

South Arm Road, Urunga Planning Proposal Flora and Fauna Assessment

Toothaches Pty Ltd



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Template 2.8.1

Contents

1. Introduction	5
1.1. Background and purpose.....	5
1.2. Study area.....	5
2. Legislative context.....	8
3. Methods	10
3.1. Database searches and literature review	10
3.2. Likelihood of occurrence	10
3.3. Site inspection	10
3.4. Survey limitations	11
4. Existing environment.....	13
4.1. Database review	13
4.2. Vegetation communities.....	18
4.2.1. Plant Community Types	18
4.2.2. Threatened Ecological Communities	25
4.3. Flora.....	27
4.3.1. Flora species	27
4.3.2. Threatened flora	27
4.4. Fauna	28
4.4.1. Fauna habitats	28
4.4.2. Fauna species.....	35
4.4.3. Threatened fauna	35
5. Rezoning and biodiversity constraints assessment.....	36
5.1. Proposed rezoning.....	36
5.2. Biodiversity values and constraints.....	38
5.3. Serious and Irreversible Impacts (SAIL)	44
5.4. Commonwealth EPBC Act considerations.....	45
5.5. Biodiversity assessment pathway of future development	46
5.5.1. Triggering the Biodiversity Offsets Scheme	46
5.5.2. Likely biodiversity assessment pathway	47
6. Conclusion.....	49
References	50
Appendix A Flora and Fauna species recorded.....	51
Appendix B Likelihood of occurrence	54

List of Figures

Figure 1: Study area	6
Figure 2: Existing land zoning	7
Figure 3: Surveys undertaken.....	12
Figure 4: Bellingen LGA Vegetation Mapping (2013)	15
Figure 5: Existing threatened flora records.....	16
Figure 6: Existing threatened fauna records	17
Figure 7: Plant Community Types and Threatened Ecological Communities	26
Figure 8: Photograph locations	34
Figure 9: Proposed Land Use Zones	37
Figure 10: Biodiversity constraints and proposed C2 (Environmental Conservation) zoning.....	39

List of Tables

Table 1: Legislative context	8
Table 2: Database review results	13
Table 3: PCT686: Blackbutt – Pink Bloodwood shrubby open forest of the coastal lowlands of the NSW North Coast Bioregion.....	18
Table 4: PCT690: Blackbutt – Tallowwood dry grassy open forest of the central parts NSW North Coast Bioregion	19
Table 5: PCT780: Coastal floodplain sedgelands, rushlands, and forblands of the North Coast	20
Table 6: PCT1064: Paperbark swamp forest of the coastal lowlands of the NSW North Coast Bioregion and Sydney Basin Bioregion	21
Table 7: PCT1230: Swamp Mahogany swamp forest on coastal lowlands of the NSW North Coast Bioregion and northern Sydney Basin Bioregion	22
Table 8: PCT1285: Turpentine moist open forest of the coastal hills and ranges of the NSW North Coast Bioregion	23
Table 9: Area of each PCT within the study area	24
Table 10: Fauna habitat features recorded within the study area	28
Table 11: Area of each PCT and TEC within the proposed land use zones	36
Table 12: High Environmental Value assessment for study area and planning proposal outcomes.....	40
Table 13: Preliminary assessment of candidate Serious and Irreversible Impact (SAII) species	44
Table 14: Area clearing threshold	46

Abbreviations

Abbreviation	Description
ASL	Above sea level
BC Act	NSW <i>Biodiversity Conservation Act 2016</i>
BCD	Biodiversity Conservation division of the NSW Department of Planning and Environment
BDAR	Biodiversity Development Assessment Report
BLEP	Bellingen Local Environmental Plan (2010)
BOS	NSW Biodiversity Offsets Scheme
BSC	Bellingen Shire Council
BV Map	Biodiversity Values Map
EEC	Endangered Ecological Community
DAWE	Commonwealth Department of Agriculture, Water and the Environment
DotE	Former Commonwealth Department of the Environment
DPE	NSW Department of Planning and Environment
EEC	Endangered Ecological Community
ELA	Eco Logical Australia Pty Ltd
EP&A Act	NSW <i>Environment Planning and Assessment Act 1979</i>
EPBC Act	Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i>
FFA	Flora and Fauna Assessment
GPS	Global Positioning System
IBRA	Interim Biogeographic Regionalisation of Australia
KMS	Bellingen Shire Council Coastal Area Core Koala Management Strategy
KTP	Key Threatening Process
LGA	Local Government Area
MNES	Matters of National Environmental Significance
PCT	Plant Community Type
SEPP	State Environmental Planning Policy
TEC	Threatened Ecological Community

1. Introduction

1.1. Background and purpose

Eco Logical Australia Pty Ltd (ELA) was engaged by Toothaches Pty Ltd to undertake a flora and fauna assessment for an area of land proposed for rezoning at South Arm Road, Urunga. The land is currently zoned RU4 (Primary Production Small Lots) under the Bellingen Local Environmental Plan (BLEP) 2010, with the proposed zoning R5 (Large Lot Residential) and C2 (Environmental Conservation).

The *North Coast Regional Plan 2036* (NCRP) (DPIE 2017) includes a regional priority for the Bellingen Shire to 'identify additional urban and employment investigation areas for inclusion in the urban growth areas, to secure future housing and employment land supply in proximity to Bellingen and Urunga'. In addition, the NCRP seeks to manage the sensitive coastal strip by identifying high environmental values areas and seeking to protect those important assets which will help to maintain the biological diversity of the North Coast.

The purpose of this assessment is to support the planning proposal by outlining the biodiversity constraints and opportunities present within the study area. This assessment was used to inform the planning proposal and incorporate the 'avoid and minimise impacts' principles of the NSW *Biodiversity Conservation Act 2016* (BC Act), and to allow for the effective management of biodiversity values within the study area in the future.

1.2. Study area

The study area is located approximately 2.5 km west of Urunga on the NSW Mid North Coast (Figure 1). The study area covers 36.65 ha and comprises portions of Lot 124 DP755557, Lot 2 DP1232259 and Lot 200 DP1242996 currently zoned RU4 (Primary Production Small Lots) under the BLEP (2010) (Figure 2).

The study area is bound by existing R5 (Large Lot Residential) development and forested wetlands (C2 (Environmental Conservation)) to the north, the Kalang River and predominantly cleared floodplain farmland to the east, freshwater wetlands (C2 (Environmental Conservation)) to the south, and forested wetlands and farmland (C3 (Environmental Management)) to the west. South Arm Road follows a ridge and bisects the study area in a north east to south west alignment.

The study area has a varied aspect with a high point of approximately 32 m above sea level (ASL) along the central ridge and a low point of approximately 2 m ASL near the Kalang River.

The study area contains predominantly cleared paddocks on the ridge and upper slopes, remnant and regenerating native vegetation in gullies, and native forest and wetland communities on the lower slopes and flats.

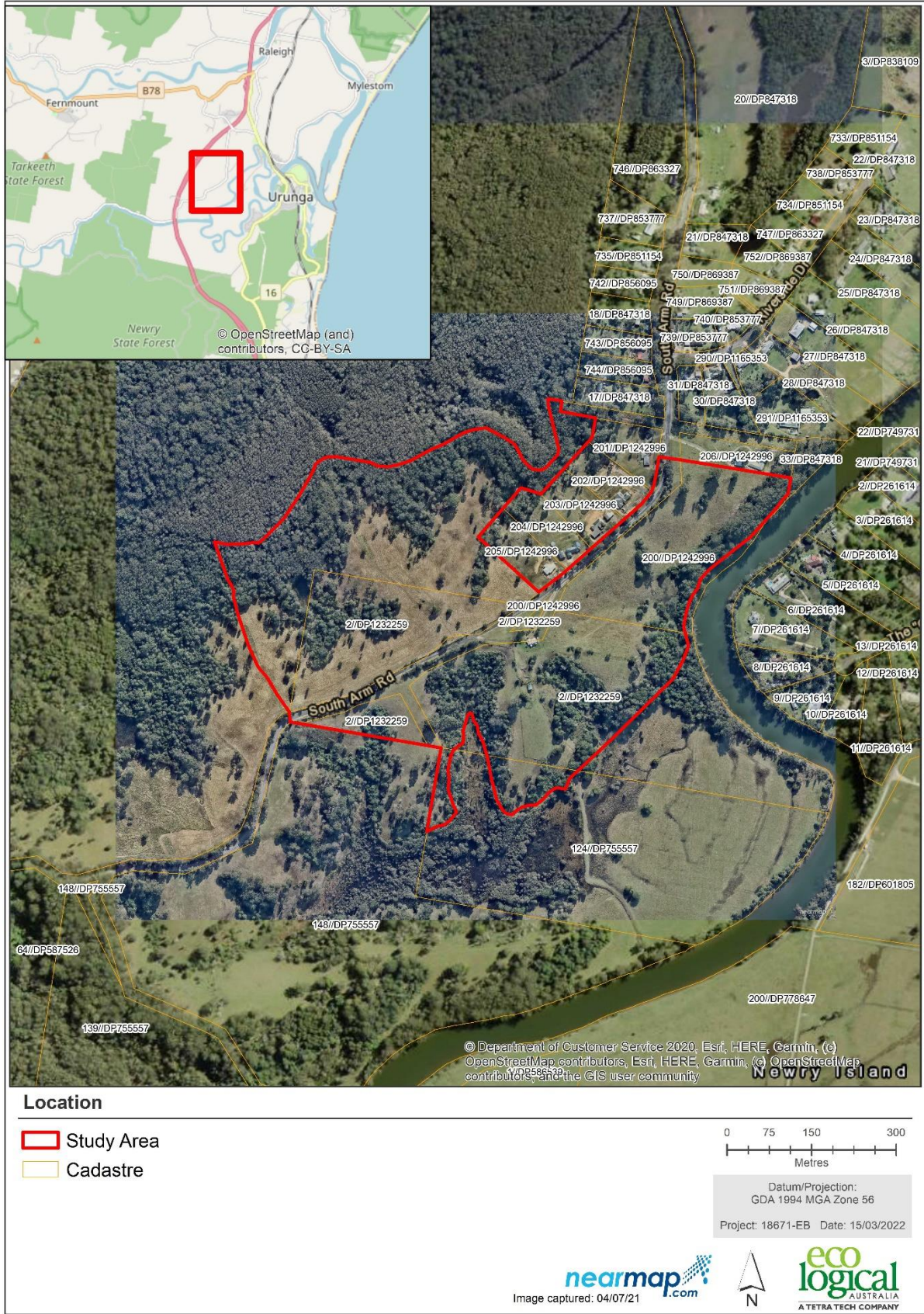


Figure 1: Study area

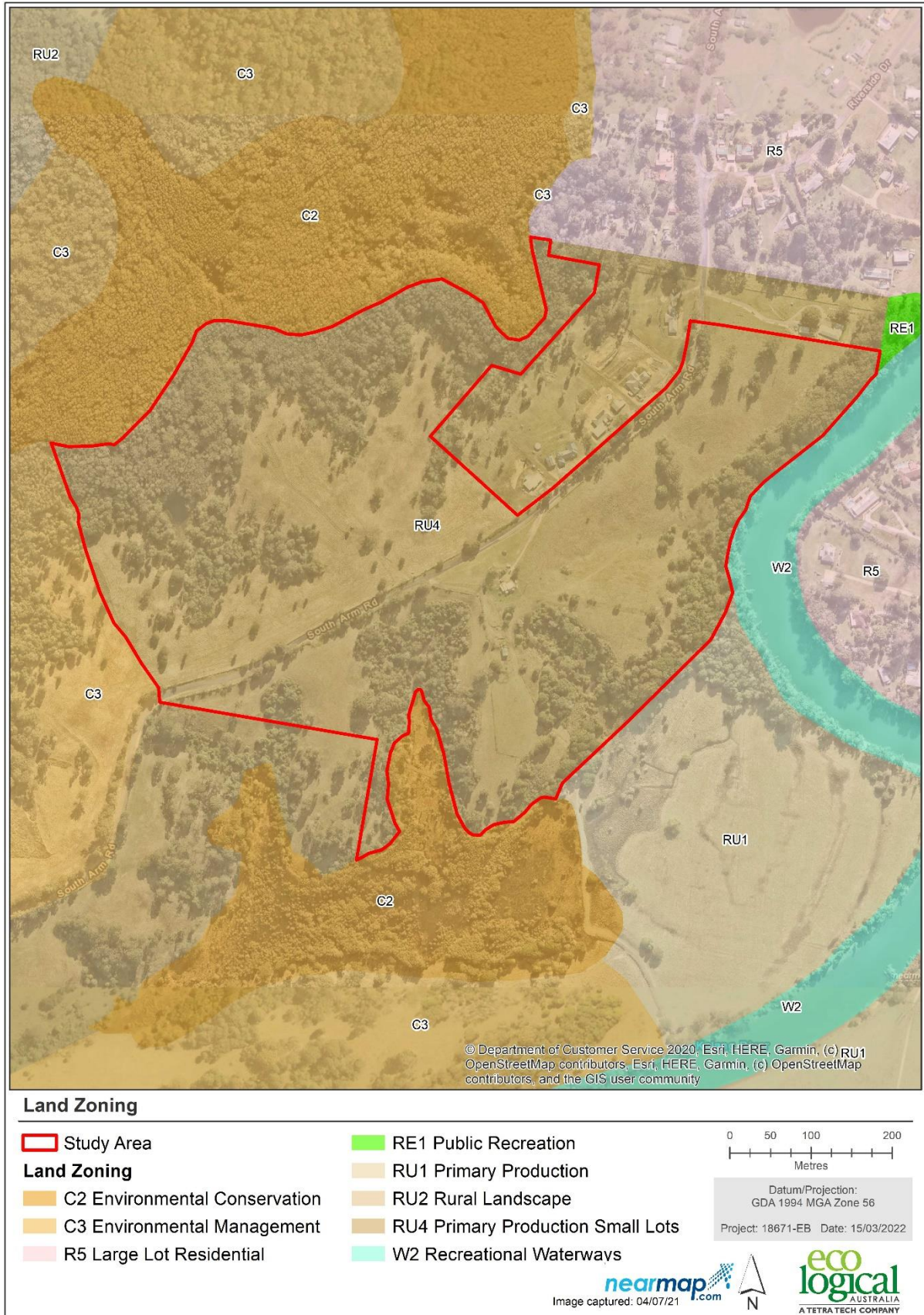


Figure 2: Existing land zoning

2. Legislative context

The legislative context of the proposal in relation to biodiversity values and impact assessment is presented in Table 1.

Table 1: Legislative context

Name	Relevance to the project
Commonwealth	
<i>Environment Protection and Biodiversity Conservation Act 1999</i> (EPBC Act)	<p>The EPBC Act aims to protect Matters of National Environmental Significance (MNES) including wetlands of international importance, threatened species and communities and listed migratory species. An action that may or is likely to have a significant impact on MNES should be referred to the Commonwealth to determine whether it is a Controlled Action that requires approval from the Commonwealth.</p> <p>MNES have been recorded or have potential to occur within the study area. A referral to the Commonwealth Department of Agriculture, Water and the Environment (DAWE) is recommended if a proposed development is likely to have a significant impact on these matters.</p>
State	
<i>Biodiversity Conservation Act 2016</i> (BC Act)	<p>The BC Act provides for the conservation of threatened species, populations and ecological communities. The Act is integrated with the NSW EP&A Act and requires consideration of whether a development or an activity is likely to significantly affect threatened species, populations and ecological communities or their habitat.</p> <p>Any future subdivision or development of the study area after rezoning would likely require the preparation of a Biodiversity Development Assessment Report (BDAR), prepared by an Accredited Assessor, in accordance with the Biodiversity Assessment Method (BAM). The thresholds for a BDAR are dependent on the minimum lot size of the study area. Assuming a future minimum lot size of 1 ha, the threshold would be removal of 0.5 ha of native vegetation.</p>
<i>Environmental Planning and Assessment Act 1979</i> (EP&A Act)	<p>The EP&A Act provides the statutory basis for a rezoning assessment and requires assessment of impacts to listed threatened species, populations and ecological communities under the BC Act. This report identifies biodiversity values present in the study area, with an emphasis on threatened species, population and ecological communities to inform the rezoning process.</p> <p>Any future subdivision or development of the study area after rezoning would likely be assessed under Part 4 (Local Development) of the EP&A Act 1979.</p>
<i>Fisheries Management Act 1994</i> (FM Act)	The study area does not contain protected marine vegetation or aquatic habitat. Assessment under the FM Act is not required.
<i>Biosecurity Act 2015</i>	Under the Biosecurity Act 2015, Priority weeds have been identified for local government areas and assigned strategies to contain, remove or manage. Occupiers of land (this includes owners of land) have responsibility for taking appropriate action for priority weeds on the land they occupy. The study area contains weeds listed under the <i>Biosecurity Act 2015</i> .
Planning Instruments	
<i>State Environmental Planning Policy (Resilience and Hazards) 2021</i>	Chapter 2 (Coastal Management): The study area contains areas of Coastal Wetlands mapped under this section.

Name	Relevance to the project
<i>State Environmental Planning Policy (Biodiversity and Conservation) 2021</i>	Chapter 4 (Koala Habitat Protection 2021): The study area contains potential Koala habitat. Any future development application for subdivision following a rezoning of the study area would require a Koala Assessment Report prepared by a suitably qualified and experienced person to document the likely and potential impacts of the development on koalas or koala habitat and the proposed management of those impacts.
<i>Bellingen Local Environmental Plan 2010</i>	The study area is currently zoned RU4 (Primary Production Small Lots). The proponent seeks to rezone the study area to a mix of R5 (Large Lot Residential) and C2 (Environmental Conservation).
Bellingen Shire Council Coastal Area Koala Management Strategy 2017 (KMS)	The KMS applies only to land mapped as Core Koala Habitat. The study area does not contain any areas mapped as Core Koala Habitat under the KMS.

3. Methods

3.1. Database searches and literature review

A review of readily available databases pertaining to the ecology and environmental features of study area and locality was conducted to identify key and relevant ecological matters. Existing reports, vegetation mapping and other available GIS data were also reviewed. Database records and relevant literature included:

- NSW Department of Planning and Environment BioNet Atlas - Database of flora and fauna records (DPE 2022), using a 10 km search buffer from the study area
- The EPBC Act Protected Matters Search Tool (PMST) (DAWE 2022) using a 10 km search buffer from the study area
- Department of Agriculture, Water and the Environment (DAWE) Species Profile and Threats Database (SPRAT) (DAWE 2022)
- Bellingen Shire Vegetation Map (OEH 2013)
- Bellingen Shire Koala Mapping (BSC 2017)
- NSW DPIE Biodiversity Values Map (DPE 2022)
- Fisheries NSW Spatial Data Portal (DPI 2022).

3.2. Likelihood of occurrence

Results from the dataset searches were combined to produce a list of threatened species, populations and communities known or predicted to occur within 10 km of the study area. Following a site inspection and habitat assessment, matters on the list were assigned to a category based on the likelihood of their occurrence.

Each species' likely occurrence was determined by database records, habitat availability within the study area based on the field survey and knowledge of the species ecology. Five terms for the likelihood of occurrence of species are used in this report and in the likelihood table in Appendix B. The terms for likelihood of occurrence are defined below:

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

3.3. Site inspection

A site inspection, comprising a flora search, rapid vegetation assessment, fauna habitat assessment and incidental fauna observations was undertaken on 6 August 2021 by ELA Ecologist Tom Schmidt. This involved a meandering traverse of the study area to identify flora species including any threatened plants that may occur and were detectable during the season, delineating vegetation types and their extent, collection of vegetation Rapid Point Data and identifying habitat features within the study area (such as tree hollows, roosting sites, forage resources, etc.) that might be utilised by threatened fauna,

as well as threatened flora habitat (Figure 3). A list of recorded flora and fauna species (Appendix A), vegetation communities and habitat features present within the study area was compiled during inspection. No plot-based floristic surveys or targeted flora or fauna surveys were undertaken.

3.4. Survey limitations

This assessment was not intended to provide an inventory of all species present across the study area but instead an overall assessment of the ecological values of the study area with particular emphasis on threatened species, endangered ecological communities and key fauna habitat features. It is important to note that some species may not have been detected within the study area during the inspection as they may be cryptic or seasonal and only detectable during flowering or during breeding. In this case the likelihood of their occurrence within the study area has been assessed based on the presence of potential habitat.

Field survey was undertaken using hand-held GPS units. It is noted that these units can have errors in accuracy of approximately 20 m (subject to availability of satellites on the day).

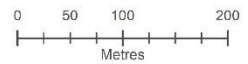


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Surveys

- ▭ Study Area
- Rapid Data Points
- Survey Tracks

nearmap.com
Image captured: 04/07/21



Datum/Projection:
GDA 1994 MGA Zone 56
Project: 18671-EB Date: 15/03/2022



Figure 3: Surveys undertaken

4. Existing environment

4.1. Database review

The results of the database review are presented in Table 2.

Table 2: Database review results

Data type	Data Source	Key Findings
Aerial imagery	ESRI, NSW Government, NearMap	<p>Large areas of cleared land/paddocks.</p> <p>Patches of native forest vegetation, particularly in low-lying areas and gullies.</p> <p>Riparian vegetation along Kalang River.</p> <p>Wetlands at periphery of study area in several locations.</p>
Bioregions	Interim Biogeographic Regionalisation for Australia, Version 7	NSW North Coast
Subregions	Interim Biogeographic Regionalisation for Australia, Version 7	Coffs Coast and Escarpment
Local Government Areas (LGA)	Australian Local Government Association Council Maps and Boundaries – National Map	The study area is located wholly within the Bellingen LGA.
Mitchell Landscapes	NSW (Mitchell) Landscapes Version 2	<p>Two Mitchell Landscape are present:</p> <ul style="list-style-type: none"> • Ingalba Coastal Hills • Manning – Macleay Coastal Alluvial Plains.
Threatened Ecological Communities	<p>Bellingen LGA Threatened Ecological Community (TEC) Mapping</p> <p>NSW DPIE Vegetation Types Database</p> <p>DAWE PMST Search</p>	<p>Existing mapping (OEH 2014) shows three TECs mapped within the study area (Figure 4):</p> <ul style="list-style-type: none"> • Freshwater wetlands on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions • Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions • Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions. <p>The above TECs are all listed as endangered under the NSW BC Act, with the Swamp Oak Community also listed as endangered under the EPBC Act.</p> <p>Several other TECs are known or predicted to occur within the locality (Appendix B).</p>
Flora and Fauna Database Review	<p>DAWE PMST (10 km radius; locality)</p> <p>BioNet records from the locality</p>	<p>The BioNet search identified 11 flora species (Figure 5) and 65 fauna species (Figure 6) listed under the BC Act and or EPBC Act that has previously been recorded within the locality.</p> <p>The PMST identified four threatened flora species, 69 threatened fauna species and 65 migratory species listed under the EPBC Act that have the potential to occur within the locality.</p>

Data type	Data Source	Key Findings
Rivers & Streams	NSW DPIE Strahler Stream Order	The Kalang River forms a portion of the eastern boundary of the study area.
Key Fish Habitat	NSW DPIE Fisheries Spatial Data Portal	Several areas of Key Fish Habitat are mapped within the study area.
Fauna Habitats and Corridors	NPWS Key Fauna Habitats and Corridors North East NSW	No Key Fauna Habitats or Corridors are mapped in or adjacent to the study area.
Important Mapped Areas	BAM - Important Areas Viewer (accessed 15/03/2022)	Migratory Shorebird Important Areas are mapped along the Kalang River adjoining the study area. The study area does not contain important mapped areas for Swift Parrot or Regent Honeyeater.
Wetlands	SEED NSW Wetlands mapping	The study area contains areas mapped as Coastal Wetlands and Coastal Wetlands Proximity Areas under the Coastal Management SEPP 2018.
Conservation areas	NPWS Estate Legal State Forest Travelling Stock Routes Crown land	There are no conservation areas state forests or Travelling Stock Routes within the study area.
Land Zoning	BLEP 2010	The entire study is currently zoned as RU4 (Primary Production Small Lots).

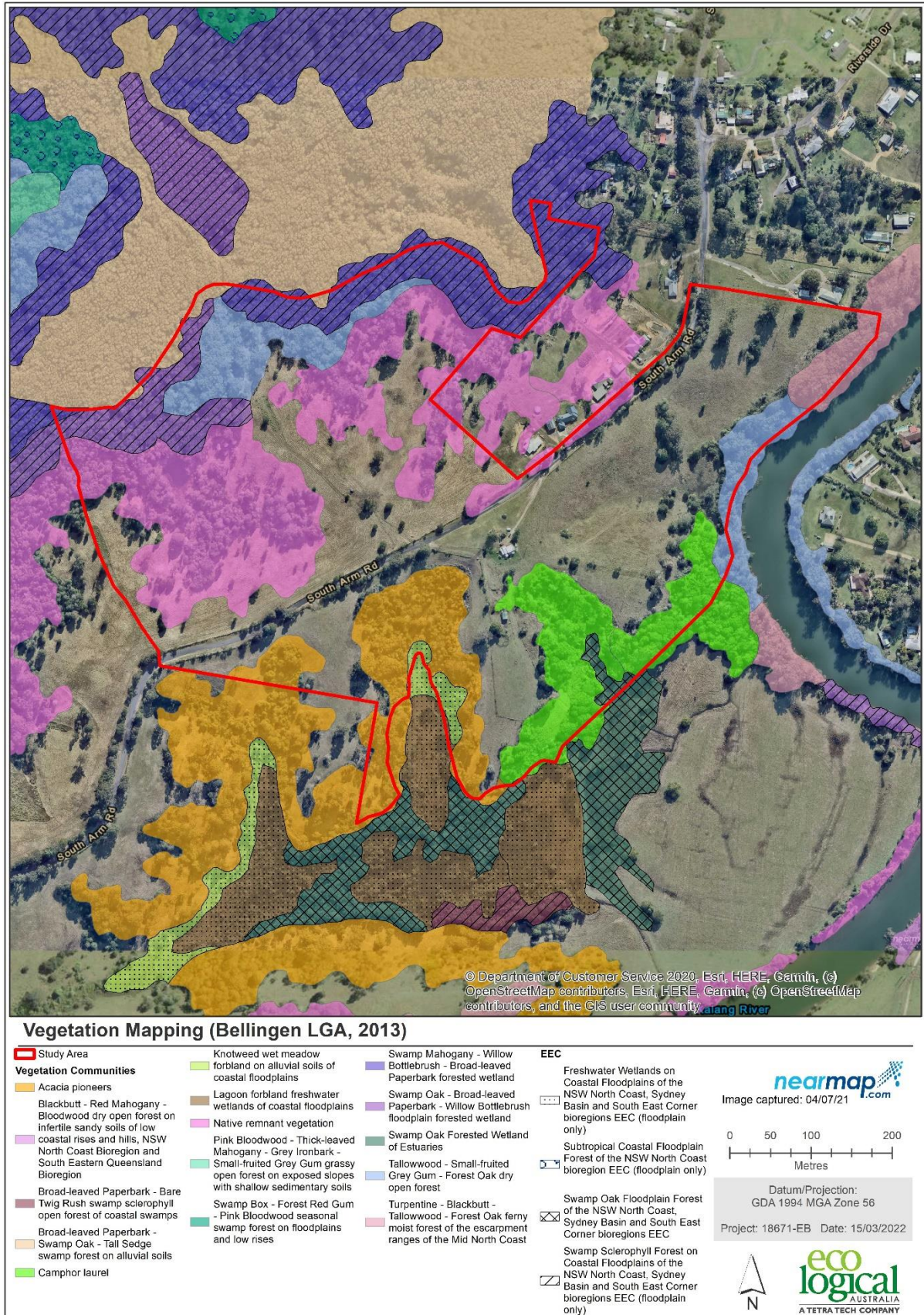


Figure 4: Bellingen LGA Vegetation Mapping (2013)

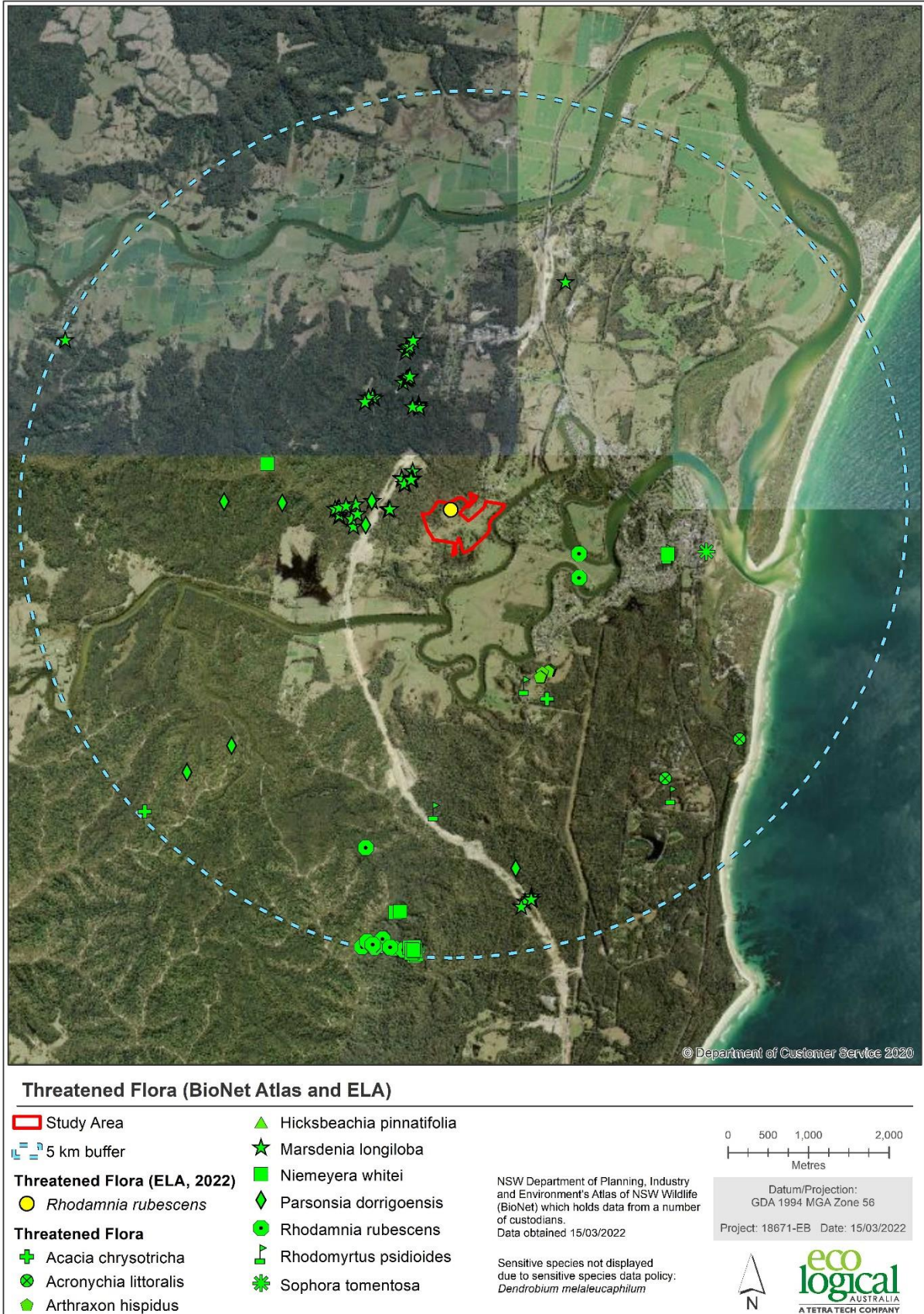


Figure 5: Existing threatened flora records (full 10km locality not shown for readability)

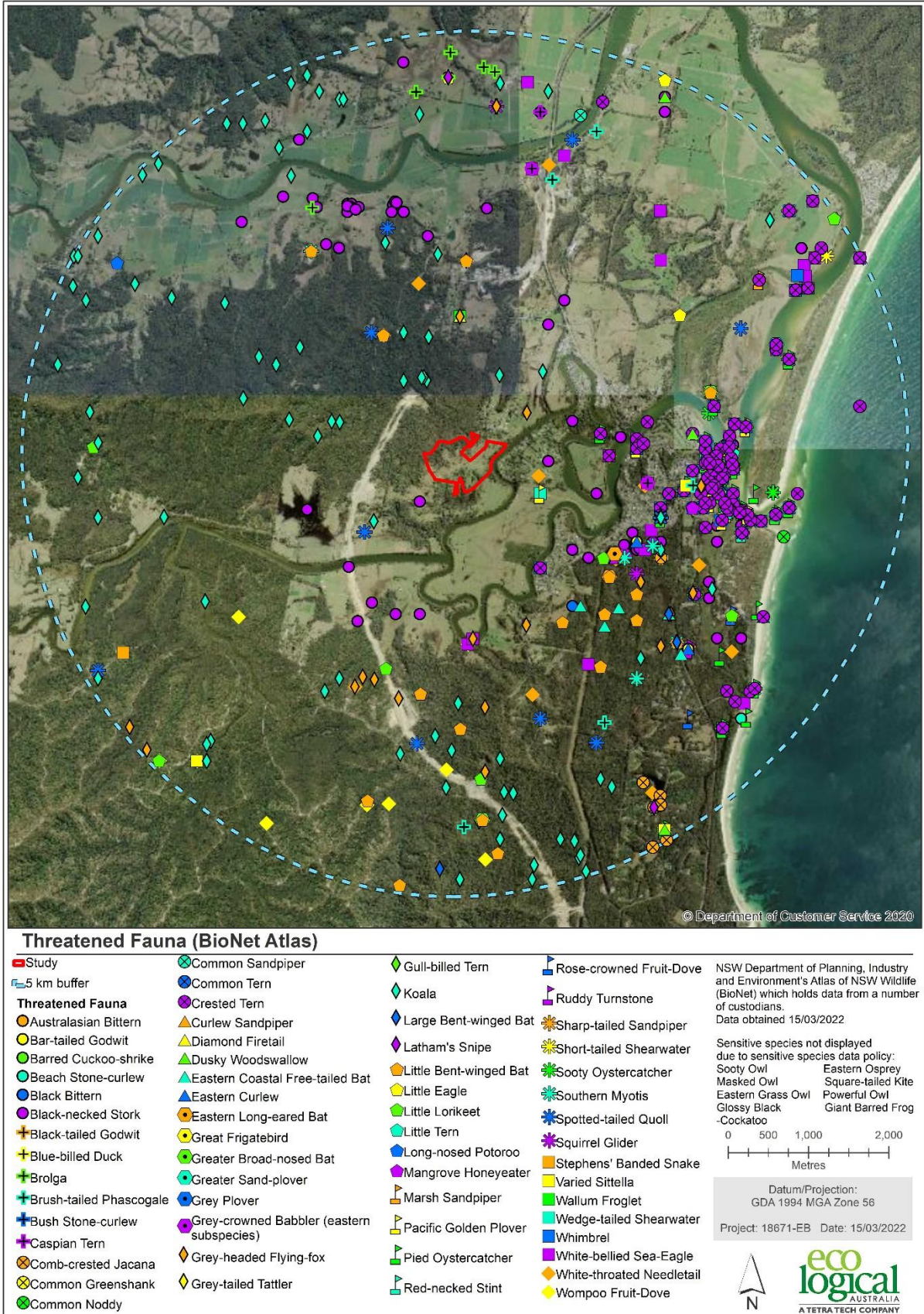


Figure 6: Existing threatened fauna records (full 10km locality not shown for readability)

4.2. Vegetation communities

4.2.1. Plant Community Types

Six Plant Community Types (PCTs) were recorded within the study area during survey (Figure 7), of which three correspond to separate TECs associated with the coastal floodplain. Detailed descriptions of each PCT within the study area are provided in the tables below.

Table 3: PCT686: Blackbutt – Pink Bloodwood shrubby open forest of the coastal lowlands of the NSW North Coast Bioregion


PCT 686: Blackbutt – Pink Bloodwood shrubby open forest of the coastal lowlands of the NSW North Coast Bioregion	
Vegetation formation:	Wet Sclerophyll Forest (Shrubby sub-formation)
Vegetation class:	North Coast Wet Sclerophyll Forests
Vegetation structure	Forest
Conservation status:	<i>Subtropical Coastal Floodplain Forest of the NSW North Coast bioregion</i> (NSW BC Act – endangered) – only where it located on the coastal floodplain.
	<p>This community is present in two areas, in the east of the study area adjoining the Kalang River and one in the west on a rise adjoining swamp sclerophyll forest. The community includes a canopy dominated by <i>Eucalyptus pilularis</i> (Blackbutt) with <i>Corymbia intermedia</i> (Pink Bloodwood), and occasional <i>E. microcorys</i> (Tallowwood). There is tall shrubby midstorey and sparse groundcover of native grasses.</p> <p>This community corresponds to the TEC <i>Subtropical Coastal Floodplain Forest of the NSW North Coast bioregion</i> in the east of the study area where it occurs on the coastal floodplain, in the west of the study area the occurrence of this PCT is on a small rise above the floodplain area and would not be subject to periodic inundation and therefore does not correspond to the listed community.</p>
Characteristic trees	<i>Eucalyptus pilularis</i> , <i>Corymbia intermedia</i> , <i>E. microcorys</i>
Characteristic midstorey	<i>Guioa semiglauc</i> a (Guioa), <i>Notelaea longifolia</i> (Large Mock-olive), <i>Allocasuarina torulosa</i> (Forest Oak), <i>Pittosporum undulatum</i> (Native Daphne), <i>Cupaniopsis anacardioides</i> (Tuckeroo)
Characteristic groundcovers	<i>Lomandra longifolia</i> (Spiny-headed Mat-rush), <i>Imperata cylindrica</i> (Blady Grass), <i>Pteridium esculentum</i> (Common Bracken), <i>Gahnia clarkei</i> (Tall Saw-sedge)
Weediness (all species)	Low to moderate
Exotic species	<i>Lantana camara</i> (Lantana), <i>Paspalum madiocanum</i> (Paspalum)
Condition	Good
Variation and disturbance	Minimal variation. Disturbance from historical clearing.
Soil type	Silty loam or clay loam
% cleared in NSW	50 %
Threats	Weed invasion and bank erosion

Table 4: PCT690: Blackbutt – Tallowwood dry grassy open forest of the central parts NSW North Coast Bioregion


PCT 690: Blackbutt – Tallowwood dry grassy open forest of the central parts NSW North Coast Bioregion	
Vegetation formation:	Wet Sclerophyll Forests (Grassy sub-formation)
Vegetation class:	Northern Hinterland Wet Sclerophyll Forests
Vegetation structure	Forest
Conservation status:	Not listed
	<p>This PCT occurs in the north east of the study area on a high bank above the Kalang River and also in modified form along South Arm Road and scattered within paddocks. This community occurs on the more open and elevated areas of the study area.</p> <p>In the study area this PCT has a canopy dominated by <i>Eucalyptus pilularis</i> and <i>E. microcorys</i> with <i>E. siderophloia</i> (Grey Ironbark) and <i>Corymbia intermedia</i> occasionally present. The open midstorey includes scattered shrubs such as <i>Allocasuarina torulosa</i>, <i>Acacia floribunda</i> (White Sally Wattle) and <i>Glochidion ferdinandi</i> (Cheese Tree). The groundcover is predominantly grassy with <i>Imperata cylindrica</i>, <i>Lomandra longifolia</i> and the scrambling climber <i>Hibbertia scandens</i> (Climbing Guinea Flower) common.</p>
Characteristic trees	<i>Eucalyptus pilularis</i> , <i>E. microcorys</i>
Characteristic midstorey	<i>Allocasuarina torulosa</i> , <i>Acacia floribunda</i>
Characteristic groundcovers	<i>Imperata cylindrica</i> , <i>Lomandra longifolia</i> , <i>Hibbertia scandens</i>
Weediness (all species)	Moderate
Exotic species	<i>Lantana camara</i> , <i>Paspalum mandiocanum</i> , <i>Setaria sphacelata</i> (South African Pigeon Grass), <i>Cinnamomum camphora</i> (Camphor Laurel)
Condition	Moderate
Variation and disturbance	Higher condition in larger patches in north east, lower condition in small patches along South Arm Road and scattered paddock trees.
Soil type	Clay loam
% cleared in NSW	55 %
Threats	Weed invasion and bank erosion

Table 5: PCT780: Coastal floodplain sedgeland, rushlands, and forblands of the North Coast

PCT 780: Coastal floodplain sedgeland, rushlands, and forblands of the North Coast	
Vegetation formation:	Forested Wetlands
Vegetation class:	Coastal Floodplain Wetlands
Vegetation structure	Wetland/Dam
Conservation status:	<i>Freshwater Wetlands on Coastal Floodplains</i> (NSW BC Act – Endangered)
	<p>This community is present in several small patches at the edges of the study area in the south and east as well as a dam in the west. Larger areas of this community extend beyond the study area boundary to the south. This PCT occurs in the low lying floodplain areas and is an open wetland community with canopy species generally absent, with the occasional <i>Eucalyptus robusta</i> (Swamp Mahogany) or <i>Melaleuca quinquenervia</i> (Broad-leaved Paperbark). The midstorey is also absent to sparse with occasional <i>Melaleuca decora</i>. The ground cover is generally dense but may be more open in areas of deeper water and is dominated by water tolerant and aquatic species.</p> <p>Areas of this PCT within the study area conform to the listed Endangered Ecological Community (EEC) <i>Freshwater Wetlands on Coastal Floodplain</i>.</p>
Characteristic trees	Not present.
Characteristic midstorey	<i>Melaleuca</i> spp.
Characteristic groundcovers	<i>Philydrum lanuginosum</i> (Woolly Waterlily), <i>Baumea</i> sp., <i>Eleocharis sphacelata</i> , <i>Eleocharis</i> sp., <i>Gahnia clarkei</i> and <i>Persicaria</i> spp.
Weediness (all species)	Low
Exotic species	<i>Setaria sphacelata</i>
Condition	Moderate
Variation and disturbance	Disturbance from grazing in some areas.
Soil type	Alluvial soils
% cleared in NSW	80 %
Threats	Weed invasion, water quality/runoff

Table 6: PCT1064: Paperbark swamp forest of the coastal lowlands of the NSW North Coast Bioregion and Sydney Basin Bioregion

PCT 1064: Paperbark swamp forest of the coastal lowlands of the NSW North Coast Bioregion and Sydney Basin Bioregion

Vegetation formation: Forested Wetlands

Vegetation class: Coastal Swamp Forests

Vegetation structure: Forest

Conservation status: *Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions* (NSW BC Act - Endangered)



This PCT occurs along the northern boundary of the study area where it continues beyond the study area as an extensive area of remnant swamp forest.

In the study area this community has a dense canopy dominated by *Melaleuca quinquenervia* with *Casuarina glauca* (Swamp Oak) sub-dominant, and *Eucalyptus robusta* occasionally present. The midstorey is sparse although climbers and epiphytes are common, including *Parsonsia straminea* (Common Silkpod) and *Asplenium australasicum* (Bird's Nest Fern). The ground cover includes a mixture of grasses, sedges and ferns.

This community is a TEC of the Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions (NSW BC Act - endangered). This community is present on the study area in a large patch from the north to west of the study area, and a small patch in the south

Characteristic trees: *Melaleuca quinquenervia, Casuarina glauca*

Characteristic midstorey: *Parsonsia straminea, Asplenium australasicum*

Characteristic groundcovers: *Gahnia clarkei, Blechnum spp., Hypolepis muelleri* (Harsh Ground Fern), *Microlaena stipoides* (Weeping Grass), *Oplismenus aemulus* (Australian Basket Grass)

Weediness (all species): Low to moderate

Exotic species: *Lantana camara*

Condition: Good

Variation and disturbance: Minimal variation and disturbance

Soil type: Alluvial

% cleared in NSW: 75 %

Threats: Weed invasion

Table 7: PCT1230: Swamp Mahogany swamp forest on coastal lowlands of the NSW North Coast Bioregion and northern Sydney Basin Bioregion

PCT 1230: Swamp Mahogany swamp forest on coastal lowlands of the NSW North Coast Bioregion and northern Sydney Basin Bioregion

Vegetation formation:	Forested Wetlands
Vegetation class:	Coastal Swamp Forests
Vegetation structure	Forest
Conservation status:	Not listed in study area. This PCT can conform to <i>Swamp Sclerophyll Forest on Coastal Floodplains</i> (NSW BC Act - endangered) however the occurrence in the study area is not on floodplain or subject to periodic inundation.



This community is present in the north-west of the study area as regenerating forest, and in small patches and scattered paddock areas. The majority of the community in the study area is regeneration and includes scattered canopy species including *Eucalyptus robusta*, *Corymbia intermedia*, *E. resinifera* (Red Mahogany) and *E. microcorys* with a dense shrub layer of pioneering species such as *Acacia* spp. The groundcover is grassy. It appears that some swamp forest species from the adjacent areas that were not cleared have partly colonised this higher ground.

This PCT can conform to the *Swamp Sclerophyll Forest on Coastal Floodplains* EEC in areas that occur on the floodplain and are subject to periodic inundation. The occurrence of this PCT in the study area is on the footslopes above the floodplain and therefore does not correspond to the listed EEC.

Characteristic trees	<i>Eucalyptus robusta</i> , <i>Corymbia intermedia</i> , <i>Eucalyptus resinifera</i> , <i>Lophostemon suaveolens</i> (Swamp Turpentine)
Characteristic midstorey	<i>Callistemon salignus</i> (Willow Bottlebrush), <i>Glochidion ferdinandi</i> , <i>Banksia integrifolia</i> (Coast Banksia), <i>Acacia floribunda</i>
Characteristic groundcovers	<i>Pteridium esculentum</i> , <i>Microlaena stipoides</i> , <i>Gahnia clarkei</i> , <i>Imperata cylindrica</i> , <i>Hibbertia scandens</i>
Weediness (all species)	Moderate
Exotic species	<i>Cinnamomum camphora</i> , <i>Lantana camara</i> , <i>Paspalum mandiocanum</i> , <i>Setaria sphacelata</i>
Condition	Moderate to low
Variation and disturbance	Moderate condition areas adjacent to paperbark swamp forest, lower condition at edges adjoining paddocks and in scattered patches on farmland where slashing and under-scrubbing occur.
Soil type	Clay loam
% cleared in NSW	75 %
Threats	Weed invasion

Table 8: PCT1285: Turpentine moist open forest of the coastal hills and ranges of the NSW North Coast Bioregion

PCT 1285: Turpentine moist open forest of the coastal hills and ranges of the NSW North Coast Bioregion	
Vegetation formation:	Wet Sclerophyll Forests (Shrubby sub-formation)
Vegetation class:	North Coast Wet Sclerophyll Forests
Vegetation structure	Forest
Conservation status:	Not listed
	<p>This community is predominantly present in steep gullies in the south and east of the study area where it occurs as regenerating thickets.</p> <p>Where present the canopy includes species such as <i>Syncarpia glomulifera</i> (Turpentine), <i>Eucalyptus microcorys</i>, <i>E. propinqua</i> (Small-fruited Grey Gum), <i>Corymbia intermedia</i>. The midstorey contains a dense small tree and shrub layer with climbers abundant, particularly in gullies, and includes <i>Allocasuarina torulosa</i>, <i>Cissus hypoglauca</i> (Native Grape), <i>Smilax australis</i> (Native Sarsparilla), <i>Melicope elleryana</i> (Pink Euodia), <i>Alphitonia excelsa</i> (Red Ash), <i>Glochidion ferdinandi</i> and <i>Elaeocarpus reticulatus</i> (Blueberry Ash). The ground cover includes grass and fern species and density varies with canopy and midstorey cover.</p>
Characteristic trees	<i>Syncarpia glomulifera</i> , <i>Eucalyptus microcorys</i> , <i>E. propinqua</i> , <i>Corymbia intermedia</i> .
Characteristic midstorey	<i>Allocasuarina torulosa</i> , <i>Cissus hypoglauca</i> , <i>Smilax australis</i> , <i>Melicope elleryana</i> , <i>Alphitonia excelsa</i> , <i>Glochidion ferdinandi</i> , <i>Elaeocarpus reticulatus</i> .
Characteristic groundcovers	<i>Lomandra longifolia</i> , <i>Pteridium esculentum</i>
Weediness (all species)	Moderate to high
Exotic species	<i>Cinnamomum camphora</i> , <i>Lantana camara</i> , <i>Andropogon virginicus</i> , <i>Paspalum mandiocanum</i>
Condition	Moderate to low
Variation and disturbance	Generally highly disturbed from previous clearing, majority within study area is regenerating in thickets in gullies. Some areas contain dense <i>Cinnamomum camphora</i> and few native species.
Soil type	Clay loam
% cleared in NSW	55 %
Threats	Weed invasion

Other vegetation

Other vegetation within the study area not classified as meeting the definition of a native plant community type include cleared paddock areas and exotic vegetation. Cleared paddock areas are classified as 'mixed pasture', dominated by exotic species such as *Paspalum mandiocanum*, *Setaria sphacelata* and *Andropogon virginicus* but also including scattered native species such as *Imperata cylindrica* and *Pteridium esculentum* (Photograph 1). Occasional exotic trees and shrubs are also present in the study area including as individual paddock trees, these include *Cinnamomum camphora* and *Pinus radiata*.



Photograph 1: Cleared paddock with scattered exotic trees (Camphor Laurel)

The total area of each PCT within the study area is presented in Table 9.

Table 9: Area of each PCT within the study area

PCT / Vegetation Type	TEC	Area (ha)
PCT 686: Blackbutt - Pink Bloodwood shrubby open forest of the coastal lowlands	No	0.5
PCT 686: Blackbutt - Pink Bloodwood shrubby open forest of the coastal lowlands	Yes	1.06
PCT 690: Blackbutt - Tallowwood dry grassy open forest	No	2.06
PCT 780: Coastal floodplain sedgelands, rushlands, and forblands	Yes	0.46
PCT 1064: Paperbark swamp forest of the coastal lowlands	Yes	4.37
PCT 1230: Swamp Mahogany swamp forest on coastal lowlands	No	5.5
PCT 1285: Turpentine moist open forest of the coastal hills and ranges	No	6.03
Cleared	No	0.05

PCT / Vegetation Type	TEC	Area (ha)
Exotic	No	0.11
Mixed pasture	No	16.05
Road	No	0.46
Total		36.65

4.2.2. Threatened Ecological Communities

An ecological community is a naturally occurring group of native plants, animals and other organisms living in a unique habitat.

A total of twelve TECs (listed under the BC Act and/or EPBC Act) were either previously mapped within the study area (based on LGA-wide mapping), predicted to occur in the locality or are known from the Coffs Coast and Escarpment IBRA Subregion (**Appendix B**).

Three TECs, all listed as EECs under the NSW BC Act were recorded in the study area during the field survey (Figure 7):

- Freshwater Wetlands on Coastal Floodplains
 - Corresponding to all areas of PCT 780.
- Subtropical Coastal Floodplain Forest of the NSW North Coast bioregion
 - Corresponding to areas of PCT 686 that occur on the coastal floodplain (i.e. are subject to regular or periodic inundation).
- Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions
 - Corresponding to all areas of PCT 1064 that occur on the coastal floodplain (i.e. are subject to regular or periodic inundation).

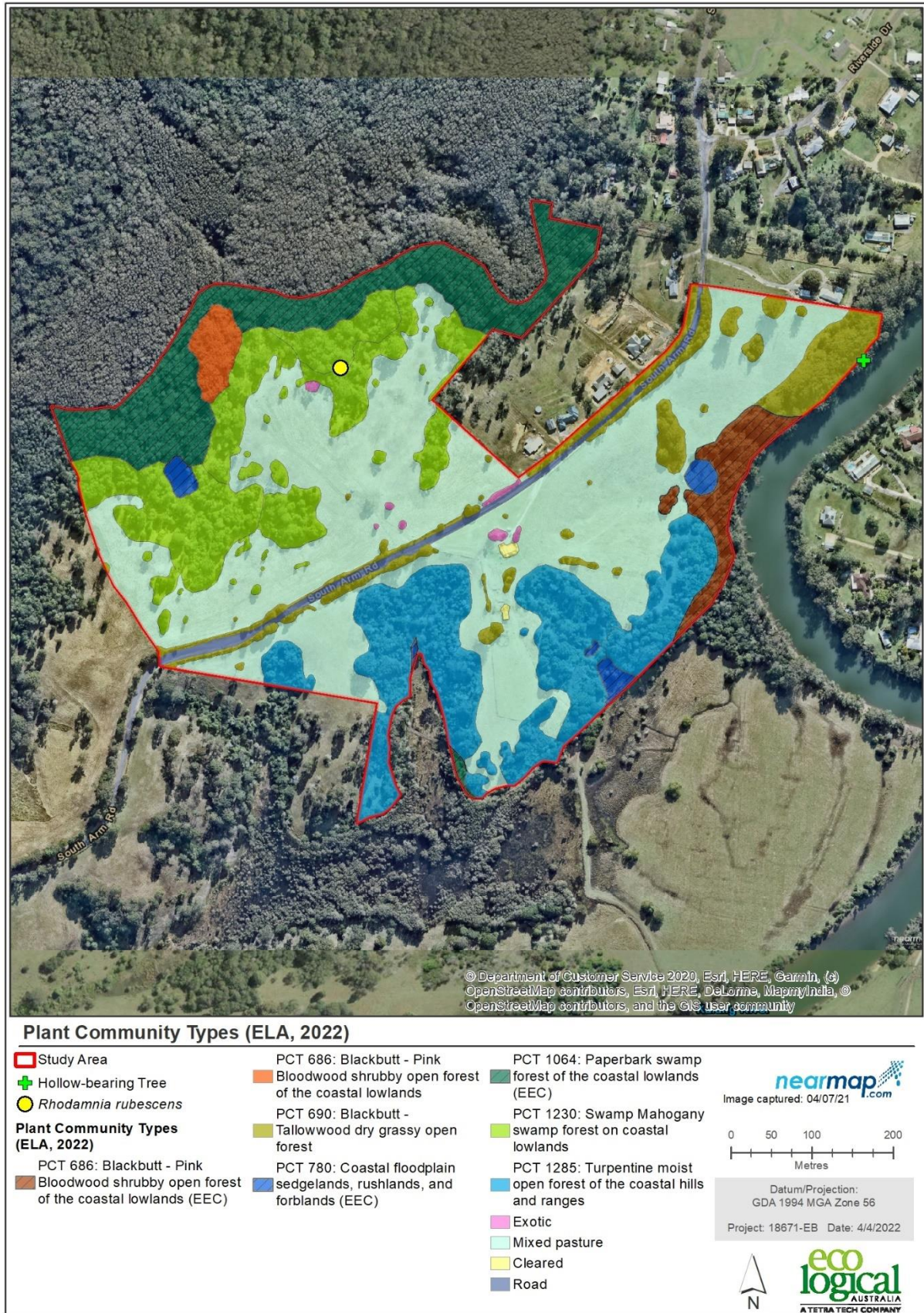


Figure 7: Plant Community Types and Threatened Ecological Communities

4.3. Flora

4.3.1. Flora species

A total of 65 flora species were identified within the study area during the site inspection (Appendix A). This included eight exotic species. The species recorded were typical of Wet Sclerophyll Forest, Coastal Swamp Forest and Coastal Wetland vegetation types on the NSW North Coast.

4.3.1.1. Weeds of National significance and Priority Weeds

Two species listed as Weeds of National Significance (WoNS) were recorded in several locations across the study area; *Lantana camara* and *Senecio madagascariensis*. Mitigation measures to control the spread of weeds should be incorporated into any future development of the study area.

4.3.2. Threatened flora

A total of 25 threatened flora species (listed under the BC Act and/or EPBC Act) were previously recorded or predicted to occur within 10 km of the study area (DPE 2022, DAWE 2022, Appendix B).

One threatened species was recorded in the study area during the site survey, *Rhodamnia rubescens* (Scrub Turpentine), listed as a critically endangered under both the BC Act and EPBC Act. One individual was recorded in a vegetated gully in the west of the study area (Photograph 2; Figure 7); the individual showed signs of Myrtle Rust.



Photograph 2: *Rhodamnia rubescens* recorded in the study area

An additional ten threatened flora species are considered to have potential to occur in the study area based on threatened species distributions, records and habitats present (Appendix B).

- *Acacia chrysotricha* (Newry Golden Wattle)
- *Arthraxon hispidus* (Hairy Jointgrass)
- *Dendrobium melaleucaphilum* (Spider Orchid)
- *Hicksbeachia pinnatifolia* (Red Boppel Nut)
- *Marsdenia longiloba* (Slender Marsdenia)
- *Niemeyera whitei* (Rusty Plum, Plum Boxwood)
- *Parsonsia dorrigoensis* (Milky Silkpod)
- *Phaius australis* (Southern Swamp Orchid)
- *Rhodomirtus psidioides* (Native Guava)
- *Tylophora woollsii* (Cryptic Forest Twiner).

Targeted surveys for some or all of these species are likely to be required during an impact assessment for future development of the study area following a rezoning if impacts to their potential habitats was proposed.

The remaining threatened flora species are considered unlikely to occur in the study area based on their habitat requirements, distributions and previous records (Appendix B).

No systematic targeted threatened flora surveys were undertaken as part of this assessment. Cleared paddock portions of the study area do not contain suitable habitat for threatened flora species.

4.4. Fauna

4.4.1. Fauna habitats

The study area contains four broad habitat types; wet sclerophyll forest, swamp forest, floodplain wetland and cleared areas (Photograph 3 to Photograph 8; Figure 8). Habitat features recorded in the study area are summarised in Table 10.

In general, the forest and wetland habitats at the edges of the study area provide the highest quality habitat for native fauna. The cleared paddock areas provide limited habitat opportunities, generally restricted to common generalist species tolerant of disturbance, or wide-ranging species passing through or over on occasion.

Table 10: Fauna habitat features recorded within the study area

Habitat feature	Species/guild	Presence within study area
Forest	Birds, microbats, fruit bats, arboreal mammals, reptiles	Present, particularly at periphery of the study area. Some areas are connected to large areas of intact forest habitat.
Winter flowering species	Winter migratory birds, arboreal mammals and fruit bats	Present in forest habitats (e.g. <i>Eucalyptus robusta</i>)
Koala feed trees	Koala	Koala feed trees including <i>Eucalyptus robusta</i> and <i>E. microcorys</i> are present in forest areas.
Hollow-bearing trees	Microbats, birds, arboreal mammals, reptiles, amphibians	Generally absent. One hollow-bearing tree recorded in study area (Photograph 9; Figure 7). A comprehensive hollow-bearing tree survey was not undertaken, however the majority of the

Habitat feature	Species/guild	Presence within study area
		study area was not found to contain hollow-bearing trees during the site visit.
She-oak (<i>Allocasuarina</i> spp.)	Glossy-black Cockatoo	Present in most forest areas except PCT1064. No extensive stands were recorded.
Mistletoe	Arboreal mammals, woodland and migratory birds, fruit bats	None opportunistically observed. Potential to occur within the study area.
Nectar producing trees (Acacia and bloodwoods)	Birds, fruit bats.	Present throughout forest areas.
Leaf litter	Invertebrates, reptiles, amphibians, terrestrial mammals	Present in forest areas.
Trees with defoliating or fibrous bark	Microbats, reptiles, amphibians	Present in forest areas and some scattered trees within paddock areas.
Fallen woody debris	Terrestrial mammals, reptiles, invertebrates	Present in forest areas.
Water body or dam	Amphibians, birds, reptiles	Kalang River provides a narrow intertidal mudflat adjoining the study area (Photograph 10). Freshwater wetlands are present at the edges of the study area.
Large rocky outcrops/caves/culverts/tunnels	Microbats, reptiles, invertebrates, small mammals	Absent



Photograph 3: Wet Sclerophyll Forest habitat within the study area



Photograph 4: Swamp Forest habitat within the study area



Photograph 5: Freshwater wetland habitat in constructed dam within the study area



Photograph 6: Cleared habitat surrounding modified patch of wet sclerophyll forest habitat within the study area



Photograph 7: Cleared habitat represented by open paddock areas dominates the ridge and upper slopes of the study area



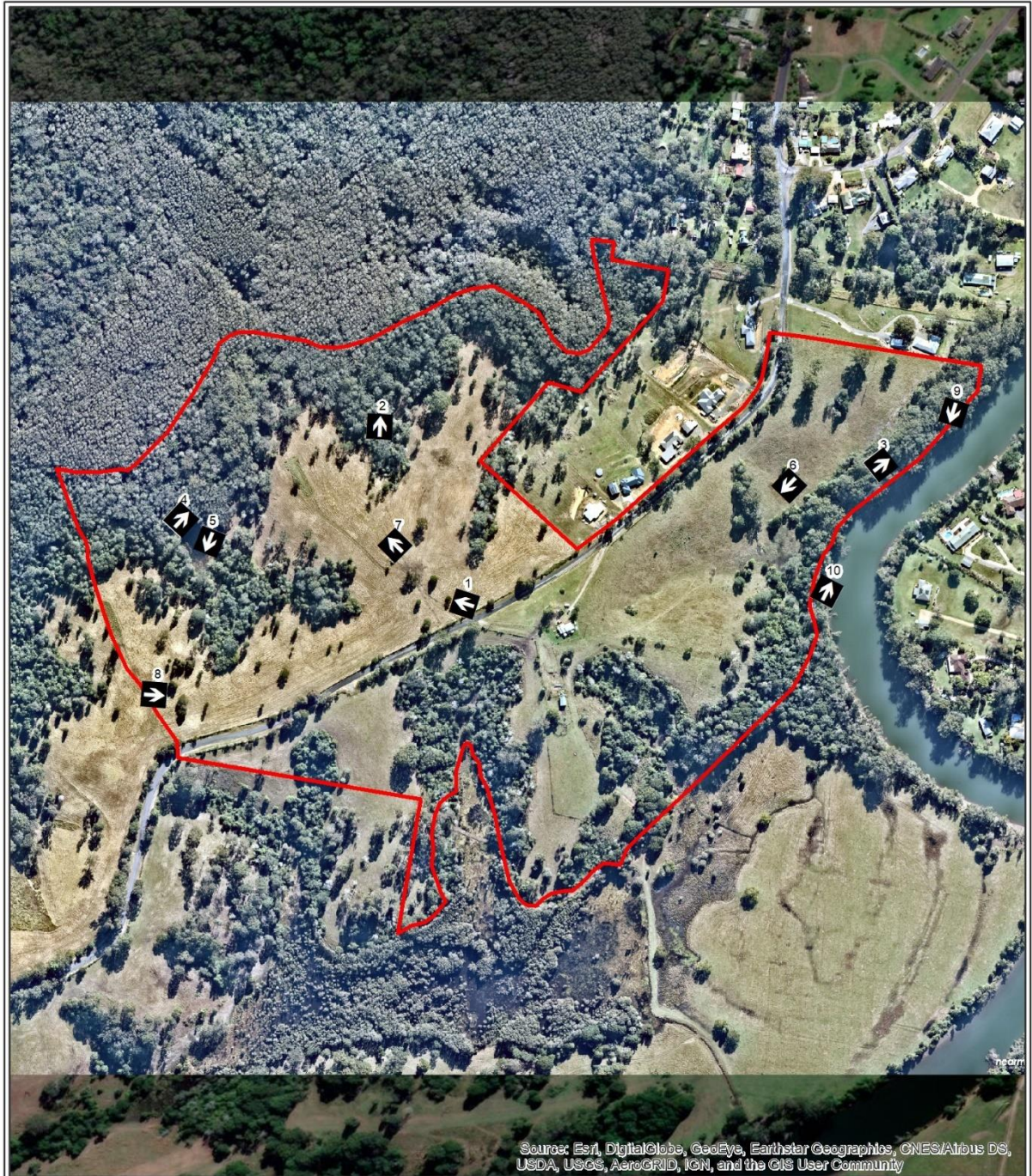
Photograph 8: Cleared habitat and scattered trees within the mid and upper slopes of the study area



Photograph 9: Hollow-bearing tree in *Eucalyptus pilularis* in north east of study area adjacent to Kalang River





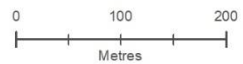
Photograph 10: Narrow band of intertidal mudflat habitat along the Kalang River at the edge of the study area



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Photograph locations

-  Planning Proposal Area
-  Photograph locations and direction



Datum/Projection:
GDA 1994 MGA Zone 56
Project: 18671-TS Date: 5/3/2022



Figure 8: Photograph locations

4.4.2. Fauna species

Twenty-eight fauna species were recorded in the study area during the site inspection including one mammal, 25 birds and two amphibians (Appendix A). These species were generally from a group of species commonly encountered throughout modified to good condition habitats in the region.

The study area contains suitable habitat for a much higher number of native species which may use the study area either regularly or on occasion but were not observed or present during the site inspection.

4.4.3. Threatened fauna

A total of 106 threatened and/or migratory fauna species (listed under the BC Act and/or EPBC Act) were previously recorded or predicted to occur within 10 km of the study area (DPE 2022, DAWE 2022, Appendix B).

No threatened fauna species were recorded during the site inspection, however no targeted surveys were undertaken.

A total of 35 threatened and/or migratory fauna species are considered likely or to have the potential to occur in the study area either regularly or on occasion (Appendix B). These species include a variety of birds (including woodland/forest species, raptors, forest owls and wetland species), terrestrial and arboreal mammals, bats (including microbats and Grey-headed Flying Fox) and a snake.

Targeted surveys for some or all of these species are likely to be required during an impact assessment for future development of the study area following a rezoning if impacts to their potential habitats was proposed.

The remaining threatened fauna species are considered unlikely to occur in the study area based their habitat requirements, distributions and previous records (Appendix B).

4.4.3.1. Bellingen Shire Council Coastal Area Core Koala Management Strategy (KMS)

The KMS only applies to land mapped on the “Core Koala Habitat Map” under the plan. The study area does not contain areas mapped as Core Koala Habitat therefore the KMS does not apply to the study area. The study area is currently zoned RU4, therefore, the provisions of SEPP (Biodiversity and Conservation) 2021, Chapter 4 (Koala Habitat Protection 2021) apply.

Nine Koala use tree species listed under Koala Habitat Protection 2021 for the North Coast Koala Management Area were recorded within the study area including *Allocasuarina torulosa*, *Corymbia intermedia*, *Eucalyptus microcorys*, *E. pilularis*, *E. propinqua*, *E. resinifera*, *E. robusta*, *E. siderophloia* and *Melaleuca quinquenervia*. All PCTs recorded within the study area contain at least one of the above species and are therefore considered potential Koala habitat.

Any future development application for subdivision following a rezoning of the study area would require a Koala Assessment Report prepared by a suitably qualified and experienced person to document the likely and potential impacts of the development on koalas or koala habitat and the proposed management of those impacts.

5. Rezoning and biodiversity constraints assessment

5.1. Proposed rezoning

The proposed rezoning would convert the 36.65 ha of current RU4 (Primary Production Small Lots) zoned land in the study area into 21.38 ha of R5 (Large Lot Residential) zoned land and 15.27 ha of C2 (Environmental Conservation) zoned land. The current zoning is presented in Figure 2, and the proposed zoning is presented in Figure 9.

The majority (75%) of the area of native PCTs within the study area is proposed for C2 (Environmental Conservation) land including all areas of TEC, with the exception of a small patch (0.06 ha) of Subtropical Coastal Floodplain Forest in the east, which could also be retained within the proposed lot at the development application stage. The proposed C2 (Environmental Conservation) zoned areas would also expand on the existing adjoining C2 (Environmental Conservation) areas beyond the study area. Existing cleared land and paddock areas have been prioritised for R5 (Large Lot Residential) development. The areas and percentage of each PCT and TEC within each proposed land use zone are presented in Table 11.

Table 11: Area of each PCT and TEC within the proposed land use zones

PCT / Vegetation Type	TEC	Total Area (ha)	Proposed Conservation - C2 Zone (ha)	Proposed development - R5 Zone (ha)	Percent PCT Retained (%)
PCT 686: Blackbutt - Pink Bloodwood shrubby open forest of the coastal lowlands	Yes	1.06	1	0.06	94
	No	0.5	0.5	0	100
PCT 690: Blackbutt - Tallowwood dry grassy open forest	No	2.06	0.81	1.25	39
PCT 780: Coastal floodplain sedgelands, rushlands, and forblands	Yes	0.46	0.46	0	100
PCT 1064: Paperbark swamp forest of the coastal lowlands	Yes	4.37	4.37	0	100
PCT 1230: Swamp Mahogany swamp forest on coastal lowlands	No	5.5	3.67	1.83	67
PCT 1285: Turpentine moist open forest of the coastal hills and ranges	No	6.03	4.12	1.91	68
Subtotal for PCT areas		19.98	14.93	5.05	75
Cleared	No	0.05	0	0.05	0
Exotic	No	0.11	0	0.11	0
Mixed pasture	No	16.05	0.34	15.71	2
Road	No	0.46	0	0.46	0
Total		36.65	15.27	21.38	

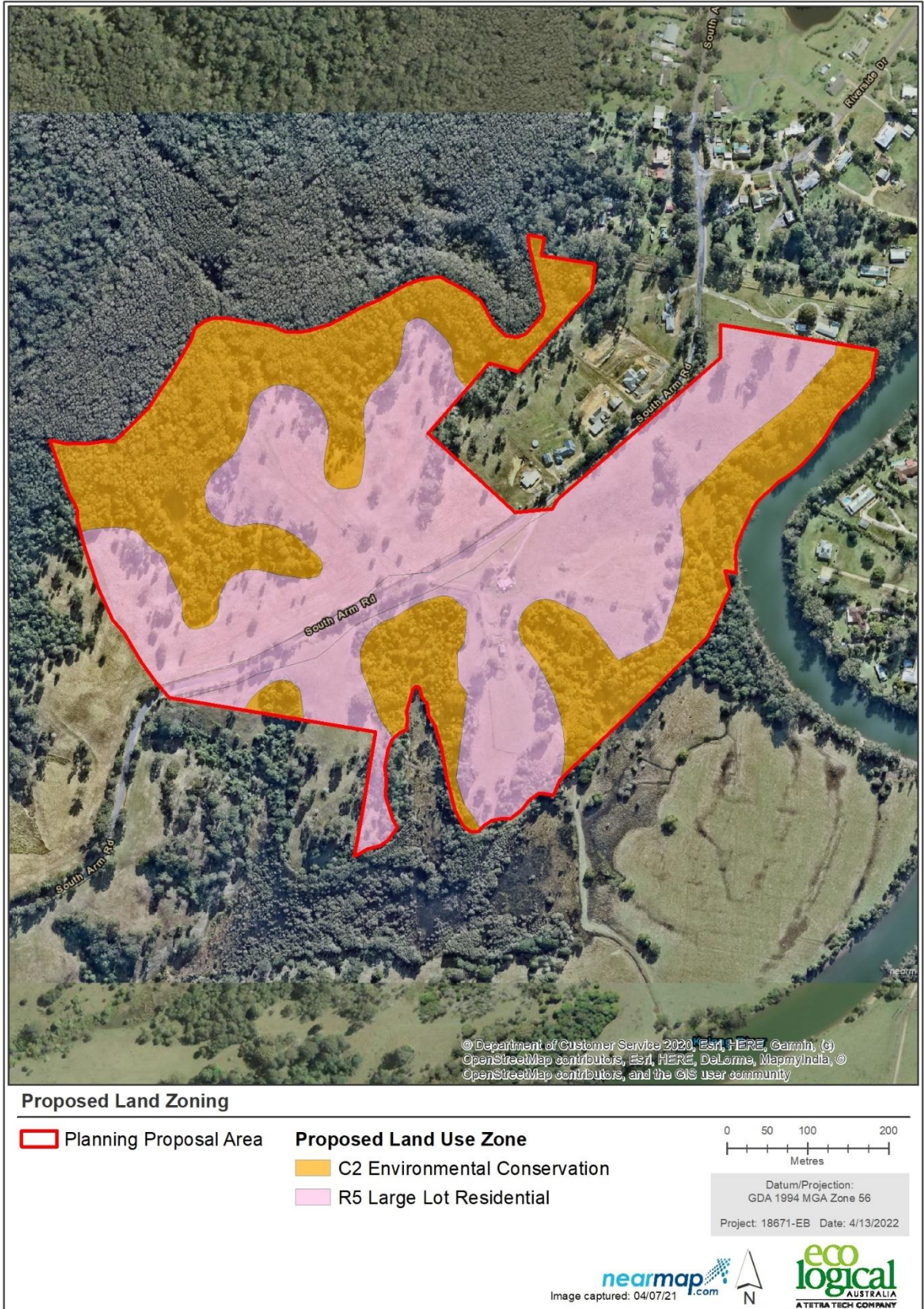


Figure 9: Proposed Land Use Zones

5.2. Biodiversity values and constraints

Biodiversity values within the study area were mapped into biodiversity constraint levels to assist in developing a proposal that avoids and minimises impacts to biodiversity values in accordance with the purposes of the BC Act. The biodiversity constraints data was applied to identify opportunities for rezoning and areas of potential future development have been concentrated in the areas comprising of 'low' biodiversity values.

The constraints mapping was based on field survey data on PCT and TEC mapping and threatened species habitat assessments and consists of the following categories:

- **Low** – cleared areas, exotic vegetation and mixed native/exotic pasture. Generally no habitat opportunities for threatened species
- **Moderate** – native vegetation in moderate or low condition. Limited habitat opportunities for threatened species
- **High** – native vegetation in good condition. Moderate quality habitat for threatened species
- **Very high** – native vegetation that is consistent with a listed TEC and/or high quality habitat for threatened species.

The constraints mapping and proposed C2 (Environmental Conservation) zones are presented in (Figure 10).

An assessment of the biodiversity values in the study area against the High Environmental Values (HEV) criteria for the NSW North Coast under the North Coast Regional Plan was also undertaken. The study area contains several portions of land consistent with the HEV criteria including:

- Coastal Wetlands listed under Chapter 2 Coastal Management of the SEPP (Resilience and Hazards) 2021
- riparian zones
- over-cleared vegetation types
- TECs
- known and potential threatened species habitat.

These values are predominantly proposed for inclusion within C2 (Environmental Conservation) zoned land as described in Table 12.

It is also noted that some areas currently proposed as C2 (Environmental Conservation), such as areas of PCT 1285 and riparian land not containing coastal wetlands, may be suitable for the C3 (Environmental Management) land use zone which would be consistent with the recommendations of the Northern Councils E Zones Review (DPE 2015).

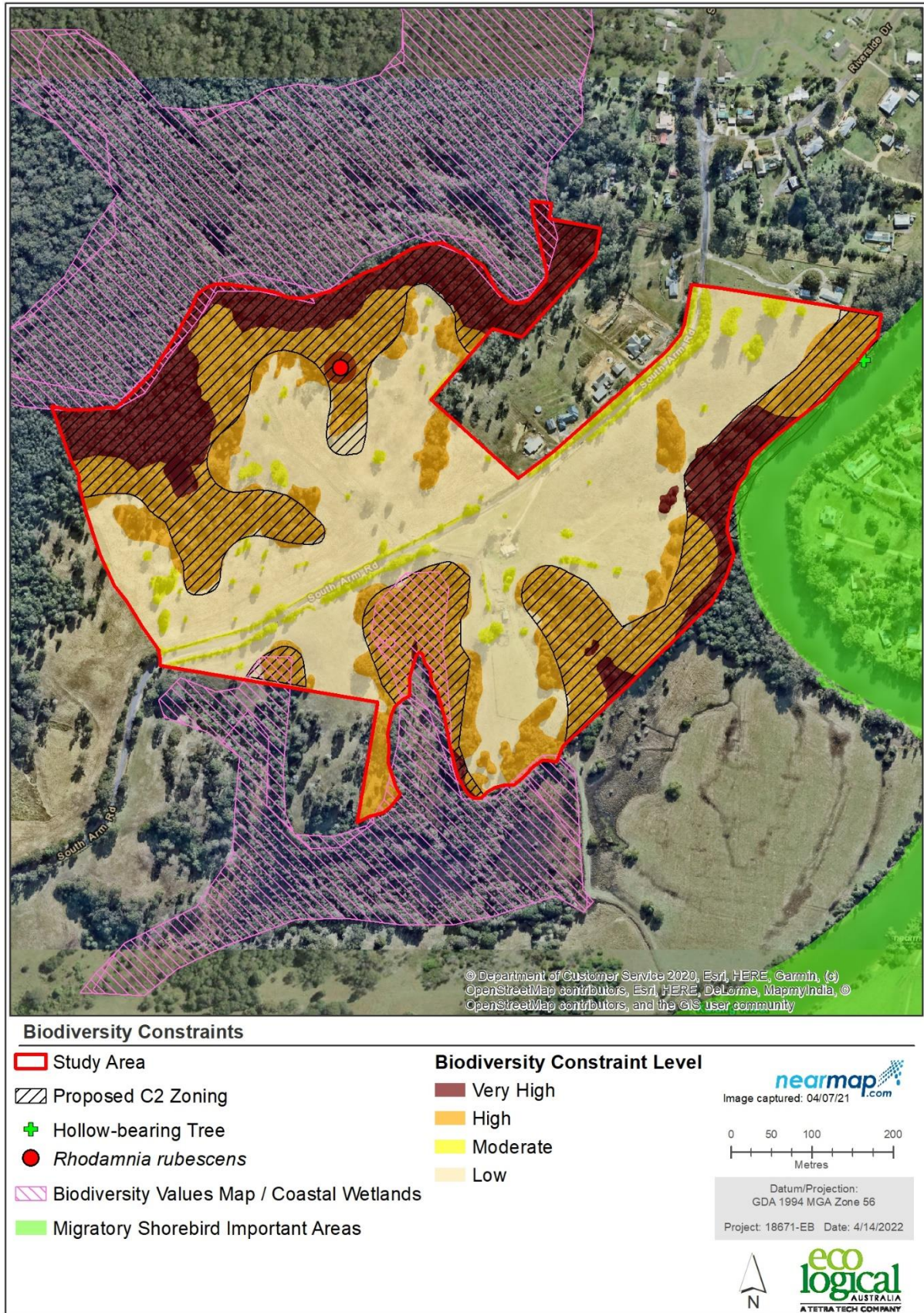


Figure 10: Biodiversity constraints and proposed C2 (Environmental Conservation) zoning

Table 12: High Environmental Value assessment for study area and planning proposal outcomes

Verification Approach	High Environmental Value Criterion	Recommended Verification Method	Assessment for study area	Outcome in relation to Planning Proposal
Desktop	1. Littoral Rainforest, Coastal Wetlands and proximity areas for these mapped by the SEPP (Coastal Management) 2018.	Check the maps of coastal wetlands, littoral rainforests and their proximity areas in the SEPP: (Coastal Management) to identify whether any of these attributes occur on the site.	Coastal Wetlands mapped within the study area. Coastal Wetlands mapping matches Biodiversity Values Map.	All mapped Coastal Wetlands included within C2 (Environmental Conservation) zones.
Desktop	2. Areas of Outstanding Biodiversity Value declared under the BC Act.	Check the list of declared Areas of Outstanding Biodiversity Value to identify whether any occur on the site.	No AOBV present on or near to the study area.	N/A
Desktop	3. Nationally Important Wetlands listed in the Directory of Important Wetlands, including a 50 m wide buffer.	Check the map of Nationally Important Wetlands to identify whether any occur on the site and/or whether a 50m wide buffer to those wetlands intersects the site.	No Nationally Important Wetlands present within the study area. Nearest is 100 Acre Swamp near Macksville.	N/A
Desktop	4. Riparian zones of third order streams and above including a buffer consistent with Appendix 3 of the Biodiversity Assessment Method.	Refer to Appendix 3 of the Biodiversity Assessment Method and use this information to analyse the site for the presence of such riparian zones and their buffers.	Kalang River: 7th order watercourse = 50m riparian buffer Unnamed 3rd order watercourse within forested wetland in north west of the study area: 30m buffer - within TEC area. Other watercourses within the study area are 1st and 2nd order and therefore do not meet the HEV criteria.	50m riparian buffer for Kalang River proposed for C2 (Environmental Conservation) zoned land. 30m riparian buffer for 3 rd order watercourse within forested wetland in north west of the study area is included within proposed C2 (Environmental Conservation) zoned land.

Verification Approach	High Environmental Value Criterion	Recommended Verification Method	Assessment for study area	Outcome in relation to Planning Proposal
Desktop	5. Native vegetation in over-cleared (Mitchell) landscapes (i.e. more than 70% cleared).	a. Identify the Mitchell Landscape in which the site occurs. b. Register and visit the Vegetation Information System Database (VIS). c. Use the VIS to determine whether the % cleared status of the Mitchell Landscape in which the site occurs is above 70%.	Study area is in: Ingalba Coastal Hills (cleared estimate 39%) - Not listed as over-cleared. Manning - Macleay Coastal Alluvial Plains (cleared estimate 54%) - Not listed as over-cleared.	No land within over-cleared landscapes is included within the rezoning area.
Desktop	6. Key habitats for threatened species including: Important habitat of migratory and vagrant species mapped for the Biodiversity Offsets Scheme.	Check Important Area Mapping (IAM) to identify whether any of these mapped areas occur on the site. IAM is available via a Map Viewer obtained by logging into the Biodiversity Offsets Agreement Management System.	Migratory Shorebird Important Habitat Mapped along Kalang River directly bordering study area.	Kalang River and therefore mapped Migratory Shorebird habitat has proposed 50m buffer of C2 (Environmental Conservation) land between river/mapped area and proposed R5 (Large Lot Residential) zoned land.
Fieldwork and analysis	1. Over-cleared vegetation types identified in the VIS as more than 70% cleared.	a. Identify Plant Community Types (PCTs) on the site through fieldwork. b. Register and visit the VIS database c. Use the VIS to determine whether the % cleared status of the PCTs identified through fieldwork on the site is above 70%.	Percent cleared status (from VIS) for PCTs recorded within the study area are shown below: <ul style="list-style-type: none"> • PCT 686: 50% • PCT 690: 55% • PCT 780: 80% • PCT 1064: 75% • PCT 1230: 75% • PCT 1285: 55% 	Three over-cleared PCTs are present: PCT 780: All areas are proposed for C2 (Environmental Conservation) zoning. PCT 1064: All areas are proposed for C2 (Environmental Conservation) zoning. PCT 1230: 1.83 ha (33%) of occurrence within study area is proposed for R5 zoning with the remaining 3.67 ha proposed for C2 (Environmental Conservation) zoning. The majority of area of this PCT proposed for R5 (Large Lot Residential) is lower condition regrowth and scattered paddock trees.

Verification Approach	High Environmental Value Criterion	Recommended Verification Method	Assessment for study area	Outcome in relation to Planning Proposal
Fieldwork and analysis	2. Threatened Ecological Communities (TECs) identified in the Vegetation Information System database or by comparison with the NSW Threatened Species Scientific Committee's Final Determinations.	<p>a. Identify Plant Community Types (PCTs) on the site through fieldwork.</p> <p>b. Register and visit the VIS database</p> <p>c. Use the VIS to determine whether the PCTs have TEC Status.</p> <p>d. If not identified as a TEC from steps a – c above, then refer to the NSW Threatened Species Scientific Committee determinations to consider whether the PCT accords with the determinations.</p>	Three TECs recorded in the study area and mapped as Very High Biodiversity Constraint in constraints assessment.	All TECs within the study area are included within the proposed C2 (Environmental Conservation) zone, with the exception of a small patch (0.06 ha) of Subtropical Coastal Floodplain Forest in the east, which could also be retained within the proposed lot at the development application stage.
Fieldwork and analysis	3. Key habitats for threatened species including: a. Breeding habitats of both species credit species and ecosystem credit species with known breeding occurrence – from existing BioNET records and/or field work.	Refer to BioNET records and undertake fieldwork.	<p>One threatened species recorded in the study area – <i>Rhodamnia rubescens</i> (critically endangered BC Act and EPBC Act).</p> <p>Potential for additional species to occur, particularly in higher condition areas.</p>	<p>Location of known individual <i>Rhodamnia rubescens</i> is retained within proposed C2 (Environmental Conservation) zone.</p> <p>Majority of potential habitat for other threatened species retained in proposed C2 (Environmental Conservation) zoned areas.</p>
Fieldwork and analysis	b. Core Koala Habitat - from existing mapping and/or field work.	<p>a. Check existing Core Koala Habitat mapping in DPE approved Koala Plans of Management and, where necessary, follow any processes set out in these plans for identifying Core Koala Habitat.</p> <p>b. If the site is not in the area covered by a DPE approved Koala Plan of Management, then undertake fieldwork in accordance with SEPP (Koala Habitat Protection) 2020 to determine whether Core Koala Habitat is present on the site.</p>	Nine Koala use tree species listed under Koala Habitat Protection 2021 for the North Coast Koala Management Area were recorded within the study and all PCTs recorded contain at least one Koala use tree species. The study area contains potential Koala habitat and further surveys would be required to determine whether core Koala habitat is present.	<p>The majority (75%) of forest areas that represent potential Koala habitat within the study area is proposed for C2 (Environmental Conservation) zoning.</p> <p>The areas proposed for R5 (Large Lot Residential) zoning include a large proportion of lower quality habitat in isolated trees, smaller patches within paddock area and regenerating habitat at the edges of larger remnants.</p>

Verification Approach	High Environmental Value Criterion	Recommended Verification Method	Assessment for study area	Outcome in relation to Planning Proposal
Fieldwork and analysis	c. Breeding, foraging and/or congregation habitats for migratory shorebird species with known occurrence – from existing Bionet records and/or field work.	Refer to BioNET records and undertake fieldwork.	<p>Kalang River intertidal zone (adjacent to the study area) is considered marginal potential foraging habitat for migratory shorebirds, with only a narrow strip of mudflat <5m present at low tide. No known roost sites are present in the vicinity of the study area and suitable high tide roost habitat for a large number of individuals is not present due to poor visibility and potential for predators to ambush shorebirds.</p> <p>Few records of migratory shorebirds are present in the locality.</p>	A buffer of approximately 50 m of C2 (Environmental Conservation) zoned land is proposed between the Kalang River (migratory shorebird potential habitat) and R5 (Large Lot Residential) zoned land.
Fieldwork and analysis	d. Known habitat for populations of species-credit species (species-credit species are identified in the Threatened Biodiversity Data Collection) – from existing Bionet records and/or field work.	Refer to BioNET records and undertake fieldwork.	<p><i>Rhodamnia rubescens</i> (critically endangered) recorded within the study area.</p> <p>Records of other threatened flora and fauna species nearby and with potential habitat present within the study area.</p>	<p>Known <i>Rhodamnia rubescens</i> habitat included within proposed C2 (Environmental Conservation) zoned land.</p> <p>Other proposed C2 (Environmental Conservation) zoned land areas contain the highest quality habitats for other threatened flora and fauna species which have potential to occur in the study area.</p>

5.3. Serious and Irreversible Impacts (SAII)

The BC Act requires a consent authority to consider whether a development will have a Serious and Irreversible Impact (SAII) on biodiversity values. If the consent authority considers a local development (under Part 4 of the EP&A Act) is likely to have an SAII it must refuse the application.

Initial assessment of SAII candidate entities was undertaken to inform this assessment. No TECs identified within the study area are candidates for SAII. The PCTs identified within the study area were input into the BAM-Calculator to generate a list of SAII candidate species associated with the study area. Based on initial assessment the proposed rezoning is unlikely to be considered unlikely to result in a SAII (Table 13). The majority of potential habitats for candidate SAII species is proposed for C2 (Environmental Conservation) zoning.

For future development of the study area, further field surveys in accordance with the BAM may be required to determine the presence of SAII candidate species.

Table 13: Preliminary assessment of candidate Serious and Irreversible Impact (SAII) species

Species Name	Common Name	BC Act Status	EPBC Act Status	Restrictions	Potential for SAII
<i>Acacia chrysotricha</i>	Newry Golden Wattle	E		Nil	Unlikely – species occurs in steep narrow gullies which do not occur within the proposed R5 (Large Lot Residential) zoned area.
<i>Acronychia littoralis</i>	Scented Acronychia	E	E	Nil	Unlikely – suitable littoral rainforest habitat for this species is not present.
<i>Alexfloydia repens</i>	Floyd’s Grass	E		Nil	Unlikely – species occurs in swamp sclerophyll forest which has been included within C2 (Environmental Conservation) zones.
<i>Anthochaera Phrygia</i>	Regent Honeyeater	CE	CE	Mapped Important Areas only	Unlikely – no mapped important area present and minimal impacts to trees proposed.
<i>Argynnis hyperbius</i>	Laced Fritillary	E	CE	Nil	Unlikely – Swampy areas which may contain potential habitat are included within C2 (Environmental Conservation) zones.
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	V	V	Nil	Unlikely – no suitable rocky cliff line breeding habitat in study area or nearby.
<i>Lathamus discolor</i>	Swift Parrot	E	CE	Mapped Important Areas only	Unlikely – no mapped important area present and minimal impacts to trees proposed.
<i>Miniopterus australis</i>	Little Bent-winged Bat	V		Breeding habitat only	Unlikely – no breeding habitat in the form of caves, cliffs or karst is present within the study area or known nearby.

Species Name	Common Name	BC Act Status	EPBC Act Status	Restrictions	Potential for SAI
<i>Miniopterus orianae oceanensis</i>	Large Bent-winged Bat	V		Breeding habitat only	Unlikely – no breeding habitat in the form of caves, cliffs or karst is present within the study area or known nearby.
<i>Numenius madagascariensis</i>	Eastern Curlew		CE, M	Mapped Important Areas only	Unlikely – mapped important habitat along Kalang River will not be impacted and a buffer of C2 (Environmental Conservation) land between the river and R5(Large Lot Residential) land is proposed. The narrow mudflat habitat does not provide suitable roosting habitat for the species and only provides a small area of occasional foraging habitat.
<i>Oberonia complanata</i>	Yellow-flowered King of the Fairies	E		Nil	Unlikely – species only known from north of Coffs Harbour. Majority of potential habitat proposed to be zoned C2 (Environmental Conservation).
<i>Petalura litorea</i>	Coastal Petaltail	E		Nil	Unlikely – swamp habitats have been included as C2 (Environmental Conservation).
<i>Rhodamnia rubescens</i>	Scrub Turpentine	CE	CE	Nil	Unlikely – known individual and majority of surrounding habitat proposed for retention in C2 (Environmental Conservation) area.
<i>Rhodomlyrtus psidioides</i>	Native Guava	CE	CE	Nil	Unlikely – majority of potential habitat included within C2 (Environmental Conservation) area.

5.4. Commonwealth EPBC Act considerations

The following threatened and migratory species listed as MNES under the EPBC Act are known or considered to have potential to occur in the study area (Appendix B):

- *Arthraxon hispidus* (Hairy Jointgrass) - vulnerable
- *Hicksbeachia pinnatifolia* (Red Boppel Nut) - vulnerable
- *Marsdenia longiloba* (Slender Marsdenia) - vulnerable
- *Parsonsia dorrigoensis* (Milky Silkpod) - endangered
- *Phaius australis* (Southern Swamp Orchid) - endangered
- *Rhodamnia rubescens* (Scrub Turpentine) - critically endangered
- *Rhodomlyrtus psidioides* (Native Guava) - critically endangered
- *Tylophora woollsii* (Cryptic Forest Twiner) - endangered
- Australasian Bittern (*Botaurus poiciloptilus*) - endangered
- Spotted-tailed Quoll (*Dasyurus maculatus*) - endangered
- White-throated Needletail (*Hirundapus caudacutus*) - vulnerable, migratory

- Koala (*Phascolarctos cinereus*) - endangered
- Long-nosed Potoroo (*Potorous tridactylus*) - vulnerable
- Grey-headed Flying-fox (*Pteropus poliocephalus*) - vulnerable
- Migratory species
 - Sharp-tailed Sandpiper (*Calidris acuminata*)
 - Latham's Snipe (*Gallinago hardwickii*)
 - Fork-tailed Swift (*Apus pacificus*).

A development application for subdivision or development of the study area following rezoning would require assessment of the above species for which potential or known habitat would be impacted. The majority and highest quality areas of potential habitat for these species within the study area is proposed for C2 (Environmental Conservation) zoning.

No TECs listed under the EPBC Act were recorded within the study area.

5.5. Biodiversity assessment pathway of future development

The proponent for a local development under Part 4 of the EP&A Act must determine whether the Biodiversity Offsets Scheme (BOS) applies to their proposal. Development proposals that trigger the BOS need to submit a BDAR prepared by an Accredited Assessor in accordance with the BAM. If the development does not trigger the BOS, but impacts to biodiversity are likely, a Flora and Fauna Assessment would be required to assess the potential impacts of the proposal.

Following a rezoning of the study area, a subdivision of R5 (Large Lot Residential) land is likely to occur. A subdivision development application must consider the clearing of native vegetation that, in the opinion of the consent authority, is required or likely to be required for the future land use. An initial assessment of the BOS thresholds for a potential subdivision of the study area based on the proposed rezoning is provided below.

5.5.1. Triggering the Biodiversity Offsets Scheme

For a local development under Part 4 of the EP&A Act, the BOS and BAM may be triggered by any one of the following thresholds:

- Area clearing threshold
- Biodiversity Value Map threshold
- Threatened species test of significance.

5.5.1.1. Biodiversity Offsets Scheme – Area Clearing Threshold

The area clearing threshold is triggered when an area of native vegetation to be cleared reaches the thresholds for the relevant lot size Table 14.

Table 14: Area clearing threshold

Minimum lot size associated with the property	Threshold for clearing native vegetation*, above which the BAM and offsets scheme apply
Less than 1 ha	0.25 ha or more
1 ha to less than 40 ha	0.5 ha or more
40ha to less than 1000 ha	1 ha or more

Minimum lot size associated with the property	Threshold for clearing native vegetation*, above which the BAM and offsets scheme apply
1000 ha or more	2 ha or more

* **Note:** native vegetation is defined in Section 1.6 of the BC Act (and has the same meaning as in Part 5A of the *Local Land Services Act 2013*); essentially encompassing any species native to NSW and does not necessarily conform to a PCT.

The minimum lot size listed for R5 (Large Lot Residential) portions of the study area would likely be 1 ha. Thus, if a proposed subdivision/development clears more than 0.5 ha of native vegetation, the BOS is triggered and a BDAR will be required. It is likely that a subdivision application (including all future intended uses of the proposed lots) would result in the clearing of greater than 0.5 ha of native vegetation. Therefore, the BOS is likely to be triggered.

It is important to note that although patches of native vegetation are present within the proposed R5 (Large Lot Residential) land, these areas generally represent the lower condition portions of the site such as scattered trees and regeneration, and in addition it is likely that a large proportion of these areas of native vegetation can be retained within future development of the site.

5.5.1.2. Biodiversity Offsets Scheme – Biodiversity Values Map Threshold

The Biodiversity Values Map (BV Map) identifies land with high biodiversity value, as defined by the *Biodiversity Conservation Regulation 2017*. The BOS applies to all local developments, major projects or the clearing of native vegetation where the *State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017* applies. Any of these will require entry into the BOS if they occur on land mapped on the BV Map.

The study area contains several Biodiversity Values mapped areas on the BV Map at the time of reporting (April 2022). The rezoning proposal includes two small areas of BV mapped land within the proposed R5 (Large Lot Residential) land (Figure 10), therefore the BOS BV map threshold may be triggered. However, due to their small area and location of these BV mapped areas at the edge of the proposed R5 land, a future development application for subdivision has the potential to avoid impacts to BV mapped areas.

5.5.1.3. Biodiversity Offsets Scheme – Threatened Species Test of Significance Threshold

A number of threatened species have potential to occur within the study area. Tests of significance were not conducted at this planning proposal stage, however the land within the study area proposed for R5 (Large Lot Residential) development is centred around cleared land and the lowest quality habitats, with the majority of native vegetation and potential threatened species habitats to be protected within C2 (Environmental Conservation) zoned areas.

5.5.2. Likely biodiversity assessment pathway

It is likely that subdivision/development of the study area following a rezoning would trigger the BOS through the area clearing threshold and potentially the BV Map threshold. Therefore, the biodiversity impacts of the development would be assessed using the BAM through preparation of a BDAR. Not all impacts require offset, however those that do must be offset by retiring biodiversity credits under the BOS which can be achieved via a number of mechanisms as outlined in Section 8.3 of the BC Act. The options for the retirement of biodiversity credits include:

- Establish a Biodiversity Stewardship Site and retire credits

- Purchasing and retire matching credits from the market
- Paying an equivalent amount (market value for credits required) to the Biodiversity Conservation Fund (BCF).

The BOS and BAM are also accredited under the EPBC Act.

5.5.2.1. Local controls

If the Planning Proposal is supported, it is expected that the land is further developed in accordance with the BLEP (2010) and guided by the development controls within the Bellingen Development Control Plan (BDCP) 2017. In which case, it is likely that the land proposed to be rezoned to have a “conservation” land zoning will be retained in one lot in accordance with Clause 4.1AC of the BLEP (2010) or alternatively incorporated into a single allotment (being common property) pursuant of a community title subdivision. The high environmental values land would be maintained with conserved, as directed by the BDCP (2017), in accordance with a suitable management plan approved by Council.

6. Conclusion

ELA was engaged to prepare flora and fauna assessment to accompany a Planning Proposal for the study area. This included the preparation of a biodiversity constraints assessment which was key to informing the design of the Planning Proposal. Areas of high biodiversity constraint, including areas consistent with High Environmental Value land under the NCRP, are prioritised for increased protection as C2 (Environmental Conservation) zone, and areas of lower biodiversity constraint are proposed for R5 (Large Lot Residential) zoning. This process has allowed the Planning Proposal to incorporate the 'avoid and minimise impacts' principles of the BC Act and also achieve the NCRP regional priority for the Bellingen Shire to identify additional housing land supply within proximity to Urunga.

The Planning Proposal includes retention of approximately 98% of the area of TEC and 75% of the native PCTs vegetation within the C2 (Environmental Conservation) zone. The proposed R5 (Large Lot Residential) areas are predominantly cleared paddocks, with native vegetation in this area generally restricted to lower condition areas including regenerating vegetation, small patches and isolated trees.

Based on the biodiversity values identified to date and initial assessment of these values, it is considered unlikely that a significant impact to BC Act and EPBC Act species and communities would occur from the Planning Proposal, particularly as the majority of high and very high biodiversity value areas are proposed for the C2 (Environmental Conservation) zone.

Future subdivision and development of the study area would likely be assessed under the BOS with offsets required for residual impacts to biodiversity values to achieve a 'no net loss' outcome.

References

Bellingen Shire Council (BSC), 2017. Bellingen Shire Council Coastal Area Core Koala Management Strategy (KMS). Bellingen Shire Council, Bellingen.

Department of Agriculture, Water and the Environment (DAWE), 2022. Protected Matters Search Tool. Retrieved from Australian Government - Department of Environment and Energy: <http://www.environment.gov.au/webgis-framework/apps/pmst/pmst-coordinate.jsf> Australian Government, Department of Agriculture, Water and the Environment, Canberra.

Department of Agriculture, Water and the Environment (DAWE), 2022. Species Profile and Threats Database. <http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl> Australian Government, Department of Agriculture, Water and the Environment, Canberra.

Department of Planning and Environment (DPE) 2015. Northern Councils E Zone Review Final Recommendations Report. NSW Department of Planning and Environment, Sydney.

Department of Planning and Environment (DPE) 2021. NSW Vegetation Information System: Classification. Retrieved from <http://www.environment.nsw.gov.au/research/Visclassification.htm>

Department of Planning and Environment (DPE) 2022. BioNet Atlas. Database of flora and fauna records (formerly known as the NSW Wildlife Atlas and Threatened Species Profile Database). www.BioNet.nsw.gov.au.

Department of Planning and Environment (DPE) 2022. BioNet Threatened Species Profile Database. www.BioNet.nsw.gov.au.

Department of Planning, Industry and Environment (DPIE) 2017. *The North Coast Regional Plan 2036* NSW Department of Planning Industry and Environment, Sydney.

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

GHD 2007, *Bellingen Shire Growth Management Strategy*. Prepared for Bellingen Shire Council. GHD.

NSW Office of Environment and Heritage (OEH) (2013). Plant Community Type Mapping (PCT) in the Bellingen Local Government Area. Office of Environment and Heritage, Coffs Harbour NSW Australia.

Appendix A Flora and Fauna species recorded

Flora species recorded during site inspection

Species	Common Name	BC Act/EPBC Act Status	Exotic (*)	KFT#
<i>Acacia floribunda</i>	White Sally Wattle			
<i>Acacia binervata</i>	Two-veined Hickory			
<i>Acmena smithii</i>	Lilly Pilly			
<i>Acronychia oblongifolia</i>	White Aspen			
<i>Allocasuarina torulosa</i>	Forest Oak			
<i>Alphitonia excelsa</i>	Red Ash			
<i>Andropogon virginicus</i>	Whisky Grass		*	
<i>Araucaria cunninghamii</i>	Hoop Pine			
<i>Asplenium australasicum</i>	Bird's Nest Fern			
<i>Banksia integrifolia</i> subsp. <i>integrifolia</i>	Coastal Banksia			
<i>Blechnum</i> sp.				
<i>Breynia oblongifolia</i>	Coffee Bush			
<i>Callistemon salignus</i>	Willow Bottlebrush			
<i>Casuarina glauca</i>	Swamp Oak			
<i>Cayratia clematidea</i>	Native Grape			
<i>Cinnamomum camphora</i>	Camphor Laurel		*	
<i>Cissus hypoglauca</i>	Giant Water Vine			
<i>Corymbia intermedia</i>	Pink Bloodwood			
<i>Cupaniopsis anacardioides</i>	Tuckeroo			
<i>Cyathea australis</i>	Rough Treefern			
<i>Elaeocarpus reticulatus</i>	Blueberry Ash			
<i>Eleocharis sphacelata</i>	Tall Spike Rush			
<i>Eucalyptus microcorys</i>	Tallowwood			Primary
<i>Eucalyptus pilularis</i>	Blackbutt			
<i>Eucalyptus propinqua</i>	Small-fruited Grey Gum			Primary
<i>Eucalyptus resinifera</i> subsp. <i>hemilampra</i>	Red Mahogany			
<i>Eucalyptus robusta</i>	Swamp Mahogany			Primary
<i>Eucalyptus siderophloia</i>	Grey Ironbark			
<i>Eupomatia laurina</i>	Bolwarra			
<i>Ficus</i> sp.				
<i>Gahnia clarkei</i>	Tall Saw-sedge			
<i>Glochidion ferdinandi</i> var. <i>ferdinandi</i>	Cheese Tree			
<i>Guioa semiglauca</i>	Guioa			
<i>Gynochthodes jasminoides</i>	Sweet Morinda			
<i>Hibbertia scandens</i>	Climbing Guinea Flower			
<i>Homalanthus populifolius</i>	Native Poplar			
<i>Hypolepis muelleri</i>	Harsh Ground Fern			
<i>Imperata cylindrica</i>	Blady Grass			
<i>Jagera pseudorhus</i> var. <i>pseudorhus</i>	Foambark Tree			
<i>Juncus kraussii</i> subsp. <i>australiensis</i>	Sea Rush			
<i>Lantana camara</i>	Lantana		*	
<i>Lomandra longifolia</i>	Spiny-headed Mat-rush			

Species	Common Name	BC Act/EPBC Act Status	Exotic (*)	KFT#
<i>Lophostemon confertus</i>	Brush Box			
<i>Melaleuca linariifolia</i>	Flax-leaved Paperbark			
<i>Melaleuca quinquenervia</i>	Broad-leaved Paperbark			
<i>Melicope elleryana</i>	Pink-flowered Doughwood			
<i>Microlaena stipoides</i>	Weeping Grass			
<i>Notelaea longifolia</i>	Large-mock Olive			
<i>Ochna serrulata</i>	Mickey Mouse Plant		*	
<i>Oplismenus aemulus</i>	Basket Grass			
<i>Parsonsia straminea</i>	Common Silkpod			
<i>Paspalum mandiocanum</i>	Broadleaf Paspalum		*	
<i>Persicaria decipiens</i>	Slender Knotweed			
<i>Philydrum lanuginosum</i>	Frogsmouth			
<i>Pittosporum revolutum</i>	Rough Fruit Pittosporum			
<i>Platyserium bifurcatum</i>	Elkhorn Fern			
<i>Pteridium esculentum</i>	Bracken			
<i>Rhodamnia rubescens</i>	Scrub Turpentine	CE (BC Act and EPBC Act)		
<i>Senecio madagascariensis</i>	Fireweed		*	
<i>Setaria sphacelata</i>	South African Pigeon Grass		*	
<i>Smilax australis</i>	Lawyer Vine			
<i>Smilax glyciophylla</i>	Sweet Sarsparilla			
<i>Solanum mauritianum</i>	Wild Tobacco Bush		*	
<i>Syncarpia glomulifera</i> subsp. <i>glomulifera</i>	Turpentine			
<i>Synoum glandulosum</i> subsp. <i>glandulosum</i>	Scentless Rosewood			
<i>Tabernaemontana pandacaqui</i>	Banana Bush			
<i>Zieria smithii</i>	Sandfly Zieria			

Notes: # KFT = Koala food tree, Bellingen Shire Council Coastal Area Koala Management Strategy (BCS 2014)

Fauna species recorded during the site inspection

Species Name	Common Name
Mammals	
<i>Macropus giganteus</i>	Eastern Grey Kangaroo
Amphibians	
<i>Crinia signifera</i>	Clicking Froglet
<i>Litoria fallax</i>	Eastern Dwarf Tree Frog
Avifauna	
<i>Acanthiza pusilla</i>	Brown Thornbill
<i>Acanthorhynchus tenuirostris</i>	Eastern Spinebill
<i>Alectura lathami</i>	Scrub Turkey
<i>Anas superciliosa</i>	Pacific Black Duck
<i>Cacomantis flabelliformis</i>	Fan-tailed Cuckoo
<i>Calyptorhynchus funereus</i>	Yellow-tailed Black Cockatoo
<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike
<i>Dacelo novaeguineae</i>	Laughing Kookaburra
<i>Eopsaltria australis</i>	Eastern Yellow Robin
<i>Geopelia humeralis</i>	Bar-shouldered Dove
<i>Malurus lamberti</i>	Variiegated Fairywren
<i>Manorina melanocephala</i>	Noisy Miner
<i>Neochmia temporalis</i>	Red-browed Finch
<i>Pachycephala pectoralis</i>	Golden Whistler
<i>Pardalotus striatus</i>	Striated Pardalote
<i>Petroica rosea</i>	Rose Robin
<i>Philemon corniculatus</i>	Noisy Friarbird
<i>Phylidonyris niger</i>	White-cheeked Honeyeater
<i>Porphyrio porphyrio</i>	Purple Swamphen
<i>Psophodes olivaceus</i>	Eastern Whipbird
<i>Rhipidura albiscapa</i>	Grey Fantail
<i>Sericornis magnirostra</i>	Large-billed Scrubwren
<i>Sericulus chrysocephalus</i>	Regent Bowerbird
<i>Trichoglossus moluccanus</i>	Rainbow Lorikeet
<i>Vanellus miles</i>	Masked Lapwing

Appendix B Likelihood of occurrence

Threatened Ecological Community likelihood table

Community Name	BC Act Status	EPBC Act Status	Description	Habitat	Likelihood of occurrence
Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E	V	Characteristic plants include <i>Baumea juncea</i> , <i>Juncus kraussii</i> subsp. <i>australiensis</i> (Sea Rush), <i>Sarcocornia quinqueflora</i> subsp. <i>quinqueflora</i> (Samphire), <i>Sporobolus virginicus</i> (Marine Couch), <i>Triglochin striata</i> (Streaked Arrowgrass), <i>Ficinia nodosa</i> (Knobby Club-rush), <i>Samolus repens</i> (Creeping Brookweed), <i>Selliera radicans</i> (Swamp Weed), <i>Suaeda australis</i> (Seablite) and <i>Zoysia macrantha</i> (Prickly Couch).	Occurs in the intertidal zone along the NSW coast.	No, not recorded during site inspection.
Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E		Dominated by herbaceous plants and have very few woody species. Areas that lack standing water most of the time are usually dominated by dense grassland or sedgeland vegetation.	Known from along the majority of the NSW coast.	Yes, recorded during site inspection.
Littoral Rainforest and Coastal Vine Thickets of Eastern Australia	E	CE	Typically is a closed canopy of trees that can be interspersed with canopy gaps that are common in exposed situations or with storm events. The canopy forms a mosaic due to canopy regeneration, typically in the form of basal coppice following canopy decapitation due to prevailing salt laden winds and storm events. Emergents may be present, for example, <i>Banksia</i> or <i>Eucalyptus</i> . The ground stratum of the vegetation typically is very sparse.	Typically occurs within two kilometres of the coast; in NSW, found in the NSW North Coast, Sydney Basin and South East Corner bioregions.	No, not recorded during site inspection.
Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E	CE	Littoral Rainforest is generally a closed forest, the structure and composition of which is strongly influenced by its proximity to the ocean. The plant species of this community are predominantly rainforest species. While the canopy is dominated by rainforest species, scattered emergent individuals of sclerophyll species, such as <i>Angophora costata</i> , <i>Banksia integrifolia</i> , <i>Eucalyptus botryoides</i> and <i>Eucalyptus tereticornis</i> occur in many stands. There is considerable floristic variation between stands.	Occurs only on the coast, mostly within two kilometres of the sea though occasionally further inland. Found at locations in the NSW North Coast Bioregion, Sydney Basin	No, not recorded during site inspection.

Community Name	BC Act Status	EPBC Act Status	Description	Habitat	Likelihood of occurrence
				Bioregion and South East Corner Bioregion.	
Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions	E	CE	In a relatively undisturbed state, the community has a closed canopy, characterised by a high diversity of trees whose leaves may be mesophyllous and encompass a wide variety of shapes and sizes. Typically, the trees form three major strata: emergents, canopy and sub-canopy which, combined with variations in crown shapes and sizes results in an irregular canopy appearance. The trees are taxonomically diverse at the genus and family levels, and some may have buttressed roots. A range of plant growth forms are present, including palms, vines and vascular epiphytes.	From the NSW north coast south to the Hawkesbury River.	No, not recorded during site inspection.
Lowland Rainforest of Subtropical Australia	E	CE	Generally a moderately tall to tall closed forest. Buttresses are common as is an abundance and diversity of vines. The canopy is often multilayered consisting of an upper, discontinuous layer of emergents, composed of species such as <i>Araucaria cunninghamii</i> (Hoop Pine), <i>Ficus</i> spp. (Figs), <i>Lophostemon confertus</i> (Brushbox), and in some sites, <i>Eucalyptus</i> spp., over the main canopy and subcanopy. The canopy/subcanopy layer may include hoop pine, figs, <i>Argyrodendron trifoliolatum</i> (White Booyong), <i>Castanospermum australe</i> (Black Bean), <i>Cryptocarya obovata</i> (White Walnut), <i>Dendrocnide excelsa</i> (Giant Stinging Tree), <i>Diploglottis australis</i> (Native Tamarind), <i>Dysoxylum fraserianum</i> (Rosewood), <i>Dysoxylum mollissimum</i> (Red Bean), <i>Elattostachys nervosa</i> (Green Tamarind), <i>Endiandra pubens</i> (Hairy Walnut), <i>Flindersia schottiana</i> (Bumpy Ash), <i>Gmelina leichhardtii</i> (White Beech). The understorey contains a sparse layer of species such as <i>Cordyline stricta</i> (Narrow-leaved Palm Lily), <i>Linospadix monostachya</i> (Walking Stick Palm), <i>Neolitsea dealbata</i> (White Bolly Gum), <i>Notelaea johnsonii</i> (Veinless Mock Olive), <i>Pittosporum multiflorum</i> (Orange Thorn), <i>Triunia youngiana</i> (Native Honey-suckle Bush), <i>Wilkiea austroqueenslandica</i> (Smooth Wilkiea) and <i>Wilkiea huegeliana</i> (Veiny Wilkiea).	From Qld to the Clarence River (near Grafton) in northern NSW. Also isolated areas between the Clarence River and Hunter River such as the Bellinger and Hastings valleys.	No, not recorded during site inspection.
Subtropical and Temperate Coastal Saltmarsh		V	Consists mainly of salt-tolerant vegetation (halophytes) including: grasses, herbs, sedges, rushes and shrubs. Succulent herbs, shrubs and grasses generally dominate and vegetation is generally of less than 0.5 m height (with the exception of some reeds and sedges). Many species of non-vascular plants are also found in saltmarsh,	Within a relatively narrow margin of the Australian coastline, within the subtropical	No, not recorded during site inspection.

Community Name	BC Act Status	EPBC Act Status	Description	Habitat	Likelihood of occurrence
			including epiphytic algae, diatoms and cyanobacterial mats. In New South Wales, the lower intertidal zone is often dominated by herbs and grasses (e.g. <i>Sarcocornia quinqueflora</i> , <i>Sporobolus virginicus</i> , <i>Samolus repens</i> and <i>Triglochin striata</i>) which give way to tall sedges and rushes in the landward sections of the intertidal zone.	and temperate climatic zones south of the South-east Queensland IBRA bioregion.	
Subtropical Coastal Floodplain Forest of the New South Wales North Coast Bioregion	E		The composition of the tree stratum (which may exceed 40 m in height) varies considerably, but the most widespread and abundant dominant trees include <i>Eucalyptus tereticornis</i> , <i>E. siderophloia</i> , <i>Corymbia intermedia</i> and, north of the Macleay floodplain, <i>Lophostemon suaveolens</i> . A layer of small trees may be present, including <i>Allocasuarina torulosa</i> , <i>Alphitonia excelsa</i> , <i>Glochidion ferdinandi</i> , <i>Callistemon</i> spp., <i>Melaleuca</i> spp. and <i>Casuarina glauca</i> . Scattered shrubs include <i>Breynia oblongifolia</i> , <i>Acacia concurrens</i> , <i>Commersonia</i> spp., and <i>Hibiscus</i> spp. Occasional vines include <i>Eustrephus latifolius</i> , <i>Parsonsia straminea</i> and <i>Geitonoplesium cymosum</i> . The groundcover is composed of abundant forbs, scramblers and grasses.	Coastal floodplains of the North Coast of NSW.	Present
Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E		The structure of the community may vary from open forests to low woodlands, scrubs or reedlands with scattered trees. It has a dense to sparse tree layer in which <i>Casuarina glauca</i> (swamp oak) is the dominant species northwards from Bermagui. Other trees including <i>Acmena smithii</i> , <i>Glochidion</i> spp. and <i>Melaleuca</i> spp. may be present as subordinate species and are found most frequently in stands of the community northwards from Gosford. <i>Melaleuca ericifolia</i> is the only abundant tree in this community south of Bermagui. The understorey is characterised by frequent occurrences of vines, <i>Parsonsia straminea</i> , <i>Geitonoplesium cymosum</i> and <i>Stephania japonica</i> var. <i>discolor</i> , a sparse cover of shrubs, and a continuous groundcover of forbs, sedges, grasses and leaf litter. The composition of the ground stratum varies depending on levels of salinity in the groundwater.	Coastal floodplains of NSW.	Unlikely, not recorded during site inspection. Swamp Oak is present however the species generally occurs in the study area as a sub-dominant species to Swamp Mahogany and Broad-leaved Paperbark.

Community Name	BC Act Status	EPBC Act Status	Description	Habitat	Likelihood of occurrence
Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E		The most widespread and abundant dominant trees include <i>Eucalyptus robusta</i> , <i>Melaleuca quinquenervia</i> and, south from Sydney, <i>Eucalyptus botryoides</i> and <i>Eucalyptus longifolia</i> . Shrubs include <i>Acacia longifolia</i> , <i>Dodonaea triquetra</i> , <i>Ficus coronata</i> , <i>Leptospermum polygalifolium</i> subsp. <i>polygalifolium</i> and <i>Melaleuca</i> spp. Occasional vines include <i>Parsonsia straminea</i> , <i>Morinda jasminoides</i> and <i>Stephania japonica</i> var. <i>discolor</i> . The groundcover is composed of abundant sedges, ferns, forbs, and grasses including <i>Gahnia clarkei</i> , <i>Pteridium esculentum</i> , <i>Hypolepis muelleri</i> , <i>Calochlaena dubia</i> , <i>Dianella caerulea</i> , <i>Viola hederacea</i> , <i>Lomandra longifolia</i> , <i>Entolasia marginata</i> and <i>Imperata cylindrica</i> .	Coastal floodplains of the NSW North Coast and Sydney Basin.	Present
Themeda grassland on seacliffs and coastal headlands in the NSW North Coast, Sydney Basin and South East Corner Bioregions	E		In this community <i>Themeda australis</i> may have a distinctive appearance, being prostrate and having glaucous leaves. <i>Banksia integrifolia</i> subsp. <i>integrifolia</i> , <i>Westringia fruticosa</i> and <i>Acacia sophorae</i> occurs as an emergent shrub or as a dense cover where they have recruited over grasslands. Smaller shrubs occur often as prostrate to dwarf forms, most frequently <i>Pimelea linifolia</i> , <i>Hibbertia vestita</i> , <i>Pultenaea maritima</i> and <i>Westringia fruticosa</i> . In central and south coastal stands tussocks of <i>Poa poiformis</i> may be found in some stands of the community. Other grasses that occur in the community include <i>Zoysia macrantha</i> and <i>Cynodon dactylon</i> . Herbs in the ground layer include <i>Polymeria calycina</i> , <i>Apium prostratum</i> , <i>Senecio pinnatifolius</i> subsp. <i>pinnatifolius</i> and <i>Xerochrysum bracteatum</i> .	Coastal headlands and sea cliffs.	No, not recorded during site inspection. No suitable habitat.
White Gum Moist Forest in the NSW North Coast Bioregion	E		White Gum Moist Forest at maturity typically has a tall open canopy of eucalypts. The community is dominated by <i>Eucalyptus dunnii</i> (White Gum) with common associates being <i>E. saligna</i> (Sydney Blue Gum), <i>E. microcorys</i> and/or <i>Lophostemon confertus</i> . In undisturbed state the understorey typically includes a diverse and prominent stratum of rainforest trees, vines, palms, ferns and herbs. Disturbed sites generally support a moist shrubby understorey containing both native and introduced species. The mesic understorey may be absent from highly disturbed occurrences which typically occur on the less steep lower slopes.	Escarpment slopes and foothills of the north-east NSW.	No, not recorded during site inspection. No suitable habitat.

Threatened flora species likelihood of occurrence table

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution	Habitat	Likelihood of occurrence	Justification
<i>Acacia chrysotricha</i>	Newry Golden Wattle	E		In NSW, restricted to an area south of Bellingen on the north coast.	Rainforest edges and in wet or dry eucalypt forest in steep narrow gullies on quartzite soils.	Potential	Marginal habitat present.
<i>Acronychia littoralis</i>	Scented Acronychia	E	E	Between Fraser Island in Qld and Port Macquarie on the north coast of NSW.	Littoral rainforest on sand.	No	No suitable littoral rainforest habitat present.
<i>Allocasuarina thalassoscopica</i>			E	Widespread along the North Coast as far south as Diamond Head, extending north to the Noosa Heads area of SE Queensland.	In graminoid low heath, on coastal flats or on rhyolite or granite outcrops close to the coast.	No	No suitable heath habitat present, no records within locality.
<i>Arthraxon hispidus</i>	Hairy Jointgrass	V	V	In NSW, found on the northern tablelands and north coast.	Edges of rainforest and in wet eucalypt forest, often near creeks or swamps.	Potential	Some suitable habitat present in the form of wet eucalypt forest near creeks and wetlands, records within locality.
<i>Cryptostylis hunteriana</i>	Leafless Tongue Orchid	V	V	In NSW, recorded mainly on coastal and near coastal ranges north from Victoria to near Forster, with two isolated occurrences inland north-west of Grafton.	Coastal heathlands, margins of coastal swamps and sedgeland, coastal forest, dry woodland, and lowland forest.	No	Species not known to occur in region.
<i>Cynanchum elegans</i>	White-flowered Plant	Wax E	E	Restricted to eastern NSW, from Brunswick Heads on the north coast to Gerroa in the Illawarra region, and as far west as Merriwa in the upper Hunter River valley.	Dry rainforest; littoral rainforest; <i>Leptospermum laevigatum</i> , <i>Banksia integrifolia subsp. integrifolia</i> (Coastal Tea-tree– Coastal Banksia) coastal scrub; <i>Eucalyptus tereticornis</i> or <i>Corymbia maculata</i> (Spotted Gum)	No	No suitable habitat present, no records in locality.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution	Habitat	Likelihood of occurrence	Justification
					open forest and woodland; and <i>Melaleuca armillaris</i> (Bracelet Honeymyrtle) scrub.		
<i>Dendrobium melaleucaphilum</i>	Spider orchid	E		Costal districts and nearby ranges, extending from Qld to the lower Blue Mountains.	Grows on <i>Melaleuca styphelioides</i> , on rainforest trees or on rocks in coastal districts.	Potential	Potential habitat present in swamp forest and large number of records in locality.
<i>Euphrasia arguta</i>		E	CE	In NSW, recently recorded only from Nundle area of the north western slopes and tablelands, from near the Hastings River and from the Barrington Tops.	Eucalypt forest with a mixed grass and shrub understorey, disturbed areas, along roadsides.	No	Site not within known distribution.
<i>Hicksbeachia pinnatifolia</i>	Red Boppel Nut	V	V	Coastal areas of north-east NSW from the Nambucca Valley north to south-east Qld.	Subtropical rainforest, moist eucalypt forest and Brush Box forest.	Potential	Marginal quality habitat present in the form of moist eucalypt forest. Recorded within locality
<i>Macadamia integrifolia</i>	Macadamia Nut	-	V	Not known to occur naturally in the wild in NSW; recorded from Camden Haven but it is not known if the tree was cultivated or growing naturally.	Drier subtropical rainforest.	No	Site not within known distribution.
<i>Macadamia tetraphylla</i>	Rough-shelled Bush Nut	V	V	Confined chiefly to the north of the Richmond River in north-east NSW, extending just across the border into Qld.	Subtropical rainforest, usually near the coast.	No	Site not within known distribution.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution	Habitat	Likelihood of occurrence	Justification
<i>Marsdenia longiloba</i>	Slender Marsdenia	E	V	In NSW, occurs at scattered locations on the north coast north from Barrington Tops.	Subtropical and warm temperate rainforest, lowland moist eucalypt forest adjoining rainforest, areas with rock outcrops.	Potential	Suitable habitat present in the form of moist eucalypt forest, and records within locality.
<i>Niemeyera whitei</i>	Rusty Plum, Plum Boxwood	V		Coast and adjacent ranges of northern NSW from the Macleay River into southern Qld.	Rainforest and adjacent moist eucalypt forest.	Potential	Marginal habitat present in the form of moist eucalypt forest, records within locality
<i>Parsonsia dorrigoensis</i>	Milky Silkpod	V	E	Found only within NSW, in the north coast region between Kendall and Woolgoolga.	Subtropical and warm-temperature rainforest, rainforest margins, and moist eucalypt forest up to 800 m, on brown clay soils.	Potential	Suitable habitat present in the form of moist eucalypt forest, records within locality
<i>Peristeranthus hillii</i>	Brown Fairy-chain Orchid	V		North-eastern NSW, north from Port Macquarie, extending to north-eastern Qld as far as the Bloomfield River.	Littoral Rainforest and Rainforest on Floodplain, in coastal and near-coastal areas. Epiphytic on tree trunks and thick vines.	No	No habitat present
<i>Persicaria elatior</i>	Tall Knotweed	V	V	In south-eastern NSW recorded from Mt Dromedary, Moruya State Forest near Turlinjah, the Upper Avon River catchment north of Robertson, Bermagui, and Picton Lakes. In northern NSW known from Raymond Terrace (near Newcastle) and the Grafton area (Cherry Tree and Gibberagee State Forests).	Beside streams and lakes, swamp forest or disturbed areas.	Unlikely	Wetland habitat present, however no records in locality.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution	Habitat	Likelihood of occurrence	Justification
<i>Phaius australis</i>	Southern Swamp Orchid	E	E	Qld and north-east NSW as far south as Coffs Harbour.	Swampy grassland or swampy forest including rainforest, eucalypt or paperbark forest, mostly in coastal areas.	Potential	Suitable habitat present in the form of swamp forest.
<i>Plectranthus nitidus</i>	Nightcap Plectranthus	E	E	Recorded in Nightcap National Park near Terania Creek, and the Nullum and Richmond Range State Forests.	Rocky cliff-faces and boulders adjacent to rainforest.	No	No suitable rainforest / rocky habitat present.
<i>Rhodamnia rubescens</i>	Scrub Turpentine	CE	CE	Occurs in coastal districts north from Batemans Bay in New South Wales, approximately 280 km south of Sydney, to areas inland of Bundaberg in Queensland.	Found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest usually on volcanic and sedimentary soils. Populations of <i>R. rubescens</i> typically occur in coastal regions and occasionally extend inland onto escarpments up to 600 m ASL in areas with rainfall of 1,000-1,600 mm	Yes	Recorded in the study area during site inspection.
<i>Rhodomyrtus psidioides</i>	Native Guava	CE		Occurs from Broken Bay, approximately 90 km north of Sydney, New South Wales, to Maryborough in Queensland.	Pioneer species found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest often near creeks and drainage lines.	Potential	Potential habitat present in the form of moist eucalypt forest, records in locality.
<i>Sarcochilus fitzgeraldii</i>	Ravine Orchid	V	V	North-east NSW, north of the Macleay River, to Maleny in south-east Qld.	On rocks or rarely on bases of trees, in subtropical rainforest, usually near streams, from 500-700 m ASL.	No	No suitable habitat present
<i>Sophora tomentosa</i>	Silverbush	E		Coastal areas north from Old Bar near Taree, into Qld.	Coastal dunes.	No	No suitable dune habitat present
<i>Thesium australe</i>	Austral Toadflax	V	V	In eastern NSW it is found in very small populations scattered along	Grassland on coastal headlands or grassland and grassy woodland away from the coast.	No	No habitat in the form of grassy woodlands

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution	Habitat	Likelihood of occurrence	Justification
				the coast, and from the Northern to Southern Tablelands.			or coastal grasslands or headlands.
<i>Tinospora tinoporoides</i>	Arrow-head Vine	V		North from the Richmond River in north-east NSW.	Wetter subtropical rainforest, including littoral rainforest, on fertile, basalt-derived soils.	No	Site not within known distribution.
<i>Tylophora woollsii</i>	Cryptic Forest Twiner	E	E	From the NSW north coast and New England Tablelands to southern Qld.	Moist eucalypt forest, moist sites in dry eucalypt forest and rainforest margins.	Potential	Marginal quality habitat present

Threatened fauna species likelihood of occurrence table

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution	Habitat	Likelihood of occurrence	Justification
<i>Actitis hypoleucos</i>	Common Sandpiper		M	Summer migrant. In NSW, widespread along coastline and also occurs in many areas inland.	Coastal wetlands and some inland wetlands, especially muddy margins or rocky shores. Also estuaries and deltas, lakes, pools, billabongs, reservoirs, dams and claypans, mangroves.	Unlikely	Marginal habitat only present at edge of study area, not regularly recorded in locality.
<i>Anthochaera phrygia</i>	Regent Honeyeater	CE	CE	Inland slopes of south-east Australia, and less frequently in coastal areas. In NSW, most records are from the North-West Plains, North-West and South-West Slopes, Northern Tablelands, Central Tablelands and Southern Tablelands regions; also recorded in the Central Coast and Hunter Valley regions.	Eucalypt woodland and open forest, wooded farmland and urban areas with mature eucalypts, and riparian forests of <i>Casuarina cunninghamiana</i> (River Oak).	Unlikely	No bionet records in locality and marginal habitat only.
<i>Apus pacificus</i>	Fork-tailed Swift		M	Recorded in all regions of NSW.	Riparian woodland., swamps, low scrub, heathland, saltmarsh, grassland, Spinifex sandplains, open farmland and inland and coastal sand-dunes.	Potential	Flies over wide variety of habitats. Unlikely land within or be dependent on habitats within study area.
<i>Arenaria interpres</i>	Ruddy Turnstone		M	Summer migrant to most coastal regions, with occasional records inland, including in NSW.	Tidal reefs and pools; pebbly, shelly and sandy shores; mudflats; inland shallow waters; sewage ponds, saltfields; ploughed ground.	No	No suitable habitat present.
<i>Argynnis hyperbius</i>	Laced Fritillary	E	CE	restricted to south-east Queensland and north-east NSW. Most recently known from a few widespread localities between Port Macquarie and Gympie, populations have declined dramatically to the extent	Open swampy coastal areas where the larval food plant <i>Viola betonicifolia</i> (Arrowhead Violet) occurs.	Unlikely	Only limited marginal quality habitat present, no records within locality

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution	Habitat	Likelihood of occurrence	Justification
				that the butterfly has not been verified at any site for over a decade.			
<i>Assa darlingtoni</i>	Pouched Frog	V		North-east NSW and far south-east Qld. There are three isolated populations in NSW: Dorrigo Plateau and Gibraltar Range, Border Ranges.	Cool, moist rainforest (including Antarctic Beech), or moist eucalypt forest in mountainous areas, mostly above 800 m.	No	No suitable habitat present, site below 800m in altitude.
<i>Botaurus poiciloptilus</i>	Australasian Bittern	E	E	Found over most of NSW except for the far north-west.	Permanent freshwater wetlands with tall, dense vegetation, particularly <i>Typha</i> spp. (Bullrushes) and <i>Eleocharis</i> spp. (Spikerushes).	Potential	Wetland habitat present, two records in locality.
<i>Burhinus grallarius</i>	Bush Stone-curlew	E		In NSW, found sporadically in coastal areas, and west of the divide throughout the sheep-wheat belt.	In NSW, it occurs in lowland grassy woodland and open forest.	Unlikely	No suitable grassy woodland or open forest habitat.
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper		M	Summer migrant. Widespread in most regions of NSW, especially in coastal areas, but sparse in the south-central Western Plain and east Lower Western Regions.	Shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation.	Potential	Marginal quality habitat present and records within locality exist
<i>Calidris canutus</i>	Red Knot		E, M	Summer migrant to Australia. In NSW, widespread in suitable habitat along the coast. Occasionally recorded inland in all regions.	Intertidal mudflats, sandflats sheltered sandy beaches, estuaries, bays, inlets, lagoons, harbours, sandy ocean beaches, rock platforms, coral reefs, terrestrial saline wetlands near the coast, sewage ponds and saltworks. Rarely inland lakes or swamps.	No	Marginal habitat only, mudflats present are not large or open enough to provide suitable habitat for the species. Species not previously recorded in locality.
<i>Calidris ferruginea</i>	Curlew Sandpiper	E	CE, M	Occurs along the entire coast of NSW, and sometimes in freshwater wetlands in the Murray-Darling Basin.	Littoral and estuarine habitats, including intertidal mudflats, non-tidal swamps, lakes and lagoons on the coast and sometimes inland.	Unlikely	Marginal habitat only present at edge of study area, not regularly recorded in locality.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution	Habitat	Likelihood of occurrence	Justification
<i>Calidris ruficollis</i>	Red-necked Stint		M	Summer migrant to Australia, widespread coastal and inland NSW.	Tidal mudflats, saltmarshes, sandy and shelly beaches, saline and freshwater wetlands, saltfields, sewage ponds.	Unlikely	Marginal habitat present in the form of swampy wetland, species not commonly recorded in locality.
<i>Calyptrorhynchus lathamii</i>	Glossy Black-Cockatoo	V		In NSW, widespread along coast and inland to the southern tablelands and central western plains, with a small population in the Riverina.	Open forest and woodlands of the coast and the Great Dividing Range where stands of sheoak occur.	Likely	Suitable Allocasuarina feed trees present, 105 records in locality.
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	V	V	Recorded from Rockhampton in Qld south to Ulladulla in NSW. Largest concentrations of populations occur in the sandstone escarpments of the Sydney basin and the NSW north-west slopes.	Wet and dry sclerophyll forests, Cypress Pine dominated forest, woodland, sub-alpine woodland, edges of rainforests and sandstone outcrop country.	No	Some suitable foraging habitat types present, no cliff/cave breeding habitat in locality and present and no records within locality.
<i>Charadrius leschenaultii</i>	Greater Sand-plover	V	V, M	In NSW, recorded between the northern rivers and the Illawarra, with most records coming from the Clarence and Richmond estuaries.	Almost entirely restricted to coastal areas in NSW, mainly on sheltered sandy, shelly or muddy beaches or estuaries with large intertidal mudflats or sandbanks.	No	Marginal habitat only, mudflats present are not large or open enough to provide suitable habitat for the species. Species not previously recorded in locality.
<i>Circus assimilis</i>	Spotted Harrier	V		Found throughout the Australian mainland, except in densely forested or wooded habitats, and rarely in Tasmania.	Grassy open woodland, inland riparian woodland, grassland, shrub steppe, agricultural land and edges of inland wetlands.	Potential	Marginal quality habitat present.
<i>Climacteris picumnus victoriae</i>	Brown Treecreeper (eastern subspecies)	V		From eastern through central NSW, west to Corowa, Wagga Wagga, Temora, Forbes, Dubbo and Inverell.	Eucalypt woodlands and dry open forest.	No	No suitable dry open forest habitat present.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution	Habitat	Likelihood of occurrence	Justification
<i>Coeranoscincus reticulatus</i>	Three-toed Snake-tooth Skink	V	V	Coast and ranges from the Macleay valley in NSW to south-eastern Qld.	Rainforest and occasionally moist eucalypt forest, on loamy or sandy soils.	No	No atlas record within locality and study area is outside of known distributional range.
<i>Coracina lineata</i>	Barred Cuckoo-shrike	V		Rare in NSW but recorded along coast south to the Manning River.	Rainforest, eucalypt forests and woodlands, clearings in secondary growth, swamp woodlands and timber along watercourses.	Potential	Suitable habitat types present, two records within locality.
<i>Crinia tinnula</i>	Wallum Froglet	V		Along the coastal margin from Litabella National Park in south-east Qld to Kurnell in Sydney.	Acidic swamps on coastal sand plains (typically in sedgelands and wet heathlands), drainage lines, and swamp sclerophyll forests.	Unlikely	No suitable acidic swamp habitat and only one record in locality.
<i>Cyclopsitta diophthalma coxeni</i>	Coxen's Fig-Parrot	E	E	Limited to about five populations scattered between Bundaberg in Qld and the Hastings River in NSW.	Drier rainforests and adjacent wetter eucalypt forest, and wetter lowland rainforests.	No	No rainforest habitat present and no records within the locality exist.
<i>Daphoenositta chrysoptera</i>	Varied Sittella	V		Distribution in NSW is nearly continuous from the coast to the far west.	Inhabits eucalypt forests and woodlands, mallee and Acacia woodland.	Potential	Suitable habitat types present, three records within locality.
<i>Dasyurus maculatus</i>	Spotted-tailed Quoll	V	E	Found on the east coast of NSW, Tasmania, eastern Victoria and north-eastern Qld.	Rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline.	Potential	Marginal quality habitat present, species may visit site on occasion as part of large home range or dispersing immature male. 10 records in locality.
<i>Ephippiorhynchus asiaticus</i>	Black-necked Stork	E		Coastal and subcoastal northern and eastern Australia, south to central-eastern NSW and with vagrants recorded further south and inland.	In NSW, floodplain wetlands of the major coastal rivers are key habitat. Also minor floodplains, coastal sandplain wetlands and estuaries.	Likely	Suitable wetland habitat present, larger areas also present adjoining site. 77 records in locality.

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<i>Erythrotriorchis radiatus</i>	Red Goshawk	E	V	In NSW, extends to ~30°S. Recent records confined to the Northern Rivers region north of the Clarence River.	Open woodland and forest, often along or near watercourses or wetlands. In NSW, preferred habitats include mixed subtropical rainforest, Melaleuca swamp forest and coastal riparian Eucalyptus forest.	No	Site not within species normal distribution.
<i>Esacus magnirostris</i>	Beach Stone-curlew	E		Across northern and north-eastern Australia, south to the Manning River in north-eastern NSW, with occasional vagrants to south-eastern NSW and Victoria.	Exclusively along the coast, on beaches, islands, reefs and in estuaries, and edges of or near mangroves.	No	No suitable habitat present.
<i>Falco hypoleucos</i>	Grey Falcon	E		Arid and semi-arid zones. In NSW, found chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range.	Shrubland, grassland and wooded watercourses, occasionally in open woodlands near the coast, and near wetlands.	No	Site not within species normal distribution.
<i>Gallinago hardwickii</i>	Latham's Snipe		M	Migrant to east coast of Australia, extending inland west of the Great Dividing Range in NSW.	Freshwater, saline or brackish wetlands up to 2000 m above sea-level; usually freshwater swamps, flooded grasslands or heathlands.	Potential	Suitable wetland habitat present.
<i>Glossopsitta pusilla</i>	Little Lorikeet	V		In NSW, found from the coast westward as far as Dubbo and Albury.	Dry, open eucalypt forests and woodlands, including remnant woodland patches and roadside vegetation.	Likely	Wide-ranging, nomadic species utilising flowering Eucalypt forest in region. Nine records within locality.
<i>Grantiella picta</i>	Painted Honeyeater	V	V	Widely distributed in NSW, predominantly on the inland side of the Great Dividing Range but avoiding arid areas.	Boree, Brigalow and Box-Gum Woodlands and Box-Ironbark Forests.	No	Site not within species normal distribution.
<i>Grus rubicunda</i>	Brolga	V		Sparsely distributed across the southern part of its range, which includes central NSW to western Victoria.	Open wetlands, grassy plains, coastal mudflats and irrigated croplands and, on the	Potential	Wetland habitat present, three records in locality exist

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution	Habitat	Likelihood of occurrence	Justification
					coast, mangrove-studded creeks and estuaries.		
<i>Haematopus fuliginosus</i>	Sooty Oystercatcher	V		Distributed along the entire NSW coast.	Rocky headlands, rocky shelves, exposed reefs with rock pools, beaches and muddy estuaries.	No	No suitable habitat present.
<i>Haematopus longirostris</i>	Pied Oystercatcher	E		Thinly scattered along the entire NSW coast.	Intertidal flats of inlets and bays, open beaches and sandbanks.	No	No suitable habitat present.
<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle	V		Distributed along the coastline of mainland Australia and Tasmania, extending inland along some of the larger waterways, especially in eastern Australia.	Freshwater swamps, rivers, lakes, reservoirs, billabongs, saltmarsh and sewage ponds and coastal waters. Terrestrial habitats include coastal dunes, tidal flats, grassland, heathland, woodland, forest and urban areas.	Likely	High-quality habitat present along Kalang River adjoining site. Species known from locality.
<i>Hieraaetus morphnoides</i>	Little Eagle	V		Throughout the Australian mainland, with the exception of the most densely-forested parts of the Dividing Range escarpment.	Open eucalypt forest, woodland or open woodland, including sheoak or Acacia woodlands and riparian woodlands of interior NSW.	Potential	Marginal habitat present, one record in locality.
<i>Hirundapus caudacutus</i>	White-throated Needletail		M	All coastal regions of NSW, inland to the western slopes and inland plains of the Great Divide.	Occur most often over open forest and rainforest, as well as heathland, and remnant vegetation in farmland.	Likely	Flies over wide variety of habitats. Unlikely land within or be dependent on habitats within study area.
<i>Hoplocephalus stephensii</i>	Stephens' Banded Snake	V		Coast and ranges from Southern Qld to Gosford in NSW.	Rainforest and eucalypt forests and rocky areas up to 950 m ASL.	Potential	Eucalypt forests present, one record in locality.
<i>Hydroprogne caspia</i>	Caspian Tern		M	Widespread in coastal and inland NSW.	Coastal offshore waters, beaches, mudflats, estuaries, rivers, lakes.	No	No suitable habitat present.

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<i>Irediparra gallinacea</i>	Comb-crested Jacana	V		In NSW, occurs south along the east coast to the Hunter region, with stragglers recorded in south-eastern NSW.	Permanent freshwater wetlands, either still or slow-flowing, with a good surface cover of floating vegetation or fringing and aquatic vegetation.	Unlikely	Wetland habitats do not contain large amounts of suitable floating vegetation habitat.
<i>Ixobrychus flavicollis</i>	Black Bittern	V		In NSW, records are scattered along the east coast, with individuals rarely being recorded south of Sydney or inland.	Terrestrial and estuarine wetlands. Also flooded grassland, forest, woodland, rainforest and mangroves where permanent water is present.	Potential	Suitable wetland habitat present.
<i>Lathamus discolor</i>	Swift Parrot	CE	CE	Migrates from Tasmania to mainland in Autumn-Winter. In NSW, the species mostly occurs on the coast and south west slopes.	Box-ironbark forests and woodlands.	Unlikely	Marginal habitat present in forest areas, species not previously recorded in locality.
<i>Lichenostomus fasciolaris</i>	Mangrove Honeyeater	V		In NSW, mainly occurs on the north coast south to the Clarence River; also some records further south around the mouth of the Macleay River between Stuarts Point and South West Rocks, and at Wauchope on the lower Hastings River.	Mangrove woodlands and shrublands, and adjacent forests, woodlands and shrublands.	No	No suitable mangrove forest habitat present.
<i>Limosa lapponica</i>	Bar-tailed Godwit		M	Summer migrant to Australia. Widespread along the coast of NSW, including the offshore islands. Also numerous scattered inland records.	Intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons, bays, seagrass beds, saltmarsh, sewage farms and saltworks, saltlakes and brackish wetlands near coasts, sandy ocean beaches, rock platforms, and coral reef-flats. Rarely inland wetlands, paddocks and airstrips.	No	No suitable habitat present, mudflats present are not large or open enough to provide suitable habitat for the species.
<i>Limosa limosa</i>	Black-tailed Godwit	V	M	Arrives in August and leaves in March. In NSW, most frequently recorded at Kooragang Island, with occasional records elsewhere along the coast, and inland in	Usually sheltered bays, estuaries and lagoons with large intertidal mudflats and/or sandflats. Further inland, it can also be found around muddy lakes and swamps.	No	No suitable habitat present, mudflats present are not large or open

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				the Murray-Darling Basin, on the western slopes of the Northern Tablelands and in the far north-western corner of the state.			enough to provide suitable habitat for the species.
<i>Litoria aurea</i>	Green and Golden Bell Frog	E	V	Since 1990, recorded from ~50 scattered sites within its former range in NSW, from the north coast near Brunswick Heads, south along the coast to Victoria. Records exist west to Bathurst, Tumut and the ACT region.	Marshes, dams and stream-sides, particularly those containing <i>Typha</i> spp. or <i>Eleocharis</i> spp.. Some populations occur in highly disturbed areas.	Unlikely	Suitable habitat, however no records within locality.
<i>Lophoictinia isura</i>	Square-tailed Kite	V		In NSW, it is a regular resident in the north, north-east and along the major west-flowing river systems. It is a summer breeding migrant to the south-east, including the NSW south coast.	Timbered habitats including dry woodlands and open forests, particularly timbered watercourses.	Likely	Suitable habitat present and 11 records within locality.
<i>Micronomus norfolkensis</i>	Eastern Coastal Free-tailed Bat	V		Found along the east coast from south Queensland to southern NSW.	Occur in dry sclerophyll forest, woodland, swamp forests and mangrove forests east of the Great Dividing Range	Likely	Habitat present in the form of swamp eucalypt forest, 9 records exist within locality.
<i>Miniopterus australis</i>	Little Bentwing-bat	V		East coast and ranges south to Wollongong in NSW.	Moist eucalypt forest, rainforest, vine thicket, wet and dry sclerophyll forest, Melaleuca swamps, dense coastal forests and banksia scrub.	Likely	Suitable habitat and wide-ranging species.
<i>Miniopterus orianae oceanensis</i>	Large Bent-winged Bat	V		Eastern Bentwing-bats occur along the east and north-west coasts of Australia.	Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures.	Likely	Suitable habitat and wide-ranging species.
<i>Mixophyes balbus</i>	Stuttering Frog	E	V	Along the east coast of Australia from southern Qld to north-eastern Victoria.	Rainforest and wet, tall open forest in the foothills and escarpment on the eastern side of the Great Dividing Range.	No	No rainforest habitat present, no records within locality.

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<i>Mixophyes iteratus</i>	Giant Barred Frog	E	E	Coast and ranges from Eumundi in south-east Qld to Warrimoo in the Blue Mountains.	Freshwater permanent/semi-permanent streams, generally at lower elevation. Riparian rainforest or wet sclerophyll forest is favoured.	Unlikely	No suitable freshwater stream habitat.
<i>Myotis macropus</i>	Southern Myotis	V		In NSW, found in the coastal band. It is rarely found more than 100 km inland, except along major rivers.	Foraging habitat is waterbodies (including streams, or lakes or reservoirs) and fringing areas of vegetation up to 20m.	Likely	Suitable habitat present, five records within locality.
<i>Ninox strenua</i>	Powerful Owl	V		In NSW, it is widely distributed throughout the eastern forests from the coast inland to tablelands, with scattered records on the western slopes and plains.	Woodland, open sclerophyll forest, tall open wet forest and rainforest.	Potential	Suitable habitat present, four records within locality.
<i>Numenius madagascariensis</i>	Eastern Curlew		CE, M	Summer migrant to Australia. Primarily coastal distribution in NSW, with some scattered inland records.	Estuaries, bays, harbours, inlets and coastal lagoons, intertidal mudflats or sandflats, ocean beaches, coral reefs, rock platforms, saltmarsh, mangroves, freshwater/brackish lakes, saltworks and sewage farms.	Unlikely	No suitable habitat present, mudflats present are not large or open enough to provide suitable habitat for the species. Five records in locality.
<i>Numenius phaeopus</i>	Whimbrel		M	Summer migrant to Australia. Found along almost the entire coast of NSW; scattered inland records.	Estuaries, mangroves, tidal flats, coral cays, exposed reefs, flooded paddocks, sewage ponds, grasslands, sports fields, lawns.	No	No suitable habitat present, mudflats present are not large or open enough to provide suitable habitat for the species. No records in locality.
<i>Nyctophilus bifax</i>	Eastern Long-eared Bat	V		In NSW, appears to be confined to the coastal plain and nearby coastal ranges, extending south to the Clarence River area, with a few records further south around Coffs Harbour.	Lowland subtropical rainforest, wet and swamp eucalypt forest, moist eucalypt forest, coastal scrub.	Potential	Habitat in the form of swamp and moist Eucalypt forest present, two records within locality.

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<i>Oxyura australis</i>	Blue-billed Duck	V		Widespread in NSW but is most concentrated in the southern Murray-Darling Basin area.	Coastal and inland wetlands and swamps.	Unlikely	Wetlands present not suitable for the species.
<i>Pandion cristatus</i>	Eastern Osprey	V		Common around the northern NSW coast, and uncommon to rare from coast further south. Some records from inland areas.	Rocky shorelines, islands, reefs, mouths of large rivers, lagoons and lakes.	Likely	High-quality habitat present along Kalang River adjoining site. Species known from locality.
<i>Petauroides volans</i>	Greater Glider		V	Found along the eastern coast of the Australian mainland, from eastern Queensland to southern Victoria	Generally restricted to fairly expansive tall eucalyptus forest and are never found in the rainforest. Patches of old growth must be at least 20 ha to sustain a population.	Unlikely	Eucalypt forest present, however study area and surroundings generally contain young forests and lacking abundance of hollows. One record in locality.
<i>Petaurus australis</i>	Yellow-bellied Glider	V		Along the eastern coast to the western slopes of the Great Dividing Range, from southern Qld to Victoria.	Tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils.	Unlikely	Eucalypt forest present, however study area and surroundings generally contain young forests and lacking abundance of hollows. One record in locality.
<i>Petaurus norfolcensis</i>	Squirrel Glider	V		Widely though sparsely distributed on both sides of the Great Dividing Range in eastern Australia, from northern Qld to western Victoria.	Mature or old growth Box, Box-Ironbark woodlands and River Red Gum forest west of the Great Dividing Range and Blackbutt-Bloodwood forest with heath understorey in coastal areas.	Potential	Forest containing Blackbutt and Bloodwood present and connected to larger patches, two records within locality.
<i>Petrogale penicillata</i>	Brush-tailed Rock-wallaby	E	V	In NSW they occur from the Qld border in the north to the Shoalhaven in the south,	Rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures, caves and ledges.	No	No suitable rocky habitat present.

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				with the population in the Warrumbungle Ranges being the western limit.			
<i>Phascogale tapoatafa</i>	Brush-tailed Phascogale	V		In NSW it is mainly found east of the Great Dividing Range although there are occasional records west of the divide.	Dry sclerophyll open forest, heath, swamps, rainforest and wet sclerophyll forest.	Likely	Habitat present in the form of wet and swamp Eucalypt forest, five records within locality.
<i>Phascolarctos cinereus</i>	Koala	V	E	In NSW it mainly occurs on the central and north coasts with some populations in the west of the Great Dividing Range. There are sparse and possibly disjunct populations in the Bega District, and at several sites on the southern tablelands.	Eucalypt woodlands and forests.	Likely	Potential habitat in the form of Eucalypt forest with feed tree species present. 144 records exist within locality.
<i>Phyllodes imperialis smithersi</i>	Pink Underwing Moth	E	E	In NSW it is known to occur in a small number of localities from the QLD border to Wardell, and there is a disjunct population in the Bellingen area.	Subtropical rainforest below about 600 m elevation; breeding habitat is restricted to areas where the caterpillar's food plant <i>Carronia multisepealea</i> occurs.	No	No habitat in the form of subtropical rainforest.
<i>Pluvialis fulva</i>	Pacific Golden Plover		M	Regular widespread summer migrant to Australia, including coastal NSW, Lord Howe and Norfolk Island.	Estuaries, mudflats, saltmarshes, mangroves, rocky reefs, inland swamps, ocean shores, paddocks, sewage ponds, ploughed land, airfields, playing fields.	No	No suitable habitat present, mudflats present are not large or open enough to provide suitable habitat for the species. No records in locality.
<i>Pluvialis squatarola</i>	Grey Plover		M	Regular summer migrant to coastal Australia, including NSW. Rarely inland, on passage.	Mudflats, saltmarsh, tidal reefs and estuaries.	No	No suitable habitat present, mudflats present are not large or open enough to provide suitable habitat for the species. No records in locality.

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<i>Pomatostomus temporalis temporalis</i>	Grey-crowned Babbler (eastern subspecies)	V		In NSW, occurs on the western slopes of the Great Dividing Range, and as far as Louth and Balranald on the western plains. Also occurs in woodlands in the Hunter Valley and in some locations on the north coast	Open woodland habitats; favours Box-gum woodlands on the slopes and Box-cypress and open Box woodlands on alluvial plains.	No	No suitable dry woodland or forest habitat present, and no recent records in locality.
<i>Potorous tridactylus</i>	Long-nosed Potoroo	V	V	In NSW it is generally restricted to coastal heaths and forests east of the Great Dividing Range, with an annual rainfall exceeding 760 mm.	Coastal heaths and dry and wet sclerophyll forests.	Potential	Potential the form of wet sclerophyll forest, one record in locality.
<i>Pseudomys novaehollandiae</i>	New Holland Mouse		V	Fragmented distribution across eastern NSW.	Open heathlands, woodlands and forests with a heathland understorey, vegetated sand dunes.	No	No suitable heathy habitat types present.
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	V	V	Along the eastern coast of Australia, from Bundaberg in Qld to Melbourne in Victoria.	Subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops.	Likely	Suitable eucalypt forest habitat, species is wide-ranging and there are 40 records from the locality.
<i>Ptilinopus magnificus</i>	Wompoo Fruit-Dove	V		In NSW, occurs south along coast and coastal ranges to the Hunter River.	Rainforest, low-elevation moist eucalypt forest and brush box forests.	Potential	Low elevation moist eucalypt forest present, 14 records within locality.
<i>Ptilinopus regina</i>	Rose-crowned Fruit-Dove	V		In NSW, found on coast and ranges north from Newcastle. Vagrants are occasionally found further south to Victoria.	Sub-tropical and dry rainforest, moist eucalypt forest and swamp forest, where fruit is plentiful.	Potential	Moist eucalypt and swamp forest present, four records within locality
<i>Rostratula australis</i>	Australian Painted Snipe	E	E	In NSW most records are from the Murray-Darling Basin. Other recent records include wetlands on the Hawkesbury River and the Clarence and lower Hunter Valleys.	Swamps, dams and nearby marshy areas.	Unlikely	Swamp habitat present, however no native grasses are present and there are no existing records within locality

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<i>Scoteanax rueppellii</i>	Greater Broad-nosed Bat	V		Both sides of the great divide, from the Atherton Tableland in Qld to north-eastern Victoria, mainly along river systems and gullies. In NSW it is widespread on the New England Tablelands.	Woodland, moist and dry eucalypt forest and rainforest.	Potential	Habitat present in the form of moist eucalypt forest, two records within locality.
<i>Stagonopleura guttata</i>	Diamond Firetail	V		Widely distributed in NSW, mainly recorded in the Northern, Central and Southern Tablelands, the Northern, Central and South Western Slopes and the North West Plains and Riverina, and less commonly found in coastal areas and further inland.	Grassy eucalypt woodlands, open forest, mallee, Natural Temperate Grassland, secondary derived grassland, riparian areas and lightly wooded farmland.	No	No habitat present in the form of grassy eucalypt woodland, only one previous record within locality from 1996.
<i>Sterna hirundo</i>	Common Tern		M	Regular summer migrant to northern and eastern coastal Australia, including coastal NSW. Also scattered inland records.	Offshore waters, ocean beaches, estuaries, large lakes. Less commonly freshwater swamps, floodwaters, sewage farms and brackish and saline lakes.	No	No suitable habitat present.
<i>Sternula albifrons</i>	Little Tern	E	M	In NSW, it arrives from September to November, occurring mainly north of Sydney, with smaller numbers found south to Victoria.	Sheltered coastal environments, harbours, inlets and rivers.	No	No suitable habitat present.
<i>Tringa brevipes</i>	Grey-tailed Tattler		M	Summer migrant to Australia. In NSW, distributed along most of the coast from the Qld border, south to Tilba Lake. More heavily distributed along coastal regions north of Sydney.	Sheltered coasts with reefs and rock platforms or intertidal mudflats; intertidal rocky, coral or stony reefs; shores of rock, shingle, gravel or shells; embayments, estuaries and coastal lagoons; lagoons and lakes; and ponds in sewage farms and saltworks.	No	Marginal habitat at edge of study area only, no records in locality.

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<i>Tringa nebularia</i>	Common Greenshank		M	Summer migrant to Australia. Recorded in most coastal regions of NSW; also widespread west of the Great Dividing Range, especially between the Lachlan and Murray Rivers and the Darling River drainage basin, including the Macquarie Marshes, and north-west regions.	Terrestrial wetlands (swamps, lakes, dams, rivers, creeks, billabongs, waterholes and inundated floodplains, claypans, saltflats, sewage farms and saltworks dams, inundated rice crops and bores) and sheltered coastal habitats (mudflats, saltmarsh, mangroves, embayments, harbours, river estuaries, deltas, lagoons, tidal pools, rock-flats and rock platforms).	No	Marginal habitat at edge of study area only, no records in locality.
<i>Tringa stagnatilis</i>	Marsh Sandpiper		M	Summer migrant to Australia. Recorded in all regions of NSW but especially the central and south coasts and (inland) on the western slopes of Great Divide and western plains.	Swamps, lagoons, billabongs, salt pans, saltmarshes, estuaries, pools on inundated floodplains, intertidal mudflats, sewage farms and saltworks, reservoirs, waterholes, soaks, bore-drain swamps and flooded inland lakes.	No	Marginal habitat at edge of study area only, no records in locality.
<i>Turnix melanogaster</i>	Black-breasted Button-quail	E	V	South-eastern Qld and far north-eastern NSW, mainly on and east of the Great Divide but extending inland to the inner western slopes. Very few NSW records in recent times.	Dry rainforests, vine forest and vine thickets. May also occupy wetter subtropical rainforests, sometimes in association with moist eucalypt forest.	No	No suitable habitat present.
<i>Tyto longimembris</i>	Eastern Grass Owl	V		Recorded occasionally in all mainland states. In NSW they are more likely to be resident in the north-east.	Areas of tall grass, including grass tussocks, swampy areas, grassy plains, swampy heath, and in cane grass or sedges on flood plains.	Unlikely	No suitable long grass habitat present, only one previous record within locality from 1995.
<i>Tyto novaehollandiae</i>	Masked Owl	V		Recorded over approximately 90% of NSW, excluding the most arid north-western corner. Most abundant on the coast but extends to the western plains.	Dry eucalypt forests and woodlands from sea level to 1100 m.	Potential	Suitable eucalypt forest habitat is present, one record from locality.

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<i>Tyto tenebricosa</i>	Sooty Owl	V		Occupies the easternmost one-eighth of NSW, occurring on the coast, coastal escarpment and eastern tablelands.	Dry rainforest, subtropical and warm temperate rainforest, as well as moist eucalypt forests.	Potential	Suitable eucalypt forest habitat is present, eight records from locality.

Note: Although marine species such as Whales, Seals, Turtles and Seabirds were returned from the database searches, these species were excluded from the assessment due to the lack of suitable habitat in the study area.

