (where relevant)	Habitat Condition (VI Score for Each Vegetation Zone in the Polygon – Area Species Only)
Glossy Black Cockatoo	<i>Calyptorhynchus lathami</i>	High (2)	No	Hollow-bearing trees with diameter of 10 cm or greater	n/a	~10	200m disturbance free buffer of potential nest trees	56.4 (PCT 1636) 51.9 (PCT 1717) 44 (PCT 1638)

Table 25: Results for EPBC Act Listed Species Present (Recorded within the Subject Land)

Common Name	Scientific Name	Abundance – No. Individual Plants Present (Flora with Unit of Measure as Count)	Extent (ha) of Suitable Habitat Present (Flora or Fauna with Unit of Measure as Area)
Glossy Black Cockatoo	<i>Calyptorhynchus lathami</i>	n/a	~10



6.0 Identifying Prescribed Impacts

Prescribed impact features are identified in Table 26 and mapped on Figure 1 and Figure 2.

Table 26: Prescribed Impacts Identified

Feature	Present	Description Of Feature Characteristics and Location	Threatened Entities that use, are likely to use, or are part of the habitat feature. Where relevant, Threatened Species or Fauna that are part of a TEC or EC, that are at Risk of Vehicle Strike
Karst, caves, crevices, cliffs, rocks or other geological features of significance	☐ Yes / ☒ No	n/a	n/a
Human-made structures	☒ Yes / ☐ No	Various buildings and structures across the Subject Land, including the Doyalson RSL club, obstacle course features and shipping containers	Ecosystem credit species which could roost/forage across the site (such as Little Bent-winged Bat, Large Bent-winged Bat, Southern Myotis)
Non-native vegetation	☒ Yes / ☐ No	Various patches of planted native vegetation and exotic vegetation	Ecosystem credit species which could forage/perch across the site (such as Powerful Owl, White-bellied Sea-Eagle, Squirrel Glider, Grey-headed Flying Fox, Eastern Osprey, microbats)
Habitat connectivity	☐ Yes / ☒ No	n/a	n/a
Waterbodies, water quality and hydrological processes	☒ Yes / ☐ No	Swamp areas receiving surface water flows from the site Small dam and obstacle ponds	Swamp Forest EC vegetation Ecosystem credit species which could forage across waterbodies (such as Southern Myotis) or drink from waterbodies (i.e. most ecosystem species)
Wind turbine strikes (wind farm development only)	☐ Yes / ☒ No	n/a	n/a
Vehicle strikes	☐ Yes / ☒ No	n/a	n/a

The list of threatened entities was generated based on site survey, habitat assessment and consideration of the habitats described for each species in the TBDC at the time of the assessment. Whilst there is currently no evidence of microbats using the human-made structures on the Subject Land, according to the TBDC it is possible that they could utilise buildings and structures for roosting and breeding from time to time (although caves are the primary breeding habitat). Whilst there is currently no evidence of threatened species using the areas of non-native vegetation or water bodies across the Subject Land, there are several species which could roost and forage over the site from time to time. Hydrological processes are important for maintaining condition of Swamp Forest EC.



STAGE 2: IMPACT ASSESSMENT (BIODIVERSITY VALUES AND PRESCRIBED IMPACTS)

7.0 Avoid and Minimise Impacts

7.1 Avoid and Minimise Direct and Indirect Impacts

7.1.1 Project Location

The proposed Englobo Subdivision is for a mixed-use development to be constructed on land that has been re-zoned to residential and recreation zoning (R2 - Low Density Residential, RE1 - Public Recreation, RE2 - Private Recreation) under *Central Coast Local Environmental Plan 2022* and is adjacent to existing residential development.

No alternative sites are available for consideration as part of the Englobo Subdivision.

7.1.2 Project Design

Eco Logical Australia Pty Ltd (ELA) have provided a detailed account of how biodiversity impacts were avoided and minimised as part of the Doyalson Wyee RSL Planning Proposal (PP-2021-4334), which underpins the current assessment of DA/1295/2023.

The ELA (2025b) letter describes that over a five-year period (2018-2022), the site underwent extensive biodiversity assessments and design iterations to identify suitable development areas while preserving native vegetation and threatened species habitats. These efforts culminated in a rezoning of the land and the execution of VPA 2022 on 15 September 2022.

Key measures implemented to avoid and minimise impacts included focusing development on already cleared land, identifying and protecting biodiversity values through surveys and mapping, and establishing three Biodiversity Corridors and four Landscape Corridors. These corridors were designed to retain and restore native vegetation, support fauna movement (particularly east-west connectivity), and manage vegetation in accordance with tailored management plans. Notably, 9.86ha (or 19.97% of the site) was designated for biodiversity and landscape protection, where previously no such protections existed.

The letter also outlines a detailed chronology of the planning process, including consultations with Central Coast Council and the NSW Biodiversity Conservation Division, which influenced the evolution of the site's masterplan. This included widening of riparian and landscape corridors, increased tree retention, and the formalisation of biodiversity protections through zoning amendments and the VPA.

For full details, refer to the attached letter from Eco Logical Australia titled "*Avoid and Minimise – Doyalson Wyee Planning Proposal (PP-2021-4334)*" (Appendix I).

Due to significant avoidance measures implemented during the rezoning stage, the Englobo Subdivision DA has been designed to maximise developable land outside the previously established corridors. The Biodiversity Corridors are protected under C2 Environmental Conservation zoning, as well as VPA 2022, and will be managed in accordance with the principles set out in the EVMP (SLR, 2025c).

With respect to the Landscape Corridors the current design (Englobo DA Site Plan - ADW Johnson, 2025b) includes road alignments developed to provide greater certainty regarding the potential impacts on trees retained within the proposed landscape corridors. The Tree Retention (ADW Johnson, 2025c-d) and Landscape Plan (ADW Johnson, 2025e-g) indicate avoidance of 31 hollow-bearing trees and 100 native trees within the Landscape Corridors.



In addition, the Landscape Plans (ADW Johnson, 2025e-g) show establishment of 163 trees and 11,868 shrubs, grasses and groundcovers that are native and mostly local species for planting. The Landscape Corridors are protected under the VPA 2022 and will be managed in accordance with the principles set out by the ELMP (SLR, 2025b).

7.2 Avoid and Minimise Prescribed Impacts

7.2.1 Project Location

The prescribed impact features identified in Section 6.0 include human-made structures, non-native vegetation, and potential impacts on water quality and hydrological processes. Given the degraded condition of much of the Subject Land, along with its history of clearing and planned development, alternative project locations are not considered necessary as a means to avoid or minimise prescribed impacts.

7.2.2 Project Design

With respect to the prescribed impact features identified in Section 6.0, the Englobo Subdivision would involve the removal of human-made structures and exotic vegetation that may provide temporary roosting habitat for threatened species of microbats and the Powerful Owl. These features are unlikely to constitute important breeding habitat for these species, and their removal is not avoided by the proposed Englobo Subdivision. Mitigation measures, such as pre-clearance surveys and clearing protocols, are proposed to minimise impacts on fauna during site clearing and development activities.

The Englobo Subdivision also occurs upstream of swamp habitats that are likely sensitive to hydrological changes. Therefore, a suitable stormwater strategy and modelling will be required. An in-principle EVMP (SLR, 2025c) has been prepared for this application, outlining measures to manage and monitor impacts on retained swamp sclerophyll vegetation. Additionally, a dam de-watering strategy has been included in the EWMP (SLR, 2025d) to reduce impacts on aquatic fauna and receiving environments.

7.3 Other Measures Considered

No other measures were considered in relation to avoiding and minimising project impacts.

7.4 Summary of Measures to Avoid and Minimise Impacts

Table 27 documents the measures to avoid and minimise direct, indirect and prescribed impacts.

Table 27: Avoidance and Minimisation Measures

Action (Avoidance and Minimisation Measures for Direct, Indirect and Prescribed Impacts)	Outcome (Describe the Outcome of Implementing the Measure, with Reference to Specific Entities Identified in Sections 4 And 5)	Timing	Responsibility
Locate development in more degraded and isolated areas of native vegetation and cleared land	Avoid clearing of better condition and connected vegetation along eastern boundary	Design/DA	Proponent, designers
Limit clearing along eastern edge	Minimise direct impacts on Swamp Forest TEC/EC	Design/DA	Proponent, designers



Action (Avoidance and Minimisation Measures for Direct, Indirect and Prescribed Impacts)	Outcome (Describe the Outcome of Implementing the Measure, with Reference to Specific Entities Identified in Sections 4 And 5)	Timing	Responsibility
Stormwater management	Minimise indirect impacts on Swamp Forest TEC/EC	Design/DA	Proponent, engineers
VPA 2022	Enable protection, conservation and enhancement of retained vegetation within Landscape and Biodiversity Corridors covering approximately 9.6 hectares	Pre-approval	Proponent, Council
EWMP	Minimise impacts of vegetation clearing activities and allow for hollow replacement strategy and dam de-watering strategy	Implemented during Construction	Proponent, construction team, project ecologist
EVMP	Enable protection, conservation and enhancement of retained vegetation within the VPA 2022 established Biodiversity Corridors	Implementation to begin at commencement of development of the relevant stage and continue for ten years, allowing for continued management in perpetuity	Landowner, project ecologist
ELMP	Enable protection, conservation and enhancement of retained vegetation within Landscape Corridors	Construction and operation	Landowner, project ecologist



8.0 Impact Assessment

8.1 Direct Impacts

8.1.1 Residual Direct Impacts

Impacts likely to occur on the Subject Land after steps are taken to avoid and minimise impacts are identified in Table 28 and Figure 12.

Table 28: Summary of Residual Direct Impacts

Direct Impact (Describe the Impact on PCT/TEC/EC or threatened species and their habitat)	BC Act Status	EPBC Act Status	SAIL Entity	Project Phase/Timing of Impact (e.g. Construction, Operation, Rehabilitation)	Extent (ha, Number of Individuals)
Clearing of PCT 1636 - Scribbly Gum - Red Bloodwood – <i>Angophora inopina</i> heathy woodland on lowlands of the Central Coast	n/a	n/a	No	Construction	6.13
Clearing of PCT 1638 - Smooth-barked Apple - Red Bloodwood - Scribbly Gum grass - shrub woodland on lowlands of the Central Coast	n/a	n/a	No	Construction	1.96
Clearing of PCT 1717 - Broad-leaved Paperbark - Swamp Mahogany - Swamp Oak - Saw Sedge swamp forest of the Central Coast and Lower North Coast which is Swamp Sclerophyll Forest EEC	E	E	No	Construction	0.32
Clearing of potential habitat for Glossy Black Cockatoo	V	V	No	Construction	7.93
Listing status: E=Endangered, V=Vulnerable					

8.1.2 Change in Vegetation Integrity Score

Table 29 documents the change in vegetation integrity for residual direct impacts on native vegetation, TECs, threatened species and their habitat that were identified on the Subject Land.

The 'Partial Clearing' Management Zone will occur within areas of native vegetation located in the Landscape Corridors - Corridor E and Corridor G. These areas will undergo partial tree retention and planting of new shrubs, grasses and groundcovers, as depicted in the Tree Retention (ADW Johnson, 2025c-d) and Landscape Plans (ADW Johnson, 2025e-g).

The future vegetation integrity scores of the 'Partial Clearing' Management Zone have been modified as follows:

- Composition: Tree layer kept the same as existing; remaining layers reduced to 0
- Structure: Tree layer reduced to 15%; remaining layers reduced to 0
- Function: Large tree and Tree Stem Class scores kept the same as existing; remaining values (litter, length of fallen logs, tree regeneration, high threat weeds) reduced to 0



Table 29 Impacts to Vegetation Integrity

Vegetation Zone	PCT ID	Management Zone	Area (ha)	Before Development				After Development				VI Change	
				Composition	Structure	Function	VI Score	Composition	Structure	Function	VI Score	Change	Total loss
1636_Mod-good	1636	Clear all vegetation	4.56	44.4	52.9	76.4	56.4	0	0	0	0	-56.4	-53.4
1636_Mod-good	1636	Partial clearing	1.57	44.4	52.9	76.4	56.4	5.6	6.5	43.3	11.7	-44.7	
1638_Mod-good	1638	Clear all vegetation	1.93	33	52.4	49.4	44	0	0	0	0	-44	-43.9
1638_Mod-good	1638	Partial clearing	0.03	33	52.4	49.4	44	2.4	6.5	15	6.2	-37.8	
1717_Mod-good	1717	Clear all vegetation	0.32	51.3	61	44.7	51.9	0	0	0	0	-51.9	-51.9



8.2 Indirect Impacts

Table 30 documents the residual indirect impacts (likely to occur on native vegetation, threatened entities and their habitat beyond the Development Footprint). Indirect impact areas are identified on Figure 12 where relevant.



Table 30: Summary of Residual Indirect Impacts (BAM 8.2, 2)

Indirect Impact (Describe Impact, e.g. Transport of Weeds and Pathogens from the Site to Adjacent Vegetation)	Impacted Entities (PCT/Threatened Entity and their Habitats and where relevant, EPBC Act Listing)	Extent (ha or Zone Reference)	Frequency	Duration (Long-Term/ Short-Term/ Medium-Term)	Project Phase/ Timing of Impact (e.g. Construction, Operation, Rehabilitation)	Likelihood and Consequences
<i>2a. Inadvertent impacts on adjacent habitat or vegetation</i>	PCT 1636, PCT 1638, PCT 1717, which represent Swamp Forest EEC and potential habitat for Glossy Black Cockatoo	2.5	Daily for the duration of construction (6m to 2yr). Sporadically during operation.	Long-term	Construction and operation	Low likelihood of occurring and could impact the condition of retained vegetation and habitats
<i>2b. Reduced viability of adjacent habitat due to edge effects</i>	PCT 1636, PCT 1638, PCT 1717, which represent Swamp Forest EEC and potential habitat for Glossy Black Cockatoo	2.5	Daily for the duration of construction (6m to 2yr). Sporadically during operation.	Long-term	Construction and operation	Low likelihood of occurring and could impact the condition of retained vegetation and habitats
<i>2c. Reduced viability of adjacent habitat due to noise, dust or light spill</i>	PCT 1636, PCT 1638, PCT 1717, which represent Swamp Forest EEC and potential habitat for Glossy Black Cockatoo	2.5	Daily for the duration of construction (6m to 2yr). Sporadically during operation.	Long-term	Construction and operation	Moderate likelihood of occurring and could reduce the suitability of directly adjoining habitats for foraging and breeding activities
<i>2d. Transportation of weeds and pathogens from the site to adjacent vegetation</i>	PCT 1636, PCT 1638, PCT 1717, which represent Swamp Forest EEC and potential habitat for Glossy Black Cockatoo	2.5	Monthly	Long-term	Construction and operation	Moderate likelihood of occurring and could result in a reduction in species composition, structure, and function of the retained vegetation
<i>2e. Increased risk of starvation or exposure, and loss of shade or shelter</i>	Glossy Black Cockatoo	2.2	One off	Short term	Construction	Low likelihood of occurring and could result in temporary loss of foraging habitat
<i>2f. Loss of breeding habitat</i>	Glossy Black Cockatoo	2.2	One off	Short term	Construction	Low likelihood of occurring and could result in



Indirect Impact (Describe Impact, e.g. Transport of Weeds and Pathogens from the Site to Adjacent Vegetation)	Impacted Entities (PCT/Threatened Entity and their Habitats and where relevant, EPBC Act Listing)	Extent (ha or Zone Reference)	Frequency	Duration (Long-Term/ Short-Term/ Medium-Term)	Project Phase/ Timing of Impact (e.g. Construction, Operation, Rehabilitation)	Likelihood and Consequences
						temporary loss of breeding habitat
<i>2g. Trampling of threatened flora species</i>	n/a	n/a	n/a	n/a	n/a	n/a
<i>2h. Inhibition of nitrogen fixation and increased soil salinity</i>	n/a	n/a	n/a	n/a	n/a	n/a
<i>2i. Fertiliser drift</i>	n/a	n/a	n/a	n/a	n/a	n/a
<i>2j. Rubbish dumping</i>	PCT 1636, PCT 1638, PCT 1717, which represent Swamp Forest EEC and potential habitat for Glossy Black Cockatoo	2.5	Potentially daily or weekly	Long term	Construction and operation	Moderate likelihood of occurring and could result in reduced vegetation and habitat condition
<i>2k. Wood collection</i>	PCT 1636, PCT 1638, PCT 1717, which represent Swamp Forest EEC and potential habitat for Glossy Black Cockatoo	2.5	Potentially every few months or years	Long term	Construction and operation	Moderate likelihood of occurring and could result in reduced extent and condition of vegetation and habitats
<i>2l. Removal and disturbance of rocks, including bush rock</i>	n/a	n/a	n/a	n/a	n/a	n/a
<i>2m. Increase in predators</i>	Glossy Black Cockatoo	2.2	Daily	Long-term	Operation	Low likelihood of occurring and could result in temporary loss of breeding habitat or death



Indirect Impact (Describe Impact, e.g. Transport of Weeds and Pathogens from the Site to Adjacent Vegetation)	Impacted Entities (PCT/Threatened Entity and their Habitats and where relevant, EPBC Act Listing)	Extent (ha or Zone Reference)	Frequency	Duration (Long-Term/ Short-Term/ Medium-Term)	Project Phase/ Timing of Impact (e.g. Construction, Operation, Rehabilitation)	Likelihood and Consequences
<i>2n. Increase in pest animal populations</i>	n/a	n/a	n/a	n/a	n/a	n/a
<i>2o. Changed fire regimes</i>	PCT 1636, PCT 1638, PCT 1717, which represent Swamp Forest EEC and potential habitat for Glossy Black Cockatoo	2.5	Fires might occur every 5-10 years	Long term	Operation	Moderate likelihood of occurring and could result in reduced extent and condition of vegetation and habitats
<i>2p. Disturbance to specialist breeding and foraging habitat (e.g. beach nesting for shorebirds).</i>	Glossy Black Cockatoo	2.2	Daily	Long-term	Operation	Low likelihood of occurring and could result in temporary loss of breeding and foraging habitat



8.3 Prescribed Impacts

8.3.1 Human-Made Structures

- Nature: Removal of several buildings and structures across the Subject Land could affect threatened micro-bats, being the Large Bent-winged Bat and Little Bent-winged Bat (if present)
- Extent: Human-made structures include the Doyalson RSL Club building, a small dwelling and shed, shipping containers and obstacle course structures which occupy a small portion of the Subject Land and represent a very small percentage of similar habitats that are available in the locality
- Duration: Short-term loss of bat roosting habitat. It is not expected that a long-term impact would occur unless bats were killed in demolition.
- Consequences: Bats killed in demolition.

8.3.2 Non-Native Vegetation

- Nature: Removal of non-native vegetation could affect foraging and roosting behaviours of the ecosystem credit species which could forage/perch across the site (such as Powerful Owl, White-bellied Sea-Eagle, Squirrel Glider, Grey-headed Flying Fox, Eastern Osprey, microbats)
- Extent: Non-native vegetation represents various patches of planted vegetation and weeds that occur across approximately 2.5ha of the Subject Land
- Duration: Short term during construction
- Consequences: Removal of potential foraging and perching habitats could result in overall reduction in available foraging habitat for the population. It is likely that there are many other areas of non-native vegetation that represent potential foraging and roosting habitat for threatened fauna species in the locality. As such, the consequence for local threatened fauna species of removing non-native vegetation within the Subject Land is minor.

8.3.3 Waterbodies, Water Quality and Hydrological Processes

- Nature: Impacts to water bodies, water quality and hydrological processes could affect the condition of receiving waters and adjoining swamp forest vegetation, as well as watering habitat for threatened species of fauna
- Extent: The extent of retained swamp forest vegetation which is down slope of the Englobo Subdivision is approximately 1.5 hectares. The extent of waterbodies is shown in Figure 1.
- Duration: Short term during construction and long-term during operation
- Consequences: Impacts on water bodies, water quality and hydrological processes could lead to erosion, sedimentation, pollution, increased phosphorous in soils, weed invasion and changes to native species composition. Removal of artificial waterbodies could result in an overall reduction in available watering habitat for threatened species of fauna. It is likely that there are many other waterbodies representing potential watering habitat for threatened fauna species in the locality. As such, the consequence for local threatened fauna species of removing the degraded waterbodies from within the Subject Land is minor.



- Maximum predicted offset liability: not applicable as the proposed Englobo Subdivision is not in relation to longwall mining

8.4 Mitigating Residual Impacts – Management Measures and Implementation

Proposed mitigation and management measures are identified in Table 31 and further details are provided in Table 32.



Table 31: Summary of Proposed Mitigation and Management Measures for Residual Impacts (Direct, Indirect and Prescribed)

Impact / BAM Section	Mitigation measure (specify if none proposed and ensure an adaptive management strategy is developed and addressed in Section 1.1)	Method/ technique	Timing	Frequency	Responsibility	Likely efficacy (including risk of failure)	MNES (when relevant)
Fauna displacement (BAM 8.4.1, 2)	<i>2a. Timing works to avoid critical life cycle events, such as breeding or nursing</i>	Survey for Glossy Black Cockatoo breeding; delay clearing if breeding is confirmed	Within breeding season (Jan-Sep), and within 1-month before clearing	Once per clearing event, repeat if delayed	Proponent, construction team, ecologist	High efficacy, low risk of failure	Yes
	<i>2b. Instigating clearing protocols, including pre-clearing surveys, daily surveys and staged clearing, and using a trained ecologist or licensed wildlife handler during clearing events</i>	Pre-clearing and daily surveys; staged clearing; ecologist or licensed wildlife handler present; rescue and care measures	Pre-clearance: within 1 month prior; surveys/ rescue during clearing	One off and daily or weekly during clearing	Proponent, construction team, ecologist	High efficacy, low risk of failure	n/a
	<i>2c. Relocating habitat features (e.g. fallen timber, hollow logs) from the development or clearing site, to adjacent retained vegetation</i>	Survey and map habitat features; implement Nest Box/Hollow Relocation Plan. Supervise relocation during clearing.	Surveys: within 1-month prior; relocation: during clearing or within 1-month post-clearing	One off	Proponent, construction team, ecologist	High efficacy, low risk of failure	n/a
Indirect impacts on native vegetation and habitats	<i>3a. Adoption of clearing protocols that identify vegetation to be retained, prevent inadvertent damage and reduce soil disturbance; for example, a chainsaw is preferable to heavy machinery to remove native vegetation for partial clearing</i>	Clearing protocols	During any vegetation clearance	One off during clearing	Proponent, construction team, ecologist	High efficacy, low risk of failure	n/a



Impact / BAM Section	Mitigation measure (specify if none proposed and ensure an adaptive management strategy is developed and addressed in Section 1.1)	Method/ technique	Timing	Frequency	Responsibility	Likely efficacy (including risk of failure)	MNES (when relevant)
(BAM 8.4.1, 3)	<i>3b. Using noise barriers, or daily/seasonal timing of construction and operational activities to reduce impacts of noise</i>	Noise controls adopted if threatened species nesting is detected	Construction	Daily for duration of construction	Proponent, construction team, ecologist	High efficacy, low risk of failure	n/a
	<i>3c. Using light shields, or daily/seasonal timing of construction and operational activities to reduce impacts of light spill</i>	Light shields and limit evening works	Construction	Duration of construction	Proponent, construction team, ecologist	High efficacy, low risk of failure	n/a
	<i>3d. Using adaptive dust management and monitoring programs to control air quality</i>	Include speed limits, dust suppressants, and wind-based activity restrictions	Construction	One off	Proponent, construction team, ecologist	High efficacy, low risk of failure	n/a
	<i>3e. Scheduling the timing of construction activities to avoid impacts (e.g. timing the construction for when migratory species are not at the site, or when particular species known to, or likely to use the habitat on the site, are not breeding or nesting)</i>	Glossy Black Cockatoo breeding surveys and contingency delays	Breeding season during construction	Monthly during construction	Proponent, construction team, ecologist	High efficacy, low risk of failure	n/a
	<i>3f. Erecting temporary fencing to protect significant environmental features, such as riparian zones</i>	Fencing plan	Pre-construction	One off	Proponent, construction team, ecologist	High efficacy, low risk of failure	n/a
	<i>3g. Using hygiene protocols to prevent the spread of weeds or pathogens between infected and uninfected areas</i>	Hygiene protocols	Construction	Duration of construction	Proponent, construction team, ecologist	High efficacy, low risk of failure	n/a



Impact / BAM Section	Mitigation measure (specify if none proposed and ensure an adaptive management strategy is developed and addressed in Section 1.1)	Method/ technique	Timing	Frequency	Responsibility	Likely efficacy (including risk of failure)	MNES (when relevant)
	<i>3h. Training staff and conducting site briefings to communicate environmental features to be protected and measures to be implemented</i>	Site briefings on retained vegetation	Construction	Duration of construction	Proponent, construction team, ecologist	High efficacy, low risk of failure	n/a
	<i>3i. Preparing a vegetation management plan to regulate activity in vegetation and habitats adjacent to residential developments. The plan may include controls on pet ownership, rubbish disposal, wood collection, fire management, and disturbance to nests and other niche habitats</i>	Prepare VMP/pamphlet for residents	Pre-construction certificate	One off	Proponent, ecologist	High efficacy, low risk of failure	n/a
	<i>3j. Providing for the ecological restoration, rehabilitation and/or ongoing maintenance of retained native vegetation habitat on, or adjacent to, the development or clearing site</i>	Conservation agreement and EVMP	Pre-DA approval	One off	Proponent, planner, ecologist	High efficacy, low risk of failure	n/a
<i>Prescribed Impacts (BAM 8.4.2, 1)</i>	<i>1a. Scheduling the timing of construction activities to avoid critical life cycle events (e.g. timing construction activities to avoid migratory species on site, or using the site)</i>	Conduct seasonal surveys of human-made structures for microbat breeding; delay demolition if breeding is detected	Within correct season, 2 days before demolition	One off	Proponent, construction team, ecologist	High efficacy and low risk of failure	n/a
	<i>1b. Instigating clearing protocols, including pre-clearing surveys, daily surveys and staged clearing, and using a trained ecologist or licensed wildlife handler during clearing, construction and</i>	Pre-clearance and daily surveys; fauna rescue during demolition and vegetation clearing;	Pre-clearance: within 1 month; Daily: during demolition/clearing	One off and daily	Proponent, construction team, ecologist	High efficacy and low risk of failure	n/a



Impact / BAM Section	Mitigation measure (specify if none proposed and ensure an adaptive management strategy is developed and addressed in Section 1.1)	Method/ technique	Timing	Frequency	Responsibility	Likely efficacy (including risk of failure)	MNES (when relevant)
	<i>maintenance activities for human-made structures and non-native vegetation</i>	dam de-watering protocols					
	<i>1c. Retaining habitat features (e.g. fallen timber, hollow logs, rocks) within the subject land, or relocating them to adjacent retained remnant vegetation</i>	Retain trees/vegetation per landscape plan where feasible.	Construction and Operation	One off	Proponent, construction team, landscape planner, site operator	High efficacy and low risk of failure	n/a
	<i>1d. Installing artificial connectivity measures (e.g. glider poles, rope crossings, habitat bridges) to re-establish connections between habitat and favoured transport corridors</i>	n/a	n/a	n/a	n/a	n/a	n/a
	<i>1e. Erecting temporary fencing to protect significant environmental features, such as karst, caves, rock outcrops and water bodies</i>	n/a	n/a	n/a	n/a	n/a	n/a
	<i>1f. Replacing habitat provided by human-made structures and non-native vegetation with alternative habitat</i>	n/a	n/a	n/a	n/a	n/a	n/a
	<i>1g. Using sediment barriers or sedimentation ponds to control the quality of water released from the site into the receiving environment</i>	Install sediment barriers and ponds per engineering specifications	Construction and operation	One-off installation, ongoing maintenance	Proponent, construction team, site operator	High efficacy and low risk of failure	n/a
	<i>1h. Training staff and conducting site briefings to communicate environmental</i>	Conduct briefings with maps/ photos/ inspections of prescribed impact	Before construction begins	One-off, with refreshers as needed	Proponent, construction team, ecologist	High efficacy and low	n/a



Impact / BAM Section	Mitigation measure (specify if none proposed and ensure an adaptive management strategy is developed and addressed in Section 1.1)	Method/ technique	Timing	Frequency	Responsibility	Likely efficacy (including risk of failure)	MNES (when relevant)
	<i>features to be protected and the measures implemented to protect them</i>	features to be managed or protected				risk of failure	
	<i>1i. Ecological restoration, rehabilitation actions and/or maintenance of retained native vegetation on, or adjacent to, the subject land</i>	n/a	n/a	n/a	n/a	n/a	n/a
	<i>1j. Development control measures that regulate the types of activities that can occur in native vegetation and habitat adjacent to residential development, including prohibiting the collection of bush rocks</i>	n/a	n/a	n/a	n/a	n/a	n/a

Table 32: Implementation of Mitigation Measures for Fauna Displacement

Mitigation Measure	Action	Monitoring and Evaluation Strategy (Data, Frequency, Timing and Reporting)	Performance Criteria (Linked to Monitoring and Evaluation Strategy)	Adaptive Management Threshold (Trigger for Adaptive Management Plan/Actions)	Adaptive Management Response (When Triggered)
2a Timing Works to Avoid Critical Life Cycle Events	Conduct and report pre-clearance breeding survey for Glossy Black Cockatoo	Include results in compliance report; audit if breeding found	No clearing during active breeding; no disturbance to nests or young	Evidence of breeding (e.g. nesting, dependent young)	Postpone clearing until breeding ends
2b. Instigating Clearing Protocols	Ecological pre-clearance survey	Once before construction; report outcomes	No fauna deaths during clearing	Breeding evidence found	Delay clearing; implement fauna rescue plan



Mitigation Measure	Action	Monitoring and Evaluation Strategy (Data, Frequency, Timing and Reporting)	Performance Criteria (Linked to Monitoring and Evaluation Strategy)	Adaptive Management Threshold (Trigger for Adaptive Management Plan/Actions)	Adaptive Management Response (When Triggered)
	Stage clearing limiting to 1-ha per week	Mapped and documented in post-construction report	No whole site clearing	Fauna remains after scheduled interval	Extend interval; monitor fauna; apply deterrents or relocate
	Restrict clearing to daylight hours	Documented in post-construction report	No clearing during nocturnal activity	Clearing occurs at night	Revise schedule to comply
	Guide fauna toward safe habitat	Document in post-construction report	No fauna deaths from hazard-directed clearing	Clearing directed toward roads or disturbed areas	Adjust clearing direction; update clearing maps and crew instructions
	Monitor and rescue fauna	Daily during clearing; report outcomes	No fauna deaths	Wildlife injury or displacement	Relocate/rehabilitate fauna; dismantle trees sectionally
2c Relocating Habitat Features	Identify and map habitat features	Survey and mapping report 1-month prior to clearing	Habitat features identified and documented	Habitat features missed during initial survey	Conduct follow-up survey; update habitat mapping
	Oversee and document relocation	Report with mapped features	Habitat features successfully relocated	Improper or incomplete relocation of habitat features	Reassess and adjust relocation process

Table 33: Implementation of Mitigation Measures for Indirect Impacts

Mitigation Measure	Action	Monitoring and Evaluation Strategy (Data, Frequency, Timing and Reporting)	Performance Criteria (Linked to Monitoring and Evaluation Strategy)	Adaptive Management Threshold (Trigger for Adaptive Management Plan/Actions)	Adaptive Management Response (When Triggered)
3a Clearing Protocols	Fence off retained vegetation with chain mesh and sediment fencing	Pre-clearance survey, photos, and report	No accidental clearing	Accidental clearing occurs	Prompt native vegetation rehabilitation



Mitigation Measure	Action	Monitoring and Evaluation Strategy (Data, Frequency, Timing and Reporting)	Performance Criteria (Linked to Monitoring and Evaluation Strategy)	Adaptive Management Threshold (Trigger for Adaptive Management Plan/Actions)	Adaptive Management Response (When Triggered)
	Use hand chainsaw in asset protection zones where feasible	Map and document clearing report	Native vegetation retained in protection zones	Insufficient vegetation retention	Review methods and enhance retention efforts
3b Noise Barriers	Install noise barriers between retained vegetation and works area	Daily monitoring of nesting species; report findings	No disturbance to breeding	Breeding disturbance observed	Enhance or relocate barriers
	Reschedule noisy activities; reinforce noise controls	Daily monitoring; report findings	No disturbance to breeding	Breeding disturbance observed	Adjust schedule and strengthen mitigation
	Restrict evening activities	Daily monitoring; report findings	No disturbance to nocturnal foraging	Nocturnal disturbance observed	Further restrict evening works; increase monitoring
3c Reduce Lighting Spill	Use directional lighting; switch off unnecessary lights	Evening inspections; post-construction report	No visible light spill; no disruption to nocturnal fauna	Light spill into adjoining vegetation	Adjust lighting setup; continue monitoring
3d Reduce Dust	Enforce speed limits; use water tankers on unpaved roads; cover or treat soil stockpiles	Inspect vegetation; post-construction report	No visible dust on vegetation	Dust observed on vegetation	Enhance dust control measures and continue monitoring
3e Timing of Construction	Survey for Glossy Black Cockatoo breeding signs	Pre-construction survey; report findings	No impact on breeding season	Breeding detected	Avoid construction Jan-Sep; identify nest tree and mitigate impacts
3f Temporary Fencing	Install chain mesh fencing around retained vegetation	Inspect and photograph pre- and during construction	Fencing remains intact; no accidental clearing	Fencing failure or clearing occurs	Repair fencing; rehabilitate disturbed area
3g Hygiene Protocols	Clean vehicles, equipment, footwear, and clothing before site entry	6-monthly weed surveys; post-construction report	No weed encroachment into retained vegetation	Weeds detected in retained vegetation	Construction team to remove weeds



Mitigation Measure	Action	Monitoring and Evaluation Strategy (Data, Frequency, Timing and Reporting)	Performance Criteria (Linked to Monitoring and Evaluation Strategy)	Adaptive Management Threshold (Trigger for Adaptive Management Plan/Actions)	Adaptive Management Response (When Triggered)
	Dispose of weeds appropriately during construction	Site inspections every 6-months; outcomes in post-clearing report	No weeds on site	Weeds detected on-site	Construction team to remove weeds
3h Environmental Site Briefings	Highlight sensitive areas in all briefings	Inspect retained vegetation every 6 months during construction; report in post-clearing report	No staff-related damage to retained vegetation	Signs of staff-related damage (e.g. dumping, stockpiling)	Rehabilitate areas; reinforce briefings; add signage if needed
3i Vegetation Management Plan	Distribute VMP/pamphlet to residents	Include vegetation monitoring in VMP	No resident impacts on biodiversity or corridors	Resident impacts detected (e.g. clearing, dumping)	Notify residents; reinforce education; install signage
3j Management of Retained Native Vegetation Habitat	Retain and rehabilitate all vegetation strata in Biodiversity Corridors	Implement VMP from development start; monitor every 6 months (Years 1-3), then annually to Year 10 or until Council confirms completion	No decline in vegetation condition; all strata present	Decline in condition or missing strata	Increase weed control and native planting efforts
	Monitor vegetation against BioNet benchmarks	Use BAM plots; report every 6 months (Years 1-3), then annually to Year 10	Minimal change in vegetation condition	Reduction in condition detected	Intensify restoration and maintenance activities



Table 34: Implementation of Mitigation Measures for Prescribed Impacts

Mitigation Measure	Action	Monitoring and Evaluation Strategy (Data, Frequency, Timing and Reporting)	Performance Criteria (Linked to Monitoring and Evaluation Strategy)	Adaptive Management Threshold (Trigger for Adaptive Management Plan/Actions)	Adaptive Management Response (When Triggered)
1a Timing Construction to Avoid Critical Life Cycle Events	Avoid demolition during Bent-winged Bat breeding season (Dec–Feb) if microbats are found	One-off survey of structures 2 days before demolition; report outcomes	No deaths of threatened microbat species	Microbats found in structures	Halt demolition, assess breeding activity, and reschedule works outside the breeding season
1b Clearing Protocols	Ecologist to inspect structures, vegetation and dams 2 days before demolition	One-off survey of impact areas; report outcomes	No deaths of threatened species	Threatened species found	Suspend works, implement fauna rescue or relocation, and adjust timing or methods
	Ecologists present during dam de-watering	One-off monitoring during de-watering; report outcomes	Minimise aquatic fauna deaths	Aquatic fauna observed	Pause de-watering, conduct salvage operations, and modify techniques to reduce impact
1c Retaining Habitat Features	Retain trees/vegetation within Development Footprint where feasible	One-off check before construction certificate issued; report outcomes	Vegetation retained within footprint	Proposed removal of retained habitat	Explore design alternatives, consult with ecologist
1g Sediment Barriers or Ponds	Install and maintain sediment controls before and during works	Inspect weekly and after rain	No visible sediment	Evidence of sedimentation and erosion	Enhance sediment controls; review erosion and drainage plans
1h Environmental Site Briefings	Deliver induction identifying prescribed impact features (Swamp Forest EEC, structures and non-native vegetation)	Features managed correctly during demolition and construction	All staff trained; correct management of sensitive features	Staff misidentify features or repeated breaches	Retrain staff; increase briefing frequency; update materials



Residual direct impacts require further assessment for SAI (BAM Section 9.1) and to determine a credit requirement (BAM Section 9.2). Residual indirect or prescribed impacts for which no mitigation measures are proposed require an adaptive management strategy (BAM Section 8.5). Other indirect and prescribed impacts that remain after the avoid, minimise and mitigate steps have been applied, may be offset using additional biodiversity credits (above the credit requirement generated by the BAM-C for direct impacts) and/or other conservation measures.

8.5 Adaptive Management of Uncertain Impacts

An adaptive management plan can be used to address impacts that are infrequent or difficult to measure. These include indirect or prescribed impacts, or other remaining biodiversity impacts. The proponent must develop an adaptive management plan to address any remaining impacts where mitigation measures have not been proposed. SLR is of the opinion that all indirect, prescribed, or other residual biodiversity impacts are minor in nature and/or will be sufficiently mitigated and managed by implementing measures outline in this BDAR. As such an adaptive management plan is not proposed.

8.6 Koala Habitat Protection SEPP

The *State Environmental Planning Policy (Koala Habitat Protection) 2021* (the 'Koala SEPP') commenced on 17 March 2021 and reinstates the policy framework of *SEPP Koala Habitat Protection 2019* to 83 LGAs in NSW.

For DAs, the Koala SEPP applies in LGAs that do not have an approved Koala Plan of Management, if:

- the Subject Land is more than one hectare
- the Subject Land is located within an LGA that the Koala SEPP applies to
- the proposed development requires development consent from council

As the Subject Land is more than one hectare, is within the Central Coast LGA (which is one of the LGAs to which the Policy applies) and requires development consent from Council, the Koala SEPP applies to the Englobo Subdivision. As such a suitably qualified ecological consultant is required to determine whether the Subject Land contains "*core koala habitat*" and may be required to undertake a "*koala assessment report*".

The Koala SEPP defines "*core koala habitat*" as:

- an area of land which has been assessed by a suitably qualified and experienced person as being highly suitable koala habitat and where koalas are recorded as being present at the time of assessment of the land as highly suitable koala habitat, or
- an area of land which has been assessed by a suitably qualified and experienced person as being highly suitable koala habitat and where koalas have been recorded as being present in the previous 18 years

The Koala SEPP 2021 Factsheet for development applications (DPIE, 2021) defines "*highly suitable habitat*" as "*where 15% or greater of the total number of trees within any Plant Community Type (PCT) are the regionally relevant species of those listed in Schedule 2 of the SEPP*". The factsheet (DPIE, 2021) defines "*an area of land*" as "*including both the development footprint and the surrounding area that may have indirect impacts from the development (that is contained within the subject lot and adjoining land within the same ownership)*". As such for the purposes of this assessment the "*Subject Land*" is considered the "*area of land*".



The Subject Land was found to contain the following trees that are Koala use tree species for the Central Coast Koala Management Area: *Allocasuarina littoralis*, *Angophora costata*, *Eucalyptus haemastoma*, *Eucalyptus racemosa*, *Eucalyptus sclerophylla*, *Eucalyptus umbra*, *Melaleuca quinquenervia* and *Casuarina glauca*. BAM plots indicate that these species occur at 15% or greater of the total number of trees across the vegetated portions of the Subject Land. As such SLR determined that the Subject Land is “*highly suitable habitat*” for the Koala.

To determine Koala presence within the “*area of land*”, targeted surveys for the Koala in accordance with the BAM methods (DPE, 2022b) were undertaken by SLR in April 2023, involving spotlighting and SAT surveys. These surveys did not detect the Koala, or any evidence of the Koala within the habitat on the Subject Land (i.e. Koalas, or their scats or scratches were not detected).

In relation to whether Koalas have been recorded as being present within the “*area of land*” in the previous 18 years, there are no recent records of the Koala within the Subject Land (see below Map Extract 1 of BioNet Atlas mapping). The nearest record of the Koala is located approximately 1km to the west of the Subject Land and the BioNet Atlas data indicates that the record is a 2017 wildlife rehabilitation record of a motor vehicle collision with a Koala. Despite the record being an apparent deceased Koala, there remains evidence of the Koala nearby to the Subject Land, but not within “*the area of land*” relevant to this assessment.

Therefore, despite the Subject Land containing Koala use tree species there is no evidence of Koala presence (either current or within the last 18 years) within the “*area of land*”. In addition:

- The Subject Land (and Central Coast generally) is not mapped as a regionally significant Koala area, according to the Areas of Regional Koala Significance mapping (DPE, 2018)
- The Subject Land (and Central Coast generally) is mapped with a “low” Koala likelihood (DPE 2019)

As such, the Subject Land and adjoining areas are not considered to represent “*core koala habitat*” and a “*koala assessment report*” is not required.



Map Extract 1: Wildlife Atlas Records for Koala within the Past 18 Years (DPE, 2023b)



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9.0 Serious and Irreversible Impacts

For this assessment there are no relevant serious and irreversible impact entities.

10.0 Impact Summary

10.1 Determine an Offset Requirement for Impacts

10.1.1 Impacts on Native Vegetation and TECs or ECs (Ecosystem Credits)

Table 35 identifies impacts on native vegetation and TECs or ECs that do not require an offset (as per BAM Subsection 9.2.1(3.)).

Table 36 identifies impacts that require an offset (as per BAM Subsection 9.2.1(1.)).
Thresholds for assessment and offsetting impacts are identified in Figure 15.



Table 35: Impacts that Do Not Require Offset – Ecosystem Credits

Vegetation Zone	PCT Name	TEC	Impact Area (ha)	TEC Association	Entity at Risk of an SAI?	Current VI Score
n/a	n/a	n/a	n/a	n/a	No	n/a

Table 36: Impacts that Require an Offset – Ecosystem Credits

Vegetation Zone	PCT Name	TEC	Impact Area (ha)	Current VI Score	Future VI Score	Change In VI Score	Biodiversity Risk Weighting	Number Of Ecosystem Credits Required
1636_Mod good	Scribbly Gum - Red Bloodwood – Angophora inopina heathy woodland on lowlands of the Central Coast	n/a	6.13	56.4	3	-53.4	1.75	143
1638 Mod good	Smooth-barked Apple - Red Bloodwood - Scribbly Gum grass - shrub woodland on lowlands of the Central Coast	n/a	1.96	44	0.1	-43.9	1.75	38
PCT 1717 Moderate-good	Broad-leaved Paperbark - Swamp Mahogany - Swamp Oak - Saw Sedge swamp forest of the Central Coast and Lower North Coast	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	0.32	51.9	0	51.9	2.00	8
Total credits								189



10.1.2 Impacts on Threatened Species and Their Habitat (Species Credit)

Table 37 identifies impacts on threatened species (species credits) that require an offset (as per BAM Subsection 9.2.2(2.)).

Table 37: Impacts that Require an Offset – Species Credits

Common Name	Scientific Name	BC Act Status	EPBC Act Status	Loss of Habitat (ha) or Individuals	Biodiversity Risk Weighting	Number of Species Credits Required
Glossy Black Cockatoo	<i>Calyptrorhynchus lathamii</i>	Vulnerable	Vulnerable	7.93	2.00	205
Total credits						205

10.1.3 Indirect and Prescribed Impacts

The retirement of biodiversity credits may be used with other conservation measures to mitigate prescribed impacts or the indirect impacts of a proposal on areas of native vegetation, TECs and/or threatened species, or their habitat adjacent to the Subject Land. SLR is of the opinion that all indirect and prescribed impacts are minor in nature and/or will be sufficiently mitigated and managed by implementing measures outlined in this BDAR.

As such, additional biodiversity credits to mitigate indirect or prescribed impacts are not proposed.

10.2 Impacts that Do Not Need Further Assessment

Table 38 identifies impacts that do not need further assessment for ecosystem credits (as per BAM Section 9.3(1-2.)). These areas are also identified in Figure 15.

Table 38: Impacts That Do Not Need Further Assessment for Ecosystem Credits

Impact	Location Within Subject Land	Justification Why No Further Assessment Is Required
Non-native Vegetation and Planted Native Vegetation	Various locations scattered across Subject Land	Assessed as prescribed impact
Cleared Land	Most of the Subject Land	No native vegetation or habitats for threatened species present



11.0 Biodiversity Credit Report

The Biodiversity Credit Report for the project is included in Appendix H.

Biodiversity credits that share the same attributes form a class of credits. The credit classes for ecosystem credits and species credits are presented in Table 39 and Table 40.



Table 39: Ecosystem Credit Class and Matching Credit Profile

Ecosystem Credit	Attributes Shared with Matching Credits						
	PCT Name	PCT Vegetation Class	PCT Vegetation Formation	Associated TEC Or EC	Offset Trading Group (BAM Section 10.2, Tables 4 & 5)	Hollow Bearing Trees Present?	IBRA Subregion (In which Proposal is Located)
PCT 1636	Scribbly Gum - Red Bloodwood – <i>Angophora inopina</i> heathy woodland on lowlands of the Central Coast	Sydney Coastal Dry Sclerophyll Forests	Dry Sclerophyll Forests (Shrubby sub-formation)	n/a	Sydney Coastal Dry Sclerophyll Forests >=50% and <70%	Yes	Wyong
PCT 1638	Smooth-barked Apple - Red Bloodwood - Scribbly Gum grass - shrub woodland on lowlands of the Central Coast	Sydney Coastal Dry Sclerophyll Forests	Dry Sclerophyll Forests (Shrubby sub-formation)	n/a	Sydney Coastal Dry Sclerophyll Forests >=50% and <70%	No	Wyong
PCT 1717	Broad-leaved Paperbark - Swamp Mahogany - Swamp Oak - Saw Sedge swamp forest of the Central Coast and Lower North Coast	Coastal Swamp Forests	Forested Wetlands	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	No	Wyong

Table 40: Species Credit Class and Matching Credit Profile

Species Credit	Attributes Shared with Matching Credits				
	Name Of Threatened Species	Kingdom	BC Act Status	EPBC Act Status	IBRA Region (In Which Proposal is Located)
Glossy Black Cockatoo	<i>Calyptorhynchus lathami</i>	Fauna	Vulnerable	Vulnerable	Wyong



12.0 References

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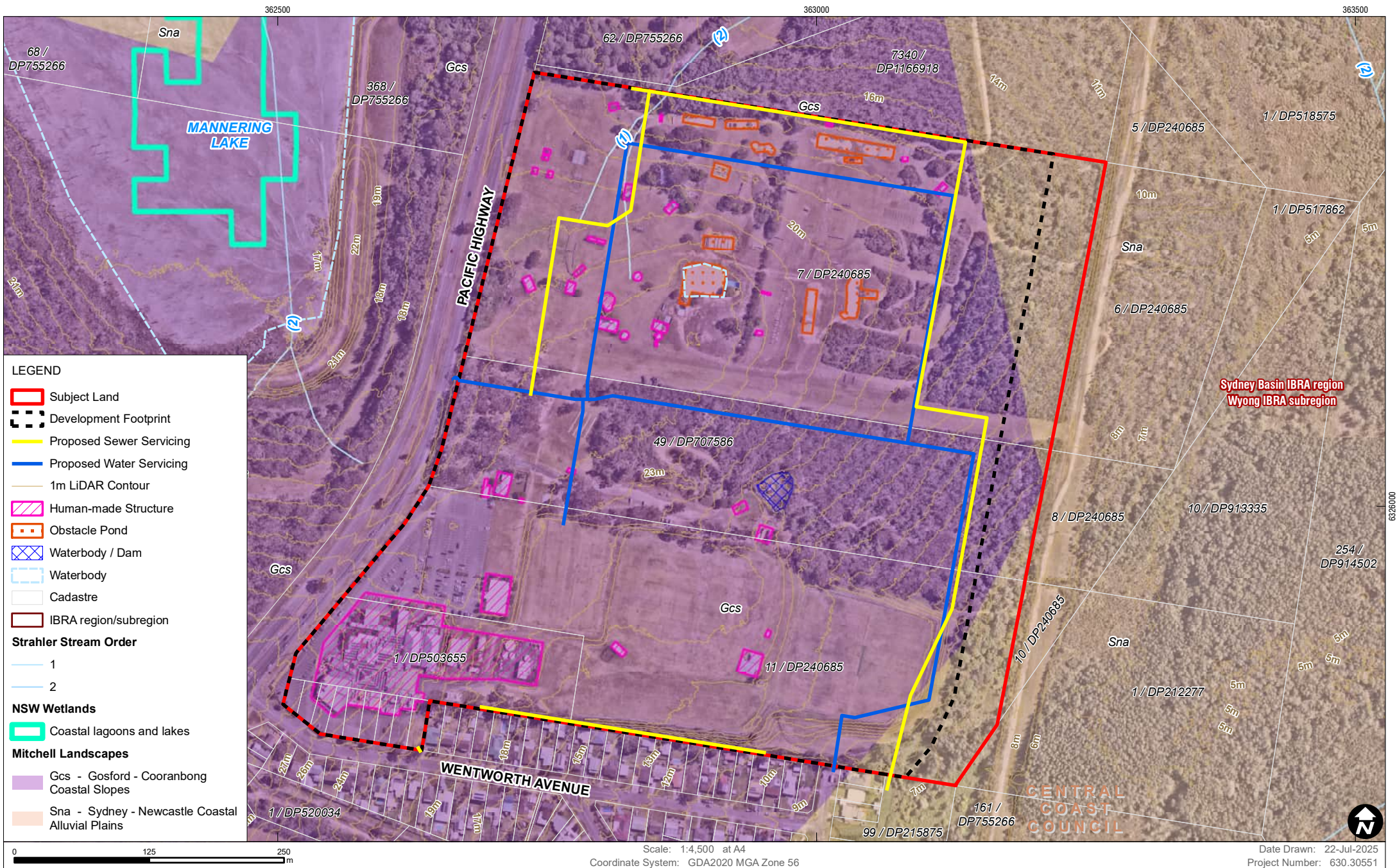
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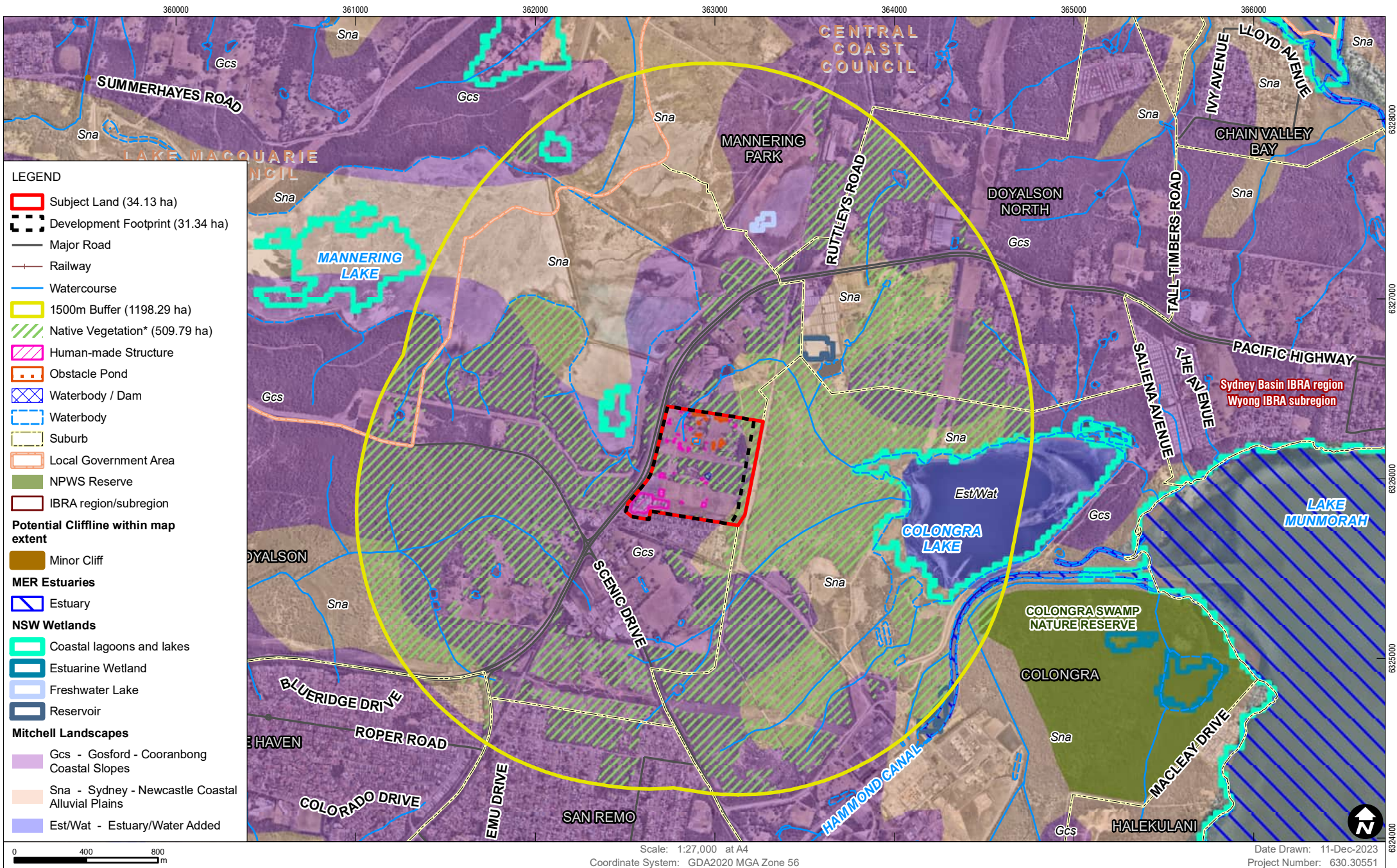




Data Source: NSW SS, March 2023, Aerial imagery supplied by Nearmap, October 2023
 Elevation data DFSI Spatial Services 2014/2015
 Mitchell Landscapes © State Government of NSW and Department of Planning, Industry and Environment 2016, IBRA Regions Australian Government Department of Agriculture, Water and the Environment.
 NSW wetlands (Office of Environment and Heritage NSW)

SITE MAP

FIGURE 1

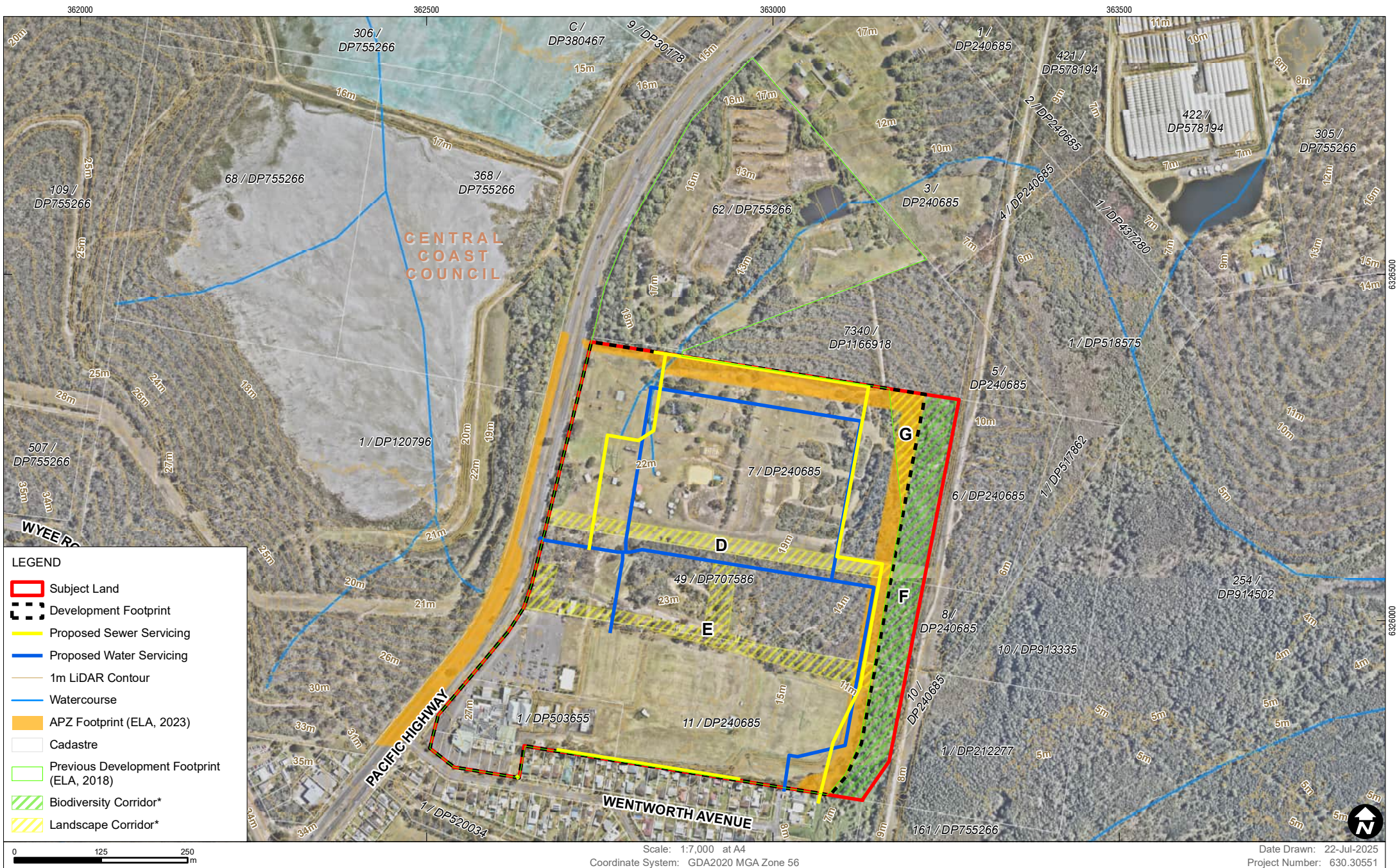


Data Source: NSW SS, March 2023, Aerial imagery supplied by Nearmap, October 2023, Elevation data DFSI Spatial Services 2014/2015 Mitchell Landscapes © State Government of NSW and Department of Planning, Industry and Environment 2016, IBRA Regions Australian Government Department of Agriculture, Water and the Environment.
* Native Vegetation: *The State Vegetation Type Map (SVTM) C1.1.M1.1 © State Government of NSW and Department of Planning and Environment 2022, Aerial Photo Interpretation, SLR assumed native vegetation and site PCTs
Estuaries (Monitoring, Evaluation and Reporting (MER) Program) (DECCW), NSW wetlands (Office of Environment and Heritage NSW)

LOCATION MAP

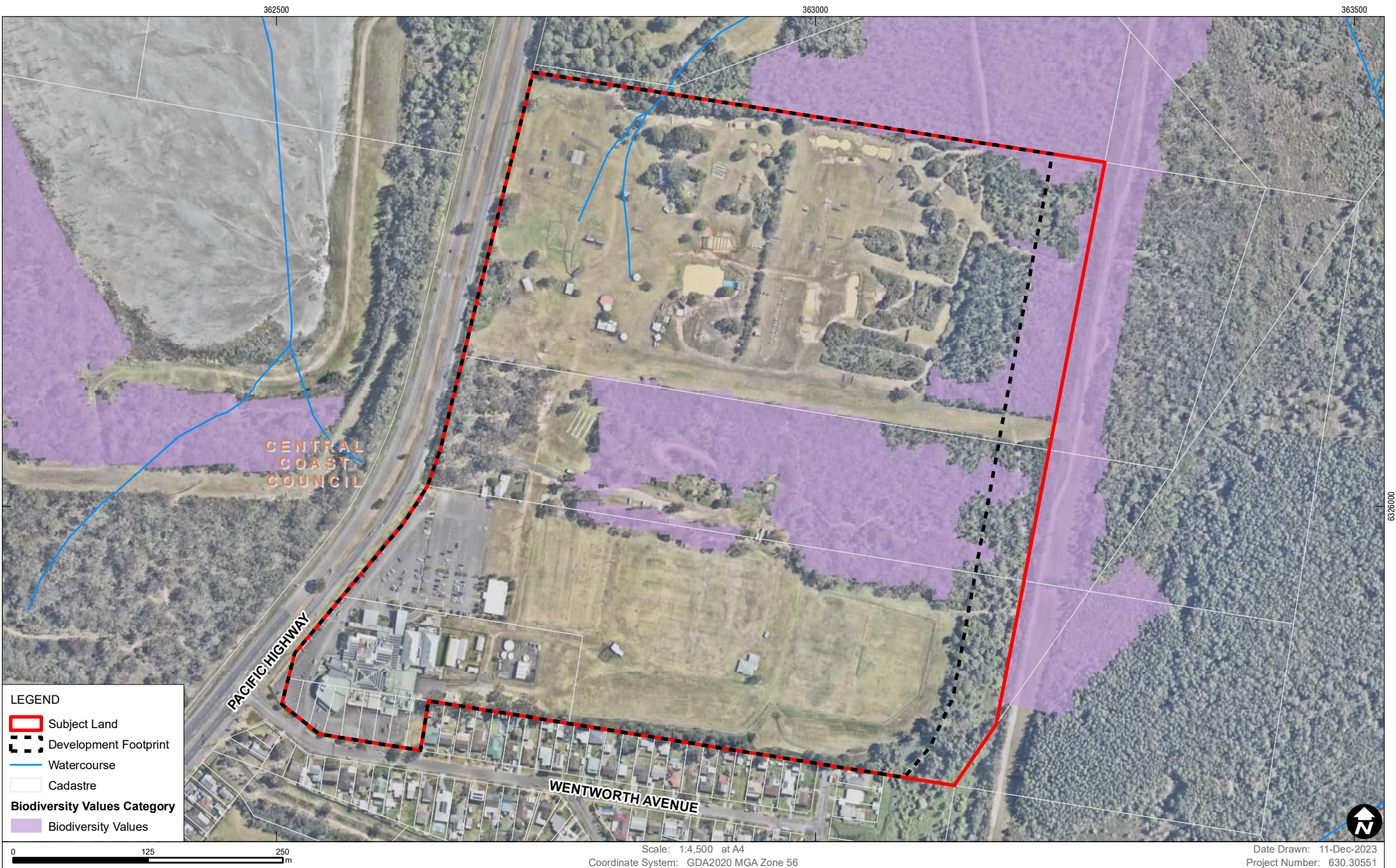
FIGURE 2





Data Source: NSW SS, March 2023
 Aerial imagery supplied by Nearmap, October 2023
 * Note: the Landscape Corridors are derived from Annexure B of the Voluntary Planning Agreement between Central Coast Council and Doyalson Wyee RSL Club Limited dated May 22.





Data Source: NSW SS, March 2023, Aerial imagery supplied by Nearmap, October 2023
 Biodiversity Values Map © State Government of NSW and Department of Planning and Environment 2018 (Version 15, 29/03/2023)



BIODIVERSITY VALUES MAP

FIGURE 4

Figure 5: Excluded Impacts (n/a)





Data Source: NSW SS, March 2023
Aerial imagery supplied by Nearmap, October 2023
Eco Logical Australia, 2018. 80 – 120 Pacific Highway,
Doyalson. Prepared for Doyalson Wyee RSL Club



FIELD SURVEY LOCATIONS FLORA

FIGURE 6a



Data Source: NSW SS, March 2023
 Aerial imagery supplied by Nearmap, October 2023
 Eco Logical Australia, 2018. 80 – 120 Pacific Highway,
 Doyalson. Prepared for Doyalson Wyee RSL Club

FIELD SURVEY LOCATIONS FAUNA

FIGURE 6b



Data Source: NSW SS, March 2023
Aerial imagery supplied by Nearmap, October 2023
Eco Logical Australia, 2018. 80 – 120 Pacific Highway,
Doyalson. Prepared for Doyalson Wyee RSL Club



**FIELD SURVEY LOCATIONS
KOALA SAT**

FIGURE 6c



Data Source: NSW SS, March 2023
Aerial imagery supplied by Nearmap, October 2023
*Plant Community Types (Eco Logical Australia, 2018. 80 – 120 Pacific Highway, Doyalson. Prepared for Doyalson Wyee RSL Club)



NATIVE VEGETATION EXTENT

FIGURE 7



Data Source: NSW SS, March 2023
Aerial imagery supplied by Nearmap, March 2023
*Plant Community Types (Eco Logical Australia, 2018. 80 – 120 Pacific Highway, Doyalson. Prepared for Doyalson Wyee RSL Club)



PLANT COMMUNITY TYPES

FIGURE 8

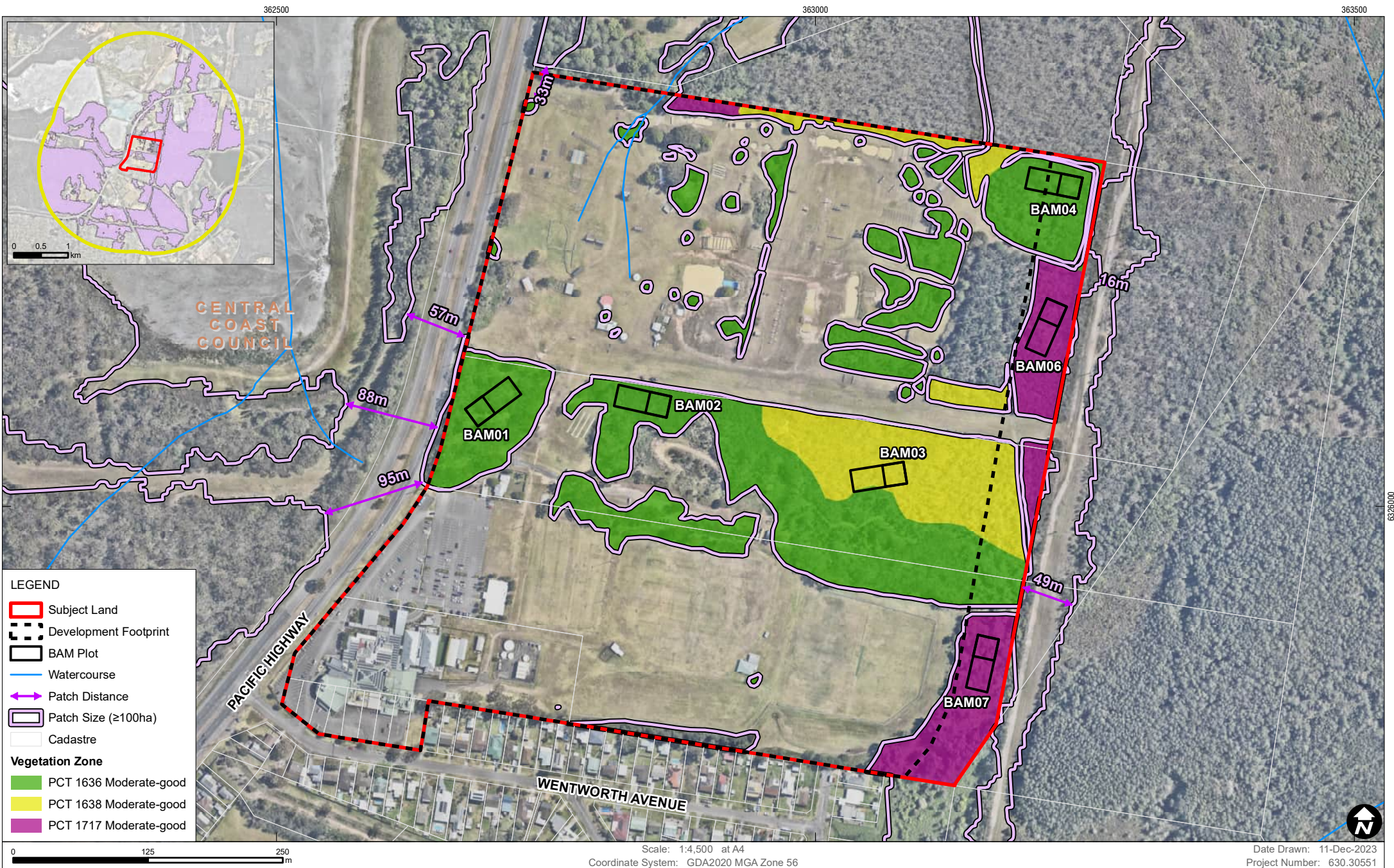


Data Source: NSW SS, March 2023
 Aerial imagery supplied by Nearmap, October 2023
 *Plant Community Types (Eco Logical Australia, 2018. 80 – 120 Pacific Highway, Doyalson. Prepared for Doyalson Wyee RSL Club)



THREATENED ECOLOGICAL COMMUNITIES AND ECOLOGICAL COMMUNITIES

FIGURE 9



VEGETATION ZONES

FIGURE 10



Data Source: NSW SS, March 2023
Aerial imagery supplied by Nearmap, October 2023
*Plant Community Types (Eco Logical Australia, 2018. 80 – 120 Pacific Highway, Doyalson. Prepared for Doyalson Wyee RSL Club)



Data Source: NSW SS, March 2023
 Aerial imagery supplied by Nearmap, October 2023





Data Source: NSW SS, March 2023
Aerial imagery supplied by Nearmap, October 2023



**FINAL IMPACTS LIKELY TO OCCUR
ON THE SUBJECT LAND**

FIGURE 12

Figure 13: Wind Turbine Disturbance Zone (n/a)



Figure 14: Serious and Irreversible Impacts (n/a)



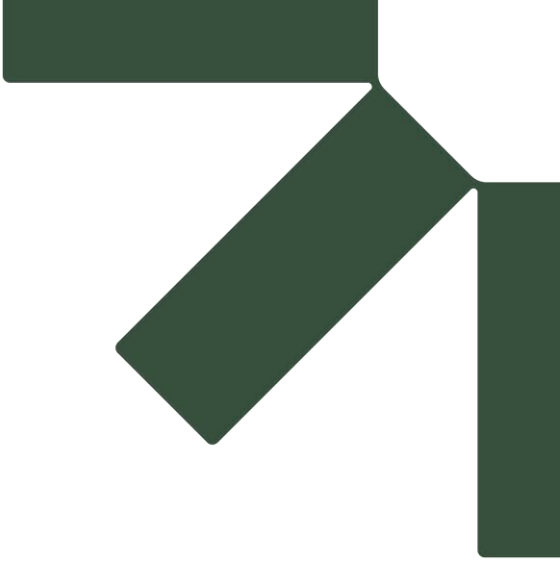


Data Source: NSW SS, March 2023
 Aerial imagery supplied by Nearmap, March 2023



THRESHOLDS FOR ASSESSING AND OFFSETTING IMPACTS

FIGURE 15



Appendix A BDAR Requirements Compliance

Biodiversity Development Assessment Report

Proposed Englobo Subdivision DA/1295/2023

Doyalson Wyee RSL Club t/a Doyalson Lifestyle Group

SLR Project No.: 630.30551.00000

22 December 2025

Table A1 Compliance of Introduction Chapter with BDAR Minimum Information Requirements (BAM Reference: Chapters 2 and 3)

Information Type	BAM Requirement	Section in BDAR
Information	Introduction to the biodiversity assessment including:	-
	☒ brief description of the proposal	1.2.3
	☒ identification of subject land boundary, including: ☐ operational footprint ☐ construction footprint indicating clearing associated with temporary/ancillary construction facilities and infrastructure	1.2.3
	☒ general description of the subject land	1.2.3
	☒ sources of information used in the assessment, including reports and spatial data	1.7
	☒ identification and justification for entering the BOS	1.4
Maps and Table	Map of the subject land boundary showing the final proposal footprint, including the construction footprint for any clearing associated with temporary/ancillary construction facilities and infrastructure	Figure 1

Table A2 Compliance of Landscape Chapter with BDAR Minimum Information Requirements (BAM Reference: Sections 3.1 and 3.2, Appendix E)

Information Type	BAM Requirement	Section in BDAR
Information	Identification of site context components and landscape features, including:	–
	☒ general description of subject land topographic and hydrological setting, geology and soils	1.2.3
	☒ per cent native vegetation cover in the Assessment Area (as described in BAM Section 3.2)	3.3
	☒ IBRA bioregions and subregions (as described in BAM Subsection 3.1.3(2.))	3.2.1
	☒ rivers and streams classified according to stream order (as described in BAM Subsection 3.1.3(3.) and Appendix E)	3.2.2
	☒ wetlands within, adjacent to and downstream of the site (as described in BAM Subsection 3.1.3(3.))	3.2.2
	☒ connectivity of different areas of habitat (as described in BAM Subsection 3.1.3(5–6.))	3.2.3
	☒ karst, caves, crevices, cliffs, rocks and other geological features of significance and for vegetation clearing proposals, soil hazard features (as described in BAM Subsections 3.1.3(7.) and 3.1.3(12.))	3.2.4
	☒ areas of outstanding biodiversity value occurring on the subject land and Assessment Area (as described in BAM Subsection 3.1.3(8–9.))	3.2.5
	☒ any additional landscape features identified in any SEARs for the proposal	3.2.7
	☒ NSW (Mitchell) landscape on which the subject land occurs	3.2.6
	☒ details of field reconnaissance undertaken to confirm the extent and condition of landscape features and native vegetation cover (as described in Operational Manual Stage 1 Section 2.4)	2.1
Maps and tables	☒ Site Map ☒ Property boundary	Figure 1



Information Type	BAM Requirement	Section in BDAR
	☒ Boundary of subject land ☒ Cadastre of subject land (including labelling of Lot and DP or section plan if relevant) ☒ Landscape features identified in BAM Subsection 3.1.3	
	☒ Location Map ☒ Digital aerial photography at 1:1,000 scale or finer ☒ Boundary of subject land ☒ Assessment Area (i.e. the subject land and either 1500 m buffer area or 500 m buffer for linear development) ☒ Landscape features identified in BAM Subsection 3.1.3 ☒ Additional detail (e.g. local government area boundaries) relevant at this scale	Figure 2
	Landscape features identified in BAM Subsection 3.1.3 and to be shown on the Site Map and/or Location Map include: ☒ IBRA bioregions and subregions ☒ rivers, streams and estuaries ☒ wetlands and important wetlands ☒ connectivity of different areas of habitat ☒ karst, caves, crevices, cliffs, rocks and other geological features of significance and if required, soil hazard features ☒ areas of outstanding biodiversity value occurring on the subject land and Assessment Area ☒ any additional landscape features identified in any SEARs for the proposal ☒ NSW (Mitchell) landscape on which the subject land occurs	Figure 1 and Figure 2
Data	☒ All report maps as separate jpeg files	-
	Individual digital shape files of:	-
	☒ subject land boundary	-
	☒ Assessment Area (i.e. subject land and 1500 m buffer area) boundary	-
	☒ cadastral boundary of subject land	-
	☒ areas of native vegetation cover	-
	☒ landscape features	-

Table A3 Compliance of Native Vegetation Chapter with BDAR Minimum Information Requirements (BAM Reference: Chapter 4, Appendix A and Appendix H)

Information Type	BAM Requirement	Section in BDAR
Information	☒ Identify native vegetation extent within the subject land, including cleared areas and evidence to support differences between mapped vegetation extent and aerial imagery (as described in BAM Section 4.1(1-3.) and Subsection 4.1.1)	4.1 and Figure 7
	☒ Provide justification for all parts of the subject land that do not contain native vegetation (as described in BAM Subsection 4.1.2)	4.1.2
	☒ Review of existing information on native vegetation including references to previous vegetation maps of the subject land and Assessment Area (described in BAM Section 4.1(3.) and Subsection 4.1.1)	2.2



Information Type	BAM Requirement	Section in BDAR
	☐ Describe the systematic field-based floristic vegetation survey undertaken in accordance with BAM Section 4.2	2.2.3
	☒ Where relevant, describe the use of more appropriate local data, provide reasons that support the use of more appropriate local data and include the written confirmation from the decision-maker that they support the use of more appropriate local data (as described in BAM Subsection 1.4.2 and Appendix A)	5.5 and Appendix G
	For each PCT within the subject land, describe:	-
	☒ PCT name and ID	4.2 and Figure 8
	☒ vegetation class	4.2
	☒ extent (ha) within subject land	4.2
	☒ evidence used to identify a PCT including any analyses undertaken, references/sources, existing vegetation maps (BAM Section 4.2(1–3.))	4.2
	☒ plant species relied upon for identification of the PCT and relative abundance of each species	4.2
	☒ if relevant, TEC status including evidence used to determine vegetation is the TEC (BAM Subsection 4.2.2(1–2.))	4.2 and Figure 9
	☒ estimate of per cent cleared value of PCT (BAM Subsection 4.2.1(5.))	4.2
	Describe the vegetation integrity assessment of the subject land, including:	-
	☒ identification and mapping of vegetation zones (as described in BAM Subsection 4.3.1)	4.4 and Figure 10
	☒ description of vegetation zones within the subject land (as described in Operational Manual Stage 1 Table 2 and Subsection 3.3.2)	4.4 and Figure 10
	☒ area (ha) of each vegetation zone	4.4
	☒ assessment of patch size (as described in BAM Subsection 4.3.2)	4.4
	☒ survey effort (i.e. number of vegetation integrity survey plots) as described in BAM Subsection 4.3.4(1–2.)	4.5
	☒ use of relevant benchmark data from BioNet Vegetation Classification (as described in BAM Subsection 4.3.3(5.))	4.5.3
	Where use of more appropriate local benchmark data is proposed (as described in BAM Subsection 1.4.2, BAM Subsection 4.3.3(5.) and BAM Appendix A): ☒ identify the PCT or vegetation class for which local benchmark data will be applied ☒ identify published sources of local benchmark data (if benchmarks obtained from published sources) ☒ describe methods of local benchmark data collection (if reference plots used to determine local benchmark data)	4.5.3
	☒ provide justification for use of local data rather than BioNet Vegetation Classification benchmark values	4.5.3
	☒ provide written confirmation from the decision-maker that they support the use of local benchmark data	Appendix G
Maps and tables	☒ Map of native vegetation extent within the subject land at scale not greater than 1:10,000 including identification of all areas of native vegetation including areas that are ground cover only , cleared areas (as described in BAM Section 4.1(1–3.)) and all parts of the subject land that do not contain native vegetation (BAM Subsection 4.1.2)	Figure 7
	☒ Map of PCTs within the subject land (as described in BAM Section 4.2(1.))	Figure 8



Information Type	BAM Requirement	Section in BDAR
	☐ Map of vegetation zones within the subject land (as described in BAM Subsection 4.3.1)	Figure 10
	☒ Map the location of floristic vegetation survey plots and vegetation integrity survey plots relative to PCT boundaries	Figure 6
	☒ Map of TEC distribution on the subject land and table of TEC listing, status and area (ha)	Figure 9 and Table 14
	☒ Map of patch size locations for each native vegetation zone and table of patch size areas (as described in BAM Subsection 4.3.2)	Figure 10 and Table 15
	Table of current vegetation integrity scores for each vegetation zone within the site and including: ☒ composition condition score ☒ structure condition score ☒ function condition score ☒ presence of hollow bearing trees	Table 12
Data	☒ All report maps as separate jpeg files	-
	☒ Plot field data (MS Excel format)	Appendix F
	☐ Plot field datasheets	n/a
	Digital shape files of:	-
	☒ PCT boundaries within subject land	-
	☒ TEC boundaries within subject land	-
	☒ vegetation zone boundaries within subject land	-
	☒ floristic vegetation survey and vegetation integrity plot locations	-

Table A4 Compliance of Threatened Species Chapter with BDAR Minimum Information Requirements (BAM Reference: Chapter 5)

Information Type	BAM Requirement	Section in BDAR
Information	Identify ecosystem credit species likely to occur on the subject land, including:	-
	☒ list of ecosystem credit species derived from the BAM-C (as described in BAM Subsection 5.1.1 and Section 5.2(1.))	Table 17
	☒ justification and supporting evidence for exclusion of any ecosystem credit species based on geographic limitations, habitat constraints or vagrancy (as described in BAM Subsections 5.2.1 and 5.2.2)	5.1.1
	☒ justification for addition of any ecosystem credit species to the list	5.1.1
	Identify species credit species likely to occur on the subject land, including:	-
	☒ list of species credit species derived from the BAM-C (as described in BAM Subsection 5.1.1)	Table 18 and Table 19
	☒ justification and supporting evidence for exclusions based on geographic limitations, habitat constraints or vagrancy (as described in BAM Subsections 5.2.1 and 5.2.2)	5.1.2
	☒ justification and supporting evidence for exclusions based on degraded habitat constraints and/or microhabitats on which the species depends (as described in BAM Subsection 5.2.2)	5.1.2



Information Type	BAM Requirement	Section in BDAR
	☒ justification for addition of any species credit species to the list	5.1.2
	From the list of candidate species credit species, identify: ☒ species assumed present within the subject land (if relevant) (as described in BAM Subsection 5.2.4(2.a.)) ☒ species present within the subject land on the basis of being identified on an important habitat map for a species (as described in BAM Subsection 5.2.4(2.d.)) ☒ species for which targeted surveys are to be completed to determine species presence (BAM Subsection 5.2.4(2.b.)) ☒ species for which an expert report is to be used to determine species presence (BAM Subsection 5.2.4(2.c.))	Table 20 and Table 21
	Present the outcomes of species credit species assessments from:	-
	☒ threatened species survey (as described in BAM Section 5.2.4)	Table 22 and Table 23
	☒ expert reports (if relevant) including justification for presence of the species and information used to make this determination (as described in BAM Subsection 5.2.4, Section 5.3, Box 3)	5.4
	Where survey has been undertaken include detailed information on:	-
	☒ survey method and effort (as described in BAM Section 5.3)	Table 22 and Table 23
	☒ justification of survey method and effort (e.g. citation of peer-reviewed literature) if approach differs from the department's taxa-specific survey guides or where no relevant guideline has been published	0
	☒ timing of survey in relation to requirements in the TBDC or the department's taxa-specific survey guides. Where survey was undertaken outside these guides include justification for the timing of surveys	Table 22 and Table 23 and 0
	☒ survey personnel and relevant experience	Declaration ii
	☒ describe any limitations to surveys and how these were addressed/overcome	2.6 and 0
	Where an expert report has been used in place of survey (as described in BAM Section 5.3, Box 3), include:	-
	☒ justification of the use of an expert report ☒ identify the expert, provide evidence of their expert credentials and departmental approval of expert status ☒ all requirements of Box 3 have been addressed in the expert report	5.4
	Where use of local data is proposed (BAM Subsection 1.4.2):	-
	☒ identify relevant species ☒ identify data to be amended ☒ identify source of information for local data, e.g. published literature, additional survey data, etc. ☒ justify use of local data in preference to VIS Classification or TBDC data	5.5
	☒ provide written confirmation from the decision-maker that they support the use of local data	Appendix G



Information Type	BAM Requirement	Section in BDAR
	Species polygon completed for species credit species present within the subject land (assumed present or determined on the basis of survey, expert report or important habitat map) ensuring that:	-
	☑ the unit of measure for each species is documented	Table 24 and Table 25
	for species assessed by area:	-
	☑ the polygon includes the extent of suitable habitat for the target species within the subject land (as described in BAM Subsection 5.2.5)	Figure 11
	☑ a description of, and evidence-based justification for, the habitat constraints, features or microhabitats used to map the species polygon including reference to information in the TBDC for that species and any buffers applied	5.6
	for species assessed by counts of individuals:	-
	☑ the number of individual plants present on the subject land (as described in BAM Subsection 5.2.5(3.))	5.6
	☑ the method used to derive this number (i.e. threatened species survey or expert report) and evidence-based justification for the approach taken	5.6
	☑ the polygon includes all individuals located on the subject land with a buffer of 30 m around the individuals or groups of individuals on the subject land	Figure 11
	☑ Identify the biodiversity risk weighting for each species credit species identified as present within the subject land (as described in BAM Section 5.4)	Table 24 and Table 25
Maps and tables	☑ Table showing ecosystem credit species in accordance with BAM Subsection 5.1.1, and identifying:	-
	☑ the ecosystem credit species removed from the list	Table 17
	☑ the sensitivity to gain class of each species	Table 17
	☑ Table detailing species credit species in accordance with BAM Section 5.2 and identifying:	Table 18 and Table 19
	☑ the species credit species removed from the list of species because the species is considered vagrant, out of geographic range or the habitat or microhabitat features are not present	Table 18 and Table 19
	☑ the candidate species credit species not recorded on the subject land as determined by targeted survey, expert report or important habitat map	Table 20 and Table 21
	☑ Table detailing species credit species recorded or assumed as present within the subject land, habitat constraints or microhabitats associated with the species, counts of individuals (flora)/extent of suitable habitat (flora and fauna) (as described in BAM Subsection 5.2.6) and biodiversity risk weighting (BAM Section 5.4)	5.6, Table 24 and Table 25
	☑ Map indicating the GPS coordinates of all individuals of each species recorded within the subject land and the species polygon for each species (as described in BAM Subsection 5.2.5)	Figure 11
Data	☑ Digital shape files of suitable habitat identified for survey for each candidate species credit species	-
	☑ Survey locations including GPS coordinates of any plots, transects, grids	-
	☑ Digital shape files of each species polygon including GPS coordinates of located individuals	-



Information Type	BAM Requirement	Section in BDAR
	☒ Species polygon map in jpeg format	-
	☒ Expert reports and any supporting data used to support conclusions of the expert report	-
	☒ Field datasheets detailing survey information including prevailing conditions, date, time, equipment used, etc.	-

Table A5 Compliance of Prescribed Impacts Chapter with BDAR Minimum Information Requirements (BAM Reference: Chapter 6)

Information Type	BAM Requirement	Section in BDAR
Information	Identify potential prescribed biodiversity impacts on threatened entities, including:	-
	☒ karst, caves, crevices, cliffs, rocks and other geological features of significance (as described in BAM Subsection 6.1.1)	Table 26
	☒ occurrences of human-made structures and non-native vegetation (as described in BAM Subsection 6.1.2)	
	☒ corridors or other areas of connectivity linking habitat for threatened entities (as described in BAM Subsection 6.1.3)	
	☒ waterbodies or any hydrological processes that sustain threatened entities (as described in BAM Subsection 6.1.4)	
	☒ protected animals that may use the proposed wind farm development site as a flyway or migration route (as described in BAM Subsection 6.1.5)	n/a
	☒ where the proposed development may result in vehicle strike on threatened fauna or on animals that are part of a threatened ecological community (as described in BAM Subsection 6.1.6)	Table 26
	☒ Identify a list of threatened entities that may be dependent upon or may use habitat features associated with any of the prescribed impacts	Table 26
	☒ Describe the importance of habitat features to the species including, where relevant, impacts on life cycle or movement patterns (e.g. Subsection 6.1.3)	6.0
	Where the proposed development is for a wind farm:	-
	☒ identify a candidate list of protected animals that may use the development site as a flyway or migration route, including resident threatened aerial species, resident raptor species and nomadic and migratory species that are likely to fly over the proposal area (as described in BAM Subsection 6.1.5)	n/a
	☒ provide details of targeted survey for candidate species of wind farm developments undertaken in accordance with BAM Subsection 6.1.5(2–3.)	n/a
	☒ predict the habitual flight paths for nomadic and migratory species likely to fly over the subject land and map the likely habitat for resident threatened aerial and raptor species (BAM Subsection 6.1.5(4.))	n/a
	Where the proposal may result in vehicle strike:	-
Maps and tables	☒ identify a list of threatened fauna or protected fauna species that are part of a TEC and at risk of vehicle strike due to the proposal	Table 26
	☒ Map showing location of any prescribed impact features (i.e. karst, caves, crevices, cliffs, rocks, human-made structures, etc.)	Figure 1 and Figure 2
	☒ Map showing location of potential vehicle strike locations	Figure 1
	☒ Maps of habitual flight paths for nomadic and migratory species likely to fly over the site and maps of likely habitat for threatened aerial species resident on the site (for wind farm developments only)	Figure 1 and Figure 2



Information Type	BAM Requirement	Section in BDAR
Data	☒ Digital shape files of prescribed impact feature locations	-
	☒ Prescribed impact features map in jpeg format	-

Table A6 Compliance of Avoid and Minimise Impacts Chapter with BDAR Minimum Information Requirements (BAM Reference: Chapter 7)

Information Type	BAM Requirement	Section in BDAR
Information	Demonstration of efforts to avoid and minimise impacts on biodiversity values (including prescribed impacts) associated with the proposal location in accordance with Chapter 7, including an analysis of alternative:	-
	☒ modes or technologies that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed mode or technology	7.1.2 and 7.2.2
	☒ routes that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed route	7.1.1 and 7.2.1
	☒ alternative locations that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed location	7.1.1 and 7.2.1
	☒ alternative sites within a property on which the proposal is located that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed site	7.1.1 and 7.2.1
	☒ Describe efforts to avoid and minimise impacts (including prescribed impacts) to biodiversity values through proposal design (as described in BAM Sections 7.1 and 7.2)	7.1.1 and 7.2.1
	☒ Identification of any other site constraints that the proponent has considered in determining the location and design of the proposal (as described in BAM Subsection 7.2.1(3.))	7.0
	☒ Detail measures or options considered but not implemented because they are not feasible and/or practical (e.g. due to site constraints)	7.3
Maps and tables	☒ Table of measures to be implemented to avoid and minimise the impacts of the proposal, including action, outcome, timing and responsibility	Table 27
	☒ Map of alternative footprints considered to avoid or minimise impacts on biodiversity values; and of the final proposal footprint, including construction and operation	Figure 3
	☒ Maps demonstrating indirect impact zones where applicable	Figure 12
Data	Digital shape files of:	-
	☒ alternative and final proposal footprint	-
	☒ direct and indirect impact zones	-
	☒ Maps in jpeg format	-

Table A7 Compliance of Assessment of Impacts Chapter with BDAR Minimum Information Requirements (BAM Reference: Chapter 8, Sections 8.1 and 8.2)

Information Type	BAM Requirement	Section in BDAR
Information	☒ Determine the impacts on native vegetation and threatened species habitat, including a description of direct impacts of clearing of native vegetation, threatened ecological communities and threatened species habitat (as described in BAM Section 8.1)	Table 28



Information Type	BAM Requirement	Section in BDAR
	Assessment of indirect impacts on vegetation and threatened species and their habitat including (as described in BAM Section 8.2):	-
	☒ description of the nature, extent, frequency, duration and timing of indirect impacts of the proposal	Table 30
	☒ documenting the consequences to vegetation and threatened species and their habitat including evidence-based justifications	0
	☒ reporting any limitations or assumptions, etc. made during the assessment	0
	☒ identification of the threatened entities and their habitat likely to be affected	Table 30
	Assessment of prescribed biodiversity impacts (as described in BAM Section 8.3) including:	-
	assessment of the nature, extent frequency , duration and timing of impacts on the habitat of threatened species or ecological communities associated with:	-
	☒ karst, caves, crevices, cliffs, rocks and other features of geological significance	n/a
	☒ human-made structures	8.3.1
	☒ non-native vegetation	8.3.2
	☒ connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range	n/a
	☒ movement of threatened species that maintains their life cycle	n/a
	☒ water quality, waterbodies and hydrological processes that sustain threatened species and threatened ecological communities	8.3.3
	☒ assessment of the impacts of wind turbine strikes on protected animals	n/a
	☒ assessment of the impacts of vehicle strikes on threatened species of animals or on animals that are part of a TEC	n/a
	☒ evaluate the consequences of prescribed impacts	0
	☒ describe impacts that are uncertain	0
	☒ document limitations to data, assumptions and predictions	0
Maps and tables	☒ Table showing change in vegetation integrity score for each vegetation zone as a result of identified impacts	Table 29
Data	N/A	-

Table A8 Compliance of Mitigation and Management of Impacts Chapter with BDAR Minimum Information Requirements (BAM Reference: Chapter 8, Section 8.4 and 8.5)

Information Type	BAM Requirement	Section in BDAR
Information	Identification of measures to mitigate or manage impacts in accordance with the recommendations in BAM Sections 8.4 and 8.5 including:	-
	☒ techniques, timing, frequency and responsibility	Table 31
	☒ identify measures for which there is risk of failure	
	☒ evaluate the risk and consequence of any residual impacts	
	☒ document any adaptive management strategy proposed	8.5
	Identification of measures for mitigating impacts related to:	-
	☒ displacement of resident fauna (as described in BAM Subsection 8.4.1(2.))	8.4



Information Type	BAM Requirement	Section in BDAR
	☒ indirect impacts on native vegetation and habitat (as described in BAM Subsection 8.4.1(3.)) ☒ mitigating prescribed biodiversity impacts (as described in BAM Subsection 8.4.2)	
	☒ Details of the adaptive management strategy proposed to monitor and respond to impacts on biodiversity values that are uncertain (BAM Section 8.5)	8.5
Maps and tables	☒ Table of measures to be implemented before, during and after construction to mitigate and manage impacts of the proposal, including action, outcome, timing and responsibility	Table 31
Data	N/A	

Table A9 Compliance of Impact Summary Chapter with BDAR Minimum Information Requirements (BAM Reference: Chapter 9)

Information Type	BAM Requirement	Section in BDAR
Information	Identification and assessment of impacts on TEC's and threatened species that are at risk of a serious and irreversible impacts (SAIL, in accordance with BAM Section 9.1) including:	-
	☒ addressing all criteria in Subsection 9.1.1 for each TEC listed as at risk of an SAIL present on the subject land	n/a
	☒ for each TEC, report the extent of the TEC in NSW	n/a
	☒ addressing all criteria in Subsection 9.1.2 for each threatened species at risk of an SAIL present on the subject land	n/a
	☒ for each threatened species, report the population size in NSW	n/a
	☒ documenting assumptions made and/or limitations to information ☒ documenting all sources of data, information, references used or consulted ☒ clearly justifying why any criteria could not be addressed	n/a
	☒ Identification of impacts requiring offset in accordance with BAM Section 9.2	Table 36 and Table 37
	☒ Identification of impacts not requiring offset in accordance with BAM Subsection 9.2.1(3.)	Table 35
	☒ Identification of areas not requiring assessment in accordance with BAM Section 9.3	Table 38
Maps and tables	☒ Map showing the extent of TEC's at risk of an SAIL within the subject land	Figure 14
	☒ Map showing location of threatened species at risk of an SAIL within the subject land	Figure 14
	Map showing location of:	-
	☒ impacts requiring offset	Figure 15
	☒ impacts not requiring offset	Figure 15
	☒ areas not requiring assessment	Figure 15
Data	Digital shape files of:	-
	☒ extent of TEC's at risk of an SAIL within the subject land	-
	☒ location of threatened species at risk of an SAIL within the subject land	-
	☒ boundary of impacts requiring offset	-



Information Type	BAM Requirement	Section in BDAR
	☒ boundary of impacts not requiring offset	-
	☒ boundary of areas not requiring assessment	-
	☒ Maps in jpeg format	-

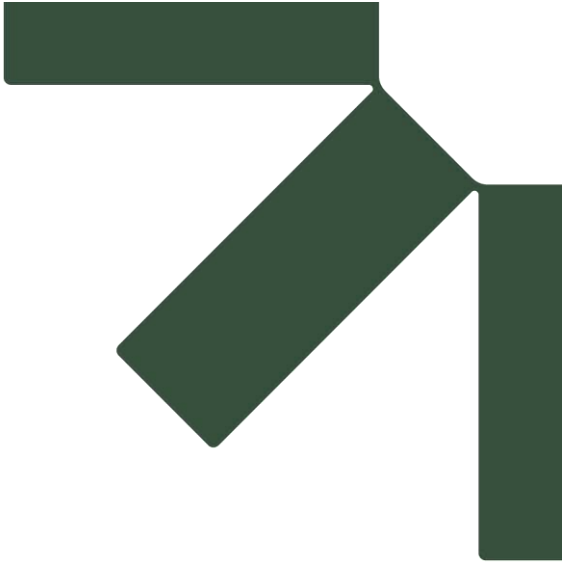
Table A10 Compliance of Impact Summary Chapter with BDAR Minimum Information Requirements (BAM Reference: Chapter 10)

Information Type	BAM Requirement	Section in BDAR
Information	Ecosystem credits and species credits that measure the impact of the development on biodiversity values, including:	-
	☒ future vegetation integrity score for each vegetation zone within the subject land (Equation 25 and Equation 26 in BAM Appendix H)	Table 36
	☒ change in vegetation integrity score (BAM Subsection 8.1.1)	
	☒ number of required ecosystem credits for the direct impacts of the proposal on each vegetation zone within the subject land (BAM Subsection 10.1.2)	
	☒ biodiversity risk weighting for each	Table 36 and Table 37
	☒ number of required species credits for each candidate threatened species that is directly impacted on by the proposal (BAM Subsection 10.1.3)	Table 37
Maps and tables	☒ Table of PCTs requiring offset and the number of ecosystem credits required	Table 36
	☒ Table of threatened species requiring offset and the number of species credits required	Table 37
Data	☒ Submitted proposal in the BAM Calculator	Appendix H

Table A11 Compliance of Biodiversity Credit Report Chapter with BDAR Minimum Information Requirements (BAM Reference: Chapter 10)

Information Type	BAM Requirement	Section in BDAR
Information	☒ Description of credit classes for ecosystem credits and species credits at the development or clearing site or land to be biodiversity certified (BAM Section 10.2)	Table 39 and Table 40
	☒ BAM credit report in pdf format	Appendix H
Maps and tables	☒ Table of credit class and matching credit profile	Table 40
Data	☒ BAM credit report in pdf format	Appendix H





Appendix B Biodiversity Values Map and Threshold Tool Report

Biodiversity Development Assessment Report

Proposed Englobo Subdivision DA/1295/2023

Doyalson Wyee RSL Club t/a Doyalson Lifestyle Group

SLR Project No.: 630.30551.00000

22 December 2025

Biodiversity Values Map



491.8 0 245.91 491.8 Metres

WGS_1984_Web_Mercator_Auxiliary_Sphere

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

THIS MAP IS NOT TO BE USED FOR NAVIGATION

Legend

- Biodiversity Values that have been mapped for more than 90 days
- Biodiversity Values added within last 90 days

Notes

© NSW Department of Planning and Environment

Biodiversity Values Map and Threshold Report

Results Summary

Date of Calculation	23/03/2023 12:42 PM	BDAR Required*
Total Digitised Area	306,154.6 sqm	
Minimum Lot Size Method	LEP	
Minimum Lot Size 10,000sqm = 1ha	450 sqm	
Area Clearing Threshold 10,000sqm = 1ha	2,500 sqm	
Area clearing trigger Area of native vegetation cleared	Unknown [#]	Unknown [#]
Biodiversity values map trigger Impact on biodiversity values map(not including values added within the last 90 days)?	yes	yes
Date of the 90 day Expiry	N/A	

*If BDAR required has:

- at least one 'Yes': you have exceeded the BOS threshold. You are now required to submit a Biodiversity Development Assessment Report with your development application. Go to <https://customer.lmbc.nsw.gov.au/assessment/AccreditedAssessor> to access a list of assessors who are accredited to apply the Biodiversity Assessment Method and write a Biodiversity Development Assessment Report
- 'No': you have not exceeded the BOS threshold. You may still require a permit from local council. Review the development control plan and consult with council. You may still be required to assess whether the development is "likely to significantly affect threatened species" as determined under the test in s. 7.3 of the Biodiversity Conservation Act 2016. You may still be required to review the area where no vegetation mapping is available.

Where the area of impact occurs on land with no vegetation mapping available, the tool cannot determine the area of native vegetation cleared and if this exceeds the Area Threshold. You will need to work out the area of native vegetation cleared - refer to the BMAT user guide for how to do this.

On and after the 90 day expiry date a BDAR will be required.

Disclaimer

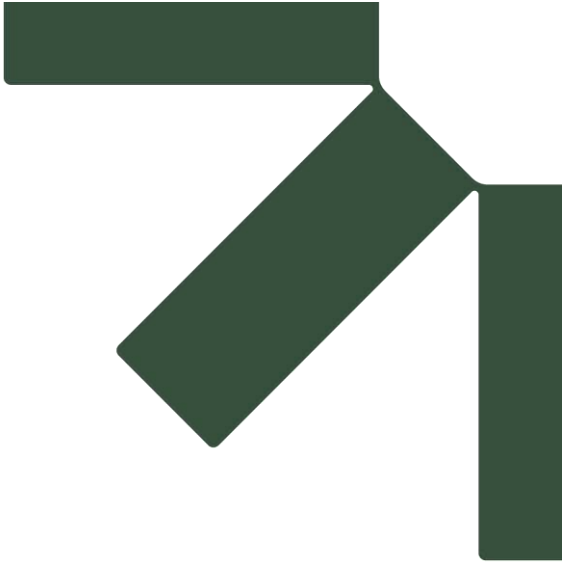
This results summary and map can be used as guidance material only. This results summary and map is not guaranteed to be free from error or omission. The State of NSW and Department of Planning and Environment and its employees disclaim liability for any act done on the information in the results summary or map and any consequences of such acts or omissions. It remains the responsibility of the proponent to ensure that their development application complies with all aspects of the *Biodiversity Conservation Act 2016*.

The mapping provided in this tool has been done with the best available mapping and knowledge of species habitat requirements. This map is valid for a period of 30 days from the date of calculation (above).

Acknowledgement

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

Signature _____ Date: 23/03/2023 12:42 PM



Appendix C Test of Significance (n/a)

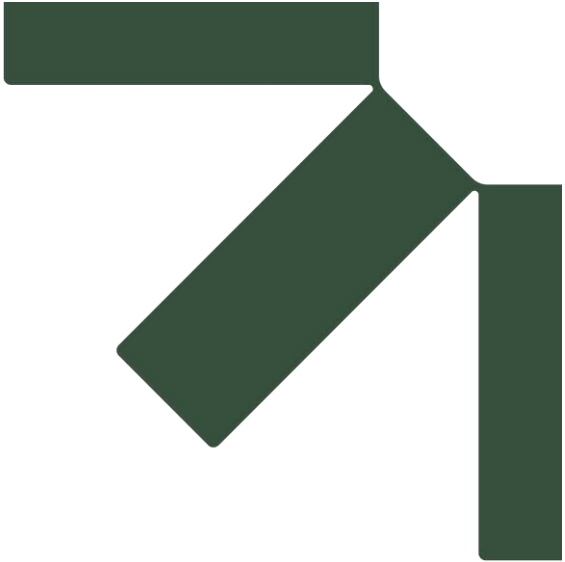
Biodiversity Development Assessment Report

Proposed Englobo Subdivision DA/1295/2023

Doyalson Wyee RSL Club t/a Doyalson Lifestyle Group

SLR Project No.: 630.30551.00000

22 December 2025



Appendix D Determination of Excluded Impacts (n/a)

Biodiversity Development Assessment Report

Proposed Englobo Subdivision DA/1295/2023

Doyalson Wyee RSL Club t/a Doyalson Lifestyle Group

SLR Project No.: 630.30551.00000

22 December 2025



Appendix E Matters of National Environmental Significance

Biodiversity Development Assessment Report

Proposed Englobo Subdivision DA/1295/2023

Doyalson Wyee RSL Club t/a Doyalson Lifestyle Group

SLR Project No.: 630.30551.00000

22 December 2025

E.1 Matters of National Environmental Significance

E.1.1 Overview

Under the EPBC Act an action will require approval from the Australian Government Environment Minister (the 'minister') if the action has, will have, or is likely to have, a significant impact on a Matter of National Environmental Significance (MNES). The general test for significance is whether an impact is 'important, notable or of consequence, having regard to its context or intensity'.

The following section provides an assessment of the Matters of National Environmental Significance Significant Impact Guidelines 1.1 (DoE 2013) with respect to threatened species and communities, as well as migratory species that could utilise the subject land. This assessment aims to assist the applicant to decide whether or not they should submit a referral to Department of Climate Change, Energy, the Environment and Water for a decision by the minister on whether assessment and approval is required under the EPBC Act.

E.1.2 Relevant Matters

A search of the Protected Matters Search Tool (PMST) reveals that 96 threatened species, 79 migratory species (and/or their habitats) and five threatened ecological communities listed in the EPBC Act are predicted to occur within a 10 km radius of the site (see attached PMST report).

Threatened species listed under the EPBC Act with potential relevance to the site include the Regent Honeyeater, Gang-gang Cockatoo, Glossy Black Cockatoo, Painted Honeyeater, White-throated Needletail, Swift Parrot, Spotted-tailed Quoll, New Holland Mouse, Grey-headed Flying-fox and *Rhizanthella slateri*. Detailed habitat assessment and targeted threatened species surveys of the subject land did not detect any of these species, except for the Glossy Black Cockatoo which has been observed foraging within the subject land on several occasions. Hollow-bearing trees across the subject land represent suitable breeding habitat for the Glossy Black Cockatoo. As such, this species is assessed in further detail in Section E.1.3 below.

Migratory species with potential relevance to the site include terrestrial migratory species that may utilise dry and wet sclerophyll forests for foraging purposes (such as White-throated Needletail, Satin Flycatcher, Rufous Fantail, Spectacled Monarch, Black-face Monarch, Yellow Wagtail). These species are considered collectively below.

One EPBC Act threatened ecological community, being *Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland* (or 'Swamp Forest EC') has been recorded on the subject land. This community is considered in further detail below.

No other EPBC Act matters are of relevance to the biodiversity of the site.

E.1.3 Significant Impact Assessment

Threatened Species

The EPBC Act Assessment of Significant Impact criteria with respect to impacts on Glossy Black Cockatoo ('vulnerable' species) as a consequence of the Englobo Subdivision are considered in Table E1.



Table E1 EPBC Act Assessment of Significant Impact on Glossy Black Cockatoo

EPBC Act Significant Impact Criteria (Vulnerable species)	Impact Assessment
<i>Is there a real chance or possibility that the action will lead to a long-term decrease in the size of an important population of a species. Note - An 'important population' is a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are:</i> <i>key source populations either for breeding or dispersal</i> <i>populations that are necessary for maintaining genetic diversity, and/or</i> <i>populations that are near the limit of the species range.</i>	In determining whether the Glossy Black Cockatoo at the subject land could be an 'important population' the following considerations apply: - No information was found suggesting that the Central Coast population of Glossy Black Cockatoo is a key source population - The Glossy Black Cockatoo has a large home range often travelling over 10 km to forage so it is unlikely that the population is necessary for maintaining genetic diversity - The Glossy Black Cockatoo is distributed along the entire NSW coast extending inland to the southern tablelands and central western plains of NSW therefore the individuals at the subject land are not at the limit of their range Based on the above it is unlikely that the individuals detected foraging at the Subject Land form an important population. It is unlikely that the Englobo Subdivision would lead to a long-term decrease in the size of an important population.
<i>Is there a real chance or possibility that the action will reduce the area of occupancy of an important population</i>	It is unlikely that the individuals detected foraging at the subject land form an important population. It is unlikely that the action will reduce the area of occupancy of an important population.
<i>Is there a real chance or possibility that the action will fragment an existing important population into two or more populations</i>	It is unlikely that the individuals detected foraging at the subject land form an important population. It is unlikely that the action will fragment an existing important population into two or more populations.
<i>Is there a real chance or possibility that the action will adversely affect habitat critical to the survival of a species</i>	There is no evidence of Glossy Black Cockatoos breeding within the hollow-bearing trees at the subject land. Based on the past and ongoing disturbances at the site it is unlikely that breeding occurs on site. Pre-clearance measures are proposed to reduce the likelihood of development activities impacting potentially breeding cockatoos should they occur. A portion of foraging habitat will be retained and managed within the Biodiversity Corridor along the eastern boundary of the site, and within the Landscape Corridors. It is unlikely that the action will adversely affect habitat critical to the survival of the Glossy Black Cockatoo.



EPBC Act Significant Impact Criteria (Vulnerable species)	Impact Assessment
<i>Is there a real chance or possibility that the action will disrupt the breeding cycle of an important population</i>	It is unlikely that the individuals detected foraging at the subject land form an important population. It is unlikely that the action will disrupt the breeding cycle of an important population.
<i>Is there a real chance or possibility that the action will modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline</i>	The Englobo Subdivision will involve the removal or modification of up to 8 hectares of potential habitat. Mitigation measures are proposed to reduce the risk of impacts to breeding and retain a portion of the foraging habitat. It is likely that the Glossy Black Cockatoo utilises other habitats within the locality. It is unlikely that the Englobo Subdivision will modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.
<i>Is there a real chance or possibility that the action will result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat</i>	The Englobo Subdivision may result in an increase of domestic species such as cats and dogs that may disturb Glossy Black Cockatoo foraging activities. Mitigation measures are proposed to manage such potential impacts. It is unlikely that the proposed action will result in invasive species establishment to the detriment of the Glossy Black Cockatoo.
<i>Is there a real chance or possibility that the action will introduce disease that may cause the species to decline</i>	It is unlikely that the Englobo Subdivision will introduce disease that may cause the Glossy Black Cockatoo species to decline
<i>Is there a real chance or possibility that the action will interfere substantially with the recovery of the species.</i>	It is unlikely that the action will interfere substantially with the recovery of the species. The Englobo Subdivision will reduce foraging habitat available to the Glossy Black Cockatoo to a relatively minor extent in comparison to the extent of suitable habitats in the locality.

Migratory Species

The subject land contains no habitat for the listed migratory wetland species and only marginal habitat for several of the listed terrestrial migratory species predicted to occur in the locality (see Section E1.2). In regard to the terrestrial migratory species, the forested and open areas of the site represent potential foraging habitat. It is theoretically possible that these highly mobile species could utilise the subject temporarily during foraging, dispersal or migration. Conversely, the subject land constitutes only a relatively small proportion of the large ranges of these species and does not contain breeding habitat for these species.

With reference to the criteria for migratory species in the Matters of National Environmental Significance Significant Impact Guidelines 1.1, the subject land does not contain an area of 'important habitat' for any migratory species. Furthermore, the Englobo Subdivision is highly unlikely to disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species. Hence the Englobo Subdivision is not likely to have a significant impact on any listed migratory species under the EPBC Act.



Threatened Ecological Communities

The EPBC Act Assessment of Significant Impact criteria with respect to impacts on *Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland* (or 'Swamp Forest EC') as a consequence of the Englobo Subdivision are considered in Table E2.

Table E2 EPBC Act Assessment of Significant Impact on Swamp Forest EC

EPBC Act Significant Impact Criteria	Impact Assessment
<i>Is there a real chance or possibility that the action will reduce the extent of an ecological community</i>	The Englobo Subdivision will reduce the extent of Swamp Forest EC within the subject land by 0.3 hectares. A 1990's estimate of the extent of Coastal Floodplain Forest (which includes Sclerophyll Forest EEC) in the lower Hunter and Central Coast region was 7,000 ha (TSC 2023). Therefore, in the context of the total extent of this community within the region the proposed action represents an estimated 0.004 % reduction, which is a relatively small amount.
<i>Is there a real chance or possibility that the action will fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines</i>	The Englobo Subdivision will not increase fragmentation of Swamp Forest EC.
<i>Is there a real chance or possibility that the action will adversely affect habitat critical to the survival of an ecological community</i>	The action will not adversely affect habitat critical to the survival of Swamp Forest EC.
<i>Is there a real chance or possibility that the action will modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns</i>	The Englobo Subdivision will not modify or destroy abiotic factors necessary for survival of the retained areas of Swamp Forest EC. The Englobo Subdivision will include a detention basin and stormwater features that will be designed to maintain existing water flows. The retained areas of Swamp Forest EC will be subject to a detailed EVMP where monitoring would detect any vegetation deterioration due to a change in abiotic factors.
<i>Is there a real chance or possibility that the action will cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting</i>	The action will not cause a substantial change in species composition. The retained areas of Swamp Forest EC will be subject to a detailed EVMP where monitoring would detect any change in vegetation composition.
<i>Is there a real chance or possibility that the action will cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to:</i> <i>assisting invasive species, that are harmful to the listed ecological community, to become established, or</i> <i>causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants</i>	The action will not cause a substantial reduction in the quality or integrity the retained areas of Swamp Forest EC. The retained Swamp Forest EC will be subject to a detailed EVMP where: - Vegetation maintenance will reduce weed invasion - Monitoring would detect any changes to vegetation integrity and facilitate corrective action



EPBC Act Significant Impact Criteria	Impact Assessment
<i>into the ecological community which kill or inhibit the growth of species in the ecological community</i>	
<i>Is there a real chance or possibility that the action will interfere with the recovery of an ecological community</i>	The action will not interfere with recovery of Swamp Forest EC

E.1.4 Conclusion

The significant impact guidelines (DoE 2013) identify the key threat to the survival of Swamp Forest EC is vegetation clearance and fragmentation. In addition, with respect to urban development the significant impact guidelines (DoE 2013) state *“proposed urban development for a housing subdivision or an industrial estate on an area which contains nationally listed threatened species or ecological communities... is likely to be significant under the EPBC Act and should be referred to the minister”*.

However, based on the likelihood that impacts to Swamp Forest EC will be very minor, by virtue of proposed clearing (representing 0.004 % of the total predicted extent of the ecological community) and based on proposed mitigation and offset measures specified in this BDAR, it is not expected that the impact is *“important, notable or of consequence, having regard to its context or intensity”*. On the basis of this assessment a referral to the minister is not likely to be required with respect to impacts on the Swamp Forest EC.

In addition, on the basis of this assessment it is not likely that the Englobo Subdivision will have a significant impact on any matters of national environmental significance with respect to threatened species or migratory species listed under the EPBC Act. Referral of the DA to the Commonwealth Department of Climate Change, Energy, the Environment and Water is not warranted.





Australian Government

Department of Climate Change, Energy,
the Environment and Water

EPBC Act Protected Matters Report

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

Report created: 12-Mar-2023

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

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[Acknowledgements](#)

Summary

Matters of National Environment Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar)	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	5
Listed Threatened Species:	96
Listed Migratory Species:	79

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Lands:	15
Commonwealth Heritage Places:	None
Listed Marine Species:	103
Whales and Other Cetaceans:	13
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

State and Territory Reserves:	5
Regional Forest Agreements:	1
Nationally Important Wetlands:	3
EPBC Act Referrals:	21
Key Ecological Features (Marine):	None
Biologically Important Areas:	6
Bioregional Assessments:	1
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities

[[Resource Information](#)]

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

Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community	Endangered	Community likely to occur within area	In feature area
Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland	Endangered	Community likely to occur within area	In feature area
Littoral Rainforest and Coastal Vine Thickets of Eastern Australia	Critically Endangered	Community likely to occur within area	In buffer area only
River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria	Critically Endangered	Community likely to occur within area	In feature area
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area	In buffer area only

Listed Threatened Species

[[Resource Information](#)]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.

Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calidris tenuirostris Great Knot [862]	Critically Endangered	Roosting known to occur within area	In buffer area only
Callocephalon fimbriatum Gang-gang Cockatoo [768]	Endangered	Species or species habitat known to occur within area	In feature area
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat known to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area	In buffer area only
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea antipodensis gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area	In feature area
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat known to occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area	In buffer area only
Pterodroma neglecta neglecta Kermadec Petrel (western) [64450]	Vulnerable	Foraging, feeding or related behaviour may occur within area	In buffer area only
Pycnoptilus floccosus Pilotbird [525]	Vulnerable	Species or species habitat known to occur within area	In feature area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area	In feature area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area	In buffer area only
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
FISH			
Epinephelus daemeli Black Rockcod, Black Cod, Saddled Rockcod [68449]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Hippocampus whitei White's Seahorse, Crowned Seahorse, Sydney Seahorse [66240]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Prototroctes maraena Australian Grayling [26179]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Serirolella brama Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area	In buffer area only
Thunnus maccoyii Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat likely to occur within area	In buffer area only
FROG			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Heleioporus australiacus Giant Burrowing Frog [1973]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Litoria aurea Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat known to occur within area	In feature area
Mixophyes balbus Stuttering Frog, Southern Barred Frog (in Victoria) [1942]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Mixophyes iteratus Giant Barred Frog, Southern Barred Frog [1944]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Uperoleia mahonyi Mahony's Toadlet [89189]	Endangered	Species or species habitat known to occur within area	In feature area
MAMMAL			
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area	In buffer area only
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat known to occur within area	In feature area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area	In feature area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Notamacropus parma Parma Wallaby [89289]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Petauroides volans Greater Glider (southern and central) [254]	Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Petaurus australis australis Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat known to occur within area	In feature area
Petrogale penicillata Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat known to occur within area	In feature area
Potorous tridactylus tridactylus Long-nosed Potoroo (northern) [66645]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Pseudomys novaehollandiae New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat known to occur within area	In feature area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
PLANT			
Acacia bynoeana Bynoe's Wattle, Tiny Wattle [8575]	Vulnerable	Species or species habitat known to occur within area	In feature area
Angophora inopina Charmhaven Apple [64832]	Vulnerable	Species or species habitat known to occur within area	In feature area
Caladenia tessellata Thick-lipped Spider-orchid, Daddy Long-legs [2119]	Vulnerable	Species or species habitat known to occur within area	In feature area
Corunastylis insignis Wyong Midge Orchid 1, Variable Midge Orchid 1 [84692]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Corunastylis sp. Charmhaven (NSW 896673) Wyong Midge Orchid 2 [86263]	Critically Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Cryptostylis hunteriana Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat known to occur within area	In feature area
Cynanchum elegans White-flowered Wax Plant [12533]	Endangered	Species or species habitat likely to occur within area	In feature area
Diuris praecox Newcastle Doubletail [55086]	Vulnerable	Species or species habitat known to occur within area	In feature area
Eucalyptus camfieldii Camfield's Stringybark [15460]	Vulnerable	Species or species habitat known to occur within area	In feature area
Eucalyptus parramattensis subsp. decadens Earp's Gum, Earp's Dirty Gum [56148]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Euphrasia arguta [4325]	Critically Endangered	Species or species habitat may occur within area	In feature area
Genoplesium baueri Yellow Gnat-orchid, Bauer's Midge Orchid, Brittle Midge Orchid [7528]	Endangered	Species or species habitat may occur within area	In buffer area only
Grevillea parviflora subsp. parviflora Small-flower Grevillea [64910]	Vulnerable	Species or species habitat known to occur within area	In feature area
Melaleuca biconvexa Biconvex Paperbark [5583]	Vulnerable	Species or species habitat known to occur within area	In feature area
Persicaria elatior Knotweed, Tall Knotweed [5831]	Vulnerable	Species or species habitat known to occur within area	In feature area
Rhizanthella slateri Eastern Underground Orchid [11768]	Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Rhodamnia rubescens Scrub Turpentine, Brown Malletwood [15763]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Rhodomyrtus psidioides Native Guava [19162]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Rutidosia heterogama Heath Wrinklewort [13132]	Vulnerable	Species or species habitat known to occur within area	In feature area
Syzygium paniculatum Magenta Lilly Pilly, Magenta Cherry, Daguba, Scrub Cherry, Creek Lilly Pilly, Brush Cherry [20307]	Vulnerable	Species or species habitat known to occur within area	In feature area
Tetraloche juncea Black-eyed Susan [21407]	Vulnerable	Species or species habitat known to occur within area	In feature area
Thelymitra adorata Wyong Sun Orchid [84724]	Critically Endangered	Species or species habitat known to occur within area	In buffer area only
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat likely to occur within area	In feature area
REPTILE			
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Hoplocephalus bungaroides Broad-headed Snake [1182]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only

SHARK

Carcharias taurus (east coast population) Grey Nurse Shark (east coast population) [68751]	Critically Endangered	Species or species habitat likely to occur within area	In buffer area only
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Galeorhinus galeus School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat may occur within area	In buffer area only
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Sphyrna lewini Scalloped Hammerhead [85267]	Conservation Dependent	Species or species habitat likely to occur within area	In buffer area only

Listed Migratory Species [\[Resource Information \]](#)

Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area	In buffer area only
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Ardenna grisea Sooty Shearwater [82651]		Breeding known to occur within area	In buffer area only
Ardenna pacifica Wedge-tailed Shearwater [84292]		Breeding known to occur within area	In buffer area only
Ardenna tenuirostris Short-tailed Shearwater [82652]		Breeding known to occur within area	In buffer area only
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat known to occur within area	In buffer area only
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In buffer area only
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat known to occur within area	In buffer area only
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat may occur within area	In buffer area only
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Sternula albifrons Little Tern [82849]		Breeding likely to occur within area	In buffer area only
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area	In buffer area only
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche melanophrys Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Migratory Marine Species			
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area	In buffer area only
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area	In buffer area only
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour may occur within area	In buffer area only
Carcharhinus longimanus Oceanic Whitetip Shark [84108]		Species or species habitat may occur within area	In buffer area only
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Dugong dugon Dugong [28]		Species or species habitat may occur within area	In buffer area only
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area	In buffer area only
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area	In buffer area only
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area	In buffer area only
Mobula alfredi as Manta alfredi Reef Manta Ray, Coastal Manta Ray [90033]		Species or species habitat may occur within area	In buffer area only
Mobula birostris as Manta birostris Giant Manta Ray [90034]		Species or species habitat may occur within area	In buffer area only
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area	In buffer area only
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Migratory Terrestrial Species			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat likely to occur within area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area	In feature area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area	In feature area
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Arenaria interpres Ruddy Turnstone [872]		Roosting known to occur within area	In buffer area only
Calidris acuminata Sharp-tailed Sandpiper [874]		Roosting known to occur within area	In feature area
Calidris alba Sanderling [875]		Roosting known to occur within area	In buffer area only
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area	In feature area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area	In buffer area only
Calidris tenuirostris Great Knot [862]	Critically Endangered	Roosting known to occur within area	In buffer area only
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area	In buffer area only
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]		Species or species habitat likely to occur within area	In feature area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area	In buffer area only
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area	In feature area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area	In buffer area only
Gallinago stenura Pin-tailed Snipe [841]	Endangered	Roosting likely to occur within area	In buffer area only
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area
Limosa limosa Black-tailed Godwit [845]		Roosting known to occur within area	In buffer area only
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area	In buffer area only
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area	In buffer area only
Pandion haliaetus Osprey [952]		Breeding known to occur within area	In feature area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area	In buffer area only
Pluvialis squatarola Grey Plover [865]		Roosting known to occur within area	In buffer area only
Tringa brevipes Grey-tailed Tattler [851]		Roosting known to occur within area	In buffer area only
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area	In feature area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area	In buffer area only
Xenus cinereus Terek Sandpiper [59300]		Roosting known to occur within area	In buffer area only

Other Matters Protected by the EPBC Act

Commonwealth Lands [\[Resource Information \]](#)

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

Commonwealth Land Name	State	Buffer Status
Communications, Information Technology and the Arts - Australian Postal Corporation		
Commonwealth Land - Australian Postal Commission [16105]	NSW	In buffer area only
Commonwealth Land - Australian Postal Commission [11755]	NSW	In buffer area only
Communications, Information Technology and the Arts - Telstra Corporation Limited		
Commonwealth Land - Australian Telecommunications Commission [16063]	NSW	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - Australian Telecommunications Commission [11731]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [11715]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [11718]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [11719]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [11716]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [11717]	NSW	In feature area
Commonwealth Land - Australian Telecommunications Commission [11749]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [11757]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [12246]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [11713]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [11714]	NSW	In buffer area only

Defence - Defence Housing Authority

Commonwealth Land - Director of War Service Homes [11712]	NSW	In buffer area only
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Listed Marine Species [\[Resource Information \]](#)

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Anous stolidus			
Common Noddy [825]		Species or species habitat likely to occur within area	In buffer area only
Apus pacificus			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Ardenna carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Ardenna grisea as Puffinus griseus Sooty Shearwater [82651]		Breeding known to occur within area	In buffer area only
Ardenna pacifica as Puffinus pacificus Wedge-tailed Shearwater [84292]		Breeding known to occur within area	In buffer area only
Ardenna tenuirostris as Puffinus tenuirostris Short-tailed Shearwater [82652]		Breeding known to occur within area	In buffer area only
Arenaria interpres Ruddy Turnstone [872]		Roosting known to occur within area	In buffer area only
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]		Roosting known to occur within area	In feature area
Calidris alba Sanderling [875]		Roosting known to occur within area	In buffer area only
Calidris canutus Red Knot, Knot [855]		Species or species habitat known to occur within area overfly marine area	In feature area
Calidris ferruginea Curlew Sandpiper [856]		Species or species habitat known to occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area overfly marine area	In buffer area only
Calidris tenuirostris Great Knot [862]	Critically Endangered	Roosting known to occur within area overfly marine area	In buffer area only
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat known to occur within area	In buffer area only
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area overfly marine area	In buffer area only
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area	In buffer area only
Charadrius ruficapillus Red-capped Plover [881]		Roosting known to occur within area overfly marine area	In buffer area only
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea antipodensis gibsoni as Diomedea gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In buffer area only
Eudyptula minor Little Penguin [1085]		Breeding known to occur within area	In buffer area only
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat known to occur within area	In buffer area only
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat known to occur within area	In buffer area only
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area overfly marine area	In buffer area only
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area overfly marine area	In buffer area only
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area	In feature area
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]	Vulnerable	Roosting known to occur within area overfly marine area	In buffer area only
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat known to occur within area overfly marine area	In feature area
Lathamus discolor Swift Parrot [744]		Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area
Limosa limosa Black-tailed Godwit [845]		Roosting known to occur within area overfly marine area	In buffer area only
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area overfly marine area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat likely to occur within area overfly marine area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]		Species or species habitat may occur within area overfly marine area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area overfly marine area	In buffer area only
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area	In buffer area only
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area	In buffer area only
Pandion haliaetus Osprey [952]		Breeding known to occur within area	In feature area
Pelagodroma marina White-faced Storm-Petrel [1016]		Breeding known to occur within area	In buffer area only
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat may occur within area	In buffer area only
Phoebastria fusca Sooty Albatross [1075]		Species or species habitat may occur within area	In buffer area only
Pluvialis fulva Pacific Golden Plover [25545]	Vulnerable	Roosting known to occur within area	In buffer area only
Pluvialis squatarola Grey Plover [865]		Roosting known to occur within area overfly marine area	In buffer area only
Rhipidura rufifrons Rufous Fantail [592]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]		Species or species habitat likely to occur within area overfly marine area	In feature area
Stercorarius skua as Catharacta skua Great Skua [823]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Sternula albifrons as Sterna albifrons Little Tern [82849]		Breeding likely to occur within area	In buffer area only
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat may occur within area overfly marine area	In feature area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche bulleri platei as Thalassarche sp. nov. Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area	In buffer area only
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Tringa brevipes as Heteroscelus brevipes Grey-tailed Tattler [851]		Roosting known to occur within area	In buffer area only
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area overfly marine area	In feature area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area overfly marine area	In buffer area only
Xenus cinereus Terek Sandpiper [59300]		Roosting known to occur within area overfly marine area	In buffer area only
Fish			
Acentronura tentaculata Shortpouch Pygmy Pipehorse [66187]		Species or species habitat may occur within area	In buffer area only
Festucalex cinctus Girdled Pipefish [66214]		Species or species habitat may occur within area	In buffer area only
Filicampus tigris Tiger Pipefish [66217]		Species or species habitat may occur within area	In buffer area only
Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area	In buffer area only
Hippichthys penicillus Beady Pipefish, Steep-nosed Pipefish [66231]		Species or species habitat may occur within area	In buffer area only
Hippocampus abdominalis Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Hippocampus whitei White's Seahorse, Crowned Seahorse, Sydney Seahorse [66240]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Histiogamphelus briggsii Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area	In buffer area only
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area	In buffer area only
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area	In buffer area only
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area	In buffer area only
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area	In buffer area only
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area	In buffer area only
Solenostomus cyanopterus Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area	In buffer area only
Solenostomus paradoxus Ornate Ghostpipefish, Harlequin Ghost Pipefish, Ornate Ghost Pipefish [66184]		Species or species habitat may occur within area	In buffer area only
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area	In buffer area only
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area	In buffer area only
Trachyrhamphus bicoarctatus Bentstick Pipefish, Bend Stick Pipefish, Short-tailed Pipefish [66280]		Species or species habitat may occur within area	In buffer area only
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area	In buffer area only
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area	In buffer area only
Mammal			
Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area	In buffer area only
Arctocephalus pusillus Australian Fur-seal, Australo-African Fur-seal [21]		Species or species habitat may occur within area	In buffer area only
Dugong dugon Dugong [28]		Species or species habitat may occur within area	In buffer area only
Reptile			
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Pelamis platurus Yellow-bellied Seasnake [1091]		Species or species habitat may occur within area	In buffer area only

Whales and Other Cetaceans			[Resource Information]
Current Scientific Name	Status	Type of Presence	Buffer Status
Mammal			
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area	In buffer area only
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area	In buffer area only
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area	In buffer area only
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour may occur within area	In buffer area only
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area	In buffer area only
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area	In buffer area only

Current Scientific Name	Status	Type of Presence	Buffer Status
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area	In buffer area only
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area	In buffer area only
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area	In buffer area only
Stenella attenuata Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area	In buffer area only
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area	In buffer area only
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area	In buffer area only

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	Buffer Status
Bird Island	Nature Reserve	NSW	In buffer area only
Colongra Swamp	Nature Reserve	NSW	In buffer area only
Lake Macquarie	State Conservation Area	NSW	In buffer area only
Munmorah	State Conservation Area	NSW	In buffer area only
Wyrabalong	National Park	NSW	In buffer area only

Regional Forest Agreements			[Resource Information]
Note that all areas with completed RFAs have been included.			
RFA Name		State	Buffer Status
North East NSW RFA		New South Wales	In feature area

Nationally Important Wetlands			[Resource Information]
Wetland Name		State	Buffer Status

Wetland Name	State	Buffer Status
Budgewoi Lake Sand Mass	NSW	In buffer area only
Colongra Swamp	NSW	In buffer area only
Tuggerah Lake	NSW	In buffer area only

EPBC Act Referrals [\[Resource Information \]](#)

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Caravan Park & Lifestyle Living	2022/09220		Approval	In buffer area only
Controlled action				
Open cut coal mine and extension to underground mine.	2006/2542	Controlled Action	Completed	In buffer area only
Residential subdivision	2007/3411	Controlled Action	Post-Approval	In buffer area only
Subdivide and Develop	2008/4419	Controlled Action	Post-Approval	In buffer area only
Subdivision and Urban Development at Gwandalan and Catherine Hill Bay	2012/6382	Controlled Action	Post-Approval	In buffer area only
Wallarrah 2 Coal Project	2012/6388	Controlled Action	Post-Approval	In buffer area only
Wallarrah 2 Coal Project	2007/3881	Controlled Action	Completed	In buffer area only
Not controlled action				
construction of additional coal handling facilities at the Wyee Rail Unloader	2004/1364	Not Controlled Action	Completed	In buffer area only
Demolition of Ablutions Block, Snapper Island, NSW	2018/8303	Not Controlled Action	Completed	In buffer area only
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
Mandalong Mine Power Line, Mandalong, NSW	2018/8321	Not Controlled Action	Completed	In buffer area only
Myuna Colliery extension of underground mining	2011/5956	Not Controlled Action	Completed	In buffer area only
Subdivision, clearing and development of industrial zoned land Lot 3 DP 1007500	2008/4385	Not Controlled Action	Completed	In buffer area only
Wallarrah Peninsula Residential development	2004/1490	Not Controlled Action	Completed	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action (particular manner)				
Magenta Shared Pathway Stage 2, NSW	2017/7926	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Multipurpose Centre Dora St Lot 122 DP 881828 Morisset	2003/1084	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Residential Development Subdivision	2011/5953	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Referral decision				
Breeding program for Grey Nurse Sharks	2007/3245	Referral Decision	Completed	In buffer area only
Mine Modification	2010/5442	Referral Decision	Completed	In buffer area only
Morisset Event Space BDAR	2022/9173	Referral Decision	Referral Publication	In buffer area only
Residential Subdivision Dickson Road Lots 231 & 233 DP755271	2003/1105	Referral Decision	Completed	In buffer area only
Biologically Important Areas				
Scientific Name		Behaviour	Presence	Buffer Status
Dolphins				
Tursiops aduncus				
Indo-Pacific/Spotted Bottlenose Dolphin [68418]		Breeding	Likely to occur	In buffer area only
Seabirds				
Ardenna grisea				
Sooty Shearwater [82651]		Foraging	Likely to occur	In buffer area only
Ardenna pacifica				
Wedge-tailed Shearwater [84292]		Foraging	Likely to occur	In buffer area only
Ardenna tenuirostris				
Short-tailed Shearwater [82652]		Foraging	Likely to occur	In buffer area only
Sharks				
Carcharias taurus				
Grey Nurse Shark [64469]		Foraging	Known to occur	In buffer area only
Whales				
Megaptera novaeangliae				
Humpback Whale [38]		Foraging	Known to occur	In buffer area only

Bioregional Assessments

SubRegion	BioRegion	Website	Buffer Status
Hunter	Northern Sydney Basin	BA website	In feature area

Caveat

1 PURPOSE

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

The report contains the mapped locations of:

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

2 DISCLAIMER

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

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

3 DATA SOURCES

Threatened ecological communities

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

Threatened, migratory and marine species

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

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

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

4 LIMITATIONS

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

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

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

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

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

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

Acknowledgements

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

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

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

Please feel free to provide feedback via the [Contact us](#) page.

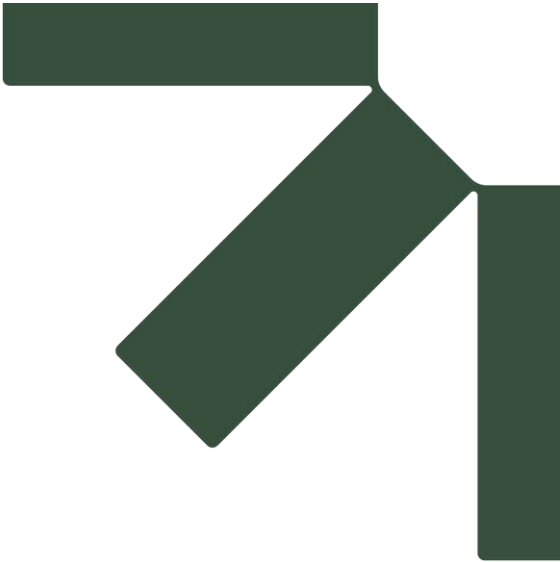
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Appendix F Vegetation Survey Data

Biodiversity Development Assessment Report

Proposed Englobo Subdivision DA/1295/2023

Doyalson Wyee RSL Club t/a Doyalson Lifestyle Group

SLR Project No.: 630.30551.00000

22 December 2025

Table F1 Vegetation Survey and Data – Plot Info

Plot	PCT	Area	Patch Size	Condition Class	Zone	Easting	Northing	Bearing	Plot-Based Vegetation Surveys	Vegetation Integrity Surveys
BAM01	1636	6.13	200	Mod-good	56	362680	6326082	40	Yes	Yes
BAM02	1636	6.13	200	Mod-good	56	362864	6326092	250	Yes	Yes
BAM03	1638	1.96	200	Mod-good	56	363083	6326031	244	Yes	Yes
BAM04	1636	6.13	200	Mod-good	56	363245	6326294	260	Yes	Yes
BAM06	1717	0.32	200	Mod-good	56	363224	6326189	203	Yes	Yes
BAM07	1717	0.32	200	Mod-good	56	363160	6325878	193	Yes	Yes

Table F2 Vegetation Survey and Data - Composition

Plot	Tree	Shrub	Grass	Fern	Forb	Other
BAM01	3	2	7	2	11	3
BAM02	3	10	5	0	8	3
BAM03	2	4	6	0	5	2
BAM04	3	4	7	0	6	2
BAM06	2	6	11	0	1	0
BAM07	6	1	7	1	3	1



Table F3 Vegetation Survey and Data - Structure

Plot	Tree	Shrub	Grass	Fern	Forb	Other
BAM01	25.1	0.2	24	0.2	3	1.2
BAM02	65.1	12.9	43.3	0	1.7	20.2
BAM03	42	6.6	50.9	0	0.5	11
BAM04	30.5	13.2	2.1	0	4.9	0.3
BAM06	10.5	92.4	12.3	0	0.5	0
BAM07	65.2	0.5	22.2	40	4	0.5

Table F4 Vegetation Survey and Data - Function

Plot	Large Trees	Hollows Trees	Litter Cover	Length Of Fallen Logs	Tree Stem 5-9	Tree Stem 10-19	Tree Stem 20-29	Tree Stem 30-49	Tree Stem 50-79	Tree Regen	High Threat Exotics
BAM01	4	2	19.2	0	Absent	Absent	Present	Present	Present	Absent	30.4
BAM02	1	0	88	16	Present	Present	Present	Present	Present	Present	0.4
BAM03	0	1	94	13.5	Present	Present	Present	Present	Absent	Present	0.1
BAM04	1	1	93	26	Present	Present	Present	Present	Present	Present	30.5
BAM06	0	0	98	0	Present	Present	Present	Absent	Absent	Present	5.7
BAM07	0	0	100	0	Present	Present	Present	Present	Absent	Present	7.3

Table F5 Raw BAM plot Data

GF Code	Species name	N, HTW, non-HTW	BAM01		BAM02		BAM03		BAM04		BAM06		BAM07	
			Cover	Abundance	Cover	Abundance	Cover	Abundance	Cover	Abundance	Cover	Abundance	Cover	Abundance
SG	<i>Acacia longifolia</i>	N	0	0	0.1	3	0	0	3	10	0.1	5	0.5	2
SG	<i>Acacia suaveolens</i>	N	0	0	0	0	0	0	0	0	0.1	2	0	0
FG	<i>Actinotus minor</i>	N	0	0	0	0	0.1	10	0	0	0	0	0	0



GF Code	Species name	N, HTW, non-HTW	BAM01		BAM02		BAM03		BAM04		BAM06		BAM07	
			Cover	Abundance	Cover	Abundance	Cover	Abundance	Cover	Abundance	Cover	Abundance	Cover	Abundance
n/a	<i>Ageratina adenophora</i>	HTW	0	0	0	0	0	0	0	0	0	0	0.2	20
TG	<i>Allocasuarina littoralis</i>	N	0	0	60	1000	40	200	10	50	10	50	5	5
n/a	<i>Andropogon virginicus</i>	HTW	0	0	0	0	0.1	1	10	1000	0	0	0	0
GG	<i>Anisopogon avenaceus</i>	N	0	0	0	0	0.2	2	0	0	0	0	0	0
n/a	<i>Aristea ecklonii</i>	Non-HTW	20	1000	0.2	10	0	0	0	0	0	0	0	0
FG	<i>Arthropodium milleflorum</i>	N	0.1	2	0.1	1	0	0	0	0	0	0	0	0
n/a	<i>Asparagus aethiopicus</i>	HTW	0	0	0	0	0	0	0	0	0.5	5	0.1	5
EG	<i>Asplenium flabellifolium</i>	N	0.1	10	0	0	0	0	0	0	0	0	0	0
n/a	<i>Axonopus fissifolius</i>	HTW	30	5000	0	0	0	0	0	0	0	0	0	0
SG	<i>Banksia oblongifolia</i>	N	0	0	5	20	1	10	0	0	0	0	0	0
n/a	<i>Bidens pilosa</i>	HTW	0.1	1	0	0	0	0	0	0	0	0	0	0
OG	<i>Billardiera scandens</i>	N	0.1	2	0	0	0	0	0.1	2	0	0	0	0
n/a	<i>Briza subaristata</i>	Non-HTW	0.1	4	0.1	3	0	0	0	0	0	0	0	0
n/a	<i>Bromus catharticus</i>	Non-HTW	0.1	5	0	0	0	0	0	0	0	0	0	0
FG	<i>Brunoniella australis</i>	N	0.1	3	0.1	2	0	0	0	0	0	0	0	0
FG	<i>Burchardia umbellata</i>	N	0.1	1	0	0	0	0	0	0	0	0	0	0
SG	<i>Callistemon citrinus</i>	N	0	0	0.2	1	0	0	0	0	0	0	0	0
FG	<i>Calochilus</i> sp.	N	0	0	0	0	0	0	0.1	3	0	0	0	0



GF Code	Species name	N, HTW, non-HTW	BAM01		BAM02		BAM03		BAM04		BAM06		BAM07	
			Cover	Abundance	Cover	Abundance	Cover	Abundance	Cover	Abundance	Cover	Abundance	Cover	Abundance
EG	<i>Calochlaena dubia</i>	N	0	0	0	0	0	0	0	0	0	0	40	1000
GG	<i>Carex inversa</i>	N	0.1	5	0	0	0	0	0	0	0	0	0	0
OG	<i>Cassytha glabella</i>	N	0	0	0.1	10	0	0	0	0	0	0	0	0
TG	<i>Casuarina glauca</i>	N	0	0	0	0	0	0	0	0	0	0	15	10
FG	<i>Centella asiatica</i>	N	1	1000	0	0	0	0	0.5	200	0	0	1	100
n/a	<i>Cinnamomum camphora</i>	HTW	0	0	0.1	2	0	0	15	20	0.1	5	0	0
SG	<i>Comesperma ericinum</i>	N	0	0	0.1	1	0	0	0	0	0	0	0	0
FG	<i>Commelina cyanea</i>	N	0.1	1	0	0	0	0	0	0	0	0	0	0
n/a	<i>Conyza bonariensis</i>	Non-HTW	0.1	3	0	0	0	0	0	0	0	0	0	0
TG	<i>Corymbia gummifera</i>	N	5	0	0	0	0	0	0	0	0	0	0	0
FG	<i>Cryptostylis subulata</i>	N	0	0	0.1	2	0	0	0.1	10	0	0	0	0
GG	<i>Cyathochaeta diandra</i>	N	0	0	20	1000	30	1000	0.5	2	2	25	0	0
n/a	<i>Cyclospermum leptophyllum</i>	Non-HTW	0.1	2	0	0	0	0	0	0	0	0	0	0
GG	<i>Cymbopogon refractus</i>	N	0	0	0	0	0	0	0	0	0.1	5	0	0
GG	<i>Cynodon dactylon</i>	N	0	0	0	0	0	0	0	0	1	50	0	0
n/a	<i>Cyperus sesquiflorus</i>	Non-HTW	0.1	10	0	0	0	0	0	0	0	0	0	0
FG	<i>Dianella caerulea</i>	N	0	0	0.1	1	0.1	6	4	50	0.5	10	2	20
FG	<i>Dianella revoluta</i>	N	0	0	0	0	0.1	1	0.1	1	0	0	0	0
FG	<i>Dichondra repens</i>	N	1	500	0	0	0	0	0	0	0	0	0	0



GF Code	Species name	N, HTW, non-HTW	BAM01		BAM02		BAM03		BAM04		BAM06		BAM07	
			Cover	Abundance	Cover	Abundance	Cover	Abundance	Cover	Abundance	Cover	Abundance	Cover	Abundance
n/a	<i>Digitaria sanguinalis</i>	Non-HTW	0	0	0	0	0	0	0	0	0	0	1	20
GG	<i>Echinopogon caespitosus</i>	N	0	0	0	0	0	0	0.1	1	0	0	0	0
GG	<i>Echinopogon ovatus</i>	N	0	0	0	0	0	0	0	0	0	0	0.1	5
n/a	<i>Ehrharta erecta</i>	HTW	0.1	10	0	0	0	0	0	0	0.1	20	0	0
GG	<i>Entolasia marginata</i>	N	0	0	0	0	0	0	0.1	1	0	0	1	20
GG	<i>Entolasia stricta</i>	N	20	3000	20	4000	20	2000	0.2	5	0	0	0	0
SG	<i>Epacris pulchella</i>	N	0	0	0	0	0	0	0.1	1	0.1	2	0	0
GG	<i>Eragrostis brownii</i>	N	0	0	0	0	0	0	0	0	0.1	10	0	0
TG	<i>Eucalyptus racemosa</i> (syn <i>E. haemostoma</i>)	N	20	1	5	3	0	0	20	40	0	0	0	0
n/a	<i>Fraxinus</i> sp.	Non-HTW	0	0	0	0	0	0	0	0	0	0	0.1	1
GG	<i>Gahnia clarkei</i>	N	0	0	0	0	0.1	1	0.1	1	5	10	10	50
n/a	<i>Gamochaeta coarctata</i>	Non-HTW	0.1	10	0	0	0	0	0	0	0	0	0	0
TG	<i>Glochidion ferdinandi</i>	N	0.1	20	0	0	2	10	0.5	5	0	0	40	25
OG	<i>Glycine microphylla</i>	N	1	500	0	0	0	0	0	0	0	0	0	0
SG	<i>Gompholobium latifolium</i>	N	0.1	2	0	0	0	0	0	0	0	0	0	0
FG	<i>Gonocarpus teucrioides</i>	N	0.1	10	0	0	0	0	0	0	0	0	0	0
SG	<i>Hakea dactyloides</i>	N	0	0	4	10	0.5	5	0	0	0	0	0	0
FG	<i>Hybanthus monopetalus</i>	N	0	0	0.1	3	0.1	1	0	0	0	0	0	0



GF Code	Species name	N, HTW, non-HTW	BAM01		BAM02		BAM03		BAM04		BAM06		BAM07	
			Cover	Abundance	Cover	Abundance	Cover	Abundance	Cover	Abundance	Cover	Abundance	Cover	Abundance
FG	<i>Hydrocotyle tripartita</i>	N	0.2	100	0	0	0	0	0	0	0	0	0	0
n/a	<i>Hypochaeris radicata</i>	Non-HTW	0.1	200	0	0	0	0	0	0	0	0	0	0
n/a	<i>Ipomoea cairica</i>	HTW	0	0	0.1	2	0	0	0	0	0	0	0	0
SG	<i>Isopogon anemonifolius</i>	N	0	0	0	0	0.1	3	0	0	0	0	0	0
GG	<i>Juncus usitatus</i>	N	0	0	0	0	0	0	0	0	0	0	0.1	10
SG	<i>Kunzea ambigua</i>	N	0	0	0	0	0	0	10	60	90	80	0	0
SG	<i>Lambertia formosa</i>	N	0	0	1	10	5	20	0	0	0	0	0	0
n/a	<i>Lantana camara</i>	HTW	0.1	1	0.1	2	0	0	0.5	1	0	0	5	25
GG	<i>Lepidosperma laterale</i>	N	0.1	1	0	0	0	0	0	0	1	10	5	50
SG	<i>Leptospermum polygalifolium</i>	N	0	0	0.3	2	0	0	0	0	2	20	0	0
SG	<i>Leptospermum trinervium</i>	N	0	0	1	10	0	0	0	0	0	0	0	0
GG	<i>Lepyrodia scariosa</i>	N	0	0	0.1	1	0.5	10	0	0	0.5	40	0	0
n/a	<i>Ligustrum sinense</i>	HTW	0	0	0	0	0	0	0	0	0	0	1	50
TG	<i>Livistona australis</i>	N	0	0	0	0	0	0	0	0	0	0	0.1	1
FG	<i>Lobelia purpurascens</i>	N	0.1	2	0.1	3	0	0	0.1	2	0	0	0	0
GG	<i>Lomandra filiformis</i>	N	0	0	0	0	0	0	0	0	1	10	0	0
GG	<i>Lomandra longifolia</i>	N	0	0	0	0	0	0	1	15	0	0	0	0
GG	<i>Lomandra multiflora</i>	N	0.2	10	0	0	0	0	0.1	2	0.5	10	0	0
GG	<i>Lomandra obliqua</i>	N	0	0	3	200	0	0	0	0	0	0	0	0



GF Code	Species name	N, HTW, non-HTW	BAM01		BAM02		BAM03		BAM04		BAM06		BAM07	
			Cover	Abundance	Cover	Abundance	Cover	Abundance	Cover	Abundance	Cover	Abundance	Cover	Abundance
n/a	<i>Lysimachia arvensis</i>	Non-HTW	0.1	2	0	0	0	0	0	0	0	0	0	0
TG	<i>Melaleuca quinquenervia</i>	N	0	0	0	0	0	0	0	0	0.5	2	5	5
GG	<i>Microlaena stipoides</i>	N	3	100	0	0	0	0	0	0	0	0	0	0
FG	<i>Opercularia diphylla</i>	N	0.1	3	0.1	3	0	0	0	0	0	0	0	0
GG	<i>Oplismenus imbecillis</i>	N	0	0	0	0	0	0	0	0	0	0	5	100
FG	<i>Oxalis perennans</i>	N	0.1	5	0	0	0	0	0	0	0	0	0	0
GG	<i>Panicum simile</i>	N	0.1	3	0	0	0	0	0	0	0	0	0	0
OG	<i>Parsonsia straminea</i>	N	0	0	0.1	1	1	20	0	0	0	0	0.5	10
FG	<i>Patersonia sericea</i>	N	0	0	1	20	0.1	20	0	0	0	0	0	0
SG	<i>Persoonia lanceolata</i>	N	0	0	0	0	0	0	0.1	1	0	0	0	0
SG	<i>Persoonia levis</i>	N	0	0	0.2	1	0	0	0	0	0	0	0	0
SG	<i>Petrophile pulchella</i>	N	0	0	1	10	0	0	0	0	0	0	0	0
SG	<i>Pimelea linifolia</i>	N	0.1	2	0	0	0	0	0	0	0	0	0	0
n/a	<i>Pinus radiata</i>	HTW	0	0	0	0	0	0	5	20	5	30	0	0
TG	<i>Pittosporum undulatum</i>	N	0	0	0.1	3	0	0	0	0	0	0	0.1	5
n/a	<i>Plantago lanceolata</i>	Non-HTW	0.1	10	0	0	0	0	0	0	0	0	0	0
OG	<i>Polymeria calycina</i>	N	0.1	10	0	0	0	0	0	0	0	0	0	0
EG	<i>Pteridium esculentum</i>	N	0.1	5	0	0	0	0	0	0	0	0	0	0
SG	<i>Pultenaea</i> sp.	N	0	0	0	0	0	0	0	0	0.1	5	0	0
n/a	<i>Richardia stellaris</i>	Non-HTW	0.1	400	0	0	0	0	0	0	0	0	0	0



GF Code	Species name	N, HTW, non-HTW	BAM01		BAM02		BAM03		BAM04		BAM06		BAM07	
			Cover	Abundance	Cover	Abundance	Cover	Abundance	Cover	Abundance	Cover	Abundance	Cover	Abundance
n/a	<i>Rubus anglocandicans</i>	HTW	0	0	0.1	2	0	0	0	0	0	0	1	30
GG	<i>Rytidosperma</i> sp.	N	0	0	0	0	0	0	0	0	0.1	10	0	0
GG	<i>Rytidosperma tenuius</i>	N	0	0	0	0	0.1	2	0	0	0	0	0	0
n/a	<i>Senecio madagascariensis</i>	HTW	0.1	2	0	0	0	0	0	0	0	0	0	0
n/a	<i>Setaria</i> sp.	Non-HTW	0	0	0	0	0	0	0	0	0	0	0.1	5
n/a	<i>Sida rhombifolia</i>	Non-HTW	0.1	5	0	0	0	0	0	0	0	0	0	0
n/a	<i>Sisyrinchium rosulatum</i>	Non-HTW	0.1	100	0	0	0	0	0	0	0	0	0	0
GG	<i>Themeda triandra</i>	N	0.5	20	0.2	1	0	0	0	0	0	0	0	0
n/a	<i>Trifolium repens</i>	Non-HTW	1	100	0	0	0	0	0	0	0	0	0	0
FG	<i>Viola hederacea</i>	N	0	0	0	0	0	0	0	0	0	0	1	50
n/a	<i>Vulpia bromoides</i>	Non-HTW	0.1	2	0	0	0	0	0	0	0	0	0	0
OG	<i>Xanthorrhoea fulva</i>	N	0	0	0	0	0	0	0.2	1	0	0	0	0
OG	<i>Xanthorrhoea latifolia</i>	N	0	0	20	1000	10	100	0	0	0	0	0	0
GG	<i>Zoysia macrantha</i>	N	0	0	0	0	0	0	0	0	1	50	1	20



Photo F1 BAM01 start transect



Photo F2 BAM01 end transect



Photo F3 BAM02 start transect



Photo F4 BAM02 end transect



Photo F5 BAM03 start transect



Photo F6 BAM03 end transect



Photo F7 BAM04 start transect



Photo F7 BAM04 end transect



Photo F8 BAM06 start transect



Photo F9 BAM06 end transect



Photo F10BAM07 start transect



Photo F11BAM07 end transect



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

(10.30-12.30)

400 m² floristics plot:

Survey name

Plot identifier

Recorders

Date 20 11 23 Doyalson esc BAMOI
PS 1 of 2

Fiona Iolin / Jeremy Pepper

GF code	Species name		N, HTW or non-HTW	² Foliage cover	Abundance	Voucher
TA	Eucalyptus haemostoma		N	20	1	
TA	~~Eucalyptus~~ gunniteria	Red Bloodwood	N	5	0	
FA	Centella asiatica		N	1	1000	
GA	Entolasia stricta		N	20	3000	
n/a	Hypochaeris radicata		non	0.1	200	
n/a	Axonopus fissifolius		HTW	30	5000	
n/a	Plantago lanceolata		non	0.1	10	
n/a	Sisyrinchium rosulatum		non	0.1	100	
n/a	Richardia stellaris		non	0.1	400	
n/a	Camarochaeta coarctata		non	0.1	10	✓
GA	Carex inversa		N	0.1	5	✓
n/a	Coryza bonariensis		non	0.1	3	
n/a	Cyclospermum leptophyllum		non	0.1	2	
n/a	Senecio madagascariensis		HTW	0.1	2	HTW
OG	Glycine microphylla		N	1	2500	
FA	Dichondra repens		N	1	500	
n/a	Aristea ecklonii		non-HTW	20	1000	
FA	Hydrocotyle tripartita		N	0.2	100	✓
EG	Pteridium esculentum		N	0.1	5	
n/a	Lysimachia aurens		non	0.1	2	
n/a	Trifolium repens		non	0.1	100	
n/a	Briza subaristida		non	0.1	4	
n/a	Bidens pilosa		HTW	0.1	1	HTW
FA	Commelina cyanea		N	0.1	1	
GA	Panicum simile		N	0.1	3	
FA	Lobelia purpurascens		N	0.1	2	
TA	Glochidion ferdinandi (juv)		N	0.1	20	
n/a						
n/a	Cyperus sesquiflorus		non	0.1	10	✓
n/a	Vulpia bromoides		non	0.1	2	
n/a	Sida rhombifolia		non	0.1	5	
n/a	Bromus catharticus		non	0.1	5	
n/a	Elythra erecta		HTW	0.1	10	HTW
FA	Oxalis perennans		N	0.1	5	
GA	Microlaene stipoides		N	0.1	100	

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. N: native, HTW: high threat weed.

² Foliage cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m. Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

Mown; rabbit droppings; lawn seen.

400 m ² floristics plot:	Survey name	Plot identifier	Recorders
Date	20 11 23	Doyalsou KSL BAMOI	Fioratolili

PS 2 of 2

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	² Foliage cover	Abund-ance	Voucher
EG	36. <i>Asplenium flabellifolium</i>	N	0.1	10	
FG	37. <i>Brunoniella australis</i>	N	0.1	14-3	
GA	38. <i>Lomandra multiflora</i>	N	0.2	10	
n/a	39. <i>Lantana camara</i>	HTW	0.1	1	HTW
FG	40. <i>Arthropodium milleflorum</i>	N	0.1	8 2	
FG	41. <i>Opescularia diphylla</i>	N	0.1	8 3	
SA	42. <i>Gompholobium latifolium</i>	N	0.1	11 2	
OG	43. <i>Calyptranthes polymorpha</i> ~~calycina~~	N	0.1	10	✓
OG	44. <i>Billardiera scandens</i>	N	0.1	4 2	
AG	45. <i>Themeda trianana</i>	N	0.5	20	
SA	46. <i>Pimelea linifolia</i> ssp. <i>linifolia</i>	N	0.1	11 2	
GA	47. <i>Lepidosperma laterale</i>	N	0.1	1	
FG	48. <i>Conocarpus teucroides</i>	N	0.1	10	
FG	49. <i>Burchardia umbellata</i>	N	0.1	1	
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

² Foliage cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m. Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

Numbers ¹⁻⁸ on this page correlate with the numbers and explanatory notes on page 3

Site sheet #	1 of	Date	20/11/23	Survey name	DAYALSON RSL	Plot identifier	BAM02	
Recorders	JP & FI	IBRA region	SYD	Veg zone ID	1636_Mod-good			
Datum	GDA 2020	Coordinate system	☐ Projected ☐ Geographic	MGA zone	56	X coordinate	362864	
						Y coordinate	6326092	
Location description								
closed woodland S of Raw Challenge								
Plot dimensions		For composition & structure (400m ²): 20 m x 20 m For function (1000m ²): 20 m x 50 m		Orientation of midline from 0 m point		250°		
Datum: AGD66, WGS84, GDA94, GDA2020 or Other (specify). MGA Zone (for Projected coordinate system only): 56 (Coastal NSW), 55 (Central NSW or 54 (Western NSW). X/Y coordinate: Long/Lat (for Projected coordinate system), Easting/Northing (for geographic coordinate system)								
Vegetation integrity								
Composition and structure sum values may be completed after entering data into available tools. It is not required while in the field								
Composition (400 m ² plot)			Structure (400 m ² plot)			Function (1000 m ² plot)		
		Sum values			Sum values (%) (may sum to >100%)	Tree stem size class (DBH)		
Total count of native plant species (richness) in each growth form group (not individual plants within each growth form)	Trees (TG)	3	Sum of foliage cover of native plant species by growth form group	Trees (TG)	65.1	80+ cm		
	Shrubs (SG)	10		Shrubs (SG)	12.9	50-79 cm		
	Grasses etc. (GG)	5		Grasses etc. (GG)	43.3	30-49 cm		
	Forbs (FG)	8		Forbs (FG)	1.7	20-29 cm		
	Ferns (EG)	0		Ferns (EG)	0	10-19 cm		
	Other (OG)	3		Other (OG)	20.2	5-9 cm		
Total high threat weed cover					0.4			
Vegetation Integrity - function cont. (five 1 m ² plots)			Litter cover (%)		Bare ground cover (%)		Cryptogam cover (%)	
Subplot score (% in each)			80 90 90 80 100		0 0 0 0 0		5 5 5 5 5	
Average of the 5 subplots			88%		0%		5%	
							0%	
These attributes require consideration of site observations and may be completed after field work:								
Vegetation class		Syd. Coastal Dry Sclerophyll Forests		Large tree benchmark size		20/ 30/ 50/ 80 DBH		
Plant community type (PCT)		1636 Scribbly Gum-Red Bloodwood - Arthropods		EEC		Confidence H/ M/ L		
Physiography and site features that may help in determining PCT and management zone (optional) or for BioNet systematic flora survey purposes:								
Morphological type		Landform element	ridge top	Landform pattern	gentle slope	Microrelief	< 5m	
Lithology		Soil surface texture	?	Soil colour	?	Soil depth	?	
Slope	gentle	Aspect	SE	Site drainage	damp	Distance to nearest water and type	?	
Disturbance	Severity code	Age code	Brief site description or other notes					
Clearing (inc. logging)	1	NR	- Black Oak tow closed forest / open forest to 10m - dense ground layer of sedges & grasses - mod. dense shrub layer - Morning Glory - Cryptanthus orchid patch; 4BC dew cones					
Cultivation (inc. pasture)	0	0						
Soil erosion	0	NR						
Firewood / CWD removal	1	NR						
Grazing (id. native/stock)	1	0						
Fire damage	1	0						
Storm damage	0/1	0						
Weediness	0/1	R						
Other								
			Emergents heights					
			Upper stratum heights					
			Middle stratum heights					
			Lower stratum heights					
			Top	Mid	Bottom	Top	Mid	Bottom
			10m	7m	2m	1m	1m	0m

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

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

0.5

12:30pm - 3pm

400 m² floristics plot:

Survey name

Plot identifier

Recorders

Date 30 11 23 Doyalson esc BAMOZ

Fiona Iolin

Plot 1

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	² Foliage cover	Abundance	Voucher
TG	<i>Allocasuarina littoralis</i>	N	80	1000	
TG	<i>Pittosporum undulatum</i>	N	0.1	11	
SG	<i>Banksia oblongifolia</i>	N	5	20	
SG	<i>Habea dactyloides</i>	N	4	10	
SG	<i>Petrophile pulchella</i>	N	1	10	
SG	<i>Lambertia formosa</i>	N	1	10	
SG	<i>Acacia longifolia</i>	N	0.1	10	3
TG	<i>Eucalyptus haemodroma</i>	N	5	11	3
OG	<i>Xanthorrhoea fulva</i> (or <i>latifolia</i> ?)	N	20	1000	✓
AG	<i>Eitlosia stricta</i>	N	20	1000	
n/a	<i>Rubus anglocandicans</i>	HTW	0.1	10	✓ P. HTW
FG	<i>Diarella caerulea</i>	N	0.1	1	
FG	<i>Lobelia purpurascens</i>	N	0.1	10	3
AG	<i>Themeda triandra</i>	N	0.2	1	
FG	<i>Paterosia sericea</i>	N	1	20	
AG	<i>Cyathochaeta diandra</i>	N	20	1000	
SG	<i>Leptospermum trinervium</i>	N	1	10	
AG	<i>Lomandra obliqua</i>	N	3	20	
FG	<i>Opsecularia diphylla</i>	N	0.1	10	3
n/a	<i>Aristea ecklonii</i>	Non-HTW	0.2	10	(M HTW)
n/a	<i>Briza subaristida</i>	Non	0.1	10	3
n/a	<i>Lantana camara</i>	HTW	0.1	10	2 HTW
FG	<i>Cryptostylis subulata</i>	N	0.1	10	2
n/a	<i>Ipomoea cairica</i>	HTW	0.1	10	2 HTW
OG	<i>Cassytha glabella</i>	N	0.1	10	
FG	<i>Arthropodium mille</i>	N	0.1	1	
FG	<i>Hybanthus monopetalus</i>	N	0.1	10	3
SG	<i>Peperomia levis</i>	N	0.2	1	
SG	<i>Lomesperma ericinum</i>	N	0.1	1	
SG	<i>Callistemon citrinus</i>	N	0.2	1	✓ P
SG	<i>Leptospermum polygalifolium</i>	N	0.3	2	
FG	<i>Brunoniella australis</i>	N	0.1	10	2
n/a	<i>Cinnamom camphora</i> (seedling)	HTW	0.1	10	2 HTW
OG	<i>Parsonsia straminea</i>	N	0.1	1	

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. N: native, HTW: high threat weed.

² Foliage cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ... 100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m. Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

Site sheet # **10/2** Date **20/11/23** Survey name **DOYALSON RSL** Plot identifier **BAM 03**

Recorders **J. Pepper / F. Iolini** IBRA region **SYD BASIN** Veg zone ID **1638 - Mod**

Datum **GDA 2020** Coordinate system **Projected** ☒ Projected ☐ Geographic MGA zone **56** X coordinate **start 50m 863083** Y coordinate **start 50m 6326031**

Location description **closed she-oak woodland S of Raw Challenge**

Plot dimensions **20m x 50m** Orientation of midline from 0 m point **244°** Photo #

Datum: AGD66, WGS84, GDA94, GDA2020 or Other (specify). MGA Zone (for Projected coordinate, system only): 56 (Coastal NSW), 55 (Central NSW or 54 (Western NSW). X/Y coordinate: Long/Lat (for Projected coordinate, system), Easting/Northing (for geographic coordinate, system)

Vegetation integrity

Composition and structure sum values may be completed after entering data into available tools. It is not required while in the field

Composition (400 m ² plot)		Sum values	Structure (400 m ² plot)		Sum values (%) (may sum to >100%)	Function (1000 m ² plot)	
Total count of native plant species (richness) in each growth form group (not individual plants within each growth form)	Trees (TG)	2	Sum of foliage cover of native plant species by growth form group	Trees (TG)	42	³ Tree stem size class (DBH)	If data are to be used as more appropriate local data i.e. to generate local benchmarks, stems must be counted
	Shrubs (SG)	4		Shrubs (SG)	6.6	80 + cm	Count
	Grasses etc. (GG)	6		Grasses etc. (GG)	50.9	50 - 79 cm	Count (best practice)/tick. If large tree benchmark size ≥ 250 cm, count
	Forbs (FG)	5		Forbs (FG)	0.5	30 - 49 cm	Count (best practice)/tick. If large tree benchmark size ≥ 30 cm, count
	Ferns (EG)	0		Ferns (EG)	0	20 - 29 cm	Count (best practice)/tick. If large tree benchmark size ≥ 20 cm, count
	Other (OG)	2		Other (OG)	11	10 - 19 cm	Count (best practice)/tick
						5 - 9 cm	Count (best practice)/tick
						Tree regeneration < 5 cm	Tick
						⁵ Length of fallen logs	Tally space
						⁶ Hollow bearing trees	Total

Vegetation Integrity - function cont. (five 1 m² plots)

Subplot score (% in each)

Average of the 5 subplots

These attributes require consideration of site observations and may be completed after field work:

Vegetation class **Syd. Coastal Dry Sclerophyll Forests** Large tree benchmark size **20/ 30/ 50/ 80 DBH** Confidence **H/ M/ L**

Plant community type (PCT) **1638 Smooth-barked Apple - Red Bloodwood EEC** Confidence **H/ M/ L**

Physiography and site features that may help in determining PCT and management zone (optional) or for BioNet systematic flora survey purposes:

Morphological type	Landform element	Landform pattern	Microrelief
	ridge	gently sloping	< 5m
Lithology	Soil surface texture	Soil colour	Soil depth
	?	?	?
Slope < 5°	Aspect SE	Site drainage N/A water logging	Distance to nearest water and type
			?

Disturbance	Severity code	Age code	Brief site description or other notes											
Clearing (inc. logging)	1	0	same condition + nature of BAM 002 ABC chew cones; she-oak cones abundant											
Cultivation (inc. pasture)	0	0												
Soil erosion	0	0												
Firewood / CWD removal	1	0												
Grazing (id. native/stock)	0	0												
Fire damage	1	0												
Storm damage	1	NR												
Weediness	1	NR	Emergents heights	Upper stratum heights	Middle stratum heights	Lower stratum heights								
Other			Top	Mid	Bottom	Top	Mid	Bottom	Top	Mid	Bottom	Top	Mid	Bottom

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

3pm - 4:30pm

400 m² floristics plot:

Survey name

Plot identifier

Recorders

Date 20 11 23 Royalson RSC BAM03
p3 2 of 2

Fiona Lolim

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	² Foliage cover	Abundance	Voucher
TG	<i>Allocasuarine littoralis</i>	N	40	200	
SG	<i>Lambertia formosa</i>	N	5	20	
OG	<i>Xanthorrhoea latifolia</i>	N	10	100	
AG	<i>Cyathochaeta diandra</i>	N	30	1000	
AG	<i>Entolasia stricta</i>	N	20	2000	
SG	<i>Banksia oblongifolia</i>	N	1	10	
SG	<i>Hakea dactyloides</i>	N	0.5	5	
FG	<i>Actinotus minor</i>	N	0.1	10	
OG	<i>Parsonsia straminea</i>	N	1	20	
FG	<i>Parsonsia sericea</i>	N	0.1	20	
AG	<i>Anisopogon avenaceus</i>	N	0.2	2	
FG	<i>Hybanthus monopetalum</i>	N	0.1	1	
SG	<i>Isopogon anemoneifolius</i>	N	0.1	3	
AG	<i>Gahnia clarkii</i>	N	0.1	1	
FG	<i>Dianella caerulea</i>	N	0.1	6	
TG	<i>Glochidion perdinandi</i>	N	2	10	
AG	<i>Rytidosperma tenuius</i>	N	0.1	2	✓ P
FG	<i>Dianella revolutum</i>	N	0.1	1	
n/a	<i>Andropogon virginicus</i>	HTW	0.1	1	
GG	<i>Lepyrodia scariosa</i>	N	0.5	10	

HTW

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. N: native, HTW: high threat weed.

² Foliage cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m. Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

Numbers 1-8 on this page correlate with the numbers and explanatory notes on page 3

Site sheet #	1 of 2	Date	20/11/23	Survey name	DOYALSON RSL	Plot identifier	BAM 04	
Recorders	TP & FI	IBRA region	SYD	Veg zone ID	1636 - Mod-good			
Datum	GDA 2020	Coordinate system	☒ Projected ☐ Geographic	MGA zone	56	X coordinate	50m start: 363245.8	
						Y coordinate	50m start: 6326294.8	
Location description								
open forest in NE								
Plot dimensions		For composition: 400m x 20m For function: 20m x 50m		Orientation of midline from 0 m point		260° W Photo #		
Datum: AGD66, WGS84, GDA94, GDA2020 or Other (specify). MGA Zone (for Projected coordinate, system only): 56 (Coastal NSW), 55 (Central NSW or 54 (Western NSW). X/Y coordinate: Long/Lat (for Projected coordinate, system), Easting/Northing (for geographic coordinate, system)								
Vegetation integrity								
Composition and structure sum values may be completed after entering data into available tools. It is not required while in the field								
Composition (400 m ² plot)			Structure (400 m ² plot)		Function (1000 m ² plot)			
Total count of native plant species (richness) in each growth form group (not individual plants within each growth form)	Trees (TG)	Sum values	Sum of foliage cover of native plant species by growth form group	Trees (TG)	Sum values (%) (may sum to >100%)	³ Tree stem size class (DBH)	If data are to be used as more appropriate local data i.e. to generate local benchmarks, stems must be counted	
	Shrubs (SG)	3		Shrubs (SG)	30.5	80+ cm		Count
	Grasses etc. (GG)	4		Grasses etc. (GG)	13.2	50-79 cm		Count (best practice) tick. If large tree benchmark size ≥ 250 cm, count
	Forbs (FG)	7		Forbs (FG)	2.1	30-49 cm		Count (best practice) tick. If large tree benchmark size ≥ 30 cm, count
	Ferns (EG)	6		Ferns (EG)	4.9	20-29 cm		Count (best practice) tick. If large tree benchmark size ≥ 20 cm, count
	Other (OG)	0		Other (OG)	0	10-19 cm		Count (best practice) tick
		2			0.3	5-9 cm		Count (best practice) tick
Total high threat weed cover				30.5%	⁴ Tree regeneration <5 cm			
					⁵ Length of fallen logs			
					⁶ Hollow bearing trees			
Vegetation integrity - function cont. (five 1 m ² plots)								
Subplot score (% in each)		Litter cover (%)		Bare ground cover (%)		Cryptogam cover (%)		
Average of the 5 subplots		80 100 95 100 0		0 1 0 5 5		100 5 5 0 0		
		93		1.2		5		
						0		
These attributes require consideration of site observations and may be completed after field work:								
Vegetation class		Syd. Coastal Dry Sclerophyll Forests		Large tree benchmark size		20/ 30/ 50/ 80 DBH		
Plant community type (PCT)		1636 heathy woodland		EEC		Confidence H/ M/ L		
Physiography and site features that may help in determining PCT and management zone (optional) or for BioNet systematic flora survey purposes:								
Morphological type	Landform element	ridge	Landform pattern	gently sloped	Microrelief			
Lithology	Soil surface texture		Soil colour	grey	Soil depth	?		
Slope	Aspect	E	Site drainage	N/A	Distance to nearest water and type	?		
Disturbance	Severity code	Age code	Brief site description or other notes					
Clearing (inc. logging)			* open forest of scribbly gum grading					
Cultivation (inc. pasture)			w to she-oak closed forest					
Soil erosion			* regen'g euc's; leaf litter					
Firewood / CWD removal								
Grazing (id. native/stock)								
Fire damage								
Storm damage								
Weediness								
Other								
			Emergents heights		Upper stratum heights		Middle stratum heights	
			Top Mid Bottom		Top Mid Bottom		Top Mid Bottom	
			m m m		m m m		m m m	

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

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

2:30 pm - 6 pm

400 m ² floristics plot:	Survey name	Plot identifier	Recorders
Date 20 11 23	Doyalson RSL BAM04		Fiona Iolin
	PS 2 of 2		

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	Foliage cover	Abundance	Voucher
TA	<i>Eucalyptus haemostoma</i> (incl juv's)	N	20	40	
TA	<i>Allocasuarina littoralis</i>	N	10	50	
n/a	<i>Pinus radiata</i> (many juv's)	HTW	5	20	HTW
n/a	<i>Cinnamomum camphora</i> (many juv's)	HTW	15	20	HTW
SG	<i>Kunzea ambigua</i>	N	10	60	
SG	<i>Acacia longifolia</i>	N	3	10	
n/a	<i>Lantana camara</i>	HTW	0.5	1	HTW
FG	<i>Dianella caerulea</i>	N	4	50	
n/a	<i>Andropogon virginicus</i>	HTW	10	1000	HTW
FG	<i>Centella asiatica</i>	N	0.5	200	
GA	<i>Lomandra longifolia</i>	N	1	1000	
GA	<i>Lomandra multiflora</i>	N	0.1	2	
TA	<i>Glochidion ferdinandi</i>	N	0.5	5	
GA	<i>Entolasia marginata</i>	N	0.1	1	
SG	<i>Epacris pulchella</i>	N	0.1	1	
GA	<i>Echinopogon caespitosus</i>	N	0.1	1	
GA	<i>Entolasia stricta</i>	N	0.2	5	
FG	<i>Lobelia purpurascens</i>	N	0.1	2	
OG	<i>Xanthorrhoea fulva?</i>	N	0.2	1	
GA	<i>Cyathochaeta diandra</i>	N	0.5	2	
GA	<i>Araucaria clarkii</i>	N	0.1	1	
SG	<i>Persoonia lanceolata</i>	N	0.1	1	
FG	<i>Calochilus</i> sp.?	N	0.1	3	✓ P
OG	<i>Gillardiella scandens</i>	N	0.1	2	
FG	<i>Cryptostylis subulata</i>	N	0.1	10	
FG	<i>Dianella revoluta</i>	N	0.1	1	
27					
28					
29					
30					
31					
32					
33					
34					
35					

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

² **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m. Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

Numbers ¹⁻⁸ on this page correlate with the numbers and explanatory notes on page 3

Site sheet #	1 of 2	Date	23/11/23	Survey name	DOTALSON RSL		Plot identifier	BAM 06	
Recorders	JP, DC			IBRA region	SYD BASIN			Veg zone ID	1717_Med-good
Datum	GDA 2020	Coordinate system	☒ Projected ☐ Geographic	MGA zone	56	X coordinate	50m start: 363224	Y coordinate	50m start: 6326189
Location description Eastern flank of site without grid reference									
Plot dimensions	For composition & structure (400m ²): 20m x 20m For structure (1000m ²): 20m x 50m standard (20m x 50m)				Orientation of midline from 0 m point	203°		Photo #	
Datum: AGD66, WGS84, GDA94, GDA2020 or Other (specify). MGA Zone (for Projected coordinate system only): 56 (Coastal NSW), 55 (Central NSW or 54 (Western NSW), X/Y coordinate: Long/Lat (for Projected coordinate system), Easting/Northing (for geographic coordinate system)									
Vegetation integrity									
Composition and structure sum values may be completed after entering data into available tools. It is not required while in the field									
Composition (400 m ² plot)			Structure (400 m ² plot)			Function (1000 m ² plot)			
		Sum values			Sum values (%) (may sum to >100%)	³ Tree stem size class (DBH)	If data are to be used as more appropriate local data i.e. to generate local benchmarks, stems must be counted		
Total count of native plant species (richness) in each growth form group (not individual plants within each growth form)	Trees (TG)	2	Sum of ² foliage cover of native plant species by growth form group	Trees (TG)	10.5	80 + cm	Count		
	Shrubs (SG)	6		Shrubs (SG)	92.4	50 – 79 cm	Count (best practice)/tick. If large tree benchmark size ≥ 50 cm, count		
	Grasses etc. (GG)	11		Grasses etc. (GG)	12.3	30 – 49 cm	Count (best practice)/tick. If large tree benchmark size ≥ 30 cm, count		
	Forbs (FG)	1		Forbs (FG)	0.5	20 – 29 cm	Count (best practice)/tick. If large tree benchmark size ≥ 20 cm, count		
	Ferns (EG)	0		Ferns (EG)	0	10 – 19 cm	Count (best practice)/tick		
	Other (OG)	0		Other (OG)	0	5 – 9 cm	Count (best practice)/tick		
Total high threat weed cover					5.7 %	⁴ Tree regeneration <5 cm	Tick		
						⁵ Length of fallen logs	Tally space		
						⁶ Hollow bearing trees	Tick		
Vegetation Integrity - function cont. (five 1 m ² plots)									
Subplot score (% in each)		Litter cover (%)		Bare ground cover (%)		Cryptogam cover (%)		Rock cover (%)	
Average of the 5 subplots		98		0		0		0	
These attributes require consideration of site observations and may be completed after field work:									
Vegetation class		⁸ Large tree benchmark size		20/ 30/ 50/ 80 DBH		Confidence		H/ M/ L	
Plant community type (PCT)		1717 Broad-leaved Paperbark - Swamp Mahogany - Swamp Oak swamp forest		EEC		YES		Confidence (H/ M/ L)	
Physiography and site features that may help in determining PCT and management zone (optional) or for BioNet systematic flora survey purposes:									
Morphological type	FLOOD PLAIN	Landform element	PLAIN	Landform pattern		Microrrelief			
Lithology	CLAY / GRAVEL	Soil surface texture		Soil colour	GREY	Soil depth	SHALLOW		
Slope	Gentle	Aspect	E	Site drainage	LAMINAR	Distance to nearest water and type			
Disturbance	Severity code	Age code	Brief site description or other notes						
Clearing (inc. logging)	3	NR	Dom BY Dense, MATURE KUNZEA. Allocas. litt. Canopy. Melquin occasional in midstorey and canopy. Occasional gnd layer (sparse) incl Gahnia, Lepidosperma, Pinus. Occ pinus in canopy						
Cultivation (inc. pasture)	3	0							
Soil erosion	0	-							
Firewood / CWD removal	3	NR							
Grazing (id. native/stock)	3	0							
Fire damage	0	-							
Storm damage	0	-	Emergents heights						
Weediness	2	R	Upper stratum heights						
Other	-	-	Middle stratum heights						
			Lower stratum heights						
			Top Mid Bottom Top Mid Bottom Top Mid Bottom Top Mid Bottom						
			m m m 10 m - m 5 m 5 m - m 1 m 1 m - m 0 m						

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

400 m² floristics plot: Survey name Plot identifier Recorders
 Date 23/4/23 DOYALSON RSL BAM 006 | TP + DC

GF code	Species name	N, HTW or non-HTW	Foliage cover	Abundance	Voucher
TA	<i>A. littoralis</i>	N	10	50	
n/a	<i>Pihis radiata</i>	HTW	5	30	(MHTW)
SA	<i>Kunzea ambigua</i>	N	90	80	
SA	<i>Leptospermum polygalifolium</i>	N	2	20	
GA	<i>Comandra filiformis</i>	N	1	10	
GA	<i>Lepidosperma laterale</i>	N	1	10	
GA	<i>Cyathochaeta diandra</i>	N	2	25	
GA	<i>Cymbopogon refractus</i>	N	0.1	5	
GA	<i>Lepirodia scariosa</i>	N	0.5	40	
GA	<i>Cynodon dactylon</i>	N	1	50	
GA	<i>Zoysa microantha</i> (?)	N	1	50	
n/a	<i>Asparagus asparagoides aethiopicus</i>	HTW	0.5	5	HTW
n/a	<i>Cinnamomum camphora</i>	HTW	0.1	5	HTW
n/a	<i>Ehretia erecta</i>	HTW	0.1	20	HTW
GA	<i>Eragrostis brownii</i>	N	0.1	10	
GA	<i>Kunzea ambigua</i>	N	0.1	5	
FG	<i>Dianella caerulea</i>	N	0.5	10	
GA	<i>Gahnia (?) sieberiana / clarkei</i> <i>G. clarkei</i>	N	5	10	
SA	<i>Acacia suaveolens</i>	N	0.1	2	
GA	<i>Austrodaphnium</i> sp. <i>Rytidosperma</i> sp.	N	0.1	10	
GA	<i>Comandra multiflora</i>	N	0.5	10	
SA	<i>Acacia longifolia</i>	N	0.1	5	
TA	<i>Melaleuca quingue flora</i>	N	0.5	2	
SA	<i>Pultanea</i> sp.	N	0.1	5	
SA	<i>Epacris pulchella</i> NSW Coast Heath	N	0.1	2	

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

Foliage cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m. Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

400 m ² floristics plot:	Survey name	Plot identifier	Recorders
Date 23/11/23	BOYALSON	BAM007	JP + DC

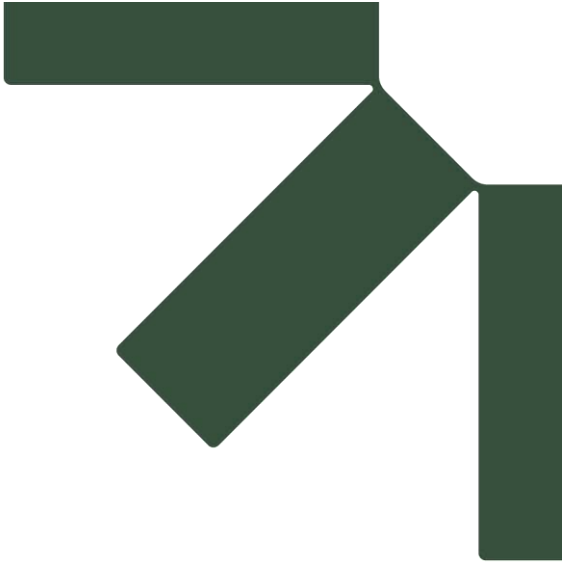
GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	Foliage cover	Abundance	Voucher
TG	Casuarina glauca	N	15	10	
TG	Allocasuarina littoralis	N	5	5	
TG	Glomiridium Ferdinandii	N	40	25	
TG	Metaleuca quinque nervia	N	5	5	
SG	Pittosporum undulatum	N	0.1	5	
GA	Gahnia clackii	N	10	50	
EG	Colobchia dubia	N	40	>1000	
n/a	Ligustrum sinense	HTW	1	50	HTW
n/a	Ageratum adenostachya	HTW	0.5	20	HTW
FG	Centella asiatica	N	1	100	
FG	Viola hederacea	N	1	50	
FG	Sisymbrium officinale	N	2	20	
SG	Acacia (?) longifolia mauritiana Acacia longifolia	N	0.5	2	
n/a	Rubus fruticosus spp. Rubus anglocandicans	HTW	1	30	HTW
GA	Lepidosperma laterale	N	5	50	
GA	Entolasia marginata	N	1	20	
n/a	Digitaria sanguinalis (summer grass)	E	1	20	
GA	Zizania microstachya	N	1	20	
GA	Echinochloa crusgalli (weedy grass)	N	0.1	5	
GA	Taraxacum officinale	N	0.1	10	
n/a	Setaria sp. (native pigeon, Non-HTW)		0.1	5	
n/a	Asparagus asparagoides aethiopicus	HTW	0.1	5	HTW
n/a	Lantana camara	HTW	5	25	HTW
GA	Opismenus (?) imbecillus	N	5	100	
OG	Parsonsia straminea	N	0.5	10	
n/a	Fraxinus sp. Himalayan Ash	E	0.1	1	
TG	Levetia australis	N	0.1	1	

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

Foliage cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m. Note the top 3 dominant native species within, each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).



Appendix G Decision-Maker Authorisation to Use More Appropriate Local Data (n/a)

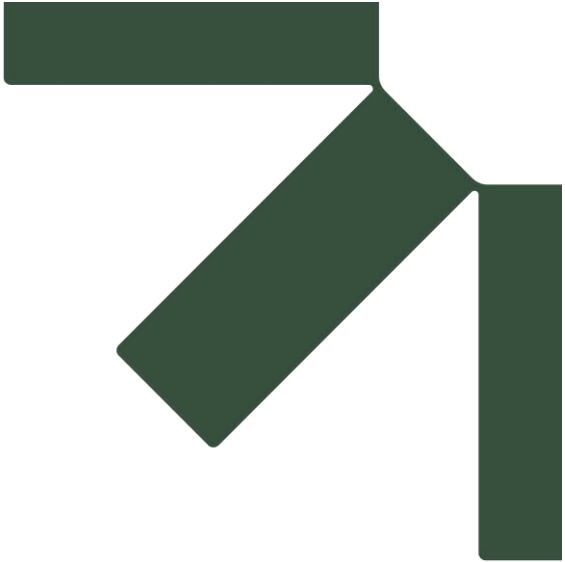
Biodiversity Development Assessment Report

Proposed Englobo Subdivision DA/1295/2023

Doyalson Wyee RSL Club t/a Doyalson Lifestyle Group

SLR Project No.: 630.30551.00000

22 December 2025



Appendix H Credit Reports

Biodiversity Development Assessment Report

Proposed Englobo Subdivision DA/1295/2023

Doyalson Wyee RSL Club t/a Doyalson Lifestyle Group

SLR Project No.: 630.30551.00000

22 December 2025

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00039247/BAAS19042/23/00039248		05/08/2025
Assessor Name	Report Created	BAM Data version *
Fiona Iolini	22/12/2025	Legacy Classification (pre-ENSW) (82)
Assessor Number	BAM Case Status	Date Finalised
BAAS19042	Finalised	22/12/2025
Assessment Revision	BOS entry trigger	Assessment Type
4	BOS Threshold: Biodiversity Values Map	Part 4 Developments (General)

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

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

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

Broad-leaved Paperbark - Swamp Mahogany - Swamp Oak - Saw Sedge swamp forest of the Central Coast and Lower North Coast												
1	1717_Mod _good	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	51.9	51.9	0.32	Biodiversity Conservation Act listing status	High Sensitivity to Gain	Endangered Ecological Community	Not Listed	2.00		8
											Subtotal	8
Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast												
2	1636_Mod _good	Not a TEC	56.4	53.4	6.1	PCT Cleared - 58%	High Sensitivity to Gain			1.75		143
											Subtotal	143

BAM Credit Summary Report

Smooth-barked Apple - Red Bloodwood - Scribbly Gum grass - shrub woodland on lowlands of the Central Coast										
3	1638_Mod_good	Not a TEC	44	43.9	2	PCT Cleared - 50%	High Sensitivity to Gain		1.75	38
									Subtotal	38
									Total	189

Species credits for threatened species

Vegetation zone name	Habitat condition (Vegetation Integrity)	Change in habitat condition	Area (ha)/Count (no. individuals)	Sensitivity to loss (Justification)	Sensitivity to gain (Justification)	BC Act Listing status	EPBC Act listing status	Potential SAIL	Species credits
Calyptrorhynchus lathami lathami / South-eastern Glossy Black-Cockatoo (Fauna)									
1717_Mod_good	51.9	51.9	0.32	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Vulnerable	False	8
1636_Mod_good	53.4	53.4	6.1	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Vulnerable	False	164
1638_Mod_good	43.9	43.9	1.5	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Vulnerable	False	33
								Subtotal	205

BAM Candidate Species Report

Proposal Details

Assessment Id 00039247/BAAS19042/23/00039248	Proposal Name	BAM data last updated * 05/08/2025
Assessor Name Fiona Iolini	Report Created 22/12/2025	BAM Data version * Legacy Classification (pre-ENSW) (82)
Assessor Number BAAS19042	Assessment Type Part 4 Developments (General)	BAM Case Status Finalised
Assessment Revision 4	BOS entry trigger BOS Threshold: Biodiversity Values Map	Date Finalised 22/12/2025

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

List of Species Requiring Survey

Name	Presence	Survey Months
<i>Acacia bynoeana</i> Bynoe's Wattle	No (surveyed)	☐ Jan ☐ Feb ☒ Mar ☒ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☒ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Angophora inopina</i> Charmhaven Apple	No (surveyed)	☐ Jan ☐ Feb ☒ Mar ☒ Apr ☐ May ☐ Jun ☐ Jul ☒ Aug ☐ Sep ☐ Oct ☒ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Asperula asthenes</i> Trailing Woodruff	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☒ Nov ☐ Dec ☐ Survey month outside the specified months?

BAM Candidate Species Report

<i>Astrotricha crassifolia</i> Thick-leaf Star-hair	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☒ Aug ☐ Sep ☐ Oct ☒ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Burhinus grallarius</i> Bush Stone-curlew	No (surveyed)	☐ Jan ☐ Feb ☒ Mar ☐ Apr ☐ May ☒ Jun ☐ Jul ☒ Aug ☐ Sep ☐ Oct ☒ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Callistemon linearifolius</i> Netted Bottle Brush	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☒ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Callocephalon fimbriatum</i> Gang-gang Cockatoo	No (surveyed) *Survey months are outside of the months specified in Bionet.	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☒ Jun ☐ Jul ☒ Aug ☐ Sep ☐ Oct ☒ Nov ☐ Dec ☒ Survey month outside the specified months?
<i>Calyptrorhynchus lathami lathami</i> South-eastern Glossy Black-Cockatoo	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Cercartetus nanus</i> Eastern Pygmy-possum	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☒ Nov ☐ Dec ☐ Survey month outside the specified months?

BAM Candidate Species Report

<i>Corunastylis sp. Charmhaven</i> (NSW896673) Corunastylis sp. Charmhaven (NSW896673)	No (surveyed)	☐ Jan ☐ Feb ☒ Mar ☒ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☒ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Crinia tinnula</i> Wallum Froglet	No (surveyed)	☐ Jan ☐ Feb ☒ Mar ☒ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Cryptostylis hunteriana</i> Leafless Tongue Orchid	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☒ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Diuris praecox</i> Rough Doubletail	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☒ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Eucalyptus camfieldii</i> Camfield's Stringybark	No (surveyed)	☐ Jan ☐ Feb ☒ Mar ☒ Apr ☐ May ☐ Jun ☐ Jul ☒ Aug ☐ Sep ☐ Oct ☒ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Eucalyptus parramattensis subsp. decadens</i> Eucalyptus parramattensis subsp. decadens	No (surveyed)	☐ Jan ☐ Feb ☒ Mar ☒ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☒ Nov ☐ Dec ☐ Survey month outside the specified months?

BAM Candidate Species Report

<i>Eucalyptus parramattensis subsp. parramattensis</i> - endangered population Eucalyptus parramattensis C. Hall. subsp. parramattensis in Wyong and Lake Macquarie local government areas	No (surveyed)	☐ Jan ☐ Feb ☒ Mar ☒ Apr ☐ May ☐ Jun ☐ Jul ☒ Aug ☐ Sep ☐ Oct ☒ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Genoplesium insigne</i> Variable Midge Orchid	No (surveyed) *Survey months are outside of the months specified in Bionet.	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☒ Aug ☐ Sep ☐ Oct ☒ Nov ☐ Dec ☒ Survey month outside the specified months?
<i>Grevillea parviflora subsp. parviflora</i> Small-flower Grevillea	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☒ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Haliaeetus leucogaster</i> White-bellied Sea-Eagle	No (surveyed) *Survey months are outside of the months specified in Bionet.	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☒ Jun ☐ Jul ☒ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☒ Survey month outside the specified months?
<i>Hoplocephalus bitorquatus</i> Pale-headed Snake	No (surveyed) *Survey months are outside of the months specified in Bionet.	☐ Jan ☐ Feb ☒ Mar ☒ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☒ Survey month outside the specified months?
<i>Litoria aurea</i> Green and Golden Bell Frog	No (surveyed) *Survey months are outside of the months specified in Bionet.	☐ Jan ☐ Feb ☒ Mar ☒ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☒ Survey month outside the specified months?

BAM Candidate Species Report

<i>Litoria brevipalmata</i> Green-thighed Frog	No (surveyed)	☐ Jan ☐ Feb ☒ Mar ☒ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Maundia triglochinoides</i> Maundia triglochinoides	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☒ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Melaleuca biconvexa</i> Biconvex Paperbark	No (surveyed)	☐ Jan ☐ Feb ☒ Mar ☒ Apr ☐ May ☐ Jun ☐ Jul ☒ Aug ☐ Sep ☐ Oct ☒ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Melaleuca groveana</i> Grove's Paperbark	No (surveyed)	☐ Jan ☐ Feb ☒ Mar ☒ Apr ☐ May ☐ Jun ☐ Jul ☒ Aug ☐ Sep ☐ Oct ☒ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Myotis macropus</i> Southern Myotis	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☒ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Ninox connivens</i> Barking Owl	No (surveyed) *Survey months are outside of the months specified in Bionet.	☐ Jan ☐ Feb ☒ Mar ☒ Apr ☐ May ☐ Jun ☐ Jul ☒ Aug ☐ Sep ☐ Oct ☒ Nov ☐ Dec ☒ Survey month outside the specified months?

BAM Candidate Species Report

<i>Ninox strenua</i> Powerful Owl	No (surveyed) *Survey months are outside of the months specified in Bionet.	☐ Jan ☐ Feb ☒ Mar ☒ Apr ☐ May ☐ Jun ☐ Jul ☒ Aug ☐ Sep ☐ Oct ☒ Nov ☐ Dec ☒ Survey month outside the specified months?
<i>Persicaria elatior</i> Tall Knotweed	No (surveyed)	☐ Jan ☐ Feb ☒ Mar ☒ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Petauroides volans</i> Southern Greater Glider	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☒ Apr ☒ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Petaurus norfolcensis</i> Squirrel Glider	No (surveyed)	☐ Jan ☐ Feb ☒ Mar ☒ Apr ☒ May ☐ Jun ☐ Jul ☒ Aug ☐ Sep ☐ Oct ☒ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Phascogale tapoatafa</i> Brush-tailed Phascogale	No (surveyed) *Survey months are outside of the months specified in Bionet.	☐ Jan ☐ Feb ☒ Mar ☒ Apr ☐ May ☐ Jun ☐ Jul ☒ Aug ☐ Sep ☐ Oct ☒ Nov ☐ Dec ☒ Survey month outside the specified months?
<i>Phascolarctos cinereus</i> Koala	No (surveyed)	☐ Jan ☐ Feb ☒ Mar ☒ Apr ☐ May ☐ Jun ☐ Jul ☒ Aug ☐ Sep ☐ Oct ☒ Nov ☐ Dec ☐ Survey month outside the specified months?

BAM Candidate Species Report

<i>Planigale maculata</i> Common Planigale	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☒ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Prostanthera askania</i> Tranquility Mintbush	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☒ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Rhizanthella slateri</i> Eastern Australian Underground Orchid	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☒ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Rutidosia heterogama</i> Heath Wrinklewort	No (surveyed)	☐ Jan ☐ Feb ☒ Mar ☒ Apr ☐ May ☐ Jun ☐ Jul ☒ Aug ☐ Sep ☐ Oct ☒ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Tetradlea glandulosa</i> Tetradlea glandulosa	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☒ Aug ☐ Sep ☐ Oct ☒ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Tetradlea juncea</i> Black-eyed Susan	No (surveyed) *Survey months are outside of the months specified in Bionet.	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☒ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☒ Survey month outside the specified months?

BAM Candidate Species Report

<i>Tyto novaehollandiae</i> Masked Owl	No (surveyed) *Survey months are outside of the months specified in Bionet.	☐ Jan ☐ Feb ☒ Mar ☒ Apr ☐ May ☐ Jun ☐ Jul ☒ Aug ☐ Sep ☐ Oct ☒ Nov ☐ Dec ☒ Survey month outside the specified months?
<i>Uperoleia mahonyi</i> Mahony's Toadlet	No (surveyed) *Survey months are outside of the months specified in Bionet.	☐ Jan ☐ Feb ☒ Mar ☒ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☒ Nov ☐ Dec ☒ Survey month outside the specified months?

Threatened species Manually Added

None added

Threatened species assessed as not on site

Refer to BAR for detailed justification

Common name	Scientific name	Justification in the BAM-C
Brush-tailed Rock-wallaby	<i>Petrogale penicillata</i>	Refer to BAR
Eastern Osprey	<i>Pandion cristatus</i>	Habitat constraints
Giant Burrowing Frog	<i>Heleioporus australiacus</i>	Refer to BAR
Giant Dragonfly	<i>Petalura gigantea</i>	Habitat constraints
Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	Habitat constraints
Large Bent-winged Bat	<i>Miniopterus orianae oceanensis</i>	Habitat constraints
Large-eared Pied Bat	<i>Chalinolobus dwyeri</i>	Habitat constraints
Little Bent-winged Bat	<i>Miniopterus australis</i>	Habitat constraints
Little Eagle	<i>Hieraaetus morphnoides</i>	Habitat constraints
Long-nosed Potoroo	<i>Potorous tridactylus</i>	Habitat constraints
Regent Honeyeater	<i>Anthochaera phrygia</i>	Habitat constraints
Square-tailed Kite	<i>Lophoictinia isura</i>	Habitat constraints
Swift Parrot	<i>Lathamus discolor</i>	Habitat constraints

BAM Predicted Species Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00039247/BAAS19042/23/00039248		05/08/2025
Assessor Name	Report Created	BAM Data version *
Fiona Iolini	22/12/2025	Legacy Classification (pre-ENSW) (82)
Assessor Number	Assessment Type	BAM Case Status
BAAS19042	Part 4 Developments (General)	Finalised
Assessment Revision	BOS entry trigger	Date Finalised
4	BOS Threshold: Biodiversity Values Map	22/12/2025

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

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

Common Name	Scientific Name	Vegetation Types(s)
Barking Owl	Ninox connivens	1717-Broad-leaved Paperbark - Swamp Mahogany - Swamp Oak - Saw Sedge swamp forest of the Central Coast and Lower North Coast
		1636-Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast
		1638-Smooth-barked Apple - Red Bloodwood - Scribbly Gum grass - shrub woodland on lowlands of the Central Coast
Black Bittern	Ixobrychus flavicollis	1717-Broad-leaved Paperbark - Swamp Mahogany - Swamp Oak - Saw Sedge swamp forest of the Central Coast and Lower North Coast
Black-chinned Honeyeater (eastern subspecies)	Melithreptus gularis gularis	1636-Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast
Brown Treecreeper (eastern subspecies)	Climacteris picumnus victoriae	1636-Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast
		1638-Smooth-barked Apple - Red Bloodwood - Scribbly Gum grass - shrub woodland on lowlands of the Central Coast

BAM Predicted Species Report

Eastern Chestnut Mouse	<i>Pseudomys gracilicaudatus</i>	1717-Broad-leaved Paperbark - Swamp Mahogany - Swamp Oak - Saw Sedge swamp forest of the Central Coast and Lower North Coast
		1636-Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast
Eastern Coastal Free-tailed Bat	<i>Micronomus norfolkensis</i>	1717-Broad-leaved Paperbark - Swamp Mahogany - Swamp Oak - Saw Sedge swamp forest of the Central Coast and Lower North Coast
		1636-Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast
Eastern False Pipistrelle	<i>Falsistrellus tasmaniensis</i>	1717-Broad-leaved Paperbark - Swamp Mahogany - Swamp Oak - Saw Sedge swamp forest of the Central Coast and Lower North Coast
		1636-Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast
Eastern Osprey	<i>Pandion cristatus</i>	1717-Broad-leaved Paperbark - Swamp Mahogany - Swamp Oak - Saw Sedge swamp forest of the Central Coast and Lower North Coast
		1636-Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast
Gang-gang Cockatoo	<i>Callocephalon fimbriatum</i>	1717-Broad-leaved Paperbark - Swamp Mahogany - Swamp Oak - Saw Sedge swamp forest of the Central Coast and Lower North Coast
		1636-Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast
Golden-tipped Bat	<i>Phoniscus papuensis</i>	1717-Broad-leaved Paperbark - Swamp Mahogany - Swamp Oak - Saw Sedge swamp forest of the Central Coast and Lower North Coast
		1636-Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast
Greater Broad-nosed Bat	<i>Scoteanax rueppellii</i>	1717-Broad-leaved Paperbark - Swamp Mahogany - Swamp Oak - Saw Sedge swamp forest of the Central Coast and Lower North Coast
		1636-Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast
Grey-crowned Babbler (eastern subspecies)	<i>Pomatostomus temporalis temporalis</i>	1636-Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast
Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	1717-Broad-leaved Paperbark - Swamp Mahogany - Swamp Oak - Saw Sedge swamp forest of the Central Coast and Lower North Coast

BAM Predicted Species Report

Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	1636-Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast
Large Bent-winged Bat	<i>Miniopterus orianae oceanensis</i>	1717-Broad-leaved Paperbark - Swamp Mahogany - Swamp Oak - Saw Sedge swamp forest of the Central Coast and Lower North Coast 1636-Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast
Little Bent-winged Bat	<i>Miniopterus australis</i>	1717-Broad-leaved Paperbark - Swamp Mahogany - Swamp Oak - Saw Sedge swamp forest of the Central Coast and Lower North Coast 1636-Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast
Little Eagle	<i>Hieraaetus morphnoides</i>	1717-Broad-leaved Paperbark - Swamp Mahogany - Swamp Oak - Saw Sedge swamp forest of the Central Coast and Lower North Coast 1636-Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast
Little Lorikeet	<i>Glossopsitta pusilla</i>	1717-Broad-leaved Paperbark - Swamp Mahogany - Swamp Oak - Saw Sedge swamp forest of the Central Coast and Lower North Coast 1636-Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast 1638-Smooth-barked Apple - Red Bloodwood - Scribbly Gum grass - shrub woodland on lowlands of the Central Coast
Masked Owl	<i>Tyto novaehollandiae</i>	1636-Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast
Painted Honeyeater	<i>Grantiella picta</i>	1636-Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast
Powerful Owl	<i>Ninox strenua</i>	1636-Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast
Regent Honeyeater	<i>Anthochaera phrygia</i>	1717-Broad-leaved Paperbark - Swamp Mahogany - Swamp Oak - Saw Sedge swamp forest of the Central Coast and Lower North Coast
Scarlet Robin	<i>Petroica boodang</i>	1636-Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast
South-eastern Glossy Black-Cockatoo	<i>Calyptorhynchus lathami lathami</i>	1717-Broad-leaved Paperbark - Swamp Mahogany - Swamp Oak - Saw Sedge swamp forest of the Central Coast and Lower North Coast 1636-Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast

BAM Predicted Species Report

Speckled Warbler	Chthonicola sagittata	1636-Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast
		1638-Smooth-barked Apple - Red Bloodwood - Scribbly Gum grass - shrub woodland on lowlands of the Central Coast
Spotted-tailed Quoll	Dasyurus maculatus	1717-Broad-leaved Paperbark - Swamp Mahogany - Swamp Oak - Saw Sedge swamp forest of the Central Coast and Lower North Coast
		1636-Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast
		1638-Smooth-barked Apple - Red Bloodwood - Scribbly Gum grass - shrub woodland on lowlands of the Central Coast
Square-tailed Kite	Lophoictinia isura	1636-Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast
Swift Parrot	Lathamus discolor	1717-Broad-leaved Paperbark - Swamp Mahogany - Swamp Oak - Saw Sedge swamp forest of the Central Coast and Lower North Coast
		1636-Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast
Turquoise Parrot	Neophema pulchella	1636-Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast
		1638-Smooth-barked Apple - Red Bloodwood - Scribbly Gum grass - shrub woodland on lowlands of the Central Coast
Varied Sittella	Daphoenositta chrysoptera	1717-Broad-leaved Paperbark - Swamp Mahogany - Swamp Oak - Saw Sedge swamp forest of the Central Coast and Lower North Coast
		1636-Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast
		1638-Smooth-barked Apple - Red Bloodwood - Scribbly Gum grass - shrub woodland on lowlands of the Central Coast
White-bellied Sea-Eagle	Haliaeetus leucogaster	1717-Broad-leaved Paperbark - Swamp Mahogany - Swamp Oak - Saw Sedge swamp forest of the Central Coast and Lower North Coast
		1636-Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast
		1638-Smooth-barked Apple - Red Bloodwood - Scribbly Gum grass - shrub woodland on lowlands of the Central Coast
White-throated Needle-tail	Hirundapus caudacutus	1717-Broad-leaved Paperbark - Swamp Mahogany - Swamp Oak - Saw Sedge swamp forest of the Central Coast and Lower North Coast

BAM Predicted Species Report

White-throated Needletail	Hirundapus caudacutus	1636-Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast
		1638-Smooth-barked Apple - Red Bloodwood - Scribbly Gum grass - shrub woodland on lowlands of the Central Coast
Yellow-bellied Glider	Petaurus australis	1717-Broad-leaved Paperbark - Swamp Mahogany - Swamp Oak - Saw Sedge swamp forest of the Central Coast and Lower North Coast
		1636-Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast
Yellow-bellied Sheath-tail-bat	Saccolaimus flaviventris	1717-Broad-leaved Paperbark - Swamp Mahogany - Swamp Oak - Saw Sedge swamp forest of the Central Coast and Lower North Coast
		1636-Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast

Threatened species Manually Added

None added

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

Common Name	Scientific Name	Plant Community Type(s)
Black-necked Stork	Ephippiorhynchus asiaticus	1717-Broad-leaved Paperbark - Swamp Mahogany - Swamp Oak - Saw Sedge swamp forest of the Central Coast and Lower North Coast

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

Refer to BAR for detailed justification

Common Name	Scientific Name	Justification in the BAM-C
Black-necked Stork	Ephippiorhynchus asiaticus	Refer to BAR



BAM Vegetation Zones Report

Proposal Details

Assessment Id	Assessment name	BAM data last updated *
00039247/BAAS19042/23/00039248		05/08/2025
Assessor Name	Report Created	BAM Data version *
Fiona Iolini	22/12/2025	Legacy Classification (pre-ENSW) (82)
Assessor Number	Assessment Type	BAM Case Status
BAAS19042	Part 4 Developments (General)	Finalised
Assessment Revision	BOS entry trigger	Date Finalised
4	BOS Threshold: Biodiversity Values Map	22/12/2025

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

Vegetation Zones

#	Name	PCT	Condition	Area	Minimum number of plots	Management zones
1	1717_Mod_good	1717-Broad-leaved Paperbark - Swamp Mahogany - Swamp Oak - Saw Sedge swamp forest of the Central Coast and Lower North Coast	Mod_good	0.32	1	ClearAll (0.32 ha)

BAM Vegetation Zones Report

2	1636_Mod_good	1636-Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast	Mod_good	6.13	3	ClearAll (4.56 ha) Partial (1.57 ha)
3	1638_Mod_good	1638-Smooth-barked Apple - Red Bloodwood - Scribbly Gum grass - shrub woodland on lowlands of the Central Coast	Mod_good	1.96	1	ClearAll (1.93 ha) Partial (0.03 ha)



BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00039247/BAAS19042/23/00039248		05/08/2025
Assessor Name	Assessor Number	BAM Data version *
Fiona Iolini	BAAS19042	Legacy Classification (pre-ENSW) (82)
Proponent Names	Report Created	BAM Case Status
Brett Elliss	22/12/2025	Finalised
Assessment Revision	BOS entry trigger	Assessment Type
4	BOS Threshold: Biodiversity Values Map	Part 4 Developments (General)
Date Finalised	* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.	
22/12/2025		

Potential Serious and Irreversible Impacts

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

Additional Information for Approval



BAM Biodiversity Credit Report (Like for like)

PCT Outside Ibra Added

None added

PCTs With Customized Benchmarks

PCT
No Changes

Predicted Threatened Species Not On Site

Name
Ephippiorhynchus asiaticus / Black-necked Stork

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

BAM Biodiversity Credit Report (Like for like)

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	HBT Cr	No HBT Cr	Total credits to be retired
1717-Broad-leaved Paperbark - Swamp Mahogany - Swamp Oak - Saw Sedge swamp forest of the Central Coast and Lower North Coast	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	0.3	0	8	8
1636-Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast	Not a TEC	6.1	143	0	143
1638-Smooth-barked Apple - Red Bloodwood - Scribbly Gum grass - shrub woodland on lowlands of the Central Coast	Not a TEC	2.0	38	0	38

1636-Scribbly Gum - Red Bloodwood - Angophora inopina heathy woodland on lowlands of the Central Coast

Like-for-like credit retirement options

Class	Trading group	Zone	HBT	Credits	IBRA region
Sydney Coastal Dry Sclerophyll Forests This includes PCT's: 1138, 1253, 1625, 1636, 1638, 1776, 1778, 1782, 1786, 3583, 3592, 3594	Sydney Coastal Dry Sclerophyll Forests >=50% and <70%	1636_Mod_goo d	Yes	143	Wyong, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

BAM Biodiversity Credit Report (Like for like)

1638-Smooth-barked Apple - Red Bloodwood - Scribbly Gum grass - shrub woodland on lowlands of the Central Coast	Like-for-like credit retirement options					
	Class	Trading group	Zone	HBT	Credits	IBRA region
	Sydney Coastal Dry Sclerophyll Forests This includes PCT's: 1138, 1253, 1625, 1636, 1638, 1776, 1778, 1782, 1786, 3583, 3592, 3594	Sydney Coastal Dry Sclerophyll Forests >=50% and <70%	1638_Mod_goo d	Yes	38	Wyong, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
1717-Broad-leaved Paperbark - Swamp Mahogany - Swamp Oak - Saw Sedge swamp forest of the Central Coast and Lower North Coast	Like-for-like credit retirement options					
	Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region

BAM Biodiversity Credit Report (Like for like)

	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions This includes PCT's: 837, 839, 926, 971, 1064, 1092, 1227, 1230, 1231, 1232, 1235, 1649, 1715, 1716, 1717, 1718, 1719, 1721, 1722, 1723, 1724, 1725, 1730, 1795, 1798, 3272, 3906, 3983, 3985, 3986, 3988, 3989, 3990, 3995, 3997, 3998, 4000, 4001, 4004, 4006, 4009, 4013, 4019, 4020, 4021, 4044, 4047, 4057	-	1717_Mod_goo d	No	8 Wyong, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Species Credit Summary

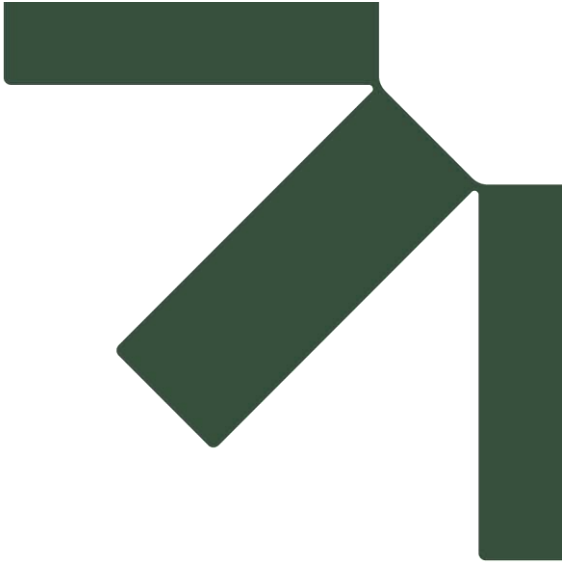
BAM Biodiversity Credit Report (Like for like)

Species	Vegetation Zone/s	Area / Count	Credits
Calyptrorhynchus lathami lathami / South-eastern Glossy Black-Cockatoo	1717_Mod_good, 1636_Mod_good, 1638_Mod_good	7.9	205.00

Credit Retirement Options

Like-for-like credit retirement options

Calyptrorhynchus lathami lathami / South-eastern Glossy Black-Cockatoo	Spp	IBRA subregion
	Calyptrorhynchus lathami lathami / South-eastern Glossy Black-Cockatoo	Any in NSW



Appendix I Additional Supporting Documentation

Biodiversity Development Assessment Report

Proposed Englobo Subdivision DA/1295/2023

Doyalson Wyee RSL Club t/a Doyalson Lifestyle Group

SLR Project No.: 630.30551.00000

22 December 2025

Fiona Iolini

From: Danielle Allen <Danielle.Allen@centralcoast.nsw.gov.au>
Sent: Monday, 5 May 2025 10:05 AM
To: Fiona Iolini
Cc: Salli Pendergast; brette@doylo.com.au
Subject: RE: Doyalson RSL BDAR RFI - request use of legacy PCT data DA/1295/2023

You don't often get email from danielle.allen@centralcoast.nsw.gov.au. [Learn why this is important](#)

Thanks Fiona

Whilst Council preference would be for the current East Coast PCTs to be used rather than the decommissioned PCTs, the following factors are considered:

- o Under the BAM decommissioned PCTs can still be used if cases were in-progress before the East Coast Classification update in the BAM-C (April 2023). You have confirmed below this applies.
- o This BDAR relates to a development application already under assessment.

Considering the above, Council does not object to the decommissioned PCTs being used in this instance.

The BDAR must however document the use of transitional arrangements and describe how the assessment is compliant.

Regards
Danielle



Danielle Allen
Principal Ecologist
Development Advisory Services
Central Coast Council

[0438 464 239](tel:0438464239)

Danielle.Allen@centralcoast.nsw.gov.au

PO Box 20 Wyong, NSW 2259

[Council on LinkedIn](#)

"We acknowledge the Traditional Custodians of the land on which we live, work and play. We pay our respects to Darkinjung country, and Elders past and present. We recognise the continued connection to these lands and waterways and extend this acknowledgement to the homelands and stories of those who also call this place home. We recognise our future leaders and the shared responsibility to care for and protect our place and people."



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From: Fiona Iolini <FIolini@slrconsulting.com>
Sent: Thursday, 1 May 2025 6:14 PM
To: Danielle Allen <Danielle.Allen@centralcoast.nsw.gov.au>
Cc: Salli Pendergast <Salli.Pendergast@centralcoast.nsw.gov.au>; brette@doylo.com.au
Subject: RE: Doyalson RSL BDAR RFI - request use of legacy PCT data

[EXTERNAL EMAIL] Do not click any links or attachments unless you have checked the sender and trust the content is safe. If you are unsure, please report this to I&T Service Desk via the Portal.

Hi Danielle,

Thank you for getting back to me. Please see below screen shot indicating that the case was opened on 23 March 2023.

The screenshot shows the NSW Government portal interface. At the top is the NSW Government logo and a search bar. Below the navigation bar, there's a section for 'Cases' with a sub-header 'My Development/Clearing Assessment Cases'. A search bar contains the text '00039247'. Below this is a table with columns: Application Type, Case Type, Subject, Status, Date/Time Opened, Contact, and Case ID. The table contains one row with the following data: Application Type: 1, Case Type: 000392..., Case Type: Application Development Pa..., Subject: Doyalson, Status: Submitted to Consent Autho..., Date/Time Opened: 23/03/2023 9:55 a..., Contact: Fiona Iolini, Case ID: A1ZTIC.

Application Type	Case Type	Subject	Status	Date/Time Opened	Contact	Case ID	
1	000392...	Application Development Pa...	Doyalson	Submitted to Consent Autho...	23/03/2023 9:55 a...	Fiona Iolini	A1ZTIC

Kind Regards,

Fiona Iolini

Associate - Ecology & Biodiversity

- PLEASE NOTE MY WORKDAYS ARE MON-THU

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M +61 404 468 168 **E** FIolini@slrconsulting.com

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If you have received this e-mail in error, please notify the author and delete this message immediately.

From: Danielle Allen <Danielle.Allen@centralcoast.nsw.gov.au>
Sent: Thursday, 1 May 2025 4:07 PM
To: Fiona Iolini <FIolini@slrconsulting.com>
Cc: Salli Pendergast <Salli.Pendergast@centralcoast.nsw.gov.au>; brette@doylo.com.au
Subject: RE: Doyalson RSL BDAR RFI - request use of legacy PCT data

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Hi Fiona

My first question is, can you confirm that the BAM case in-progress before the East Coast Classification update in the BAM-C (April 2023)?

I can then provide further advice.

Thanks
Danielle



Danielle Allen
Principal Ecologist
Development Advisory Services
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"We acknowledge the Traditional Custodians of the land on which we live, work and play. We pay our respects to Darkinjung country, and Elders past and present. We recognise the continued connection to these lands and waterways and extend this acknowledgement to the homelands and stories of those who also call this place home. We recognise our future leaders and the shared responsibility to care for and protect our place and people."



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From: Salli Pendergast <Salli.Pendergast@centralcoast.nsw.gov.au>
Sent: Thursday, 1 May 2025 1:05 PM
To: Danielle Allen <Danielle.Allen@centralcoast.nsw.gov.au>
Subject: FW: Doyalson RSL BDAR RFI - request use of legacy PCT data

Hi Danielle
Refer below. Can you please assist?
Thanks
Salli

Salli Pendergast
Principal Development Planner
Employment and Urban Release
Central Coast Council
 0434 323 541
 Salli.Pendergast@centralcoast.nsw.gov.au



As an ECO Destination, we encourage you to reduce your footprint by not printing this email and keeping file sizes to a minimum.

From: Fiona Iolini <FIolini@slrconsulting.com>
Sent: Thursday, 1 May 2025 12:40 PM
To: Salli Pendergast <Salli.Pendergast@centralcoast.nsw.gov.au>
Cc: Brett Elliss <brette@doylo.com.au>
Subject: Doyalson RSL BDAR RFI - request use of legacy PCT data

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Hi Salli,

In relation to DA/1295/2023 and BAM-C case number 00039247 could I please request use of Legacy PCT data to enable us to complete updates to the Biodiversity Development Assessment Report (BDAR). Advice we have received from the BOS helpdesk is as follows:

"Please discuss the retention and use of legacy PCTs with the decision-making authority to confirm that they are agreeable to the case being submitted using legacy PCT dataset. It is the decision-making authority's discretion to allow the ongoing use of legacy PCT data for the biodiversity assessment. The decision-making authority has the discretion to request the BAM-C case and BDAR be updated to include the revised plant community types, in its evaluation of the assessment, and to ensure biodiversity impacts have been appropriately assessed. For continued access to legacy PCT data after 14 April 2025 provide the following to the BOS Helpdesk with your request:

- a. written support from the consent authority for the use of the legacy PCT dataset in the biodiversity assessment*
- b. the BAM-C and BOAMS case numbers that require access to legacy PCT dataset."*

Kind Regards,

Fiona Iolini

Associate - Ecology & Biodiversity

- PLEASE NOTE MY WORKDAYS ARE MON-THU

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17 September 2025

Our ref: 24HUS8504

Doyalson Wyee RSL Club Ltd t/a Doyalson Lifestyle Group
80 Pacific Highway, Doyalson NSW 2262
Attention: Brett Ellis

Dear Brett

Avoid and Minimise – Doyalson Wyee Planning Proposal (PP-2021-4334)

80, 90, 100, 110 and 120 Pacific highway and 49-65 Wentworth Ave Doyalson

As requested, Eco Logical Australia Pty Ltd (ELA) provides this summary of how the Doyalson Wyee RSL Planning Proposal avoided and minimised biodiversity impacts for the above Planning Proposal which resulted in Voluntary Planning Agreement Dealing AS580574 on 15 September 2022 (VPA 2022).

This information is relevant to the assessment of the Englobo Subdivision DA/1295/2023 as the Planning Proposal incorporated avoid and minimise measures which then set the context for subsequent development applications.

Overview

Over the 5 year Planning Proposal period (2018-2022) the Doyalson site has been the subject of biodiversity studies and design reviews to determine the potential development envelopes, and to avoid and minimise impacts to native vegetation and threatened species habitat as much as possible. These are described in the Biodiversity Development Assessment Report (Eco Logical Australia) that was submitted with the Planning Proposal. The Planning Proposal identified lands that are suitable for development, and culminated in the LEP being amended to rezone the land to which the Doyalson DA applies for development.

To further ensure the protection of biodiversity values at the site, VPA 2022 was entered into in connection with the rezoning to set aside land with biodiversity values or establish newly planted corridors with native and endemic species with a particular focus on east-west fauna movement.

The ways in which impacts were avoided and minimized in the Planning Proposal include:

- Identification of biodiversity values including habitat for threatened species and analysis of corridors, threatened species survey and mapping of trees was undertaken during preparation of the Planning Proposal.
- Placement of development primarily on existing cleared land containing no biodiversity values.

- Introduction of 3 x Biodiversity Corridors in which all vegetation strata including most Endangered Ecological Communities will be restored, planted and managed. Two of the Biodiversity Corridors were zoned C2 and C3.
- Introduction of 4 x Landscape Corridors in which tree canopy and native understory will be retained and managed or otherwise planted to native and endemic species compliant with 'Planning for Bushfire Protection 2019'.
- Retention of hollow bearing trees in parks in Landscape Corridors.
- Management of protected vegetation in accordance with Vegetation Management Plans for each Biodiversity Corridor and Landscape Management Plans for Landscape Corridors.

Where impacts cannot be avoided, they will be offset via the biodiversity offset scheme.

The Planning Proposal and VPA 2022 resulted in 52,376 m² being placed into the C2 and C3 zoned corridors and a further 46,279 m² ha into the Landscape corridors, giving a total biodiversity area of 98,655 m² – approximately 9.86 ha. This is 19.97% of the site which previously had no zoning protection or Planning Agreements requiring protection of biodiversity values.

Chronology

Below is a chronology of events that demonstrate how biodiversity values were studied, understood and incorporated into evolving design of the Planning Proposal in consultation with Central Coast Council and NSW agencies.

Date	Comment	Figure
Prior to Planning Proposal	• Site is zoned RU6 (Transition) and RE2. • No C2 zoning or protection of corridors.	1
2018	Biodiversity assessment by Eco Logical Australia • Mapping of Plant Community Types, their condition and collection of BAM plots • Targeted Flora and Fauna Surveys • Investigation of potential squirrel glider corridor The results were provided to the Doyalson design team to ensure a thorough understanding of the existing biodiversity values on site.	
October 2018	Initial Doyalson Wyee RSL Masterplan • Proposes a north-south corridor along the eastern boundary to maintain north-south connectivity within the site and protect Endangered Ecological Community. • Proposes protection of a riparian corridor in the north of the site. • No east-west biodiversity corridors.	2
August 2019	Updated Masterplan • Riparian corridor in the north is widened to protect additional vegetation. • Central park is proposed to protect hollow bearing trees • Linear biodiversity link along gas pipeline identified.	3

2020	Consultation with BCD Biodiversity Conservation Division (<i>BCD</i>) of the NSW Department of Planning and Environment (as it was then known) seeks confirmation of the mechanisms by which biodiversity corridors will be protected and managed																																					
2020	Consultation with Council Council’s Ecologist sought an east-west corridor in addition to the north-south ecological corridors and to protect as many trees as possible within a corridor with an average width of 20m (11,170m2) from the eastern boundary to western boundary across Lot 49 DP 707586.																																					
2020	Tree survey and updated corridor width in Masterplan • Tree survey undertaken on Lot 49 DP 707586 • East-west landscape Corridor E is proposed with an area of 14,041m2 - an increase of 26% on what Council was seeking. • Corridor E provides for increased retention of trees from 72 to 92. Incorporating the central park increases the retention of hollow bearing trees from 17 to 31.	4																																				
September 2021	Planning Proposal lodged. • Biodiversity corridors intended to be established through DA design and a Planning Agreement.	5																																				
September 2022	Planning Agreement signed. • Biodiversity Corridors (A, B, F) to be fully vegetated with ground, mid and overstorey. A Vegetation Management Plan is to provide detail on works within the corridors including removal of exotic vegetation and replanting of endemic species. Corridor A is largely unvegetated and therefore the VPA will provide for a biodiversity link where one currently does not exist. • Landscape Corridors (C, D, E and F) retain tree canopy, but not ground and mid story as these corridors form part of the bushfire Asset Protection Zones. The final Corridor C is expanded to include additional paperbark species. <table><tr><td>Corridor</td><td>Corridor Type</td><td>Area (m2)</td><td>% of site</td></tr><tr><td>A</td><td>Biodiversity</td><td>14,343</td><td>2.90</td></tr><tr><td>B</td><td>Biodiversity</td><td>11,465</td><td>2.32</td></tr><tr><td>C</td><td>Landscape</td><td>15,551</td><td>3.15</td></tr><tr><td>D</td><td>Landscape</td><td>10,103</td><td>2.04</td></tr><tr><td>E</td><td>Landscape</td><td>15,450</td><td>3.20</td></tr><tr><td>F</td><td>Biodiversity</td><td>26,568</td><td>5.38</td></tr><tr><td>G</td><td>Landscape</td><td>5,175</td><td>1.05</td></tr><tr><td>Total</td><td></td><td>98,655</td><td>19.97</td></tr></table>	Corridor	Corridor Type	Area (m2)	% of site	A	Biodiversity	14,343	2.90	B	Biodiversity	11,465	2.32	C	Landscape	15,551	3.15	D	Landscape	10,103	2.04	E	Landscape	15,450	3.20	F	Biodiversity	26,568	5.38	G	Landscape	5,175	1.05	Total		98,655	19.97	6
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Total		98,655	19.97																																			
December 2022	Publication of LEP amendment. • Biodiversity corridor A is zoned C3 and Biodiversity Corridors B and F are zoned C2.	7																																				

	• The Landscape corridors C, D, E and G are zoned RE2 and R2, but are subject to the Planning Agreement and commitment to prepare and implement a Vegetation Management Plan.	
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Regards,



David Bonjer
Principal Planning Consultant / Sydney Operations Manager

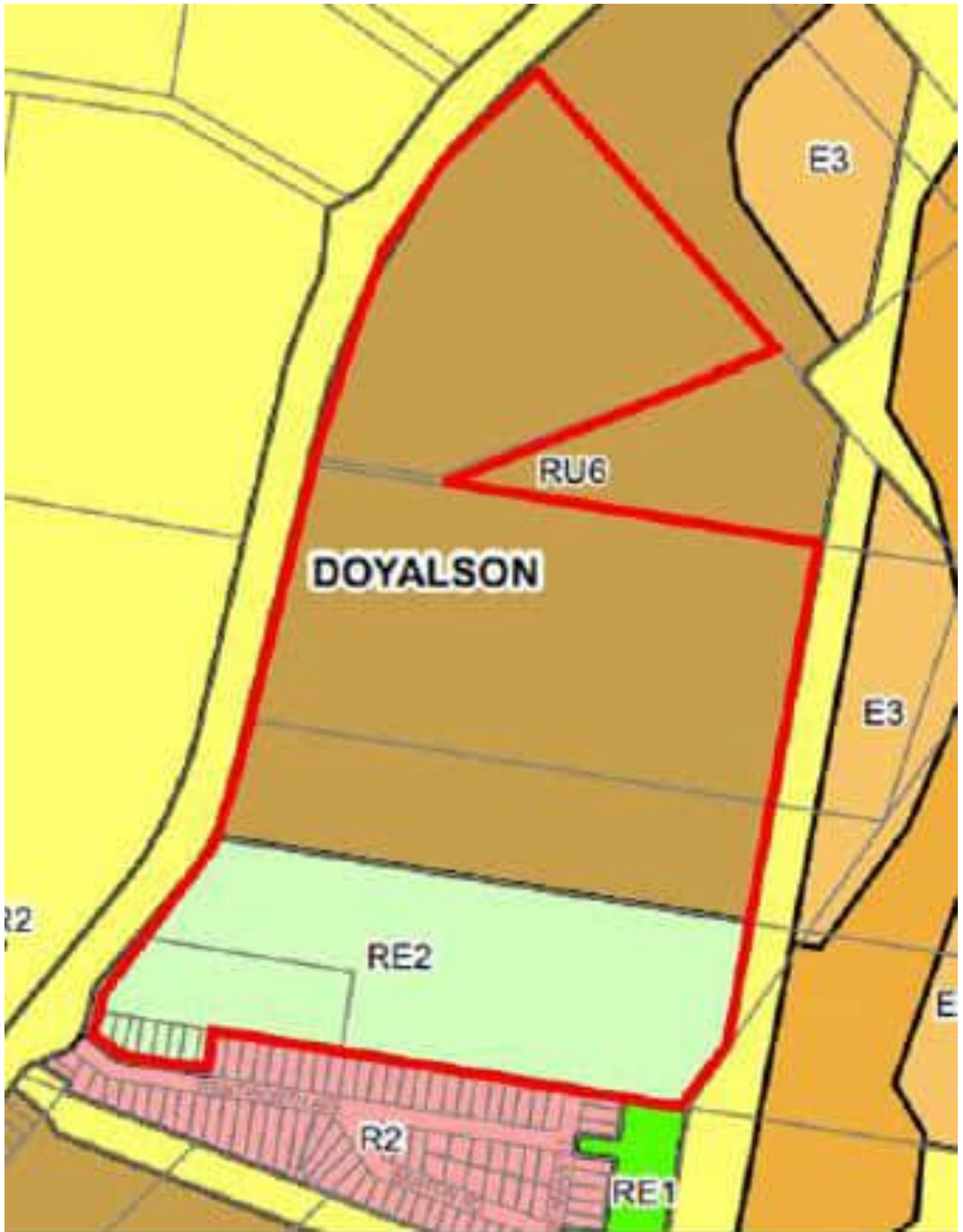


Figure 1 Zoning prior to Planning Proposal

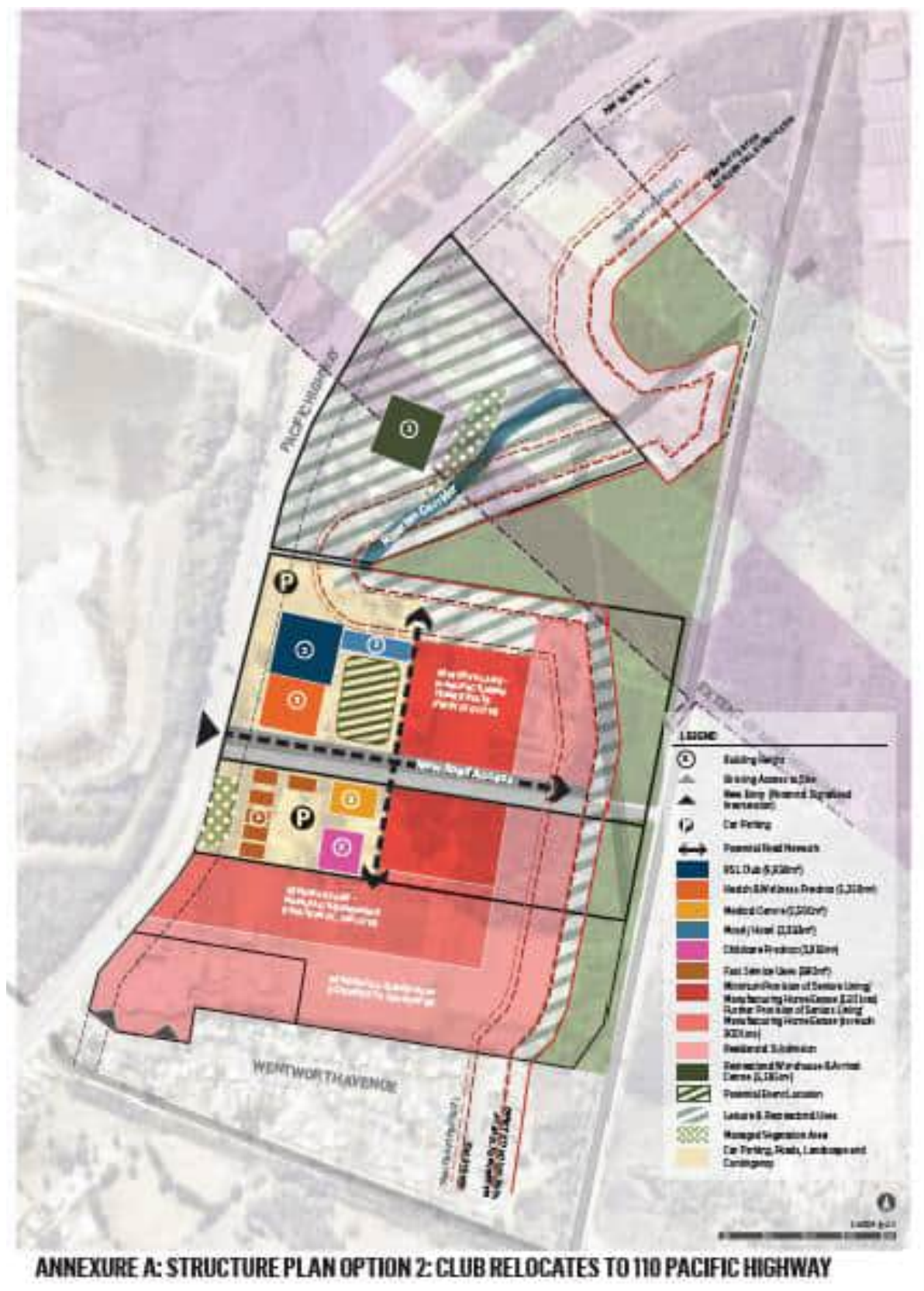


Figure 2 Masterplan August 2018





Figure 4 Increase corridor E width to retain trees (2020)

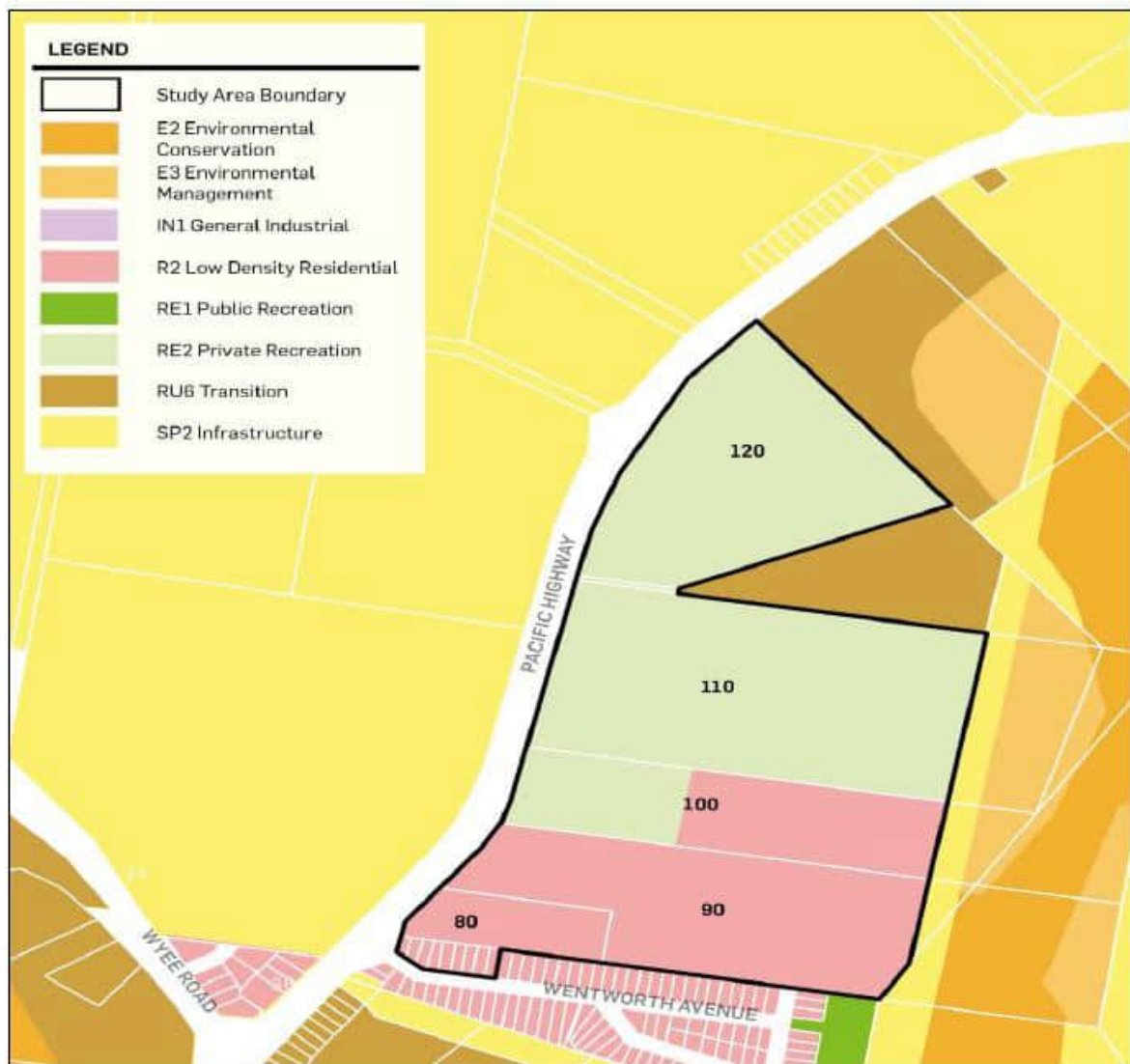
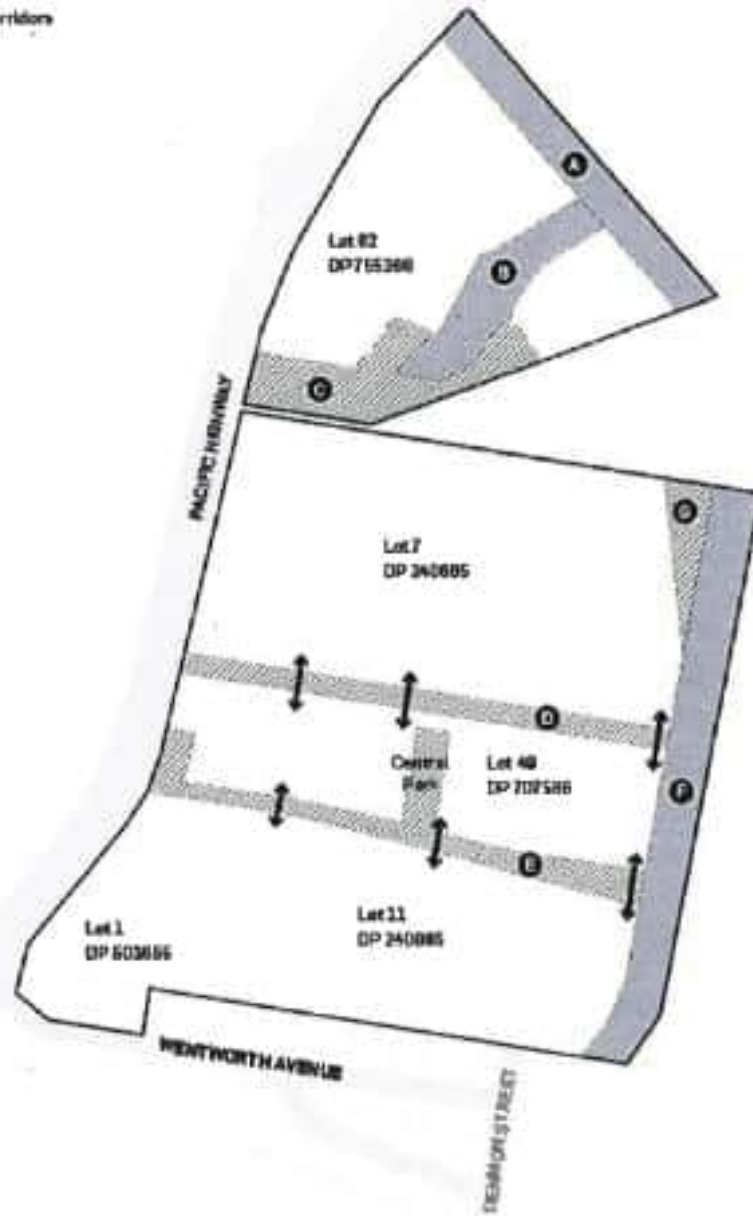


Figure 5 Planning Proposal as lodged (September 2021)

LEGEND

CROSSINGS OVER CORRIDORS

-  Indicative Location of Road Crossings
-  Biodiversity Corridors
-  Landscape Corridors



1:1,000 @ A4
 ALL DIMENSIONS GIVEN UNLESS OTHERWISE SPECIFIED



DOYALSON WYEE RSL CLUB
BIODIVERSITY CORRIDOR PLAN

DATE: 04.04.2022
 JOB NO: P03201003
 DWG NO: -
 REV: A

Figure 6 Planning Agreement

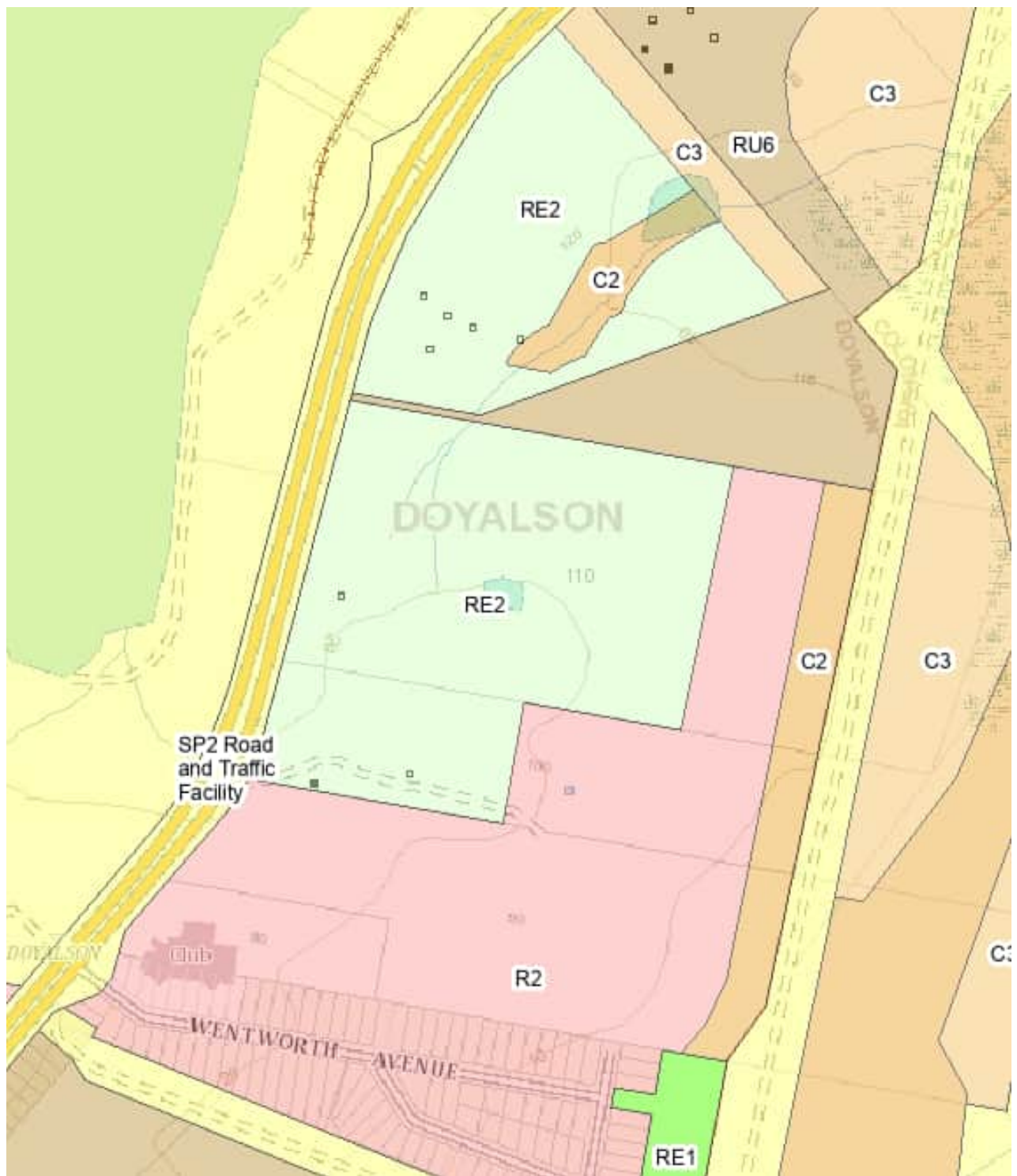
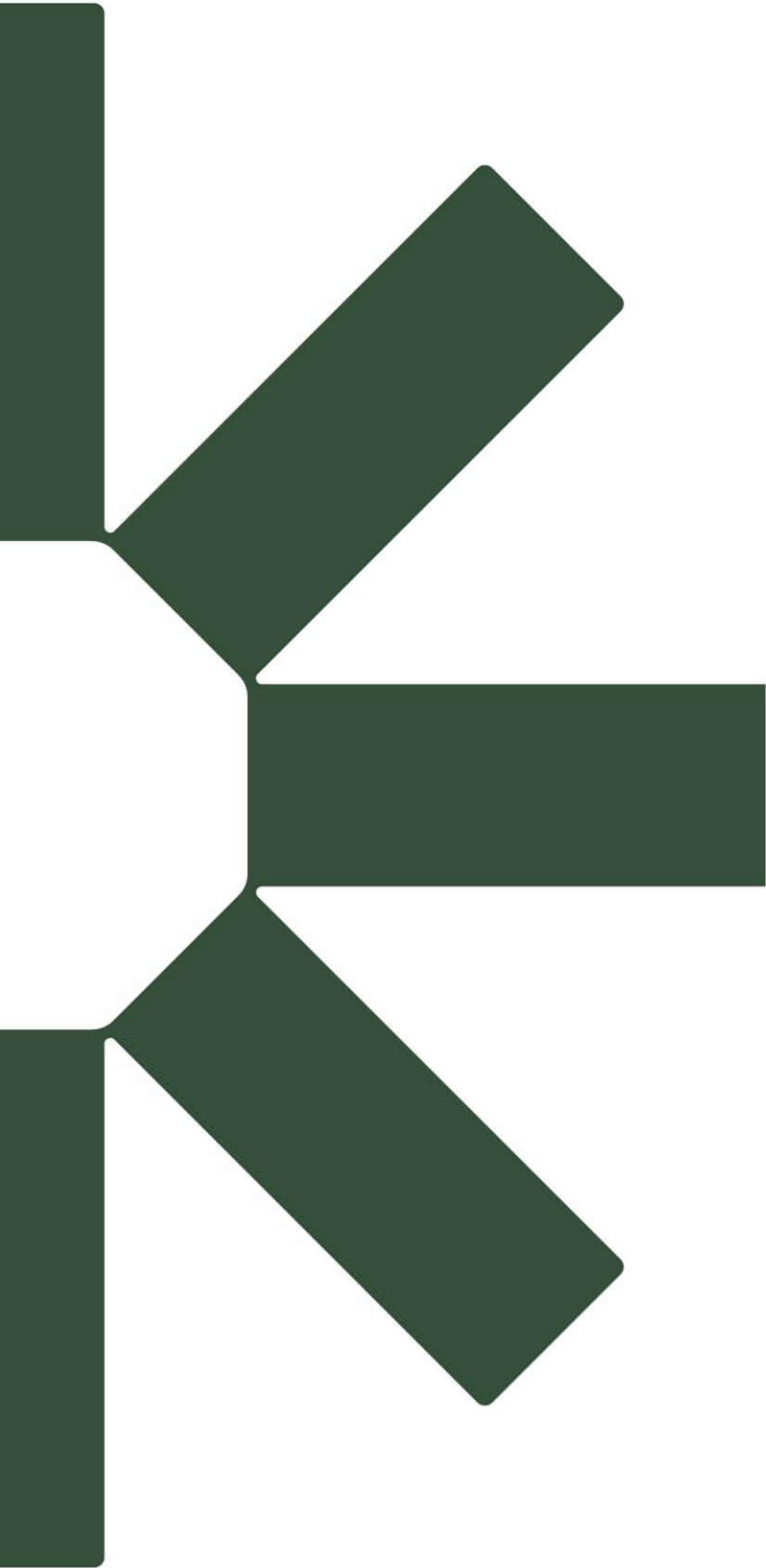


Figure 7 Gazetted LEP amendment (December 2022)



Making Sustainability Happen