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Part Lot 2 DP 1159910 Planning Proposal Ecological Assessment Report

Prepared for Gulgan Road Property Pty Ltd, instructed by Creative Capital

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Executive Summary

Gulgan Road Property Pty Ltd seeks to amend the Byron Local Environment Plan 2014 (LEP) zoning of part of Lot 2 DP 1159910 on Gulgan Rd, Brunswick Heads. Specifically, the LEP zoning amendments are proposed to facilitate an employment land project in a manner consistent with the Byron Shire Business and Industrial Lands Strategy (BILS, 2020). In summary, the Planning Proposal includes:

- Rezoning of RU2 land to E3 Productivity Support and E4 General Industrial.
- An increase (by approximately 215%) in the extent of land zoned C2 Environmental Conservation and C3 Environmental Management within the subject land.
- A redefining of the minimum area of Torrens Title subdivision for the E3 and E4 zoned land to be 2,000 m^2.
- Amendments to the Floor Space Ratio Map and Lot Size Map.
- Amendments to the maximum building height to 11.5 m to support the optimisation of the BILS precincts.
- Amendments to provide for working/living accommodation in the E3 precinct to support employment land uses.

This report provides the results of an ecological assessment prepared to support the assessment of the Planning Proposal under the *Environmental Planning and Assessment Act 1979*. The report is based on both a desktop assessment and a site survey.

Plant Community Types (PCTs) and associated Endangered Ecological Communities (EECs) were mapped during the ecological survey undertaken for this assessment. Four different native PCTs were recorded on the property, some in better condition than others.

Vegetation on the property includes isolated patches of rainforest, small areas of swamp and wet sclerophyll forest, and freshwater wetlands (sedgelands/forblands). There is also a constructed farm dam as well as minor drainage lines on the property.

To avoid ecological impacts, a majority of the proposed Planning Proposal area (the subject land) intentionally overlays exiting paddock areas, which are dominated by exotic grasses and forbs and have been subject to grazing. Further, the proposed expansion of the C zones across the subject land provides opportunities for environmental restoration.

During the surveys undertaken as part of this assessment, four threatened species were observed on the property, whilst many others have the potential to occur. These observed threatened species were the White-bellied Sea Eagle which was flying over the site (foraging), the White-eared Monarch (foraging), and the threatened flora species *Tinospora tinosporoides* (Arrow-head Vine) and *Cryptocaria foetida* (Stinking cryptocarya). The threatened flora were observed within C2 zoned land – Land that is not proposed to be rezoned. It is not expected that a significant impact to threatened species will result if the site is developed, however further assessment during future development applications will be required.

If development is enabled by approval of the Planning Proposal, the resultant ecological impacts are likely to be minor overall, whilst there is also the opportunity for further impact reduction via future DA design and environmental management.

Given the presence of Biodiversity Values mapping in the south-east of the site (NSW Government, 2023a), and the likely requirement for traffic access from Gulgan Road, future DAs are likely to trigger the requirement for a Biodiversity Development Assessment Report under the *Biodiversity Conservation Act 2016*. This legislative process provides the opportunity for further assessment and mitigation, whilst also formalising any future biodiversity offset requirements.

In conclusion, the approval of the Planning Proposal is unlikely to result in unreasonable or significant impacts to ecological matters. Further, approval of the Planning Proposal will not enable development that is exempt from further ecological assessment and mitigation.

The Planning Proposal aligns with the Byron Shire Business and Industrial Lands Strategy (2020) and generally consistent with the Local Planning Directions issued by the Minister (latest version issued by DPE on 1 March 2022). It also largely avoids High Ecological Value vegetation and other 'red flags', as defined within the Byron DCP.

1. Introduction

Gulgan Road Property Pty Ltd seeks to amend the Byron Local Environment Plan 2014 (LEP) zoning of part of Lot 2 DP 1159910 (66 The Saddle Road, Brunswick Heads). Specifically, the LEP zoning amendments are proposed to facilitate an employment land project.

The Planning Proposal includes an area of land identified for potential development in the Byron Shire Business and Industrial Lands Strategy (BILS, 2020), October 2020, known as *Area 5: Gulgan North* and identified as an "Investigation area - employment land" in the North Coast Regional Plan 2041

This report provides an ecological assessment to support the Planning Proposal relating to the proposed employment land precinct. That is, this report has been limited in scope to matters within the Planning Proposal that are relevant to biodiversity and ecological issues. Please refer to the Planning Proposal documentation prepared by Planners North for more information.

The 'subject land' assessed as part of this report is shown on Figure 1.

1.1. Background to the BILS

The Byron Shire Business and Industrial Lands Strategy 2020 (BILS) was developed to "create business centres and industrial areas that work for people, commerce and the environment" (BILS, p.3). Furthermore, Direction 3 of the BILS aims to "secure a sustainable long-term supply of suitable industrial lands" (BILS, p.2). *Area 5 - Gulgan North industrial and business park* has been identified within the BILS with a preferred role of a business park-type development.

The proposed area subject to this Planning Proposal is generally consistent with the areas shown in the BILS mapping. Minor variances arise in response to the proposed areas of rezoning having been refined to account for engineering, bushfire, and ecological constraints on site.

Within the BILS (p.72), "key issues and further investigations" have been identified. This report addresses the following relevant key "issue: "Biodiversity and ecological matters have been assessed, including prime koala habitat, and verified by a qualified and experienced ecologist".

1.2. Site Description

The subject land is located west of the Pacific Motorway, approximately 2 km south southwest of Brunswick Heads and to the north of Gulgan Road (Figure 1). The area under consideration is 19.2 ha, part of a land parcel under single ownership as Lot 2 DP 1159910 (Figure 2) in the Bryon Shire Council Local Government Area. The property currently comprises farmland, ephemeral water courses, and patches of native vegetation, and the BILS area (as per the BILS itself) has intentionally avoided most of the significant environmental values on the site.

1.3. Proposed LEP Amendments

Amendments are proposed to the *Byron Local Environmental Plan 2014* (LEP) to change the zoning of Area 5 Gulgan North. This is to enable the development of a business park-type development incorporating multiple small businesses and supporting permissible uses. The land areas subject to the proposed rezoning are shown in Figure 3. As advised by Planners North, the proposal seeks to:

- Rezone BILS Area 5 - Precinct A into Zone E3 Productivity Support (53,300 m^2; Figure 2 and Figure 3).
- Rezone BILS Area 5 – Precincts B and C into Zone E4 General Industrial (B: 8,700 m^2, C: 10,000 m^2; Figure 2 and Figure 3).
- Increase (by approximately 215%) the extent of land zoned C2 Environmental Conservation and Environmental Management in the proposed BILS Community Title precinct (Figure 2 and Figure 3).
- Amend the Floor Space Ratio Map to provide a 0.9:1 Floor Space Ratio specific to BILS precincts, consistent with the typical Floor Space Ratios applying in the Byron Arts and Industry Estate locality.

- Amend the Lot Size Map to a minimum of 5 ha in relation to the land on the eastern side of the Pacific Motorway to facilitate the excision of this severed part of the lot from the main western parcel. (please note that land to the east of the pacific highway is not addressed in this ecological assessment report).
- Amend the Lot Size Map in relation to the land on the eastern side of the Pacific Motorway to facilitate the creation of a Community Title precinct for the BILS land and environs.
- Define the minimum area of Torrens Title subdivision for the E3 and E4 zoned land to be 2,000 m^2.
- Amend the maximum building height to 11.5 m to support the optimisation of the BILS precincts.
- Provide for working/living accommodation in the E3 precinct to support employment land uses.

If approved, the proposed amendments will help facilitate the proposed precincts (A to D) shown within the 'subject land' in Figure 1. Although details are yet to be confirmed, Precinct A is currently intended to support business park-type of land use with ancillary residential accommodation, Precincts B and C are intended to support industrial uses, and Precinct D will be reserved primarily for environmental rehabilitation. However, Precinct D will also provide ancillary infrastructure such as internal roads, walking paths and stormwater infrastructure.

1.4. Sources of information

All sources of information used to prepare this report are included in the list of References.

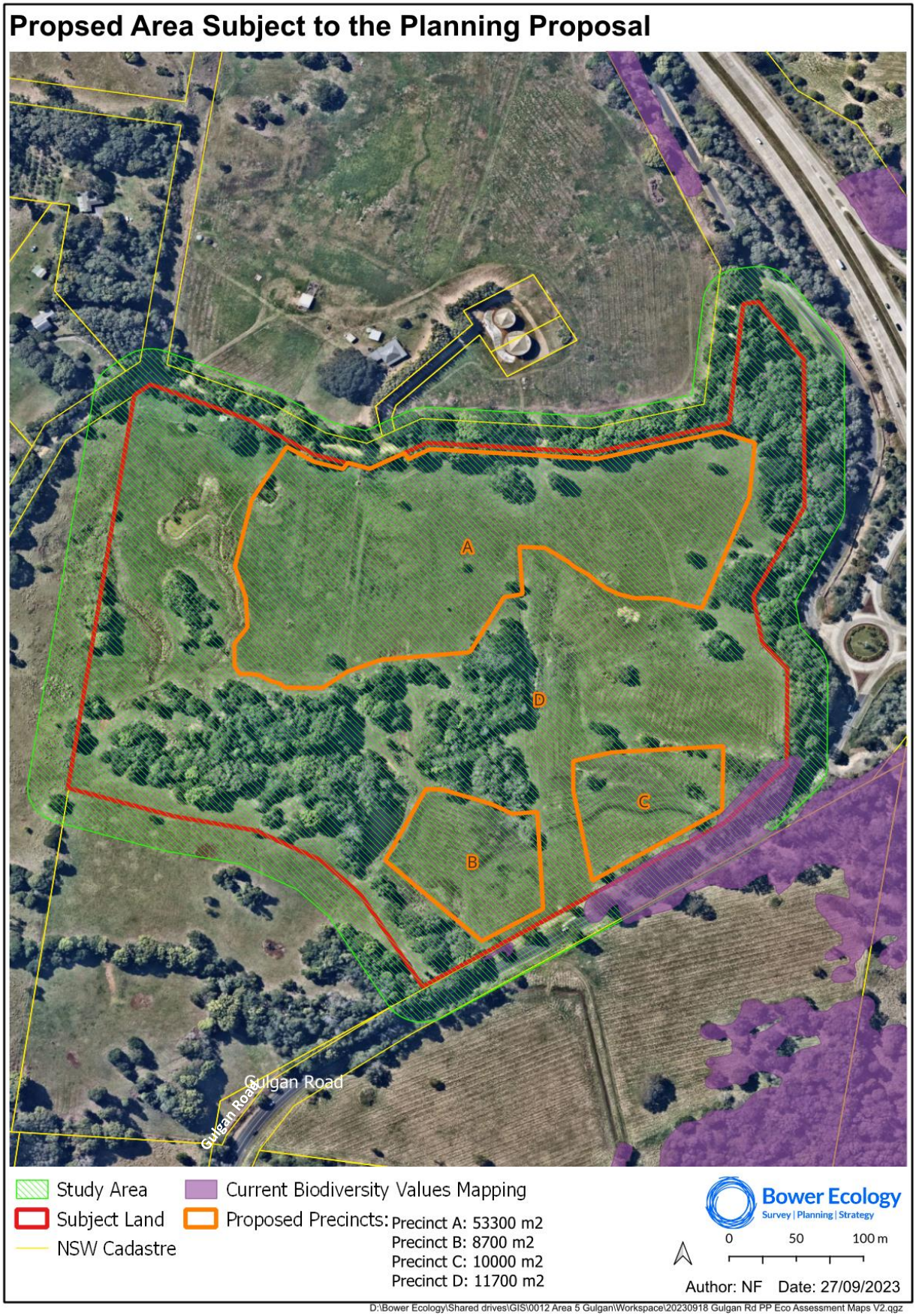

Figure 1: The area subject to the Planning Proposal and the proposed precincts.

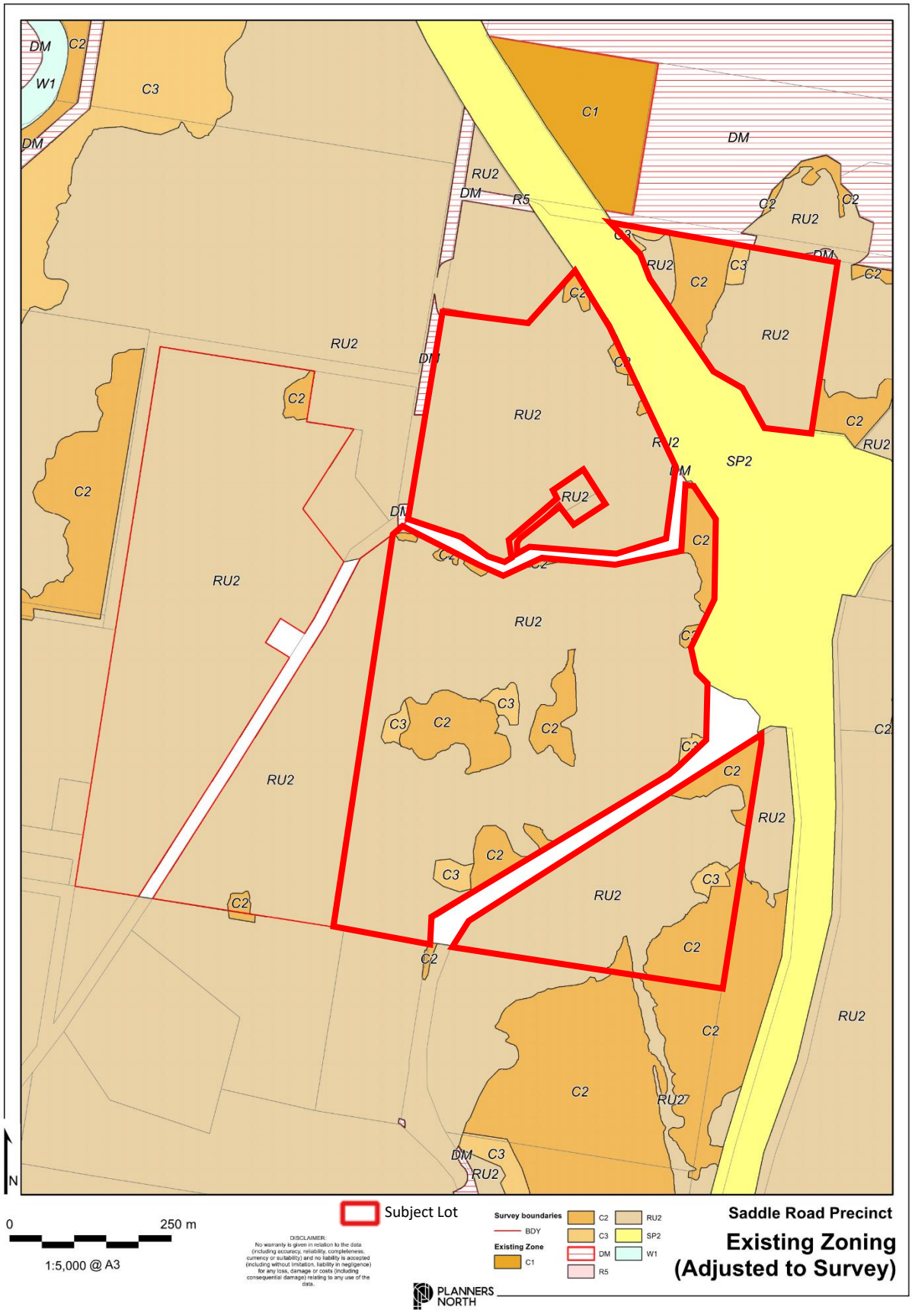

Figure 2: Current zoning within and around the study area (Map supplied by Planners North).

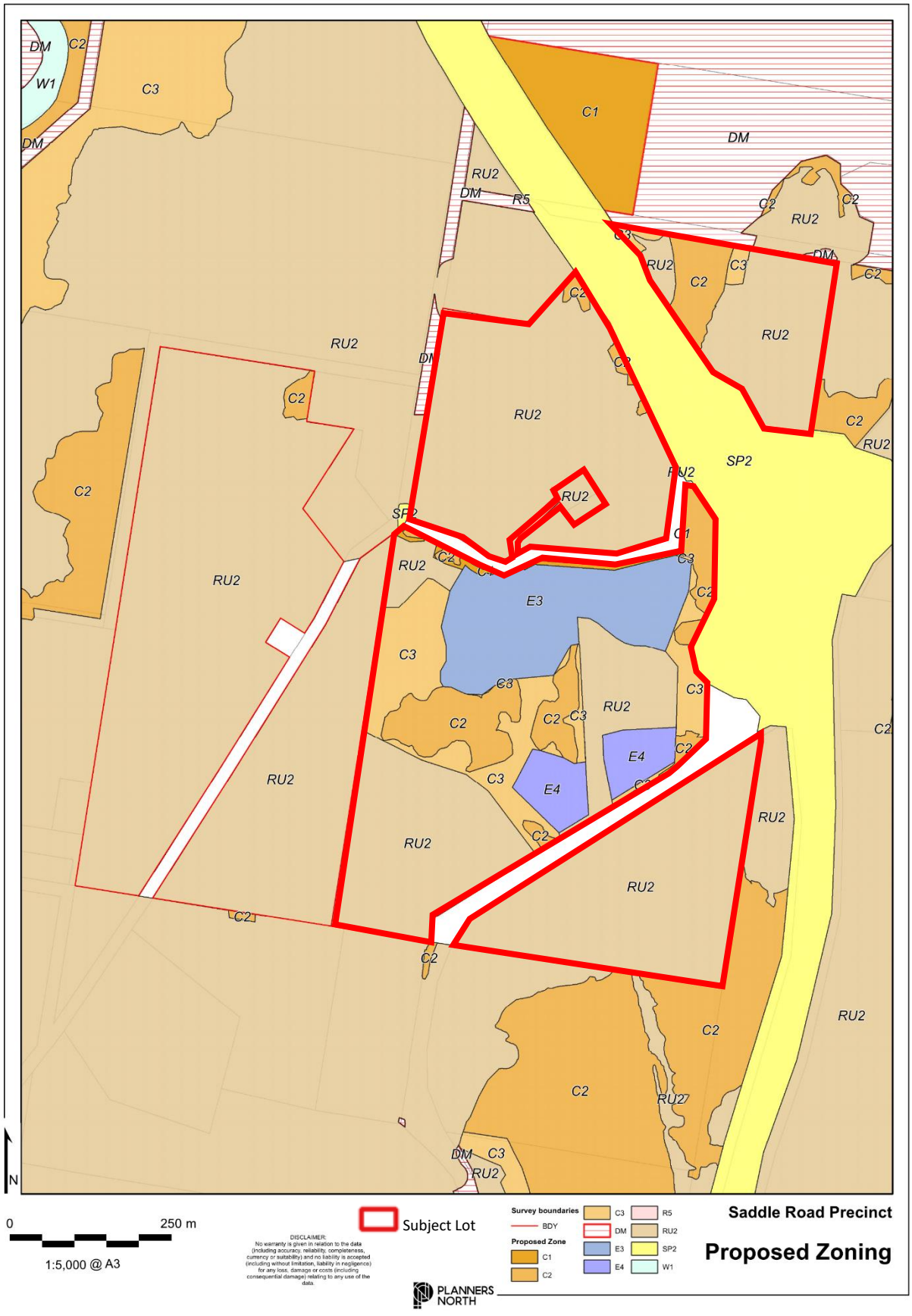

Figure 3: Proposed zoning within the subject land (Map supplied by Planners North).

1.5. Legislative context and background

1.5.1. State and Federal Requirements

The State and Commonwealth legislative framework relevant to biodiversity and ecology issues is provided in Table 1.

Table 1: Commonwealth and State Legislative Requirements:

Statute	Trigger / Background	Relevance
Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)	Actions (projects) that are likely to significantly impact matters of national environmental significance are required to be referred to the Department of Agriculture, Water and the Environment.	Based on an initial review, if the Planning Proposal is approved, the subsequent development is unlikely to result in significant impacts to matters of national environmental significance, referral of the project is not considered necessary. This assessment does not consider EPBC Act requirements any further. Once the ultimate development plans are known for the site, the project will be required to re-confirm the application of the EPBC Act.
NSW *Biodiversity Conservation Act 2016* (BC Act)	The BC Act provides a framework for the conservation of biodiversity in NSW. The BC Act mandates the Biodiversity Offset Scheme, which requires impacts of development over a certain threshold to be offset through purchasing of credits or creating a biodiversity stewardship site. This current ecological assessment pertains to a Planning Proposal (rezoning of the land). If a DA is submitted in the future, the provisions of the BC Act will be addressed at this point. Nonetheless, it is acknowledged that the Planning Proposal goes part way to enabling future development applications on the site. As such, biodiversity matters relevant to the BC Act are briefly assessed within this report. DAs trigger the requirement for Biodiversity Development Assessment Reports (BDAR) and the Biodiversity Offsets Scheme (BOS) where the following thresholds are met: • Exceedance of the native vegetation area clearing thresholds. • Impacts to land mapped on the State's Biodiversity Values Map (NSW Government 2023a). • Significant impacts to matters listed under the BC Act (threatened species or ecological communities), as assessed using section 7.3 of the BC Act. • Impacts to Areas of Outstanding Biodiversity Value (AOBV) occur. • For 'serious and irreversible impacts' (SAII). Principles relating to SAII are set out in Clause 6.7 of the *Biodiversity Conservation Regulation 2017* and	• The native vegetation clearing threshold for this site will be 0.5 ha if the Planning Proposal is approved. Future DAs enabled by approval of this Planning Proposal are unlikely to exceed the clearing thresholds, and therefore the BAM / BOS is **unlikely to be triggered due to this requirement**. • Although the land area subject to the Planning Proposal (rezoning) is overlaid by the BV mapping, the small area involved (~200 m^2) is within Precinct D (Figure 1). The majority of Precinct D is proposed to be zoned C2 and C3, including this area of BV mapping, and will therefore not be affected by the Planning Proposal. If a BV mapping area is impacted as part of future DAs (such as by the proposed roundabout - which is not Part of this Planning Proposal), **a BDAR will be required**. • Based on the initial review undertaken as part of this Planning Proposal, the project is unlikely to result in significant impacts to threatened species or ecological communities protected by the BC Act. **However, upon preparation of future DAs, further assessment is required** to re-confirm whether the project will result in a significant impact to these matters. • No areas within the Planning Proposal area are identified as AOBV and therefore the BOS **will not be triggered** by this matter.

Statute	Trigger / Background	Relevance
	OEH's Guidance to assist a decision-maker to prepare a serious and irreversible impact document (OEH 2017).	• The Planning Proposal, or any subsequent DAs enabled by Planning Proposal approval is unlikely to result in any SAII, and therefore the BOS is **unlikely to be triggered** by this matter. Re-assessment of the above will be required during the preparation of future DAs.
NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) **Local Planning Directive 1.1 – Implementation of Regional Plans**	Direction 1.1 applies to a relevant planning authority when preparing a planning proposal for land to which a Regional Plan has been released by the Minister for Planning. Direction 1.1: Planning proposals must be consistent with a Regional Plan released by the Minister for Planning. In this case the relevant documents are the North Coast Regional Plan 2041 (NSW Government, 2022).	The Planning Proposal land is identified as an "Investigation area - employment land" precinct in the North Coast Regional Plan 2041 Objective 3 of the North Coast Regional Plan 2041 (NCRP) is: Protect regional biodiversity and areas of high environmental value. The Byron local government narrative within NCRP includes the goal: Protect and enhance local biodiversity through partnerships and management of environmental assets and ecological communities. This Planning Proposal aligns with these objectives as follows: In line with these objectives, this planning proposal includes increasing the areas of C2 and C3 zoning within the subject land (Figure 2, Figure 3), and the current intent (for future development) is to improve the biodiversity values of the subject land within the C zones. Additionally, the majority of the area of the proposed Precincts A, B, and C is currently zoned RU2, and primarily consists of previously grazed exotic pasture. Moreover, proposed Precincts A, B, and C largely avoid areas of vegetation classified as HEV (Figure 18).
NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) **Local Planning Directive 3.1 - Conservation Areas (Issued to commence 1 March 2022)**	Directions are issued by the Minister for Planning to relevant planning authorities under section 9.1(2) of the *Environmental Planning and Assessment Act 1979*. These directions apply to planning proposals lodged with the Department of Planning and Environment on or after the date the particular direction was issued and commenced. Local Planning Direction 3.1 (Conservation Zones) applies to all relevant planning authorities when preparing a planning proposal. *(1) A planning proposal must include provisions that facilitate the protection and conservation of environmentally sensitive areas.* *(2) A planning proposal that applies to land within a conservation zone or land otherwise identified for environment conservation / protection purposes in a LEP must not reduce the conservation standards that apply to the land (including by modifying development standards that apply to the land). This requirement does not apply to a change to a development standard for*	Direction 3.1 – 1) the site does not include and environmentally sensitive areas 2) the site includes land currently zoned RU2, C2 and C3. This proposal intends to increase the extent of C2 and C3 land by more than 200 % (Section 1.3). Furthermore, the planning proposal does not reduce the conservation standards that apply to the land. Therefore, the intent of the planning directive has been met.

Statute	Trigger / Background	Relevance
	minimum lot size for a dwelling in accordance with Direction 9.2 (2) of "Rural Lands". For reference: 'environmentally sensitive areas' are defined in Part 1 of the *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008* as: (a) the coastal waters of the State, (b) a coastal lake identified in *State Environmental Planning Policy (Resilience and Hazards) 2021*, Schedule 1, (c) land identified as "coastal wetlands" or "littoral rainforest" on the Coastal Wetlands and Littoral Rainforests Area Map, within the meaning of *State Environmental Planning Policy (Resilience and Hazards) 2021*, Chapter 2, (d) land reserved as an aquatic reserve under the *Fisheries Management Act 1994* or as a marine park under the *Marine Parks Act 1997*, (e) land within a wetland of international significance declared under the Ramsar Convention on Wetlands or within a World heritage area declared under the World Heritage Convention, (f) land within 100m of land to which paragraph (c), (d) or (e) applies, (g) land identified in this or any other environmental planning instrument as being of high Aboriginal cultural significance or high biodiversity significance, (h) land reserved under the *National Parks and Wildlife Act 1974* or land to which Part 11 of that Act applies, (i) land reserved or dedicated under the *Crown Land Management Act 2016* for the preservation of flora, fauna, geological formations or for other environmental protection purposes, (j) land identified as being critical habitat under the *Threatened Species Conservation Act 1995 or Part 7A of the Fisheries Management Act 1994*.	
NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) **Local Planning Directive 3.4 – Application of C2 and C3 Zones and Environmental Overlays in Far North Coast LEPs (Issued to commence 1 March 2022)**	Direction 3.4 applies when a relevant planning authority prepares a planning proposal within the Ballina, Byron, Kyogle, Lismore and Tweed local government areas that introduces or alters an C2 Environmental Conservation or C3 Environmental Management zone or introduces or alters an overlay and associated clause. Direction 3.4 specifies that "A planning proposal that introduces or alters an C2 Environmental Conservation or C3 Environmental Management zone or an overlay and associated clause must apply that proposed C2 Environmental Conservation or C3 Environmental Management zone, or the overlay and associated clause, in line with the *Northern Councils E Zone Review Final Recommendations*."	This planning proposal alters both C2 and C3 zones by proposing to increase them within the Subject Land (Section 1.3). Therefore, the overarching intent of the planning directive has been met and exceeded.

Statute	Trigger / Background	Relevance
NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) **Local Planning Directive 4.2 – Coastal Management (Issued to commence 1 March 2022)**	Direction 4.2 applies when a planning proposal authority prepares a planning proposal that applies to land that is within the coastal zone, as defined under the *Coastal Management Act 2016* - comprising the coastal wetlands and littoral rainforests area, coastal vulnerability area, coastal environment area and coastal use area - and as identified by chapter 2 of the *State Environmental Planning Policy (Resilience and Hazards) 2021.* Direction 4.2 focusses on NSW Government mapping in coastal areas in terms of zoning, land management and ecological threats.	No Resilience and Hazards SEPP mapping exists over the site; therefore, the provisions of the SEPP are **not currently relevant.** Due to this, Direction 4.2 of the Local Planning Directions (Department of Planning, no date) also does not apply.
State Environmental Planning Policy (Resilience and Hazards) 2021 **(Resilience and Hazards SEPP)**	The aim of the Resilience and Hazards SEPP is to promote an integrated and co-ordinated approach to land use planning in the coastal zone. This is achieved by managing development in the coastal zone and protecting the environmental assets of the coast, and by establishing a framework for land use planning to guide decision-making in the coastal zone.	No Resilience and Hazards SEPP mapping exists over the site; therefore, the provisions of the SEPP are **not currently relevant.**
NSW State Environmental Planning Policy (Biodiversity and Conservation) 2021 **(Biodiversity and Conservation SEPP)**	The Biodiversity and Conservation SEPP applies to the subject land; however, requirements relating to koalas are devolved to the approved Koala Plan of Management for the area. This is the *Byron Coast Comprehensive Koala Plan of Management* (BCCKPoM).	The site is outside of a *Koala Management Precinct* that is mapped within the BCCKPoM (Figure 21). There is a very small area of *Potential Koala Habitat* (as defined in the BCCKPoM) on site (Figure 21). As per the BCCKPoM, proposals relating to land containing potential koala habit outside of a Koala Management Precinct must undertake survey to assess koala activity on the site. A koala survey within koala habitat areas was undertaken as part of this ecological assessment. No evidence of koala was observed, and therefore the site is not considered to represent "core koala habitat". Further information is provided in Section 4.6. The development assessment provisions of the BCCKPoM **do not apply** if there is no "core koala habitat" on site. Despite the above, Council DCP requirements relevant to Koalas will apply to any future DAs (see Section 1.5.2). This will be assessed upon preparation of future DAs.
NSW *Water Management Act 2000* (WM Act)	The object of the WM Act is to provide for the sustainable and integrated management of the water sources of the State. Some activities are "controlled activities" under the act. For example, works on waterfront land. Waterfront land means the bed of any river, lake or estuary, and the land within 40 metres of the riverbanks, lake shore or estuary mean high-water mark.	Given the existence of mapped waterways on the site, the requirements for approval for works on waterfront land will need to be confirmed with NSW DPIE (Water). Any necessary waterfront land approval will be dealt with during the DA phase.

1.5.2. Byron Bay Council Requirements

In the Byron Shire Business and Industrial Lands Strategy (BILS, 2020), Area 5 Gulgan North is identified as a potential site for an industrial and business park, as part of the Council's plan to secure a sustainable long-term supply of suitable business and industrial lands. The Planning Proposal is based directly on Council's strategy and seeks to enact the goal of the BILS. Further, the Planning Proposal seeks to realise Area 5's 'preferred role' as an industrial area (e.g., business park), as stated within the BILS.

The Planning Proposal has also been designed to consider overarching LEP requirements pertaining to biodiversity. That is, pursuant to Section 1.2[2][a] and [i] of the *Byron LEP 2014*, the aims of the LEP are to conserve biological diversity and ecological integrity, and to protect, manage and restore the natural environment and biodiversity of Byron. This Planning Proposal supports these goals by excluding the patches of good quality native vegetation from the Planning Proposal area.

In addition, if future DAs are facilitated due to the approval of the Planning Proposal, there are large tracts of land that provide an opportunity for revegetation to support rainforest ECC or wet sclerophyll forest. At this stage, there is no commitment to undertake revegetation on the site; however, such a proposal may be considered in the future as part of DA requirements.

Although not technically applicable at this stage, it is prudent to consider Byron Bay DCP (2014) requirements (at a high level) due to the potential environmental impacts of future development which the Planning Proposal may enable. The Proposal largely avoids 'red flags' (as defined in the DCP) and is generally consistent with Area 5 (as defined in the BILS). Despite this, further Council assessment of any future DA will be required. It is understood that a site-specific DCP will likely be prepared for this site. That DCP can refine the general shire-wide guidance and provide requirements tailored to the specific characteristics of this site.

2. Ecological Assessment Methodology

2.1. Desktop Assessment

A desktop assessment included a review of data available on the websites and in the reports as listed in text, and in the References section of this document to understand the ecological values within the study area.

2.2. Field Assessments

Bower Ecology undertook a site inspection to validate data collected during the desktop assessment. The following methods were employed over two days (7 and 8 October 2021):

- Five 20m x 20m floristic plots within the patches of vegetation on the property. The floristic plot surveys followed the methods outlined in the NSW Biodiversity Assessment Methodology (DPIE 2020). One representative plot was located in each of the identified Plant Community Types (PCTs) on the property (Figure 10). A list of flora species recorded during the floristic plot surveys is provided in Appendix D.
- A tree survey of standalone paddock trees recording species, height, diameter at breast height, canopy width and health (Appendix E).
- Survey to confirm fauna habitat values across the site, including koala habitat. This included a search for koala scats, or scratches on koala habitat trees.
- A meander of the property to record incidental sightings of threatened flora or fauna observed during the survey.
- Dawn and dusk bird surveys, totalling four hours of survey effort over two days (Appendix C).

Other targeted fauna survey methods (e.g., trapping, motion sensor cameras, anabat, bioacoustics records, etc.) have not been undertaken as part of this ecological assessment. However, an assessment of habitat resources was conducted to inform the likelihood assessment.

2.3. Terminology

Exotic species are marked with an asterisk * throughout this report.

The term “subject land” describes the footprint of the planning proposal, that is relevant to this report, per Figure 1.

The term “study area” refers to the site as well as adjacent areas (buffer of approximately 30 m) that may be indirectly impacted by potential future development (e.g., due to edge effects), and encompasses a total area of 32.375 ha.

The “property” or “subject lot” refers to the portion of Lot 2 DP 1159910 to the north of Gulgan Road.

For the purposes of reviewing local BioNet threatened species records, an area including a 5 km buffer from the site was calculated.

3. Landscape Features

The landscape features and site context of the subject land are detailed in Table 2, and those present are illustrated in Figure 5.

Table 2: Landscape features pertaining to the subject land:

Landscape Feature	Pertinent to the subject land
Interim Biogeographic Regionalisation for Australia (IBRA) bioregion	South East Queensland
IBRA sub-region	Burringbar-Connondale Ranges
Local Government Area	Byron Shire Council
Mitchell Landscape	SEQ Volcanics (NSW Government, 2023d)
Rivers, streams, estuaries	There are six ephemeral drainage lines throughout the subject land (NSW Government, 2023e.). A *Riparian Zone Assessment* has been prepared by Planners North (2023) to support the future preparation of a site-specific DCP.
Wetlands	No wetlands are recorded on the relevant Resilience and Hazards SEPP mapping. There is a sedgeland/forbland area on the western side of proposed Precinct B, which has a catchment to the north-west and is likely to be ephemerally inundated/saturated. See Section 4.1 for information about floristics and an associated photograph. A constructed dam (Figure 12) also exists to the north-west of proposed Precinct B and is fed by a small rainforest drainage line from the north-west.
Connectivity of different areas of habitat	The subject land falls outside the Fauna Corridor for North-east NSW (NSW Government, 2023c) and outside the Climate Change Corridors of coastal North-east NSW (NSW Government, 2023b, Figure 6). On a local level, the subject land consists of mostly-cleared grazing land, with patches of native and exotic vegetation. Habitat connectivity to the west and north of the proposed project footprint is generally limited due to extensive agricultural clearing resulting in relatively small, isolated patches of native vegetation (Figure 6). The Pacific Highway negatively affects landscape permeability to the east, where there are more extensive areas of connected woody native vegetation. To the south of the proposed project footprint, habitat connectivity is supported with woody vegetation patches generally within 100 m of each other (Figure 6).
Areas of geological significance and geological features	There are no areas of geological significance within the subject Land. There are no significant soil hazard features within the subject land: no steep slopes occur, and there are no mapped Acid Sulphate Soil (ASS) areas, apart from a small area at the Gulgan Road intersection. This area is rated L2: Low probability 1–3 m below ground surface (NSW Government, 2023f). Further assessment of ASS areas will be undertaken by others as part of the DA process, if required.
Biodiversity Values Mapping	Biodiversity values mapping (NSW Government 2023a) overlaps a small area within the south-east of the subject land (Figure 1 and Figure 5) and includes a number of mature *Euclayptus tereticornis* trees (Figure 4).
Areas of outstanding biodiversity value	There are no areas of outstanding biodiversity value mapped within the subject land.

3.1. Site Context

The landscape evaluation was conducted using site-based assessment methodology and conducted by a qualified ecologist and BAM accredited assessor. Native vegetation cover was assessed within a 1500 m diameter buffer area surrounding the development site. The site and 1500 m buffer have a total area of 912 ha and include native vegetation cover of approximately 455 ha (50%). See Figure 5.

Figure 4: Mature Eucalyptus tereticornis *along Gulgan Road and within the area of Biodiversity Values Mapping.*

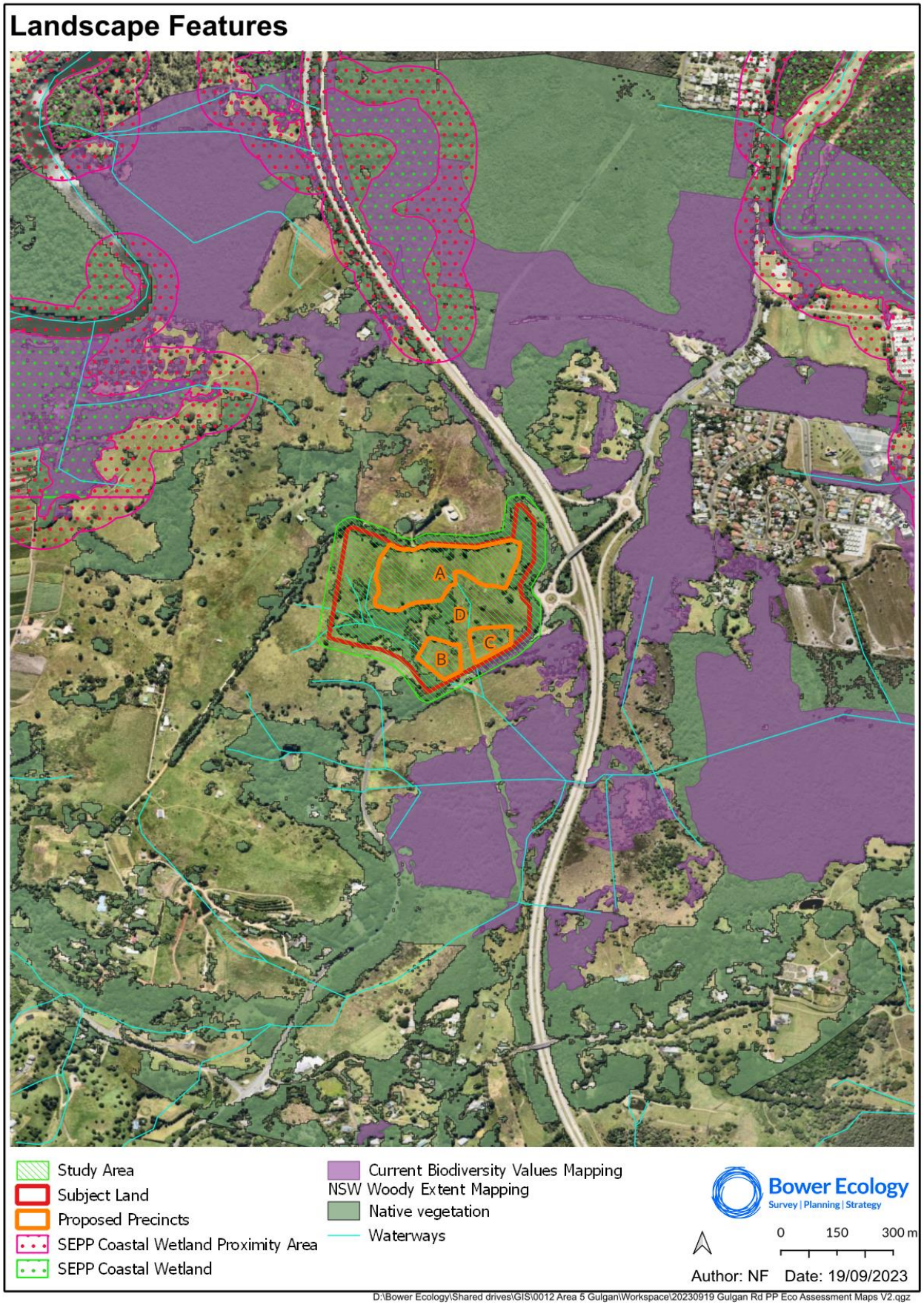

Figure 5: The landscape features and site context of the subject land are shown in this figure and detailed in Table 2.

Figure 6: Native vegetation within 1500 m of the project footprint.

4. Baseline Ecological Information

4.1. Plant Community Types and EECs

Plant Community Types (PCTs, Table 3) and the associated Endangered Ecological Communities were mapped during the ecological survey undertaken for this assessment. These communities are shown in Figure 10. NOTE: PCT 3989 appears twice in Table 3 because the degraded state of some land within the study area resulted in the PCT being classified in two different ways.

Table 3: PCTs identified across the site, dominant species, and corresponding EECs:

Description	Photos
Lower Richmond Hills Dry-Subtropical Rainforest (PCT 3002) Represented by Plot 1 in Figure 10. The canopy is dominated by *Ficus macrophylla* and *Ficus virens* with *Mallotus philippensis* and *Cupaniopsis anacardioides* also present. The midlayer is diverse, and comprises a combination of *Maclura cochinchinensis*, *Cryptocarya triplinervis*, *Ligustrum sinense**, *Dysoxylum mollissimum, Flacourtia jangomas*, Acmena smithii, Harpullia hillii, Synoum glandulosum, Duranta erecta*, Schefflera actinophylla*, Endiandra globosa, Glochidion ferdinandi, Cryptocarya obovata, Jagera pseudorhus, Eugenia uniflora*, Syagrus romanzoffiana*, Lantana camara*, Ochna serrulata*, Senna pendula*, Coffea arabica*, Cinnamomum camphora*.* Groundcovers were dominated by *Ageratina riparia*,* in addition to *Nephrolepis cordifolia, Aiantum hispidulum, Oplismenus sp., Ottochloa gracillima, Asparagus africanus* and Cissus antarctica.* **This PCT meets the determination of the Lowland Rainforest EEC (OEH 2019).**	

Description	Photos
Far North Brush Box-Bloodwood Wet Forest (PCT 3147) Represented by Plot 2 in Figure 10. The canopy of this community is dominated by *Lophostemon confertus,* with a range of other species including *Corymbia intermedia, Elaeocarpus obovatus, Cinnamomum camphora*, Mallotus philippensis* and *Ficus rubiginosa*. The midstorey comprised a mix of *Macaranga tanarius, Ligustrum sinense*, Ochna serrulata*, Acacia melanoxylon, Eugenia uniflora*, Guioa semiglauca, Lantana camara*, Rubus rosifolius, Schefflera actinophylla,* and *Senna pendula*,* with less cover of *Solanum mauritianum*, Solanum seaforthianum** and *Syagrus romanzoffiana**. Ground cover species included *Asparagus aethiopicus*, Nephrolepis cordifolia, Cissus antarctica, Ageratina adenophora*, Paspalum* sp.**, Smilax australis, Gahnia aspera, Passiflora foetida** and *Ageratina riparia*.* The epiphyte *Platycerium bifurcatum* was also recorded in this plant community. **This PCT does not correspond to an EEC**	
Poor Condition Waterlogged Areas Represented by Plot 3 in Figure 10. There are three locations of this type of vegetation community within the subject land – one area on alluvial soils in the west of proposed Precinct B, and another two areas in the north-west of the site (to the west of Proposed Precinct B). All areas have been previously cleared for the purposes of grazing. The lowland area on alluvial soils is considered a poor condition form of PCT 3989, and includes some ground layer species such as sedges and forbs, but lacks a shrub layer and overstorey. It is dominated by *Ranunculus inundatus* and *Rhynchospora corymbosa.* Other species observed included *Commelina benghalensis*, Setaria sphacelata*, Persicaria hydropiper, Gomphocarpus* sp**., Ludwigia octovalvis, Ageratina adenophora*, Senecio madagascariensis*, Ageratum houstonianum*, Persicaria strigosa, Centella asiatica, Eleocharis equisetina, Bidens pilosa*, Sida* sp.*, *Vigna parkeri*, Juncus usitatus, Oxalis perennans*, and Conyza bonariensis.* The other two areas in the north-west of the site have similar floristics to the lowland waterlogged area, though they are higher (AHD) and are associated with basalt geology. It is likely that these two upland areas were rainforest prior to clearing (Lower Richmond Hills Dry-Subtropical Rainforest [PCT 3002]) Due to the native sedge and forb cover, the lowland area may be considered to represent a Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and	

Description	Photos
South East Corner Bioregions EEC (OEH 2020a). Although it is in a relatively disturbed state and likely to be a community that has been derived due to grazing, degraded states are still considered to meet the determination for the Freshwater Wetland EEC. Nonetheless, if future development is assessed under the Biodiversity Assessment Methodology (BAM), this land will be considered to be a degraded form of PCT 3989 in accordance with Section 4.2(3) of the BAM**,** which is actually considered to be the Swamp Sclerophyll Forest on Coastal Floodplains EEC (OEH 2020c). As such, it is mapped in Figure 10 as the Swamp Sclerophyll EEC and not the Freshwater Wetland EEC. The upland waterlogged areas are not considered to be an EEC as they do not exist on alluvial soils and do not show evidence of rainforest.	
Far North Paperbark Fern Swamp Forest (PCT 3989) Represented by Plot 4 in Figure 10. This community comprises mostly native species. *Melaleuca quinquenervia* dominates the canopy in this community. The midlayer is comprised of *Melicope elleryana, Myrsine variabilis, Ficus coronata, Glochidion ferdinandi, Archontophoenix cunninghamiana, Parsonsia straminea, Ficus sp. Cinnamomum camphora*, Glochidion sumatranum, Ligustrum sinense** and *Senna pendula*.* Groundcovers observed included *Carex appressa, Blechnum indicum, Poacea* sp., *Cyclosorus interruptus, Persicaria strigosa, Lygodium microphyllum, Viola* sp. and *Lomandra longifolia.* **This PCT meets the determination of the Swamp Sclerophyll Forest on Coastal Floodplains EEC (OEH 2020c).**	

Description	Photos
Far North Swamp Oak-Tuckeroo Swamp Fringe Forest (PCT 4034) Represented by Plot 5 in Figure 10. Due to the dominance of remnant *Eucalyptus tereticornis* in the canopy, and *Casuarina glauca* in the wider area, this area is presumed to be a disturbed version of PCT 4034. It has been subject to grazing and is therefore lacking the shrub and ground layers associated with this PCT. The canopy of this community consists of *Eucalyptus tereticornis.* The midlayer is a mix of exotic and native species including *Callistemon salignus, Cinnamomum camphora*, Ligustrum sinense*, Cupaniopsis anacardioides, Parsonsia straminea, Schefflera actinophylla, Senna pendula*, Smilax australis, Lantana camara*, Glochidion ferdinandi, Ochna serrulata*, Asparagus aethiopicus** and *Passiflora edulis*. Paspalum* sp.* (probably *mandiocarnum*, although no fertile material was available to assist with identification) is the dominant ground cover. Others include *Setaria sphacelata*, Vigna parkeri*, Centella asiatica, Poacea* sp.*, Verbena* sp.**, Bidens Pilosa*, Juncus usitatus, Stephania japonica, Hibbertia scandens, Marsdenia* sp. and *Geitonoplesium cymosum.* **This PCT does not correspond to an EEC**.	

There is also an area of regenerating shrubland, dominated by *Acacia melanoxylon* to the east of the subject land. This shrubland area appears to have been planted as part of revegetation efforts.

Scattered paddock trees were surveyed (Figure 7, Figure 8, Figure 9, and Figure 27 in Appendix E). The majority of these were *Cupaniopsis anacardioides, Melaleuca quinquenervia, Eucalyptus tereticornis* and *Callistemon salignus*; full species list in Table 14 in Appendix E. Some of the scattered trees appearing in aerial photography were Camphor Laurel and have since been removed as part of weed management works across the site.

The large areas of paddock are dominated by grass species such as *Paspalum mandiocanum**, *Setaria sphacelata**, *Axonopus compressus** and *Cynodon dactylon,* amongst others, with several common exotic paddock forbs also present.

Figure 7: Scattered trees in paddock area (Photo taken from the eastern third of proposed Precinct A, looking west).

Figure 8: Vegetation along the northern fence line, looking east.

Figure 9: Scattered native trees in paddock area (Photo taken from the east of Precinct A, looking south-west towards Gulgan Road. The minor drainage line across proposed Precinct C is visible in the lowland area).

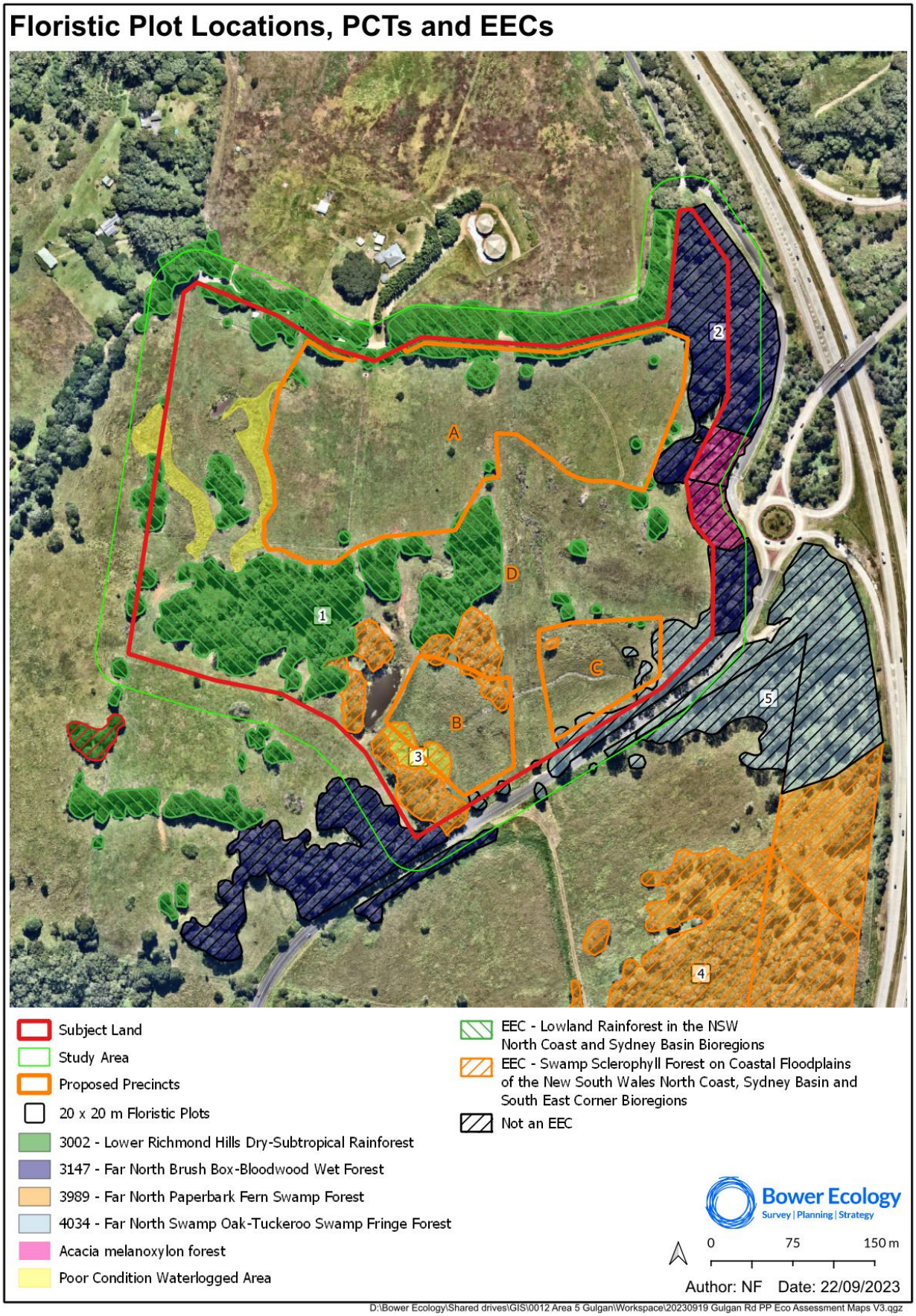

Figure 10: 20m x 20m Floristic Plot locations, surveyed Plant Community Types and EECs.

Figure 11: Threatened Species observed during the survey.

4.2. Wetlands and Waterways

Wetlands and waterways on this site are shown in Figure 5.

No wetlands are recorded on the relevant Resilience and Hazards SEPP mapping (see Section 1.5.1 for more information).

Waterways on site consist of six mapped ephemeral drainage lines (Figure 5). Only one of the drainage lines is a river as defined under the *Water Management Act (2000)* (NSW Government, 2000), according to an assessment undertaken by Planners North (2023).

The waterlogged sedgeland/forbland on the western side of proposed Precinct B has a catchment to the north-east (see Table 3 for information about floristics and a photograph). The area is likely to be ephemerally inundated/saturated.

There is also an elevated waterlogged area in the north-west of the study area, which consists of a diffuse array of drainage paths, which generally flow south-east towards the dam near Precinct B. A photograph of this area is provided in Figure 14, whilst it is also visible in Figure 10 to the west of Precinct A, and Figure 15 (historical aerial photography). This waterlogged area is perched above the floodplain on basalt geology and is likely fed by both overland flows and groundwater interflows. The floristics are similar to that of the freshwater wetland to the east of Precinct C (mentioned above). It is not considered to be a Freshwater Wetland EEC as it is not on the floodplain.

The waterlogged areas are also subject to continual disturbance by weed invasion and grazing and are typical of paddock areas in the region where the regular presence of water assists in keeping the exotic pasture grass cover relatively low.

A constructed farm dam also exists to the north-west of proposed Precinct B and is fed from a small rainforest drainage line from the north-west (shown in Figure 12). The dam has a narrow fringe of native flora species such as *Ludwigea ocotovalvis, Juncus* sp.*,* and *Philydrum lanuginosum*, although *Setaria sphacelata** is also common. Due to its depth, it also supports the exotic water lily *Nymphaea caerulea**.

The drainage line in the east (in proposed Precinct C) is not a mapped watercourse (See Figure 5). It flows towards the east and is dominated by mostly native species (Figure 13). Species recorded in the drainage line include *Eleocharis* sp., *Cyperus* sp., *Commelina benghalensis**, *Cynodon dactylon*, *Ludwigea peploides*, *Juncus* sp. and *Ranunculus inundatus*. It is assumed that this drainage line has been constructed to assist with site drainage, as the area appears to have a much more diffuse overland flow, per 1958 historical aerial photography provided in Figure 15.

Although only approximately 1 m wide, this drainage line may represent a derived version of the *Freshwater Wetlands on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions* EEC for freshwater wetlands (Figure 13). If future development is assessed under the BAM, this land will be considered to be a degraded form of "PCT 3989 – Far North Paperbark Fern Swamp Forest" or "PCT 4034 - Far North Swamp Oak-Tuckeroo Swamp Fringe Forest" in accordance with Section 4.2(3) of the BAM. Hence, it is not mapped in Figure 10 as a freshwater EEC.

The 2nd order stream in the west (of proposed Precinct B) is an overflow from the dam and discharges into the paddock on the south side of Gulgan Road. The stream is fringed by Paperbark forest and flows in a southerly direction, across Gulgan Road. This stream has been assessed as a river within the meaning of the *Water Management Act (2000)* (NSW Government, 2000), according to an assessment undertaken by Planners North (2023).

Some segments of the natural drainage lines have defined beds and banks, while the remaining segments are more swale-like. Active management is warranted for parts of the five natural drainage lines.

Figure 12: Constructed dam, looking north-west from the northern section of proposed Precinct B.

Figure 13: The drainage line in the east (looking west from the centre of proposed Precinct C).

Figure 14: Elevated bog in the north-west of the subject land.

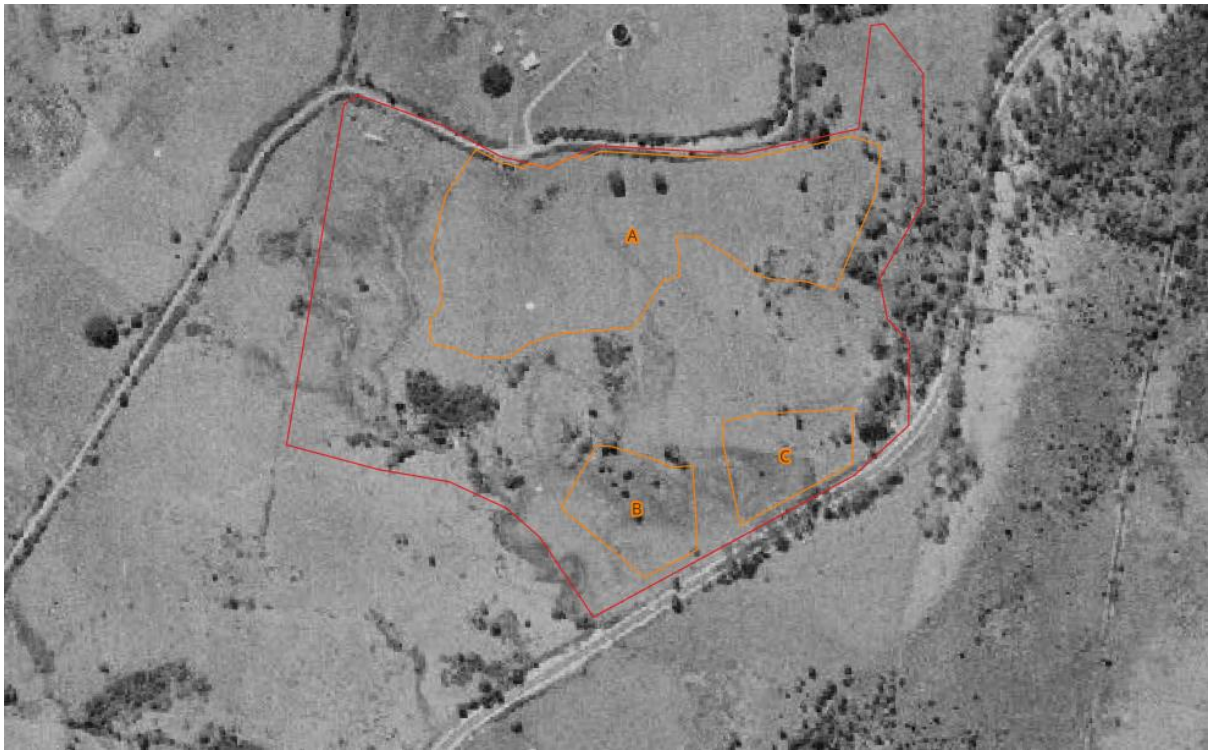

Figure 15: Historical Aerial Photography from 12/10/1958.

Please note the alignment of the historical aerial photography is approximate due to image warping within the original file.

4.3. Threatened Flora

A likelihood assessment for threatened species presence has been undertaken as part of this assessment (Appendix A). Based on the result of the assessment, 42 threatened flora species could possibly occur within the study area, whilst two *Biodiversity Conservation Act 2016* (BC Act) listed threatened species were directly observed during the survey (Figure 11, Figure 16). These were *Cryptocaria foetida* and *Tinospora tinosporoides*. Details of each are provided in Table 4.

Due to the density of rainforest on the site and the significant number of threatened species recorded within 5 km of the site (Figure 17), additional threatened flora will likely be present within the patches of rainforest on the site that were not detected during the survey. This is likely to include additional individuals of *Cryptocaria foetida* and *Tinospora tinosporoides*, and potentially individuals of other species.

Further to this, two species (*Archidendron muellerianum* and *Decaspermum humile*) are not currently listed under the BC Act or *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act). However, both these species may be listed in the future due to the impacts of myrtle rust, and a review of their conservation status should be undertaken during the DA process. *Decaspermum humile* is a very high priority species under the *Myrtle Rust in Australia National Action Plan* (Makinson *et al*., 2020).

Table 4: Threatened flora known to occur or possibly occurring on the property:

Species	Status	Presence based on distribution, habitat, recorded sightings
Acacia bakeri	V – BC Act N – EPBC Act	Recorded within 5 km of site. Not recorded during on-site surveys but possibly occurring on the property due to suitable habitat and distribution.
Acronychia littoralis	E – BC Act E – EPBC Act	As above
Archidendron hendersonii	V – BC Act N – EPBC Act	As above
Arthraxon hispidus	V – BC Act V – EPBC Act	Not recorded within 5 km of site or during on-site surveys. It has been recorded in the Burringbar-Conondale IBRA sub-region, and it is possible it might occur on site due to suitable habitat and distribution.
Backhousia subargentea	E – BC Act N – EPBC Act	Recorded within 5 km of site. Not recorded during on-site surveys but possibly occurring on the property due to suitable habitat and distribution.
Belvisia mucronata	E – BC Act N – EPBC Act	As above
Corokia whiteana	V – BC Act V – EPBC Act	As above
Cryptocaria foetida	V – BC Act V – EPBC Act	**Four individuals recorded on site** (Figure 11), all of which were saplings <1 m high. Additional specimens are likely to occur within suitable habitat (patches of rainforest) across the site.
Cyanchum elegans	E – BC Act E – EPBC Act	Recorded within 5 km of site. Not recorded during on-site surveys but possibly occurring on the property due to suitable habitat and distribution
Davidsonia johnsonii	E – BC Act E – EPBC Act	Not recorded within 5 km of site or during on-site surveys. It has been recorded in the Burringbar-Conondale IBRA sub-region and it is possible it might occur on site due to suitable habitat and distribution.
Diploglottis campbellii	E – BC Act E – EPBC Act	As above
Drynaria rigidula	E – BC Act N – EPBC Act	Recorded within 5 km of site. Not recorded during on-site surveys but possibly occurring on the property due to suitable habitat and distribution.
Diospyros mabacea	E – BC Act E – EPBC Act	As above
Elaeocarpus williamsianus	E – BC Act E – EPBC Act	As above
Endiandra floydii	E – BC Act E – EPBC Act	As above
Endiandra hayesii	V – BC Act	As above

Species	Status	Presence based on distribution, habitat, recorded sightings
	V – EPBC Act	
Endiandra muelleri subsp. *bracteata*	E – BC Act N – EPBC Act	As above
Floydia praealta	V- BC Act V – EPBC Act	As above
Fontainea australis	V – BC Act V – EPBC Act	Not recorded within 5 km of site or during on-site surveys. It has been recorded in the Burringbar-Conondale IBRA sub-region and it is possible it might occur on site due to suitable habitat and distribution.
Gossia fragrantissima #	E – BC Act E – EPBC Act	Recorded within 5 km of site. Not recorded during on-site surveys but possibly occurring on the property due to suitable habitat and distribution.
Grevillea hilliana	E – BC Act N – EPBC Act	As above
Harnieria hygrophiloides	E – BC Act N – EPBC Act	As above
Hicksbeachia pinnatifolia	V – BC Act V – EPBC Act	Not recorded within 5 km of site or during on-site surveys. It has been recorded in the Burringbar-Conondale IBRA sub-region and it is possible it might occur on site due to suitable habitat and distribution.
Lindsaea brachypoda	E – BC Act N – EPBC Act	Recorded within 5 km of site. Not recorded during on-site surveys but possibly occurring on the property due to suitable habitat and distribution.
Macadamia integrifolia	N – BC Act V – EPBC Act	As above
Macadamia tetraphylla	V – BC Act V – EPBC Act	As above
Marsdenia longiloba	E – BC Act V – EPBC Act	Recorded within 5 km of site. Not recorded during on-site surveys but possibly occurring on the property due to suitable habitat and distribution.
Melicope vitiflora	E – BC Act N – EPBC Act	As above
Niemeyera whitei	V – BC Act N – EPBC Act	Recorded within 5 km of site. Not recorded during on-site surveys but possibly occurring on the property due to suitable habitat and distribution.
Ochrosia moorei	E – BC Act E – EPBC Act	Not recorded within 5 km of site or during on-site surveys. It has been recorded in the Burringbar-Conondale IBRA sub-region and it is possible it might occur on site due to suitable habitat and distribution.
Phaius australis	E – BC Act E – EPBC Act	As above
Phyllanthus microcladus	E – BC Act N – EPBC Act	Recorded within 5 km of site. Not recorded during on-site surveys but possibly occurring on the property due to suitable habitat and distribution.
Randia moorei	E – BC Act E – EPBC Act	As above
Rhodamnia maideniana	CE – BC Act N – EPBC Act	As above
Rhodamnia rubescens !	CE – BC Act N – EPBC Act	As above
Rhodomyrtus psidioides !	E – BC Act N – EPBC Act	As above
Senna acclinis	E – BC Act N – EPBC Act	As above
Syzygium hodgkinsoniae #	V – BC Act V – EPBC Act	As above
Syzygium moorei	V – BC Act V – EPBC Act	As above
Thesium austral	V – BC Act V – EPBC Act	Not recorded within 5 km of site or during on-site surveys. It has been recorded in the Burringbar-Conondale IBRA sub-region and it is possible it might occur on site due to suitable habitat and distribution.

Species	Status	Presence based on distribution, habitat, recorded sightings
Tinospora tinosporoides	V – BC Act N – EPBC Act	**Nine individuals recorded on site** within rainforest patches (Figure 11). Additional specimens may occur within suitable habitat across the site as this species is considered common where it does exist.
Xylosma terrae-reginae	E – BC Act N – EPBC Act	As above

Species with exclamation mark ! are listed as Emergency Priority and those marked # are listed as Very High Priority under the Myrtle Rust in Australia – a National Action Plan.
Key: CE: Critically Endangered, E: Endangered, V: Vulnerable, N: not listed.

Figure 16: Example of Tinospora tinosporoides *(left) and* Cryptocaria foetida *(right) recorded on site.*

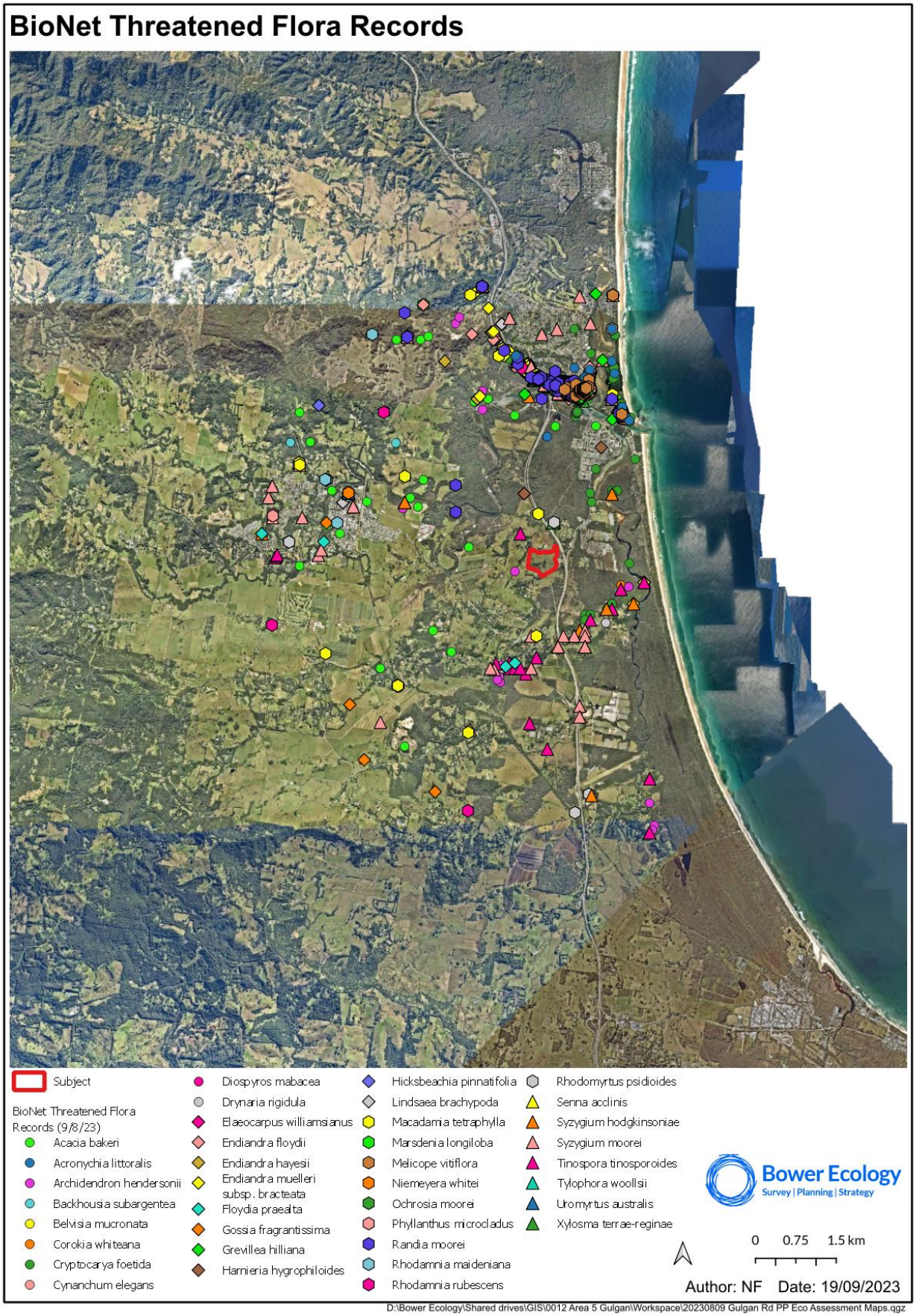

Figure 17: BioNet Records of Threatened Flora within 5 km of the Subject Land.

4.4. High Environmental Value (HEV) Vegetation

Under the Byron Bay DCP (2014), HEV vegetation is defined as "land identified as being high environmental value according to the ecological criteria specified in the relative ecological Value Matrix in Part 3 of the 'Byron Biodiversity Strategy 2004' as amended" (DCP Part A, page 31). In summary, this includes:

1. Old growth forest
2. Rare, endangered, and vulnerable forest ecosystems, including rainforest
3. Forest ecosystems with limited extend in the shire
4. Poorly protected forest ecosystems
5. Forest ecosystems with >55% of the original extent cleared
6. Local endemic forest ecosystems
7. Forest ecosystems whose conservation target cannot be met wholly on public lands
8. Fauna Corridors
9. Significant animal habitats
10. Grey headed flying fox and Black Flying Fox maternity / roost sites
11. Koala habitat
12. Threatened animal species
13. Significant Byron Shire Flora habitats
14. Forest ecosystems subject to threatened processes within Byron
15. Other significant habitats
16. Rate and threatened plant locations
17. Wetlands
18. Native grasslands
19. Heath and Banksia ecosystems
20. Land on the register of National Estate
21. Woody native vegetation on floodplain
22. Littoral Rainforest mapped as SEPP26 (now repealed and mapped under the *State Environmental Planning Policy (Resilience and Hazards) 2021*
23. EECs
24. Vegetation with patch/remnant sizes >250ha
25. Patch/remnant size – ecological threat in core vegetation <50ha

Based on vegetation assessed during a site visit, Bower Ecology determined the extent of HEV vegetation within the study area. This HEV vegetation has been mapped in Figure 18 alongside HEV vegetation mapped by Byron Shire Council. The latter was identified and mapped in 2017 (DCP Chapter B1).

There are several differences, albeit minor, between the land classified as HEV by BSC and that identified by Bower Ecology (Figure 18). Generally speaking, the EECs, rainforest vegetation, wetlands, and scattered eucalypts were considered to be HEV vegetation. Far North Brush Box-Bloodwood Wet Forest (PCT 3147) was not originally considered to be HEV, as it is not primary koala habitat or an EEC, and has a percent cleared of 15%. However, a precautionary approach has been adopted as this area may constitute forest ecosystem that is subject to threatening processes in Byron.

Further:

- It is assumed that standalone paddock trees do not constitute HEV vegetation.
- the Acacia regrowth to the east of the subject land is not considered to be HEV (please refer to Figure 10 as well as Figure 18).

It is acknowledged that classification of HEV vegetation involves subjective interpretation, and therefore further discussion with Council is warranted to confirm the nature of HEV across the site. This can occur during any future DA phases. At this point in time however, HEV mapping can demonstrate avoidance of impacts.

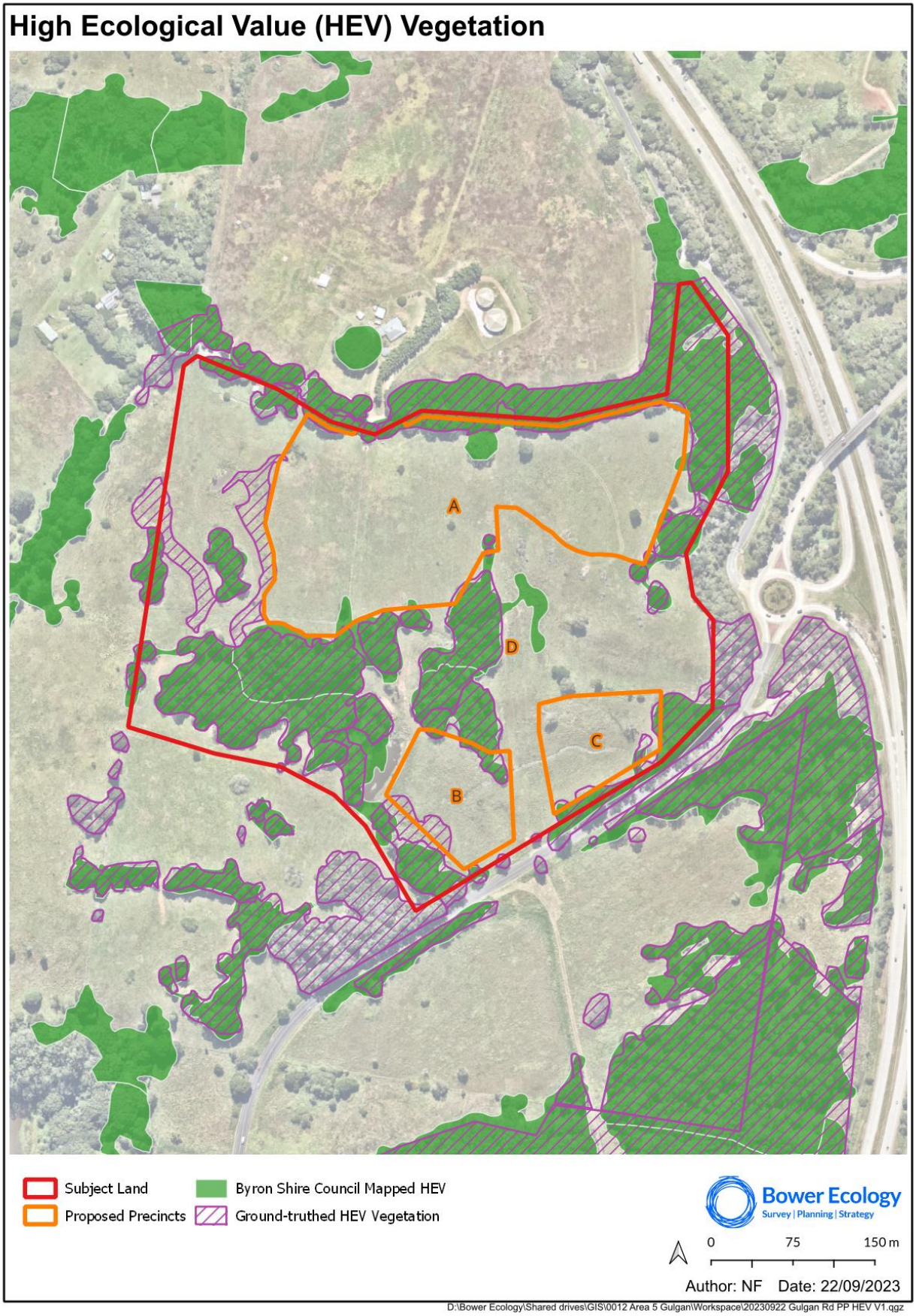

Figure 18: HEV vegetation comparison.

4.5. Threatened Fauna

Based on the result of the likelihood assessment (Appendix B), 31 threatened fauna species have the potential to utilise habitat resources on the site. Details of each are provided in Table 5. Presence on site is an estimation of presence based on available habitat, recorded sightings, and distribution of each species. The degree of fragmentation and disturbance of the habitat available on site has also been considered.

Table 5 also includes the White-bellied sea eagle (*Haliaeetus leucogaster)*, which was observed flying over the site during the ecological survey. The open terrestrial habitats on site provide potential foraging habitat for this species (and other birds of prey), although the value of this habitat for birds of prey is somewhat limited by the existing grazing land use.

A single White-eared monarch (*Carterornis leucotis*) was also observed during surveys, in the north-west of the site amongst small patches of rainforest vegetation.

Figure 19 provides BioNet records for threatened fauna within approximately 5 km of the site. A majority of these records exist in the large tracts of native vegetation to the east of the Pacific Motorway; however, there are several records on the western side - particularly koala.

The Pacific Motorway is likely to provide a significant barrier to terrestrial fauna movement. Further, due to the degree of fragmentation and the size of the forest patches on site, the site is not likely to represent core or important habitat for most species listed in Table 5. Nonetheless, birds, bats, and koalas generally have the ability to travel between fragmented forest patches within their broader home ranges, albeit sometimes hindered by terrestrial barriers such as degree of isolation and/or infrastructure, including roads and fences.

The subject land also has capacity to support fauna that require small home ranges and can persist in fragmented patches of vegetation. For example, the Mitchell's Rainforest Snail, which has been found to the south-east near the Tyagarah Air Strip has a possibility of occurring on site due to the rainforest and wetland ecotones that exist on the property.

The farm dam also offers potential habitat for the Comb-crested Jacana, Southern Myotus and the Freckled Duck. However, these species were not observed during the survey.

As noted in Section 2.2, several targeted fauna survey methods have not been employed as part of this ecological assessment. Target fauna survey may be required to support the any future development application. Despite this, however, an assessment of habitat resources was undertaken to inform the likelihood assessment within this assessment.

Table 5: Threatened fauna known to occur or possibly occurring on the property:

Species	Common Name	Status	Presence on site
Artamus cyanopterus cyanopterus	Dusky woodswallow	V – BC Act N – EPBC Act	Recorded within 5 km of site. Not recorded during on-site surveys but could possibly utilise habitat on the site (or immediately adjacent to the site).
Burhinus grallarius	Bush stone-curlew	E – BC Act N – EPBC	As above
Carterornis leucotis	White-eared monarch	V – BC Act N – EPBC Act	Recorded within 5 km of site. Recorded during on-site surveys.
Circus assimilis	Spotted harrier	V – BC Act N – EPBC Act	As above
Coeranoscincus reticulatus	Three-toed snake-tooth skink	V – BC Act V – EPBC Act	Not recorded within 5 km of site. It is predicted to occur in the Burringbar-Conondale IBRA sub-region and it is possible it might occur on the site (or immediately adjacent to the site).
Cyclopsitta diophthalma coxeni	Double-eyed fig parrot	E – BC Act E – EPBC Act	Not recorded within 5 km of site. It is predicted to occur in the Burringbar-Conondale IBRA sub-region and it is possible that it may occasionally utilise habitat resources on the site (or immediately adjacent to the site).

Species	Common Name	Status	Presence on site
Falco subniger	Black falcon	V – BC Act N – EPBC Act	Recorded within 5 km of site. Not recorded during on-site surveys but may forage in the area. The open terrestrial habitats on site provide potential foraging habitat for this species, although the site would not represent a core or important area of habitat for this species.
Glossopsitta pusilla	Little lorikeet	V – BC Act N – EPBC Act	Not recorded within 5 km of site. It is predicted to occur in the Burringbar-Conondale IBRA sub-region and it is possible that it may occasionally utilise habitat resources on the site (or immediately adjacent to the site).
Haliaeetus leucogaster	White-bellied sea eagle	V – BC Act N – EPBC Act	**Recorded as a fly over during on-site surveys.** Also recorded within 5 km of site.
Hieraaetus morphnoides	Little eagle	V – BC Act N – EPBC Act	Recorded within 5 km of site. Not recorded during on-site surveys but may forage in the area. The open terrestrial habitats on site provide potential foraging habitat for this species, although the site would not represent a core or important area of habitat for this species.
Hirundapus caudacutus	White-throated needletail	N – BC Act V – EPBC Act	Recorded within 5 km of site. Not recorded during on-site surveys but could possibly utilise habitat on the site (or immediately adjacent to the site).
Irediparra gallinacea	Comb-crested jacana	V – BC Act N – EPBC Act	As above
Ixobrychus flavicollis	Black bittern	V – BC Act N – EPBC Act	As above
Micronomus norfolkensis	Eastern coastal free-tail bat	V – BC Act N – EPBC Act	As above
Miniopterus australis	Little bent-winged bat	V – BC Act N – EPBC Act	As above
Miniopterus orianae oceanensis	Large bent-winged bat	V – BC Act N – EPBC Act	As above
Myotis macropus	Southern myotis	V – BC Act N – EPBC Act	As above
Ninox connivens	Barking owl	V – BC Act N – EPBC Act	As above
Nyctimene robinsoni	Eastern tube-nosed fruit bat	V – BC Act N – EPBC Act	As above
Nyctophilus bifax	Eastern long-eared bat	V – BC Act N – EPBC Act	As above
Pandion cristatus	Eastern osprey	V – BC Act N – EPBC Act	As above
Petroica boodang	Scarlet robin	V – BC Act N – EPBC Act	As above
Phascolarctos cinereus	Koala	V – BC Act V – EPBC Act	As above
Planigale maculata	Common planigale	V – BC Act N – EPBC Act	As above
Pteropus poliocephalus	Grey-headed flying fox	V – BC Act V – EPBC Act	As above
Ptilinopus magnificus	Wompoo fruit dove	N – BC Act V – EPBC Act	As above
Ptilinopus regina	Rose-crowned fruit dove	V – BC Act N – EPBC Act	As above
Ptilinopus superbus	Superb fruit dove	V – BC Act N – EPBC Act	Not recorded within 5 km of site. It has been recorded in the Burringbar-Conondale IBRA sub-region and could possibly utilise habitat on the site (or immediately adjacent to the site).
Stictonetta naevosa	Freckled duck	V – BC Act N – EPBC Act	Recorded within 5 km of site. Not recorded during on-site surveys but could possibly utilise habitat on the site (or immediately adjacent to the site).

Species	Common Name	Status	Presence on site
Syconycteris australis	Common blossom bat	V – BC Act N – EPBC Act	As above
Thersites mitchellae	Mitchell's rainforest snail	E – BC Act CE – EPBC Act	As above

Key: CE = Critically Endangered; E = Endangered; V = Vulnerable; N = Not listed

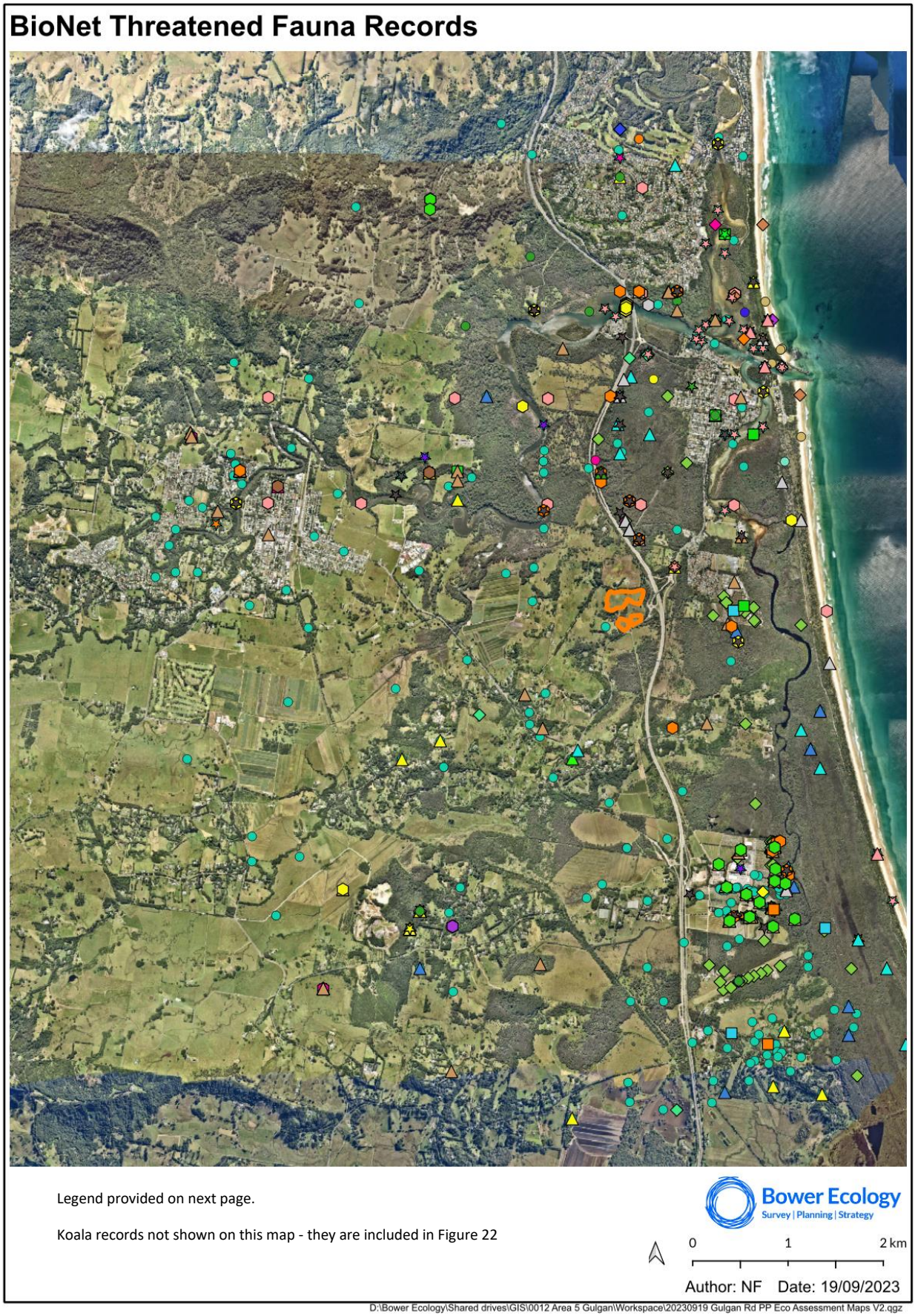

Figure 19: BioNet Records of Threatened Fauna within 5 km of the Site.


Project
BioNet Threatened Fauna Records (9/8/23)
Amaurornis moluccana
Anseranas semipalmata
Ardenna carneipes
Artamus cyanopterus cyanopterus
Botaurus poiciloptilus
Burhinus grallarius
Caretta caretta
Carterornis leucotis
Chalinolobus nigrogriseus
Chelonia mydas
Circus assimilis
Crinia tinnula
Dugong dugon
Ephippiorhynchus asiaticus
Esacus magnirostris
Falco subniger
Grus rubicunda
Gygis alba
Haematopus fuliginosus
Haematopus longirostris
Haliaeetus leucogaster
Hieraaetus morphnoides
Irediparra gallinacea
Ixobrychus flavicollis
Lathamus discolor
Lichenostomus fasciogularis
Litoria olongburensis
Micronomus norfolkensis
Miniopterus australis
Miniopterus orianae oceanensis
Myotis macropus
Ninox connivens
Nyctimene robinsoni
Nyctophilus bifax
Pandion cristatus
Petaurus norfolcensis
Petroica boodang
Phascolarctos cinereus
Phyllodes imperialis southern subspecies
Planigale maculata
Potorous tridactylus
Pteropus poliocephalus
Ptilinopus magnificus
Ptilinopus regina
Ptilinopus superbus
Scoteanax rueppellii
Sternula albifrons
Stictonetta naevosa
Syconycteris australis
Thersites mitchellae
Todiramphus chloris
Tyto longimembris

4.6. Migratory Fauna

Impacts of projects upon migratory fauna are regulated via the EPBC Act. Although no targeted survey has occurred for migratory fauna, it is not likely that the subject land provides habitat for significant or important populations/habitats of migratory fauna (as defined under the EPBC Act). This is based on the level of grazing (limiting habitat associated with tall grass or sedges), the small area of wetland habitat, and the fragmented nature of rainforest and other forests on the subject land.

Further assessment during any future development assessment phase may be required. A list of migratory fauna that may occur in the area according to the EPBC Act Protected Matters Search Tool is provided in Appendix F. Of these, Table 6 lists migratory species that are considered to have some potential to utilise the subject land.

Table 6: Migratory Species with potential to occur on the subject land:

Species Name	Common Name	Likelihood	Comment
Cuculus optatus	Oriental Cuckoo, Horsfield's Cuckoo	May	Species or species habitat may occur within area
Phaethon lepturus	White-tailed Tropicbird	May	Species or species habitat may occur within area
Rhipidura rufifrons	Rufous Fantail	Likely	Species or species habitat likely to occur within area
Symposiachrus trivirgatus	Spectacled Monarch	Known to occur within 5km of the subject land	Species or species habitat known to occur within area
Myiagra cyanoleuca	Satin Flycatcher	Known to occur within 5km of the subject land	Species or species habitat known to occur within area
Tringa nebularia	Common Greenshank, Greenshank	Likely	Species or species habitat likely to occur within area
Pandion haliaetus	Osprey	Known to occur within 5km of the subject land	Species or species habitat known to occur within area
Monarcha melanopsis	Black-faced Monarch	Known to occur within 5km of the subject land	Species or species habitat known to occur within area
Apus pacificus	Fork-tailed Swift	Likely	Species or species habitat likely to occur within area
Hirundapus caudacutus	White-throated Needletail	Known to occur within 5km of the subject land	Species or species habitat known to occur within area
Gallinago hardwickii	Latham's Snipe, Japanese Snipe	Likely	Species or species habitat likely to occur within area
Gallinago stenura	Pin-tailed Snipe	Likely	Foraging, feeding or related behaviour likely to occur within area
Gallinago megala	Swinhoe's Snipe	Likely	Foraging, feeding or related behaviour likely to occur within area
Motacilla flava	Yellow Wagtail	Likely	Species or species habitat likely to occur within area

4.7. Koala habitat

While Potential Koala Habitat exists on site, as defined in the Byron Coast Comprehensive Koala Plan of Management (BCCKPoM, 2015) (Figure 21), no evidence of koala was observed during the targeted koala surveys and therefore the site is not considered to represent "core koala habitat". However, the small stand of *Eucalyptus tereticornis* (Figure 20) directly to the east of Precinct C does represent potential koala habitat. This group of trees includes several large *E. tereticornis*, some measuring >1 m in their diameters at breast height (DBH).

Despite the lack of evidence of koalas on site, there are many records of koalas in the local area. Figure 22 shows BioNet koala records for the local area, and the date associated with each record. The majority of records span the last 20 years, with the earliest record from 1949 and the latest available nearby records from 2021. The status of the local population in this area is not known, however it's likely that a small number of koalas persist in the local area. For this reason, the small stand of *E. tereticornis* on the property should be considered potential koala habitat, albeit with limitations on habitat value due to isolation from other areas and significant barriers to movement within the wider area.

Figure 20: A stand of Eucalyptus tereticornis *in the south-east of the site, along Gulgan Road.*

Figure 21: Potential Koala Habitat (from BCCKPoM).

Note: This map has been supplied by Byron Shire Council. The green layer is potential koala habitat, and the blue line is the boundary of the 'Brunswick Heads - Tyagarah Koala Management Precinct', which the project area is outside. The project area is circled in red.

Figure 22: BioNet Koala Records.

5. Impacts of Rezoning

The proposed rezoning goes part way to enabling development on the site. Any impacts due to construction or operations of a particular development should be re-assessed during preparation of the associated DA. Nonetheless, potential impacts are discussed below at a high level, and with consideration of the likely development that will result (i.e., business park or similar uses).

The mitigation inherent in the design is discussed first, as this significantly reduces potential impacts.

5.1. Mitigation Through Design

As mentioned above, the Planning Proposal area has been designed as part of the Byron Shire BILS (2020) to largely avoid impacts to ecological matters. That is, the Planning Proposal area has prioritised rezoning of exotic grassland areas (currently grazing paddocks) and largely avoids EECs, HEV vegetation, other patches of native vegetation, and significant habitat areas. Ecological buffers will be developed and assessed at the DA stage.

We are instructed that the proponent is committed to the embellishment of large tracts of land (i.e., the existing conservation zoned land and the proposed additional conservation land) that provide opportunities for revegetation to support rainforest, wet eucalypt forest, or forested wetlands. Such proposals will form part of the DA Vegetation and Riparian Zone Management Plan commitments of the proponent.

5.2. Potential Construction Impacts

Standard construction impacts, including some vegetation clearing, soil disturbance, erosion and sedimentation, and noise, are likely to occur as a result of any future development on site.

Vegetation removal will be required to facilitate future development. Such removal will likely include:

- Removal of a small number of native trees across the site – mostly standalone paddock trees (see Figure 27).
- Removal of a portion (approx. 790m^2) of the disturbed wetland area in west of Precinct B, which technically also constitutes an EEC (Figure 10), although is in poor condition and has been derived due to removal of the pre-exiting forest ecosystem. The adjacent wetland area may also experience changes to hydrology during construction (and subsequent use), resulting in changes to the floristics.

The small artificial drainage line through Precinct C will likely need to be either piped or realigned to facilitate development. This change is considered a minor loss to ecological values across the site. The associated impacts can be addressed during the DA phase of any future project.

Although the area is not part of the Planning Proposal site, in order to facilitate suitable vehicular access from Gulgan Road, there is potentially small number of existing native trees along Gulgan Road will need to be removed. This removal may include one or more of Trees 57-59 and Tree 67 (see Appendix E) and will need to be re-assessed and confirmed during the DA phase of any future project. The options for access from Gulgan Road are discussed below, however, they will be refined during the DA phase.

Earthworks are likely to be required to create suitable building pads, road earthworks, water-sensitive urban design measures, and trenches for utilities. Potential impacts associated with these activities include sediment transportation to surrounding environments and weed colonisation, all of which can be managed via the implementation of an Environmental Management Plan for Construction.

Construction noise impacts are likely to be temporary and minimal in the context of the wider landscape. Such impacts also occur in the context of Gulgan Road, which functions as an arterial road.

Light impacts on wildlife during construction are likely to be negligible as hours are expected to be limited to standard working days.

Overall, it is likely that any future development on the site will result in only minor impacts on ecological values during construction and that many of these potential impacts can be managed via the implementation of an Environmental Management Plan for Construction.

5.2.1. Design Options for Gulgan Road Entry

Four design options have been proposed for access to the development from Gulgan Road. The impact on flora of each option is discussed below and traffic impacts are discussed in the Traffic Impact Study prepared by Ingen Consulting Pty Ltd (2023). All four options are included here because they have different ecological impacts. A preferred option will be selected and further assessed as part of any future development application. Figure 23 is a map of the proposed Entry Area including all trees noted in Table 7, Table 8 and Table 9.

The options include:

Option A: Left in/left out only

This option relies on the construction of a roundabout at 'Uncle Tom's', currently funded to design stage by Byron Shire Council. The roadworks required for Option A (Figure 24) would likely involve the removal of Trees 57, 58 and 59 (see Appendix E and Table 7). As indicated in Figure 23, Trees 58 and 59 are within Biodiversity values mapping (NSW Government 2023a). This option would involve the least earthworks of the four Gulgan Road intersection options.

Table 7: Trees likely requiring removal with Option A:

Tree No.	Species	DBH (cm)	Height (m)	Canopy Width (m)	Tree Protection Zone (m)	Health
57	*Lophostemon suaveolens*	34	9	4	4.08	Good
58	*Cupaniopsis anacardioides*	18	5	5	2.16	Good
59	*Eucalyptus tereticornis*	175	26	14	21	Good

Option B: Roundabout

This option involves a single lane roundabout with southbound traffic bypass and separate left and right turning lanes from site in order to minimise the potential for queuing back to the Brunswick Heads overpass (Figure 24). This option involves considerable earthworks and the removal of six trees, three of which are within Biodiversity values mapping (NSW Government, 2023a). Data have been collected for four of the six impacted trees. All six are marked in Figure 23 and are within Table 8 whilst the two that have no data are likely moderately sized *Eucalyptus tereticornis* based on review of available photos.

Table 8: Trees likely requiring removal with Option B:

Tree No.	Species	DBH (cm)	Height (m)	Canopy Width (m)	Tree Protection Zone (m)	Health
57	*Lophostemon suaveolens*	34	9	4	4.08	Good
58	*Cupaniopsis anacardioides*	18	5	5	2.16	Good
59	*Eucalyptus tereticornis*	175	26	14	21	Good
67	*Lophostemon confertus*	140	18	10	16.8	Good
NA	Two additional trees, likely moderately sized *E. tereticornis*.	-	-	-	-	

Option C: Signalised intersection and Option D: Channelised turn

Options C and D are very similar, and both appear to involve the same amount of earthworks and tree removal (Figure 26). The main difference between two options is the inclusion of traffic lights as part of Option C.

Options C and D have been designed specifically to avoid any tree removal with the Biodiversity Values Mapping layer (NSW Government, 2023a), whilst staying clear from the Rous water mains (Figure 33, Ingen Consulting Pty Ltd 2023).

Two trees would need to be removed (Table 9), with Trees 58 and 59 being retained if possible.

As there is currently no detailed design for any of these options, the assessment of impacts, e.g., amount of earthworks, tree removal, is limited in its accuracy. These impacts would be assessed in detail as part of any future development application.

Table 9: Trees likely requiring removal with Option C and D:

Tree No.	Species	DBH (cm)	Height (m)	Canopy Width (m)	Tree Protection Zone (m)	Health
57	*Lophostemon suaveolens*	34	9	4	4.08	Good
67	*Lophostemon confertus*	140	18	10	16.8	Good

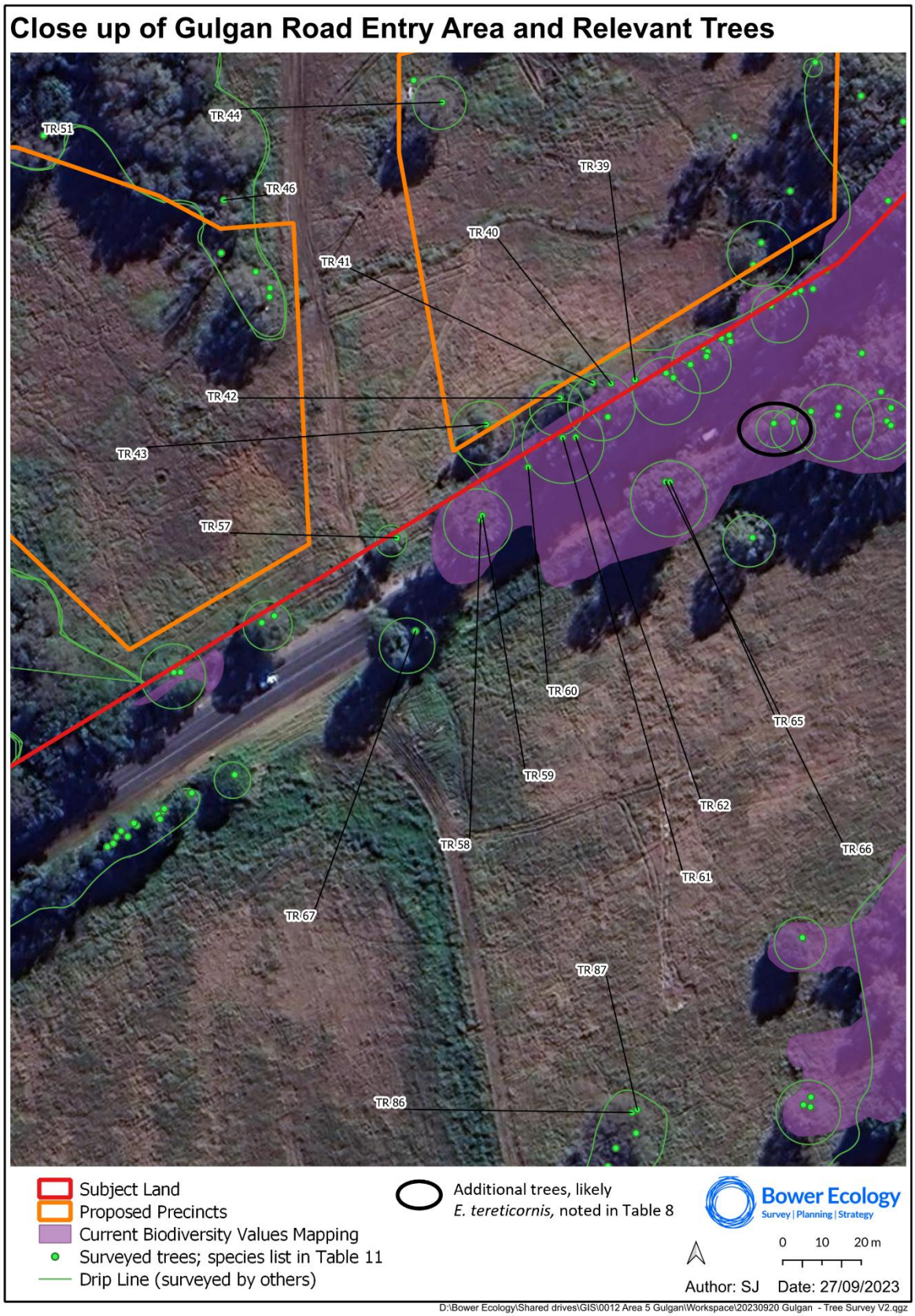

Figure 23: Close up of the area where the Gulgan Road Entry is proposed.

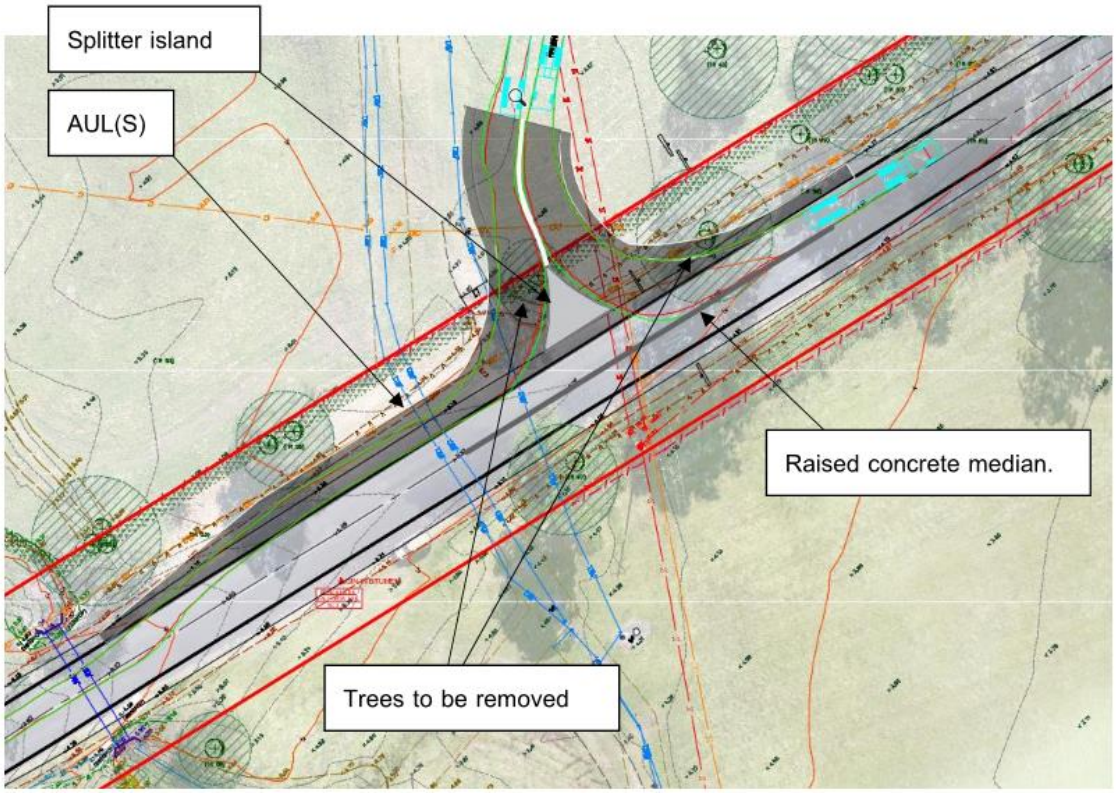

Figure 24: Option A Concept Layout (from Ingen Consulting).

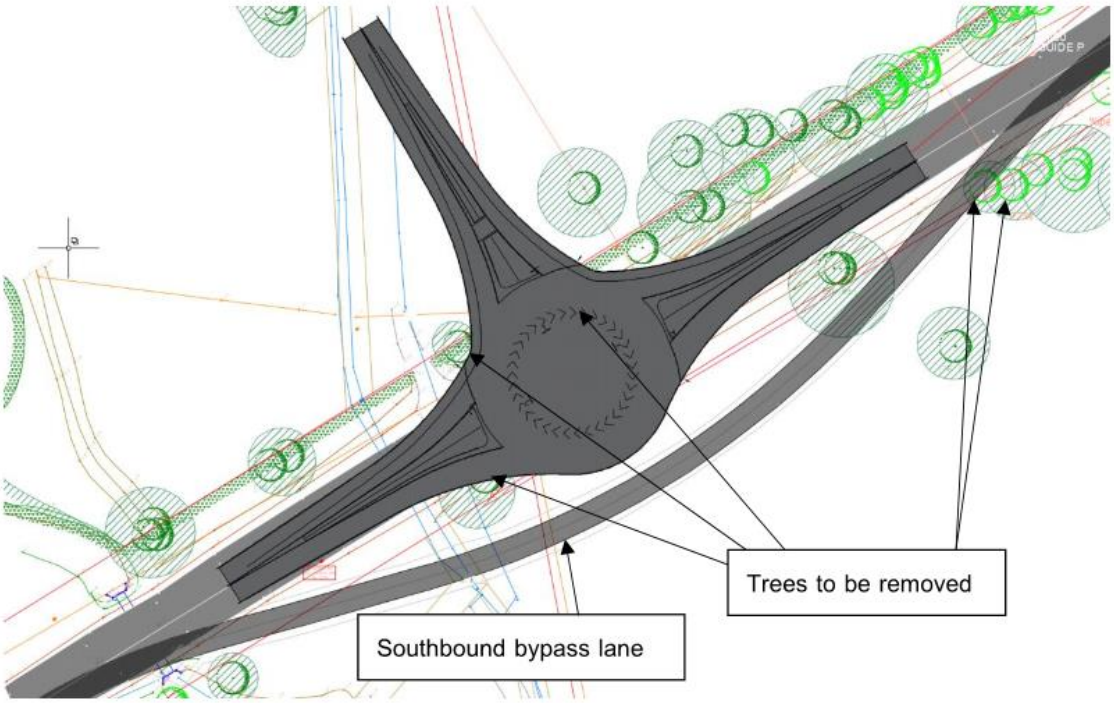

Figure 25: Option B Concept Layout (from Ingen Consulting).

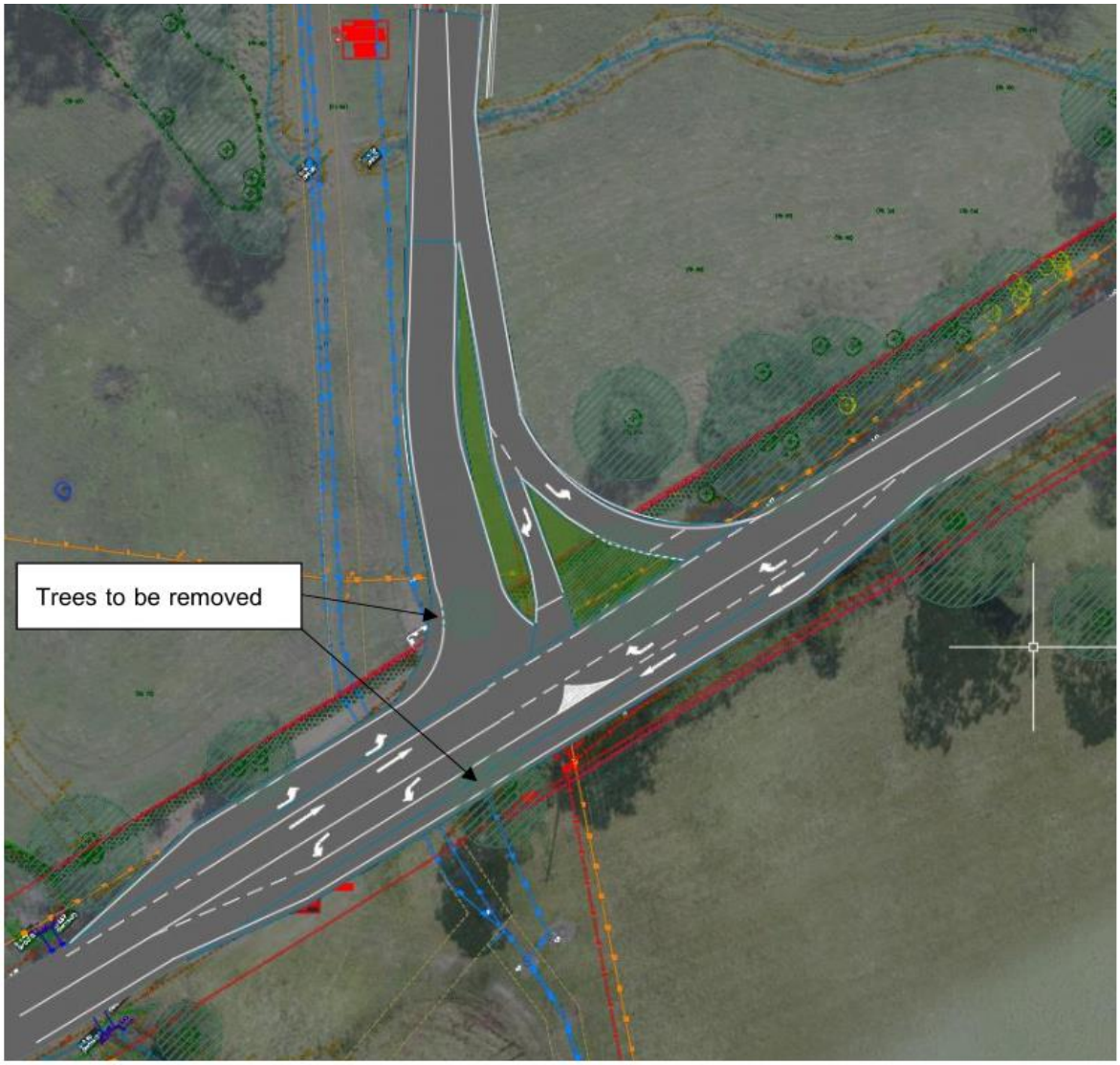

Figure 26: Option C and D Concept Layout (from Ingen Consulting).

5.3. Potential Residual Post-Construction Impacts

Post-construction impacts are likely to include a standard raft of environmental impacts normally associated with the types of development envisaged for the site. Specifically, visual disturbance to wildlife, noise and light impacts, introduction of weeds, and water quality and quantity issues due to the introduction of impermeable surfaces. Most of these impacts can be mitigated or reduced to acceptable levels via the design process (during any future DA phase), and via rehabilitation of portions of the site to rainforest and wet sclerophyll forest. Importantly, the development is intended to be carried out in the form of a Community Title scheme with the employment land occupants funding, in perpetuity, the management and maintenance of the conservation land curtilage.

These will be assessed further once detailed design has been undertaken as part of the DA phase, and once consultant reports on the various elements (e.g., hydrology, stormwater quality etc) have been prepared.

6. Conclusions

This ecological assessment provides relevant information to assist in the assessment of the Planning Proposal for Lot 2 DP 1159910. Overall, the ecological assessment process has resulted in the consideration and conservation of the key ecological values on the subject land. That is, the site footprint has been refined to protect the existing good quality vegetation on site, as well as the known threatened flora.

The proposed amendments (and potential subsequent development) have purposely been designed to overlay existing paddock areas dominated by exotic pasture grasses and exotic forbs. In these paddock areas, the ecological impact of any future development is expected to be minor, and there is a significant opportunity for further impact reduction via future design and environmental management. Such impacts and opportunities will be further assessed and considered during any future DA phase.

The expansion of the C zones is also key to the project and will set up the site for extensive ecosystem restoration of existing forest patches and exotic pasture areas. As the development is to be carried out in the form of a Community Title scheme, the employment land occupants will fund, in perpetuity, the management and maintenance of the conservation land curtilage.

A small area of freshwater wetland exists within the site footprint. This area includes part of a sedgeland/forbland patch of vegetation in the south and a minor drainage line that traverses the south-east part of the site. As noted in this report, both these areas are a result of previous land clearing and subsequent grazing, as the pre-existing vegetation on site was likely PCT 3989 (Far North Paperbark Fern Swamp Forest). The impacts of the current land use (grazing) also result in the wetlands having a reduced ecological value. In this regard, the potential loss of these areas is unlikely to constitute a significant impact. Further assessment during the DA phase will be required however, if the Planning Proposal is approved.

The Planning Proposal is in alignment with the Byron Shire Business and Industrial Lands Strategy (2020) and does not conflict with the list of Local Planning Directions issued by the Minister (latest version issued by DPIE on 1 March, 2022). Further, the Proposal largely avoids red flags, as defined within the DCP.

Given the presence of Biodiversity Values mapping in the south-east of the site and the expected requirement for site access, future DAs are likely to trigger the requirement for a Biodiversity Development Assessment Report under the BC Act. This legislative process provides opportunity for further assessment and mitigation whilst also formalising any future biodiversity offset requirements.

In conclusion, the approval of the Planning Proposal will not result in unreasonable or significant impacts to ecological matters. Further, approval of the Planning Proposal will not enable development that is exempt from further ecological assessment and mitigation.

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Appendix A – Threatened Flora Likelihood Assessment

Unless otherwise referenced, the information in the likelihood tables (Table 10, Table 11) has been sourced from NSW BioNet (https://www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity/nsw-bionet) and from an EPBC Act Species Profiles and Threats Database (http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl)

Note: the relevant IBRA sub-region for the study site is the Burringbar-Conondale Ranges

Table 10: Likelihood assessment for threatened flora species:

Species	Likelihood of Occurrence	Notes
Marblewood (*Acacia bakeri*)	Possible	Marblewood is restricted to coastal south-east Queensland and north-east NSW, where it occurs north from Mullumbimby. Most plants are on private property. This species usually occurs in the understorey, growing in or near lowland subtropical rainforests, in adjacent eucalypt forest and in regrowth of both. May occur as a large canopy tree.
Scented Acronychia (*Acronychia littoralis*)	Possible	Scented Acronychia is found between Fraser Island in Queensland and Port Macquarie on the north coast of NSW. It occurs in transition zones between littoral rainforest and swamp sclerophyll forest; between littoral and coastal cypress pine communities; and margins of littoral forest. The species mainly occurs within 2km from the coast on sandy soil. Two forms of Scented Acronychia exist, one which can produce viable seeds, and one which can only reproduce vegetatively.
White Lace Flower *(Archidendron hendersonii)*	Possible	This species occurs from north Queensland south to the Richmond River in north-east NSW. White Lace Flower occurs in riverine and lowland subtropical rainforest, littoral rainforest, coastal cypress pine forest and their ecotones. It is found on a variety of soils including coastal sands and those derived from basalt and metasediments.
Hairy-joint Grass (*Arthraxon hispidus*)	Possible	Occurs over a wide area in south-east Queensland, and on the northern tablelands and north coast of NSW but is never common. Also found from Japan to central Eurasia. Moisture and shade-loving grass, found in or on the edges of rainforest and in wet eucalypt forest, often creeks or swamps.
Giant Ironwood (*Backhousia subargentea*)	Unlikely	Giant Ironwood is known in NSW only from Mount Chincogan near Mullumbimby and one recent record at Jiggi north-west of Lismore, and in Queensland from Boonah to Imbil. It is found in dry rainforest regrowth consisting of thickets growing in steeply sloping paddocks on basalt-derived soil as well as in sub-tropical and warm temperate rainforests.
Marbled Balogia (*Baloghia marmorata*)	Unlikely	Known only from the Lismore district in north-east NSW and the Tamborine Mountains and Springbrook area in south-east Queensland. In NSW, Jointed Baloghia is found in subtropical rainforest, notophyll vine forest and wet sclerophyll forest on soils derived from basalt. Found between 150m and 550m above sea level.
Needle-leaf fern (*Belvisia mucronata*)	Possible	In NSW this species is only known from five locations north from Evans Head. It forms small clumps on trees or rocks in dry rainforest or along creeks in moist open forest and occurs in low numbers at all sites.
Corokia (*Corokia whiteana*)	Possible	Occurs only in north-east NSW and has a highly restricted distribution. Three distinct populations are known: one in the Nightcap Range, one in the Tweed Valley, and the other close to the coast near Brunswick Heads.
Stinking Cryptocarya (*Cryptocarya foetida*)	Known	This species occurs in coastal south-east Queensland and north-east NSW south to Iluka. Found in littoral, warm temperate and subtropical rainforest, wet sclerophyll forest and Camphor laurel forest usually on sandy soils, but mature trees are also known on basalt soils. The seeds are readily dispersed by fruit-eating birds, and seedlings and saplings have been recorded from other habitats where they are unlikely to develop to maturity. Though seedlings can be fairly numerous, few mature trees are known.
Leafless Tongue-orchid (*Cryptostylis hunteriana*)	Unlikely	The Leafless Tongue Orchid has been recorded from as far north as Gibraltar Range National Park south into Victoria around the coast as far as Orbost. It is known historically from a number of localities on the NSW south coast and has been observed in recent years at many sites between Batemans Bay and Nowra

Species	Likelihood of Occurrence	Notes
		(although it is uncommon at all sites). Does not appear to have well defined habitat preferences and is known from a range of communities, including swamp-heath and woodland. The larger populations typically occur in woodland and appear to prefer open areas in the understorey of this community; often found in association with the Large Tongue Orchid (*C. subulata*) and the Tartan Tongue Orchid (*C. erecta*).
White-flowered Wax Plant (*Cynanchum elegans*)	Possible	This climber usually occurs on the edge of dry rainforest vegetation and has been recorded in association with littoral rainforest, coastal scrub, Forest Red Gum-aligned or Spotted Gum-aligned open forest and woodland.
Smooth Davidson's Plum (*Davidsonia johnsonii*)	Possible	Restricted distribution in south-east Queensland and north-east NSW south to Tintenbar. Occurs in lowland subtropical rainforest and wet eucalypt forest at low altitudes (below 300m). Many trees are isolated in paddocks and on roadsides in cleared land.
Small-leaved Tamarind (*Diploglottis campbellii*)	Possible	Recorded from the coastal lowlands between Richmond River on the Far North Coast of NSW and Mudgeeraba Creek on the Gold Coast hinterland, Queensland. Confined to the warm subtropical rainforests of the NSW Queensland border lowlands and adjacent low ranges. The forest types in which this species occurs vary from possible lowland subtropical rainforest to drier subtropical rainforest with a Brush Box open overstorey. Occurs on basalt-derived soils and also on poorer soils such as those derived from quartz monzonite.
Basket Fern (*Drynaria rigidula*)	Possible	Occurs widely in eastern Queensland as well as islands of the Pacific and parts of south-east Asia. In NSW it is only found north of the Clarence River, in a few locations at Maclean, Bogangar, Byron Bay, Mullumbimby, in the Tweed Valley and at Woodenbong. Grows on plants, rocks or the ground, usually in rainforest, but also in moist eucalypt and Swamp Oak forest.
Hairy Quandong (*Elaeocarpus williamsianus*)	Unlikely	Distribution is restricted to very few sites between Goonengerry and Burringbar in north-east NSW. Occurs within subtropical to warm temperate rainforest, including regrowth areas where it has apparently regrown from root suckers after clearing. Occurs on soils that are derived from metasediments.
Crystal Creek Walnut (*Endiandra floydii*)	Possible	Confined to the Tweed and Brunswick Valleys and Byron Bay area of north-east NSW, and to one or two locations in south-east Queensland. Warm temperate, subtropical rainforest or wet sclerophyll forest with Brush Box overstorey, and in and Camphor Laurel forest. The species can occur in disturbed and regrowth sites.
Rusty Rose Walnut (*Endiandra hayesii*)	Possible	This species has a restricted distribution from Burleigh Heads in Queensland to the Richmond River in north-east NSW. It is locally abundant in some parts of its range in NSW. Occurs in sheltered moist gullies in lowland subtropical and warm temperate rainforest on alluvium or basaltic soils. The species occurs in regrowth and highly modified forms of these habitats.
Green-leaved Rose Walnut (*Endiandra muelleri* subsp. *bracteata*)	Possible	Occurs in Queensland and in north-east NSW south to Maclean. It is sparsely distributed within this range. Occurs in subtropical and warm temperate rainforests and Brush Box forests, including regrowth and highly modified forms of these habitats. Records are usually from poorer soils derived from sedimentary, metamorphic or acid volcanic rocks. The species is generally recorded at lower altitudes. Flowering and fruiting have been observed from November to May.
Ball Nut (*Floydia praealta*)	Possible	This species occurs in small scattered populations distributed from Gympie in Queensland to the Clarence River in north-east NSW. Riverine and subtropical rainforest, usually on soils derived from basalt, is the optimal habitat type.
Southern Fontainea (*Fontainea australis*)	Possible	Southern Fontainea is found in lowland subtropical rainforest, usually on basaltic alluvial flats, and also in cooler subtropical rainforest in the Nightcap Range. It is known to occur at a few locations in the Richmond Valley and Tweed Valley in NSW north to Currumbin Valley and Springbrook National Park in southeast Queensland.
Sweet Myrtle (*Gossia fragrantissima*)	Possible	Occurs in south-east Queensland and in north-east NSW south to the Richmond River. Mostly found on basalt derived soils. Occurs in dry, subtropical and riverine rainforest. As this species can coppice from roots left in the ground

Species	Likelihood of Occurrence	Notes
		when rainforest is cleared, it is found at several sites as isolated plants in paddocks or regrowth.
White Yiel Yiel (*Grevillea hilliana*)	Possible	This species occurs north from Brunswick Heads on the north coast of NSW and in Queensland. The only populations currently known in NSW are near Brunswick Heads, on the slopes of Mt Chincogan near Byron Shire, and in patches of remnant habitat in the Tweed Shire, particularly around Terranora. White Yiel Yiel grows in subtropical rainforest, often on basalt-derived soils.
White Karambal (*Harnieria hygrophiloides*)	Possible	In NSW this plant has been recorded only at Hortons Creek and two other places south of Nymboida, and at Brunswick Heads. It is found in the understorey of littoral rainforest, dry rainforest and wet eucalypt forest, usually in well-drained areas.
Red Boppel Nut (*Hicksbeachia pinnatifolia*)	Possible	Coastal areas of north-east NSW from the Nambucca Valley north to south-east Queensland. Subtropical rainforest, moist eucalypt forest and Brush Box forest.
Screw-footed Screw Fern (*Lindsaea brachypoda*)	Possible	In NSW this fern is mainly found in a few locations north from Minyon Falls in Nightcap National Park. Records exist for Tumbulgum, Mullumbimby and Mooball. It prefers very moist habitats in subtropical or warm-temperate rainforest or palm forest.
Macadamia Nut (*Macadamia integrifolia*)	Possible	This species is not known to occur naturally in the wild in NSW. Grows in remnant rainforest, preferring partially open areas such as rainforest edges.
Rough-shelled Bush Nut (*Macadamia tetraphylla*)	Possible	Confined chiefly to the north of the Richmond River in north-east NSW, extending just across the border into Queensland. Many records, particularly those further south, are thought to be propagated. Found in subtropical rainforest usually near the coast.
Slender Marsdenia (*Marsdenia longiloba*)	Possible	This species occurs at scattered sites on the north coast of NSW north from Barrington Tops. Also occurs in southeast Queensland. Subtropical and warm temperate rainforest, lowland moist or open eucalypt forest adjoining rainforest and, sometimes, in areas with rock outcrops. Flowering occurs in summer.
Coast Euodia (*Melicope vitiflora*)	Unlikely	Coast Euodia occurs in Queensland and reaches its southern limit in NSW, where it is largely restricted to coastal areas around Brunswick Heads and Ocean Shores, Broken Head, also in the Tweed Valley and the Nightcap Range. In NSW, it is known from a small number of locations. It is reserved in Broken Head Nature Reserve, Brunswick Heads Nature Reserve and Whian Whian State Conservation Area. It grows in subtropical and littoral rainforest and all populations are thought to be small.
Rusty Plum, Plum Boxwood (*Niemeyera whitei*)	Possible	Rusty Plum occurs in the coast and adjacent ranges of northern NSW from the Macleay River into southern Queensland. This species is generally found in gully, warm temperate or littoral rainforests and the adjacent understorey of moist eucalypt forest. It occurs on poorer soils in areas below 600 metres above sea level.
Southern Ochrosia (*Ochrosia moorei*)	Possible	Southern Ochrosia is found in north-east NSW, north from the Richmond River, and in south-east Queensland. It is very sparsely distributed within this range. Southern Ochrosia is found in riverine and lowland subtropical rainforest.
Lesser Swamp-orchid (*Phaius australis*)	Possible	Occurs in Queensland and north-east NSW as far south as Coffs Harbour. Historically, it extended farther south, to Port Macquarie. Swampy grassland or swampy forest including rainforest, eucalypt or paperbark forest, mostly in coastal areas.
Brush Sauropus (*Phyllanthus microcladus*)	Possible	In NSW, this species is restricted to a few locations in the Tweed, Brunswick, Richmond and Wilson River Valleys with an outlying population near Grafton. Also occurs in South East Queensland. Usually found on banks and creeks and rivers, in streamside rainforest or dry rainforest.
Spiny Gardenia (*Randia moorei*)	Possible	Found from Lismore in north-east NSW north to the Logan River in south-east Queensland. Sparsely distributed, with most records in the Tweed and Brunswick areas. Spiny Gardenia occurs in subtropical, riverine, littoral and dry rainforest. In NSW, Hoop Pine and Brush Box are common canopy species. It is found along moist scrubby water courses at altitudes up to 360 m asl, with most records below 100 m asl.

Species	Likelihood of Occurrence	Notes
Smooth Scrub Turpentine (*Rhodamnia maideniana*)	Possible	*Rhodamnia maideniana* occurs in subtropical rainforest on basaltic soils, including red-brown loams and clay loams. It can be locally common on slopes and in gullies, growing from 40–1000 m above sea level. The distribution of *Rhodamnia maideniana* extends for Ballina and inland to Alstonville in NSW up into South-east QLD. It is found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest usually on volcanic and sedimentary soils
Scrub Turpentine (*Rhodamnia rubescens*)	Possible	Scrub Turpentine occurs in coastal districts north from Batemans Bay in New South Wales, approximately 280 km south of Sydney, to areas inland of Bundaberg in Queensland. Populations of *R. rubescens* typically occur in coastal regions and occasionally extend inland onto escarpments up to 600 m asl. in areas with rainfall of 1,000–1,600 mm. It is found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest, usually on volcanic and sedimentary soil.
Native Guava (Rhodomyrtus psidioides)	Possible	Native Guava occurs from Broken Bay, approximately 90 km north of Sydney, New South Wales, to Maryborough in Queensland. Populations are typically restricted to coastal and sub-coastal areas of low elevation however, the species does occur up to c. 120 km inland in the Hunter and Clarence River catchments and along the Border Ranges in NSW. It is a pioneer species found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest, often near creeks and drainage lines.
Rainforest Cassia (*Senna acclinis*)	Possible	Occurs in coastal districts and adjacent tablelands of NSW from the Illawarra in NSW to Queensland. Grows on the margins of subtropical, littoral and dry rainforests. Often found as a gap phase shrub. Flowering occurs in spring and summer, and the fruit is ripe in summer and autumn. Primarily pollinated by a variety of bees.
Red Lilly Pilly (*Syzygium hodgkinsoniae*)	Possible	A restricted range from the Richmond River in north-east NSW to Gympie in Queensland. Locally common in some parts of its range but otherwise sparsely distributed. Usually found in riverine and subtropical rainforest on rich alluvial or basaltic soils.
Coolamon (*Syzygium moorei*)	Possible	Found in the Richmond, Tweed, and Brunswick River valleys in north-east NSW and with limited occurrence in south-east Queensland. Durobby is found in subtropical and riverine rainforest at low altitude. It often occurs as isolated remnant paddock trees.
Austral Toadflax (*Thesium austral*)	Unlikely	Austral Toad-flax is found in very small populations scattered across eastern NSW, along the coast, and from the Northern to Southern Tablelands. It is also found in Tasmania and Queensland and eastern Asia. Although initially described from material collected in the SW Sydney area, populations have not been seen in a long time. It may persist in some areas in the broader region. Occurs in grassland on coastal headlands or grassland and grassy woodland and away from the coast. Often found in association with Kangaroo Grass (*Themeda australis*). A root parasite that takes water and some nutrient from other plants, especially Kangaroo Grass.
Arrow-head Vine (*Tinospora tinosporoides*)	Known	This species occurs north from the Richmond River in north-east NSW, where it is locally common in some parts of its range. Also recorded from a single location in south-east Queensland. Wetter subtropical rainforest, including littoral rainforest, on fertile, basalt-derived soils is the optimal habitat type.
Tylophora (*Tylophora woollsii*)	Unlikely	The climber is found along coastal areas in north-east NSW from Ballina, north to the Maryborough region in Queensland. Littoral and subtropical rainforest on coastal sands or soils derived from metasediments.
Queensland Xylosma (*Xylosma terrae-reginae*)	Possible	Queensland Xylosma is found along coastal areas in north-east NSW from Ballina, north to the Maryborough region in Queensland in littoral and subtropical rainforest on coastal sands or soils derived from metasediments.

Appendix B – Threatened Fauna Likelihood Assessment

Threatened Fauna Likelihood Assessment

Table 11: Likelihood assessment for threatened fauna species:

Species	Likelihood of Occurrence	Notes
Pale-vented bush-hen (Amaurornis *moluccana*)	Unlikely due to preference for dense undergrowth and low degree of habitat resources available to it	The Pale vented bush-hen occurs in coastal northern Australia and through eastern Qld to the NSW North Coast. It inhabits a variety of coastal wetlands from mangroves, lagoons, and swamps, to river margins and rainforest creeks.
Regent honeyeater (*Anthochaera phrygia*)	Unlikely due to habitat preference	This species inhabits dry open forest and woodland, particularly Box-Ironbark woodland, and riparian forests of River Sheoak. It prefers woodlands with significantly large numbers of mature trees, high canopy cover, and abundance of mistletoes. Every few years non-breeding flocks are seen foraging in flowering coastal Swamp mahogany and Spotted gum forests, particularly on the central coast and occasionally on the upper north coast.
Australian Fritillary (*Argynnis hyperbius inconstans*)	Unlikely	The Australian Fritillary is restricted to south-east Queensland and north-east NSW in open swampy coastal areas where the larval food plant Arrowhead Violet (*Viola betonicifolia*) occurs. Most recently known from a few widespread localities between Port Macquarie and Gympie, populations have declined dramatically to the extent that the butterfly has not been verified at any site for over a decade. This species is found in open swampy coastal habitat. Its food plant occurs in the vegetation ground layer beneath grasses and mat-rushes (*Lomandra* spp.).
Dusky Woodswallow (*Artamus cyanopterus cyanopterus*)	Possible	This species occurs throughout much of NSW, most commonly inhabiting dry open eucalypt forests and woodlands, particularly those with an open or sparse understorey of eucalypt saplings, acacias and other shrubs, and ground-cover of grasses or sedges and fallen woody debris.
Australian Bittern (*Botaurus poiciloptilus*)	Unlikely due to preference for dense undergrowth and low degree of habitat resources available to it.	The Australasian bittern is widespread but uncommon in south-west and south-east Australia, generally preferring freshwater habitats with tall, dense vegetation with bulrushes and spike rushes.
Bush-stone curlew (*Burhinus grallarius*)	Possible	This species is rare east of the Great Divide except for isolated populations along the North Coast. It forages and breeds in open-grassed woodlands or sparsely treed rangelands, often with a non-existent shrub layer and abundant leaf litter
White-eared Monarch (*Carterornis leucotis*)	Possible	This species is endemic to the coastal lowlands and eastern slopes of the Great Divide of eastern Australia, extending from Cape York Peninsula south to north-eastern NSW. In NSW, White-eared Monarchs are generally found from the Queensland border south to Iluka at the mouth of the Clarence River, and inland as far as the Richmond Range. There are occasional records south of the Clarence River, near Woolgoolga and around Port Macquarie. In NSW, White-eared Monarchs occurs in rainforest, especially drier types, such as littoral rainforest, wet and dry sclerophyll

Species	Likelihood of Occurrence	Notes
		forests, swamp forest and regrowth forest. They appear to prefer the ecotone between rainforest and other open vegetation types or the edges of rainforest, such as along roads.
Large-eared Pied Bat *(Chalinolobus dwyeri)*	Unlikely, no extensive cliffs or caves nearby.	This bat roosts in caves (near their entrances), crevices in cliffs, old mine workings and in the disused,bottle-shaped mud nests of the Fairy Martin (*Hirundo ariel*), frequenting low to mid-elevation dry open forestand woodland close to these features. It is usually recorded in well-timbered areas containing gullies.
Hoary wattled Bat (*Chalinolobus nigrogriseus*)	Unlikely. No preferred habitat.	The Hoary-wattled Bat is widely distributed across northern Australia, although absent from the arid centre. In north east NSW, it extends from Port Macquarie in the south, north to the Queensland border. The species has been recorded as far west as Armidale and Ashford. In NSW, the Hoary Wattled Bat occurs in dry open eucalypt forests, favouring forests dominated by Spotted Gum, boxes and ironbarks, and heathy coastal forests where Red Bloodwood and Scribbly Gum are common. Because it flies fast below the canopy level, forests with naturally sparse understorey layers may provide the best habitat.
Spotted Harrier (*Circus assimilis*)	Possible. Potential foraging habitat on site.	The Spotted Harrier occurs in grassy open woodland including *Acacia* and mallee remnants, inland riparian woodlands, grassland and shrub steppe. It is found most commonly in native grassland, but also occurs in agricultural land, foraging over open habitats including edges of inland wetlands.
Three-toed Snake-tooth Skink (*Coeranoscincus reticulatus*)	Possible	The Three-toed Snake-tooth Skink occurs on the coast and ranges from the Macleay valley in NSW to south-eastern Queensland. It is most commonly found in rainforests and occasionally moist eucalypt forests, on loamy or sandy soils. The Three-toed Snake-tooth Skink lives in loose soil, leaf litter and rotting logs, and feeds on earthworms and beetle grubs.
Wallum Froglet (*Crinia tinnula*)	Unlikely. No suitable habitat.	The Wallum froglet is found in coastal areas from South-East Qld to the central coast of NSW. It is found only in acid Paperbark swamps and sedge swamps of the coastal 'wallum' country.-It can also be found along drainage lines within other vegetation communities and disturbed areas and occasionally in swamp sclerophyll forests.
Coxen's Fig-Parrot (*Cyclopsitta diophthalma coxeni*)	Possible, as suitable habitat present. However, population is predicted to be around 200, making the chances of it utlising the site low.	This species is usually recorded from drier rainforests and adjacent wetter eucalypt forest but rarely seen due to its small size and cryptic habits. Also found in the wetter lowland rainforests that are now largely cleared in NSW. The bird shows a decided preference for fig trees but also feeds on other fruiting rainforest species.
Spotted-tailed Quoll (*Dasyurus maculatus* maculatus (SE mainland population)	Unlikely	The Spotted-tailed quoll occurs along the escarpments, tablelands and coast of the eastern seaboard. It inhabits various habitats including dry and moist sclerophyll forests, woodlands, coastal heathlands and rainforests. The Quolls require large intact habitat patches and are generally only recorded from forested areas of the Great Dividing Range.
Adorned Delma (*Delma torquata*)	Unlikely	The Collared Delma normally inhabits eucalypt dominated woodland and open forest where it is associated with suitable micro-habitats (exposed rocky outcrops). The ground

Species	Likelihood of Occurrence	Notes
		cover is predominantly native grasses, such as Kangaroo Grass (*Themeda triandra*), Barbed-wire Grass (*Cymbopogon refractus*), Wiregrass (*Aristida* sp.) and Lomandra (*Lomandra* sp.) (DOE 2008)
Black-necked Stork (*Ephippiorhynchus asiaticus*)	Unlikely due to preference for larger wetland habitats.	This species is widespread in northern Australia but sparse on the east coast from Qld to southern NSW. It inhabits swamps, mangroves, mudflats, dry floodplains and irrigated land and occasionally forages in open grassy woodland.
Red Goshawk (*Erythrotriorchis radiatus*)	Unlikely, though potential foraging habitat exists on site.	Most records of this species are from the Clarence River catchment, with a few from the lower Richmond and Tweed Rivers. In NSW, this species is mainly found along or near watercourses, in swamp forest and woodlands and on the coastal plain.
Grey Falcon (*Falco hypoleucos*)	Unlikely	The Grey Falcon is sparsely distributed in NSW, with the occasional vagrant east of the Great Dividing Range. Usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, it is occasionally found in open woodlands near the coast. The species also occurs near wetlands where surface water attracts prey.
Black Falcon (*Falco subniger*)	Unlikely	The Black Falcon is widely, but sparsely, distributed in New South Wales, mostly occurring in inland regions. The Black Falcon is found along tree-lined watercourses and in isolated woodlands, mainly in arid and semi-arid areas. It roosts in trees at night and often on power poles by day (Birdlife Australia, 2021)
Little Lorikeet (*Glossopsitta pusilla*)	Possible	The Little Lorikeet is distributed widely across the coastal and Great Divide regions of eastern Australia from Cape York to South Australia. It forages primarily in the canopy of open *Eucalyptus* forest and woodland, yet also finds food in *Angophora, Melaleuca* and other tree species. Riparian habitats are particularly used, due to higher soil fertility and hence greater productivity. It nests in proximity to feeding areas if possible, most typically selecting hollows in the limb or trunk of smooth-barked Eucalypts. Nest entrance is small (3 cm) and usually high above the ground (2–15 m). These nest sites are often used repeatedly for decades, suggesting that preferred sites are limited. Riparian trees are often chosen, including species like *Allocasuarina*.
Brolga (*Grus rubicunda*)	Unlikely due to preference for larger wetland habitats.	Although this species occurs in northern and eastern Australia, it is uncommon and localised in the east. It inhabits shallow swamps and swamp margins, floodplains, grasslands and pastoral lands, usually in pairs or parties.
White-bellied Sea Eagle (*Haliaeetus leucogaster*)	Known (observed as a flyover). Foraging habitat available on site.	In New South Wales the White-bellied Sea Eagle is widespread along the east coast, and along all major inland rivers and waterways. Its preferred habitats are generally characterised by the presences of large areas of open water including rivers, swamps, lakes, and the sea. Breeding habitat consists of mature tall open forest, open forest, tall woodland, and swamp sclerophyll forest close to foraging habitat. Nest trees are typically large emergent eucalypts and often have emergent dead branches or large dead trees nearby which are used as 'guard roosts'. Nests are large structures built from sticks and lined with leaves or grass.

Species	Likelihood of Occurrence	Notes
Little Eagle (*Hieraaetus morphnoides*)	Possible	The Little Eagle is found throughout the Australian mainland excepting the most densely forested parts of the Dividing Range escarpment. It occurs as a single population throughout NSW. Occupies open eucalypt forest, woodland, or open woodland.
White-throated Needletail (*Hirundapus caudacutus)*	Possible	Migratory and usually seen in eastern Australia from October to April. In this region, the White-throated Needletail is found in North coast dry sclerophyll forests, coastal floodplain wetlands, and littoral rainforests.
Comb-crested Jacana (*Irediparra gallinacea*)	Possible	This species is found in coastal and sub-coastal northern and eastern Australia. It lives amongst vegetation floating on the surface of slow-moving rivers and permanent lagoons, swamps, lakes, and dams.
Black Bittern (*Ixobrychus flavicollis*)	Likely	This species occurs in coastal and sub-coastal areas of south-west, north and eastern Australia. It is usually found in the dense vegetation fringing streams, swamps, tidal creeks, and mudflats, particularly amongst Swamp she-oaks and Mangroves.
Swift Parrot (*Lathamus discolor)*	Unlikely, though cannot be ruled out. Minimal suitable habitat exists on the property.	The Swift Parrot is migratory and usually occurs on the coast and south west slopes of NSW between February and October. They occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations. Favoured feed trees include winter flowering species such as Swamp Mahogany *Eucalyptus robusta*, Spotted Gum *Corymbia maculata*, Red Bloodwood *C. gummifera*, Forest Red Gum *E. tereticornis*, Mugga Ironbark *E. sideroxylon*, and White Box *E. albens*. Commonly used lerp infested trees include Inland Grey Box *E. microcarpa*, Grey Box *E. moluccana*, Blackbutt *E. pilularis*, and Yellow Box *E. melliodora*.
Mangrove Honeyeater (*Lichenostomus fasciogularis*)	Unlikely	The Mangrove honeyeater is common in Qld but rare in NSW, where it is known from a few scattered localities, including the Tweed, Richmond, and Clarence River estuaries. It primarily inhabits mangroves and occursin other near-coastal forests and woodlands, including casuarinas and paperbark swamp forests.
Green and Golden Bell Frog *(Litoria aurea)*	Unlikely, though cannot be ruled out. Minimal suitable habitat exists on the property and predatory fish are likely to be present in the dam. The species also prefers ephemeral ponds rather that sites with permanent ponds.	This species occurs in isolated populations along the coast of NSW. It is found amongst vegetation in and around permanent swamps, lagoons, and farm dams, and on flood-prone river flats. The Green and golden bell frog favours areas of Bulrush and Spikerush.
Wallum Sedge Frog (*Litoria olongburensis*)	Unlikely – no suitable habitat on site.	This species occurs in coastal areas from Fraser Island in south-east Qld to Yuraygir National Park in northern NSW.It inhabits paperbark swamps and sedge swamps of the coastal 'wallum' country.
Eastern Coastal Free-tailed Bat (*Micronomus*	Possible	The Eastern freetail-bat is found along the east coast of Australia from south QLD to southern NSW. This species occurs in Dry sclerophyll and Open woodland, east of the Great Dividing Range. This species roosts mainly in tree

Species	Likelihood of Occurrence	Notes
***norfolkensis*)**		hollows but may also roost under bark or in man-made structures.
Little Bent-winged Bat (*Miniopterus australis*)	Possible due to presence in the wider area, although preference for well-timbered areas noted and potential limiting factor.	This species occurs in coastal north-east NSW and eastern Qld. It inhabits moist Eucalypt forest, Rainforest and dense Coastal scrub. It generally occupies caves and tunnels during the day and may occasionally roost singularly or in small collectives under the bark of mature paperbark trees.
Large Bent-winged Bat (*Miniopterus orianae oceanensis*)	Possible due to presence in the wider area.	Eastern Bentwing-bats occur along the east and north-west coasts of Australia. Caves are their primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures. The bats hunt in forested areas, catching moths and other flying insects above the tree tops.
Fleay's Frog (*Mixophyes fleayi*)	Unlikely due to preference for higher altitudes.	This frog has restricted distribution on the eastern side of the ranges in south-east Queensland (south from Conondale ranges) and northeast NSW. Recent records in NSW are from Nightcap National Park, Border Ranges National Park, Mt. Warning National Park, Tooloom National Park and Yabbra National Park. These frogs live in rainforests and wet eucalypt forests of the escarpment and foothills, usually close to gravely streams. The species occurs along stream habitats from first to third order streams (i.e., small streams close to their origin through to permanent streams with grades of 1 in 50) but is not found in ponds or ephemeral pools.
Southern Myotis (*Myotis macropus*)	Possible	The Southern Myotis is found in the coastal band from the north-west of Australia, across the top-end and south to western Victoria. It is rarely found more than 100 km inland, except along major rivers. Forage over streams and pools catching insects and small fish by raking their feet across the water surface. These bats generally roost in groups of 10 - 15 close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings, under bridges and in dense foliage.
Barking Owl (*Ninox connivens*)	Possible	Inhabits woodland and open forest, including fragmented remnants and partly cleared farmland. It is flexible in its habitat use, and hunting can extend into closed forest and more open areas. Sometimes able to successfully breed along timbered watercourses in heavily cleared habitats (e.g., western NSW) due to the higher density of prey found on these fertile riparian soils. Roosts in shaded portions of tree canopies, including tall midstorey trees with dense foliage such as *Acacia* and *Casuarina* species. During nesting season, the male perches in a nearby tree overlooking the hollow entrance.
Eastern Tube-nosed Bat (*Nyctimene robinsoni*)	Possible	These bats favour streamside habitats within coastal subtropical rainforest and moist eucalypt forests with a well-developed rainforest understorey. They feed mainly on fruit and nectar from trees in the rainforest canopy and sometimes come close to human settlement to visit flowering or fruiting trees.

Species	Likelihood of Occurrence	Notes
Eastern Long-eared Bat (*Nyctophilus bifax*)	Likely	This species occurs from Cape York through eastern Qldto the far north-east corner of NSW. It inhabits lowland subtropical rainforests and wet and swamp eucalypt forests, extending into adjacent moist eucalypt forests. Coastal rainforest and patches of coastal scrub are particularly favoured.
Eastern Osprey (*Pandion cristatus)*	Possible	Eastern Ospreys are found right around the Australian coastline, except for Victoria and Tasmania. They are common around the northern coast, especially on rocky shorelines, islands, and reefs. This species favours coastal areas, especially the mouths of large rivers, lagoons, and lakes.
Squirrel Glider (*Petaurus norfolcensis*)	Unlikely due to preference for larger forest areas i.e., that have higher numbers of large hollows	This species inhabits 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. It prefers mixed-species stands with a shrub or Acacia midstorey and requires abundant tree hollows for refuge and nest sites.
Scarlet Robin (*Petroica boodang*)	Possible	The Scarlet Robin lives in dry eucalypt forests and woodlands. The understorey is usually open and grassy with few scattered shrubs. This species lives in both mature and regrowth vegetation. It occasionally occurs in mallee or wet forest communities, or in wetlands and tea-tree swamps. Scarlet Robin habitat usually contains abundant logs and fallen timber: these are important components of its habitat.
Koala (*Phascolarctos cinereus*)	Likely	Koalas occur in eucalypt woodlands and forests throughout eastern Australia. They inhabit areas where there are appropriate food trees.
Southern Pink Underwing Moth (*Phyllodes imperialis* southern subspecies)	Unlikely due to preference for undisturbed rainforest.	In NSW, this moth 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. The Southern Pink Underwing Moth is found in subtropical rainforest below about 600 m elevation. Potential breeding habitat is restricted to areas where the caterpillar's food plant, a native rainforest vine, *Carronia multisepalea*, occurs in subtropical rainforest.
Common Planigale *(Planigale maculata)*	Possible	This species occurs in coastal north-east NSW, occupyinga wide range of habitats. The Common Planigale is found in rainforest, sclerophyll forest, grasslands, marshlands, rocky areas, some suburban areas, and usually close to water.
Long-nosed Potoroo (*Potorous tridactylus*)	Unlikely due to habitat fragmentation/isolation on the property. Very minimal suitable habitat.	This species inhabits coastal heaths and dry and wet sclerophyll forests. Dense understorey with occasional open areas is an essential part of habitat, and may consist of grasstrees, sedges, ferns or heath, or of lowshrubs of tea-trees or melaleucas. A sandy loam soil is also a common feature.
New Holland Mouse (*Pseudomys novaehollandiae*)	Unlikely due to preference for sandstone country.	This species is known to inhabit open heathlands, woodlands and forests with a heathland understorey and vegetated sand dunes. It has a fragmented distribution across NSW.
**Grey-headed Flying-fox (*Pteropus*	Likely	This species occurs from central eastern Qld south to Victoria. In NSW, the Grey-headed flying fox mainly occurs in coastal areas and along river valleys. They typically roost in conspicuous camps in Lowland rainforest and Swamp

Species	Likelihood of Occurrence	Notes
***poliocephalus*)**		Forest, often in isolated remnants or on islands in rivers. They forage on fruit, nectar and pollen in Rainforests and Eucalypt forests.
Wompoo Fruit Dove (*Ptilinopus magnificus*)	Possible	This species is found along the coast and coastal rangesfrom Cape York to the Hunter River in NSW. It occurs in rainforests, low-elevation moist eucalypt forest and brushbox forests. These doves most often occur in mature forests but are also found in remnant and regenerating forest.
Rose-crowned Fruit Dove (*Ptilinopus regina*)	Possible	The Rose-crowned fruit-dove occurs along the coast and the ranges of Qld and Eastern NSW. It occurs mainly in subtropical and dry rainforest and occasionally in moist eucalypt forest and swamp forest, where fruit is plentiful.
Superb Fruit Dove (*Ptilinopus superbus*)	Possible	This species is widely distributed along the East Coast of Australia from Cape York to north-east NSW. It occurs mainly in Subtropical and Dry rainforest and occasionally in moist Eucalypt Forest and Swamp forest, where fruits are plentiful.
Australian Painted Snipe (*Rostratula australis)*	Unlikely due to habitat preference.	The Painted Snipe occurs in the better-watered areas of eastern Australia and the NT. They are generally rare and prefer shallow freshwater swamps or saltmarsh areas. They prefer fringes of swamps, dams, and nearby marshy areas where there is a cover of grasses, lignum, low scrub, or open timber. This species nests on the ground amongst tall vegetation, such as grasses, tussocks, or reeds.
Greater Broad-nosed Bat (*Scoteanax rueppellii*)	Unlikely. Preference for tall wet forest.	This species occurs on the coast and ranges from Qld to southern NSW. The Greater broad-nosed bat is found in a variety of habitats from woodlands, moist and dry eucalypt forest, and rainforest, roosting in tree hollows. It is most commonly found in tall wet forest. Open woodland habitat and dry open forest suits the direct flight of this species as it searches for beetles and other large, slow-flying insects; this species has been known to eat other bat species.
Freckled Duck (*Stictonetta naevosa*)	Possible	This species occasionally occurs on the North Coast of NSW as a vagrant. Its preferred habitats are freshwater swamps or creeks rich in plankton with a heavy growth of cumbungi, lignum or tea-tree. During drier times, they move from ephemeral breeding swamps to more permanent waters such as lakes, reservoirs, farm dams and sewage ponds.
Common Blossom-bat (*Syconycteris australis*)	Possible	Common blossom-bats occur in the coastal areas of north-east NSW and eastern Qld. They often roost in littoral rainforest and feed on flowers in adjacent heathland and paperbark swamps. They have also been recorded in a range of other vegetation communities, such as subtropical rainforest, wet sclerophyll forest and other coastal forests.
Mitchell's Rainforest Snail (*Thersites mitchellae*)	Possible	This snail is restricted to remnant areas of lowland subtropical rainforest and swamp sclerophyll forest with a rainforest understorey on alluvial soils with a basaltic influence on the coastal plain between the Richmond and Tweed Rivers (NPWS 2001). Slightly higher ground around the edges of wetlands with palms and fig trees are particularly favoured habitat.

Species	Likelihood of Occurrence	Notes
Collared Kingfisher (*Todiramphus chloris*)	Unlikely	The Collared Kingfisher is commonly observed in the Tweed River Estuary and has been recorded at Coffs Harbour and Woolgoolga. The species is virtually restricted to mangroves and other estuarine habitats about the mouths of the larger coastal rivers. They sometimes occur in terrestrial forests or woodlands bordering mangroves, where they will nest in holes in trees or in arboreal termitaria. They are sometimes seen in streets or gardens in built-up areas bordering mangrove vegetation.
Black-breasted Button-quail (*Turnix melanogaster*)	Unlikely	Few reliable records in NE NSW, all north of the Bruxner Highway and east of the Great Divide. This quail prefers drier rainforests and viney scrubs, often in association with Hoop Pine and a deep, moist leaf litter layer.
Eastern Grass Owl (*Tyto longimembris*)	Unlikely	Eastern Grass Owls are found in areas of tall grass, including grass tussocks, in swampy areas, grassy plains, swampy heath, and in cane grass or sedges on flood plains.
False Water Rat (*Xeromys myoides*)	Unlikely	This species is found in coastal wetlands such as lagoons, swamps and sedged lakes close to foredunes. It forages amongst the mangroves at night when the tide is low, and when the tide rises it returns to the adjacent sedgelands for shelter.

Appendix C – Bird Survey Results

Bird survey results

Table 12: Birds identified during the site survey:

Scientific name	Common name
Alectura lathami	Brush Turkey
Anas superciliosa	Pacific Black Duck
Ardea ibis	Cattle Egret
Calyptorhynchus funereus	Yellow-tailed Black Cockatoo
Carterornis leucotis	White-eared Monarch
Chenonetta jubata	Australian Wood Duck
Coracina novaehollandiae	Black-faced Cuckoo-Shrike
Corvus orru	Crow
Cracticus torquatus	Grey Butcherbird
Dacelo novaeguineae	Kookaburra
Entomyzon cyanotis	Blue-faced Honeyeater
Gerygone olivacea	White-throated Gerygone
Gymnorhina tibicen	Magpie
Haliaeetus leucogaster	White-bellied Sea Eagle
Hirundo neoxena	Welcome Swallow
Malurus cyaneus	Superb Fairy-wren
Manorina melanocephala	Noisy Miner
Meliphaga lewinii	Lewin's Honeyeater
Phaps chalcoptera	Bronzewing Pigeon
Psophodes olivaceus	Whipbird
Psophodes olivaceus	Grey Fantail
Rhipidura leucophrys	Willy Wagtail
Sphecotheres vieilloti	Fig Bird
Strepera graculina	Currawong
Threskiornis spinicollis	Straw-necked Ibis
Vanellus miles	Plover

Appendix D – Floristic Plot Data

Note: Plots are identified in Figure 10

Table 13: Species recorded in each of five floristic surveys conducted at the study site.

Plot	Species	Abundance	Cover (%)
Plot 1	*Ficus macrophylla*	1	20
	*Ageratina riparia**	100	15
	Ficus virens	1	10
	Nephrolepis cordifolia	50	5
	Maclura cochinchinensis	15	2
	Adiantum hispidulum	50	2
	Oplismenus sp.	50	2
	Ottochloa gracillima	50	2
	Cryptocarya triplinervis	4	1.5
	*Ligustrum sinense**	6	1.5
	Dysoxylum mollissimum	1	1.5
	*Flacourtia jangomas**	3	1.5
	Acmena smithii	3	1
	Mallotus philippensis	3	1
	Harpullia hillii	3	1
	Synoum glandulosum	6	1
	Cupaniopsis anacardioides	4	1
	*Asparagus africanus**	20	1
	*Duranta erecta**	3	1
	*Schefflera actinophylla**	3	1
	Cissus antarctica	10	1
	Endiandra globosa	1	1
	Glochidion ferdinandi	1	1
	Cryptocarya obovata	1	0.5
	Jagera pseudorhus	2	0.5
	Wilkiea huegeliana	3	0.5
	Actephila lindleyi	3	0.5
	*Eugenia uniflora**	3	0.5
	Aphananthe philippinensis	1	0.5
	Smilax australis	15	0.5
	Exocarpos latifolius	1	0.5
	Flagellaria indica	1	0.5
	Macaranga tanarius	1	0.5
	Arytera distylis	1	0.5
	Celtis paniculata	2	0.5
	Ripogonum album	5	0.4
	Pandorea jasminoides	10	0.3
	*Syagrus romanzoffiana**	1	0.3
	Melicope elleryana	2	0.3

Plot	Species	Abundance	Cover (%)
	Ficus fraseri	2	0.3
	Elaeocarpus obovatus	1	0.3
	*Lantana camara**	2	0.3
	Archontophoenix cunninghamiana	1	0.3
	Pothos longipes	5	0.3
	*Ochna serrulate**	3	0.2
	Myrsine variabilis	2	0.2
	Mucuna gigantea	2	0.2
	*Senna pendula**	2	0.2
	Pittosporum revolutum	1	0.2
	Pilidiostigma glabrum	1	0.2
	Tabernaemontana pandacaqui	1	0.2
	Gossia hillii	1	0.2
	Notelaea longifolia	1	0.2
	Ripogonum brevifolium	2	0.2
	Trophis scandens	3	0.2
	*Coffea arabica**	1	0.2
	Murraya paniculata	1	0.2
	Tinospora tinosporoides	1	0.2
	Cordyline petiolaris	1	0.2
	Passiflora suberosa	1	0.2
	Passiflora edulis	1	0.2
	Embelia australiana	1	0.2
	Cryptocarya foetida	4	0.1
	Asplenium australasicum	2	0.1
	Pyrossia confluens	6	0.1
	*Cinnamomum camphora**	1	0.1
	Dioscorea transversa	10	0.1
	Solanum capsicoides	1	0.1
	Sterculia quadrifida	1	0.1
	Geitonoplesium cymosum	3	0.1
	Drypetes deplanchei	1	0.1
	Pseuderanthemum variabile	10	0.1
	Notogrammitis billardierei	4	0.1
	Syzygium luehmannii	1	0.1
Plot 2	*Lophostemon confertus*	6	40
	*Asparagus aethiopicus**	5	10
	Nephrolepis cordifolia	200	10
	Cissus antarctica	20	3
	Corymbia intermedia	1	3
	Elaeocarpus obovatus	2	3
	Macaranga tanarius	2	3
	*Ageratina adenophora**	50	2

Plot	Species	Abundance	Cover (%)
	*Cinnamomum camphora**	10	2
	*Ligustrum sinense**	10	2
	Mallotus philippensis	5	2
	*Ochna serrulate**	20	2
	Paspalum sp.*	20	2
	Smilax australis	20	2
	Acacia melanoxylon	1	1
	*Eugenia uniflora**	3	1
	Ficus rubiginosa	2	1
	Gahnia aspera	10	1
	Guioa semiglauca	10	1
	*Lantana camara**	5	1
	Platycerium bifurcatum	6	1
	Rubus rosifolius	3	1
	Schefflera actinophylla	3	1
	*Senna pendula**	12	1
	Oplismenus sp.*	50	0.55
	Acacia fimbriata	2	0.5
	Cryptocarya triplinervis	3	0.5
	Cupaniopsis anacardioides	10	0.5
	Dianella sp.	3	0.5
	Dioscorea transversa	3	0.5
	Doodia aspera	30	0.5
	Exocarpos latifolius	1	0.5
	Jagera pseudorhus	2	0.5
	Maclura cochinchinensis	10	0.5
	Polyscias elegans	1	0.5
	Aphananthe philippinensis	2	0.3
	*Passiflora foetida**	2	0.3
	Pteridium esculentum	10	0.3
	*Ageratina riparia**	200	0.2
	Asplenium australasicum	3	0.2
	Derris involuta	3	0.2
	Flacourtia jangomas	1	0.2
	Hibbertia scandens	1	0.2
	Melodinus acutiflorus	1	0.2
	Myrsine variabilis	1	0.2
	Passiflora suberosa	4	0.2
	Pyrrosia confluens	4	0.2
	*Solanum mauritianum**	1	0.2
	*Solanum seaforthianum**	1	0.2
	Trophis scandens	3	0.2
	Austrosteenisia blackii	2	0.1

Plot	Species	Abundance	Cover (%)
	Geitonoplesium cymosum	3	0.1
	Stephania japonica	2	0.1
	*Syagrus romanzoffiana**	1	0.1
Plot 3	*Ranunculus inundatus*	500	60
	*Commelina benghalensis**	300	10
	Cyperaceae sp.	100	5
	*Setaria sphacelate**	30	4
	Persicaria hydropiper	50	2
	Gomphocarpus sp.*	30	1
	*Ludwigia octovalvis**	20	1
	*Ageratina adenophora**	30	0.5
	*Senecio madagascariensis**	20	0.5
	*Ageratum houstonianum**	30	0.2
	Persicaria strigosa/dichotoma	100	0.2
	Centella asiatica	50	0.2
	Eleocharis equisetina	30	0.2
	*Bidens pilosa**	20	0.1
	Sida sp.*	6	0.1
	*Vigna parkeri**	20	0.1
	Juncus usitatus	20	0.1
	*Oxalis perennans**	10	0.1
	Conyza sp.*	10	0.1
	Forb sp. (unidentifiable)	1	0.1
Plot 4	*Melaleuca quinquenervia*	20	15
	Melicope elleryana	20	10
	Carex appressa	50	5
	Blechnum indicum	50	3
	Poacea sp.	300	3
	Myrsine variabilis	30	2
	Ficus coronata	10	2
	Glochidion ferdinandi	5	2
	Cyclosorus interruptus	30	2
	Persicaria strigosa/dichotoma	200	2
	Lygodium microphyllum	10	1
	Archontophoenix cunninghamiana	2	1
	Parsonsia straminea	10	1
	Viola sp.	200	1
	Ficus sp.	1	1
	*Cinnamomum camphora**	2	0.5
	Glochidion sumatranum	1	0.5
	Lomandra longifolia	5	0.2
	Embelia australiana	1	0.1
	Maclura cochinchinensis	3	0.1

Plot	Species	Abundance	Cover (%)
	*Ligustrum sinense**	1	0.1
	Cyperaceae sp.	1	0.1
	*Senna pendula**	1	0.1
Plot 5	*Paspalum* sp.*(probably *mandiocanum*)	500	80
	Eucalyptus tereticornis	7	25
	Callistemon salignus	3	4
	*Setaria sphacelata**	15	3
	*Cinnamomum camphora**	20	1
	*Ligustrum sinense**	5	0.2
	Cupaniopsis anacardioides	5	0.2
	*Vigna parkeri**	40	0.2
	Parsonsia straminea	1	0.2
	Centella asiatica	50	0.2
	Schefflera actinophylla	1	0.2
	Poacea sp.	20	0.2
	*Senna pendula**	2	0.1
	Smilax australis	3	0.1
	Verbena sp*.*	10	0.1
	*Bidens pilosa**	5	0.1
	Juncus usitatus	2	0.1
	Stephania japonica	5	0.1
	Hibbertia scandens	1	0.1
	Marsdenia sp.	1	0.1
	Geitonoplesium cymosum	5	0.1
	*Lantana camara**	3	0.1
	Glochidion ferdinandi	5	0.1
	Guioa semiglauca	2	0.1
	Mallotus philippensis	1	0.1
	Jagera pseudorhus	1	0.1
	Poacea sp.	5	0.1
	Carex appressa	3	0.1
	Lomandra longifolia	3	0.1
	*Ochna serrulate**	1	0.1
	*Asparagus aethiopicus**	1	0.1
	*Passiflora edulis**	1	0.1
	Lobelia purpurascens	5	0.1

Appendix E – Paddock Tree Survey

Figure 27: Map of standalone trees. Refer to Table 14 for species list.

Table 14: Results of survey of standalone paddock trees across the site:

Tree ID (Figure 27)	Species	DBH (cm)	Height (m)	Canopy Width (m)	Tree Protection Zone (m)	Health
1	*Cupaniopsis anacardioides*	55	10	8	6.6	Good
2	*Citrus limon*	35	5	5	4.2	Good
3	*Flindersia schottiana*	132	23	222	15.84	Good
4	*Lophostemon confertus*	110	20	14	13.2	Good
5	*Citrus limon*	32	4	5	3.84	Good
6	*Cupaniopsis anacardioides*	49	11	8	5.88	Good
7	*Guioa semiglauca*	37	11	5	4.44	Good
8	*Mallotus philippensis*	35	6	3	4.2	Good
9	*Cupaniopsis anacardioides*	52	12	11	6.24	Good
10	*Cupaniopsis anacardioides*	36	10	7	4.32	Good
11	*Aphananthe philippinensis*	13	6	3	2	Good
12	*Mallotus philippensis*	36	9	8	4.32	Good
13	*Mallotus philippensis*	36	8	6	4.32	Good
14	*Mallotus philippensis*	32	6	5	3.84	Good
15	*Cupaniopsis anacardioides*	43	10	8	5.16	Good
16	*Psidium guajava*	31	5	6	3.72	Good
17	*Guioa semiglauca*	41	12	6	4.92	Good
18	*Cupaniopsis anacardioides*	42	10	10	5.04	Good
19	*Guioa semiglauca*	28	12	5	3.36	Good
20	*Guioa semiglauca*	28	12	5	3.36	Good
21	*Mallotus philippensis*	132	11	11	15.84	Good
22	*Cupaniopsis anacardioides*	22	7	5	2.64	Good
23	*Cupaniopsis anacardioides*	43	10	10	5.16	Good
24	*Commersonia bartramia*	63	10	10	7.56	Good
25	*Glochidion ferdinandi*	33	10	6	3.96	Good
26	*Cupaniopsis anacardioides*	21	5	5	2.52	Good
27	*Cupaniopsis anacardioides*	17	5	5	2.04	Good
28	*Eucalyptus tereticornis*	108	27	12	12.96	Good
29	*Guioa semiglauca*	23	7	5	2.76	Good
30	*Callistemon salignus*	21	8	4	2.52	Good
31	*Eucalyptus tereticornis*	56	25	11	6.72	Good
32	*Eucalyptus tereticornis*	150	28	17	18	Good
33	*Eucalyptus tereticornis*	118	28	20	14.16	Good
34	*Melaleuca quinquenervia*	56	15	7	6.72	Good
35	*Eucalyptus tereticornis*	84	17	10	10.08	Poor. Dead, but reshooting
36	*Eucalyptus robusta*	78	16	12	9.36	Good
37	*Eucalyptus tereticornis*	86	19	11	10.32	Good
38	*Lophostemon suaveolens*	35	12	6	4.2	Good
39	*Eucalyptus tereticornis*	86	19	6	10.32	Some die back but OK health
40	*Eucalyptus tereticornis*	121	28	20	14.52	Good

Tree ID (Figure 27)	Species	DBH (cm)	Height (m)	Canopy Width (m)	Tree Protection Zone (m)	Health
41	*Lophostemon suaveolens*	52	15	7	6.24	Good
42	*Eucalyptus tereticornis*	97	18	12	11.64	Good
43	*Lophostemon suaveolens*	77	14	12	9.24	Good
44	*Melaleuca quinquenervia*	112	12	11	13.44	Good
45	*Melaleuca quinquenervia*	95	11	12	11.4	Base hollowed out but healthy
46	*Melaleuca quinquenervia*	103	11	13	12.36	Good
47	*Eucalyptus tereticornis*	49	12	10	5.88	Good
48	*Melaleuca quinquenervia*	70	14	8	8.4	Good
49	*Melaleuca quinquenervia*	103	13	10	12.36	Good
50	*Melaleuca quinquenervia*	70	11	6	8.4	Good
51	*Melaleuca quinquenervia*	96	13	13	11.52	Good
52	*Cupaniopsis anacardioides*	88	15	11	10.56	Good
53	*Cupaniopsis anacardioides*	33	7	6	3.96	Stunted, gnarly growth
54	*Commersonia bartramia*	24	8	5	2.88	Good
55	*Cupaniopsis anacardioides*	22	9	5	2.64	Good
56	*Cupaniopsis anacardioides*	52	10	5	6.24	Good
57	*Lophostemon suaveolens*	34	9	4	4.08	Good
58	*Cupaniopsis anacardioides*	18	5	5	2.16	Good
59	*Eucalyptus tereticornis*	175	26	14	21	Good
60	*Eucalyptus tereticornis*	20	9	5	2.4	Good
61	*Eucalyptus tereticornis*	83	20	15	9.96	Good
62	*Eucalyptus tereticornis*	82	20	15	9.84	Good
63	*Eucalyptus tereticornis*	74	20	12	8.88	Good
64	*Lophostemon suaveolens*	46	10	6	5.52	Good
65	*Eucalyptus robusta* with *Ficus* sp. strangling	130	24	15	15.6	Health ok
66	*Melaleuca quinquenervia*	68	12	6	8.16	Good
67	*Lophostemon confertus*	140	18	10	16.8	Good
68	*Cupaniopsis anacardioides*	38	6	8	4.56	Good
69	*Melaleuca quinquenervia*	102	13	16	12.24	Good
70	*Cupaniopsis anacardioides*	74	10	10	8.88	Good
71	*Callistemon salignus*	39	4	7	4.68	Good
72	*Cupaniopsis anacardioides*	36	6	6	4.32	Good
73	*Callistemon salignus*	53	8	4	6.36	Good
74	*Callistemon salignus*	35	8	5	4.2	Good
75	*Acacia melanoxylon*	21	3	5	2.52	Good
76	*Callistemon salignus*	62	10	3	7.44	Good
77	*Melaleuca quinquenervia*	97	10	7	11.64	Good
78	*Callistemon salignus*	88	10	10	10.56	Good
79	*Acacia melanoxylon*	15	6	5	2	Good
80	*Melaleuca quinquenervia*	54	12	6	6.48	Good

Tree ID (Figure 27)	Species	DBH (cm)	Height (m)	Canopy Width (m)	Tree Protection Zone (m)	Health
81	*Acacia melanoxylon*	25	8	5	3	Good
82	*Melaleuca quinquenervia*	86	17	9	10.32	Good
83	*Melaleuca quinquenervia*	93	15	8	11.16	Good
84	*Melaleuca quinquenervia*	91	18	8	10.92	Good
85	*Melaleuca quinquenervia*	72	17	8	8.64	Good
86	*Melaleuca quinquenervia*	118	18	10	14.16	Good
87	*Cupaniopsis anacardioides*	25	13	8	3	Good
88	*Callistemon salignus*	37	6	6	4.44	Good
89	*Callistemon salignus*	71	8	8	8.52	Poor health. Half of tree has dieback
90	*Callistemon salignus*	40	10	2	4.8	Good
91	*Callistemon salignus*	45	10	4	5.4	Good
92	*Eucalyptus tereticornis*	86	18	11	10.32	Good
93	*Ficus watkinsiana*	240	20	20	28.8	Good

Appendix F – Matters of National Environmental Significance Migratory Species list

Table 15: Migratory species list obtained through a Protected Matters Search, Department of Climate Change, Energy, the Environment, and Water, 20/9/2023:

Scientific Name	Common Name	Rank	Threatened Category (EPBC Act)	Migratory Category
Cuculus optatus	Oriental Cuckoo, Horsfield's Cuckoo	May		Terrestrial Species
Actitis hypoleucos	Common Sandpiper	Known		Wetlands Species
Fregata ariel	Lesser Frigatebird, Least Frigatebird	Known		Marine Birds
Phaethon lepturus	White-tailed Tropicbird	May		Marine Birds
Macronectes giganteus	Southern Giant-Petrel, Southern Giant Petrel	May	Endangered	Marine Birds
Anous stolidus	Common Noddy	Likely		Marine Birds
Thalassarche melanophris	Black-browed Albatross	May	Vulnerable	Marine Birds
Calonectris leucomelas	Streaked Shearwater	Known		Marine Birds
Rhipidura rufifrons	Rufous Fantail	Likely		Terrestrial Species
Symposiachrus trivirgatus	Spectacled Monarch	Known		Terrestrial Species
Mobula alfredi	Reef Manta Ray, Coastal Manta Ray	Known		Marine Species
Macronectes halli	Northern Giant Petrel	May	Vulnerable	Marine Birds
Thalassarche steadi	White-capped Albatross	May	Vulnerable	Marine Birds
Thalassarche salvini	Salvin's Albatross	May	Vulnerable	Marine Birds
Myiagra cyanoleuca	Satin Flycatcher	Known		Terrestrial Species
Tringa nebularia	Common Greenshank, Greenshank	Likely		Wetlands Species
Pandion haliaetus	Osprey	Known		Wetlands Species
Calidris acuminata	Sharp-tailed Sandpiper	Known		Wetlands Species
Monarcha melanopsis	Black-faced Monarch	Known		Terrestrial Species
Apus pacificus	Fork-tailed Swift	Likely		Marine Birds
Charadrius leschenaultii	Greater Sand Plover, Large Sand Plover	Likely	Vulnerable	Wetlands Species
Ardenna grisea	Sooty Shearwater	Likely		Marine Birds
Thalassarche cauta	Shy Albatross	May	Endangered	Marine Birds
Hirundapus caudacutus	White-throated Needletail	Known	Vulnerable	Terrestrial Species
Gallinago hardwickii	Latham's Snipe, Japanese Snipe	Likely		Wetlands Species
Diomedea exulans	Wandering Albatross	May	Vulnerable	Marine Birds
Diomedea epomophora	Southern Royal Albatross	May	Vulnerable	Marine Birds
Gallinago stenura	Pin-tailed Snipe	Likely		Wetlands Species
Gallinago megala	Swinhoe's Snipe	Likely		Wetlands Species
Calidris ferruginea	Curlew Sandpiper	May	Critically Endangered	Wetlands Species
Calidris melanotos	Pectoral Sandpiper	Likely		Wetlands Species
Ardenna carneipes	Flesh-footed Shearwater, Fleshy-footed Shearwater	Likely		Marine Birds
Numenius madagascariensis	Eastern Curlew, Far Eastern Curlew	May	Critically Endangered	Wetlands Species

Scientific Name	Common Name	Rank	Threatened Category (EPBC Act)	Migratory Category
Thalassarche impavida	Campbell Albatross, Campbell Black-browed Albatross	May	Vulnerable	Marine Birds
Diomedea antipodensis	Antipodean Albatross	May	Vulnerable	Marine Birds
Motacilla flava	Yellow Wagtail	Likely		Terrestrial Species
Calidris canutus	Red Knot, Knot	Likely	Endangered	Wetlands Species
Fregata minor	Great Frigatebird, Greater Frigatebird	Likely		Marine Birds
Limosa lapponica	Bar-tailed Godwit	Known		Wetlands Species
Numenius minutus	Little Curlew, Little Whimbrel	Likely		Wetlands Species