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ECOLOGICAL AND ECONOMICAL BALANCE

LEADING THE WAY
IN ENVIRONMENTAL
MANAGEMENT

HIGH ENVIRONMENTAL VALUES REPORT

ARAKOON RD, SOUTH WEST ROCKS

MARCH 2024

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Version Control

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Executive Summary

This report has assessed the ecological values of land within Lot 9 DP 1219664, 157 Arakoon Road, South West Rocks. This assessment is to support the rezoning planning proposal for land currently zoned R5 – Large Lot Residential and has been requested by the Kempsey Shire Council as part of their pre lodgement meeting request for information and has presented the ecological values that are present on the Subject Land. This assessment critically analyses the criteria presented in *Table 1* of the *Northern E Zone Review – Final Recommendations Report* (2015) against the ecological values present on the Subject Land. The Subject Land is mapped within an Urban Growth Area by the Kempsey Shire Councils (KSC) Local Strategic Plan 2020.

This assessment considers all relevant documentation that has been published for the Subject Land. Existing information has concluded that two Plant Community Types (PCTs) exist within the Subject Land in varying condition states. None of these PCTs conform to Endangered Ecological Communities listed under the *NSW Biodiversity Conservation Act (BC Act) 2016* or *Environmental Protection & Biodiversity Conservation Act (EPBC Act)* 1999.

The Subject Land has been partially cleared historically and is subject to ongoing maintenance of the groundlayer via slashing and grazing. Large portions of the subject land are devoid of canopy and understory structure and PCTs in these areas exist only with distributed ground layer vegetation. Areas where mature canopy trees are present still lack shrub layer structure with the exception of a small remnant patch on the southern boundary. Whilst the groundlayer is largely native much of the Subject Land has a distinct lack of habitat and connectivity value.

The Subject Land currently zoned R5 is mapped as Secondary 'A' and Secondary 'B' Koala and Unknown Habitat under KSC Comprehensive Koala Plan of Management (CKPoM). Detailed survey of the Subject Land has determined that this mapping is inaccurate and vegetation present does not conform to the definitions of the above Secondary 'A' or 'B' habitat. Field survey failed to locate evidence of the species on the Subject Land and failed to record any Preferred Koala Food Trees as defined under the CKPoM on the Subject Land. Under the assessment pathway all land mapped as 'other' requires no further assessment under the KSC CKPoM all land mapped as Secondary 'A' or 'B' must comply with the performance criteria described in Section 4.10 of the CKPoM.

The HBT recorded on the Subject Land are not considered HEV land when assessed against the *Northern Councils E – Zone review: Final Recommendations* definition of Key Threatened Species Habitat and the *Private Native Forest Code of Practice Guideline No. 2, Protocol for re-evaluating old-growth forest on private property.*

An assessment of ecological values of the broader subject land in relation to criteria listed in Attachment 2 of the *BCD NE Branch Steps for Assessing Biodiversity in Planning Proposals* has been undertaken. The results of the assessment is summarised below:

- **Biodiversity Values Mapping:** No Biodiversity Values are mapped within the Subject Land (Figure 3).
- **Over cleared Vegetation Types:** Vegetation types, PCT 4004 and PCT 3573 confirmed within land zoned R5 is not considered over cleared. Further detail found in section 2.1 of Table 14

- **Vegetation in Over-cleared landscapes:** The Macleay Alluvial Plains and Ingalba Coastal Hills on which the Subject Land exists is not considered an over cleared landscape. Further detail in Section 2.2 of Table 14.

- **Threatened Ecological Communities:** PCTs present on the Subject Land did not conform to the Final Determination (*BC Act*) or the Conservation Advice – Key Diagnostics (*EPBC Act*) for Coastal Swamp Sclerophyll TEC due to the geological setting or inundation period. Further detail found in section 2.3 in Table 14 and Section 3.3 and Section 4.6.

- **Key habitat for threatened species under the BC Act:** One threatened species has been recorded on the Subject Land. Habitat within the Rezoning Area is moderate condition habitat exists within the western and eastern portions of the Subject Land and highly degraded forested wetland habitat in the central portion. It is unlikely the vegetation in the Rezoning Area constitutes key breeding habitat for the Brush-tailed Phascogale as it is considered very likely that the key habitat for the species exists within the much higher integrity vegetation which adjoins the Subject Land.

- **National Important Wetlands:** No National Important Wetlands were mapped within the Rezoning Area**.**

- **Vulnerable estuaries and ICOLLS:** There are no vulnerable estuaries or ICOLLS present in the Rezoning Area.

- **Karst Landscapes:** No Karsts are recorded in the Locality.
- **Sites of Geological Significance:** No sites of geological significance are present in the locality

In conclusion, the values listed above are absent from the Subject Land and do not meet the key consideration criteria for High Environmental Value Land (as described within Attachment 2 of the BCD NE Branch Steps for Assessing Biodiversity in Planning Proposals). Those matters which may marginally occur within the Rezoning Footprint (foraging habitat for the Brush-tailed Phascogale) will not see a considerable decrease in available resource through the proposed development. As such, it is deemed appropriate that the land is rezoned from R5 to R1 from a perspective of biodiversity.

Abbreviations

Table 1: List of abbreviations within report

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

STAGE 1 - BIODIVERSITY ASSESSMENT

1. Introduction

Biodiversity Australia (Bio Aus) was requested to undertake an assessment of the High Environmental Value (HEV) land for a planning proposal for the proposed subdivision at 157 Arakoon Road, South West Rocks.

1.1 Land Zoning

The Development Site is currently zoned as R5 – Large Lot Residential and the proponent is seeking to rezone to R1 - General Residential.

For the purposes of this HEV Report the Rezoning Footprint exists with R5 Large lot residential zoning, this is defined in depth within the descriptions below and shown within Figure 2. The area does not contain areas mapped as Biodiversity Values.

1.2 Definitions Used in the Report

This report uses the following key definitions:

- **Assessment Area:** includes the subject land and the area of land within the 1500 m buffer zone surrounding the subject land (or 500 m buffer zone for linear proposals) that is determined as per Subsection 3.1.2 of the BAM (Figure 4)
- **Subject Land:** Lot 9 DP1219664, South West Rocks which is an area of 23.97 ha. Figure 2: Subject Land, Land Zones and photo locations
- **Rezoning Footprint:** the entirety of Lot 9 DP1219664, South West Rocks which is an area of 23.97 ha is intended to be rezoned. Figure 2: Subject Land, Development Footprint and photo locations

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

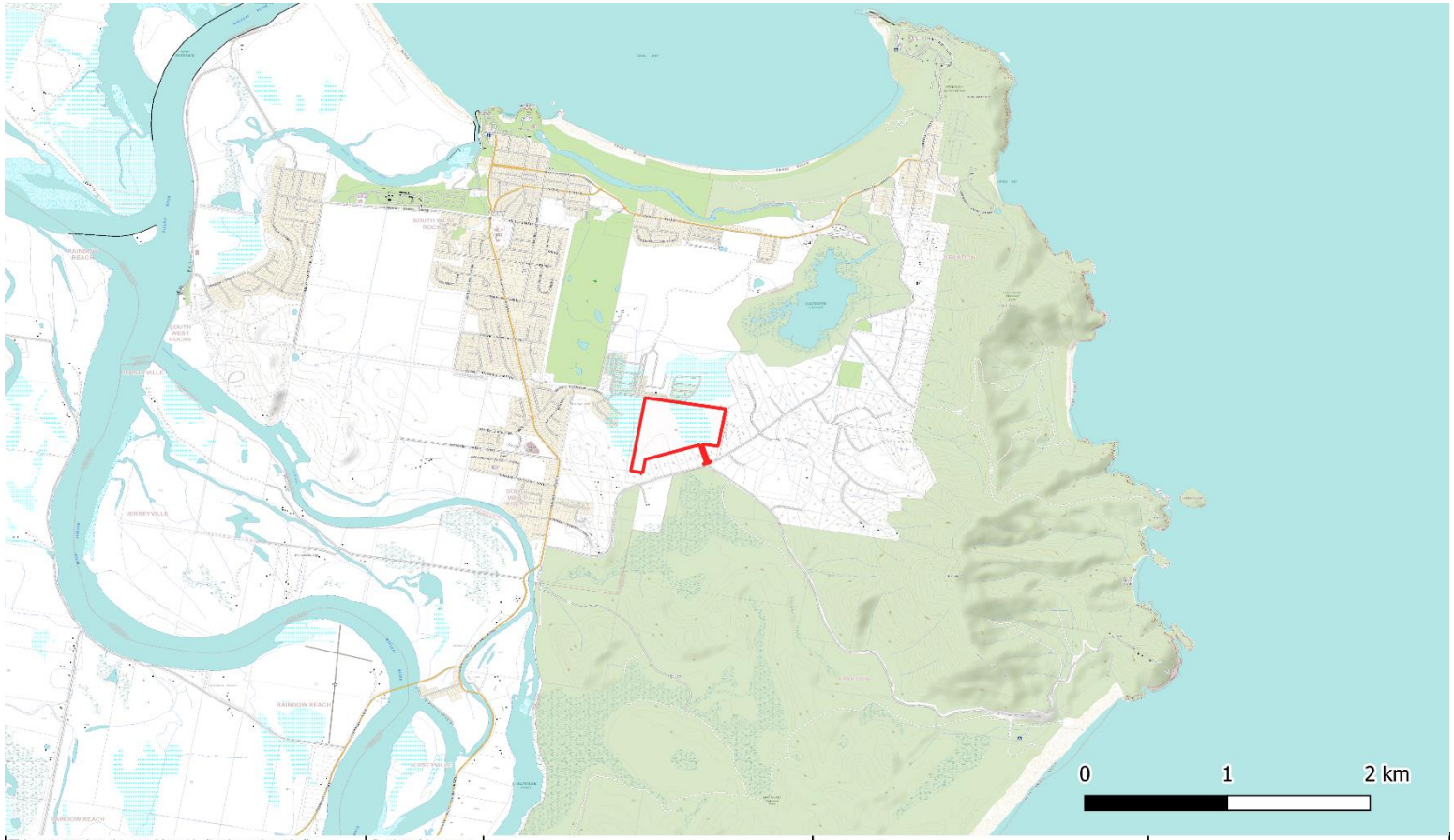
1.3 Description of the Subject Land

The Development Site comprises a 23.97 ha property located at 157 Arakoon Road, South West Rocks. It is formally described as Lot 9 DP1219664. The entirety of Development Site is zoned R5 – Large Lot residential. The context of the Development Site is provided within Figure 2.

The Subject Land consists of two Plant Community Types both existing in multiple integrity conditions due to historical clearing and ongoing maintenance. Uses of the Subject Land are limited with existing residential lots and areas subject to frequent slashing and grazing. Patches of remnant canopy vegetation exist in the far east central and southwest of the Subject Land. These patches of vegetation contain remnant canopy trees and a largely native ground layer that is regularly slashed or grazed by horses. A small patch of remnant PCT 3573 exists along the southern boundary the supports an intact canopy, shrub and ground layer. Low lying areas have been determined to be highly degraded examples of PCT 4004. Further information on native vegetation is provided in Section 3.

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

Figure 1: Location of the Subject Land



This mapping is to be considered indicative only and all derivations (eg of areas of EECs and vegetation communities) are at best approximations and subject to errors including individual interpretation and reliance on information provided to Biodiversity Australia where were not independently verified. All information is intended to be indicative only and no reliance for extrapolation, mapping, ect. should be placed upon this map without independent validation of the information by the user.Biodiversity Australia takes no responsibility for any sudsequent error losses etc. that may arise from use of this data without independent verification.	Project Manager: KR Drawn By: LW Date: 14 June 2022 Map Projection: MGA Zone 56 Datum: GDA1994	Figure Name: Location of the Development Site Site: 157 Arakoon Road, South West Rocks Client: King & Campbell	**Legend** Development Site	Biodiversity AUSTRALIA QGIS Job Number: ENS4974 Page: 1 of 1	Scale: 1:26000 Veriation A

Figure 2: Subject Land, Land Zones and photo locations

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

Project Manager: KR	Figure Name: Development Site Photos
Drawn By: LW	Site: 157 Arakoon Road, SW Rocks
Date: 14/06/2022	Client: King & Campbell
Map Projection: MGA Zone 56	Legend: Development Site; Photos
Datum: GDA1994	QGIS
Job Number: ENS4974	Scale: 1:2900
Page: 1 of 1	Veriation A

Photo Plate 1: Images of the Subject Land

Photo 7

Photo 8

Photo 9

1.4 Information Sources

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

- Department of Climate Change, Energy, the Environment and Water - Protected Matters Search Tool (DCCEEW 2024a).
- Department of Climate Change, Energy, the Environment and Water - MNES SPRAT Profiles (DCCEEW 2024b).
- Office of Environment and Heritage Threatened Biodiversity Data Collection (OEH 2024).
- NSW Department of Planning and Environment - BioNet/Atlas of Wildlife (DPE 2024a).
- NSW Department of Planning and Environment - Regional Corridors and Key Habitat Mapping (DPE 2024b).
- NSW Department of Planning and Environment - Biodiversity Values Map and Threshold Tool and digital data layer (DPE 2022c).
- NSW Department of Planning and Environment – NSW Mitchell Landscapes (DPE 2024d).
- NSW Department of Planning and Environment – State Vegetation Type Mapping (DPE 2024e).
- NSW Department of Planningand Environment – BioNet Vegetation Classification (DPE 2024f)
- NSW Department of Planningand Environment – BioNet Vegetation Classification (DPE 2024g)
- South West Rocks LES Investigations Detailed Wallum Froglet Study (Connell Wagner PTY LTD 2007)
- Literature Review, Preliminary Ecological Assessment – RU2 Rezoning Planning Proposal – Wainbar Avenue, South West Rocks (Biodiversity Australia, 2021). Provided in Appendix 5.
- Coastal Quaternary Geology – North and South Coast of NSW digital data layer (Troedson & Hashimoto 2008)

2. Site Context

2.1.1 IBRA Bioregions and Subregions

The Development Site is located in the NSW North Coast IBRA region and the Macleay Hastings subregion. The Development Site is located on Manning - Macleay Coastal Alluvial Plains and Ingalba Coastal Hills Mitchell Landscape.

2.1.2 Native Vegetation Extent in 1500m Buffer

A 1500 m buffer was established around the Subject Land. Analysis with GIS has determined that there is approximately 74 % native vegetation cover within 1500 m buffer.

2.1.3 Cleared Areas

Cleared areas occur both on and adjacent to the development site. The majority of the Development Site has been cleared and parts are utilised as horse agistment.

2.1.4 Landscape Features

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

Table 2: Landscape features present

Feature	Present on site?	Present on adjoining land?	Description
Rivers and Streams	Yes	Yes	An unnamed drainage line runs through south to north through the centre of the site and held water during time of survey.
Important Local Wetlands	No	Yes	Resilience and Hazards SEPP mapped wetlands are mapped adjacent to the site along on the southern side of Arakoon Road. At the closest point the Development Area is 97 m to the mapped wetland. A negligible area of the Development Footprint falls within the wetland buffer area.
Connectivity Features	No	Yes	Forested areas occur on adjacent land which provide connectivity for flora and fauna. The Development Footprint itself does not hold significant connectivity value as it is highly fragmented
Areas of Geological Significance (e.g. karst, caves, crevices, cliffs)	No	No	-
Soil Hazard Features	No	No	-

2.1.5 Biodiversity Values

There are no Biodiversity Value areas mapped within the Development Footprint (Figure 3).

Figure 3: Biodiversity Values map

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

Project Manager:	KR
Drawn By:	LW
Date:	27/05/2022
Map Projection:	MGA Zone 56
Datum:	GDA2020

Figure Name: Biodiversity Values

Site: 157 Arakoon Road, SW Rocks

Client: King & Campbell

Legend

- Development Footprint
- Biodiversity Values

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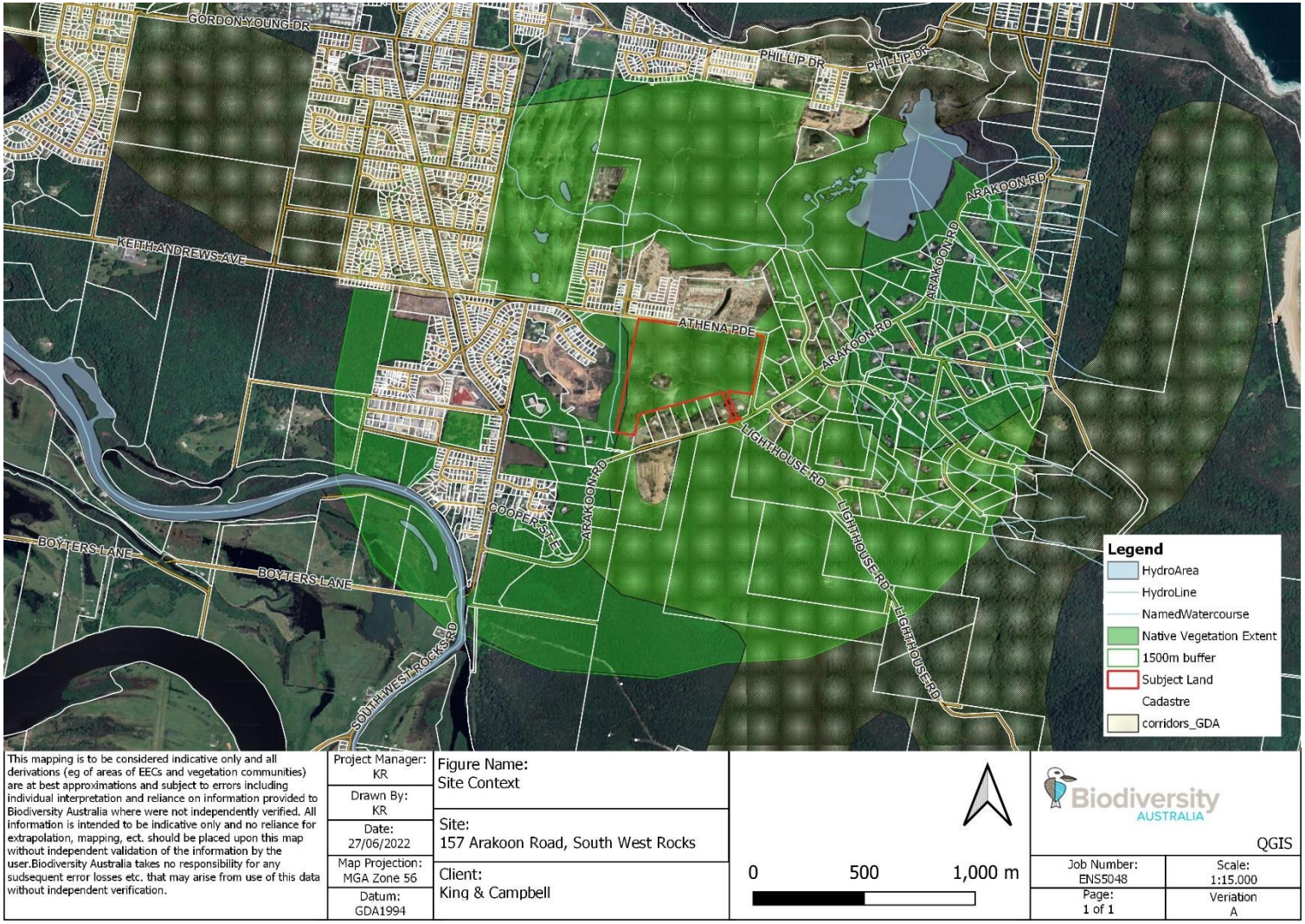
QGIS

Job Number: ENS4974	Scale: 1:6000
Page: 1 of 1	Veriation A

Figure 4: Subject Land context



3. Native Vegetation

3.1 Survey Methods

Vegetation surveys were undertaken by BAM accredited assessors and Botanists in May of 2022. The NSW State Vegetation Type Mapping layer was initially consulted to guide plot locations and potential vegetation. The results of this search are shown in Figure 5. The following PCTs were mapped on the Subject Land;

- PCT 3573 – Northern Lowland Scribbly Gum – Bloodwood Forest
- PCT 4004 – Northern Melaleuca quinquenervia Swamp Forest

3.1.1 Vegetation Integrity Survey

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

The vegetation within the Subject Land has been disturbed over many years and as such the structure of the Vegetation Zones varies substantially. The establishment of multiple Vegetation Zones is one method which has been adopted to categorise these differences in structure and integrity. In this circumstance, the method for locating plots was used as an additional measure to ensure that plot data was representative of the numerous Vegetation Zones throughout the Subject Land. Randomly allocated locations and bearings were not considered appropriate as it allowed a high probability of misrepresenting the Vegetation Zone. For this reason, plots were located to ensure they capture the attributes relevant to that Vegetation Zone as per Section 4.3.4 (3)(c) of the BAM 2020. Section 4.3.4 (5) was also fully considered and adopted in this process. In some circumstances, this meant that plot locations fell within 50m of ecotones.

The following information was collected within each vegetation plot:

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

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

3.1.2 Vegetation Classification and Mapping

Vegetation communities were sampled by the vegetation plots described above and through walking random meander transects. The random meander transects also allowed for a more comprehensive flora inventory on the Subject Land. Vegetation was then classified based on the NSW Plant Community Type Classification.

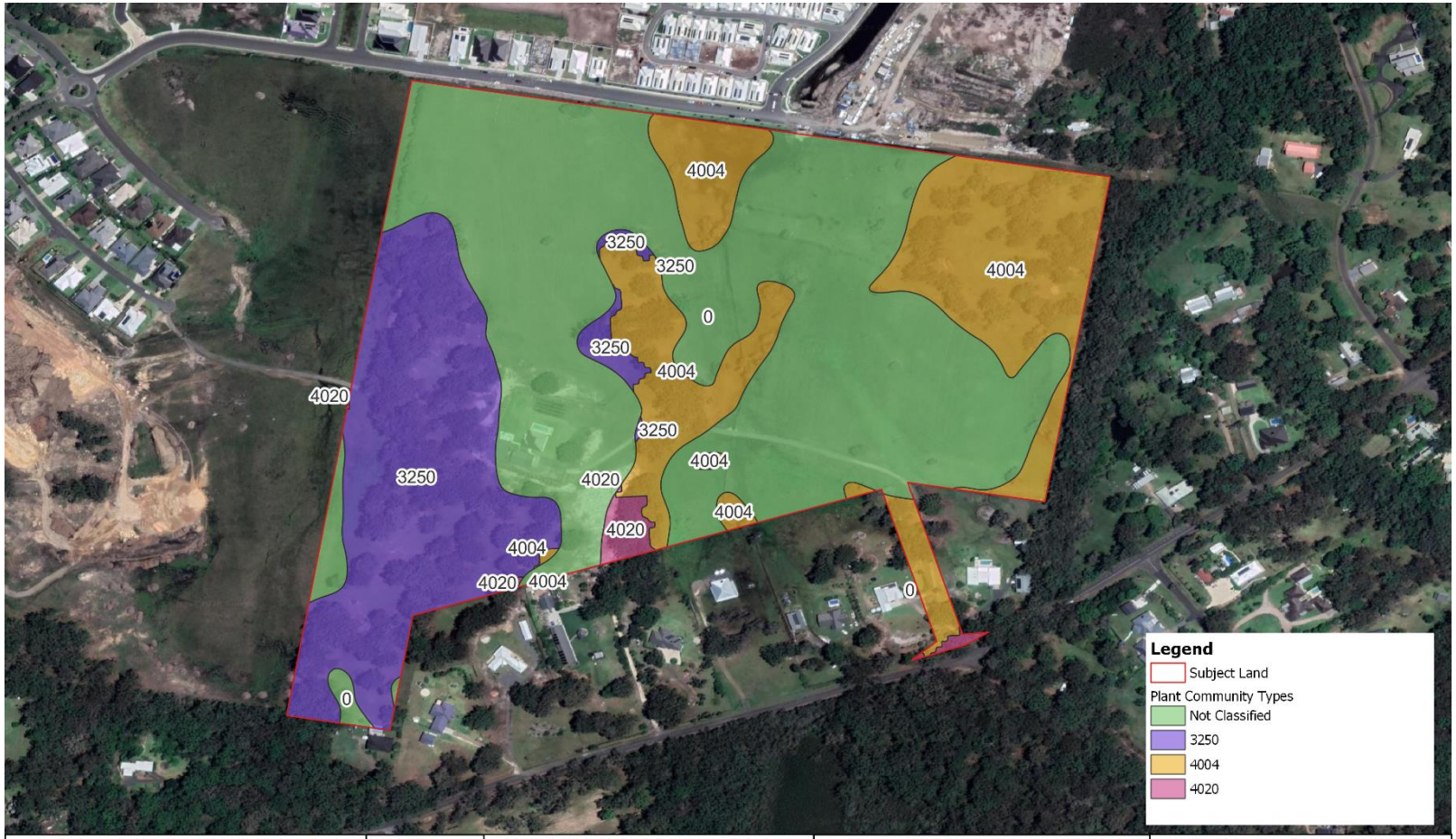
Plant species were identified to species or subspecies level and nomenclature conforms to that currently recognised by the Royal Botanic Gardens and follows Harden and PlantNET for changes since Harden.

Review of the NSW State Vegetation Type mapping through the SEED Portal shows the following PCTs present on the Subject Land.

- PCT 3250 - Northern Foothills Blackbutt Grassy Forest,
- PCT 4004 – Northern *Melaleuca quinquenervia* Swamp Forest,
- PCT 4020 – Coastal Creekflat Layered Grass-Sedge Swamp Forest.

The location of these PCTs are depicted in Figure 5.

Figure 5: NSW State Vegetation Type Mapping (SEED Portal)



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

Project Manager: KR	Figure Name: NSW STVM
Drawn By: LW	
Date: Feb 2024	Site: 157 Arakoon Road, SW Rocks
Map Projection: MGA Zone 56	Client: King & Campbell
Datum: GDA2020	

0 100 200 m

Biodiversity AUSTRALIA

QGIS

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3.2 Plant Community Type Descriptions

Native vegetation is dominant across the Subject Land with cleared areas still exhibiting high cover and abundance of native species albeit in highly to extremely disturbed state. Vegetation survey determined the following PCTs were present within the Subject Land;

- PCT 3573 Northern Scribbly Gum – Bloodwood Forest,
- PCT 4004 Northern *Melaleuca quinquenervia* Swamp Forest.

The following provides a description of the Native Vegetation within the Subject Land that will be affected by the proposal. No PCTs conform to the associated Threatened Ecological Communities (TECs) or Endangered Ecological Communities (EECs) under the *EPBC Act* or *BC Act*.

These communities were largely consistent with the broad Vegetation Types which had the Subject Land mapped. Vegetation Zones have been more accurately mapped following the field verifications. These are presented within Figure 6: Vegetation zones and survey locations.

A description of the vegetation communities sampled is provided below, with photos following. A map of the vegetation communities is provided in Figure 6: Vegetation zones and survey locations.

3.2.1 Community 1

Table 3: Vegetation community 1 description

Vegetation Community (NSW PCT)	PCT 3573 – Northern Scribbly Gum – Bloodwood Forest
Vegetation Formation	Dry Sclerophyll Forest (Shrubby sub-formation)
Vegetation Class	North Coast Dry Sclerophyll Forests
Land Zones & Area	Degraded 5.5 ha, Moderate – 9.3 ha & Remnant – 0.24 ha
EEC Status	N/A
Clearing Extent	25%, however the accuracy of the clearing extent has not been assessed.
Vegetation Zones	3
Number of Plots	8
Location	Occurs on higher elevations across the Development Site.
Description	**Canopy:** Structure and Species: Tall to very tall open forest dominated by *Eucalyptus signata & Eucalyptus planchoniana* with scattered *Corymbia intermedia, Corymbia gummifera & Eucalyptus pilularis*. Other canopy species present include *Syncarpia glomulifera, Eucalyptus umbra, Angophora woodsiana* & *Eucalyptus baileyana*. **Shrub layer:** Structure and Species: The mid-stratum included *Pimelea linifolia, Pultenaea myrtoides, Persoonia* and *Banksia* sp. The Shrub layer was sparse in moderate and derived vegetation zones. Diversity was highest in remnant zones. **Ground layer:**

	Structure and Species: The ground stratum varied across the development site from moderate in remnant areas to sparse with areas of bare sands. Species present included *Dianella caerulea, Entolasia stricta*, *Lepidosperma laterale* and *Pteridium esculentum.* **Lianas, scramblers, etc.:** *Glycine clandestina* may sometimes occur. *Pandorea pandorana* was present in remnant zones.
Condition	This community existed in various conditions from a small remnant area in the south to areas with select canopy trees present and little understory to areas with no canopy or shrub layer. Cleared areas were dominated by native species despite what appears to be relatively frequent slashing.

Photo Plate 2: Community 1 at survey plot 8 (Degraded)

Photo Plate 3: Community 1 at survey plot 10 (Moderate)

Photo Plate 4: Community 1 at survey plot 11 (Remnant)

3.2.2 Community 2

Table 4: Vegetation community 2 description

Vegetation Community (NSW PCT)	PCT 4004 – Northern *Melaleuca quinquenervia* Swamp Forest
Vegetation Formation	Forest Wetland
Vegetation Class	Coastal Swamp Forest
Land Zones & Area	Highly Degraded – 4.1 ha, Degraded – 4.3 ha
Clearing Extent	31%, however the accuracy of the estimate has not been assessed.
EEC Status	The PCT is associated with Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and Southeast Corner Bioregions EEC under the *BC Act* 2016 and the *EPBC Act 1999*. PCT does not Conform state or federally listed EEC. See section 3.3.
Vegetation Zones	2
Number of Plots	1
Location and Area	Occurs in the centre of the Development Site from the southern boundary to the northern boundary.
Description	**Canopy:** Structure and Species: Swamp Open Forest typically dominated by *Melaleucas*. Canopy species expected include *Melaleuca quinquenervia, Eucalyptus robusta* and *Livistona australis. Melaleuca quinquenervia* regrowth was present across most of the PCT with patches of mature individuals. **Shrub layer:** Structure and Species: The mid-stratum was absent from the majority of this PCT. It is typically described by *Casuarina glauca, Glochidion ferdinandi* and *Acacia longifolia.* **Ground layer:** Structure and Species: The ground stratum is typically dense. The characteristic species that were present across this PCT include *Baumea* spp., *Juncus bufonius, Sacciolepis indica* and *Eleocharis minutum.* **Lianas, scramblers, etc.:** No scramblers or lianas were present.
Condition	This community was highly modified across the development site. Large areas were devoid of canopy species with mature *Melaleuca quinquenervia* only existing in small patches. Weed invasion was very low in most areas with ground layer species largely native.

Photo Plate 5: Community 2 at survey plot 4 (Highly Degraded)

Photo Plate 6: Community 2 at survey plot 2 (Degraded)

3.2.3 Justification of PCT and Vegetation Zones

PCT 3753- This community occurs in the appropriate IBRA subregion occurs on the correct substrate and landscape position, i.e. coastal lowlands on sandy soils derived from metasediments, to enable its identification at this development site. Vegetation Zones in better condition exhibit the appropriate floristic attributes of the PCT. The PCT is present in various conditions as described below;

– Degraded condition

- Does not contain canopy trees,
- Does not contain a shrub layer,
- Does not contain coarse woody debris,
- Contains a high cover of ground layer species, &
- Weed coverage is low.

– Moderate condition

- Contains canopy species some of which support hollows,
- Contains large trees over 49cm DBH,
- Contains isolated piles of fallen logs,
- Contains a relatively high percentage of bare ground (average 27%),
- Species diversity is moderate, &
- Weed coverage is very low.

– Remnant condition

- Contains mature canopy species,
- Mid-story and shrub layer present,
- Contains leaf litter and coarse woody debris, &
- Species diversity was high

PCT 4004 - Although much of the PCT is in a derived state the necessary diagnostic features exists including the appropriate IBRA subregion and correct topographic position including NSW landscape profile (Manning – Macleay Coastal Alluvial Plain as well as the appropriate substrate and landscape position, i.e. floodplains and barrier sands of the lower North Coast. Though the PCT is degraded the floristic composition supports the selection of this PCT. The PCT has been separated into two vegetation zones as follows;

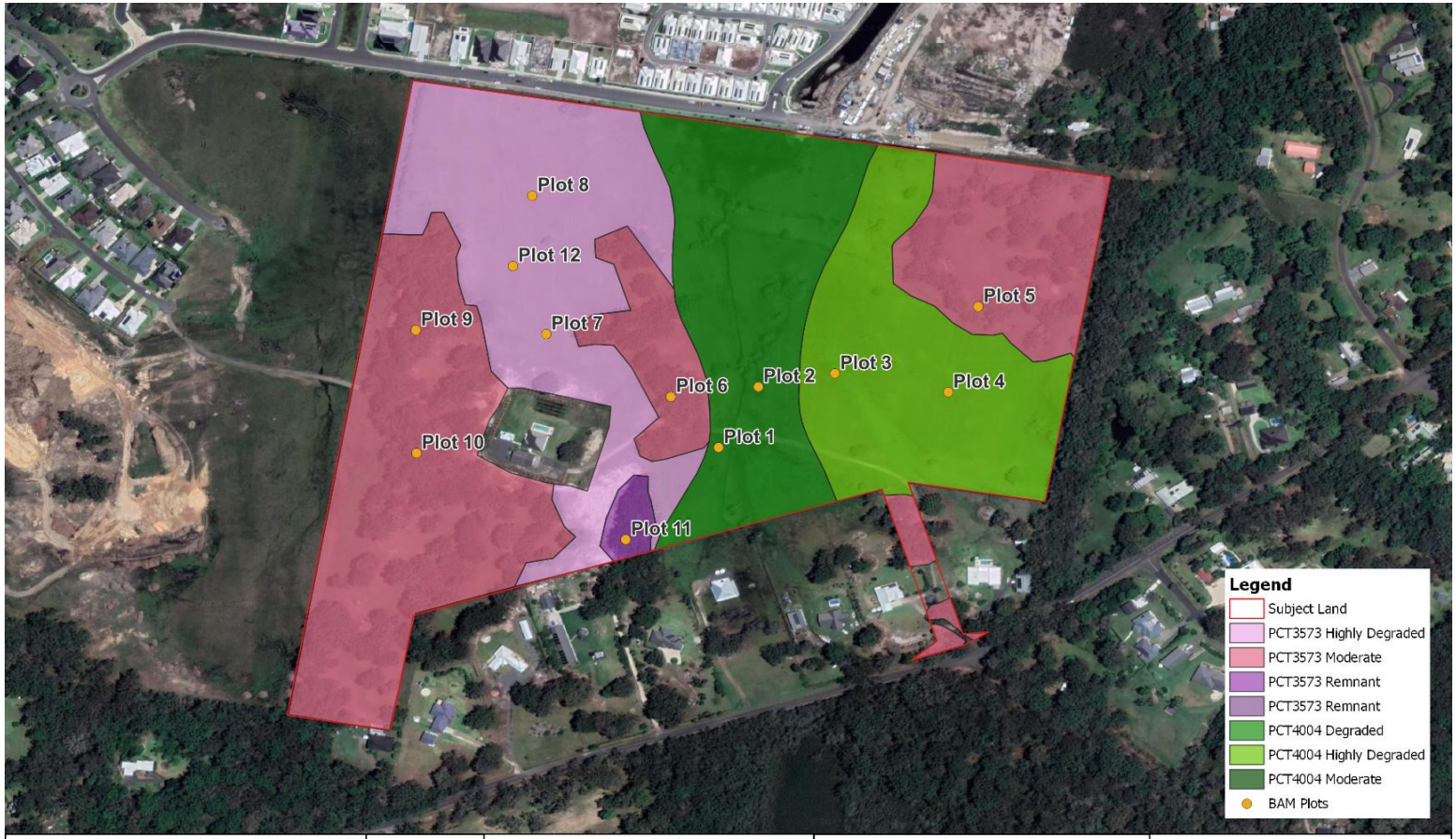
– Highly Degraded condition

- Does not contain canopy layer,
- Does not contain shrub layer,
- Does not contain coarse woody debris, &
- Ground layer is dense, however, is subject to frequent slashing.

– Degraded condition

- Contains very few large trees,
- Contains no hollow bearing trees,
- Contains a dense ground layer, &
- Contains relatively low cover of weeds.

Figure 6: Vegetation zones and survey locations



3.3 Endangered Ecological Community Assessment – BC Act

Biodiversity Australia accredited assessor Karl Robertson (BAAS21022) assessed the areas of Tall Open Swamp Sclerophyll Forest as not conforming to the Swamp Sclerophyll EEC on the basis of geological and hydrological details including the edaphic descriptors and flood inundation period listed by the NSW Scientific Committee 2011 – Final Determination. This final determination provides a detailed description of the four requirements needed to define an ecological community (Preston & Adam 2004a). Namely;

- The constituents of a community must be species – The species which are indicative of the community are clearly listed within Part 1 of the Final Determination.
- The community must occur on a floodplain which are defined as level landform patterns on which there may be active erosion and aggradation by channelled or over bank flow with an average occurrence of 100 years or less as stated in Part 1 of the Final Determination.
- The species need to be brought together into an assemblage – The assemblage of the community is described within, but not limited to Part 2 of the Final Determination,
- The assemblage of species must occupy a particular area – The particular area by which the assemblage must occupy is described within Part 1 of the Final Determination. It states, "*Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions is the name given to the ecological community associated with humic clay loams and sandy loams, on waterlogged or periodically inundated alluvial flats and drainage lines associated with coastal floodplains. Floodplains are level landform patterns on which there may be active erosion and aggradation by channelled and overbank stream flow with an average recurrence interval of 100 years or less (adapted from Speight 1990). Swamp Sclerophyll Forest on Coastal Floodplains generally occurs below 20 m (though sometimes up to 50 m) elevation, often on small floodplains or where the larger floodplains adjoin lithic substrates or coastal sand plains in the NSW North Coast, Sydney Basin and South East Corner bioregions. …..The composition of Swamp Sclerophyll Forest on Coastal Floodplains is primarily determined by the frequency and duration of waterlogging and the texture, salinity nutrient and moisture content of the soil*." The soil origins of the Subject Land are depicted in Figure 7.

Previously provided commentary around the classification of Swamp Mahogany/Broad-leaved Paperbark forest vegetation as an EEC relying on the *NSW Threatened Species Scientific Committee guidelines for interpreting listing criteria for species, populations and ecological communities under the NSW Biodiversity Conservation Act 2016 (TSSC 2020):* This commentary has relied on a guideline which contradicts the descriptions provided within the Final Determinations which is legally incorrect in accordance with the **Newcastle & Hunter Valley Speleological Society Inc v Upper Hunter Shire Council and Stoneco Pty Limited [2010] NSWLEC 48.** The case found the following

'42' Resolution of these competing positions requires interpretation of the Final Determination and the application of this interpretation to the Project Site. This flows from the definition of "endangered ecological community". An "endangered ecological community" is defined in s 4 of the TSC Act as meaning an ecological community specified in Part 3 of Schedule 1 of the

TSC Act. Part 3 of Schedule 1 specifies the listed endangered ecological communities to date, including the White Box EEC, adding after each of the words "(as described in the Final Determination of the Scientific Committee to list the ecological community)". Hence, the inquiry as to whether the vegetation on the Project Site comprises the White Box EEC must be directed to the description in the Final Determination of the Scientific Committee to list the White Box EEC as an EEC.

'43' Documents not referred to in the Final Determination of the Scientific Committee to list White Box EEC, such as the White Box Yellow Box Blakely's Red Gum Woodland (Box-Gum Woodland) Identification Guidelines or the White Box – Yellow Box – Blakely's Red Gum (Box-Gum) Woodland fact-sheet, both produced by the NSW National Parks and Wildlife Service, are useful sources of information. ***However, where the documents describe the White Box EEC in different terms to the description in the Final Determination, or use of the documents results in different outcomes than the outcome that would arise from application of the description in the Final Determination, the description in the Final Determination must prevail."***

This case law is also backed by guidance released from the DPE titled – Updating BioNet Plant Community Types: Eastern NSW PCT Classifications Version 1.1 (2022) which prevails the TSSC 2020 document stated by Dimitri. The DPE guidance states the following within Appendix E.

Appendix E: Guiding principles applied to the process of identifying relationships between PCTs of eastern NSW and TECs

A Preamble

1. A Final Determination (FD) made by the NSW Threatened Species Scientific Committee constitutes the legal definition of a threatened ecological community (TEC), and is not superseded by any advice, publication or opinion (other than a revised Determination or a judgement of the courts). Applied interpretations of a TEC do not influence its definition unless confirmed through legal processes.
2. A TEC is an assemblage of species in an area. A site cannot be diagnosed as representing an example of a TEC unless it occurs within the geographic boundaries stated in the Final Determination, and some component of the species assemblage listed in the Determination is found to be present.
3. The principles outlined in this document are relevant to the interpretation of Final Determinations for the purposes of the Department of Planning and Environment (DPE) operational needs to relate Approved plant community types (PCTs) included in the PCT master list. Other interpretations may exist elsewhere that may result in independent and alternative outcomes. Additional information in the form of published TEC interpretations and mapping may be considered but does not supersede the FD or constrain the interpretations of DPE.

The above shows both case law and recent DPE guidance that demonstrates that in no situation does advice supersede the Final Determinations.

In addition to the above, the following case law also supports the position that an EEC must meet both the floristic and edaphic criteria of the Final Determinations to be defined as the EEC.

Gales Holdings Pty Limited v Tweed Shire Council [2008] NSWLEC 209 – which describes edaphic, topographical and location criteria of the EEC according to the FD and how these are essential for categorising the EEC. This case is acutely similar to the current Subject Land in that;

- The soils within the central portion of the Subject Land do not satisfy the edaphic criteria as soils are clearly from marine origins. Based on GIS data layers (Figure 7)

This case law concluded that "*For these reasons, I am not satisfied that vegetation community 6 can be properly characterised as comprising Swamp Sclerophyll Forest endangered ecological community*."

Kyluk Pty Ltd v Chief Executive, Office of Environment and Heritage [2013] NSWCCA 114 – this case further enforces the characteristics of flora, transitional soil and location are interlinked and must be present. And concludes "*I conclude that there are no "dominant" or "subordinate" characteristics in the final determination.* ***The characteristics of flora, transitional soil and location are interlinked and must be present.*** *A similar analysis was adopted in Gale Holdings Pty Limited v Tweed Shire Council [2008] NSWLEC 209, a civil case, where Preston CJ considered the final determination of the Scientific Committee to list Freshwater Wetlands. "*

The location of PCT 4004 within the Subject Land as it currently exists does not occur below the 1 in 100 year flood level as per the results of a flood study carried out on Saltwater Creek carried out by WBM Oceanics Australia for Kempsey Shire Council in 2006. The results of this flood study are shown in Figure 8 and depict the subject land lies well outside the 1 in 100 flood level. On this information, plus other edaphic factors, the vegetation mapped as PCT 4004 that cannot be considered as EEC as listed under the *NSW BC Act 2016*.

3.4 Vegetation Integrity Assessment

3.4.1 Vegetation Zones and Integrity Scores

Table 5 presented the vegetation integrity scores for the PCT condition zones recorded on the Subject Land. Figure 6 shows the location of these zones.

Table 5: Vegetation zone and current integrity score

Vegetation Community	Vegetation Zone	Condition Class	No. of plots	Patch Size Category	Area Impacted	Vegetation Integrity (VI) Score			
						Composition	Structure	Function	Total
No 3573 – Northern Scribbly Gum – Bloodwood Forest	1	Degraded	2	>100 ha	5.6 ha	17.6	36.5	15.0	21.3
No 3573 – Northern Scribbly Gum – Bloodwood Forest	2	Moderate	4	>100 ha	9.1 ha	57.9	70.2	53.7	60.2
No 3573 – Northern Scribbly Gum – Bloodwood Forest	3	Remnant	1	>100 ha	0.25 ha	59.6	48.8	50.6	52.8
No 4004 – Northern *Melaleuca quinquenervia* Swamp Forest	4	Highly Degraded	2	>100 ha	4.14 ha	35.3	56.2	15.0	31.0
No 4004 – Northern *Melaleuca quinquenervia* Swamp Forest	5	Degraded	2	>100 ha	4.33 ha	51.1	58.8	24.4	41.9

Figure 7: Quaternary geology

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

Project Manager: KR	Figure Name: Vegetation Communities & Zones
Drawn By: LW	
Date: Feb 2024	Site: 157 Arakoon Road, SW Rocks
Map Projection: MGA Zone 56	Client: King & Campbell
Datum: GDA2020	

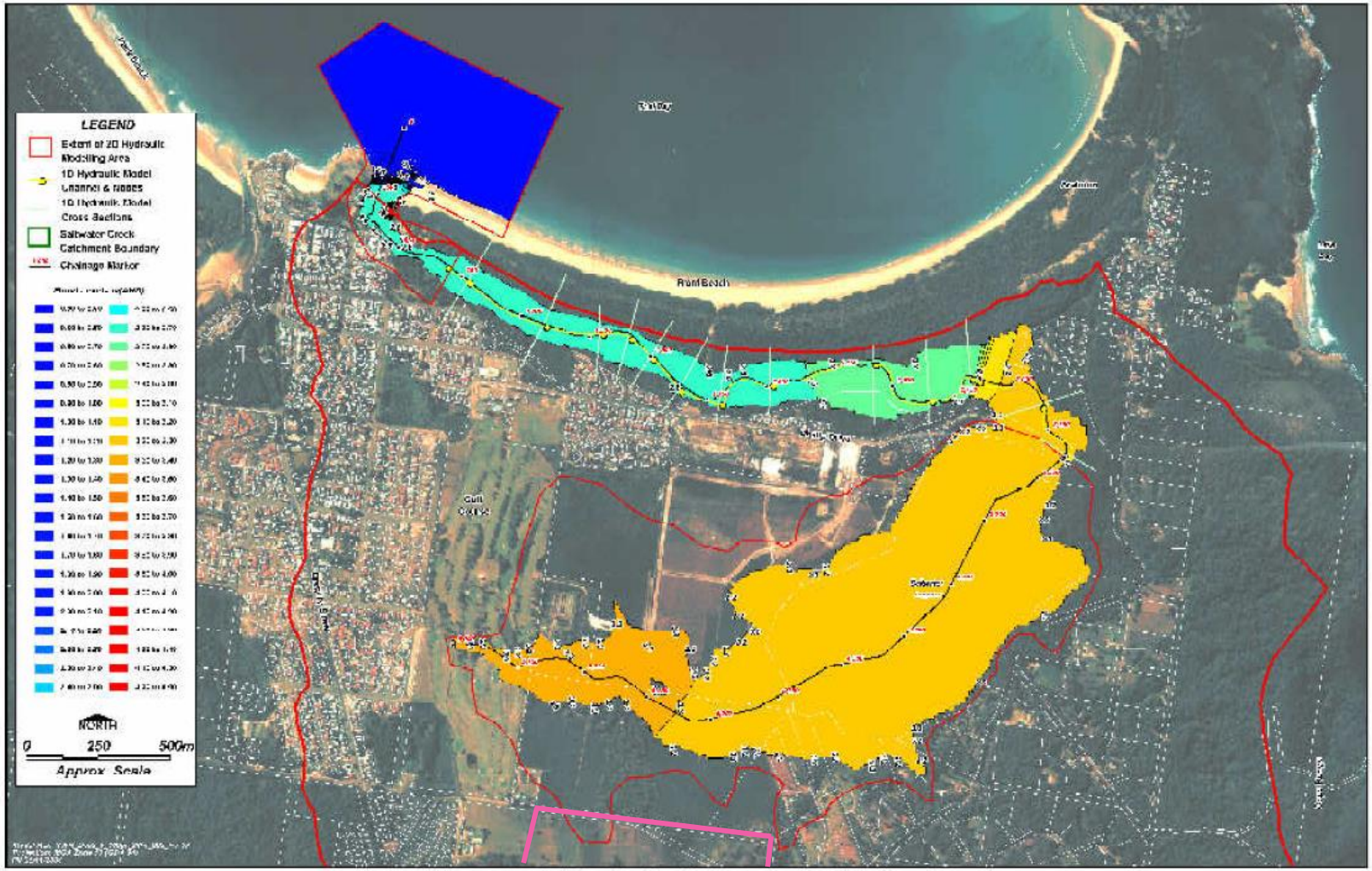
0 250 500 m

Biodiversity AUSTRALIA

QGIS

Job Number: ENS4974	Scale: 1:3000
Page: 1 of 1	Veriation A

Figure 8: 1 in 100 Year Flood Level (Yellow Polygon) and Subject Land (Pink Line)



4. Threatened Species

4.1 Targeted Survey Methods

Targeted surveys were undertaken for the threatened flora and fauna with the potential to occur on the Subject Land. These were undertaken by a BAM Accredited Assessor and Senior Botanist during May & August 2022 and January 2023. The surveys were conducted by suitably qualified botanists and ecologists under Biodiversity Australia's scientific licence and animal research authority.

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

4.1.1 Threatened Flora Survey

Threatened flora searches were undertaken by Senior Botanist and Ecologist during May 2022 and January 2023. Observations were made during systematic searches whilst conducting plots and opportunity whilst traversing the Subject Land.

The survey methodology consisted of field traverses as per the Surveying Threatened Plants and Their Habitats, NSW Survey guide for the Biodiversity Assessment Method 2020 (DPE 2020). This survey technique typical involves searches along a grid of parallel traverses within the Development Site. The traverses are a set distance apart depending on the life form and type of vegetation and cover the entire extent of potential habitat for each target plant species. Traverses were conducted along all vegetated and cleared areas and were predominantly parallel. This ensured that the full extent of the Subject Land was surveyed.

4.1.2 Fauna Survey

In consideration of the survey requirements of the candidate threatened fauna species as listed within the Bionet Atlas, and other potentially occurring fauna species (DEC 2004, DECC 2007), the following survey methods were utilised:

- Habitat evaluation;
- Secondary Evidence & Herpetological Searches;
- Aural-Visual Survey (Amphibians);
- Diurnal bird surveys;
- Nocturnal Stage Watch;
- Spotlighting and torch searches;
- Call playback and detection;
- PIR Cameras

The first round of fauna surveys were undertaken between 26th-30th of August 2022, and the second occurred during 16-20th of January 2023. PIR cameras were left *in situ* from 16th January to 17th February 2023.

4.1.2.1 Habitat Evaluation

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

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

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

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

4.1.2.2 Secondary Evidence and Active Herpetological Searches

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

Nocturnal active searches employed a similar method to the above and were undertaken as per the *Threatened reptiles biodiversity assessment method survey guide* (DPE 2024j) in conjunction with spotlighting over four (4) nights for two (2) hours between 29th August – 1st September 2022. These searches focused on detection of the Pale-headed Snake.

4.1.2.3 Amphibian Survey

Active amphibian survey was undertaken across the Subject Land as per the *NSW survey guide for threatened frogs* (DPE 2024g). This involved two ecologists conducting survey transects which covered 100% of the amphibian habitats across the Subject Land. Observers undertook the surveys in late dusk to nocturnal hours and recorded all calls as well as carrying spotlights and undertaking targeted call playback for all targeted threatened amphibian species. A total of eight hours over four (4) nights was undertaken during targeted survey in 30th May 2022, 29th August – 1st September 2022 and 17th – 20th January 2023 a total of eight hours over four (4) nights was undertaken.

Rainfall data for the locality has been taken from Smokey Cape Lighthouse (59030). However data from Smokey Cape Lighthouse is not available for much of July, all of August and much of September as such data for these survey times has been taken from Bellwood (Nambucca Heads, 59150). Rainfall during may totalled 205 mm (59030) with the majority falling prior to survey. Rainfall preceding the August survey period totalled 293 mm in July (59150) and 40 mm in August (59150). A total of 80 mm fell preceding January 2023 survey period (59030). Though heavy rain did not fall directly preceding survey periods 2022, rainfall exceeded median rainfall for the locality for 6 out of 12 months i.e. wetter than average year. Observations taken on the Subject Land during survey periods suggests that large portions of low-lying areas were inundated to some degree providing potential habitat for the species. The conditions on the Subject Land are thought to meet the necessary survey requirements for the Wallum Froglet as vegetation in low-lying areas was partially inundated via overland flows via heavy rainfall over a greater time scale.

Habitat on the Subject Land is deemed to be of low suitability for the species, surveys were undertaken under the precautionary principle. A study conducted by Connell & Wagner (2004) on the adjoining lot to the north shows the calling extent of the wallum froglet largely restricted to disturbed coastal heath habitat (PCT 3915) and likely influenced by Saltwater Lagoon to the east as shown in mapped calling extent in Appendix 3. Potential habitat on the Subject Land in question is located >1km upstream of Saltwater Lagoon limiting its influence on the available 'acidic' habitat which is preferred by the species.

4.1.2.4 Diurnal Bird Survey

This involved passive surveys (e.g. listening for bird calls) and active observation/binocular searches while walking around the entire Subject Land; and opportunistically during other activities. Bird surveys were undertaken primarily within two hours of dawn or dusk to coincide with periods of peak activity. Surveys were undertaken during 30th May 2022, 29th August – 1st September 2022 and

Targeted searches for large stick nests were also conducted.

4.1.2.5 Spotlighting and Torch Searches

Spotlighting was conducted by two ecologists for two hours per night over four nights during 29th August – 1st September 2022 and 17th – 20th of January 2023. Spotlighting involved walking transects through forested areas, and through areas of suitable habitat for amphibians, reptiles and mammals. A hand held 1100 lumen LED spotlight was used and the ecologist targeted the trunks and branches of canopy trees and understorey, and wet areas with still or flowing water, whilst also periodically scanning the ground.

4.1.2.6 Nocturnal Stage Watch

Passive observation of hollows throughout the Development Footprint was undertaken for a total of eight person hours over four nights in 29th August – 1st September 2022 to observe breeding forest owls, and for 16 person hours over four nights in 17th -20th January 2023 to observe nocturnal fauna emerging. This survey targeted the large hollows within the Development Footprint that have potential to harbour large forest owls however smaller hollows were also observed for the presence of arboreal mammals including Squirrel Gliders.

4.1.2.7 Koala Spot Assessment Technique (SAT) surveys

Four dedicated Koala surveys using the Spot Assessment Technique (SAT) were conducted within the Development Site as shown in Figure 10. SAT surveys were undertaken between 29th August – 1st September 2022.

Each SAT surveys consisted of identifying a centre tree which is known to be frequented by the Koala, known to contain faecal pellets of the Koala or is likely to be considered as a potentially important tree for the Koala. In the event that a tree of this criteria was not located, a centre tree was randomly selected in an area of habitat most likely to support this species.

Once a centre tree was selected, active searches for Koala scats were undertaken under this tree and under the twenty-nine nearest trees. Searches involved checking the ground and leaf litter within a one metre radius of each tree, for a period of two minutes per tree or until a scat was found. This technique is recognised as a very efficient method of detecting Koala presence, and in some instances, is a method used to identify areas of major Koala activity/significance e.g. Core Koala Habitat (Phillips and Callahan 1995; Jurskis and Potter 1997)

4.1.3 Survey Timing and Limitations

4.1.3.1 Flora

Threatened flora searches were undertaken in the appropriate survey period for all species maximising chances of detection.

4.1.3.2 Fauna

Fauna detectability is limited by seasonal, behavioural or lifecycle characteristics of each species, and even by habitat variations (e.g. flowering periods), which can occur within a year, between years, decades, etc. (DEC 2004). The fauna survey period fell in summer which is a period of high activity for arboreal mammals, Microchiropteran bats, frogs and birds (DEC 2004). All target fauna species have been surveyed for in the appropriate survey period maximising chances of detection.

4.2 Targeted Survey Results

4.2.1 Flora

Threatened flora surveys failed to detect the presence of any threatened flora species within the Subject Land. Targeted survey for all species has not yet been undertaken however this process will occur as per the requirements of the BAM when necessary.

4.2.2 Fauna

4.2.2.1 Fauna Survey

Targeted fauna survey carried on the Subject Land recorded the Brush-tailed Phascogale (*Phascogale tapoatafa*) was present and utilising the Subject Land. The species was recorded using baited Passive Infra-red Cameras.

Targeted survey failed to detect all other targeted species credit species.

4.2.2.2 Habitat Features

The Subject Land was found to be in a modified state and included disturbances such as frequent slashing and cleared areas. A range of habitat features were recorded which are described in Table 6.

Table 6: Summary of site habitat values

Habitat/ Attribute Type	Vegetation Zone 1	Vegetation Zone 2	Vegetation Zone 3	Vegetation Zone 4	Vegetation Zone 5
	3573 Highly Degraded	3573 Moderate	3573 Remnant	4004 Degraded	4004 Highly Degraded
Groundcover	open to dense groundcover layer depending on use.	Moderate to light depending on canopy cover.	Ground cover sparse to moderate depending on canopy and shrub cover.	Typically dense cover of grass and sedges and scattered forbs.	Typically dense cover of grass and sedges and scattered forbs.
Leaf litter	Leaf litter light to absent	Minimal leaf litter over the majority of zone due to limited canopy cover	Moderate to dense.	Litter cover was sparse across the vegetation zone	Litter cover was sparse across the vegetation zone
Logs and debris	Absent.	Absent	Light to moderate cover of coarse woody debris	Absent	Absent
Hollows	Absent.	Hollows abundant in southwest and northeast corners of Subject Land	Present, largely small hollows providing habitat for small arboreal mammals and microbats.	Small hollows present in Paperbarks providing habitat for small arboreal mammals and microbats.	Absent.
Nectar Sources	Absent.	Abundant *Eucalyptus signata* and *Eucalyptus planchoniana.* Scattered *Corymbia spp.* Also present.	Abundant flowering canopy and shrub species present.	Scattered Paperbarks	Scattered Paperbarks
Sap and gum sources	Absent	Abundant *Eucalyptus* and scattered *Corymbia* spp. present	Eucalypt and *Corymbia* species present	Absent.	Absent.
Primary preferred Koala browse trees	Absent.	Many eucalypt species present however no Primary or Secondary food tree species as defined by Kempsey CKPoM are present.	Many eucalypt species present however no Primary or Secondary food tree species as defined by Kempsey CKPoM are present.	Absent.	Absent.
Allocasuarinas	Absent.	Absent	Absent	Absent.	Absent.
Aquatic/ wetland habitats	Absent. Vegetation zone present on elevated portions of the Subject Land	Absent. Vegetation zone present on elevated portions of the Subject Land	Absent. Vegetation zone present on elevated portions of the Subject Land	During wet periods Vegetation Zone would hold water providing habitat for amphibians.	During wet periods Vegetation Zone would hold water providing habitat for amphibians.
Fruiting species	Absent	Absent	Limited a small number of *Glochidion* sp.	Absent	Absent

Habitat/ Attribute Type	Vegetation Zone 1	Vegetation Zone 2	Vegetation Zone 3	Vegetation Zone 4	Vegetation Zone 5
	3573 Highly Degraded	3573 Moderate	3573 Remnant	4004 Degraded	4004 Highly Degraded
Forest bird habitat	Absent	Limited to mature canopy trees within the vegetation zone. The understory, shrub and ground layer provide little habitat.	Good habitat diversity for forest birds present within the vegetation zone.	Limited forest bird habitat.	Absent.
Caves, cliffs, overhangs, culverts, bridges	Absent. Absence of roosts for obligate Microchiropteran bats.	Absent. Absence of roosts for obligate Microchiropteran bats.	Absent. Absence of roosts for obligate Microchiropteran bats.	Absent. Absence of roosts for obligate Microchiropteran bats.	Absent. Absence of roosts for obligate Microchiropteran bats.
Small terrestrial prey	Dense ground cover from sedges and grasses cover parts of the vegetation zone and provide some cover for small terrestrial prey species.	Minimal habitat provided by leaf and bark litter.	Good cover provided for small terrestrial prey species. Abundance may be impacted by patch size.	Habitat for small terrestrial fauna limited to dense sedge and grasses cover.	Habitat for small terrestrial fauna limited to dense sedge and grasses cover.
Habitat Linkages	Vegetation zone provides little habitat connectivity value to the local area.	Vegetation provides limited link east to west across the Subject Land to vegetation in adjacent properties.	Though the habitat is of high condition within this vegetation zone the patch size is small and there for provides limited connectivity value to fauna moving through the Subject Land.	Vegetation Zone provides minimal value to local connectivity.	Vegetation Zone provides minimal value to local connectivity.

4.2.2.3 Hollow Bearing Trees

It is acknowledged that a considerable number of hollow bearing trees (HBT) are recorded on the Subject Land. The ecological significance of these hollows has been assessed in the context of HEV land, specifically, their potential to be *Key Threatened Species Habitat* as defined in the *Northern Councils E zone Review – Final Recommendations* and the *North Coast regional Plan 2041*. The *E zone review* describes Key Threatened Species Habitat with the following criteria:

- Old growth forests where the overstory canopy trees are in the late mature stage of growth;
- Area of predicted high conservation value for forest fauna assemblages, refugia, endemic forest fauna or endemic invertebrates; and
- Habitats for threatened species or endangered populations that cannot withstand further loss where the threatened species or endangered population is present.

Assessment of the Subject Land recorded a large number of HBT trees with varying hollow sizes. The vegetation present on the Subject Land is not considered old-growth forest as it does not meet the definition for old growth forest, *'Old-growth forest is ecologically mature forest where the effects of disturbance are now negligible'* as provided in the Private Native Forestry Code of Practice Guideline No.2 - *Protocol for re-evaluating old-growth forest on private property*. Vegetation on the Subject Land has a highly disturbed understory and entirely lacks a shrub layer and understory vegetation. Targeted survey has also been applied across the Subject Land in line with the requirements of the *Biodiversity Assessment Method 2020.* Results of these surveys excluded all potentially occurring threatened species with the exception of the brush-tailed phascogale (*Phascogale tapoatafa*). Whilst the Subject Land has potential to provide denning habitat for the species, the appropriateness of the site for this purpose is far less than other very high integrity vegetation which adjoins within Hat Head National Park. It is highly likely that survey techniques (baited PIR cameras) have drawn the species from high quality habitat south of the Subject Land within Hat Head National Park and is unlikely the Subject Land itself provides high ecological value to the species. High Environmental Value Land for the species would be defined as "*habitats for threatened species or endangered populations that cannot withstand further loss where the threatened species or endangered population is present"* which could not be said for the Subject Land.

Contrary to the site providing value for the species, it is considered far more likely that the Subject Land likely form an 'ecological sink' through attracting the species to a highly exposed environment where it is exposed to predation from Natural predators and feral cats etc from adjoining residential land uses. Furthermore, If the vegetation on the Subject Land were to be removed it would be highly unlikely that it would impact on the local population of brush-tail phascogale to a significant extent given the very large expanses of high quality habitat in Hat Head National Park.

Considering the information above it would be inappropriate to consider this habitat HEV land on the basis of the presence of HBTs alone.

Hollow Bearing Trees recorded in on the Subject Land are described in Table 7 and their location shown in Figure 9.

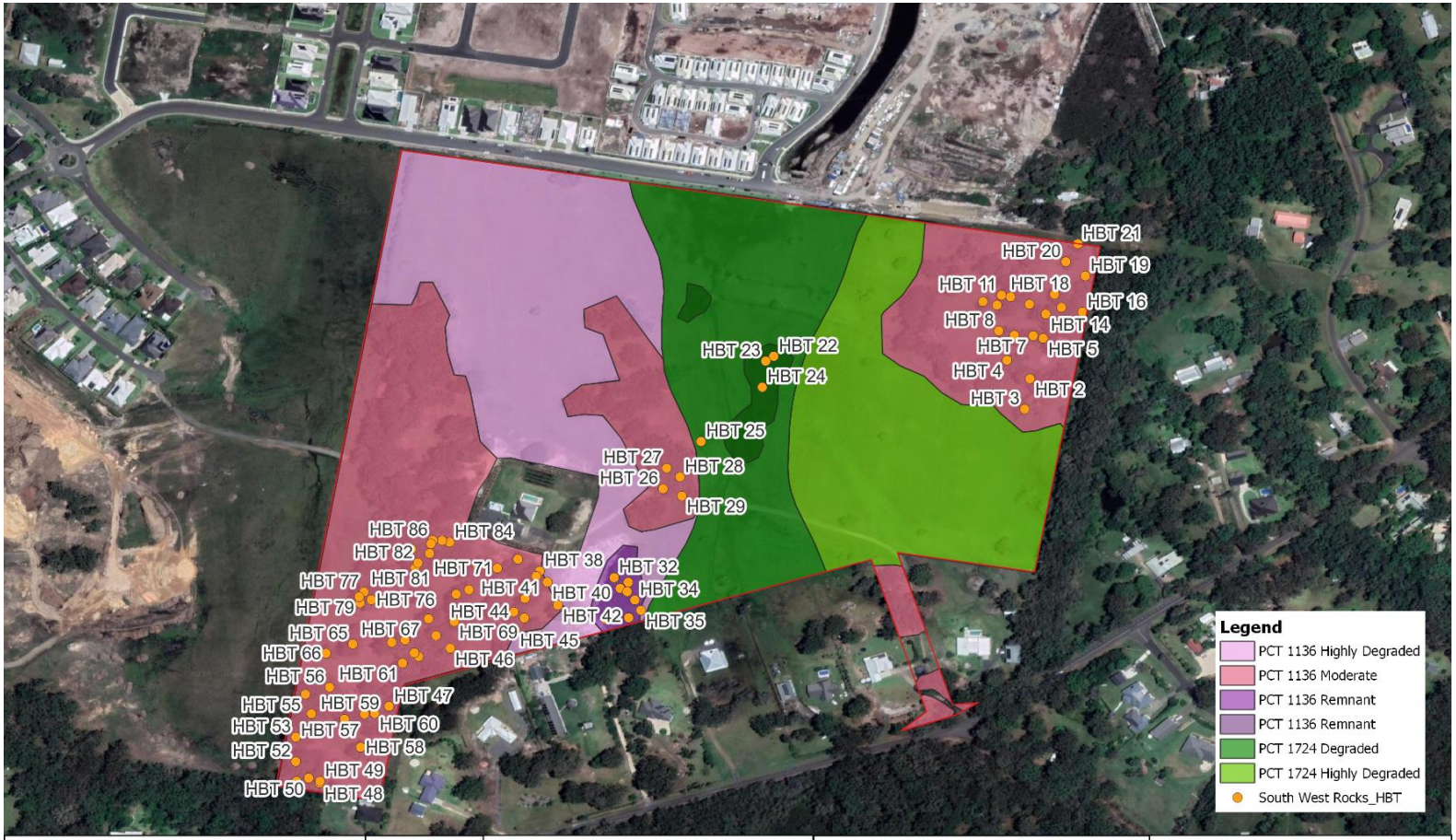
Table 7: Hollow Bearing Tree Details

Name	Tag Number	Species	Height	DBH	Small Hollow	Medium Hollow	Large Hollow
HBT 10	1062	*Eucalyptus signata*	15	60	1		
HBT 11	1061	*Eucalyptus signata*	18	65	1		
HBT 12	1059	*Eucalyptus signata*	18	80	1		
HBT 13	1050	*Eucalyptus signata*	19	90	2	3	1
HBT 14	1051	*Eucalyptus signata*	13	55	2	1	3
HBT 15	1053	*Eucalyptus signata*	120	18	3	1	1
HBT 16	1048	*Corymbia intermedia*	20	40	1		
HBT 17	1047	*Eucalyptus signata*	24	85	2		
HBT 18	1046	*Eucalyptus signata*	16	70			
HBT 19	1045	*Eucalyptus signata*	13	65	3	2	2
HBT 2	1090	*Eucalyptus signata*	15	60	3		1
HBT 20	1044	*Eucalyptus signata*	15	70		3	1
HBT 21	1043	*Eucalyptus signata*	14	80	3	2	
HBT 22	985	*Melaleuca quinquenervia*	13	43	1		
HBT 23	983	*Melaleuca quinquenervia*	12	28	1		
HBT 24	992	*Melaleuca quinquenervia*	11	50		1	
HBT 25	1000	*Eucalyptus planchoniana*	17	45	1		
HBT 26	445	*Eucalyptus planchoniana*	16	65	1		
HBT 27	436	*Eucalyptus planchoniana*	25	70	1		
HBT 28	440	*Eucalyptus planchoniana*	22	50	2		
HBT 29	446	*Eucalyptus planchoniana*	23	60	4		
HBT 3	1093	*Eucalyptus signata*	22	80	1		
HBT 30	475	*Eucalyptus planchoniana*	12	50	2		
HBT 31	476	*Stag*	16	40, 45, 50	4		
HBT 32	473	*Eucalyptus planchoniana*	22	110	3		
HBT 33	479	*Stag*	18	45	1		
HBT 34	489	*Corymbia intermedia*	18	40	1		
HBT 35	493	*Eucalyptus planchoniana*	16	40	3		
HBT 36	498	*Corymbia intermedia*	21	45	1		
HBT 37	495	*Eucalyptus planchoniana*	23	70	5		
HBT 38	811	*Eucalyptus planchoniana*	21	80	4		
HBT 39	810	*Eucalyptus planchoniana*	21	100	1	2	
HBT 4	1088	*Eucalyptus signata*	21	90	3		1

Name	Tag Number	Species	Height	DBH	Small Hollow	Medium Hollow	Large Hollow
HBT 40	809	*Eucalyptus planchoniana*	21	75	1		
HBT 41	808	*Eucalyptus planchoniana*	22	90	2		
HBT 42	801	*Eucalyptus signata*	20	80	3		
HBT 43	0	*Stag*	7	60		1	1
HBT 44	807	*Eucalyptus signata*	22	80	2		
HBT 45	803	*Eucalyptus signata*	20	60	1		
HBT 46	834	*Eucalyptus signata*	18	70	2		
HBT 47	917	*Eucalyptus signata*	17	45	1		
HBT 48	976	*Eucalyptus signata*	17	50	1		
HBT 49	975	*Eucalyptus signata*	18	70	1	1	
HBT 5	1055	*Eucalyptus signata*	22	75	2		
HBT 50	973	*Eucalyptus signata*	18	50	1		
HBT 51	971	*Eucalyptus signata*	17	40, 45	1		
HBT 52	965	*Eucalyptus signata*	21	65	4	1	
HBT 53	955	*Eucalyptus signata*	20	70	1		
HBT 54	952	*Eucalyptus signata*	16	50	1		
HBT 55	946	*Eucalyptus signata*	18	70	1	1	
HBT 56	942	*Eucalyptus signata*	26	110	1		
HBT 57	936	*Eucalyptus signata*	21	75	1		
HBT 58	930	*Eucalyptus pilularis*	26	90	4		
HBT 59	931	*Eucalyptus signata*	19	60	1		
HBT 6	1056	*Eucalyptus signata*	16	78	2		1
HBT 60	925	*Eucalyptus signata*	21	100	1		
HBT 61	839	*Eucalyptus signata*	21	125	1		
HBT 62	840	*Eucalyptus signata*	22	70	1		
HBT 63	841	*Eucalyptus signata*	21	70	1		
HBT 64	845	*Eucalyptus signata*	22	100		1	
HBT 65	847	*Eucalyptus signata*	31	90	1		
HBT 66	849	*Eucalyptus signata*	22	65	2		
HBT 67	842	*Eucalyptus signata*	21	100	2		
HBT 68	833	*Eucalyptus signata*	19	80	1	1	
HBT 69	831	*Eucalyptus signata*	14	60	4		
HBT 7	1057	*Eucalyptus signata*	20	120	2	1	1
HBT 70	865	*Eucalyptus signata*		100		1	1
HBT 71	818	*Eucalyptus signata*	17	70	1		
HBT 72	812	*Eucalyptus signata*	15	60	1		
HBT 73	821	*Eucalyptus signata*	19	60	1		
HBT 74	825	*Eucalyptus signata*	18	65	4		
HBT 75	827	*Eucalyptus signata*	20	85	1		
HBT 76	857	*Eucalyptus signata*	31	90	1		

Name	Tag Number	Species	Height	DBH	Small Hollow	Medium Hollow	Large Hollow
HBT 77	855	*Eucalyptus signata*	17	95	3	1	
HBT 78	851	*Eucalyptus signata*	22	80	2		
HBT 79	852	*Eucalyptus signata*	18	60	3		
HBT 8	1058	*Eucalyptus signata*	23	70	5		3
HBT 80	862	*Eucalyptus signata*	18	70	1		
HBT 81	982	*Eucalyptus signata*	22	100	2		
HBT 82	981	*Stag*	25	90	2		
HBT 83	880	*Eucalyptus signata*	27	115	2		
HBT 84	872	*Eucalyptus signata*	23	75	1		
HBT 85	874	*Eucalyptus signata*	30	70	1		
HBT 86	875	*Eucalyptus signata*	22	70	1		
HBT 87	873	*Eucalyptus signata*	20	80	1		
HBT 88	885	*Eucalyptus signata*	23	40	1		
HBT 9	1063	*Eucalyptus signata*	21	80	5	3	

Figure 9: Hollow Bearing Tree Locations



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

Project Manager: KR	Figure Name: Hollow Bearing Tree Locations
Drawn By: LW	
Date: Feb 2024	Site: 157 Arakoon Road, SW Rocks
Map Projection: MGA Zone 56	Client: King & Campbell
Datum: GDA2020	

0 100 200 m

Biodiversity AUSTRALIA

QGIS

Job Number: ENS4974	Scale: 1:3000
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4.2.2.4 Observed/Detected Fauna

During the survey period of June and August 2022 and January 2023 a range of fauna species were detected over the Subject Land. Birds were the most common taxa detected with nine (9) while four (4) mammal and three (3) amphibian and two (2) reptiles were also detected. One (1) threatened species was detected during January 2023 targeted survey, the Brush-tailed Phascogale (*Phascogale tapoatafa*).

4.3 Kempsey KPoM

The Subject Land and Rezoning Footprint fall within the jurisdiction of the KSC CKPoM (KSC 2011), and hence a compliance assessment is required.

4.3.1 Site Classification and Required Assessments

As shown in Figure 10, the majority of the Subject Land is mapped as Secondary (Class A), Secondary (Class B) and Unknown Preferred Koala Habitat (PKH) under the Kempsey Shire Council Comprehensive Koala Plan of Management (KSC CKPoM) (Figure 10).

The following assessments are required and undertaken for the site:

- Unknown: Section 4.5 requires vegetation community mapping to determine if the Unknown habitat is Potential Koala Habitat, or Other vegetation.
- Preferred Koala Habitat: Section 4.6 requires that a Koala Habitat assessment must be undertaken using a regularised SAT grid, and all preferred Koala Food Trees (KFTs) potentially affected by the proposal located and mapped.

4.3.2 Field Survey

A site inspection and field survey was undertaken over the site by two Biodiversity Australia ecologists during 29th August – 1st September 2022. This involved vegetation assessment, four (4) dedicated scat searches for the Koala as per the Spot Assessment Technique (SAT) and marking of Koala food trees listed under the KSC CKPoM. No primary Koala food trees were recorded on the Subject Land.

The location of the primary SAT surveys is provided in Figure 10.

4.3.3 Unknown Vegetation Assessment

Verification of vegetation in the portion of the Rezoning Footprint mapped as Unknown was undertaken during the survey. This identified the area mapped as Unknown as containing primarily PCT 3573 in north west which has no value for the Koala due to the absence of canopy vegetation and maintained condition, similarly vegetation in the central portion of the Subject Land was verified to be a highly degraded example of PCT 4004. This too does not constitute suitable habitat for the species. Areas mapped as Secondary (A) in the far east are aligned with the PCT 3573 and was largely dominated by Scribbly Gum (*Eucalyptus signata*) or Needlebark Stringybark (*Eucalyptus planchoniana*) which are not considered a primary or secondary koala food tree under the CKPoM. Vegetation mapped as Secondary (B) in the central and west of the Subject Land is verified as degraded PCT 4004 and degraded PCT 3573

and a small area of remnant PCT 3573. PCT 4004 largely lacks canopy vegetation, PCT 3573 supports a variety of Eucalypt and Corymbia spp. of which none are considered primary Koala food trees under the KSC CKPoM.

Given the above classification, no further survey in this area is required.

4.3.4 Koala Habitat Assessment

As large portions of the Subject Land is devoid of canopy vegetation, a regularised grid-based SAT assessment was not undertaken due to lack of trees to satisfy the statistical assumptions of the method.

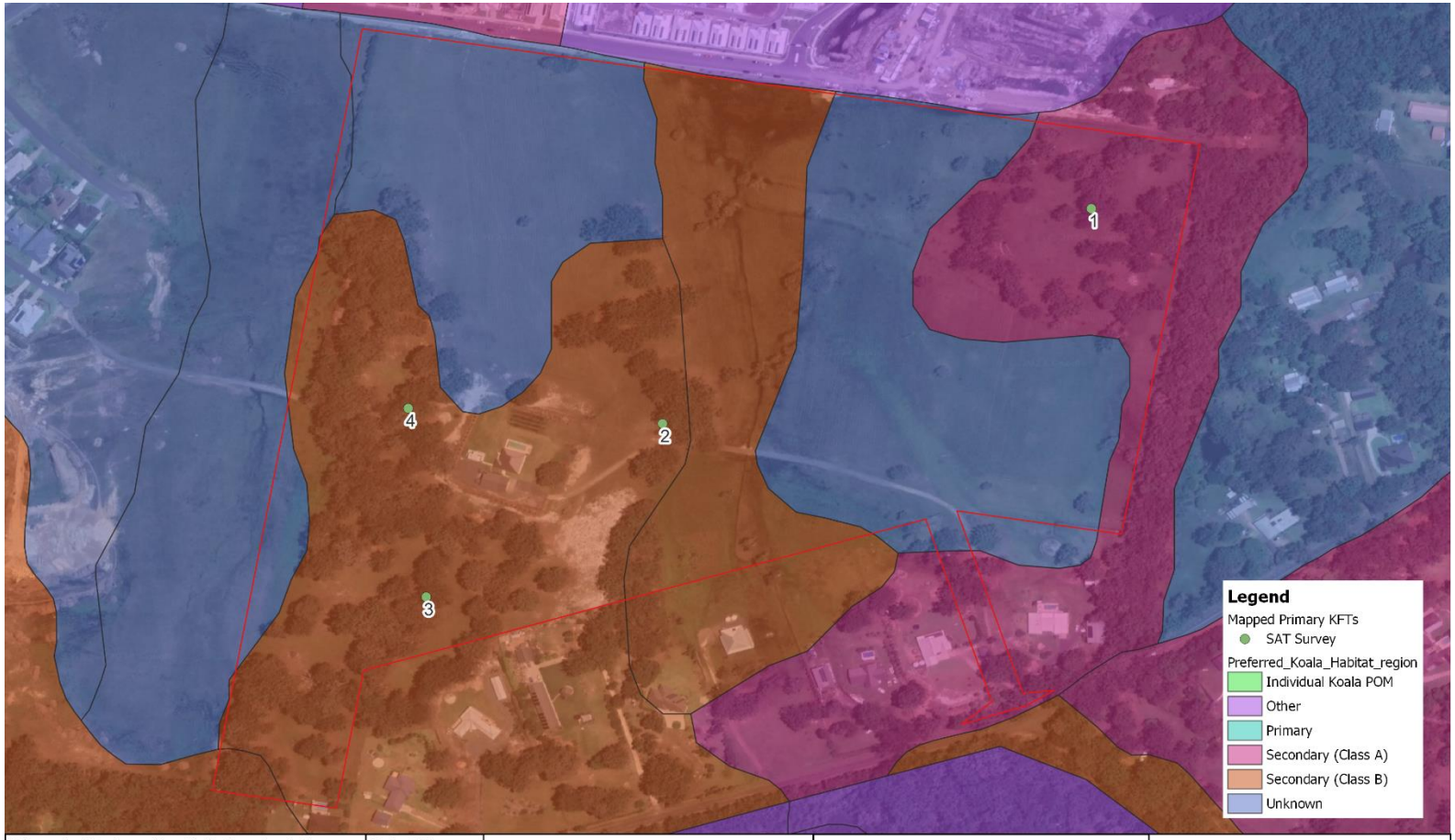
Four SAT surveys were undertaken on the property as shown in Figure 10. The second of which was located within a cluster of Tallowwood in the central portion of the property. The second was located in the south of the property. SAT survey locations were distributed around the Subject Land to best capture the canopy vegetation and give the best chance of detecting the species. Despite this, no evidence of Koala activity was found during the searches, thus the SATs recorded zero activity. Hence the entire Subject Land should be mapped as 'other as no primary or secondary koala food trees have been recorded.

South West Rocks is known to harbour a small Koala population and records of Koalas do occur nearby. While the survey did not record any Koalas, there is still a possibility that Koalas would use habitat on the Subject Land primarily in the southwest and central areas due to its connectivity value to remnant vegetation to the southwest.

However, much of the land in the northwest and southeastern portions of the Subject Land provide no Koala Habitat or connectivity value and are subject to current residential developments. These developments provide no habitat for the species and do not hold in-perpetuity agreements for Koalas. In addition, despite targeted surveys, the Koala has not been recorded. Due consideration should be given to the appropriateness of the area as a resource for the Koala and the KTPs which a Koala would be subjected to if they frequented the area. This ecologist would recommend that if the area were to be removed, it would have no material impact on the local Koala population (given that there are no records of Koalas using the area) and the statutory offsetting as per the CKPoM would provide a net benefit to the species both in resource and strategic connectivity. A search of NSW BioNet records suggest that the species has not been recorded north of Arakoon Road. Two records exist directly south of the Subject Land and were recorded in 2020 and 2021 (Figure 11)

This assessment has concluded that mapping of koala habitat under the KSC CKPoM is not accurate and the vegetation on the Subject Land does not conform to the CKPoM's definition of Secondary 'A' or Secondary 'B' habitat and conforms to the definition of 'Other' Koala Habitat. As surveys determined that koalas were absent from the Subject Land and there were no PKFTs the KSC CKPoM assessment pathway states that land mapped as 'Other' within the Subject Land does not require further assessment. Land mapped as Secondary 'A' and Secondary 'B' remains and the rezoning must meet performance criteria listed in Section 4.10 of the KSC CKPoM.

Figure 10: KSC CKPoM Preferred Koala Habitat Mapping



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

Project Manager: KR	Figure Name: Preferred KOala Habitat & SAT Locations
Drawn By: LW	Site: 157 Arakoon Road, SW Rocks
Date: Feb 2024	Client: King & Campbell
Map Projection: MGA Zone 56	0 75 150 m
Datum: GDA2020	QGIS
Job Number: ENS4974	Scale: 1:3000
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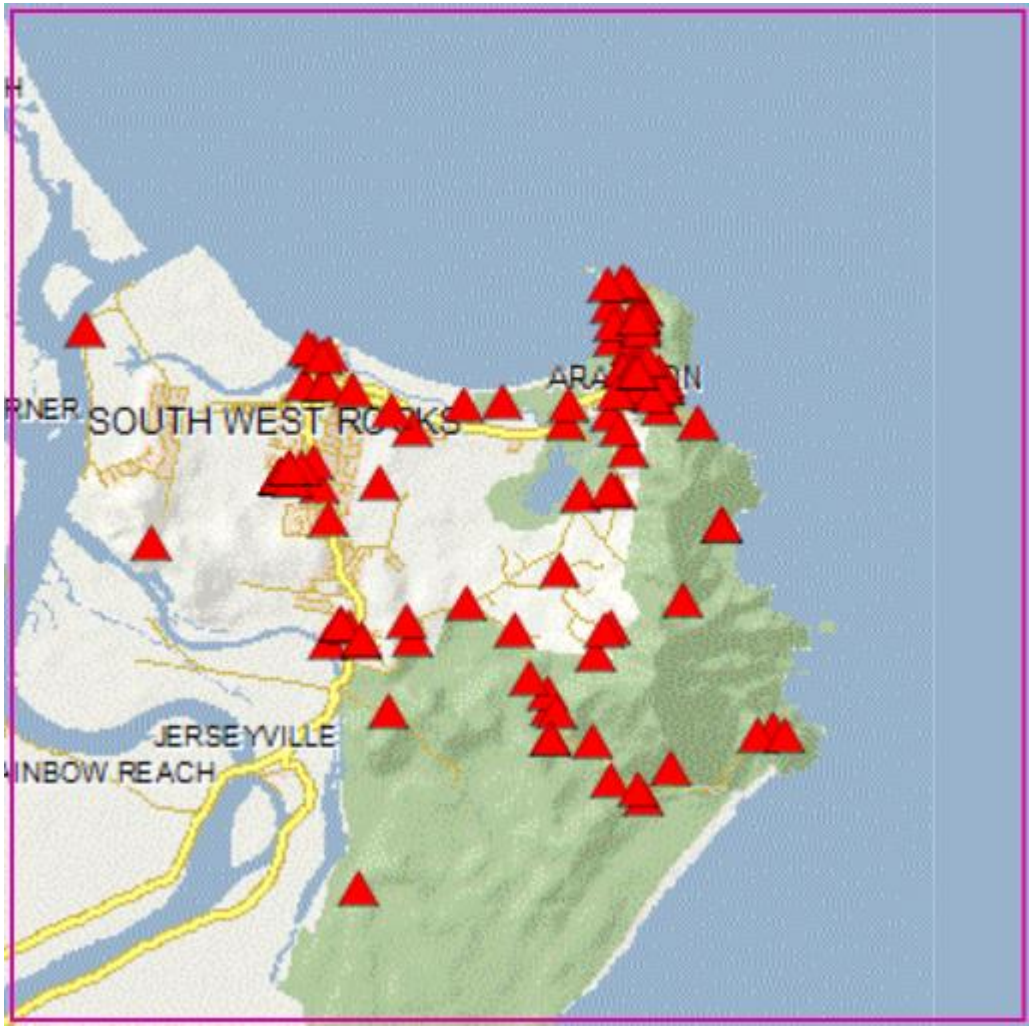
Figure 11: Bionet Koala records



4.4 Environmental Protection and Biodiversity Conservation Act 1999

A potential occurrence assessment has been undertaken to assess the potential impact of rezoning he land in question on threatened species listed under the *EPBC Act 1991* that have the potential to occur on the Subject Land. The potential occurrence assessment included those species returned from a BioNet Atlas Search.

An initial desk top assessment was undertaken, and from this a list of threatened entities recorded in the locality was produced. A summary of the search are shown below in Table 8.

Table 8: Locally recorded MNES (DCCEEW 2024)

Category	Result	Description
World Heritage Properties	None	-
National Heritage Places	None	-
Wetlands of International Importance	None	-
Great Barrier Reef Marine Park	None	-
Commonwealth Marine Area	1	One Commonwealth Marine Area occurs within the locality.
Listed Threatened Ecological Communities	6	Four listed threatened ecological communities are listed as likely to occur within the locality.
Listed Threatened Species	81	Species or species habitat is known/likely/may occur within the locality. Suitable habitats for threatened flora species *Acronychia littoralis* (Scented Acronychia) and *Phaius australis* (Southern Swamp Orchid) occur on the subject site. Three threatened fauna species listed under the EPBC Act are considered to potentially occur none of which are considered to have Key habitat within the Rezoning Footprint.
Listed Migratory Species	61	Migratory wetland, terrestrial and marine species or species habitat is known/likely/may occur within the locality. The Potential Occurrence Assessment has determined three terrestrial Migratory Species listed under the EPBC Act have potential to occur at the subject land.
Other matters protected by the EPBC Act		
Commonwealth Land	2	Commonwealth Land - Australian Telecommunications Commission. Refer to full report in Appendix
Commonwealth Heritage Places	1	Smokey Cape Lighthouse. Refer to full report in Appendix
Listed Marine Species	82	Species or species habitat is known/likely/may occur within the locality.
Whales and other Cetaceans	13	Species or species habitat is known/likely/may occur within the locality.
Critical Habitats	None	-
Commonwealth Reserves - Terrestrial	None	-
Commonwealth Reserves - Marine	None	-

4.5 Potential Occurrence Assessment

This section assesses the threatened entities listed under the BC Act and/or the EPBC Act that have been recorded or predicted to occur within the locality have been assessed for their potential to occur on the subject site given the habitats present. Threatened species listed under the EPBC Act have not been considered in the assessment as they do not form part of the criteria of HEV land under Attachment 2 of the *BCD NE Branch Steps for Assessing Biodiversity in Planning Proposals)*. Potential occurrence assessment of threatened flora and fauna species listed under the NSW BC Act 2016 is provided in Appendix 2.

This desktop assessment and literature review has determined the following threatened species to potentially occur at the Subject Land.

Table 9: Potential occurrence assessment – flora

Species Name	Common Name	BC Act Listing	EPBC Act Listing	Likelihood of Occurrence	Significance Assessment Required?
Acronychia littoralis	Scented Acronychia	Endangered	Endangered	Thirteen record within the locality none within 4.5km of the subject site. The subject site does not contain the preferred littoral rainforest mosaic habitat of the species. Unlikely to occur	No
Allocasuarina defungens	Dwarf Heath Casuarina	Endangered	Endangered	Subject Land support appropriate habitat for the species. Much of the habitat in areas of potential impact is highly degraded.	No
Caesalpinia bonduc	Knicker Nut	Endangered	-	Grows on sandy coral derived soil close to shore lin. Suitable habitat absent form Subject Land	No
Chamaesyce psammogeton	Sand Spurge	Endangered	-	Suitable dune, strandlines and headland habitat absent form the subject land.	No
Cynanchum elegans	White-flowered Wax Plant	Endangered	Endangered	The potential habitat of the species within the Subject Land is present in a degraded state. There are six records of the species within the locality however all occur approximately 4.5km to the south east around Smokey Cape Lighthouse. Unlikely to occur.	No
Peristeranthus hilli	Brown Fairy-chain Orchid	Vulnerable	-	Species restricted to littoral and lowland rainforest. Suitable	No

Species Name	Common Name	BC Act Listing	EPBC Act Listing	Likelihood of Occurrence	Significance Assessment Required?
				habitat absent from subject land	
Phaius australis	Lesser Swamp orchid	Endangered	-	Suitable habitat on the Subject land though in a degraded state. Survey concluded species absent	No
Rhodamnia rubescens	Scrub Turpentine, Brown Malletwood	Critically Endangered	Critically Endangered	No records within the locality. The subject site does not contain the preferred rainforest habitats of the species. Unlikely to occur	No
Rhodomyrtus psidioides	Native Guava	Critically Endangered	Critically Endangered	No records within the locality. The subject site does not contain the preferred rainforest habitats of the species. Unlikely to occur	No
Syzygium paniculatum	Magenta Lilly Pilly	Endangered	Vulnerable	Restricted to margins of littoral rainforest. Suitable habitat absent form Subject Land.	No

Table 10: Potential occurrence assessment – fauna

Species Name	Common Name	BC Act Listing	EPBC Act Listing	Likelihood of Occurrence	Significance Assessment Required?
Amphibia					
Mixophyes balbus	Stuttering Frog, Southern Barred Frog (in Victoria)	Endangered	Endangered	Preferred habitat for the species is Rainforest which does not occur within the Development Footprint. Unlikely.	No
Crinia tinnula	Wallum Froglet	Vulnerable	-	Suitable habitat for the species occurs on the subject land. Targeted survey did not record the species.	No
Reptilia					
Caretta caretta	Loggerhead turtle	Endangered	Endangered	Marine Species. No Suitable habitat present on the subject land	No
Chelonia mydas	Green Turtle	Vulnerable	Vulnerable	Marine Species. No Suitable habitat present on the subject land	No
Dermochelys coriacea	Leatherback Turtle	Endangered	Endangered	Marine Species. No Suitable habitat present on the subject land	No
Aves					

Anthochaera phrygia	Regent Honeyeater		Critically Endangered	The Development Footprint does not contain land mapped as important habitat for the species. Unlikely to occur.	No
Anseranas semipalmata	Magpie Goose	Vulnerable	-	Suitable foraging habitat absent from the subject land.	No
Ardenna carneipes	Flesh-footed shearwater	Vulnerable	-	Marine species	No
Botaurus poiciloptilus	Australasian Bittern		Endangered	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Calyptorhynchus lathami lathami	Glossy-black Cockatoo	Vulnerable	-	Limited foraging habitat for the species. Limited breeding habitat for the species.	No
Daphoenositta chrysoptera	Varied Sitella	Vulnerable	-	Suitable habitat available on the subject land. Higher quality habitat available south and east of subject land	No
Esacus magnirostris	Beach-stone curlew	Critically Endangered	-	Habitat degraded on the subject land.	No
Ephippiorhynchus asiaticus	Black-necked stork	Endangered	-	Suitable wetland habitat absent from the Subject Land	No
Epthianura albifrons	White-fronted Chat	Vulnerable		Suitable habita occurs on the Subject Land. No Records of species on Subject Land or adjacent properties.	No
Glossopsitta pusilla	Little Lorikeet	Vulnerable	-	Limited foraging habitat present on the subject land. Higher quality habitat in close proximity likely to be preferential foraging habitat.	No
Grus rubicunda	Brolga	Vulnerable	-	The subject land provides limited foraging habitat to the species during periods of high rainfall.	No
Haliaeetus leucogaster	White-bellied Sea-eagle	Vulnerable	-	Limited breeding habitat inside rezoning area. Suitable breeding habitat in Conservation zoned area. No stick nest observed on Subject Land	No
Ixobrychus flavicollis	Black Bittern	Vulnerable	-	Suitable habitat absent from subject land.	No
Lathamus discolor	Swift Parrot		Critically Endangered	The Subject Land contains habitat mapped as important areas for the species. The actual area of habitat is much smaller than that depicted by mapping as such a review has been submitted. Low likelihood of occurring,	No
Limosa limosa	Black tailed Godwit	Vulnerable	-	Suitable habitat for the species absent from the Subject land	

Lophoictinia isura	Square-tailed Kite	Vulnerable	-	The Subject Land contains suitable foraging habitat in Conservation zoned areas which will remain.	No
Macronectes giganteus	Southern Giant-Petrel, Southern Giant Petrel	Endangered	Endangered / Marine / Migratory	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Pandion Cristatus	Eastern Osprey	Vulnerable	-	Foraging habitat absent. Breeding habitat present in conservation zoned area.	No
Procelsterna cerulea	Grey Ternlet	Vulnerable	-	The Subject Land does not contain preferred habitat for the species. Unlikely to occur	No
Ptilinopus magnificus	Wompoo Fruit-Dove	Vulnerable	-	Suitable foraging habitat extremely limited on subject land	No
Ptilinopus regina	Rose-crowned Fruit-Dove	Vulnerable	-	Suitable foraging habitat extremely limited on subject land	No
Sternula albifrons	Little Tern	Endangered	-	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Sula Dactylatra	Masked Booby	Vulnerable		The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Thalassarche cauta	Shy Albatross		Endangered / Marine / Migratory	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Tyto longimembris	Eastern Grass Owl	Vulnerable	-	Foraging habitat limited to vegetated areas of the subject land. Limited breeding habitat present	No
Tyto novaehollandiae	Masked Owl	Vulnerable	-	Foraging habitat limited to vegetated areas of the subject land. Limited breeding habitat present	No
Tyto tenebricosa	Sooty Owl	Vulnerable	-	Foraging habitat limited to vegetated areas of the subject land. Roost habitat absent.	No
Mammals					
Cercartetus nanus	Eastern Pygmy-possum	Vulnerable	-	Limited Suitable foraging habitat for the species in PCT 3573. Very low Potential to occur on the Subject Land	no
Dasyurus maculatus maculatus (SE mainland population)	Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population)	Vulnerable	Endangered	There are two records of the species within the locality. The Subject Land contains a small number of potentially suitably hollow bearing trees however burrows, small caves or rock outcrops are absent.	No

				Much better habitat occurs external to the Subject Land. Unlikely to occur.	
Falsistrellus tasmaniensis	Eastern False Pipistrelle	Vulnerable	-	Suitable foraging habitat present on the subject land. Potential to occur	No
Micronomus norfolkensis	Eastern Coastal Free-tailed Bat	Vulnerable	-	Suitable foraging habitat present on the subject land. Potential to occur	No
Miniopterus australis	Little Bent-winged Bat	Vulnerable	-	Suitable roost habitat absent from subject land. No bionet records. Unlikely to occur.	No
Miniopterus orianae oceanensis	Large Bent-winged Bat	Vulnerable	-	Suitable roost habitat absent from subject land. No bionet records. Unlikely to occur.	No
Petaurus norfolcensis	Squirrel Glider	Vulnerable	-	Suitable foraging habitat present on the subject land. Potential to occur. Targeted survey did not detect the species	No
Phascogale tapoatafa	Brush-tailed Phascogale	Vulnerable	-	Foraging habitat present on the subject land. Species recorded via targeted survey	**Yes**
Phascolarctos cinereus	Koala	Vulnerable	Endangered	The Subject Land falls within the Kempsey Shire Council CKPoM. This CKPoM has mapped the area as Secondary A and Secondary B habitat, however mapping is inaccurate and no Primary or Secondary Koala Food Trees are present on the Subject Land. Targeted survey found no evidence of the species on he Subject Land	No
Planigale maculata	Common Planigale	Vulnerable	-	Limited habitat available on the Subject Land.	No
Potorous tridactylus tridactylus	Long-nosed Potoroo (SE Mainland)	Vulnerable	-	Limited habitat on the Subject Land Highly Unlikely to occur.	No
Pteropus poliocephalus	Grey-headed Flying-fox	Vulnerable	Vulnerable	No records of Grey-headed Flying-fox were recorded during the field survey. No evidence of roosting was recorded. The Subject Land contains eucalyptus and melaleuca species which	No

				may form a minute part of a much larger foraging range for the species. If the species were to occur within the Subject Land it would be for very finite foraging and hence the significance is negligible. Unlikely to occur	
Scoteanax rueppellii	Greater Broad-nosed Bat	Vulnerable	-	Suitable foraging habitat present across the Subject Land. Potential to occur.	**Yes**
Syconycteris australis	Common Blossom bat	Vulnerable	-	Suitable foraging habitat present across the Subject Land. Potential to occur.	**Yes**
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	Vulnerable	-	No records of the species on the subject land. Potential foraging habitat present. Low likelihood of occurring	No
Vespadelus troughtoni	Eastern Cave Bat	Vulnerable	-	Suitable roost habitat absent from subject land. No bionet records. Unlikely to occur.	No

4.6 Threatened Ecological Community Assessment

As described in the table above there is the potential for PCT 4004 to be associated with the *Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland* as listed under the *EPBC Act 1999* due to the floristic composition and landscape position being appropriate for the community. As such the Conservation Advice for the community has been consulted to determine where it is appropriate for the community to be considered part of the TEC.

Section 1 describes the community as having a layered canopy whereby melaleucas and/or *Eucalyptus robusta* are dominant. This is consistent with the community on the Subject Land.

Section 2.1 of the Conservation Advice states the following "*Areas of vegetation* ***that do not meet the key diagnostics do not support the nationally listed ecological community***".

A summary of these diagnostic features include:

- Occurs in the appropriate geographic location i.e. near coastal eastern australia from South-east Queensland to South-east NSW. *The subject land occurs in coastal NSW Mid North Coast.*
- Occurs in coastal catchments below 20m but up occasionally up to 220m ASL. *The Subject Land occurs on lands between 5-7m ASL.*
- Occurs on hydric soils with inundation patterns ranging from intermittent to episodic. *Modelling has been conducted for the Subject Land and surrounds and demonstrates that a 1 in 100 year flood even with the addition of 30% increase in rainfall would not inundate the vegetation mapped as PCT 4004 in the north west of the property*

suggesting that it is not periodically or episodically inundated. The extent of such an event is shown Appendix 4 courtesy of de Groot & Benson 2023. It is for this reason that the patch of mapped PCT 4004 is not considered part of the Coastal Swamp Sclerophyll TEC.

Further assessment of Key Diagnostics attributes of the community were not considered as the vegetation on the subject land did not meet the requirement of being periodically or intermittently inundated and there cannot be considered as the TEC.

HIGH ENVIRONMENTAL VALUE LAND ASSESSMENT

5. Assessment of High Environmental Value Land

5.1 What is High Environmental Value Land

An assessment of the suitability of the Subject Land to be considered has been undertaken using the criteria for HEV land in Attachment 2 of the *BCD NE Branch Steps for Assessing Biodiversity in Planning Proposals*. The results of this assessment are presented below in Table 11.

Table 11: Application of the High Environmental Value Criteria

High Environmental Value (HEV) Criteria and Components	PCT Scale HEV Result (4004)	PCT Scale HEV Result (3573)
1.1 Biodiversity Values Map	There is no Biodiversity Values mapped on the Subject Land (Figure 3)	There is no Biodiversity Values mapped on the Subject Land (Figure 3)
2.1 Over-cleared vegetation types	The Subject Land does not support any PCT that is considered 'over cleared (>70%)'. The percent cleared status of PCT 4004 – 32.84%	The Subject Land does not support any PCT that is considered 'over cleared (>70%)'. The percent cleared status of PCT 3573 – 12.95%
2.2 Vegetation in over-cleared landscapes	Reviewing over-cleared Mitchell Landscapes map data through the SEED portal showed that the Mitchell Landscapes, Manning - Macleay Alluvial Plains and Ingalba Coastal Hills is not mapped as over cleared. Vegetation on this Mitchell landscape does not meet the requirements to be mapped HEV as an over-cleared landscape.	Reviewing over-cleared Mitchell Landscapes map data through the SEED portal showed that the Mitchell Landscapes, Manning - Macleay Alluvial Plains and Ingalba Coastal Hills is not mapped as over cleared. Vegetation on this Mitchell landscape does not meet the requirements to be mapped HEV as an over-cleared landscape.
2.3 Threatened Ecological Communities – Any vulnerable, endangered, or critically endangered ecological community listed under the *Biodiversity Conservation Act* 2016, *Fisheries Management Act 1994, EPBC Act 1999* and not mapped as Biodiversity Values.	PCT 4004 is associated with *BC Act* listed *Swamp Sclerophyll forest on coastal floodplains of the NSW North Coast, Sydney basin and South East Corner Bioregion*. This TEC is described in the NSW final determination as occurring on floodplains on soils derived of alluvial processes and is periodically inundated on an average time scale of 1 in 100 years. The quaternary geology mapping for the locality is described as coastal barrier sands in the west and alluvial flats in the east. The Subject Land however falls outside of the mapped 1 in 100 year flood level. Though part of the land occurs on alluvial deposited soils it falls below the 1 in 100 flood level and therefore does not meet the definition of the Swamp Sclerophyll EEC in this location. Please refer to Section 4.6 for further explanation. With regards to assessing this vegetation against the Key Diagnostics (Section 2.1 of the DAWE Conservation Advice 8/12/2021) of the EPBC Act Listed – COASTAL SWAMP SCLEROPHYLL FOREST OF NEW SOUTH WALES AND SOUTH EAST QUEENSLAND. The area of PCT 4004 which falls within the Rezoning Footprint is not subject to periodic inundation as it falls well outside of the 100 year ARI Flood with 30% increase in rainfall intensity (Appendix 2), the community therefore does not meet the third key diagnostic criteria and is therefore not a TEC. This is described in depth within Section 4.6. In conclusion, the Rezoning area does not contain any areas of EEC or TEC.	The PCT is not associated with a TEC and therefore vegetation ground trothed as PCT 3753 does not conform to a TEC.

High Environmental Value (HEV) Criteria and Components		PCT Scale HEV Result (4004)	PCT Scale HEV Result (3573)
2.4 100m Buffer on Coastal Wetlands and Littoral Rainforest as per State Environmental Planning Policy (SEPP) (Resilience and Hazards) 2021		Of the lands mapped as PCT 4004 none falls within lands mapped as Proximity to Coastal Wetland or within a minimum 195 m of a mapped Coastal Wetland and as such has not been included in any HEV lands mapped.	Of the lands mapped as PCT 3573 none falls within lands mapped as Proximity to Coastal Wetland or within a minimum of 195 m of a mapped Coastal Wetland as such has not been included in any HEV lands mapped.
3.1 Key habitat for threatened species (vulnerable, endangered, or critically endangered species listed under BC Act)	Key breeding habitat with known breeding occurrence	Suitable habitat does not occur in PCT 4004 for the Brush-tailed Phascogale.	The Brush-tailed Phascogale was recorded across the Subject Land. Though the species was recorded a number of locations within the Subject Land it is likely that as surveys were carried out during the height of activity in the breeding season that bait stations used likely attracted a number of individuals from adjacent remnant bushland. It is known that the species shows preference to rough barked species. Of which the Subject Land is dominated by smooth barked, Scribbly Gum (*Eucalyptus signata*). It is acknowledged that the Subject Land does support rough barked species (i.e. Needlebark Stringybark, *Eucalyptus planchoniana*), the key breeding habitat for the species occurs south of the subject land in remnant bushland.
	Core Koala Habitat	The Kempsey KPoM suggest that vegetation mapped on the Subject Land is of Secondary A and Secondary B koala habitat. However the Koala Habitat Assessment undertaken by Biodiversity Australia did not record koalas or evidence of within the Subject Land. Primary or Secondary Koala Food Trees were also not present over much of the mapped vegetation. Much of the vegetation mapped as PCT 4004 therefore should be mapped as 'Other'.	The Kempsey KPoM suggest that vegetation mapped on the Subject Land is of Secondary A and Secondary B koala habitat. However the Koala Habitat Assessment undertaken by Biodiversity Australia did not record koalas or evidence of within the Subject Land. Primary or Secondary Koala Food Trees were also not present over much of the mapped vegetation with the exception of a stand of Tallowwood. Much of the vegetation mapped as PCT 3573 therefore should be mapped largely as 'Other' with a small portion as Primary Koala Habitat.
	Habitat for known populations of species credit species and SAII entities	No SAII entities were recorded within vegetation mapped as PCT 4004.	No SAII entities were recorded within vegetation mapped as PCT 3573
	Key habitats for migratory species	A search of Bionet records of migratory species recorded within 5 km of the subject land revealed numerous records. None of which fell within the subject land. The vast majority of the species records generated are of marine/coastal associated species of which suitable habitat is not supported on land mapped as PCT 4004.	A search of Bionet records of migratory species recorded within 5 km of the subject land revealed numerous records. None of which fell within the subject land. The vast majority of the species records generated are of marine/coastal associated species of which suitable habitat is not supported land mapped as PCT 3573. The fork-tailed swift is the exception to this, however due to the low vegetation integrity of the subject land and better quality habitat that is present on adjacent land it is not considered that the land in question is considered key habitat for the fork-tailed swift and hence has not been included in HEV mapping for the land in question

High Environmental Value (HEV) Criteria and Components	PCT Scale HEV Result (4004)	PCT Scale HEV Result (3573)
4.1 Nationally important wetlands	A review of DIWA shows that there are no recognised wetlands in vegetation mapped as PCT 4004. Therefore such wetland values have not been considered for HEV.	A review of DIWA shows that there are no recognised wetlands in vegetation mapped as PCT 3573. Therefore such wetland values have not been considered for HEV.
4.2 Vulnerable estuaries and Intermittently Opening and Closing Lakes and Lagoons (ICOLLs)	A review of mapping revealed that no vulnerable estuaries or ICOLLs are mapped on the Subject Land.	A review of mapping revealed that no vulnerable estuaries or ICOLLs are mapped on the Subject Land.
5.1 Karst landscapes	A review of relevant mapping and Guide to New South Wales Karst and caves suggest no such habitat is present in the locality of the Subject Land.	A review of relevant mapping and Guide to New South Wales Karst and caves suggest no such habitat is present in the locality of the Subject Land.
5.2 Sites of geological significance included in the State Heritage register or Heritage Register	A review of sites of geological significance listed in Annexure A are not within the vicinity of the land in question and will not contribute to HEV of the site.	A review of sites of geological significance listed in Annexure A are not within the vicinity of the land in question and will not contribute to HEV of the site.

6. Conclusion

This report has assessed the ecological values of land within Lot 9 DP 1219664, 157 Arakoon Road, South West Rocks. This assessment is to support the rezoning planning proposal for land currently zoned R5 – Large Lot Residential and has been requested by the Kempsey Shire Council as part of their pre lodgement meeting request for information and has presented the ecological values that are present on the Subject Land. This assessment critically analyses the criteria presented in *Table 1* of the *Northern E Zone Review – Final Recommendations Report* (2015) against the ecological values present on the Subject Land. The Subject Land is mapped within an Urban Growth Area by the Kempsey Shire Councils (KSC) Local Strategic Plan 2020.

This assessment considers all relevant documentation that has been published for the Subject Land. Existing information has concluded that two Plant Community Types (PCTs) exist within the Subject Land in varying condition states. None of these PCTs conform to Endangered Ecological Communities listed under the *NSW Biodiversity Conservation Act (BC Act) 2016* or *Environmental Protection & Biodiversity Conservation Act (EPBC Act)* 1999.

The Subject Land has been partially cleared historically and is subject to ongoing maintenance of the groundlayer via slashing and grazing. Large portions of the subject land are devoid of canopy and understory structure and PCTs in these areas exist only with distributed ground layer vegetation. Areas where mature canopy trees are present still lack shrub layer structure with the exception of a small remnant patch on the southern boundary. Whilst the groundlayer is largely native much of the Subject Land has a distinct lack of habitat and connectivity value.

The Subject Land currently zoned R5 is mapped as Secondary 'A' and Secondary 'B' Koala and Unknown Habitat under KSC Comprehensive Koala Plan of Management (CKPoM). Detailed survey of the Subject Land has determined that this mapping is inaccurate and vegetation present does not conform to the definitions of the above Secondary 'A' or 'B' habitat. Field survey failed to locate evidence of the species on the Subject Land and failed to record any Preferred Koala Food Trees as defined under the CKPoM on the Subject Land. Under the assessment pathway all land mapped as 'other' requires no further assessment under the KSC CKPoM all land mapped as Secondary 'A' or 'B' must comply with the performance criteria described in Section 4.10 of the CKPoM.

The HBT recorded on the Subject Land are not considered HEV land when assessed against the *Northern Councils E – Zone review: Final Recommendations* definition of Key Threatened Species Habitat and the *Private Native Forest Code of Practice Guideline No. 2, Protocol for re-evaluating old-growth forest on private property.*

An assessment of ecological values of the broader subject land in relation to criteria listed in Attachment 2 of the *BCD NE Branch Steps for Assessing Biodiversity in Planning Proposals* has been undertaken. The results of the assessment is summarised below:

- **Biodiversity Values Mapping:** No Biodiversity Values are mapped within the Subject Land (Figure 3).
- **Over cleared Vegetation Types:** Vegetation types, PCT 4004 and PCT 3573 confirmed within land zoned R5 is not considered over cleared. Further detail found in section 2.1 of Table 14

- **Vegetation in Over-cleared landscapes:** The Macleay Alluvial Plains and Ingalba Coastal Hills on which the Subject Land exists is not considered an over cleared landscape. Further detail in Section 2.2 of Table 14.
- **Threatened Ecological Communities:** PCTs present on the Subject Land did not conform to the Final Determination (*BC Act*) or the Conservation Advice – Key Diagnostics (*EPBC Act*) for Coastal Swamp Sclerophyll TEC due to the geological setting or inundation period. Further detail found in section 2.3 in Table 14 and Section 3.3 and Section 4.6.
- **Key habitat for threatened species under the BC Act:** One threatened species has been recorded on the Subject Land. Habitat within the Rezoning Area is moderate condition habitat exists within the western and eastern portions of the Subject Land and highly degraded forested wetland habitat in the central portion. It is unlikely the vegetation in the Rezoning Area constitutes key breeding habitat for the Brush-tailed Phascogale as it is considered very likely that the key habitat for the species exists within the much higher integrity vegetation which adjoins the Subject Land.
- **National Important Wetlands:** No National Important Wetlands were mapped within the Rezoning Area**.**
- **Vulnerable estuaries and ICOLLS:** There are no vulnerable estuaries or ICOLLS present in the Rezoning Area.
- **Karst Landscapes:** No Karsts are recorded in the Locality.
- **Sites of Geological Significance:** No sites of geological significance are present in the locality

In conclusion, the values listed above are absent from the Subject Land and do not meet the key consideration criteria for High Environmental Value Land (as described within Attachment 2 of the BCD NE Branch Steps for Assessing Biodiversity in Planning Proposals). Those matters which may marginally occur within the Rezoning Footprint (foraging habitat for the Brush-tailed Phascogale) will not see a considerable decrease in available resource through the proposed development. As such, it is deemed appropriate that the land is rezoned from R5 to R1 from a perspective of biodiversity.

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Appendices

A-1 EPBC MNES Search Results

A-2 Connell & Wagner 2004 Wallum Froglet Mapping

The Subject Land in question is located directly to the south of the Study Area, marked in blue.