Salamander Shores
Biodiversity Development Assessment Report – Streamlined Assessment Module (Small Area)

Salamander Hotel Unit Trust

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Template 2.8.1

Executive Summary

Eco Logical Australia Pty Ltd (ELA) was engaged by Salamander Hotel Unit Trust (the proponent) to provide a Biodiversity Development Assessment Report (BDAR) in accordance with the Biodiversity Assessment Method (BAM 2020) to assess the biodiversity impacts of the proposed redevelopment/modification (MP 06_0183 MOD 2) of the existing Bannisters Resort at 147 Soldiers Point Road (Lot 31/DP 529002), Soldiers Point NSW.

The proposed development site is approximately 1.21 ha and largely encompasses the current hotel building envelope, including; 0.8 ha of cleared/existing buildings and 0.27 ha of non-vegetation (comprising of 0.2 ha of planted landscape/exotic garden and 0.07 ha of exotic lawn). Native vegetation within the proposed development site, largely comprises of scattered trees around the existing resort buildings, with more intact remnant vegetation occurring outside of the proposed development site to the east and south.

Plot-based vegetation surveys and habitat surveys were undertaken in accordance with the BAM to confirm presence of Plant Community Types (PCTs), the extent of native vegetation, patch size and calculate vegetation integrity and habitat values.

Within the development site 0.14 ha consists of native vegetation identified as PCT 1626 - *Smooth-barked Apple - Broad-leaved Mahogany – Red Bloodwood heathy low open forest on hills at Nelson Bay*. This PCT does not align with any Threatened Ecological Communities (TEC) under the NSW *Biodiversity Conservation Act 2016* (BC Act) or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Three Hollow Bearing Trees (HBT) (<20cm dbh), including; one *Eucalyptus tereticornis* (Forest Red Gum) and two *Eucalyptus umbra* (Broad-leaved White Mahogany) were detected within the development site. This assessment has assumed that the total 0.14 ha of PCT1626 and all three HBTs will be impacted by the proposed development. The removal of 0.27 ha of non-native vegetation does not require further assessment.

The associated ecosystem credit requirements to offset impacts to this vegetation are listed in the table below.

Vegetation Zone	PCT ID	Condition	PCT Name	Direct impact (ha)	Credits required
1	1626	High	Smooth-barked Apple - Broad-leaved Mahogany - Red Bloodwood heathy low open forest on hills at Nelson Bay	0.05 ha	1
2	1626	Low	Smooth-barked Apple - Broad-leaved Mahogany - Red Bloodwood heathy low open forest on hills at Nelson Bay	0.09 ha	2
Total				**0.14**	**3**

The streamlined assessment module (small area) (Appendix C of BAM 2020) has been applied to this development site. Based on this assessment method, targeted surveys are only required for candidate Serious And Irreversible Impact (SAII) species with a habitat constraint or candidate species credit

species incidentally observed on site. Based on surveys completed, the vegetation present within the proposed development site did not provide habitat constraints suitable for any of the candidate 'species credit' species that are also listed candidate SAII species. No candidate 'species credit' species were incidentally observed during surveys. As such, no candidate species credit species required further assessment or credits to offset the impacts of the project. All other species are considered 'ecosystem credit' species based on habitat associated with PCT 1626 within the development site.

An assessment of the potential impacts of the proposed subdivision on Matters of National Environmental Significance (MNES) listed under the EPBC Act was undertaken and it was determined that no significant impacts are likely to occur.

This Biodiversity Development Assessment Report is certified by Shawn Ryan who is an accredited person to apply the BAM (accreditation number BAAS21002). The report has been prepared based on the requirements of, and information provided under the BAM (2020).

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Abbreviations

Abbreviation	Description
BAM	Biodiversity Assessment Method
BAMC	Biodiversity Assessment Method Credit Calculator
BC Act	NSW *Biodiversity Conservation Act 2016*
BDAR	Biodiversity Development Assessment Report
BSSAR	Biodiversity Stewardship Site Assessment Report
CEEC	Critically Endangered Ecological Community
DAWE	Commonwealth Department of Agriculture, Water and the Environment
DNG	Derived Native Grassland
DPE	NSW Department of Planning and Environment
EEC	Endangered Ecological Community
ELA	Eco Logical Australia Pty Ltd
EP&A Act	NSW *Environmental Planning and Assessment Act 1979*
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
FM Act	NSW *Fisheries Management Act 1994*
GIS	Geographic Information System
GPS	Global Positioning System
IBRA	Interim Biogeographic Regionalisation for Australia
LGA	Local Government Area
LLS	Local Land Service
NSW	New South Wales
NOW	NSW Office of Water
PCT	Plant Community Type
SEPP	State Environmental Planning Policy
SSD	State Significant Development
SSI	State Significant Infrastructure
TEC	Threatened Ecological Community
VIS	Vegetation Information System
WM Act	NSW *Water Management Act 2000*

1. Introduction

Eco Logical Australia Pty Ltd (ELA) was engaged by Salamander Hotel Unit Trust (the proponent) to assess the biodiversity impacts of the proposed redevelopment/modification of the existing Bannisters Resort at 147 Soldiers Point Road, Soldiers Point NSW.

Eco Logical Australia Pty Ltd (ELA) understands the proponent received recommendations from the Department of Planning and Environment (DPE), provided to ELA on 12 November 2021 for additional context. An updated assessment under the NSW *Biodiversity Conservation Act 2016* (BC Act) along with other recently updated relevant legislation were flagged for consideration in the advice. Subsequently the Biodiversity and Conservation Division (BCD) advised (via letter dated 17 January 2022) that a Biodiversity Development Assessment Report (BDAR) in accordance with the BAM (2020); or a BDAR waiver under section 7.9 of the BC Act would be required in relation to assessment requirements supporting the redevelopment/modification application.

A preliminary site assessment undertaken by ELA (2021) identified areas of native vegetation consistent with a locally occurring PCT and with an extent of <1 ha within the development site. ELA determined that a BDAR using the Appendix C: Streamlined assessment module (small area) of the BAM (2020) would be the most appropriate approach for the proponent.

As such this BDAR, using the streamlined assessment module (small area) and utilising the site-based method, has been prepared by Shawn Ryan, an Accredited Person (BAAS21002) to apply the BAM under the BC Act (2016). All credit calculations have been undertaken using the BAM Calculator (BAMC) version 2020 in case number 00031138.

Definitions of terminology used throughout this report are presented in Appendix A.

1.1. General description of the development site

The developments site includes the entirety of Lot 31/DP 529002, which is located at 147 Soldiers Point Road, Soldiers Point. This property is approximately 1.21 ha and zoned R3 *'Medium Density Residential'* under the Port Stephens Local Environmental Plan (LEP) 2013 (hereafter referred to as the development site).

1.2. Brief description of the proposal

The proposed redevelopment/modification to the mixed-use (residential/tourist) development (MP 06_0183 MOD 2) of Lot 31/DP 529002 (the proposal), includes the demolition of existing buildings and facilities on site and the construction, operation and maintenance of new and expanded hotel and residential structures. These structures will include five separate buildings that contain temporary and permanent residential accommodation, conference facilities, multiple hospitality venues, recreational/health facilities including outdoor pool and parking and additional recreational facilities largely contained within the existing development footprint. Landscape plans including the existing resort building layout (Plate 1) (provided to ELA 18 November 2021) and an overlay of the current concept plans (Plate 2) (provided to ELA 18 January 2022) show the proposed redevelopment/modification will be largely infill construction of existing buildings, landscaped gardens and previously required Asset Protection Zones (APZ) areas within the development site.

1.3. Development footprint

The development footprint is defined as the area of land that is directly impacted on by a proposed development, including access roads, and areas used to store construction materials within the development site.

Given the existing development footprint and proposed development footprint largely encompass the entirety of the development site (the lot), for the purposes of this report the development footprint is hereafter collectively referred to as the development site. As such, this report acknowledges the development site boundary to include total impacts of the proposal, including; the proposed project footprint and the construction and operational footprint for any clearing associated with temporary/ancillary construction facilities and infrastructure (Figure 1).

This report includes two base maps, the Location Map (Figure 2) and the Site Map (Figure 3).

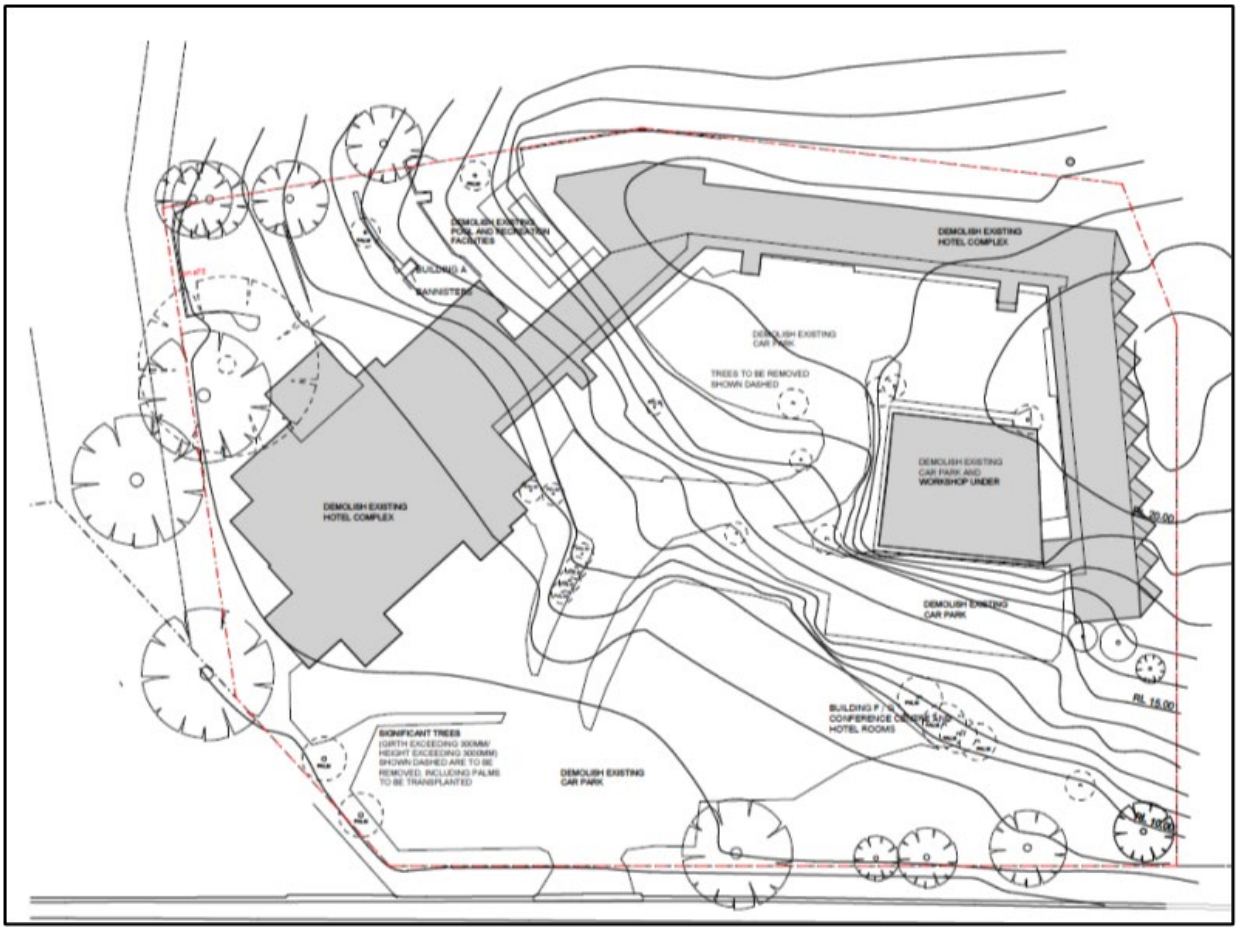

Plate 1: Provided landscape plans displaying the development site boundary (red line) and the existing resort layout (including; buildings, facilities and landscaping). Note: plans provided by the proponent and locations approximate only.

Plate 2: The existing development (satellite imagery) and landscape plan overlayed with the current concept plan for the proposed redevelopment/modification. Note: plans provided by the proponent and included here as an indicative display of the proposed development's location within the development site (red line).

1.4. Sources of information used

The following data sources were reviewed as part of this report:

- BioNet Vegetation Classification (accessed 21/10/2021)
- BioNet Atlas Database (accessed 21/10/2021)
- EPBC Act Protected Matters Search Tool (PMST) (accessed 20/10/2021)
- Threatened Biodiversity Data Collection (accessed 21/10/2021)

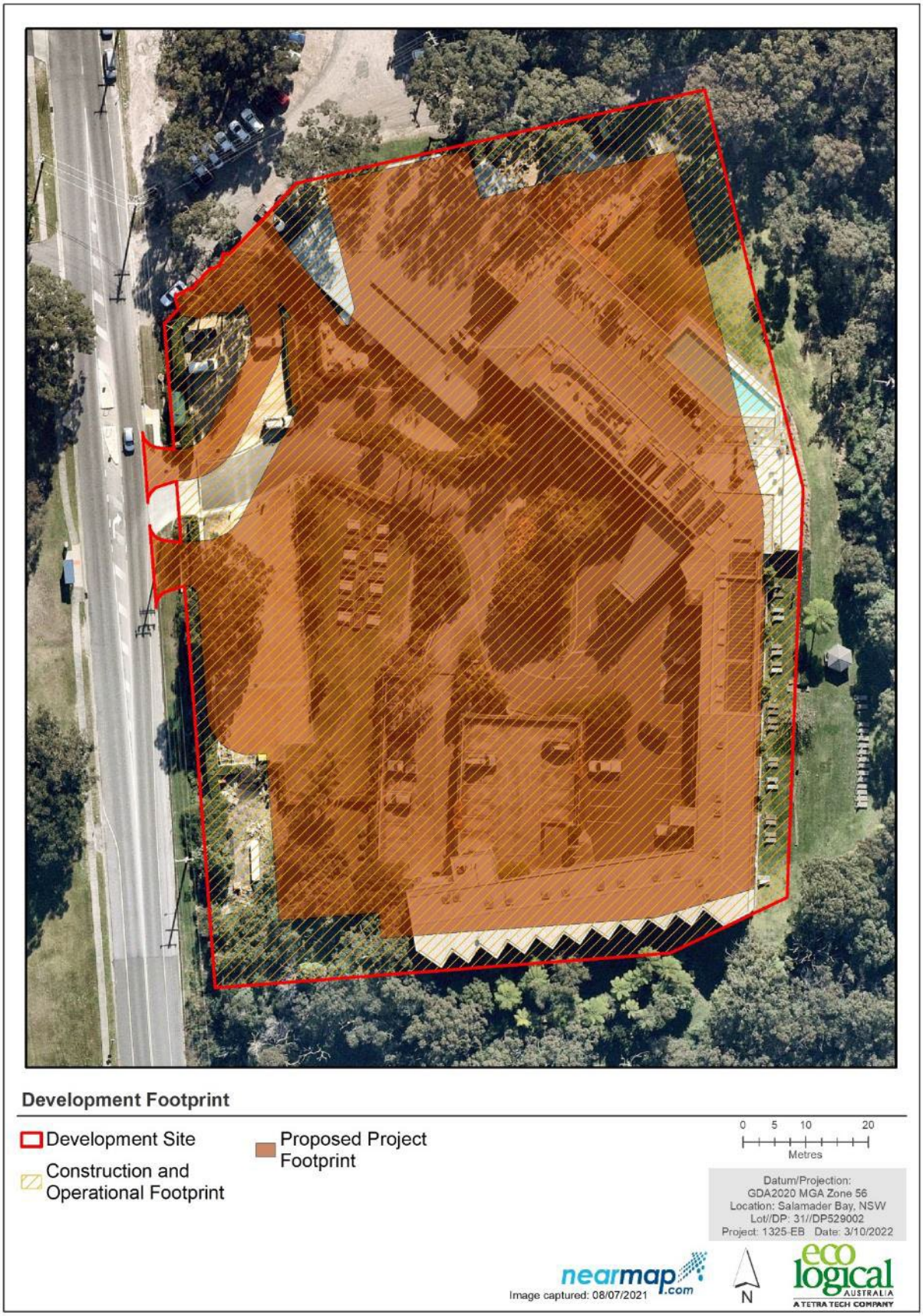

Figure 1: Development site including the proposed project footprint and construction and operational footprint

1.5. Legislative context

Legislation relevant to the development site is outlined in Table 1.

Table 1: Legislative context

Name	Relevance to the project	Report Section
Commonwealth		
Environmental Protection and Biodiversity Conservation Act 1999	Matters of National Environmental Significance (MNES) may occur near the development site. This report assesses impacts to MNES and concludes that the development is not likely to have a significant impact on MNES.	**Section 8**
NSW		
Environmental Planning and Assessment Act 1979	The EP&A Act is the principal planning legislation for NSW. It provides a framework for the overall environmental planning and assessment of development proposals. The proposed development requires consent under the Port Stephens LEP (2013) and is to be assessed under Part 4 of the EP&A Act.	-
Biodiversity Conservation Act 2016	The BC Act requires that State Significant Development (SSD) applications must be accompanied by a BDAR unless the Planning Agency Head (or delegate) and the Environment agency Head (or delegate) determine that the proposed development is not likely to have a significant impact on biodiversity values. This determination is referred to as a BDAR waiver. In this circumstance it was determined that the proposed SSD-29702120 application would require clearing of native vegetation consistent with a PCT and therefore not eligible for a BDAR waiver. Given the above and that the native vegetation to be cleared did not exceed the BAM threshold (>1 ha) it is determined that a BDAR under the streamlined assessment module (small areas) is required for this development.	**This Report**
Fisheries Management Act 1994	The development does not involve impacts to Key Fish Habitat, does not involve harm to marine vegetation, dredging, reclamation or obstruction of fish passage. A permit or consultation under the FM Act is not required.	-
Water Management Act 2000	The project does not involve works on waterfront land. A Controlled Activity Approval under s91 of the WM Act is not required.	-
Planning Instruments		
State Environmental Planning Policy (Coastal Management) 2018	The development site does not contain areas of Coastal Wetlands or Littoral Rainforest mapped under the Coastal Management SEPP.	-
State Environmental Planning Policy (Biodiveristy and Conservation) 2021	State Environmental Planning Policy (Biodiversity and Conservation) 2021 applies to local development only.	-
Port Stephens Local Environment Plan (LEP) 2013	The subject land is zoned R3 - *Medium Density Residential* under the Port Stephens LEP (2013).	-

2. Landscape features

The site-based method was applied for this assessment. The assessment area is the 1,500 m buffer surrounding the outside edge of the boundary of the subject land.

The landscape features considered for this assessment are presented in Table 2, Figure 2 and Figure3.

Table 2: Landscape features

Landscape feature	Subject Land/Development Site	Assessment Area	Data source
IBRA Region(s)	NSW North Coast	NSW North Coast	Interim Biogeographic Regionalisation for Australia, Version 7
IBRA subregion(s)	Karuah Manning	Karuah Manning	Interim Biogeographic Regionalisation for Australia, Version 7
Rivers and streams	Not present	Not present	NSW LPI Waterway mapping
Estuaries and wetlands	Not present	Not present	NSW directory of important wetlands
Connectivity of different areas of habitat	The development site is located on the edge of a small sized north-south corridor of dry sclerophyll forest, with fragmented native vegetation to the north, urban areas dominating the west, intact vegetation as well as ocean to the east and fragmented vegetation to the south.	The assessment area is located on a narrow peninsular that has low levels of connectivity to the north, dominated by fragmented street trees and dry sclerophyll forest providing a weak matrix of connectivity. Slightly better levels of connectivity are continued to the south with urban areas dominating to the west and open ocean to the east.	Aerial imagery
Geological features of significance and soil hazard features	The development site does not contain karst, caves, crevices, cliffs or other areas of geological significance. Acid Sulphate Soils risk mapping identifies the subject land includes areas of low probability (Figure 2).	The assessment area does not contain karst, caves, crevices, cliffs or other areas of geological significance. Acid Sulphate Soils risk mapping identifies the assessment area to include both areas of high and low probability (Figure 3).	Aerial imagery
Areas of Outstanding Biodiversity Value	The development site does not include any areas of outstanding biodiversity value as defined under the BC Act (Figure 2)	The assessment area includes areas of outstanding biodiversity value as defined under the BC Act, directly east of the development site (Figure 3).	Register of Declared Areas of Outstanding Biodiversity Value (DPE 2020)
NSW (Mitchell) Landscapes	Sydney - Newcastle Barriers and Beaches	Sydney - Newcastle Barriers and Beaches	NSW (Mitchell) Landscapes - version 3.1 (DPE 2016)

Figure 2: Location Map

Figure 3: Site Map

3. Native Vegetation

3.1. Survey Effort

Vegetation surveys were undertaken within the development site by Dan Watts and Shawn Ryan on 25/11/2021 and 16/02/2022 (Figure 4).

A total of two full-floristic vegetation plots were surveyed to identify PCTs and Threatened Ecological Communities (TECs) on the development site (Table 3). A total of two vegetation integrity survey plots were undertaken on the development site to assess the composition, structure and function components of each vegetation zone in accordance with the BAM (2020). Due to the small size and modified nature of the development site, plot data was collected from adjacent vegetation where a plot could be wholly located within the native vegetation zone. The plot location was within better quality habitat and therefore the scores from the BAMC are likely to be higher than within the development site.

All field data collected at full-floristic and vegetation integrity plots is included in Appendix B and Appendix C.

Table 3: Full-floristic PCT identification plots

PCT ID	PCT Name	BC Act listing	EPBC Act listing	Number of plots surveyed
PCT1626	Smooth-barked Apple - Broad-leaved Mahogany - Red Bloodwood heathy low open forest on hills at Nelson Bay	Not listed	Not listed	2

3.2. Native vegetation extent on the subject land

There are no substantial differences between the extent of native vegetation on the subject land as identified in recent aerial imagery and that identified during the vegetation survey.

The development site is comprised largely of built areas, including dwellings and courtyards interspersed with planted landscape/exotic garden and exotic lawn vegetation. These areas are dominated by species, such as *Syagrus romanzoffiana* (Cocos Palm), *Bougainvillea ssp.* (Bougainvillea vine), *Murraya paniculata* (Orange jessamine) and *Stenotaphrum secundatum* (Buffalo Grass) and do not conform to any native PCT (Plate 1 and Plate 2).

The remainder of the development site consists of small areas of native vegetation influenced by varying levels of disturbance from existing landscaping activities and resort management. These areas vary from more intact vegetation with remnant native canopy and understorey species (Plate 3) to small areas consisting of a remnant native canopy species with a highly modified and managed understory (Plate 4).

Plate 1: Example of existing facilities to be replaced within the central area of development site, interspersed with planted landscape/exotic garden vegetation.

Plate 2: Example of exotic lawns along the eastern boundary of the development site.

Plate 3: Native vegetation within the south eastern corner of the development site, with disturbance from existing planted landscape/exotic gardens.

Plate 4: Native vegetation along the northern boundary of the development site, with remnant canopy species and a highly modified understorey.

3.3. Plant Community Types present

One PCT (0.14 ha) was identified within the proposed development site (Table 4; Figure 4) comprising of PCT 1626 *Smooth-barked Apple - Broad-leaved Mahogany - Red Bloodwood heathy low open forest on hills at Nelson Bay*.

This PCT does not align with any currently listed TEC under the BC Act or EPBC Act.

3.3.1. Planted landscape/exotic vegetation

The remainder of the development site (1.07 ha) comprises of cleared/existing building (0.8 ha), planted landscape/exotic gardens (0.2 ha) and exotic lawns (0.07 ha) (Figure 4).

Table 4: Plant Community Types

PCT ID	PCT Name	Vegetation Class	Vegetation Formation	Area	Percent cleared
1626	Smooth-barked Apple - Broad-leaved Mahogany - Red Bloodwood heathy low open forest on hills at Nelson Bay	Hunter-Macleay Dry Sclerophyll Forests	Dry Sclerophyll Forests (Shrub/grass sub-formation)	0.14 ha	3%
-	Planted landscape/exotic vegetation	-	-	0.2ha	-
-	Exotic lawn	-	-	0.07 ha	-
-	Cleared/existing buildings	-	-	0.8 ha	-
			Total	1.21ha	

3.3.2. Plant Community Type selection justification

In determining the PCT for the development site, various attributes were considered in combination to assign vegetation to the best fit PCT. Attributes included dominant species in each stratum and relative abundance, community composition, soils and landscape position. Reference was made to the PCT descriptions in the BioNet Vegetation Classification and the final scientific determinations for TECs. Possible PCT options considered are provided in Table 5.

Table 5: Potential PCTs

Selected PCT ID	PCT Name	Other PCT options
1626	Smooth-barked Apple - Broad-leaved Mahogany - Red Bloodwood heathy low open forest on hills at Nelson Bay	1083 - *Red Bloodwood - scribbly gum heathy woodland on sandstone plateaux of the Sydney Basin Bioregion*. This community was not selected as Scribbly Gum species are absent (within the development site and adjacent areas), it is associated with '*Sydney Coastal Dry Sclerophyll Forest*' formations and older sandstone derived lithology outside of the Karuah Manning IBRA subregion. 1183 - *Smooth-barked Apple - Sydney Peppermint - Turpentine heathy open forest on plateaux areas of the Sydney Basin Bioregion*. This community was not selected as Sydney peppermint was not dominate, it is associated with older Sydney Basin and Central Coast sandstone lithology and outside of the Karuah Manning IBRA sub region. 1776 - *Smooth-barked Apple - Red Bloodwood open forest on enriched sandstone slopes around Sydney and the Central Coast*. This community was not selected based of its association with enriched sandstone lithology of the Sydney and Central Coast areas rather than depository coastal sands and is also not known to occur within the Karuah Manning IBRA sub region.

All potential PCT's share a diverse canopy and sclerophyllous shrub stratum showing floristic affinities with each other. However, within the study area the dominance of diagnostic canopy species; *Angophora costata* (Smooth-barked Apple) and *Eucalyptus umbra* (Broad-leaved Mahogany) in combination with a mixture of sub-dominate species; *Eucalyptus piperita* (Sydney Peppermint), *Corymbia gummifera* (Red Bloodwood) and *Eucalyptus pilularis* (Black Butt) aligned best with PCT1626. Furthermore, the understory displayed a diverse range of heathy shrubs, grasses, forbs and scrambling vines characteristic of Hunter-Macleay Dry Sclerophyll Forest formation within Karuah Manning IBRA subregion. The above assemblage of key canopy species, formation characteristics along with a coastal lowlands landscape position on coastal sand lithology make PCT1626 the best fit community.

3.4. Vegetation integrity assessment

3.4.1. Vegetation zones

A total of two vegetation zones were identified on the development site based on the broad condition state of PCTs present. A total of two vegetation integrity survey plots were collected on the development site consistent with the BAM (Table 5). Descriptions of vegetation zones are provided in Table 7 to Table 9 and their extent displayed in Figure 5.

Table 5: Vegetation zones and vegetation integrity survey plots collected on the development site

Vegetation Zone	PCT ID	PCT Name	Condition	Area (ha)	Patch Size	Vegetation Integrity Plots required	Vegetation Integrity Plots collected
1	1626	Smooth-barked Apple - Broad-leaved Mahogany - Red Bloodwood heathy low open forest on hills at Nelson Bay	High	0.05 ha	>100 ha	1	1
2	1626	Smooth-barked Apple - Broad-leaved Mahogany - Red Bloodwood heathy low open forest on hills at Nelson Bay	Low	0.09 ha	>100 ha	1	1
-	-	Planted landscape/ exotic vegetation	-	0.2 ha	>100 ha	-	-
-	-	Exotic Lawn	-	0.07 ha	>100 ha	-	-
			Total	0.4 ha	>100 ha	2	2

3.4.2. Patch size

Patch size was calculated using available vegetation mapping for all patches of intact native vegetation on and adjoining the development site. Patch size was assigned to one of four classes (<5 ha, 5-24 ha, 25-100 ha or ≥100 ha). A patch size >100 ha was determined for the forested vegetation zone within development site due to the connectivity to large areas of forest habitat.

Table 6: Zone 1 PCT 1626 High Condition

1626 - Smooth-barked Apple - Broad-leaved Mahogany - Red Bloodwood heathy low open forest on hills at Nelson Bay	
Vegetation formation/class	Hunter-Macleay Dry Sclerophyll Forests/Dry Sclerophyll Forests (Shrub/grass sub-formation).
Conservation status	NSW BC Act: N/A
	EPBC Act: N/A
Description	This Dry Sclerophyll Forest community occurs along the southern and eastern boundary as an open forest woodland dominated by Smooth-barked Apple and Broad-leaved Mahogany with a mixture of other sub-dominate eucalypts. Its understorey comprises of a moderate diversity of native shrubs and groundcovers intermixed with planted/exotic species.
Characteristic canopy trees	Within plot: *Angophora costata* (Smooth-barked Apple), *Eucalyptus umbra* (Broad-leaved Mahogany), *Eucalyptus tereticornis* (Forest Red Gum) and *Eucalyptus piperita* (Sydney Peppermint). Within development: *A. costata, E. umbra, C. gummifera* and *E. pilularis.*
Characteristic mid-storey	Within plot: *Pittosporum undulatum* (Sweet Pittosporum), *Elaeocarpus reticulatus* (Blueberry Ash) and *Dodonaea triquetra* (Large-leafed Hops Bush). Within development site: *Cyathea ssp.* (Tree Fern), *cordyline ssp.* (Walking stick palm) and *Strelitzia ssp.* (Bird of paradise flower).
Characteristic groundcovers	Within plot: *Themeda triandra* (Kangaroo grass), *Hibbertia dentata* (Twining Guinea Flower), *Xanthorrhoea macronema* (Grass tree), *Smilax glyciphylla* (Sweet Sarsparilla) and *Imperata cylindrica* (Blady Grass). Within development site: *Ehrharta erecta* (Panic veldt grass), *Stenotaphrum secundatum* (Buffalo Grass), *Cynodon dactylon* (Couch) and *Eragrostis spp*. (Lovegrass).
Mean native richness	42
Exotic species / HTW cover	Lantana camara (Lantana) / 0.2%, *Ochna serrulata* (Mickey Mouse Plant) / 0.1% and *E.erecta* / 0.2%
Condition	The plot was undertaken in adjacent more intact vegetation to south east of the subject land where vegetation is in high condition. Within the development site this vegetation zone is modified and contains a mixture of scattered remanent trees and planted native and exotic trees and shrubs. Overall, within the development site this zone is of moderate condition However, a conservative approach was taken to apply the higher condition plot data from adjacent to the development site to this zone.
Variation and disturbance	Levels of disturbance vary in relation to landscaping and past development activities.
No. sites sampled & Plot No.	1 sample (Plot 2) – sampled in adjacent area (higher quality) to fit full plot.
Threatened flora species	None recorded within site.
Fauna habitats	Within development: Low levels of groundcover and leaf litter for ground mammals. Moderate nectar and fruit resources in trees and shrubs for birds and arboreal mammals. Two HBT (<20cm diameter at breast height (dbh)) (*E.umbra*). No *Allocasuarina ssp.* for Glossy Black-cockatoo.

Composition	**Structure**	**Function**	**Vegetation Integrity Score**
79.4	44.7	64.4	61.1

Plot location

Development site

Table 7: Zone 2 PCT 1626 Low Condition

1626 - Smooth-barked Apple - Broad-leaved Mahogany - Red Bloodwood heathy low open forest on hills at Nelson Bay			
Vegetation formation/class	Hunter-Macleay Dry Sclerophyll Forests/Dry Sclerophyll Forests (Shrub/grass sub-formation).		
Conservation status	NSW BC Act: N/A		
	EPBC Act: N/A		
Description	This Dry Sclerophyll Forest community occurs along the northern boundary as an open forest woodland dominated by Smooth-barked Apple and Red Bloodwood. There is a low abundance of native midstory species, and the understorey is largely dominated by exotic/planted native shrubs and managed exotic lawn.		
Characteristic canopy trees	*A.costata* and *C. gummifera*.		
Characteristic mid-storey	*Cupaniopsis anacardioides* (Tuckeroo) and *Glochidion ferdinandi var. ferdinandi* (Cheese Tree). A mixture of planted landscape and exotic species such as *Araucaria heterophylla* (Lord Howe Island Pine), *Philodendron ssp*. (Monstera) and *Schefflera ssp.* (Umbrella Tree).		
Characteristic groundcovers	*S. secundatum* and *C.dactylon.*		
Mean native richness	16		
Exotic species / HTW cover	*O. serrulata* / 0.3%, *Eragrostis curvula* (African Lovegrass) / 0.1%, *E. erecta* / 0.2% and *S. secundatum* / 70%		
Condition	This vegetation zone consists largely of landscaped gardens and managed exotic lawns with a remnant native canopy. Overall, within the development site this zone is of low condition.		
Variation and disturbance	Levels of disturbance are consistent with all areas having undergone high levels of modification and management.		
No. sites sampled & Plot No.	1 sample (Plot 1).		
Threatened flora species	None recorded within site.		
Fauna habitats	Minimal groundcover and leaf litter for ground mammals. Low nectar and fruit resources in trees and shrubs for birds and arboreal mammals. One HBT (<20cm dbh) (*E. tereticornis*). No *Allocasuarina ssp.* for Glossy Black-cockatoo.		
Composition	**Structure**	**Function**	**Vegetation Integrity Score**
26.8	19.4	42	27.9

3.4.3. Assessing vegetation integrity

A vegetation integrity assessment using the BAM Calculator (BAMC) was undertaken and the results are outlined in Table 8.

Table 8: Vegetation integrity scores

Veg Zone	PCT ID	Condition	Area (ha)	Composition Condition Score	Structure Condition Score	Function Condition Score	Presence of Hollow bearing trees	Current vegetation integrity score
1	1626	High	0.05 ha	79.4	44.7	64.4	2	61.1
2	1626	Low	0.09 ha	26.8	19.4	42	27.9	26.8

Figure 4: Plant Community Types

Figure 5: Vegetation Zones and Plots

4. Threatened species

4.1. Threatened fauna habitats

Fauna habitat searches were conducted in conjunction with vegetation surveys on 25/11/2021 and additional habitat surveys targeting man-made structures occurred on 16/02/2022.

Surveys included identification of potential foraging, roosting, breeding or nesting habitat for potential candidate specie credit species that are SAII values. This included the presence of tree hollows, stags, bird nests, possum dreys, decorticating bark, food trees (*Banksia spp*., *Allocasuarina spp*. and winter-flowering eucalypts), culverts, dens, riparian areas and roosting/breeding habitat of man-made structures.

Fauna habitats within the development site are typical of an operating resort environment, with the available habitat features considerably degraded and limited. Habitat features relevant to fauna groups with potential to use the study area are described in the following sections.

4.1.1. Hollow bearing trees and stags

Three hollow bearing trees (HBTs) were recorded within the development site, including; one (1) *E. tereticornis* and two (2) *E. umbra* which may provide habitat for threatened tree roosting microchiropteran bats and/or woodland birds (Figure 4). No stags were present and none of the HBTs present on the site are suitable habitat (>20cm dbh) for large forest owls and hollow dependent cockatoos.

4.1.2. Dry sclerophyll forest

The majority of dry sclerophyll forest habitat within the study area is in low condition and highly degraded or modified by landscaping and past development activities. Limited seasonal flower resources (largely from planted native and non-native species) and hollow bearing trees are present (<20 cm dbh). The mid-storey is largely absent, and groundcover is typically modified and degraded.

4.1.3. Non-native vegetation

These highly disturbed and previously cleared areas dominate the development site and present limited habitat opportunities.

4.1.4. Man-made structures

Some threatened microbat species are known to utilise human made structures regularly or on occasion. Access to conduct on ground inspections was limited to physically and safely accessible areas. As such, on ground inspections were conducted using binoculars to detect roof cavities, possible entrances for microbats and evidence of use (such as scats, scratch marks or staining).

No potential crevices or entrances within man-made structures were identified as suitable for roosting/breeding habitat of threatened microbat species.

4.1.5. Features not present

Within the development site the following habitat features are not present:

- Cliffs, overhangs, escarpments or crevices

- Nests, including nests for raptors
- Old mines or tunnels within 2 km
- Flying-fox camps
- Riparian areas and waterbodies
- Suitable roost trees for owls
- Mapped important habitat for Regent Honeyeater or Swift Parrot, as per BAM important areas viewer(DPE 2022) (accessed 10/03/2022), displayed in Figure 6.

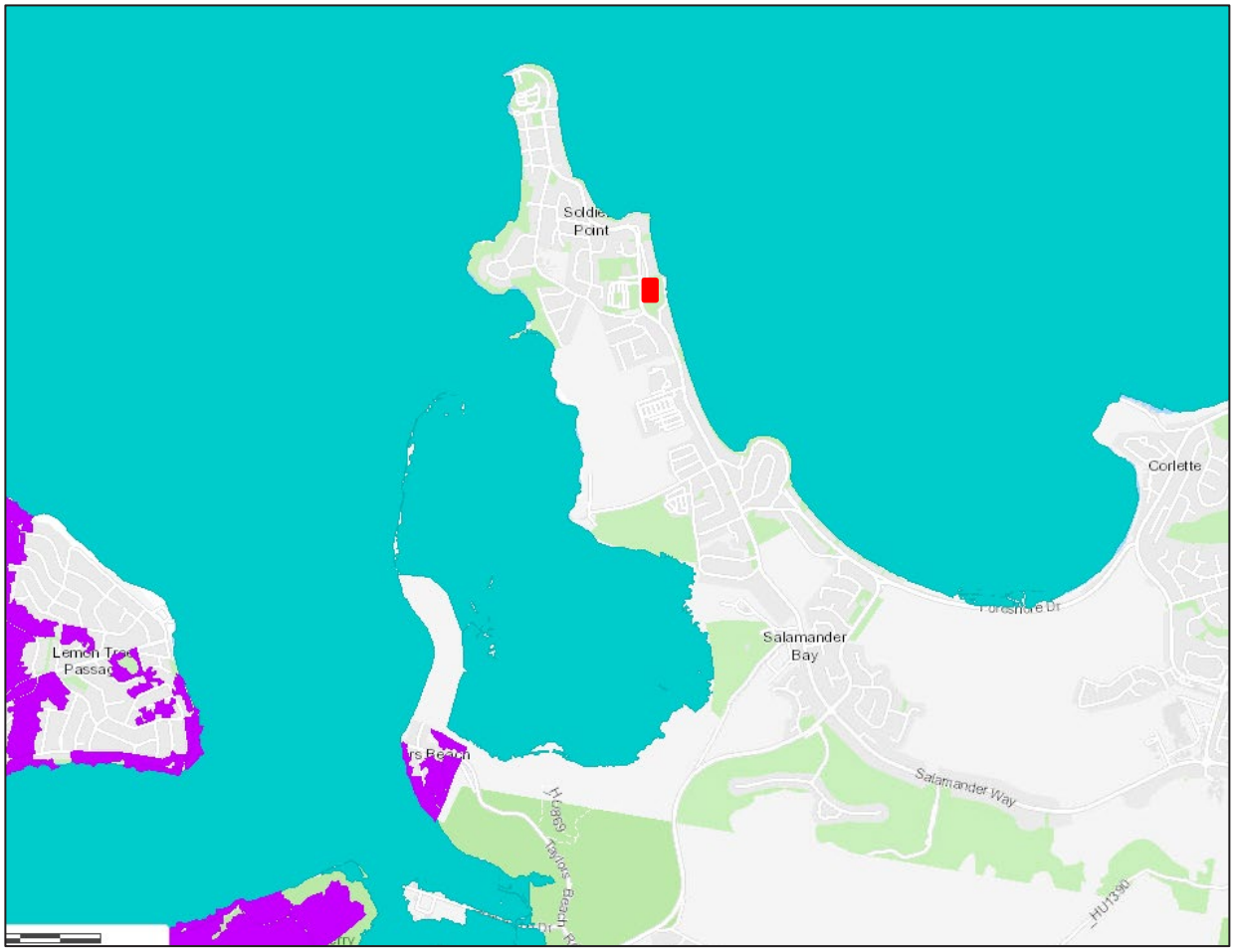

Figure 6: Important area mapping for Swift Parrot (purple), and migratory shorebirds (teal). Approximate site location shown in red

4.2. Threatened flora habitat

Potential habitat for threatened flora shrub and groundcover species is marginal within high condition dry sclerophyll forest areas outside the development site (vegetation zone 1) and not present in low condition dry sclerophyll forest areas (vegetation zone 2). These areas are present as narrow patches along the periphery of the development site, and are generally degraded from existing landscaping activities and other development related disturbances inherent to an operational resort.

The development site is considered too degraded to provide threatened flora habitats.

4.3. Ecosystem credit species

Ecosystem credit species predicted to occur within the development site are generated by the BAMC following the input of VI data and the PCTs identified within Chapter 3 (BAM 2020). Ecosystem credit species predicted to occur at the development site, their associated habitat constraints, geographic limitations, sensitivity to gain class, included in Table 9.

Table 9: Predicted ecosystem credit species

Species	Common Name	Habitat Constraints	Geographic limitations	Sensitivity to gain class	BC Act listing status	EPBC Act Listing status
Callocephalon fimbriatum	Gang-gang Cockatoo	N/A	N/A	Moderate	V	-
Calyptorhynchus lathami	Glossy Black- Cockatoo	Presence of *Allocasuarina* and *casuarina* species	N/A	High	V	-
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	N/A	N/A	High	V	-
Daphoenositta chrysoptera	Varied Sittella	N/A	N/A	Moderate	V	-
Dasyurus maculatus	Spotted-tailed Quoll	N/A	N/A	High	V	E
Glossopsitta pusilla	Little Lorikeet	N/A	N/A	High	V	-
Hieraaetus morphnoides	Little Eagle	N/A	N/A	Moderate	V	-
Hirundapus caudacutus	White-throated Needletail	N/A	N/A	High	-	V
Lathamus discolor	Swift Parrot	N/A	N/A	Moderate	E	CE
Lophoictinia isura	Square-tailed Kite	N/A	N/A	Moderate	V	-
Micronomus norfolkensis	Eastern Coastal Free-tailed Bat	N/A	N/A	High	V	-
Miniopterus australis	Little Bent-winged Bat	N/A	N/A	High	V	-
Miniopterus orianae oceanensis	Large Bent-winged Bat	N/A	N/A	High	V	-
Neophema pulchella	Turquoise Parrot	N/A	N/A	High	V	-
Ninox connivens	Barking Owl	N/A	N/A	High	V	-
Ninox strenua	Powerful Owl	N/A	N/A	High	V	-
Pandion cristatus	Eastern Osprey	N/A	N/A	Moderate	V	-
Petroica boodang	Scarlet Robin	N/A	N/A	Moderate	V	-
Phascolarctos cinereus	Koala	N/A	N/A	High	V	E
Pomatostomus temporalis	Grey-crowned Babbler (eastern subspecies)	N/A	N/A	Moderate	V	-
Pteropus poliocephalus	Grey-headed Flying- fox	N/A	N/A	High	V	V

Species	Common Name	Habitat Constraints	Geographic limitations	Sensitivity to gain class	BC Act listing status	EPBC Act Listing status
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	N/A	N/A	High	V	-
Tyto novaehollandiae	Masked Owl	N/A	N/A	High	V	-

4.4. Species credit species

4.4.1. Identification of species credit species

Species credit species that require further assessment on the development site (i.e. candidate species), their associated habitat constraints, geographic limitations, sensitivity to gain class and relevant justification for the exclusion is provided in Table 10.

4.4.2. Assessment of habitat constraints and vagrant species

Justification for the exclusion of other candidate species credit species is provided in Table 10.

Table 10: Candidate species credit species and Justification for exclusion

Species	Common Name	Habitat Constraints	Geographic limitations	Sensitivity to gain class	BC Act listing status	EPBC Act Listing status	Justification for exclusion of species
Chalinolobus dwyeri	Large-eared Pied Bat	Cliffs Within two kilometres of rocky areas containing caves, overhangs, escarpments, outcrops, or crevices, or within two kilometres of old mines or tunnels.	N/A	Very High	V	V	Excluded The study area is not located within two kilometres of rocky areas containing caves, or overhangs or crevices, cliffs or escarpments, or old mines, tunnels, culverts, derelict concrete buildings.
Lathamus discolor	Swift Parrot	As per mapped areas.	N/A	Moderate	E	CE	Excluded The study area does not include ' Mapped Areas of Important Habitat' for this species (Figure 6).
Miniopterus australis	Little Bent-winged Bat	Breeding - 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'.	N/A	Very High	V	-	Excluded The study area does not contain breeding habitat such as caves, tunnels, mines, culverts or other structures known or suspected to be used for breeding.
Miniopterus orianae oceanensis	Large Bent-winged Bat	Breeding - 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'.	N/A	Very High	V	-	Excluded The study area does not contain breeding habitat such as caves, tunnels, mines, culverts or other structures known or suspected to be used for breeding.
Petrogale penicillata	Brush-tailed Rock Wallaby	Land within 1 km of rocky escarpments, gorges, steep slopes, boulder piles, rock outcrops or clifflines	N/A	Very High			Excluded The study area is not within 1 km of rocky escarpments, gorges, steep slopes, boulder piles, rock outcrops or cliff lines

4.4.3. Candidate species requiring further assessment

In accordance with Appendix C and Section 5.2 of the BAM, the Streamline Assessment Module (Small Area);

- Species considered unlikely to occur and no further assessment is required for that species if it is determined that no habitat constraints are present on the entire study area for the threatened species (as per Section 5.2 of the BAM) (OEH 2020), or
- Candidate species credit species that are not at risk of an SAII and are not incidentally recorded on the subject land do not require further assessment.

The development site does not meet the habitat constraints of any of the candidate species credit species that are candidate SAII species, and no species were incidentally recorded. As such, all species in Table 10 were excluded from further assessment.

4.5. Targeted surveys

The streamlined assessment method only requires targeted surveys for candidate SAII species with a habitat constraint. The development site does not meet the habitat constraints of any of the candidate species credit species that are candidate SAII species. None of the candidate species credit species were incidentally recorded on the subject land.

In accordance with the BAM, no targeted surveys were required.

4.5.1. Species credit species included in the assessment

There are no candidate species credit species that require further assessment.

4.6. Identification of prescribed additional biodiversity impact entities

4.6.1. Karst, caves, crevices, cliffs, rocks and other geological features of significance

The subject land does not contain any geological features of significance.

4.6.2. Human-made structures and non-native vegetation

The development site does not contain human-made structures or non-native vegetation that is likely to provide potential habitat for threatened species.

4.6.3. Habitat connectivity

The subject site is situated on the western edge of what is considered an existing north south corridor. The proposed development site does not encroach into this corridor as it is located within the existing development footprint already within an established residential setting. Therefore the proposed development has not been identified as providing connectivity between areas of habitat for threatened species.

4.6.4. Water bodies, water quality and hydrological processes

The proposal will not impact water bodies, water quality or hydrological processes.

4.6.5. Wind farm developments

The proposal is not a wind farm development.

4.6.6. Vehicle strikes

The proposal is unlikely to result in vehicle strike to threatened species. The greatest risk of vehicle strike is associated with the adjacent Soldiers Point Road and Seaview crescent. Given the proposed development is within the existing development envelope, risk of vehicle strike on both these roads will likely remain the same.

5. Avoiding and Minimising Impacts on Biodiversity Values

The BAM requires locating and designing a project to avoid and minimise direct and indirect impacts on biodiversity values and prescribed biodiversity impacts.

5.1. Locating a project to avoid and minimise impacts on biodiversity values

5.1.1. Direct and indirect impacts

The development has been located to avoid and minimise impacts as outlined in Table 11.

Table 11: Locating a project to avoid and minimise impacts on vegetation and habitat

Approach	How addressed and justification
Locating the project in areas where there are no biodiversity values	The proposed development and associated works have been located entirely within the existing hotel development footprint. This includes the existing cleared areas and non-native vegetation where there are no biodiversity value possible. The location of the proposed development has prioritised retention of higher quality habitat directly to the east and south of the development site.
Locating the project in areas where the native vegetation or threatened species habitat is in the poorest condition	The proposed development is located within the existing resort footprint which is almost entirely non-native vegetation and already disturbed areas. Areas of native vegetation onsite representing higher habitat values occur along the peripheries and locating the proposal to avoid these areas is inherently difficult, given the limited space within the development site to begin with.
Locating the project in areas that avoid habitat for species with a high biodiversity risk weighting or land mapped on the important habitat map or native vegetation that is a TEC or a highly cleared PCT	The development minimises impacts to habitat for threatened species by being located predominantly in non-native vegetation or disturbed areas with limited habitat value. The development site does not include any area mapped Important Area for SAII species. The development site does not contain any TECs.
locating the project such that connectivity enabling movement of species and genetic material between areas of adjacent or nearby habitat is maintained	The development is centred around the area of least biodiversity impact, which includes the existing development footprint with the aim to conserve biodiversity values surrounding the development site. The design has sought to mitigate impacts to intact native vegetation directly to the east and connectivity elements through landscape plantings that will provide similar features to what is currently present, i.e. native eucalypt species. These landscaping features will facilitate movement for mobile species along this fragmented corridor to allow continued movement of species and genetic material between areas of nearby habitat.

The proposed building envelope has been kept to a minimum logical size based on existing lot boundaries, land zoning and disturbed areas.

5.1.2. Prescribed biodiversity impacts

The proposal does not have any prescribed biodiversity impacts as identified in Section 4.8.

5.2. Designing a project to avoid and minimise impacts on biodiversity values

The project is proposed on already modified land. The design has incorporated existing cleared areas and building footprints as much as possible and minimised the clearing native vegetation. The majority of native vegetation within the development area will be retained, thereby avoiding and minimising direct impacts on biodiversity values where possible. The avoidance portion of the design occurred during the Planning Proposal phase; this is further outlined in Table 12 below.

Table 12: Designing a project to avoid and minimise impacts on vegetation and habitat

Approach	How addressed and justification
reducing the clearing footprint of the project	The project has been designed to minimise the clearing footprint by designing the redevelopment/modification to sit within the existing development footprint. This includes the existing cleared areas, buildings and non-native vegetation where there are no biodiversity value possible. All areas of native vegetation within the development site are all currently disturbed to some degree by existing management activities and will require ongoing management regardless of the outcome of the application. The design has sought to mitigate impacts to intact native vegetation directly to the east and connectivity elements through landscape plantings that will provide similar features to what is currently present, i.e. native eucalypt species. These landscaping features will facilitate movement for mobile species along this corridor to allow continued movement of species and genetic material between areas of nearby habitat.
locating ancillary facilities in areas where there are no biodiversity values	The design has endeavoured to locate ancillary facilities (such as temporary offices and laydown areas) areas, within already cleared areas and avoid patches of native vegetation or impacts to adjacent native vegetation.
locating ancillary facilities in areas where the native vegetation or threatened species habitat is in the poorest condition (i.e. areas that have a lower vegetation integrity score)	The placement of ancillary facilities has been designed to minimise impacts to biodiversity values by largely locating them in areas of lower biodiversity value (existing cleared areas, non-native vegetation and buildings) within the development site boundary.
locating ancillary facilities in areas that avoid habitat for species and vegetation in high threat status categories (e.g. an EEC or CEEC)	The placement of ancillary facilities has been designed to work in and around areas of cleared land. No clearing of threatened species habitat or TEC will occur.
providing structures to enable species and genetic material to move across barriers or hostile gaps	The proposed development will not increase any hostile gaps or barriers.
making provision for the demarcation, ecological restoration, rehabilitation and/or ongoing maintenance of retained native vegetation habitat on the development site.	Impacts to the vegetation will occur in small areas within the existing development footprint. All areas of native vegetation within the development site are all currently disturbed to some degree by existing management activities and will require ongoing management regardless of the outcome of the application. The design has sought to mitigate impacts to intact native vegetation directly to the east and connectivity elements through landscape plantings that will provide similar features to what is currently present, i.e. native eucalypt species. These landscaping features will facilitate movement for mobile species along this corridor to allow continued movement of species and genetic material between areas of nearby habitat. The proponent will demarcate all boundaries of the impact areas to avoid any impacts to areas outside of the development site.

Approach	How addressed and justification
Efforts to avoid and minimise impacts through design must be documented and justified	The proposed development site boundary has been designed from the beginning with avoidance of higher quality habitat to the east and south. Areas of native vegetation to be impacted, excluding landscaped non-native vegetation, existing buildings and carparks are all currently disturbed to some degree by existing management activities and will require ongoing management regardless of the outcome of the application.

5.3. Avoiding and minimising prescribed biodiversity impacts during project planning

The proposal does not have any prescribed biodiversity impacts.

6. Assessment of Impacts

6.1. Direct impacts

The direct impacts of the development on native vegetation is outlined in Table 13.

There are no direct impacts on threatened species or threatened species habitat for species credit species assessed using the small area module.

Direct impacts including the final project footprint (construction and operation) are shown Figure 7.

Table 13: Direct impacts to native vegetation

Zone	PCT ID	PCT Name	Condition	BC Act listing	EPBC Act listing	Direct impact (ha)
1	1626	Smooth-barked Apple - Broad-leaved Mahogany - Red Bloodwood heathy low open forest on hills at Nelson Bay	High	Not listed	Not listed	0.05 ha
2	1626	Smooth-barked Apple - Broad-leaved Mahogany - Red Bloodwood heathy low open forest on hills at Nelson Bay	Low	Not listed	Not listed	0.09 ha

6.2. Change in vegetation integrity

The change in vegetation integrity as a result of the development is outlined in Table 14.

Table 14: Change in vegetation integrity

Veg Zone	PCT ID	Condition	Area (ha)	Current vegetation integrity score	Future vegetation integrity score	Change in vegetation integrity
1	1626	High	0.05 ha	61.1	0	- 61.1
2	1626	Low	0.09 ha	27.9	0	-27.9

6.3. Indirect impacts

The indirect impacts of the development are outlined in Table 15.

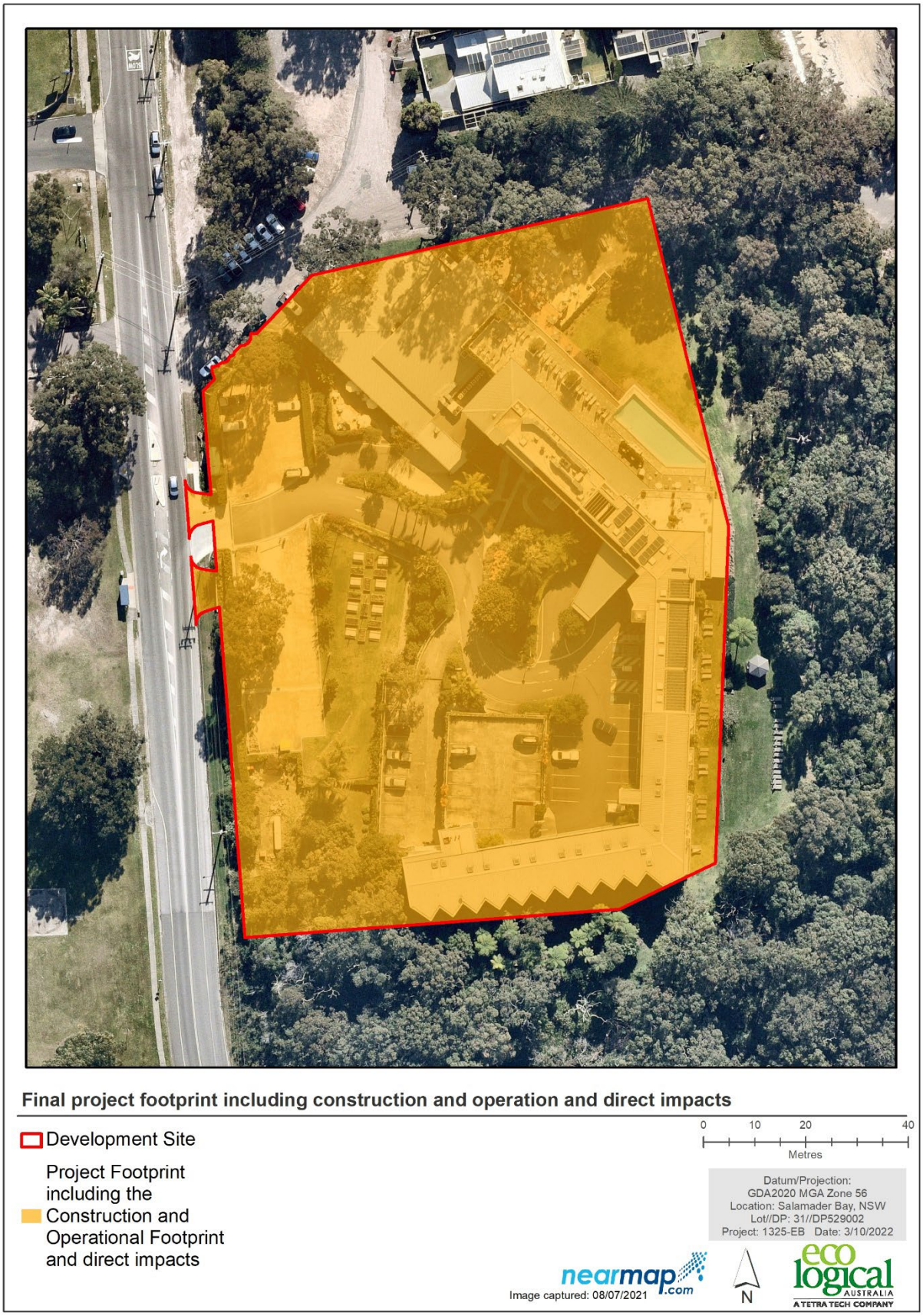

Figure 7: Final project footprint including construction and operation and direct impacts

Table 15: Indirect impacts

Indirect impact	Project phase	Nature	Extent	Frequency	Duration	Timing
Sedimentation and contaminated and/or nutrient rich run-off	Construction	Runoff during construction works	Sedimentation and runoff into nearby waterbodies.	During heavy rainfall or storm events	During rain events	Short-term impacts
Noise, dust or light spill	Construction	Noise and dust created from machinery	Adjacent vegetation	Daily, during construction	Sporadic throughout construction and throughout operation period	Short-term impacts
Inadvertent impacts on adjacent habitat or vegetation	Construction	Damage to adjacent habitat or vegetation	Adjacent vegetation	Daily, during construction and operational phases	Throughout project period	Potentially long-term impacts
Transport of weeds and pathogens from the site to adjacent vegetation	Construction	Spread of weed seed and pathogens from incoming machinery and equipment	Potential for spread into nearby habitat	Daily, during construction and operational phases	Throughout project period	Potentially long-term impacts
Vehicle strike	Construction/ operation	Potential for native fauna to be struck by working machinery and moving vehicles	Within Development Site	Daily, during construction and operational phases	Throughout project period	Potentially long-term impacts
Trampling of threatened flora species	N/A	N/A	N/A	N/A	N/A	N/A
Rubbish dumping	Construction/ operation	Illegal dumping by workers	Potential for rubbish to spread into areas outside Development Site	Any time	Throughout life of project	Potentially long-term impacts
Wood collection	N/A	N/A	N/A	N/A	N/A	N/A
Bush rock removal and disturbance	N/A	N/A	N/A	N/A	N/A	N/A
Increase in predatory species populations	N/A	N/A	N/A	N/A	N/A	N/A

Indirect impact	Project phase	Nature	Extent	Frequency	Duration	Timing
Increase in pest animal populations	Construction/ operation	Potential to increase if food scraps/rubbish is left on site. Potential to increase -/+ decrease due to disturbance to existing vegetation.	Throughout adjacent vegetation	Likely to occur gradually after disturbance to habitat and vegetation takes place	During construction phase of project	Short-term impacts
Increased risk of fire	N/A	N/A	N/A	N/A	N/A	N/A
Disturbance to specialist breeding and foraging habitat, e.g. beach nesting for shorebirds	N/A	N/A	N/A	N/A	N/A	N/A

6.4. Prescribed biodiversity impacts

The development does not have any prescribed biodiversity impacts.

6.5. Mitigating and managing direct and indirect impacts

Measures proposed to mitigate and manage impacts at the development site before, during and after construction are outlined in Table 16.

6.6. Mitigating prescribed impacts

The development does not have any prescribed biodiversity impacts.

6.7. Adaptive management strategy

This section is required for those impacts that are infrequent, cumulative or difficult to predict. Impacts associated with the proposed development have been considered extensively and addressed in Section 5 and Section 6. Further consideration of infrequent, cumulative or difficult to predict impacts is not considered to be necessary.

Table 16: Measures proposed to mitigate and manage impacts

Measure	Risk before mitigation	Risk after mitigation	Action	Outcome	Timing	Responsibility
Timing works to avoid critical life cycle events such as breeding or nursing	Low	Very Low	Carry out pre-clearance survey to ensure fauna are not present prior to clearing.	Impacts to fauna during nesting/nursing avoided.	During clearing works.	Project Manager / Contractor
Instigating clearing protocols including pre-clearing surveys, daily surveys and staged clearing, the presence of a trained ecological or licensed wildlife handler during clearing events	Low	Very Low	Pre-clearance survey of trees to be removed and identification/location of active nests by a suitably qualified ecologist.	Any fauna utilising habitat within the development site will be identified and managed to ensure clearing works minimise the likelihood of injuring resident fauna.	During clearing works.	Project Manager / Ecologist
Clearing protocols that identify vegetation to be retained, prevent inadvertent damage and reduce soil disturbance; for example, removal of native vegetation by chain-saw, rather than heavy machinery, is preferable in situations where partial clearing is proposed	Moderate	Low	Boundaries of the impact area to be clearly delineated with fencing, retained areas marked with "No Go" signage.	Protection of retained vegetation.	During clearing works.	Project Manager

Measure	Risk before mitigation	Risk after mitigation	Action	Outcome	Timing	Responsibility
Sediment barriers or sedimentation ponds to control the quality of water released from the site into the receiving environment	Moderate	Low	Install sediment barriers and erosion control during and post construction to prevent runoff. Maintain controls throughout construction and undertake weekly inspections. Detailed stormwater controls should be designed and implemented during the DA stage which manages quality and quantity of stormwater into the adjacent areas.	Control of erosion, sedimentation and runoff of contaminated substances into adjacent areas.	Throughout life of project.	Project Manager
Light shields or daily/seasonal timing of construction and operational activities to reduce impacts of light spill	Low	Very Low	Conduct construction works during daylight hours. Any lights associated with a future development of the site should face away or be shielded from retained vegetation.	Avoid light disturbance to native species and their habitat.	During construction and operation.	Project Manager / Contractor
Hygiene protocols to prevent the spread of weeds or pathogens between infected areas and uninfected areas	Medium	Low	Vehicles, machinery and building refuse should remain only within the development site and disposed of at an appropriate waste management facility.	Prevent spread of weeds/disease in to retained vegetation or to/from the site	During construction.	Project Manager / Contractor
Staff training and site briefing to communicate environmental features to be protected and measures to be implemented	Low	Very Low	All staff working on the development will undertake an environmental induction as part of their site familiarisation. Site briefings should be updated based on phase of the work.	All staff entering the site are fully aware of all environmental aspects relating to the development and know what to do in case of any environmental emergencies.	To occur for all staff entering / working at the site and when environmental issues become apparent.	Project Manager / All staff

7. Impact summary

Following implementation of the BAM and the BAMC, the following impacts have been determined.

7.1. Serious and Irreversible Impacts (SAII)

This assessment does not include any SAII species, as in accordance with Appendix C and Section 5.2 of the BAM and outlined in Section 4.6.3.

7.2. Impacts requiring offsets

The impacts of the development requiring offset for native vegetation are outlined in Table 17 and shown on Figure 8. There are no impacts to species credit species.

Table 17: Impacts to native vegetation that require offsets

Vegetation Zone	PCT ID	PCT Name	Vegetation Class	Vegetation Formation	Direct impact (ha)
1	1626	Smooth-barked Apple - Broad-leaved Mahogany - Red Bloodwood heathy low open forest on hills at Nelson Bay	Hunter-Macleay Dry Sclerophyll Forests	Dry Sclerophyll Forests (Shrub/grass sub-formation)	0.05 ha
2	1626	Smooth-barked Apple - Broad-leaved Mahogany - Red Bloodwood heathy low open forest on hills at Nelson Bay	Hunter-Macleay Dry Sclerophyll Forests	Dry Sclerophyll Forests (Shrub/grass sub-formation)	0.09 ha

7.3. Impacts not requiring offsets

The impacts of the development not requiring offset for native vegetation are shown in Figure 9.

7.4. Areas not requiring assessment

Areas not requiring assessment relate to areas that do not contain native vegetation or threatened species habitat and are shown on Figure 10.

Figure 8: Impacts requiring offset

Figure 9: Impacts not requiring offset

Figure 10: Areas not requiring assessment

7.5. Credit summary

The number of ecosystem credits required for the development are outlined in Table 18. A biodiversity credit report is included in Appendix D.

Table 18: Ecosystem credits required

Vegetation Zone	PCT ID	PCT Name	Credit Class	Direct impact (ha)	Credits required
1	1626	Smooth-barked Apple - Broad-leaved Mahogany - Red Bloodwood heathy low open forest on hills at Nelson Bay	Hunter-Macleay Dry Sclerophyll Forests This includes PCT's: 715, 904, 922, 1178, 1215, 1588, 1589, 1590, 1591, 1592, 1593, 1600, 1601, 1602, 1608, 1612, 1626, 1748	0.05 ha	1
2	1626	Smooth-barked Apple - Broad-leaved Mahogany - Red Bloodwood heathy low open forest on hills at Nelson Bay	Hunter-Macleay Dry Sclerophyll Forests This includes PCT's: 715, 904, 922, 1178, 1215, 1588, 1589, 1590, 1591, 1592, 1593, 1600, 1601, 1602, 1608, 1612, 1626, 1748	0.09 ha	2

8. Consistency with legislation and policy

8.1. Commonwealth Environment Protection and Biodiversity Conservation Act (1999)

The EPBC Act establishes a process for assessing the environmental impact of activities and developments where "Matters of National Environmental Significance" (MNES) may be affected. Under the Act, any action which "has, will have, or is likely to have a significant impact on a matter of MNES" is defined as a "controlled action", and requires approval from the Commonwealth Department of Agriculture, Water and the Environment (DAWE), which is responsible for administering the EPBC Act.

The process includes conducting a Significant Impact Criteria assessment for listed threatened species and ecological communities that represent a matter of MNES that will be impacted as a result of the proposed action. Guidelines that outline of the significant impact criteria have been developed by the Commonwealth and help decide whether or not a referral to the Minister is required. The likelihood of occurrence for EPBC listed threatened species is shown in Appendix E.

The assessment (Table 26 and Table 27) has been undertaken in accordance with significant impact guidelines 1.1 under the EPBC Act (DotE, 2013) to address the significant impact criteria for following EPBC listed threatened species;

- Grey-headed Flying-fox (*Pteropus poliocephalus*) - Vulnerable
- Koala (*Phascolarctos cinereus*) - Endangered

The significant impact criteria found that there will not be a significant impact to any MNES, and as such a referral to the Minister for the Environment is not required.

9. Conclusion

This report has been prepared to meet the requirements of the BAM 2020 established under Section 6.7 of the BC Act.

This BDAR outlines the measures taken to avoid, minimise and mitigate impacts to the vegetation and habitats present within the development site during the design, construction and operation of the development. The direct impacts of the proposed development were calculated in accordance with the BAM by utilising the BAMC.

Native vegetation within the development site was identified as PCT 1626 - *Smooth-barked Apple - Broad-leaved Mahogany - Red Bloodwood heathy low open forest on hills at Nelson Bay* as listed in the table below. PCT 1626 does not align with any TEC listed under the BC Act or EPBC Act. The area within the development site was too small to undertake all vegetation integrity plots and therefore the one plot and associated data was collected from the adjacent vegetation which was higher in quality. Whilst the scores from the BAMC are likely to be higher than that calculated from the development site, a conservative approach was applied, and these scores were used to determine offset requirements.

The table below also outlines the associated ecosystem credit requirements to offset impacts to this vegetation.

Vegetation Zone	PCT ID	Condition	PCT Name	Direct impact (ha)	Credits required
1	1626	High	Smooth-barked Apple - Broad-leaved Mahogany - Red Bloodwood heathy low open forest on hills at Nelson Bay	0.05 ha	1
2	1626	Low	Smooth-barked Apple - Broad-leaved Mahogany - Red Bloodwood heathy low open forest on hills at Nelson Bay	0.09 ha	2
				0.14 ha	**3**

The BAMC calculated a total of 3 ecosystem credits required to offset the unavoidable impacts to the vegetation and fauna habitats present within the development site. No species credits have been calculated for the proposed development.

No SAII values were required to be considered as part of this assessment. The proposed development will not result in any SAII.

Following consideration of the administrative guidelines for determining significance under the EPBC Act, it is concluded that the proposal is unlikely to have a significant impact on MNES or Commonwealth land, and a referral to the Commonwealth Environment Minister is therefore not recommended.

10. References

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Appendix A Definitions

The following terminology has been used throughout this report for the purposes of describing the impacts of the proposal in the context of a biodiversity assessment in accordance with the NSW Biodiversity Assessment Method 2020. This terminology may or may not align with other technical documents associated with the proposed development.

Terminology	Definition
Biodiversity credit report	The report produced by the Credit Calculator that sets out the number and class of biodiversity credits required to offset the remaining adverse impacts on biodiversity values at a development site, or on land to be biodiversity certified, or that sets out the number and class of biodiversity credits that are created at a biodiversity stewardship site.
BioNet Atlas	The BioNet Atlas (formerly known as the NSW Wildlife Atlas) is the OEH database of flora and fauna records. The Atlas contains records of plants, mammals, birds, reptiles, amphibians, some fungi, some invertebrates (such as insects and snails) and some fish.
Broad condition state	Areas of the same PCT that are in relatively homogenous condition. Broad condition is used for stratifying areas of the same PCT into a vegetation zone for the purpose of determining the vegetation integrity score.
Connectivity	The measure of the degree to which an area(s) of native vegetation is linked with other areas of vegetation.
Credit Calculator	The computer program that provides decision support to assessors and proponents by applying the BAM, and which calculates the number and class of biodiversity credits required to offset the impacts of a development or created at a biodiversity stewardship site.
Development	Has the same meaning as development at section 4 of the EP&A Act, or an activity in Part 5 of the EP&A Act. It also includes development as defined in section 115T of the EP&A Act.
Development footprint	The area of land that is directly impacted on by a proposed development, including access roads, and areas used to store construction materials.
Development site	An area of land that is subject to a proposed development that is under the EP&A Act.
Ecosystem credits	A measurement of the value of EECs, CEECs and threatened species habitat for species that can be reliably predicted to occur with a PCT. Ecosystem credits measure the loss in biodiversity values at a development site and the gain in biodiversity values at a biodiversity stewardship site.
Extent of occurrence (EOO)	Measures the spatial spread of a taxon to determine the degree to which risks from threatening factors could impact an entire population and is not intended to be an estimate of the amount of occupied or potential habitat.
High threat exotic plant cover	Plant cover composed of vascular plants not native to Australia that if not controlled will invade and outcompete native plant species.
Hollow bearing tree	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 minimum entrance width is at least 5 cm; (c) the hollow appears to have depth (i.e. you cannot see solid wood beyond the entrance); (d) the hollow is at least 1 m above the ground. Trees must be examined from all angles.
Important wetland	A wetland that is listed in the Directory of Important Wetlands of Australia (DIWA) and SEPP 14 Coastal Wetlands.
Linear shaped development	Development that is generally narrow in width and extends across the landscape for a distance greater than 3.5 kilometres in length.

Terminology	Definition
Local population	The population that occurs in the study area. In cases where multiple populations occur in the study area or a population occupies part of the study area, impacts on each subpopulation must be assessed separately.
Local wetland	Any wetland that is not identified as an important wetland (refer to definition of Important wetland).
NSW (Mitchell) landscape	Landscapes with relatively homogeneous geomorphology, soils and broad vegetation types, mapped at a scale of 1:250,000.
Multiple fragmentation impact development	Developments such as wind farms and coal seam gas extraction that require multiple extraction points (wells) or turbines and a network of associated development including roads, tracks, gathering systems/flow lines, transmission lines.
Operational Manual	The Operational Manual published from time to time by DPE, which is a guide to assist assessors when using the BAM.
Patch size	An area of intact native vegetation that: a) occurs on the development site or biodiversity stewardship site, and b) 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 may extend onto adjoining land that is not part of the development site or stewardship site.
Proponent	A person who intends to apply for consent to carry out development or for approval for an activity.
Reference sites	The relatively unmodified sites that are assessed to obtain local benchmark information when benchmarks in the Vegetation Benchmarks Database are too broad or otherwise incorrect for the PCT and/or local situation. Benchmarks can also be obtained from published sources.
Regeneration	The proportion of over-storey species characteristic of the PCT that are naturally regenerating and have a diameter at breast height <5 cm within a vegetation zone.
Residual impact	An impact on biodiversity values after all reasonable measures have been taken to avoid, minimise or mitigate the impacts of development. Under the BAM, an offset requirement is determined for the remaining impacts on biodiversity values.
Retirement of credits	The purchase and retirement of biodiversity credits from an already-established biobank site or a biodiversity stewardship site secured by a biodiversity stewardship agreement.
Riparian buffer	Riparian buffers applied to water bodies in accordance with the BAM.
Sensitive biodiversity values land map	Development within an area identified on the map requires assessment using the BAM.
Site attributes	The matters assessed to determine vegetation integrity. They include: native plant species richness, native over-storey cover, native mid-storey cover, native ground cover (grasses), native ground cover (shrubs), native ground cover (other), exotic plant cover (as a percentage of total ground and mid-storey cover), number of trees with hollows, proportion of over-storey species occurring as regeneration, and total length of fallen logs.
Site-based development	A development other than a linear shaped development, or a multiple fragmentation impact development
Species credits	The class of biodiversity credits created or required for the impact on threatened species that cannot be reliably predicted to use an area of land based on habitat surrogates. Species that require species credits are listed in the Threatened Biodiversity Data Collection.
Subject land	Is land to which the BAM is applied in Stage 1 to assess the biodiversity values of the land. It includes land that may be a development site, clearing site, proposed for biodiversity certification or land that is proposed for a biodiversity stewardship agreement.

Terminology	Definition
Threatened Biodiversity Data Collection	Part of the BioNet database, published by DPE and accessible from the BioNet website.
Threatened species	Critically Endangered, Endangered or Vulnerable threatened species as defined by Schedule 1 of the BC Act, or any additional threatened species listed under Part 13 of the EPBC Act as Critically Endangered, Endangered or Vulnerable.
Vegetation Benchmarks Database	A database of benchmarks for vegetation classes and some PCTs. The Vegetation Benchmarks Database is published by OEH and is part of the BioNet Vegetation Classification.
Vegetation zone	A relatively homogenous area of native vegetation on a development site, land to be biodiversity certified or a biodiversity stewardship site that is the same PCT and broad condition state.
Wetland	An area of land that is wet by surface water or ground water, or both, for long enough periods that the plants and animals in it are adapted to, and depend on, moist conditions for at least part of their life cycle. Wetlands may exhibit wet and dry phases and may be wet permanently, cyclically or intermittently with fresh, brackish or saline water.
Woody native vegetation	Native vegetation that contains an over-storey and/or mid-storey that predominantly consists of trees and/or shrubs.

Appendix B Vegetation Floristic Plot Data

Table 19: Species recorded in the BAM plots

Family	Species	Common Name	Listing Status	Exotic	High Threat Weed	Growth Form Group	Plot 1			Plot 2		
							Stratum & Layer	Cover	Abundance	Stratum & Layer	Cover	Abundance
Fabaceae (Mimosoideae)	*Acacia ulicifolia*	Prickly Moses	-	-	-	Shrub (SG)	-	-	-	g	0.1	1
Orchidaceae	*Acianthus spp.*	Mosquito Orchid	-	-	-	Forb (FG)	-	-	-	g	0.1	6
Myrtaceae	*Angophora costata*	Smooth-barked Apple	-	-	-	Tree (TG)	u	10	1	u	15	1
Araucariaceae	*Araucaria spp.*	-	-	-	-	Tree (TG)	u	10	3	-	-	-
Araceae	*Arum spp.*	-	-	*	-	Other (OG)	g	0.1	2	-	-	-
Myrtaceae	*Corymbia gummifera*	Red Bloodwood	-		-	Tree (TG)	u	3	1	u	5	2
Sapindaceae	*Cupaniopsis anacardioides*	Tuckeroo	-	-	-	Tree (TG)	m	0.5	50	-	-	-
Cyperaceae	*Cyperus spp.*	-	-	-	-	Grass & grass like (GG)	g	0.1	1	g	0.1	2
Fabaceae (Faboideae)	*Desmodium rhytidophyllum*	-	-	-	-	Forb (FG)	-	-	-	g	0.1	3
Phormiaceae	*Dianella caerulea var. caerulea*	-	-	-	-	Forb (FG)	-	-	-	g	0.1	20
Sapindaceae	*Dodonaea triquetra*	Large-leaf Hop-bush	-	-	-	Shrub (SG)	-	-	-	m	3	20
Blechnaceae	*Doodia spp.*	-	-	-	-	Fern (EG)	g	0.1	2	-	-	-
Doryanthaceae	*Doryanthes excelsa*	Gymea Lily	-	-	-	Other (OG)	g	0.5	5	-	-	-
Meliaceae	*Dysoxylum fraserianum*	Rosewood	-	-	-	Tree (TG)	m	0.5	3	-	-	-
Poaceae	*Echinopogon caespitosus var. caespitosus*	Tufted Hedgehog Grass	-	-	-	Grass & grass like (GG)	-	-	-	g	0.1	1

Family	Species	Common Name	Listing Status	Exotic	High Threat Weed	Growth Form Group	Plot 1			Plot 2		
							Stratum & Layer	Cover	Abundance	Stratum & Layer	Cover	Abundance
Poaceae	*Ehrharta erecta*	Panic Veldt grass	-	*	-	Grass & grass like (GG)	g	0.2	5	g	0.2	50
Elaeocarpaceae	*Elaeocarpus reticulatus*	Blueberry Ash	-	-	-	Shrub (SG)	-	-	-	m	3	20
Poaceae	*Eragrostis curvula*	African Lovegrass	-	*	*	Grass & grass like (GG)	g	0.1	20	-	-	-
Myrtaceae	*Eucalyptus piperita*	Sydney Peppermint	-	-	-	Tree (TG)	-	-	-	u	7	1
Myrtaceae	*Eucalyptus tereticornis*	Forest Red Gum	-	-	-	Tree (TG)	-	-	-	u	10	2
Myrtaceae	*Eucalyptus umbra*	Broad-leaved White Mahogany	-	-	-	Tree (TG)	-	-	-	u	25	6
Luzuriagaceae	*Eustrephus latifolius*	Wombat Berry	-	-	-	Other (OG)	-	-	-	g	0.1	50
Santalaceae	*Exocarpos strictus*	Dwarf Cherry	-	-	-	Shrub (SG)	-	-	-	m	2	3
-	*Exotic*	-	-	-	-	Exotic	g	0.3	2	-	-	-
Moraceae	*Ficus spp.*	-	-	-	-	Tree (TG)	m	0.3	5	-	-	-
Luzuriagaceae	*Geitonoplesium cymosum*	Scrambling Lily	-	-	-	Other (OG)	-	-	-	g	0.1	20
Phyllanthaceae	*Glochidion ferdinandi var. ferdinandi*	Cheese Tree	-	-	-	Tree (TG)	m	5	3	-	-	-
Fabaceae (Faboideae)	*Glycine clandestina*	Twining glycine	-	-	-	Other (OG)	-	-	-	g	0.1	20
Fabaceae (Faboideae)	*Hardenbergia violacea*	False Sarsaparilla	-	-	-	Other (OG)	-	-	-	g	0.1	1
Dilleniaceae	*Hibbertia dentata*	Twining Guinea Flower	-	-	-	Other (OG)	-	-	-	g	3	50
Dilleniaceae	*Hibbertia obtusifolia*	Hoary Guinea Flower	-	-	-	Shrub (SG)	-	-	-	g	0.1	1

Family	Species	Common Name	Listing Status	Exotic	High Threat Weed	Growth Form Group	Plot 1			Plot 2		
							Stratum & Layer	Cover	Abundance	Stratum & Layer	Cover	Abundance
Dilleniaceae	*Hibbertia scandens*	Climbing Guinea Flower	-	-	-	Other (OG)	-	-	-	g	0.1	1
Poaceae	*Imperata cylindrica*	Blady Grass	-	-	-	Grass & grass like (GG)	-	-	-	g	1	50
Verbenaceae	*Lantana camara*	Lantana	-	*	*	Shrub (SG)	-	-	-	g	0.2	3
Cyperaceae	*Lepidosperma laterale*	Variable Sword-sedge	-	-	-	Grass & grass like (GG)	-	-	-	g	0.1	1
Arecaceae	*Livistona australis*	Cabbage Palm	-	-	-	Other (OG)	-	-	-	m	0.5	2
Campanulaceae	*Lobelia purpurascens*	whiteroot	-	-	-	Forb (FG)	g	0.1	3	g	0.1	50
Lomandraceae	*Lomandra cylindrica*	-	-	-	-	Grass & grass like (GG)	-	-	-	g	0.1	1
Lomandraceae	*Lomandra longifolia*	Spiny-headed Mat-rush	-	-	-	Grass & grass like (GG)	g	3	10	g	0.2	20
Lomandraceae	*Lomandra multiflora* subsp. *multiflora*	Many-flowered Mat-rush	-	-	-	Grass & grass like (GG)	-	-	-	g	0.1	5
Lomandraceae	*Lomandra obliqua*	-	-	-	-	Grass & grass like (GG)	-	-	-	g	0.1	50
Proteaceae	*Lomatia spp.*	-	-	-	-	Shrub (SG)	-	-	-	g	0.1	1
Oleaceae	*Notelaea longifolia f. longifolia*	-	-	-	-	Tree (TG)	-	-	-	g	0.2	5
Ochnaceae	*Ochna serrulata*	Mickey Mouse Plant	-	*	*	Other (OG)	g	0.3	1	g	0.1	1
Poaceae	*Oplismenus aemulus*	-	-	-	-	Grass & grass like (GG)	g	0.3	2	-	-	-
Poaceae	*Oplismenus imbecillis*	-	-	-	-	Grass & grass like (GG)	-	-	-	g	0.1	20

Family	Species	Common Name	Listing Status	Exotic	High Threat Weed	Growth Form Group	Plot 1			Plot 2		
							Stratum & Layer	Cover	Abundance	Stratum & Layer	Cover	Abundance
Apocynaceae	*Marsdenia ssp.*	-	-	-	-	Other (OG)	-	-	-	m	0.5	20
Bignoniaceae	*Pandorea pandorana* subsp. *pandorana*	Wonga Wonga Vine	-	-	-	Other (OG)	-	-	-	g	0.1	20
Araceae	*Philodendron spp.*	-	-	*	-	Other (OG)	g	0.4	2			
Pittosporaceae	*Pittosporum undulatum*	Sweet Pittosporum	-	-	-	Shrub (SG)	m	2	5	m	40	20
Fabaceae (Faboideae)	*Platylobium spp.*	-	-	-	-	Shrub (SG)	-	-	-	g	0.2	10
Poaceae	*Poaceae*	-	-	-	-	Grass & grass like (GG)	g	0.2	20	-	-	-
Dennstaedtiaceae	*Pteridium esculentum*	Bracken	-	-	-	Fern (EG)	-	-	-	g	0.4	5
Fabaceae (Faboideae)	*Pultenaea flexilis*	-	-	-	-	Shrub (SG)	-	-	-	g	0.5	5
Rubiaceae	*Richardia spp.*	-	-	*	-	Other (OG)	g	0.2	5	-	-	-
Araliaceae	*Schefflera actinophylla*	Umbrella Tree	-	*	-	Tree (TG)	m	0.3	50	-	-	-
-	*Unidentified shrub*	-	-	-	-	Shrub (SG)	m	0.3	1	-	-	-
Smilacaceae	*Smilax glyciphylla*	Sweet Sarsaparilla	-	-	-	Other (OG)				g	1	50
Poaceae	*Stenotaphrum secundatum*	Buffalo Grass	-	*	-	Grass & grass like (GG)	g	70	1000	-	-	-
Myrtaceae	*Syzygium australe*	Brush Cherry	-	-	-	Shrub (SG)	m	3	1	-	-	-
Poaceae	*Themeda triandra*	-	-	-	-	Grass & grass like (GG)	-	-	-	g	3	50
Xanthorrhoeaceae	*Xanthorrhoea macronema*	-	-	-	-	Other (OG)	-	-	-	g	1	20
Rutaceae	*Zieria spp.*	-	-	-	-	Shrub (SG)	-	-	-	g	0.2	10

Appendix C Vegetation Integrity Plot Data

Table 20: Plot location data

Plot no.	PCT	Condition	Easting	Northing	Bearing
1	1626	Low	413052.3	6380415.8	20
2	1626	High	413064.5	6380246.8	130

Table 21: Vegetation integrity data (composition)

Composition (number of species)						
Plot	Tree	Shrub	Grass	Forb	Fern	Other
1	7	3	3	2	1	1
2	6	10	10	4	1	11

Table 22: Vegetation integrity data (Structure)

Structure (Total cover)						
Plot	Tree	Shrub	Grass	Forb	Fern	Other
1	29.3	5.3	3.4	70.1	0.1	0.5
2	62.2	49.2	4.9	0.4	0.4	6.6

Table 23: Vegetation integrity data (Function)

Function											
Plot	Large Trees	Hollow trees	Litter Cover	Length 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 Weed Cover
1	1	2	34	0	1	0	1	0	1	1	70.6
2	0	2	90.4	38	1	1	1	1	1	1	0.5

Plate 5: Plot 1 Start

Plate 6: Plot 2 Start

Appendix D Biodiversity credit report

Appendix E Likelihood of occurrence for EPBC Act listed species

An assessment of likelihood of occurrence was made for threatened and migratory species identified from the database search. Only species listed under the EPBC Act were included in the assessment. Species listed only under the BC Act were assessed as part of determining credit species included in the BAMC. Five terms for the likelihood of occurrence of species are used in this report. This assessment was based on database or other records, presence or absence of suitable habitat, features of the proposal site, results of the site inspection and professional judgement. Some Migratory or Marine species identified from the Commonwealth database search have been excluded from the assessment, due to lack of habitat. The terms for likelihood of occurrence are defined below:

- "known" = the species was or has been observed on the site
- "likely" = a medium to high probability that a species uses the site
- "potential" = suitable habitat for a species occurs on the site, but there is insufficient information to categorise the species as likely to occur, or unlikely to occur
- "unlikely" = a very low to low probability that a species uses the site
- "no" = habitat on site and in the vicinity is unsuitable for the species

A test of significance was conducted for threatened species that were recorded within the development site or had a higher likelihood of occurring and were not recorded during the site visit. It is noted that some threatened fauna species that are highly mobile, wide ranging and vagrant may use portions of the development site intermittently for foraging. For these fauna species, the habitat present and likely to be impacted is not considered to be important to the threatened species, particularly in relation to the amount of similar habitat remaining in the surrounding landscape. As such, a test of significance in reference to Commonwealth legislation was not considered necessary.

Information provided in the habitat associations' column has primarily been extracted (and modified) from the Commonwealth Species Profile and Threats Database and the NSW Threatened Species Profiles.

Table 24: Likelihood of occurrence for EPBC Act Listed flora species

Scientific Name	Common Name	EPBC Act Status	Distribution and habitat	Likelihood of occurrence	Justification	Impact Assessment required
Angophora inopina	Charmhaven Apple	V	Endemic to the Central Coast region of NSW. Populations occur around Karuah, and from Toronto to Charmhaven. There is an unconfirmed record of the species near Bulahdelah. Occurs most frequently in Eucalyptus haemastoma–Corymbia gummifera–Angophora inopina woodland/forest, Hakea teretifolia–Banksia oblongifolia wet heath, Eucalyptus resinifera–Melaleuca sieberi–Angophora inopina sedge woodland and Eucalyptus capitellata–Corymbia gummifera–Angophora inopina woodland/forest.	Unlikely	Presence of species was not identified, and only marginal habitat identified within the small area of native vegetation.	No
Asperula asthenes	Trailing Woodruff	V	Only in NSW, in scattered locations from Bulahdelah north to near Kempsey, with several records from the Port Stephens/Wallis Lakes area. Damp sites, often along river banks.	Unlikely	Presence of this species was not identified, and only marginal habitat identified within the small area of native vegetation.	No
Cryptostylis hunteriana	Leafless Tongue Orchid	V	In NSW, recorded mainly on coastal and near coastal ranges north from Victoria to near Forster, with two isolated occurrences inland north-west of Grafton. Coastal heathlands, margins of coastal swamps and sedgelands, coastal forest, dry woodland, and lowland forest.	Unlikely	Only marginal habitat identified within the small area of native vegetation. Site is likely to degraded for presence of this species.	No

Scientific Name	Common Name	EPBC Act Status	Distribution and habitat	Likelihood of occurrence	Justification	Impact Assessment required
Cynanchum elegans	White-flowered Wax Plant	E	Restricted to eastern NSW, from Brunswick Heads on the north coast to Gerroa in the Illawarra region, and as far west as Merriwa in the upper Hunter River valley. Dry rainforest; littoral rainforest; Leptospermum laevigatum-Banksia integrifolia subsp. integrifolia (Coastal Tea-tree– Coastal Banksia) coastal scrub; Eucalyptus tereticornis (Forest Red Gum) or Corymbia maculata (Spotted Gum) open forest and woodland; and Melaleuca armillaris (Bracelet Honey myrtle) scrub.	Unlikely	Presence of this species was not identified, and only marginal habitat identified within the small area of native vegetation.	No
Diuris praecox	Rough Doubletail	V	Between Bateau Bay and Smiths Lake, in hills and slopes of near-coastal districts. Open forests.	Unlikely	Only marginal habitat identified within the small area of native vegetation. Site is likely to degraded for presence of this species. Surveys conducted within flowering period as part of Flora and Fauna assessment (ELA 2010) did not detect this species.	No
Eucalyptus camfieldii	Camfield's Stringybark	V	Narrow band from the Raymond Terrace area south to Waterfall. Coastal heath on shallow sandy soils overlying Hawkesbury sandstone, mostly on exposed sandy ridges.	Unlikely	Presence of this species was not identified, and no suitable habitat within the small area of native vegetation.	No

Scientific Name	Common Name	EPBC Act Status	Distribution and habitat	Likelihood of occurrence	Justification	Impact Assessment required
Eucalyptus parramattensis subsp. decadens		V	Two separate meta-populations: one bordered by Cessnock—Kurri Kurri in the north and Mulbring—Abedare in the south, and the other bounded by Salt Ash and Tanilba Bay in the north and Williamtown and Tomago in the south. Dry sclerophyll woodland, wet or dry heath on deep, low-nutrient sands, often subject to periodic inundation or where water tables are relatively high.	Unlikely	Presence of this species was not identified, and no suitable habitat was identified within the small area of native vegetation.	No
Grevillea parviflora subsp. parviflora	Small-flower Grevillea	V	Sporadically distributed throughout the Sydney Basin and in the Hunter in the Cessnock - Kurri Kurri area. Also known from Putty to Wyong and Lake Macquarie on the Central Coast. Heath and shrubby woodland to open forest on sandy or light clay soils usually over thin shales.	Unlikely	Presence of this species was not identified, and only marginal habitat identified within the small area of native vegetation.	No
Melaleuca biconvexa	Biconvex Paperbark	V	Only found in NSW, populations found in the Jervis Bay area in the south and the Gosford-Wyong area in the north. Damp places, often near streams or low-lying areas on alluvial soils.	Unlikely	Presence of this species was not identified, and no suitable habitat was not identified within the small area of native vegetation.	No

Scientific Name	Common Name	EPBC Act Status	Distribution and habitat	Likelihood of occurrence	Justification	Impact Assessment required
Persicaria elatior	Tall Knotweed	V	In south-eastern NSW recorded from Mt Dromedary, Moruya State Forest near Turlinjah, the Upper Avon River catchment north of Robertson, Bermagui, and Picton Lakes. In northern NSW known from Raymond Terrace (near Newcastle) and the Grafton area (Cherry Tree and Gibberagee State Forests). Beside streams and lakes, swamp forest or disturbed areas.	Unlikely	Presence of this species was not identified, and no suitable habitat was not identified within the small area of native vegetation.	No
Prostanthera densa	Villous Mint-bush	V	Currarong area in Jervis Bay, Royal National Park, Cronulla, Garie Beach and Port Stephens (Gan Hill, Nelson Bay). Sclerophyll forest and shrubland on coastal headlands and near-coastal ranges, chiefly on sandstone.	Unlikely	Presence of this species was not identified, and only marginal habitat identified within the small area of native vegetation.	No
Rhizanthella slateri	*Rhizanthella slateri* (Rupp) M.A. Clem. & Cribb in the Great Lakes local government area	E	The population occurs near Bulahdelah (within the Great Lakes LGA). Sclerophyll forest in shallow to deep loams.	Unlikely	Only marginal habitat identified within the small area of native vegetation. Site is likely to degraded for presence of this species.	No
Rhizanthella slateri	Eastern Australian Underground Orchid	E	In NSW, currently known from fewer than 10 locations, including near Bulahdelah, the Watagan Mountains, the Blue Mountains, Wiseman's Ferry area, Agnes Banks and near Nowra. Sclerophyll forest in shallow to deep loams.	Unlikely	Only marginal habitat identified within the small area of native vegetation. Site is likely to degraded for presence of this species.	No

Scientific Name	Common Name	EPBC Act Status	Distribution and habitat	Likelihood of occurrence	Justification	Impact Assessment required
Rhodamnia rubescens	Scrub Turpentine	CE	Occurs in coastal districts north from Batemans Bay in New South Wales, approximately 280 km south of Sydney, to areas inland of Bundaberg in Queensland. Populations of R. rubescens typically occur in coastal regions and occasionally extend inland onto escarpments up to 600 m a.s.l. in areas with rainfall of 1,000-1,600 mm. Found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest usually on volcanic and sedimentary soils.	Unlikely	Presence of this species was not identified, and only marginal habitat identified within the small area of native vegetation.	No
Syzygium paniculatum	Magenta Lilly Pilly	V	Only in NSW, in a narrow, linear coastal strip from Upper Lansdowne to Conjola State Forest. Subtropical and littoral rainforest on gravels, sands, silts and clays.	Unlikely	Presence of this species was not identified, and suitable habitat was not identified within the development site.	No
Tetratheca juncea	Black-eyed Susan	V	Confined to the northern Sydney Basin bioregion and the southern North Coast bioregion in the local government areas of Wyong, Lake Macquarie, Newcastle, Port Stephens, Great Lakes and Cessnock. Low open forest/woodland, heathland and moist forest, mainly on low nutrient soils associated with the Awaba Soil Landscape.	Unlikely	Only marginal habitat identified within the small development site. Site is likely to degraded for presence of this species.	No

Scientific Name	Common Name	EPBC Act Status	Distribution and habitat	Likelihood of occurrence	Justification	Impact Assessment required
Thesium australe	Austral Toadflax	V	In eastern NSW it is found in very small populations scattered along the coast, and from the Northern to Southern Tablelands. Grassland on coastal headlands or grassland and grassy woodland away from the coast.	Unlikely	No suitable habitat was identified within the development site.	No

Table 25: Likelihood of occurrence for EPBC Act Listed fauna species

Scientific Name	Common Name	EPBC Act Status	Distribution and habitat	Likelihood of occurrence	Justification	Impact Assessment required
Anthochaera phrygia	Regent Honeyeater	CE	Inland slopes of south-east Australia, and less frequently in coastal areas. In NSW, most records are from the North-West Plains, North-West and South-West Slopes, Northern Tablelands, Central Tablelands and Southern Tablelands regions; also recorded in the Central Coast and Hunter Valley regions. Eucalypt woodland and open forest, wooded farmland and urban areas with mature eucalypts, and riparian forests of Casuarina cunninghamiana (River Oak).	Unlikely	The extent of habitat on site is restricted to marginal highly degraded foraging habitat. No mapped 'Important Areas' within the study area.	No
Botaurus poiciloptilus	Australasian Bittern	E	Found over most of NSW except for the far north-west. Permanent freshwater wetlands with tall, dense vegetation, particularly Typha spp. (bullrushes) and Eleocharis spp. (spikerushes).	Unlikely	The extent of habitat on site is restricted to marginal highly degraded foraging habitat.	No
Chalinolobus dwyeri	Large-eared Pied Bat	V	Recorded from Rockhampton in Qld south to Ulladulla in NSW. Largest concentrations of populations occur in the sandstone escarpments of the Sydney basin and the NSW north-west slopes. Wet and dry sclerophyll forests, Cyprus Pine dominated forest, woodland, sub-alpine woodland, edges of rainforests and sandstone outcrop country.	Unlikely	The extent of habitat on site is restricted to marginal highly degraded foraging habitat.	No

Scientific Name	Common Name	EPBC Act Status	Distribution and habitat	Likelihood of occurrence	Justification	Impact Assessment required
Dasyurus maculatus (SE mainland population)	Spotted-tailed Quoll	E	Found on the east coast of NSW, Tasmania, eastern Victoria and north-eastern Qld. Rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline.	Unlikely	The extent of habitat on site is restricted to marginal highly degraded foraging habitat.	No
Grantiella picta	Painted Honeyeater	V	Widely distributed in NSW, predominantly on the inland side of the Great Dividing Range but avoiding arid areas. Boree, Brigalow and Box-Gum Woodlands and Box-Ironbark Forests.	Unlikely	The extent of habitat on site is restricted to marginal highly degraded foraging habitat.	No
Lathamus discolor	Swift Parrot	CE	Migrates from Tasmania to mainland in Autumn-Winter. In NSW, the species mostly occurs on the coast and south west slopes. Box-ironbark forests and woodlands.	Unlikely	The extent of habitat on site is restricted to marginal highly degraded foraging habitat.	No
Litoria aurea	Green and Golden Bell Frog	V	Since 1990, recorded from ~50 scattered sites within its former range in NSW, from the north coast near Brunswick Heads, south along the coast to Victoria. Records exist west to Bathurst, Tumut and the ACT region. Marshes, dams and stream-sides, particularly those containing Typha spp. (bullrushes) or Eleocharis spp. (spikerushes). Some populations occur in highly disturbed areas.	Unlikely	No suitable habitat identified with the study area.	No
Mixophyes balbus	Stuttering Frog	V	Along the east coast of Australia from southern Qld to north-eastern Victoria. Rainforest and wet, tall open forest in the foothills and escarpment on the eastern side of the Great Dividing Range.	Unlikely	No suitable habitat identified with the study area.	No

Scientific Name	Common Name	EPBC Act Status	Distribution and habitat	Likelihood of occurrence	Justification	Impact Assessment required
Potorous tridactylus tridactylus	Long-nosed Potoroo	V	In NSW it is generally restricted to coastal heaths and forests east of the Great Dividing Range, with an annual rainfall exceeding 760 mm. Coastal heaths and dry and wet sclerophyll forests.	Unlikely	The extent of habitat on site is restricted to marginal highly degraded foraging habitat.	No
Pseudomys novaehollandiae	New Holland Mouse	V	Fragmented distribution across eastern NSW. pen heathlands, woodlands and forests with a heathland understorey, vegetated sand dunes.	Unlikely	The extent of habitat on site is restricted to marginal highly degraded foraging habitat.	No
Phascolarctos cinereus	Koala	E	In NSW it mainly occurs on the central and north coasts with some populations in the west of the Great Dividing Range. There are sparse and possibly disjunct populations in the Bega District, and at several sites on the southern tablelands. Eucalypt woodlands and forests.	Likely	Bionet records of this species within the study area and adjoining areas.	Yes
Pteropus poliocephalus	Grey-headed Flying-fox	V	Along the eastern coast of Australia, from Bundaberg in Qld to Melbourne in Victoria. Subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops.	Potential	Some marginal foraging habitat occurs within the site.	Yes

Appendix F EPBC assessment of significance

Table 26: EPBC assessment of significance for vulnerable species – Grey-headed Flying Fox

Criterion	Question	Assessment
a)	**Lead to a long-term decrease in the size of an important population of a species**	The Grey-headed Flying-fox is considered one population due to the constant exchange of genetic material between individuals and its movement between camps throughout its entire geographic range. Maternity or other roosting habitat is considered important habitat for this species. No Grey-headed Flying-fox camps currently occur within the development site with the nearest active Grey-headed Flying-fox camp approximately 7 km to the south west (Bobs Farm - 607). The proposed development will remove 0.14 ha of high-low condition native vegetation and 0.27 ha of non-native vegetation which comprises potential foraging habitat for the Grey-headed Flying-fox. It is unlikely that this provides any suitable breeding habitat for these species. Given the proximity of more suitable habitat outside the assessment area, the removal of this potential foraging habitat would not lead to the long-term decrease in the size of an important population of these species.
b)	**Reduce the area of occupancy of an important population**	The proposed development will reduce the extent of available potential foraging habitat for this species. Approximately 0.14 ha of high-low condition native vegetation and 0.27 ha of non-native vegetation will be removed. Due to the extent of habitat outside the development site, the removal of a small amount of native and non-native vegetation is unlikely to significantly reduce the extent of occupancy for an important population.
c)	**Fragment an existing important population into two or more populations**	The proposed action will remove approximately 0.14 ha of high-low condition native vegetation and 0.27 ha of non-native vegetation across the development site. The removal of this vegetation will not significantly fragment vegetation corridors that may be used by this highly mobile species throughout its large home range. Therefore the proposed action will not fragment an existing important population into two or more populations.
d)	**Adversely affect habitat critical to the survival of a species**	Foraging habitat within a 50-kilometre radius of a Grey-headed Flying Fox roost site with greater than 30,000 individuals is foraging habitat critical to the survival of this species. The study area is approximately 7 km north east of the closest camp at Bobs Farm (607) which recorded zero individuals in 2019. Therefore, foraging habitat at the study area is not consistent with habitat that would be critical to the survival of this species. No camps/roost sites will be affected by the proposed action. Given the above and that this species is highly mobile, it is considered unlikely that the works would adversely affect habitat critical to the survival of this species.
e)	**Disrupt the breeding cycle of an important population**	The proposed action will not disrupt the breeding cycle of the Grey-headed Flying-fox given that no camps will be affected by the proposed action and suitable foraging habitat is available adjacent to the development site.

Criterion	Question	Assessment
f)	**Adversely affect habitat critical to the survival of a species; modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline**	The potential foraging habitat to be removed is marginal and of low quality. Given the small amount of potential foraging habitat to be removed, that potential foraging habitat will persist adjacent to the development site and across the locality, and that this species is highly mobile throughout their home ranges, it is unlikely that the habitat to be removed would cause the species to decline.
g)	**Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat**	The proposed action is unlikely to result in the establishment of an invasive species that is harmful to these two species.
h)	**Introduce disease that may cause the species to decline**	cause clinical disease and mortality in Grey-headed Flying-foxes (DECCW 2009). The proposed action is unlikely to present a significant ecological stress on any camps or on individuals that may utilise the development site and therefore the works are unlikely to introduce or exacerbate this virus or any other disease that may cause this species to decline.
i)	**Interfere substantially with the recovery of the species**	Considering the above factors, the proposed works will not interfere substantially with the recovery of these species.
Conclusion	**Is there likely to be a significant impact**	In consideration of the above, the proposed works are considered unlikely to have a significant impact on the Grey-headed Flying-fox

Table 27: EPBC assessment of significance for endangered species - Koala

Criterion	Question	Assessment
a)	**Lead to a long-term decrease in the size of a population**	The development site is almost entirely covered by the footprint of the existing hotel development, and remnant native vegetation is very limited too eight (8) potentially important and preferred koala feed tree species as per the Port Stephens Councils Koala Comprehensive Plan of Management (KCPoM 2002). These include; *A.costata* (3), *E.umbra* (3) and *E.tereticornis* (2) all of which occur along the margins of development site. The adjacent bushland vegetation to the east and south provides a habitat corridor for this species with preferred koala feed trees (KCPoM 2002), including; *Eucalyptus robusta* (swamp mahogany) and *E.tereticornis* occurring. There are records of koala within these areas and also within the study area in proximity to this corridor along the eastern boundary. The proposed redevelopment will remove approximately 0.14 ha of high-low condition native vegetation along the margins of the development site. Given the proposal is infill development, whilst some trees with potential to provide refuge/forage for the koala will be removed, koala are likely to continue to use the site at current levels and this impact is unlikely to lead to a long-term decrease in the size of a population.

Criterion	Question	Assessment
b)	**Reduce the area of occupancy of the species**	The proposed development will reduce the extent of available potential foraging habitat for this species. Approximately 0.14 ha of high-low condition native vegetation and 0.27 ha of non-native vegetation which does not contain preferred feed trees for this species, as per Port Stephens CKPoM (2002) will be removed. Based on the Port Stephens CKPoM, the study area including existing development footprint is mapped primarily as habitat Linking Area and Habitat Buffer. Preferred Koala habitat is located along the coastal strip to the adjacent east on the study area. The proposal will not result in the removal of Preferred Koala Habitat as mapped within the CKPoM. Considering the above the proposed removal of a small amount of native and non-native vegetation within the existing development footprint is unlikely to significantly reduce the extent of occupancy for the species.
c)	**Fragment an existing population into two or more populations**	As per Koala habitat priority mapping (CKPoM 2002), no mapped Preferred Habitat or Supplementary Habitat occurs within the development site. Approximately 0.3 ha of Cleared Buffer will be affected, though this area already comprises the existing resort and the proposal is an infill construction. Therefore there will be no net change to the extent of Cleared Buffer. The rest of the proposed development is mapped as Cleared Link (0.9 ha) and comprised of the existing resort and cleared areas. Several mall small patchy areas of high-low condition PCT1626 occur within, however these areas of native vegetation are already impacted by current management and landscaping disturbance. The proposal is largely an infill construction of the existing development footprint, and net change to the extent of Cleared Link and Cleared Buffer will be minimal. Given the above, the proposal is unlikely to significantly fragment vegetation corridors anymore then what already exists. Therefore the proposed action will not fragment an existing important population into two or more populations.
d)	**Adversely affect habitat critical to the survival of a species**	As per Koala habitat priority mapping (CKPoM 2002), no mapped Preferred Habitat or Supplementary Habitat occurs within the development site. Therefore the study area does not contain habitat listed as critical to the survival of the Koala.
e)	**Disrupt the breeding cycle of a population**	The removal of approximately 0.14 ha of high-low condition vegetation which does not contain mapped areas of Preferred Habitat or Supplementary Habitat is unlikely to disrupt the breeding cycle of a population.
f)	**Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline**	The removal of approximately 0.14 ha of high-low condition vegetation which does not contain important feed trees for this species (CKPoM 2002) is unlikely to result in the species decline.
g)	**Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat**	The proposed redevelopment of an existing hotel complex will not be an enlargement of the existing development footprint. The proposal is unlikely to result in increased edge effects, increased weed invasion, or increase fire frequency of koala habitat. Planting of koala feed trees within the landscape design to increase the ecological value and resilience of the study areas boundary will help increase habitat values. Given the above, it is unlikely that Invasive species are to become established.

Criterion	Question	Assessment
h)	**Introduce disease that may cause the species to decline**	Disease is unlikely to be introduced.
i)	**Interfere with the recovery of the species**	The removal of approximately 0.14 ha of high-low condition vegetation which does not contain important feed trees for this species (CKPoM 2002) is unlikely to interfere with the species recovery.
Conclusion	**Is there likely to be a significant impact**	No. The proposed activity is unlikely to have a significant impact on Koala as the impacts are restricted to a small area of generally unsuitable habitat for the species.

Appendix G Staff CVs

Shawn Ryan **ECOLOGIST**

Shawn is an ecologist with eight years' combined experience in ecological consulting and environmental field work. With project experience across coastal NSW, Shawn has completed biodiversity assessments and monitoring projects in a variety of environments for a range of activities including infrastructure, mining, energy, government and urban development. Shawn has experience in all aspects of ecological consultancy including survey design and planning, flora and fauna surveys, data collection and analysis, reporting and client communication.

Shawn has extensive field experience on large projects in regional and remote areas of New South Wales which has led to the development of strong skills in field logistics including preparation of survey plans and conducting large field-based surveys.

QUALIFICATIONS

Bachelor of Environmental Science & Management (Ecology), University of Newcastle

BAM Accredited Assessor under the NSW Biodiversity Conservation Act 2016

Senior First Aid

Defensive Driving Training

PROJECT EXPERIENCE

ECOLOGICAL SURVEYS & MONITORING

- Preclearance surveys for Green and Golden Bell Frog (*Litoria aurea*) Kooragang Island – Port Authority NSW
- Assist in Implementation of various broad scale vegetation-based monitoring programs for large-scale and complex seasonal and annual monitoring programs for this State and Commonwealth listed EEC. Monitoring included flora based repeated measures sampling within a BACI monitoring design, Newnes Plateau – Large mine
- Monitoring and research programs for the Blue Mountains Water Skink and Giant Dragon Fly, Newnes Plateau – Large mine
- Land Management Strategy, Compensatory Habitat and EEC monitoring based on vegetation condition within the BBAM and BAM frameworks, Lower Hunter and South Eastern Highlands – Large mine
- Targeted threatened flora and fauna surveys as part of impact assessments and preclearance surveys in NSW
- Rapid Data Plot vegetation assessments and mapping in NSW

TARGETED FLORA AND FAUNA SURVEYS

- Large scale targeted Koala surveys, utilising; SAT, eucalyptus foliage sampling and dog detection, Port Stephens – Large Development
- Targeted threatened fauna surveys, including trapping, call-playback, spotlighting and diurnal bird census for impact assessments in South Eastern Highlands, Sydney Basin, Lower Hunter, NSW North Coast and North Western Slopes.
- Targeted threatened flora surveys, in South Eastern Highlands, Sydney Basin, Lower Hunter, NSW North Coast and North Western Slopes.

REFS & IMPACT ASSESSMENTS

- Assessments under NSW Biodiversity Offsets Scheme using the Biodiversity Assessment Method (BAM) that included targeted surveys and assessment of the following Threatened Ecological Communities (TEC) and species:

- EECs such as Box Gum Grassy Woodland, Tableland Cool Temperate Grassy Woodland, Swamp Sclerophyll Forest, Lowland Rainforest and Lower Hunter Spotted Gum - Ironbark Forest
- Threatened woodland fauna such as Koala, Regent Honeyeater and Squirrel Glider.
- Threatened bats such as Grey-headed Flying-fox, Large-footed Myotis and East Coast Freetail Bat.
- Threatened frogs such as Green and Golden Bell Frog, Stuttering Frog, Green-thighed Frog and Wallum Froglet.
- Threatened flora such as *Prasophyllum Pallens*, *Genoplesium plumosum* and *Melaleuca biconvexa.*

URBAN DEVELOPMENT AND INFRASTRUCTURE

- Assessments under NSW Biodiversity Offsets Scheme using the Biodiversity Assessment Method (BAM)

ENERGY AND MINING

- Preliminary Ecological Assessments for Solar Farm, NSW Western Slopes - UPC Renewables
- Preliminary Ecological Assessments for Quarry upgrades, Northstar and Johns River - Boral
- Biodiversity Management Plans and Conditions of Consent compliance, Western Blue Mountains and Lake Macquarie – Large mine
- Ecological due diligence for permissible activities, Western Blue Mountains and Lake Macquarie – Large mine
- Broad and fine scale monitoring programs for targeted threatened entities, Western Blue Mountains and Lake Macquarie – Large mine

DEPARTMENT OF ENVIRONMENT

- Large scale grid-based surveys in high priority areas Barrington Tops and Gloucester Tops, focusing on threatened species, feral fauna and exotic flora - Biodiversity Conservation Division
- Targeted threatened orchid surveys, Barrington Tops and Gloucester Tops – Biodiversity Conservation Division
- Targeted threatened species surveys for SOS species *Prostanthera junonis*, Somersby Plateau - Biodiversity Conservation Division

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