

PLANS AND DOCUMENTS
referred to in the PDA
DEVELOPMENT APPROVAL

Approval no: DEV2022/1315

Date: 28 April 2023



28°S

ENVIRONMENTAL

Proposed Industrial Development at 4653-4691 Mount Lindesay Highway, North Maclean

**TERRESTRIAL ECOLOGICAL ASSESSMENT REPORT SUPPORTING
A CONTROLLED ACTION REFERRAL TO THE COMMONWEALTH
REGULATOR, AND A DEVELOPMENT APPLICATION TO
ECONOMIC DEVELOPMENT QUEENSLAND**

28 July 2022

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1.0 Introduction

1.1 Purpose of this Report

28 South Environmental has been engaged by Maclean Estates Pty Ltd (**Proponent**) to advise on ecological and environmental planning matters in regard to a proposed industrial development at North Maclean, Southeast Queensland (**Proposed Action**). The purpose of this report is to support:

- (i) a Controlled Action Referral (**CAR**) submitted to the Department of Agriculture Water and the Environment (**DAWE**) to assist in determining if the Proposed Action should be deemed a *Controlled Action* under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (**EPBC Act**); and
- (ii) a development application submitted to Economic Development Queensland (**EDQ**), the assessment authority for the Greater Flagstone Priority Development Area (**GFPDA**) in which the Subject Site is located.

1.2 The Subject Site

1.2.1 Locality, Setting and Features

The Site the subject of the Proposed Action (**Subject Site**) is located at 4653-4691 Mount Lindesay Highway, North Maclean (Lot 1 on RP113251). North Maclean is part of the GFPDA, a State coordinated urban growth area approximately 30km south of Brisbane (**Figure 1**). In recent years, DAWE has assessed many CAR's for residential development in nearby parts of the GFPDA. The Subject Site is a key component of the employment generating hub providing employment for these wider residential areas and as such has been designated Industry and Business Zone by EDQ. Further discussion is provided in Section 1.2.2.

The Subject Site's more immediate setting, and its boundaries and features are shown by **Figure 2**. An approved industrial development to the north of the Subject Site is an important contextual element. The project (**Wearing Development Site/Approval**) was assessed and approved under the EPBC Act (Referral No. 2013/6941), and its offset was approved in December 2021. EDQ approvals have been obtained, and the project commenced. Clearing has now commenced. Construction of this project will significantly alter the Subject Site's ecological setting because the majority of vegetation will be removed from the Wearing Development Site.

Current aerial photography indicates the Subject Site to be well-vegetated, but closer examination reveals much of the vegetation to be regrowth arising from clearing from before the 1950's and maintained well into the 1970's. This historic disturbance, an important determinant of ecological values, is discussed further in Section 2.1.1.

Topographically, the Subject Site is characterised by gently undulating sandstone hillslopes and an overland flow path (**Figure 3**). The overland flow path, which is not a recognised watercourse, commences on the Wearing Developments Site to the north. Approvals for that project allow for the overland flow path to be repositioned to the western boundary and incorporated into the stormwater treatment system. Plan 2 in **Attachment 1**¹ shows the position of the stormwater swale on the western edge of the Wearing Developments Site and the lawful point of discharge from that site into the Subject Site. Plan 3 in Attachment 1 shows the swale cross sections illustrated on Plan 2.

¹ The EDQ-approved plans for the Wearing Developments Approval.

Once discharged to the Subject Site, flows progress through a broad flat area of land supporting paperbark forest.² At the time of survey this area was wet (noting well above average rainfall for Summer-Autumn 2022), but in more regular conditions the community is likely to be seasonally dry. The overland flow path progresses past the Subject Site's southern boundary before turning east and then north, where it is significantly disrupted by a former aquaculture farm³ now used for an unknown form of landscape yard or soil stockpile/treatment area. This use significantly disrupts natural flows and fauna movement along the overland flow path.

As the overland flow path re-enters the Subject Site, naturalistic conditions are returned for a short section, but the Wearing Development Approval to the north allows for flows to be captured at the southern boundary of that site (northern boundary of the Subject Site) and piped north to an existing culvert under the Mount Lindsay Highway. Plan 2 of **Attachment 1** shows the retaining wall and extent of culvert.

This outcome was allowed on the Wearing Development Site after detailed assessment⁴ determined that the overland flow path did not have waterway values or provide fish passage. It logically follows that this assessment of waterway values downstream from the Subject Site⁵ extinguishes the Waterway for Waterway Barrier Works designation on the Subject Site. The Waterway for Waterway Barrier Works mapping, and EDQ's acceptance of the assessment findings are provided in **Attachment 2**.

1.2.2 Landuse Planning Context

The Subject Site's landuse planning intent is governed by the *Greater Flagstone Urban Development Area Interim Landuse Plan (ILP)*. The ILP identifies the Subject Site as part of a *Proposed Urban Development Area (Attachment 3)*, and more specifically as an *Existing and Proposed Major Employment Area*. The Subject Site's position in relation to other *Proposed Urban Development Areas* is also usefully shown (**Attachment 3**).

At closer scale, this development intent is illustrated by an EDQ-approved context plan, which identifies the development footprint as Industry and Business Zone (**Attachment 4**). This precinct continues through to the soil/landscape yard to the south and beyond. The approved Wearing Developments Site to the north is assigned to the *Industry and Warehouse Precinct* and the *Business, Research and Technology Precinct*. The intention of the EDQ designation is that the land will provide a major employment hub for the rapidly growing residential population. The local authority, Logan City Council, is upgrading infrastructure (roads, sewer, water) in the broader locality to meet the demands of this planned future development. The Council is fully supportive of the proposed redevelopment of land within this context area.

Section 3.3.8 of the Greater Flagstone Development Scheme (**Development Scheme**) identifies expectations for protection of natural and cultural values. Requirements relevant to this ecological assessment are identified by **Inset 1**. Management obligations for remnant vegetation and koala are further defined by PDA guideline No. 17 (**Guideline 17**). These requirements are addressed in Section 6 of this report.

² Described further in Section 3.1.1.

³ The ponds are first apparent in 1990 aerial photography (Figure 5d), but contour data (Figure 4) shows that they were later expanded.

⁴ Ecological Service Professionals. 2021. North Maclean Waterway Assessment. The document can be provided upon request.

⁵ And the development which will now follow.

<ul style="list-style-type: none"> » Logan River » Flagstone Creek » Sandy Creek » Abade Creek » Oxley, Norris and Chambers Creeks, their tributaries and wetlands. <p>Development responds to the constraints of the land and delivers:</p> <ul style="list-style-type: none"> » protection of significant environmental and ecological values » protection of Remnant Endangered vegetation where proven by groundtruthing to be viable <p>» minimal emissions to land, water and atmosphere</p> <p>» protection of culturally significant places and items</p> <p>» efficient use of land and resources.</p>	<ul style="list-style-type: none"> » respects cultural heritage values » minimises adverse impacts on natural landforms and the visual amenity of the site » maintains or improves the ecological health and environmental values of surface and groundwater, including wetlands and waterways in and adjacent to the UDA » maintains and improves the functioning and characteristics of the hydrological network (including surface and groundwater) and generally maintains the natural flow regime » incorporates total water cycle management and water sensitive urban design principles to appropriately manage floodwater and stormwater » applies best industry practice erosion and sediment control techniques giving particular regard to the local dispersive soils » ensures that all land and groundwater will be fit for purpose in accordance with accepted standards and practices » manages air quality, noise and hazardous materials according to current standards » promotes innovative and efficient use of energy and water » maximises recycling opportunities and reduces waste generation. 	<p><i>Koala conservation</i></p> <p>The design, siting and layout of development:</p> <ul style="list-style-type: none"> » incorporates koala conservation and habitat protection outcomes in a way that contributes to a net increase in koala habitat and assists in the long term viability of koala populations in SEQ » avoids (to the greatest extent possible) the clearing of areas mapped as High Value Bushland on the relevant State Planning Policy 2/10: Koala Conservation in South East Queensland (SPP) Koala Habitat Values Map » caters for koala movement between conserved areas of bushland koala habitat » ensures impacts on koala habitat are offset⁵ through the delivery of a net benefit to koalas, including through the expansion of habitat on lands as suitable for rehabilitation » incorporates koala sensitive urban design. <p>Map 6 - Natural Values shows the key natural values in the UDA.</p> <p>The map is indicative only. Details of development, including greenspace, will be resolved through development applications and context planning.</p>
<p>The design, siting and layout of development:</p> <ul style="list-style-type: none"> » preserves and enhances important environment values, and respects local land forms » avoids, minimises and offsets development impacts on areas of biodiversity values and koala habitat values » maintains or improves ecological connectivity in the local urban context » incorporates landscaping with endemic species that contribute to bushland character, flora and fauna habitat, and fauna movement 		

5 Refer to the applicable ULDA guideline for koala offsets.

Inset 1 – Relevant Requirements

1.3 The Proposed Action

1.3.1 Footprint

While the entire Subject Site is identified as *Proposed Urban Development Area* and *Proposed Major Employment Area* by the ILP, the EDQ approved context plan identifies an *Indicative Future Biodiversity Corridor* in the west (**Attachment 4**).

Based on advice from 28 South Environmental, the Proponent will maintain this corridor, and a further area of land beyond the corridor in the southwest of the Subject Site. The footprint of the Proposed Action is thus limited to the eastern part of the Subject Site, which ecological assessment has shown to be the area of lowest ecological value. **Figure 4** shows:

- (i) the **development footprint** (19.22 hectares);
- (ii) land at the far eastern end of the Subject Site to be resumed by the Queensland Department of Transport and Main Roads for upgrade of the Mount Lindesay Highway (the **resumption area**); and

- (iii) the balance land to be retained as a **conservation area**. Discussions are being held with Logan City Council regarding dedication of this land to the Council as Open Space.

1.3.2 Development Form

The Context Plan's designation for the Subject Site (Industry and Business Zone) envisages Low and Medium Impact Industry, Research and Technology Industry, and some Service Industry. Extractive, High Impact, and Noxious and Hazardous industry uses are prohibited by the ILP in this zone.

The proposed use will require a flat pad landform typical of all industrial developments of this type. The lot configuration is not yet known and cannot be determined until a later stage of the project when potential end users and their requirements have been identified. This does not limit understanding of impacts, because the ecological assessment proceeds on the premise that the development footprint is completely cleared.

All external infrastructure is brought to the Subject Site through the adjoining (approved) Wearing Developments Site. Engineering design plans supporting the proposed development show a sewer alignment running along the western boundary of the Subject Site before turning to run along the (already cleared) powerline easement. This is trunk infrastructure proposed to service the broader locality and not directly associated with the Proposed Action. We are advised that the proponent of that infrastructure is assessing requirements to make a CAR.

1.3.3 Development Timeframe

The Proponent is coordinating EPBC Act and EDQ approvals concurrently and seeks to have all approvals in place by Q4 2022 with a view to commencing operational works in Q1 2023.

2.0 Methods Used to Assess the Subject Site's Ecological Values

2.1 Desktop Assessment

2.1.1 Pre-clear Vegetation and Historic Disturbance

Queensland Herbarium pre-clear regional ecosystem (**RE**) mapping shows that the Subject Site's alluvial areas historically supported RE 12.3.18 and RE 12.3.19, while the gently undulating hillslopes supported RE 12.9-10.2; RE 12.9-10.12; RE 12.9-10.7; RE 12.9-10.27 and RE 12.9-10.3 (often in a mosaic) (**Attachment 5**). A description of these RE's is provided in **Attachment 6**.

The Regulated Vegetation Management Map (**RVMM**) (**Attachment 7**) shows that the Site contains Category B (Remnant) and Category C (Regrowth) vegetation. The Regrowth mapping, which as discussed below dominates the footprint of the Proposed Action, reflects a disturbance history illustrated by the following historic aerial photography:

- The earliest available aerial photography (1948) shows the development footprint almost entirely cleared at this time. Low-lying areas in the west remained uncleared (**Figure 5a**);
- Photography from 1962 shows a similar extent of clearing but is captured at a higher resolution and more clearly illustrates a Swamp tea tree (*Melaleuca irbyana*)

community in the southwest (**Figure 5b**). This conservation-significant community is discussed in later sections of this report;

- Some regeneration is evident in the 1973 photography, but it is apparent that the eastern parts of the Subject Site remain heavily disturbed (**Figure 5c**); and
- By 1990, regrowth has become more advanced in the eastern part of the Subject Site, but the historic clearing is still apparent. Vegetation in the west remains intact, and adjoining areas are recovering well (**Figure 5d**).

The impact of historic clearing remains evident on-ground today, most notably in the form even-aged regrowth and a lack of mature and hollow-bearing trees (a function of vegetation age). This lack of tree hollows has implication for conservation-significant species that might otherwise be expected to occur at the Subject Site (e.g., Greater glider).

2.1.2 Other State-Mapped Values

The State's Koala priority area, koala habitat area and identified koala broad-hectare area map (**Koala Map**) shows that the Subject Site is located outside of the Koala Priority Area but supports core koala habitat (**Attachment 8**). At a site scale, this broad designation does not reflect significant differences in koala habitat value that occur between the areas of remnant and regrowth vegetation (refer discussion in Section 2.1.1).

The State's Matters of State Environmental Significance (**MSES**) mapping (**Attachment 9**) reflects the values identified by the RVMM and Koala mapping discussed above.

Maps supporting the Southeast Queensland Biodiversity Planning Assessment shows that the Subject Site is not part of a State or Regional biodiversity corridor (**Attachment 9**).

2.2 Assessment of Flora Values

2.2.1 Database Searches and Shortlisting for Targeted Assessment

A search of the Protected Matters Search Tool (**PMST**) reveals the potential or likely occurrence of flora MNES within a 5 km search radius of the Subject Site (**Attachment 10**). A further search of the Queensland Department of Environment and Science (**DES**) Wildlife Online database reveals confirmed records for Swamp tea-tree (*Melaleuca irbyana*) within that same search radius (**Attachment 11**). No other State-listed (Matters of State Environmental Significance - **MSES**) flora species were identified by the database search.

The occurrence of MNES flora communities can (to a large degree) be revealed by the RVMM. The PMST identifies the potential occurrence of five MNES Threatened Ecological Communities (TEC's). Preliminary assessment revealed that two of these TEC's could occur at the Subject Site:

- Coastal swamp sclerophyll forest of New South Wales and Southeast Queensland (**Swamp Sclerophyll TEC**); and
- Swamp Tea-tree (*Melaleuca irbyana*) Forest of South-east Queensland (**Swamp Tea-tree TEC**).

Individually,⁶ Swamp Tea-tree is also listed as an Endangered species under the Qld *Nature Conservation (Protected Plants Regulation) 2020*. Swamp Tea-tree is known from the Site. The remaining conservation significant flora species identified by the PMST are not known from the locality, are not provided with suitable habitat,⁷ or both.

2.2.2 Flora Survey

Flora survey was undertaken in April 2022. It involved:

- A detailed transect-based search of the Subject Site to identify the occurrence of individual Swamp Tea-tree specimens (**Figure 6**). This search was also used to determine the occurrence of other conservation significant flora;
- Collating a flora species list; and
- Ground truthing the regional ecosystem mapping, assessing vegetation condition, and defining the occurrence of the Swamp Sclerophyll TEC and Swamp Tea-tree TEC.

2.3 Assessment of Fauna Values

2.3.1 Database Searches and Shortlisting for Targeted Assessment

A search of the Protected Matters Search Tool (**PMST**) reveals the potential or likely occurrence of fauna MNES within a 5 km search radius of the Subject Site (**Attachment 10**). A further search of the Queensland Department of Environment and Science (**DES**) Wildlife Online database reveals confirmed records for the following MNES: Koala, Yellow-bellied glider, Central greater glider, and Spotted-tailed quoll. Grey-headed flying fox is not identified by the database search, but this ubiquitous species is an almost certain occurrence. Additional MSES fauna identified by the database search are: Powerful owl and Tusked frog (**Attachment 11**).

2.3.2 Targeted Survey

2.3.2.1 Methods and Timing

Fauna habitat assessment and survey was undertaken during April and May 2022 by EcoSmart Ecology. Methods and findings are described in **Attachment 12**. Data is also taken from detailed fauna survey of the adjoining Wearing Developments Project.⁸

⁶ i.e., not as an individual within a broader Swamp Tea-tree forest.

⁷ e.g., they typically occur in rainforest habitats.

⁸ Assessment completed by 28 South Environmental.

3.0 Findings of the Site Assessment

3.1 Flora Values

3.1.1 Vegetation Communities

Vegetation Community 1 – Coastal grey box (*Eucalyptus molucanna*) and Narrow-leaved ironbark (*Eucalyptus crebra*) +/- Pink bloodwood (*Corymbia intermedia*), Smooth-barked apple (*Angophora leiocarpa*) and Narrow-leaved red gum (*Eucalyptus seeana*)

This regenerating community is generally dominated by Coastal grey box (*Eucalyptus molucanna*) with a secondary occurrence of Narrow-leaved red ironbark (*Eucalyptus crebra*), but these species are replaced by Pink bloodwood (*Corymbia intermedia*) and Smooth-barked apple (*Angophora leiocarpa*) on lighter (sandier) soils. Narrow-leaved red gum (*Eucalyptus seeana*)⁹ is present, but uncommon. Typical character is illustrated by **Plates 1-3**.

The midstorey is dominated by Swamp turpentine (*Lophostemon suaveolens*) which forms dense stands in places. Other midstorey species include Red ash (*Alphitonia excelsa*), Brush-ironbark wattle (*Acacia disparrima*) and *Acacia leiocalyx*. Individual Swamp Tea-tree (*Melaleuca irbyana*) are a scattered occurrence.¹⁰ The significant gaps that remain from historic clearing are occupied by Lantana (*Lantana camara*),¹¹ which forms thickets reaching 2m in some areas.

Where the groundcover is not shaded by thickets of Lantana, it is dense and dominated by various grasses including Barbed wire grass (*Cymbopogon refractus*), *Leptochloa decipiens* and *Aristida* spp. Herbs are common and include *Chrysocephalum apiculatum*, White root (*Lobelia purpurascens*), and Star goodenia (*Goodenia rotundifolia*). Weeds include *Lantana montevidensis* and *Ageratum houstonianum*.

This regrowth community is indicative of the mosaic of regional ecosystems mapped by the pre-clear mapping, with differences arising from the surface expression of relatively 'sandier' or 'clayey' soils.

This community is a mosaic of the pre-clear regional ecosystems. Clearly assigning boundaries and polygons to each regional ecosystem is complicated by the historic disturbance.

Vegetation Community 2 – Coastal grey box (*Eucalyptus moluccana*), Narrow-leaved red ironbark (*Eucalyptus crebra*) +/- Queensland blue gum (*Eucalyptus tereticornis*)

This regenerating community occurs in the eastern broad overland flow path. The canopy is dominated by Coastal grey box and Narrow-leaved red ironbark. There is scattered occurrence of Queensland blue gum (*Eucalyptus tereticornis*).

The midstorey strata is dominated by Swamp turpentine, with secondary occurrence of Broad-leaved paperbark (*Melaleuca quinquenervia*), Narrow-leaved Tea-tree

⁹ An indicator species for the mapped RE 12.9-10.12.

¹⁰ Occurrence of the Swamp Tea-tree community and individuals is discussed in Section 3.1.2.

¹¹ A Declared Invasive Pest Plant under the Queensland *Biosecurity Act 2014*, and a Weed of National Significance (WoNS).

(*Melaleuca alternifolia*) and Snow-in-Summer (*Melaleuca linariifolia*). Swamp Tea-tree occurs patchily.

Shrubs are sparse, and include; Winter senna (*Senna pendula* var. *glabra*) and *Psyrax odorata*. In drier areas, common groundcover species include: Basket grass (*Oplismenus aemulus*), Matrush species (*Lomandra filiformis*) and Matrush species (*Lomandra longifolia*). Asparagus (*Asparagus africanus*)¹² and Common silkpod (*Parsonsia straminea*) are common vines. In wet areas, the groundcovers change to *Alternanthera denticulata*, *Lobelia stenophylla*, *Hygrophila angustifolia*, *Oldenlandia galioides*, *Eleocharis philippinensis* and *Haloragis heterophylla*.

This community is analogous to RE 12.3.19.

Community 3 – Broad-leaved paperbark (*Melaleuca quinquenervia*) open forest

The analysis of historic aerial photography in Section 2.1.1 illustrates that this community is remnant vegetation that has not been subject to broad-scale clearing. Further, disturbance occurring around its margins has regenerated well.

This community is dominated by Broad-leaved paperbark. Emergent Queensland blue occurs as widely scattered individuals, occupying the slightly more elevated areas. Common silkpod is a widespread canopy vine.

The midstorey is sparse and dominated by Broad-leaved paperbark and Swamp turpentine. Shrubs are generally absent.

Groundcovers are common and include a variety of water plants such as *Philydrum lanuginosum*, *Leersia hexandra*, *Eleocharis philippinensis*, *Nymphoides exiliflora*, *Damasonium minus*, *Triglochin multifructum*, *Eclipta platyglossa*, *Eclipta prostrata*, *Eleocharis* sp., *Cyperus* spp. and *Azolla pinnata*. Weeds include *Limnobiium laevigatum*.

This community is analogous to RE 12.3.5 rather than the mapped RE 12.3.18. The community is similar to the Swamp Sclerophyll TEC but fails a key diagnostic characteristic. It is therefore not representative of the TEC.

Vegetation Community 4 – Swamp Tea-tree (*Melaleuca irbyana*) open to closed forest

This community occupies a slightly more elevated position than Community 3. The analysis of historic aerial photography in Section 2.1.1 illustrates that this community is remnant vegetation that has not been subject to significant disturbance.

The canopy of the community is wholly dominated by Swamp Tea-tree. There is no shrub layer. The groundcover is dominated by the exotic Pink lady (*Callisia repens*), which has been able to out-compete native species in the shady (but not submerged) conditions. The native groundcover species present are scarce *Eleocharis philippinensis*, *Alternanthera denticulata* and *Cyperus* spp.

This community reflects RE 12.3.18.

¹² A Declared Invasive Pest Plant under the Queensland Biosecurity Act 2014, and a WoNS.

3.1.2 Conservation Significant Communities and Species

3.1.2.1 Swamp Sclerophyll TEC

The Commonwealth's Swamp Sclerophyll TEC Conservation Advice identifies the floristic, structural and locational requirements for the TEC. While Community 3 is analogous to the TEC floristically and structurally, the Subject Site is more than 20km from the coast.¹³ It therefore fails Criterion 1 of the key diagnostic characteristics for the TEC and is not representative of the TEC. No further consideration is required.

2.1 Key diagnostics



The key diagnostic characteristics are designed to allow identification of the ecological community irrespective of the season.

Areas of vegetation that do not meet the key diagnostics do not support the nationally listed ecological community.

The ecological community is defined as patches of native vegetation meeting the description in [Section 1](#) that meet the following key diagnostic characteristics:

- Occurs on the mainland and islands **near to the coast (within 20 km)** from South East Queensland to south-eastern NSW specifically within these IBRA Bioregions: South Eastern Queensland (SEQ); NSW North Coast (NNC); Sydney Basin (SYB) and the Bateman sub-region of the South East Corner (SEC).

3.1.2.2 Swamp Tea-tree (forest) TEC (MNES) / Swamp Tea-tree (MSES)

Regional ecosystem mapping identifies the area generally aligned to Community 3 (**Figure 7**) as RE 12.3.19 (*Eucalyptus moluccana* and/or *Eucalyptus tereticornis* and *E. crebra* open forest to woodland, with a sparse to mid-dense understorey of *Melaleuca irbyana* on alluvial plains). However, site assessment quickly established that the area was wholly dominated by a Broad-leaved paperbark (*Melaleuca quinquenervia*) forest (RE 12.3.5), which is a Least Concern regional ecosystem. **Plate 1** provides a characteristic view of Community 3.

The canopy of Community 4 is wholly dominated by Swamp tea tree. There is no shrub layer. The groundcover is dominated by the exotic Pink lady (*Callisia repens*), which has been able to out-compete native species in the shady (but not submerged) conditions. The native groundcover species present are scarce *Eleocharis philippinensis*, *Alternanthera denticulata* and *Cyperus* spp. **Plate 2** provide a characteristic view of Community 4.

The Subject Site is within the geographic range of this TEC, and the community exhibits the TEC's identified form (a dense thicket 8-12m high, with few shrubs and vines. Community 4 is the Swamp tea-tree TEC.

Communities 1 and 2 also contain Swamp Tea-tree, but the specimens occur as individual plants or as small groups comprised of multiple coppice-regrowth stems. This is likely a response to historic clearing. Nowhere do these groups form a dense thicket with a suppressed understorey characteristic of the TEC (**Figure 8**). As individuals,

¹³ The Subject Site is 33km from the coast.

these specimens are listed as Endangered under the *Nature Conservation (Protected Plants) Regulation 2020*.



Plate 1 – Community 3 (dominated by Broad-leaved paperbark (*Melaleuca quinquenervia*))



Plate 2 – Community 4 (dominated by Swamp Tea-tree (*Melaleuca irbyana*))

3.2 Fauna Values

3.2.1 General Fauna Values

General fauna values are described by the EcoSmart Ecology assessment in **Attachment 12**.

3.2.2 Conservation Significant Fauna

3.2.2.1 Assessment for the MNES Koala

The Wildlife Online database search revealed koala records in the locality (**Attachment 11**), and this species was detected on the adjoining Wearing Developments Site. Koala occurrence was considered likely on the Subject Site.

Initial assessment recorded koala scat in eastern areas (refer Figure 2 in **Attachment 12**). Four Spot Assessment Technique (**SAT**) survey sites were subsequently established to determine levels of use as prescribed by Phillips and Callaghan (2011) (**Figure 9**). Plots were restricted to the eastern portions of the Site (the development footprint) because the ground in the western portions of the Subject Site (the conservation area) was flooded. The analysis revealed a medium level of use by an East Coast Low Density koala population.

The 10 person-hours of spotlighting targeted (amongst other species), koala. Complete coverage of the Subject Site was achieved (refer 'nocturnal search' transect shown in Figure 1 of **Attachment 12**). Over the two nights of survey, koala was observed at 4 locations (Figure 2 of **Attachment 12**).

The survey results would appear to suggest that the eastern portions of the Subject Site are more significant for koala than the western portions, but consideration must also be given to an inability to conduct effective scat survey in the Swamp sclerophyll community at the time of survey,¹⁴ and the likelihood of this community being used by koala in normal years given the occurrence of the primary koala habitat tree, Queensland blue gum in this area.

Impact to Koala have been considered further against the Significant Impact Guidelines (Section 5.2).

3.2.2.2 Assessment for the MNES Grey-headed flying fox

The wildlife online database search fails to identify Grey-headed flying fox records within a 5km radius of the Subject Site, but this ubiquitous species is considered a certain occurrence at the Subject Site. Figure 3 of the EcoSmart assessment (**Attachment 12**) shows that there are no flying fox roosts at the Subject Site, and this has been confirmed by site assessment.¹⁵

The analysis of historic aerial photography is important for determining Grey-headed flying fox forage habitat values. Areas providing a continuum of blossom resource, and in particular winter blossoms, are of importance for this species. However, vegetation maturity is also an important consideration, as more mature trees produce a greater abundance of blossom. The Subject Site's disturbance history is therefore an important consideration. As discussed in Section 2.1.1, the eastern portions of the Subject Site

¹⁴ South East Queensland has experienced well above average rainfall over Summer-Autumn 2022.

¹⁵ Flying fox roosts are typically raucous, easily detected features. It would be highly unusual for such a feature to be missed.

have been completely cleared, and while they are now regenerating, the vegetation is fragmented and comprised of mid-mature trees (40-50 years of age). This suggests vegetation of moderate (rather than high) forage value.

Impacts to Grey-headed flying fox have been considered further against the Significant Impact Guidelines (Section 5.3).

3.2.2.3 Assessment for the MNES Spotted-tailed quoll

The Wildlife Online database search reveals one record for Spotted-tailed quoll within a 5km radius of the Subject Site (**Attachment 11**). Community interest in regard to the species saw a targeted Spotted-tailed quoll survey completed on the adjoining Wearing Developments Site. Despite considerable effort (exceeding the DAWE assessment guidelines), Spotted-tailed quoll was not by this recorded (**Attachment 13**). Nor has it been recorded by a considerable number of other ecological surveys supporting development applications in the Greater Flagstone PDA. Camera traps were deployed to detect Spotted-tailed quoll (refer description in **Attachment 12**), but it was not detected. Spotted-tailed quoll is considered a highly unlikely occurrence and is not assessed further.

3.2.2.5 Assessment for the MNES Greater glider & Yellow-bellied glider

The wildlife online database search revealed one record of each species within a 5km radius of the Subject Site (**Attachment 11**). Historically, the Subject Site and surrounding landscape is likely to have provided habitat for both, but significant clearing and habitat fragmentation has caused a significant decline in values. Most critical in this regard is forest age, particularly in the east where development is proposed. As discussed in Section 2.1.1 this area has been completely cleared and is regenerating regrowth without suitable tree hollows. Swamp sclerophyll forest in the west is a community with a typically low abundance of hollows, again suggesting unsuitable habitat for these species. Neither species is considered likely to occur, and they are not assessed further.

3.2.2.6 Assessment for the MSES Powerful owl

The Wildlife Online database search reveals two records of Powerful owl within a 5km radius of the Subject Site (**Attachment 11**). A lack of hollow bearing trees over the eastern portions of the Subject Site (the development footprint) restricts the value of this area as nesting habitat for Powerful owl. Riparian vegetation could be used for roosting, with Community 3 (Swamp Sclerophyll Forest) being the most important habitat in this regard. The Subject Site's regrowth forest does not provide suitable tree hollows for hollow-dependent prey species of Powerful owl (e.g., Greater glider), but more common prey species such as Common ringtail possum, Common brushtail possum, and Flying foxes were either recorded or are considered likely to occur. In this regard, the Subject Site is likely to provide forage habitat for Powerful owl.

3.2.2.7 Assessment for the MSES Tusked frog

The Wildlife Online database search reveals one record of Tusked frog within a 5km radius of the Subject Site (**Attachment 11**). While not recorded by surveys, the Subject Site's habitats are suitable, particularly the Swamp sclerophyll Forest in the west, and this species is considered a probable occurrence.

3.2.3 Habitat Connectivity

3.2.3.1 Regional Scale Corridors

Large contiguous areas of habitat to the west and north of the Subject Site are associated with the regionally significant Flinders-Karawatha Corridor. The corridor is the “the largest remaining continuous stretch of open eucalypt forest in Southeast Queensland and a significant landscape feature for the region. The corridor is about 56350 hectares in size and about 60km long” (DEHP 2015). Maintenance of Flinders-Karawatha Corridor has been considered in the broadscale planning defining the bounds of the GFPDA

3.2.3.2 Sub-regional and Local Corridors

Figure 10 shows the Southeast Queensland Biodiversity Planning Assessment (BPA) bioregional corridors layer. As shown, the Subject Site is not within a defined corridor. Mapping of remnant and regrowth vegetation on the RVMM illustrates landscape connections at a finer scale (local connections).

The mapping clearly illustrates that there is no habitat connection beyond the Subject Site’s eastern boundary, where the Mount Lindesay Highway creates a significant barrier to movement, and where the highway upgrade has made no provision for fauna crossing structures. The mapping suggests a north-south habitat connection in the west, which is also reflected in the PDA Context Map (**Attachment 4**).

4.0 Impact Mitigation Hierarchy

4.1 Avoiding Impacts

The Subject Site’s disturbance history and ecological context were important considerations in defining the development footprint, which was identified to the Proponent by 28 South Environmental after ecological due diligence assessment.

The eastern portions of the Subject Site have been cleared,¹⁶ and while now appearing well-vegetated, lack important elements of more mature forest such as large hollow bearing trees. There are consequential outcomes for MNES¹⁷ and MSES¹⁸ dependent on such features, and the lack of forest ‘maturity’ also reduces blossom productivity for MNES such as Grey-headed flying fox.

The historic analysis found that the western portions of the Subject Site have not been historically disturbed or have subject to less significant disturbance than areas in the east. These western portions of the also support Swamp Tea-tree TEC (**Figure 8**). Swamp Tea-tree also occurs in the development footprint, but here is not representative of the Swamp Tea-tree TEC.

Contextually, the eastern portions of the Site are bound by approved development areas on the Wearing Developments Site to the north, and highly disturbed areas associated with the former aquaculture ponds (now soil stockpile area) to the south. Approvals are in place for the Wearing Developments Site, and there does not appear to be significant constraint to development of the soil stockpile site.

¹⁶ Refer analysis in Section 2.1.1.

¹⁷ Greater glider and Yellow-bellied glider.

¹⁸ Powerful owl.

This eastern part of the Site does not facilitate movement any further to the east because the Mount Lindesay highway creates a significant barrier to movement further east, and recent upgrades have not included fauna movement infrastructure to allow for such movement. This reflects a lack of connective habitat east of the highway.

In contrast, the western portions of the Site are adjoined to the north and west by land identified on the EDQ approved context plan as '*Biodiversity Corridor*'. The western portion of the site itself is identified as '*Indicative Future Biodiversity Corridor*'. The southwestern part of the Site lies beyond the '*Indicative Future Biodiversity Corridor*' and Swamp Sclerophyll TEC, but is almost wholly comprised of the Swamp Tea-tree TEC.

4.2 Mitigation

4.2.1 Limiting the Extent of Works and Managing Edge Effects

The flat pad landform required to construct the Proposed Action is typical of all industrial developments of this type. It requires the land to be re-shaped, precluding vegetation retention in a way that can occur with other forms of development configured at finer scale and allowing for more nimble design (e.g., residential development). The focus for mitigation will thus be at the edges, and particularly on the western edge, where development will adjoin retained areas of swamp sclerophyll forest.¹⁹ In this regard, the Proponent is considering the following possible mitigation strategies for the detailed design phase:

- (i) If possible, using a retaining wall to define the western edge of the development footprint. If implemented, this will establish a sharp (and clear) demarcation between the development area and conservation area;
- (ii) If possible, using the western edge of the development footprint to accommodate uses that establish a transition between the urban area (buildings etc) and conservation area. For example, stormwater basins. Such a configuration would offer the following advantages:
 - (a) There is no need to establish further cleared buffers in the retained vegetation to provide bushfire protection for buildings, as setbacks/buffers are provided for by the transition area;
 - (b) This configuration would establish a better management interface, insofar that materials cannot be discarded over back fences directly into the conservation area, and the potential for pollution impacts from spills etc. is reduced by the greater physical separation between the areas;
 - (c) The physical separation could reduce other common edge effects such as light spill and the impact of noise and activity; and
 - (d) The naturalistic edge can make some contribution to the movement of mobile species.

4.2.2 Stormwater Management Plan

The conceptual stormwater management plan is provided in **Technical Attachment 1**.

¹⁹ But not representative of the Swamp Sclerophyll TEC.

4.2.3 Management of the Conservation Area

Future ownership of the Conservation Area is matter under assessment, but the area will be subject to a comprehensive weed management and infill planting program. Weed management in and around the Swamp Tea-tree TEC is an important consideration.

4.3 Translocation of Swamp Tea-tree

The development footprint contains individual specimens and multi-stemmed (likely coppicing) individual regenerating Swamp Tea-tree (**Figure 8**). The Proponent will seek approval from the State (Department of Environment and Science) to translocate these specimens to the conservation area where possible, and otherwise to the offset site discussed in Section 4.4. The Proponent has engaged with (and will engage) Dr. Andrew Benwell to assist with preparing a detailed translocation strategy. The starting point will be to confirm the identify of multi-stemmed plants (i.e., multi-stemmed individuals or separate plants). Dr Benwell successfully coordinated a translocation strategy for *M. irbyana* on the Pacific Highway upgrade in northern NSW, and is an author of the Guidelines for the Translocation of Threatened Plants in Australia (3rd Edition).²⁰

4.4 Offsets

While offsets cannot be contemplated by the Commonwealth at the CAR assessment stage, the offset site and broad strategy is identified here to indicate the Proponent's 'advanced thinking' on this issue. It also provides context for the proposed Swamp tea-tree translocation.

The offset site, which has already been secured by the Proponent under a Heads of Agreement, is located at Ebenezer, approximately 38km to the west of the Subject Site (**Figure 11**). The locality of the offset site supports a strong population of Swamp-tea tree (**Attachment 14**) and Swamp Tea-tree specimens are located on the offset site and nearby.

The offset site adjoins an existing offset approved by the Commonwealth in December 2021.²¹ Submissions to the Commonwealth identified the ecological value of this (now approved) offset as follows:

The offset site occupies a strategically important position between the two largest patches of remnant Queensland blue gum woodland (a regionally threatened plant ecosystem) within a 50km radius. The offset incorporates one of these patches and will improve its ecological condition. Rehabilitation of land to the east will consolidate and enlarge the patch and improve connections along the Bremer River to a further large blue gum patch near Amberly Air Base. If approved, this offset will be the catalyst for further offsets in this locality that cumulatively establish the largest patch of Queensland blue gum in Southeast Queensland (~1,000 hectares).

Work has commenced on the existing offset. The proposed offset is located to the immediate east (**Figure 12**). Like the approved offset, the proposed offset will continue to focus on establishing Queensland blue gum woodland (RE 12.3.3) across the floodplain; enhancing the naturally occurring floodplain wetlands (RE 12.3.8); consolidating riparian vegetation on the Bremer River (RE 12.3.7). and establishing narrow-leaved red ironbark/Queensland blue gum

²⁰ https://www.nespthreatenedspecies.edu.au/media/bsagrlmy/translocation-guidelines_v9newer.pdf

²¹ Referral No. 2013/6941. Offset management plan prepared by 28 South Environmental.

forest (RE 12.9-10.7) on foot slopes. Translocation efforts will focus on establishing the Swamp Tea-tree TEC at the offset site.

5.0 Assessment Against Significant Impact Guideline 1.1 for the MNES of Interest

5.1 Swamp Tea-tree TEC

5.1.1 Avoidance and Mitigation

The Swamp Tea-tree TEC is restricted to the southwestern corner of the Site (**Figure 7**) and is well-removed from direct impact. Section 2.4.1 describes how other indirect impacts will be mitigated. The conceptual stormwater management plan (**Technical Attachment 1**) describes how stormwater discharged from the Proposed Action will be managed to avoid impact on the wetland habitats to be retained (of which the Swamp Tea-tree TEC is a component).

5.1.2 Criterion 1 – Reduce the extent of an Ecological community

The Proposed Action will retain the full extent of the Swamp Tea-tree TEC. There will be no reduction in its extent.

5.1.3 Criterion 2 – Cause or Increase Fragmentation

The Proposed Action will retain the full extent of the Swamp Tea-tree TEC. It will not cause fragmentation of the TEC.

5.1.4 Criterion 3 – Adversely Affect Habitat Critical to the Survival of the TEC

The footprint of the Proposed Action is well-removed from the Swamp Tea-tree TEC, and indirect impacts will be managed as discussed in Section 4.2. Weed management and buffer planting around the Swamp Tea-tree TEC is an important consideration.

5.1.5 Criterion 4 – Modify or Destroy Abiotic Factors

Changes to water quality²² and hydrological conditions²³ in the wetland could affect the Swamp Tea-tree TEC. The Stormwater Management Plan (**Technical Attachment 1**) outlines how the potential for such abiotic impacts will be managed.

5.1.6 Criterion 5 – Cause a Substantial Change in the Species Composition

The Swamp Tea-tree TEC is well removed from the development footprint and will not bring about any direct change to species composition through (for example) underscrubbing for bushfire management. Changes to abiotic conditions (refer Section 5.1.5) could increase the prevalence of weeds, but as described in Section 2.2., the understorey is already heavily weed infested. Management is required to improve ecological condition (refer Section 4.2.3).

5.1.7 Criterion 6 – Cause a Substantial Change in Quality or Integrity

²² e.g., increased nutrients or sediment loads.

²³ e.g., changes to the level or duration of ponding.

The Proposed Action will not cause a substantial change in the quality or integrity to the TEC, because development is well-removed from (and will not directly impact) the TEC. Secondary impacts will be managed.

5.1.8 Criterion 7 – Interfere with the Recovery of the Ecological Community

The Proposed Action will not cause direct or indirect impacts to the Swamp tea tree TEC and will not interfere with its recovery.

5.1.9 Is there a Significant Impact

It is unlikely that the Proposed Action will give rise to a Significant Impact on the Swamp Tea-tree TEC, but the Proponent will provide further detail on impact mitigation measures in the Preliminary Documentation Report.²⁴

5.2 Koala

5.3.1 Avoidance and Mitigation

The Koala is a leaf-eating specialist that feeds primarily during dawn, dusk or night. Its diet is restricted mainly to foliage of *Eucalyptus* spp; however, it may also consume foliage of related genera, including *Corymbia* spp., *Angophora* spp. and *Lophostemon* spp. The koala may, at times, supplement its diet with other species, including *Leptospermum* spp. and *Melaleuca* spp. While across Australia koalas have been observed sitting in or eating up to 120 species of eucalypt, the diet of individual koalas is usually limited to obtaining most of their nutrition from one or a few species present at a site. Species-level preferences may also vary between regions or seasons. Consequently, assessment of habitat quality for koalas is usually based on the identification of local preferences for species and quantification of the availability of those species.

Koalas show strong preferences between individual trees within species. Experiments show that the chemical anti-feedants may limit or prevent Koalas feeding on foliage of individual trees even when the species is considered preferred. This variability creates a nutritional patchiness such that species-based assessments of habitat likely result in overestimates of the availability of high-quality habitat and food trees.

The Proposed Action will cause loss of 19.22 hectares of variable quality habitat that can be defined as habitat critical to the survival of koala. 15.76 hectares will be retained (Figure 13). Section 4.2 describes mitigation.

5.3.2 Is there a Significant Impact

The Proponent accepts that consideration against the Significant Impact Guidelines illustrates that the Proposed Action will give rise to a Significant Impact on Koala and will require further assessment and approval under the Act. In summary:

- The Proposed Action will cause loss of habitat occupied by koala. This impact will be addressed though through the proposed offset, which was assessed and considered acceptable for the adjoining Wearing Development's Project.
- The Proposed Action has been configured to establish a consolidated development area, and consolidated conservation area with links to the

²⁴ Noting that the Proponent will proactively identify Significant Impacts in relation to other MNES.

broader landscape²⁵ (**Figure 10**). Development in the Site's east will not compromise koala movement elsewhere, because: land to the north has a development approval; land to the south is degraded and unlikely to establish a development constraint; and the Mt Lindesay Highway to the east establishes a barrier to movement, and the land which lies beyond in any case does not provide significant habitat for koala.

5.3 Grey-headed Flying-Fox

5.3.1 Avoidance and Mitigation

The grey-headed flying-fox occupies the coastal lowlands and slopes of southeastern Australia from Bundaberg to Geelong. It is usually found at altitudes < 200 m. Areas of repeated occupation extend inland to the tablelands and western slopes in northern New South Wales and the tablelands in southern Queensland.

The grey-headed flying-fox requires a continuous sequence of productive foraging habitats, the migration corridors or stopover habitats that link them, and suitable roosting habitat within nightly commuting distance of foraging areas. Areas with these characteristics are habitat critical to the survival of the grey-headed flying fox. On the basis of current knowledge, foraging habitat that meets at least one of the following criteria can be explicitly identified as habitat critical to survival, or essential habitat, for grey headed flying-foxes. Natural foraging habitat that is:

- productive during winter and spring when food bottlenecks have been identified;
- known to support populations of > 30,000 individuals within an area of 50 km radius (the maximum foraging distance of an adult);
- productive during the final weeks of gestation, and during the weeks of birth, lactation and conception (September to May);
- productive during the final stages of fruit development and ripening in commercial crops affected by grey-headed flying-foxes (months vary between regions); and
- known to support a continuously occupied camp.

Grey-headed flying-fox roosts in large aggregations in the exposed branches of canopy trees. The locations of camps are generally stable through time, and several sites have documented histories that exceed 100 years. Camps provide resting habitat, sites of social interactions and refuge for animals during significant phases of their annual cycle, such as birth, lactation and conception. On the basis of current knowledge, roosting habitat that meets at least one of the following criteria can be explicitly identified as habitat critical to survival, or essential habitat, for grey-headed flying-foxes. Roosting habitat that:

- is used as a camp either continuously or seasonally in > 50% of years;
- has been used as a camp at least once in 10 years (beginning in 1995) and is known to have contained > 10,000 individuals, unless such habitat has been

²⁵ Considering vegetation likely to be retained in the adjoining landscape, and development expectations identified by the GFPDA.

used only as a temporary refuge, and the use has been of limited duration (i.e. in the order of days rather than weeks or months); and

- has been used as a camp at least once in 10 years (beginning in 1995) and is known to have contained > 2,500 individuals, including reproductive females during the final stages of pregnancy, during lactation, or during the period of conception (i.e. September to May).

Survey has determined that the Site and adjoining areas do not support a roost site for grey-headed flying-fox. Grey-headed flying fox has not been detected by Site survey but was recorded on the adjoining Wearing Developments Site and is considered a likely occurrence on the Subject Site, where the blossoming sclerophyll vegetation will provide forage habitat.

The Proposed Action has been configured to impact regenerating regrowth vegetation in the Site's east and largely retain the remnant vegetation in the Site's west, which also contributes to local habitat corridors (**Figure 10**).

5.3.2 Is there a Significant Impact

The Proponent accepts that consideration against the Significant Impact Guidelines illustrates that the Proposed Action will give rise to a Significant Impact on Grey-headed flying fox and that further assessment and approval under the Act will be required. The impact arises from loss of 19.22 hectares of forage variable quality forage habitat (**Figure 13**). Importantly, there is no impact to roosting habitat.

5.4 White-throated Needletail (Threatened Species Criteria)

5.4.1 Avoidance and Mitigation

The Conservation Advice for white-throated needletail notes that, in Australia, the white-throated needletail is mostly aerial, from heights of less than 1 m up to more than 1,000 m above the ground (Coventry 1989; Tarburton 1993). Although they occur over most types of habitat, they are recorded most often above wooded areas, including open forest and rainforest, and may also fly below the canopy between trees or in clearings (Higgins 1999).

When flying above farmland, they are more often recorded above partly cleared pasture, plantations or remnant vegetation at the edge of paddocks (Emison & Porter 1978; Friend 1982; Tarburton 1993). In coastal areas, they have been observed flying over sandy beaches or mudflats (Cooper 1971; Crompton 1936; Davis 1965), and often around coastal cliffs and other areas with prominent updraughts, such as ridges and sand-dunes (Cooper 1971; Dawson et al. 1991; Lyon 1980; Mitchell et al. 1996; Schulz & Kristensen 1994).

The Site does not provide important habitat for white-throated needletail, as follows:

- The Conservation Advice for white-throated needletail indicates that this primarily aerial species is widespread in eastern and southeastern Australia. The region in which the Site occurs does not support an ecologically significant proportion of the species population.
- White-throated needletail is a non-breeding migrant to Australia, and so the important reproductive stage of the species lifecycle will not be affected by the proposed action.

- White-throated needletail is a widespread species in eastern and southeastern Australia. The Site is not at the limit of the species range.
- White-throated needletail is not known to be declining in the region the Site is located.

5.4.2 Criterion 1 – Lead to a Long-term Decrease in the Size of the Population

White-throated needletail is an aerial species that occupies very large home ranges containing a wide variety of habitats. The Proposed Action will affect 19.22 of vegetation that could provide habitat for this species, but the Site will only be a component of a much larger ranging area. Marginal reductions in population size might be expected.

5.4.3 Criterion 2 – Reduce the Area of Occupancy

Clearing associated with the Proposed Action will remove habitat for this species, but habitat will be retained in adjoining areas. White-throated needletail will continue to occupy the locality, but the clearing will reduce its productivity.

5.4.4 Criterion 3 – Fragment an Existing Important Population

White-throated needletail is an aerial species that traverses large areas and a wide range of habitats. The small area (in landscape terms) of habitat to be affected by the proposed works will not cause habitat fragmentation.

5.4.5 Criterion 4 – Adversely Affect Habitat Critical to Survival

Refer response to Criterion 1.

5.4.6 Criterion 5 – Disrupt the Breeding Cycle of an Important Population

White-throated needletail is a non-breeding migrant to Australia. The breeding cycle of this species will not be disrupted.

5.4.7 Criterion 6 – Modify etc. Habitat Leading to Species Decline

Clearing associated with the Proposed Action will cause a marginal decline in the habitat values of the area for White-throated needletail. The extent of impact is highly unlikely to cause any meaningful decline for the species.

5.4.8 Criterion 7 – Result in Invasive Species Becoming Established

The Proposed Action is unlikely to cause establishment of native species that would cause the decline of White-throated needletail in this locality.

5.4.9 Criterion 8 – Introduce Disease

The Proposed Action will not introduce disease to White-throated needletail.

5.4.10 Criterion 9 – Interfere Substantially with Recovery

While the Proposed Action will remove habitat for this species, the extent of habitat affected is small in context of the species' range. This loss will not substantially interfere with the recovery of White-throated needletail.

5.4.11 Is there a Significant Impact

No, the Proposed Action will not give rise to a Significant Impact on White-throated needletail. The offset works proposed for other species will have beneficial impacts.

5.5 White-throated needletail (migratory species criteria)

5.5.1 Criterion 1 – Substantially Modify an Area of Important habitat

Section 5.5.1 has established that the Site does not provide important habitat for white-throated needletail.

5.5.2 Criterion 2 – Result in Establishment of an Invasive Species

The Proposed Action is unlikely to cause establishment of native species that would cause the decline of White-throated needletail in this locality.

5.5.3 Criterion 3 – Disrupts the Lifecycle

White-throated needletail is a non-breeding migrant to Australia, and so the important reproductive stage of the species lifecycle will not be affected by the proposed works. There will be no significant impact on the species life cycle.

5.5.4 Is there a Significant Impact

No, the Proposed Action will not give rise to a Significant Impact on White-throated needletail. The offset works proposed for other species will have beneficial impacts.

5.6 Fork-tailed Swift (migratory species criteria)

5.6.1 Avoidance and Mitigation

The Conservation Advice for fork-tailed swift notes as follows: The fork-tailed swift is a non-breeding visitor to all states and territories of Australia. In Australia, they mostly occur over inland plains but sometimes above foothills or in coastal areas. They often occur over cliffs and beaches and also over islands and sometimes well out to sea. They also occur over settled areas, including towns, urban areas and cities. They mostly occur over dry or open habitats, including riparian woodland and tea-tree swamps, low scrub, heathland or saltmarsh. They are also found at treeless grassland and sandplains covered with spinifex, open farmland and inland and coastal sand-dunes. They sometimes occur above rainforests, wet sclerophyll forest or open forest or plantations of pines (Higgins 1999).

They forage aerially, up to hundreds of metres above ground, but also less than 1 m above open areas or over water. They often occur in areas of updraughts, especially around cliffs. They are said to search along edges of low-pressure systems, which assist flight. Low-flying swifts are said to be precursors of unsettled weather, possibly because insect prey fly at a lower altitude when the air is humid and when the air density is low (Cameron 1952). They sometimes feed aerially among tree-tops in open forest (Higgins 1999).

They probably roost aerially but are occasionally observed to land (Higgins 1999). They were once recorded roosting in trees, using a bare exposed branch emergent above the foliage (Newell 1930). Sometimes they loaf in the air, by allowing strong winds to support them (Boehm 1939). There have been rare records of loafing elsewhere including swifts briefly resting on ground (Campbell 1900) and alighting on wire netting

of a tennis court (Wheeler 1959). Once, one was seen attempting to land on the wall of a lighthouse (Scarff 1990).

The Site does not provide important habitat for fork-tailed swift, as follows:

- The Conservation Advice for fork-tailed swift indicates that this primarily aerial species. The region in which the Site occurs does not support an ecologically significant proportion of the species' population.
- Fork-tailed swift is a non-breeding migrant to Australia, and so the important reproductive stage of the species lifecycle will not be affected by the proposed action. There will be no significant impact on this part of the species life cycle.
- Fork-tailed swift is a widespread species in eastern and southeastern Australia. The Site is not at the limit of the species range.
- Fork-tailed swift is not known to be declining in the region the Site is located.

5.6.2 Criterion 1 – Substantially Modify an Area of Important Habitat

Section 5.6.1 has established that the Site does not provide important habitat for white-throated needletail.

5.6.3 Criterion 2 – Result in Establishment of an Invasive Species

The Proposed Action is unlikely to cause establishment of native species that would cause the decline of Fork-tailed swift in this locality.

5.6.4 Criterion 3 – Disrupts the Lifecycle

Fork-tailed swift is a non-breeding migrant to Australia, and so the important reproductive stage of the species lifecycle will not be affected by the proposed works. There will be no significant impact on the species life cycle.

5.6.5 Is there a Significant Impact

No, the Proposed Action will not give rise to a Significant Impact on White-throated needletail. The offset works proposed for other species will have beneficial impacts.

6.0 Impacts to other MSES Fauna

6.1 Powerful owl

The disturbance history of the Subject Site is described in Section 2.2.1. As noted, the development footprint has been almost completely cleared and now lacks hollow bearing trees of suitable size to provide breeding habitat. Targeted surveys failed to detect use of the Site by Powerful owl, but it is known from the locality, and the Site would support prey species such as Common ringtail possum, flying foxes and small glider species.²⁶ It is likely the Subject Site provides occasional forage habitat for Powerful owl. 19.22 of variable quality habitat will be removed. 15.76 hectares will be retained. While sufficient habitat is retained to ensure persistence of this species in the

²⁶ As noted elsewhere in this report, Central greater glider is considered an unlikely occurrence.

locality, and Powerful owl can adapt to urban settings, there is an impact that will be beneficially addressed by the proposed offset.

6.2 Tusked frog

Tusked frog was not recorded by surveys but is considered a probable occurrence in Community 3 (Swamp sclerophyll forest). Much of this habitat is to be retained (**Figure 13**). The conceptual stormwater management plan (**Technical Attachment 1**) how stormwater is to be managed in this area.

7.0 PDA Development Scheme Requirements

7.1 Synopsis

Section 3.3.8 of the development scheme identifies matters relevant to this assessment (**Inset 1**).

7.2 Development Responds to the Constraints of the Land

7.1.1 By protecting significant environmental and ecological values

Refer discussion in Section 4 (Impact Mitigation Hierarchy).

7.1.2 By protecting viable remnant endangered vegetation

The Vegetation Management Supporting Map shows that the Subject Site supports three areas of endangered remnant vegetation (**Inset 1**). The mapped patch in the west is largely comprised of RE 12.3.19, but as described in Section 3.1.2 it is instead dominated by Broad-leaved paperbark analogous to the Least Concern RE 12.3.5. Areas in the south of the patch are analogous to RE 12.3.18 (endangered), but these areas are well-removed from the development footprint. No further assessment is required.



Inset 1 – Mapped Remnant Endangered Vegetation

In the centre of the development footprint is an 0.4-hectare remnant area that is a mosaic of the Least Concern RE 12.9-10.2 (50%); Endangered 12.9-10.12 (30%) and Of Concern RE 12.9-10.7 (20%). Schedule 1 of PDA Guideline 17 defines non-viable remnant area. It is not clear whether some (or all) of the criteria must be met to satisfy the 'non-viable' test, but notable considerations are:

- It is less than 5 ha;
- It is surrounded by regrowth communities;
- It is not associated with a watercourse;
- It is not within any of the defined corridors; and
- It will become isolated by surrounding landuse (i.e., adjoining unconstrained land);

A 2.1-hectare patch of remnant RE 12.3.19 occurs in the east of the development footprint. Regarding the non-viable criteria, the patch is:

- Less than 5ha;
- Associated with a watercourse;
- It is not within any of the defined corridors; and
- It will become isolated by surrounding landuse (i.e., adjoining unconstrained land);

In the course of negotiations for the Wearing Developments Project, EDQ allowed the applicant for that project to address loss of remnant patches through offsets. The Proponent's offset area identified to address impacts to MNES is discussed in Section 4.4. MSES (EDQ) offsets can be acquitted at the same site.

7.3 Design Siting and Layout

7.2.1 Preserves and enhances important environmental values

Refer discussion in Section 4 (Impact Mitigation Hierarchy).

7.2.2 Avoids minimises and offsets development impacts

Refer discussion in Section 4 (Impact Mitigation Hierarchy).

7.2.3 Local urban context connectivity

Refer Section 3.2.3.2

7.4 Maintains or improves the health of waters

The development footprint largely maintains the paperbark wetland in the Site's west. Stormwater is managed as per Conceptual Stormwater Management Plan (**Technical Attachment 1**). The overland flow path in the east will be removed, but it is only a short

section of natural waterway between approved development to the north,²⁷ and the former aquaculture ponds/soil stockpile site to the south (**Figure 4**).

7.5 Koala conservation

7.5.1 Offsets / Net gain in koala habitat

The Proposed Action's impact to koala is also being addressed under the EPBC Act. As identified in Section 5.2 of this report, the Proponent accepts that the development will give rise to a Significant Impact on koala and will require further assessment and approval under the EPBC Act. A natural consequence of this assessment process is the Proponent's obligation to balance development impacts through provision of offsets. The Proponent is well-advanced with offset site investigations and planning. Further discussion is provided in Section 4.4.

7.5.2 Habitat Connectivity

Section 3.2.3 of this report discusses habitat connectivity.

²⁷ Where flows are directed to the stormwater system.

8.0 Summary and Conclusion

This ecological assessment report has been prepared in relation to the proposed development of land at North Maclean, in the Greater Flagstone Priority Development Area. The land is defined as a Proposed Urban Development Area, and more specifically as a Proposed Major Employment Area with an Industry and Business zoning. The Proponent seeks to establish development consistent with the landuse designation.

The land is well-vegetated, but closer inspection reveals historic disturbance. Historic aerial photography show that the eastern parts of the Site have been completely cleared and have only regenerated to their present state since the late 1970's. The western parts of the Site have suffered significantly less disturbance, a factor that can be likely attributed to the occurrence of paperbark wetlands. This pattern of disturbance has informed the Proponent's footprint, insofar that development is restricted to the generally more disturbed areas, while the generally more intact areas are retained in a conservation area.

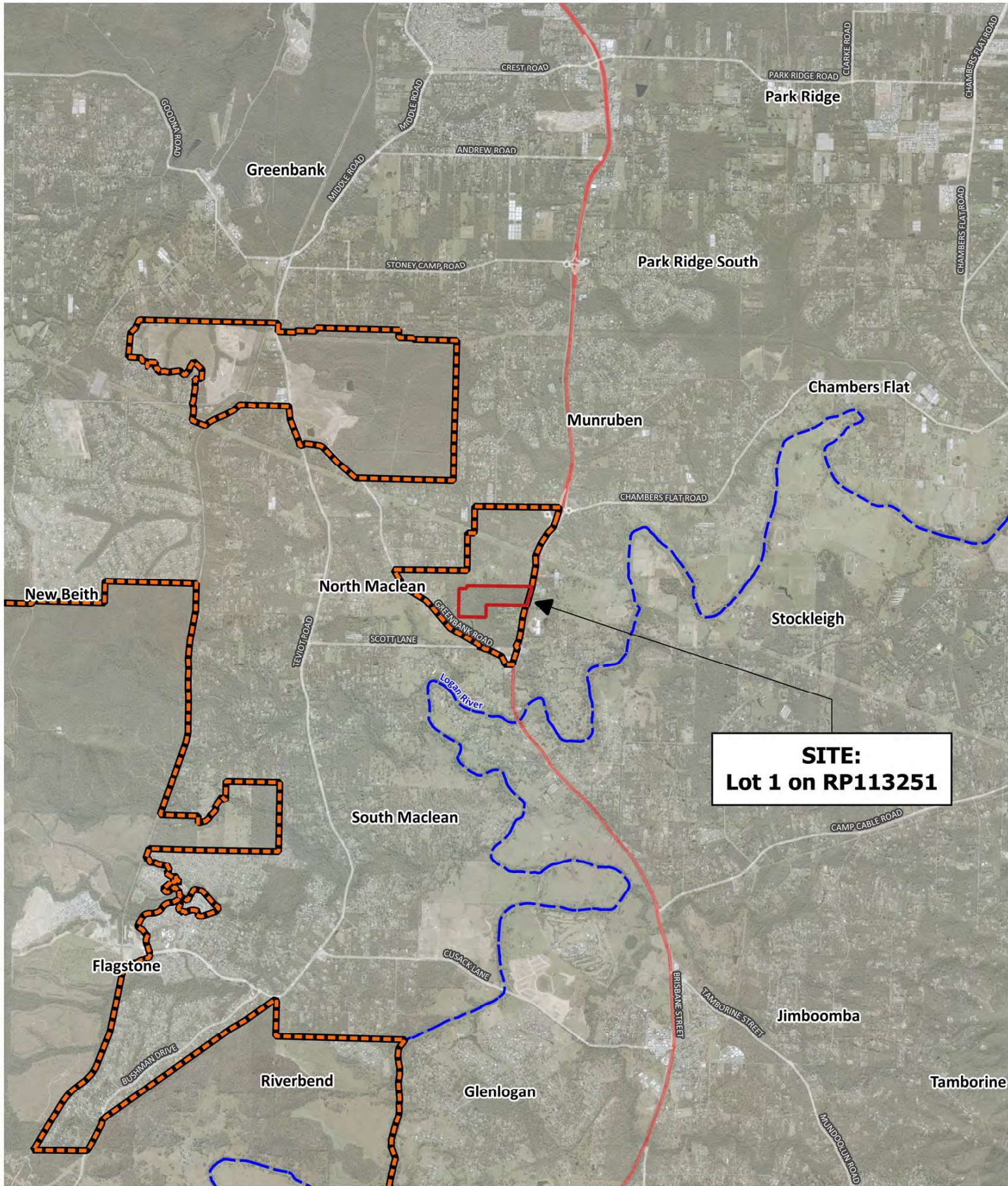
Ecological assessment has determined that the Site supports communities and species of conservation significance. Their occurrence and relationship to the development is as follows:

- The Swamp Tea-tree threatened ecological community, a Matter of National Environmental Significance. This community is restricted to the southwestern corner of the Site and is well-removed from direct development impacts. There is potential for indirect impacts, but these can be reasonable managed;
- Koala, a Matter of National Environmental Significance. Koala is known from the adjoining landscape and was expected to occur at the Site. The development footprint will remove 19.22 of variable quality habitat for koala. This will give rise to a Significant Impact on koala, in turn requiring further assessment and approval under the Environment Protection and Biodiversity Act. A natural consequence of this assessment process is the Proponent's obligation to balance development impacts through provision of offsets. The Proponent is well-advanced with offset planning and secured an offset site;
- Grey-headed flying fox, a Matter of National Environmental Significance. The development footprint will remove 19.22 of variable quality habitat for Grey-headed flying fox, giving rise to a Significant Impact and also requiring further assessment and approval under the EPBC Act. Offset provided for koala will also benefit Grey-headed flying fox; and
- Swamp Tea-tree (*Melaleuca irbyana*), which as an individual is afforded protected as an Endangered Species under the *Nature Conservation (Protected Plants) Regulation 2020*. Specimens occur as individuals and coppicing clumps in parts of the development footprint. These plants will be impacted by the Proposed Action. The Proponent will be seeking approval from the State regulator to translocate these plants on-site where possible, and otherwise to the proposed offset site. The Proponent has engaged a recognised expert with a track record in successful translocation of this species and will be preparing a translocation management strategy to support the application.

This ecological assessment report provides information on these MNES, and others known from the locality, and supports a Controlled Action Referral to the Commonwealth Regulator.

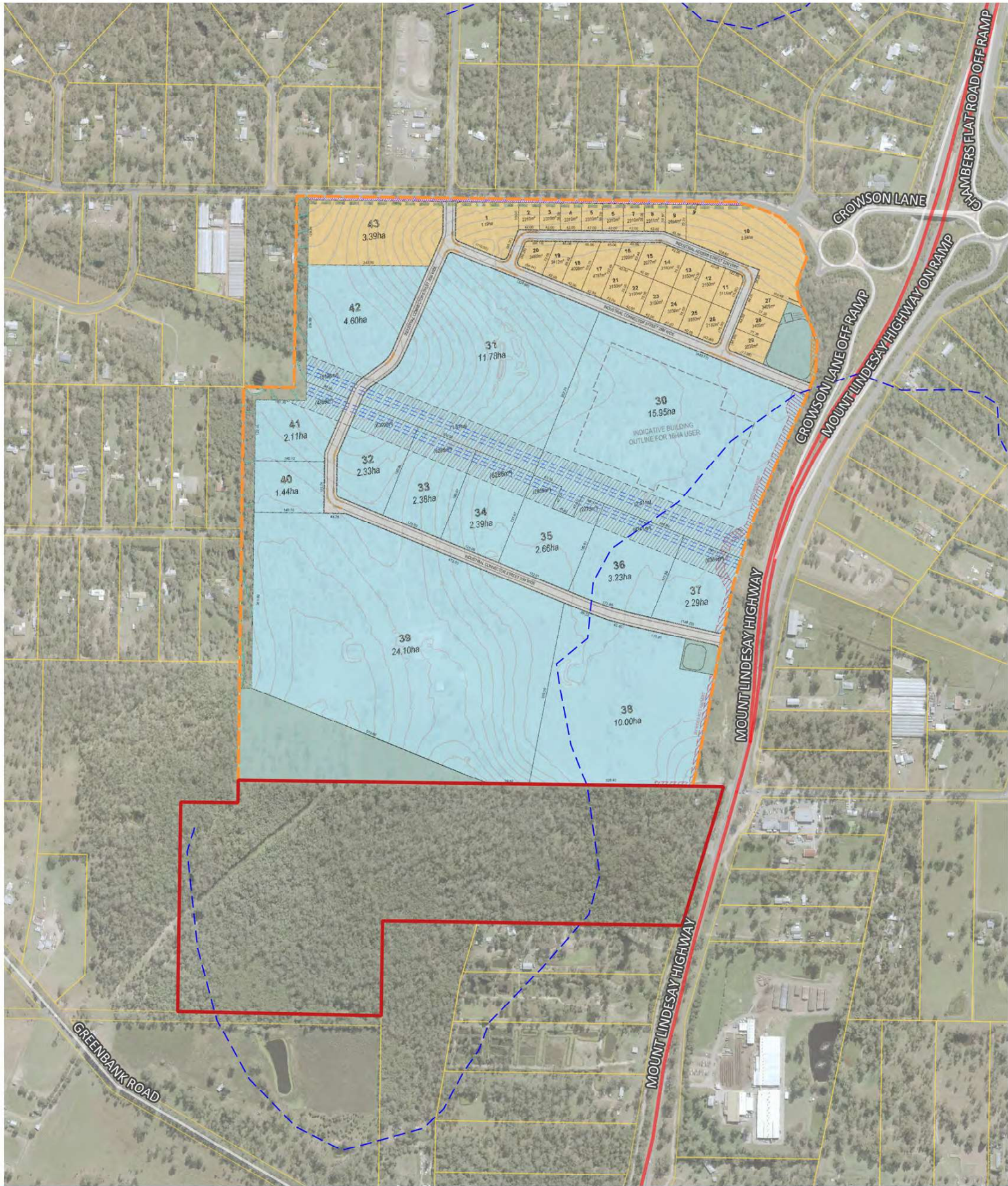
A second purpose of this report has been to support a development application to the State development assessment authority, Economic Development Queensland. Matters of interest to EDQ addressed by this report are protection of significant ecological values, protection of remnant vegetation and maintenance of habitat connectivity. Expectations for a balancing of development impacts and conservation outcomes is achieved through development design and are otherwise through the proposed offset, which will achieve substantial net gain in ecological value.

Figures



**SITE:
Lot 1 on RP113251**

North Maclean	Legend														
Figure 1 - Locality	<ul style="list-style-type: none"> Site Boundary Watercourse Major Road Road Greater Flagstone PDA Boundary 	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">Issue Date</td> <td style="width: 33%;">Dwg No.</td> <td style="width: 33%;">Author</td> </tr> <tr> <td>30 June 2022</td> <td>2022-033-001</td> <td>MO</td> </tr> <tr> <td colspan="2">Approved</td> <td>Revision Note</td> </tr> <tr> <td colspan="2">WM</td> <td></td> </tr> </table>	Issue Date	Dwg No.	Author	30 June 2022	2022-033-001	MO	Approved		Revision Note	WM			<p style="text-align: center;">(A3) GDA 94 MGA 55 1:52,000</p> <p style="text-align: center;">0 1,000 2,000 3,000 4,000 m</p> <div style="text-align: right;"> <p>N</p> </div>
Issue Date	Dwg No.	Author													
30 June 2022	2022-033-001	MO													
Approved		Revision Note													
WM															
<p>28 South Project Ref: 2022-033</p> <p><small>Source: D:\Dropbox\Projects\2022\2022-033 (North Maclean No. 2)\(a) Data\GIS</small></p> <p><small>Data Sources: QLD Globe Imagery (SIPS 2016); Digital Cadastre Database (Dept. Natural Resources and Mines, 2020); Baseline Roads (DNRME 2020); Waterways (DNRME 2019).</small></p>															



North Maclean

Legend

Figure 2 - Site Setting

28 South Project Ref: 2022-033

Source: D:\Dropbox\A Projects\2022\2022-033 (North Maclean No. 2)\A Data\A GIS

Data Sources: QLD Globe Imagery (SIPS 2016); Digital Cadastre Database (Dept. Natural Resources and Mines, 2020); Baseline Roads (DNRME 2020); Waterways (DNRME 2019).

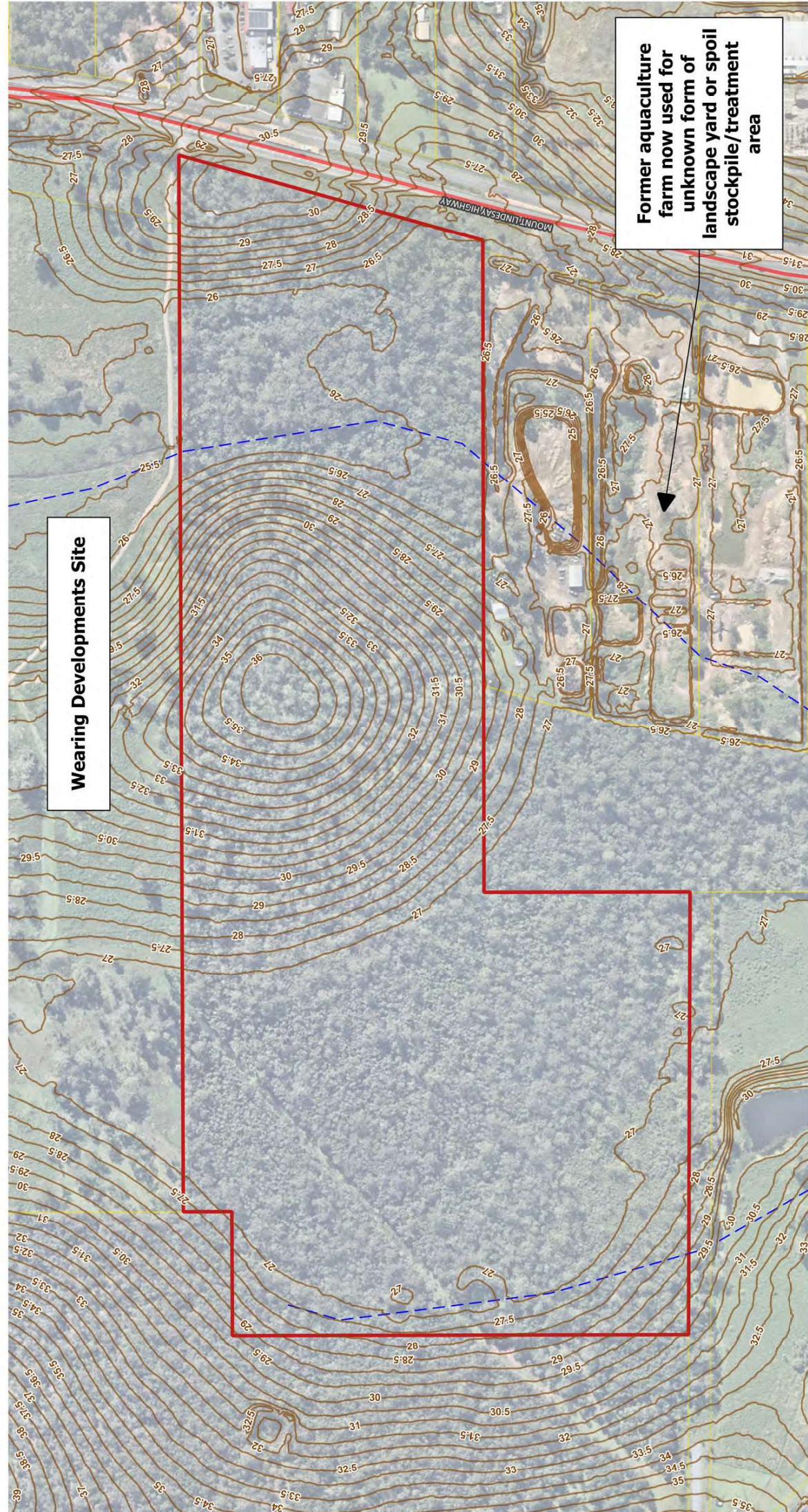


- Site Boundary
- Cadastre
- Major Road
- Overland Flow Path
- Wearing Developments Project

Issue Date	Dwg No.	Author
30 June 2022	2022-033-002	MO
Approved		Revision Note
WM		

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1:7,000





Wearing Developments Site

Former aquaculture farm now used for unknown form of landscape yard or spoil stockpile/treatment area

North Maclean

Legend

- Site Boundary
- DCDB
- Overland Flow Path
- Major Road
- Contours (0.5m)

Figure 3 - Site Features

28 South Project Ref: 2022-033

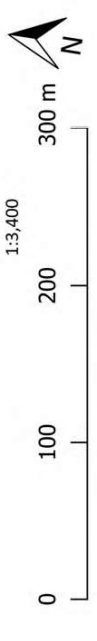
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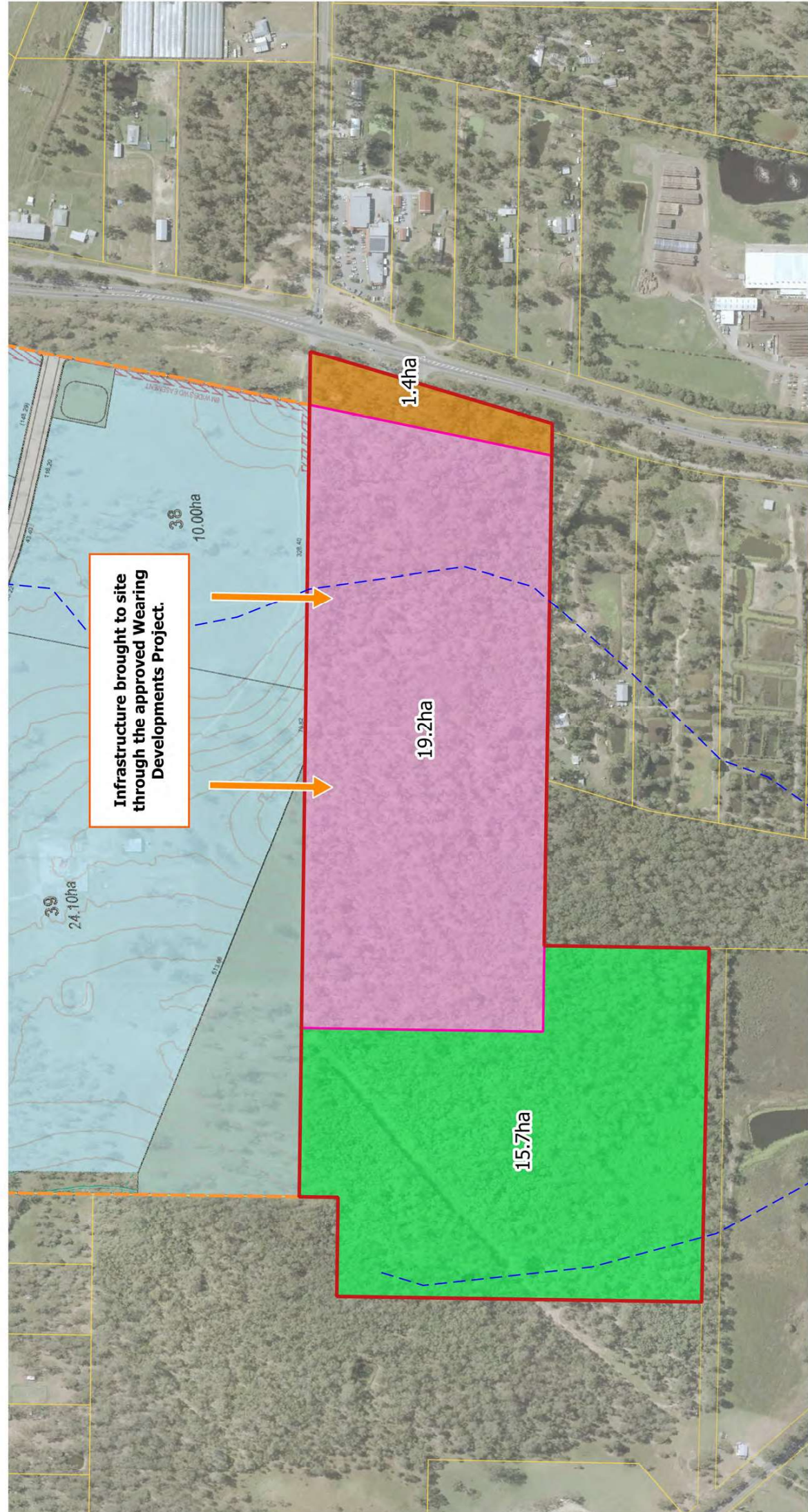
Data Sources: Qld Globe (SIPS 2016); Digital Cadastre Database (Dept. Natural Resources and Mines, 2021); Roads (DNRME, 2020); Watercourse (DNRME, 2020); Contours (DNRME 2016).



Issue Date	Dwg No.	Author
22 July 2022	2022-033-004	M/O
Approved	Revision Note	
WM		

(A3) GDA 94 MGA 56
1:3,400





Infrastructure brought to site through the approved Wearing Developments Project.

North Maclean

Figure 4 - Development Footprint

28 South Project Ref: 2022-033

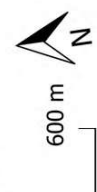
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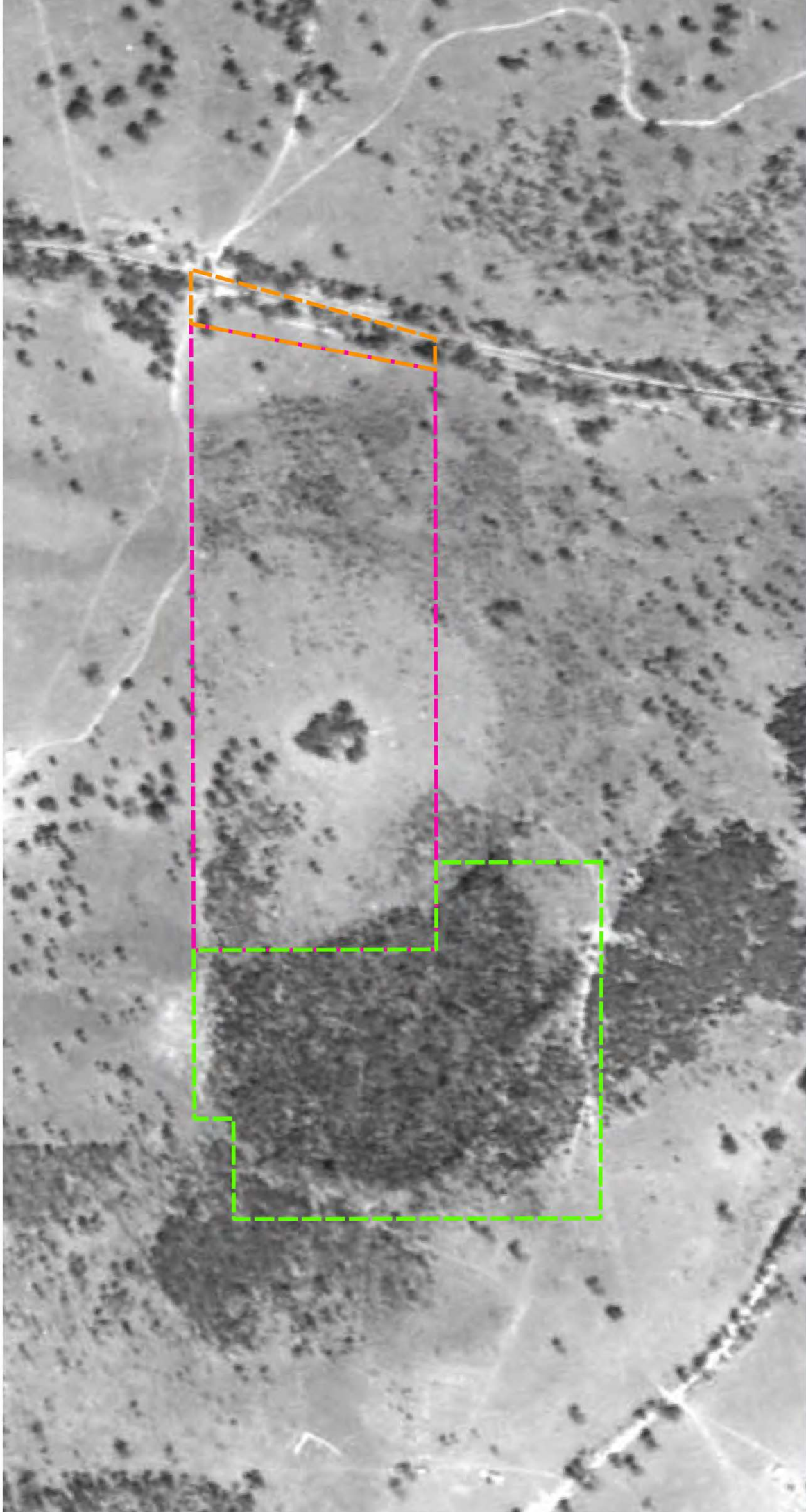
Data Sources: Qld Globe (SIPS 2016); Digital Cadastre Database (Dept. Natural Resources and Mines, 2021); Roads (DNRME, 2020); Watercourse (DNRME, 2020); Contours (DNRME 2016).

- Site Boundary
- Cadastre
- Overland Flow Path
- Wearing Developments Project
- Development Footprint [19.2 ha]
- Balance Land / Conservation Area [15.7 ha]
- Road Resumption Area [1.4 ha]

Issue Date	Dwg No.	Author
22 July 2022	2022-033-004	M/O
Approved	Revision Note	
WM		

(A3) GDA 94 MGA 56
1:4,250
600 m





North Maclean

Legend

-  Balance Lot / Conservation Area [15.7ha]
-  Road Resumption Area [1.4ha]
-  Development Footprint [19.2ha]

Figure 5a - Historic Aerial Photographs (1948)

28 South Project Ref: 2022-033

Source: D:\Dropbox\Projects\2022\2022-033 (North Maclean No. 2)\Data\GIS

Data Sources: Qld Globe (SIPS 2016); Digital Cadastre Database (Dept. Natural Resources and Mines, 2021); Roads (DNRME, 2020); Watercourse (DNRME, 2020); Contours (DNRME 2016).

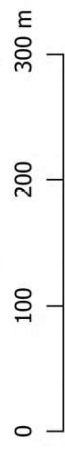


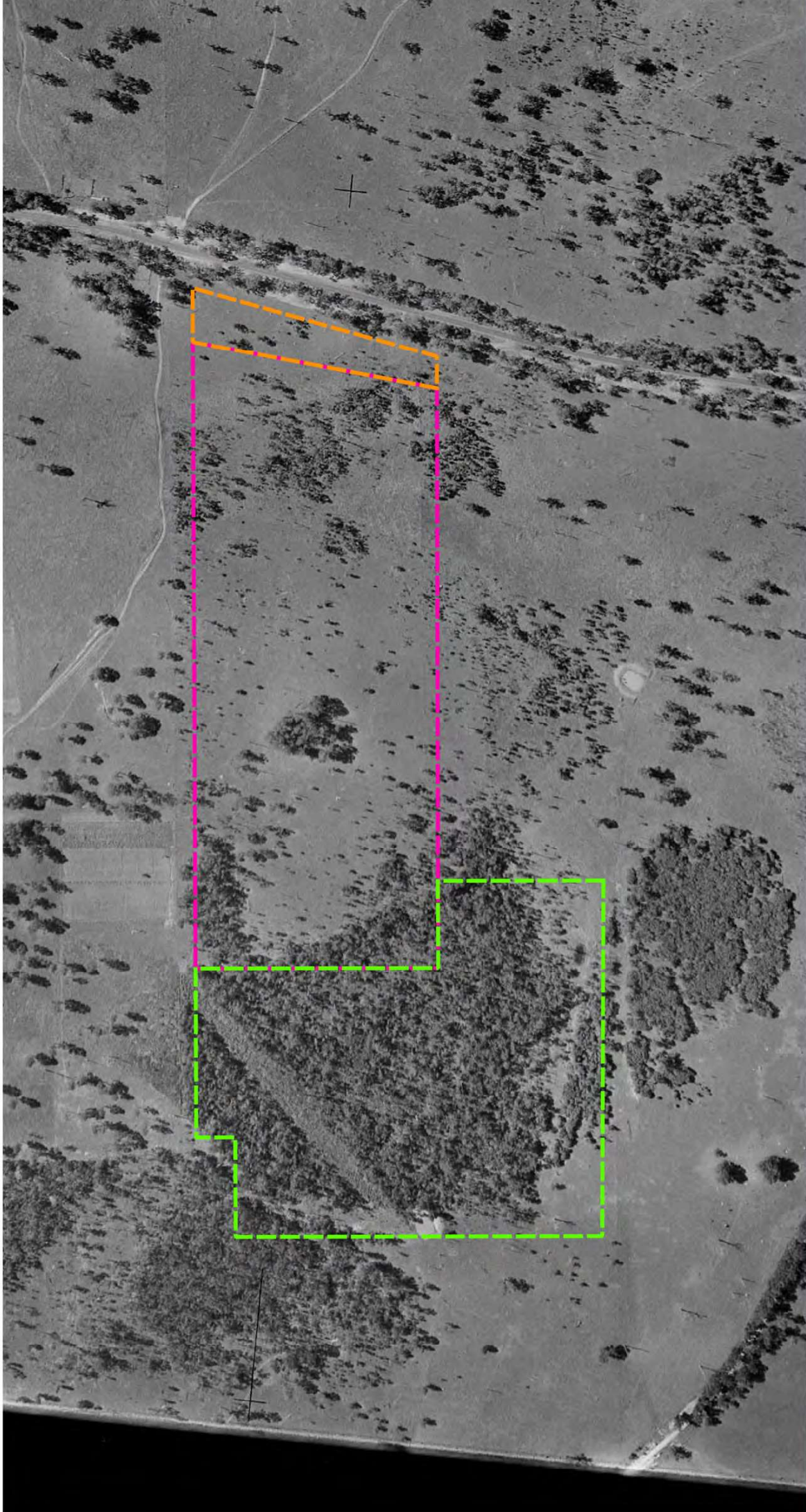
Issue Date	Dwg No.	Author
29 June 2022	2022-033-0058	M/O

Approved	Revision Note
WM	

(A3) GDA 94 MGA 56

1:4,250





North Maclean

Legend



Balance Lot / Conservation Area [15.7ha]

Road Resumption Area [1.4ha]

Development Footprint [19.2ha]

Figure 5b - Historic Aerial Photographs (1962)

28 South Project Ref: 2022-033

Source: D:\Dropbox\G\Projects\2022\2022-033 (North Maclean No. 2)\G\Data\G\GIS

Data Sources: Qld Globe (SIPS 2016); Digital Cadastre Database (Dept. Natural Resources and Mines, 2021); Roads (DNRME, 2020); Watercourse (DNRME, 2020); Contours (DNRME 2016).



Issue Date	Dwg No.	Author
29 June 2022	2022-033-005b	M/O
Approved	Revision Note	
WM		

(A3) GDA 94 MGA 56

1:4,250





North Maclean

Legend

- ▭ Balance Lot / Conservation Area [15.7ha]
- ▭ Road Resumption Area [1.4ha]
- ▭ Development Footprint [19.2ha]

Figure 5c - Historic Aerial Photographs (1973)

28 South Project Ref: 2022-033

Source: D:\Dropbox\G\Projects\2022\2022-033 (North Maclean No. 2)\G\Data\G\GIS

Data Sources: Qld Globe (SIPS 2016); Digital Cadastre Database (Dept. Natural Resources and Mines, 2021); Roads (DNRME, 2020); Watercourse (DNRME, 2020); Contours (DNRME 2016).



Issue Date: 29 June 2022

Dwg No.: 2022-033-005c

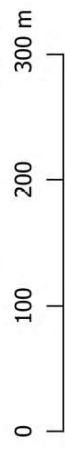
Author: M/O

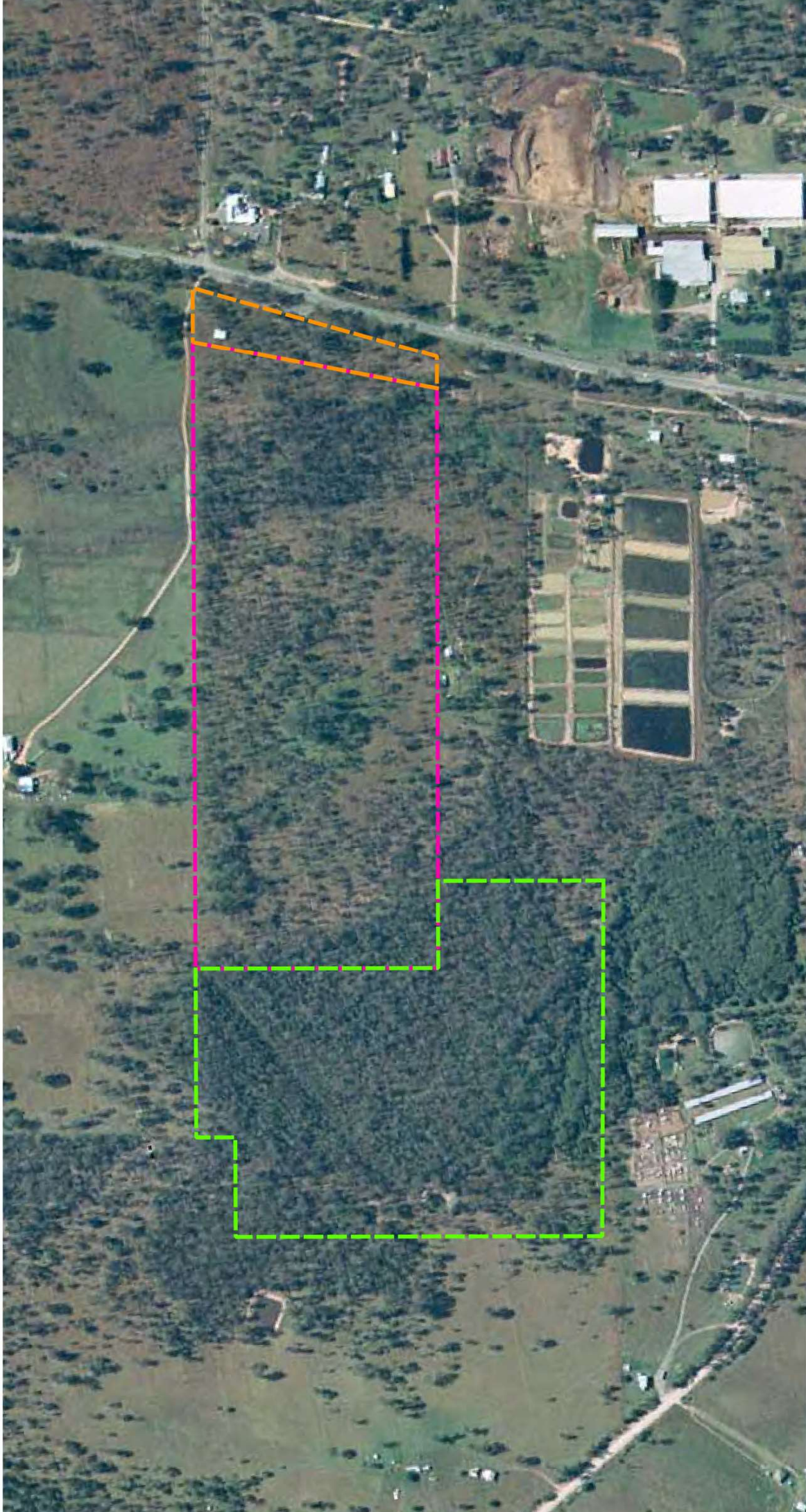
Approved: WM

Revision Note:

(A3) GDA 94 MGA 56

1:4,250





North Maclean

Legend



Balance Lot / Conservation Area [15.7ha]

Road Resumption Area [1.4ha]

Development Footprint [19.2ha]

Figure 5c - Historic Aerial Photographs (1990)

28 South Project Ref: 2022-033

Source: D:\Dropbox\Gf Projects\2022\2022-033 (North Maclean No. 2)\Gf Data\Gf GIS

Data Sources: Qld Globe (SIPS 2016); Digital Cadastre Database (Dept. Natural Resources and Mines, 2021); Roads (DNRME, 2020); Watercourse (DNRME, 2020); Contours (DNRME 2016).



Issue Date
29 June 2022

Author
M/O

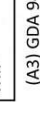
Dwg No.
2022-033-005d

Approved
WM

Revision Note

(A3) GDA 94 MGA 56
1:4,250

0 100 200 300 m





North Maclean

- Legend**
- Site Boundary
 - DCDB
 - Overland Flow Path
 - Transects (20m apart)

Issue Date	Dwg No.	Author
29 June 2022	2022-033-006	M/O
Approved	Revision Note	
WM		

(A3) GDA 94 MGA 56
1:3,750

0 100 200 300 m

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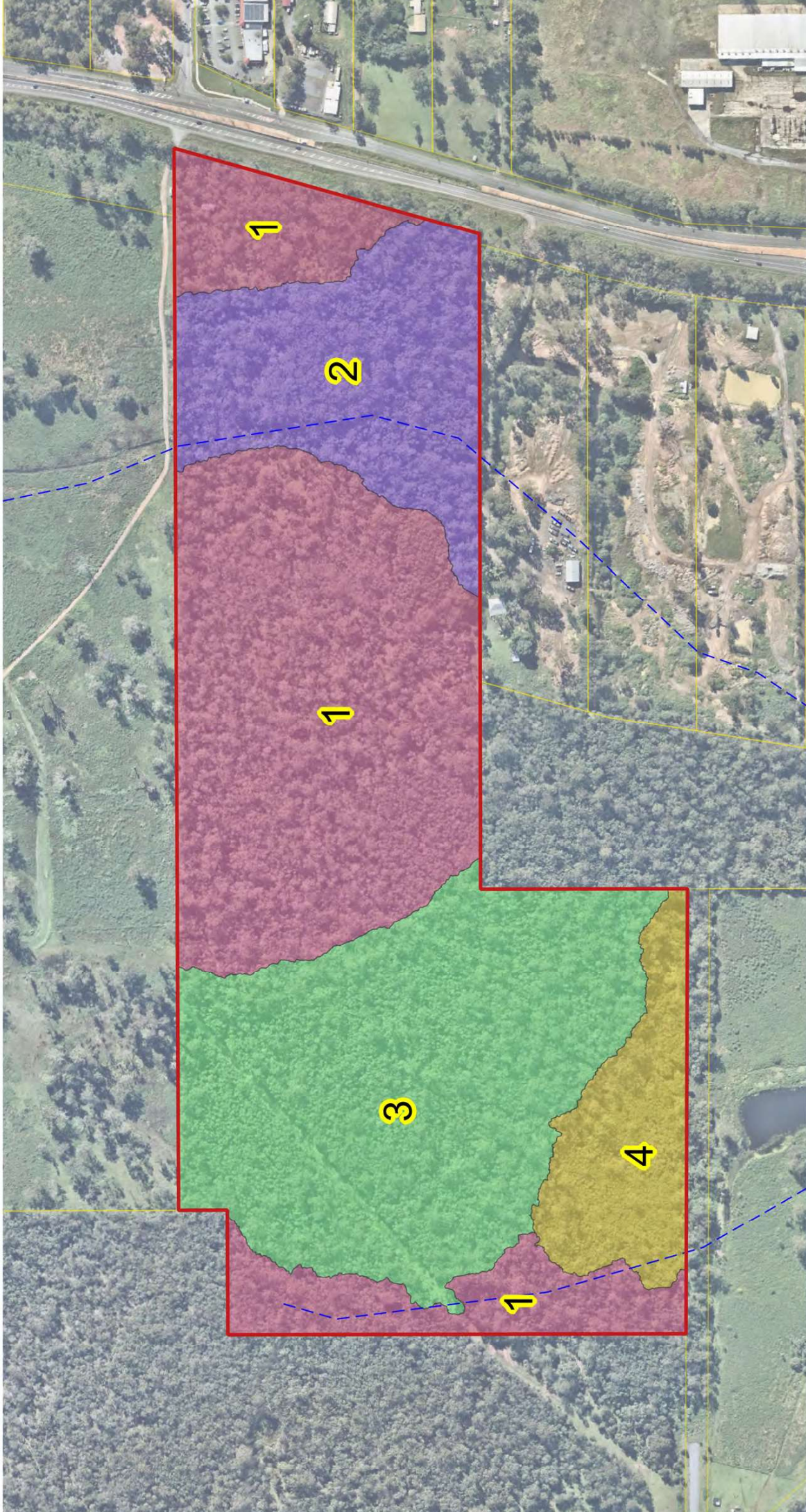
Figure 6 - Transect Survey

28 South Project Ref: 2022-033

Source: D:\Dropbox\G\Projects\2022\033 (North Maclean No. 2)\G\Data\GIS

Data Sources: Qld Globe (SIPS 2016); Digital Cadastre Database (Dept. Natural Resources and Mines, 2021); Roads (DNRME, 2020); Watercourse (DNRME, 2020); Contours (DNRME 2016).

28°S
ENVIRONMENTAL



North Maclean

Legend

- Site Boundary
- DCDB
- Overland Flow Path
- Vegetation Community 1 [15.89 ha]
- Vegetation Community 2 [5.65 ha]
- Vegetation Community 3 [11.83 ha]
- Vegetation Community 4 (Swamp Tea-tree TEC) [2.99 ha]

Figure 7 - Ground-truthed Vegetation

28 South Project Ref: 2022-033

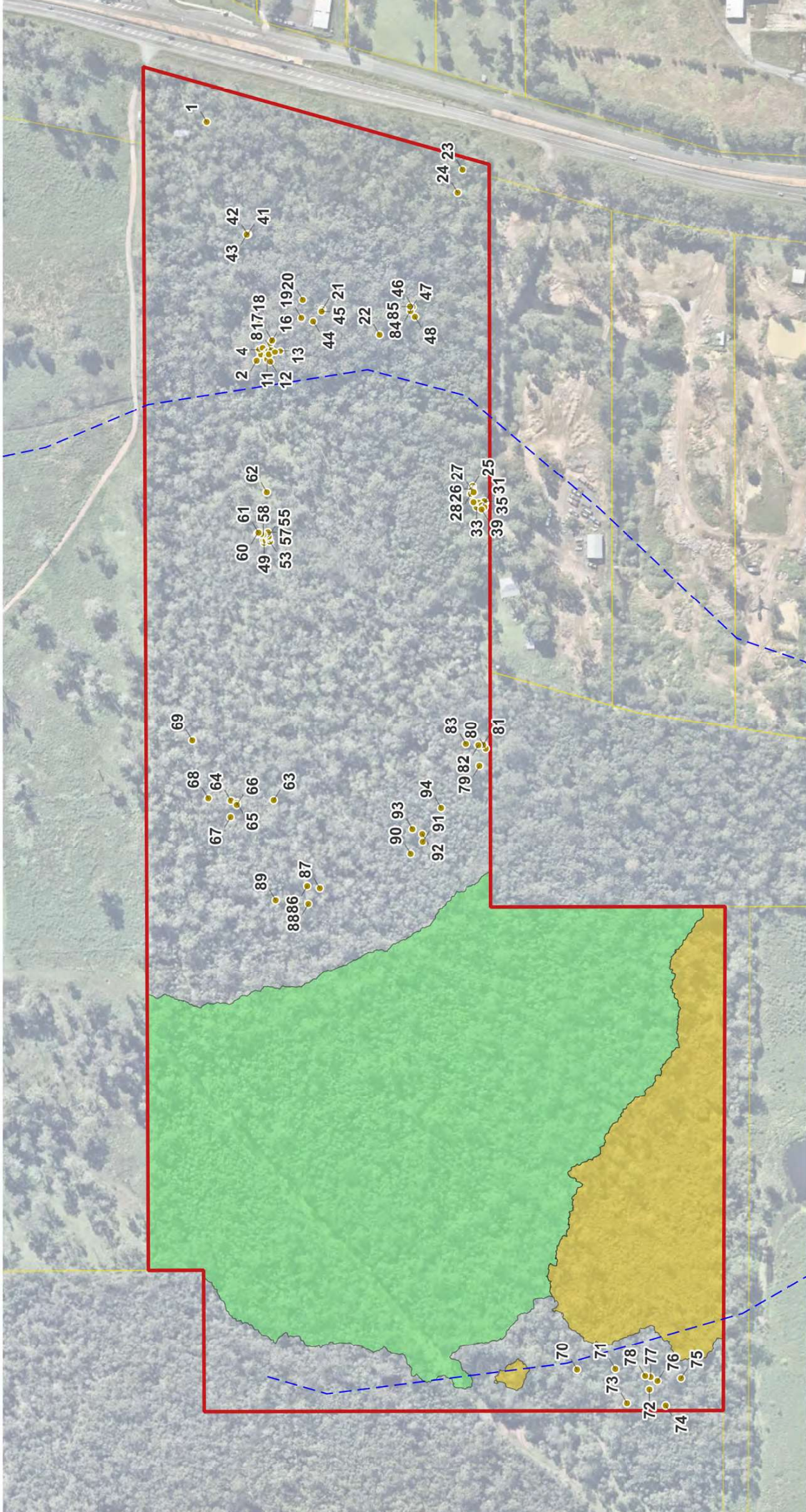
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Data Sources: Qld Globe (SIPS 2016); Digital Cadastre Database (Dept. Natural Resources and Mines, 2021); Roads (DNRME, 2020); Watercourse (DNRME, 2020); Contours (DNRME 2016).



Issue Date	Dwg No.	Author
22 July 2022	2022-033-007	M/O
Approved	Revision Note	
WM		

(A3) GDA 94 MGA 56
1:3,400



North Maclean

Figure 8 - Conservation Significant

Flora

28 South Project Ref: 2022-033

Source: D:\Dropbox\Gf Projects\2022\033 (North Maclean No. 2)\Gf Data\Gf GIS

Legend

- Site Boundary
- DCDB
- Overland Flow Path
- Swamp Tea-tree [*Melaleuca irbyana*]
- Vegetation Community 3
- Vegetation Community 4 (Swamp Tea-tree TEC)

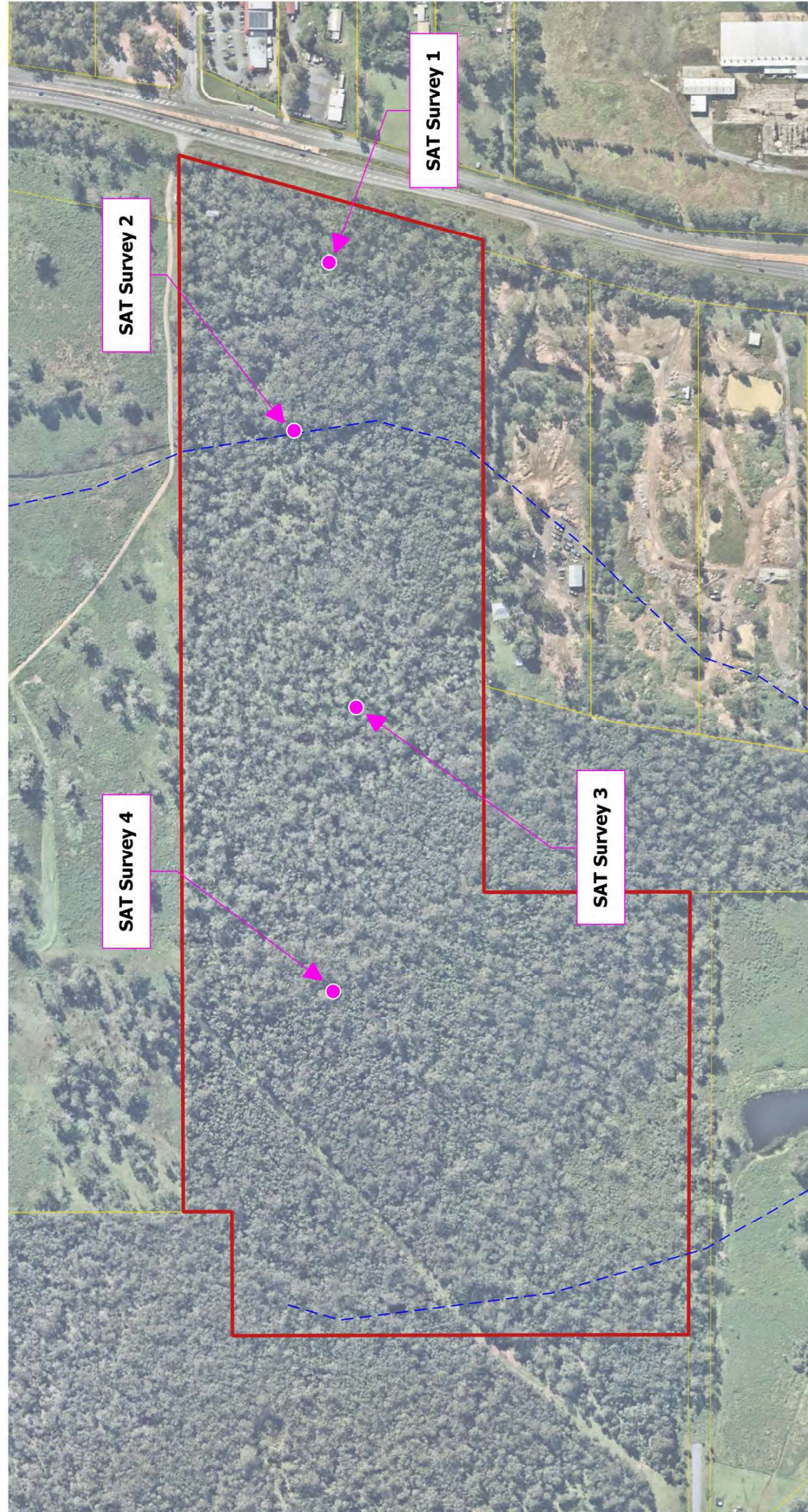
Issue Date	Dwg No.	Author
29 June 2022	2022-033-008	M/O

Approved	Revision Note
WM	

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N



North Maclean

Legend

- Site Boundary
- DCDB
- Overland Flow Path
- Koala SAT Survey Point

Figure 9 - Koala SAT Surveys

28 South Project Ref: 2022-033

Source: D:\Dropbox\GIS\Projects\2022\2022-033 (North Maclean No. 2)\GIS Data\GIS

Data Sources: Qld Globe (SIPS 2016); Digital Cadastre Database (Dept. Natural Resources and Mines, 2021); Roads (DNRME, 2020); Watercourse (DNRME, 2020); Contours (DNRME 2016).

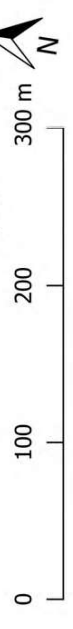
28°S

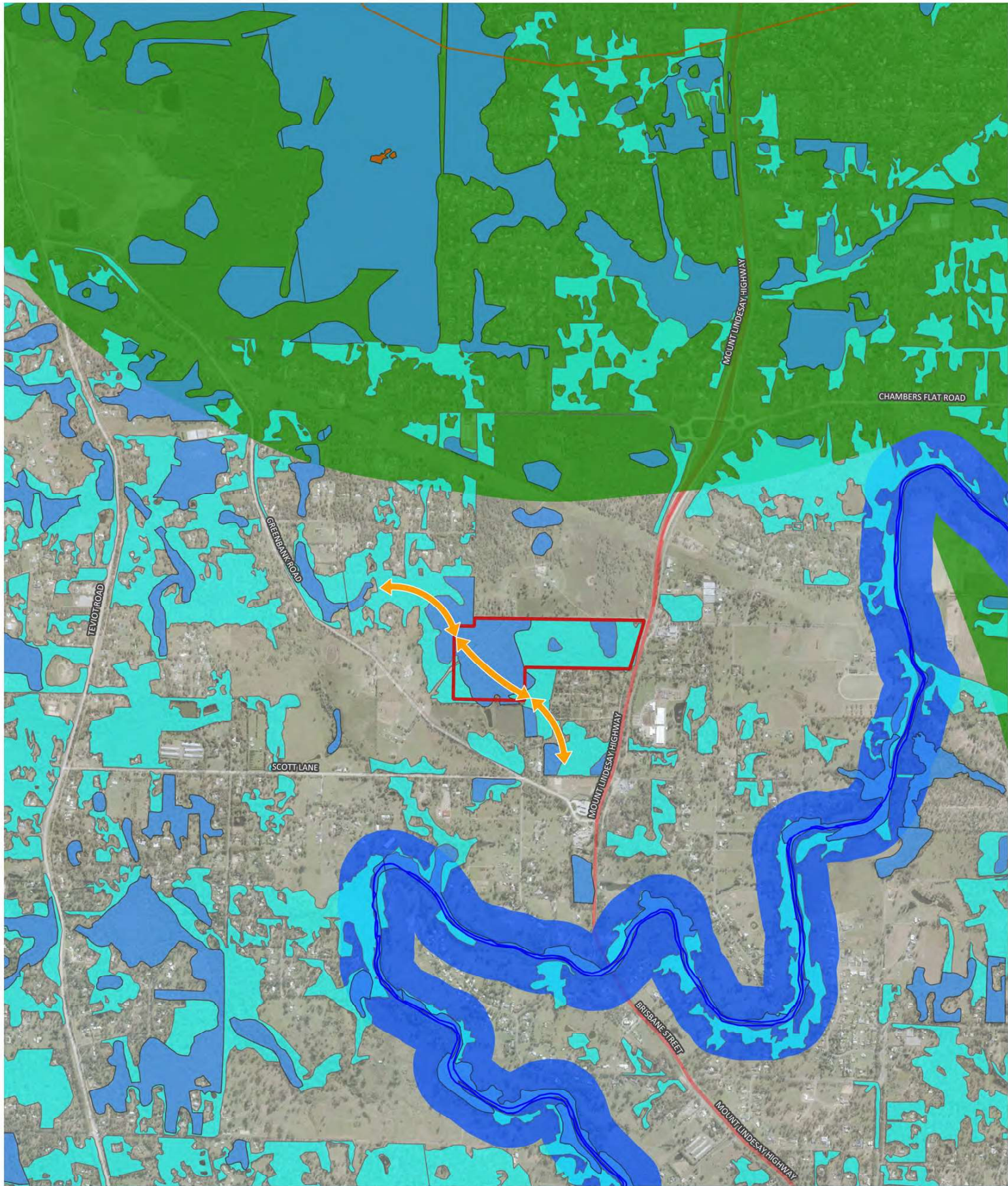
ENVIRONMENTAL

Issue Date	Dwg No.	Author
29 June 2022	2022-033-009	M/O
Approved	Revision Note	
WM		

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North Maclean

Legend

Figure 10 - Local Connectivity

28 South Project Ref: 2022-033

Source: D:\Dropbox\Projects\2022\2022-033 (North Maclean No. 2)\(a) Data\GIS

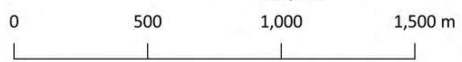
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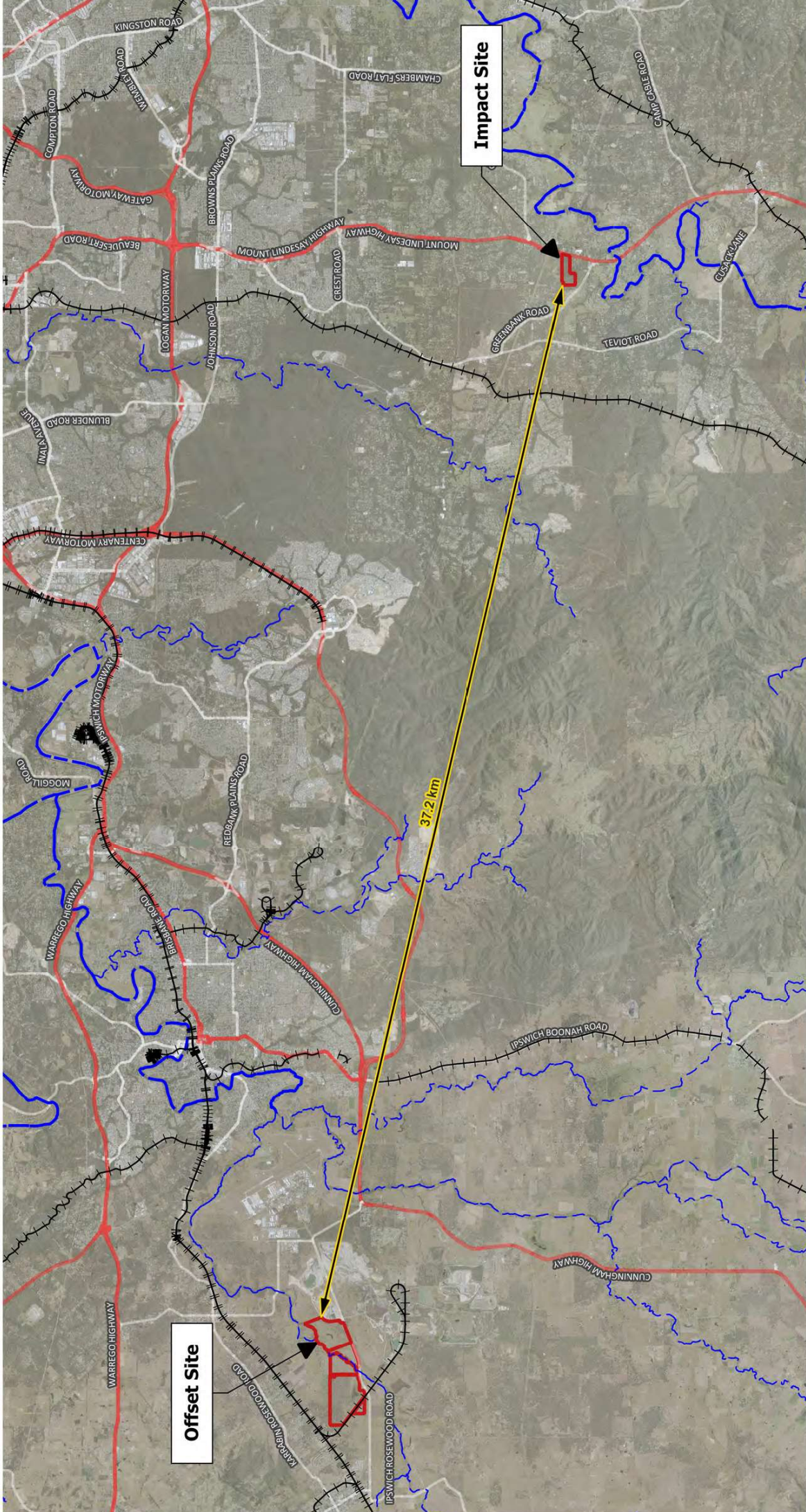


- Site Boundary
- Major Road
- Road
- RVM category A
- RVM category B
- RVM category C
- RVM category R
- Statewide Biodiversity Corridor - Regional Significance
- Statewide Biodiversity Corridor - State Significance
- Statewide Biodiversity Corridor - Riparian centreline
- Statewide Biodiversity Corridor - Terrestrial centreline
- ➔ Corridor connection

Issue Date	Dwg No.	Author
22 July 2022	2022-033-010	MO
Approved		Revision Note
WM		

(A3) GDA 94 MGA 55
1:20,000





North Maclean

Figure 11 - Impact and Offset Site

Context

28 South Project Ref: 2022-033

Source: D:\Dropbox\Projects\2022-033 (North Maclean No. 2)\Data\GIS

Data Sources: Qld Globe (SIPS 2016); Digital Cadastre Database (Dept. Natural Resources and Mines, 2021); Roads (DNRME, 2020); Watercourse (DNRME, 2020); Contours (DNRME 2016).

Legend

- Site Boundary
- Waterway
- Major Road
- Road
- Railway Network

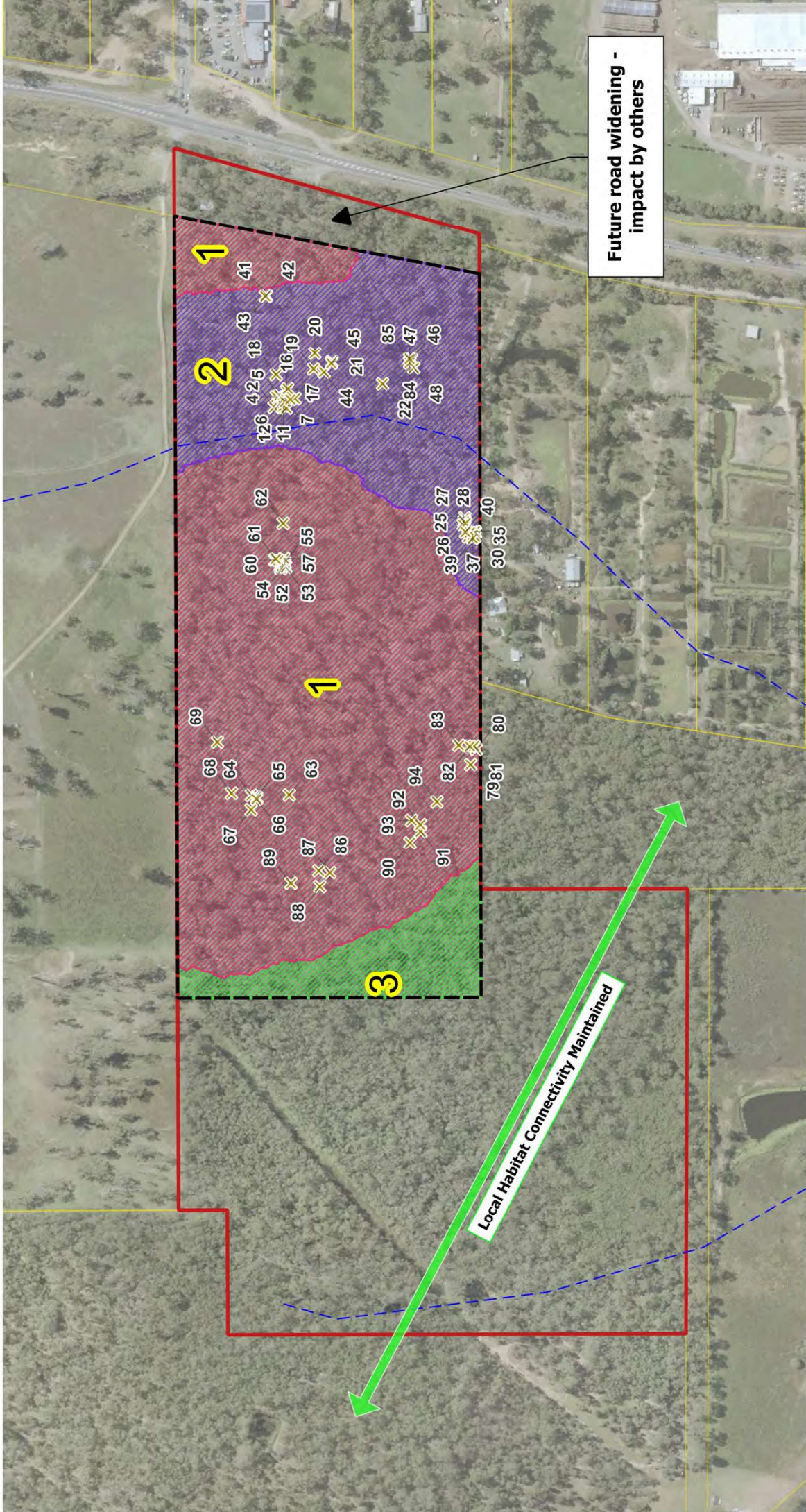
Issue Date	Dwg No.	Author
22 July 2022	2022-033-011	M/O

Approved	Revision Note
WM	

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Page 43



Future road widening -
impact by others

Local Habitat Connectivity Maintained

North Maclean

Figure 13 - Avoidance, Mitigation, and Impacts

28 South Project Ref: 2022-033

Source: D:\Dropbox\Projects\2022\033 (North Maclean No. 2)\Data\GIS

Data Sources: Qld Globe (SIPS 2016); Digital Cadastre Database (Dept. Natural Resources and Mines, 2021); Roads (DNRME, 2020); Watercourse (DNRME, 2020); Contours (DNRME 2016).

28°S
ENVIRONMENTAL

Legend

- Site Boundary
- DCDB
- Waterway
- Development Footprint
- Impact to Vegetation Community 1
- Impact to Vegetation Community 2
- Impact to Vegetation Community 3
- Impact to Vegetation Community 4
- Individual Swamp tea-tree impacted [82]
- X

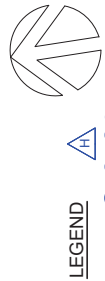
- Vegetation Community Impacts
- Impact to Vegetation Community 1 [12.4 ha]
 - Impact to Vegetation Community 2 [5.3 ha]
 - Impact to Vegetation Community 3 [1.51 ha]
 - Impact to Vegetation Community 4 (Swamp Tea-tree TEC) [0 ha]

Issue Date	Dwg No.	Author
29 June 2022	2022-033-013	M/O
Approved	Revision Note	
WM		

(A3) GDA 94 MGA 56
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0 100 200 300 m



Attachment 1 – Wearing Approved Plans

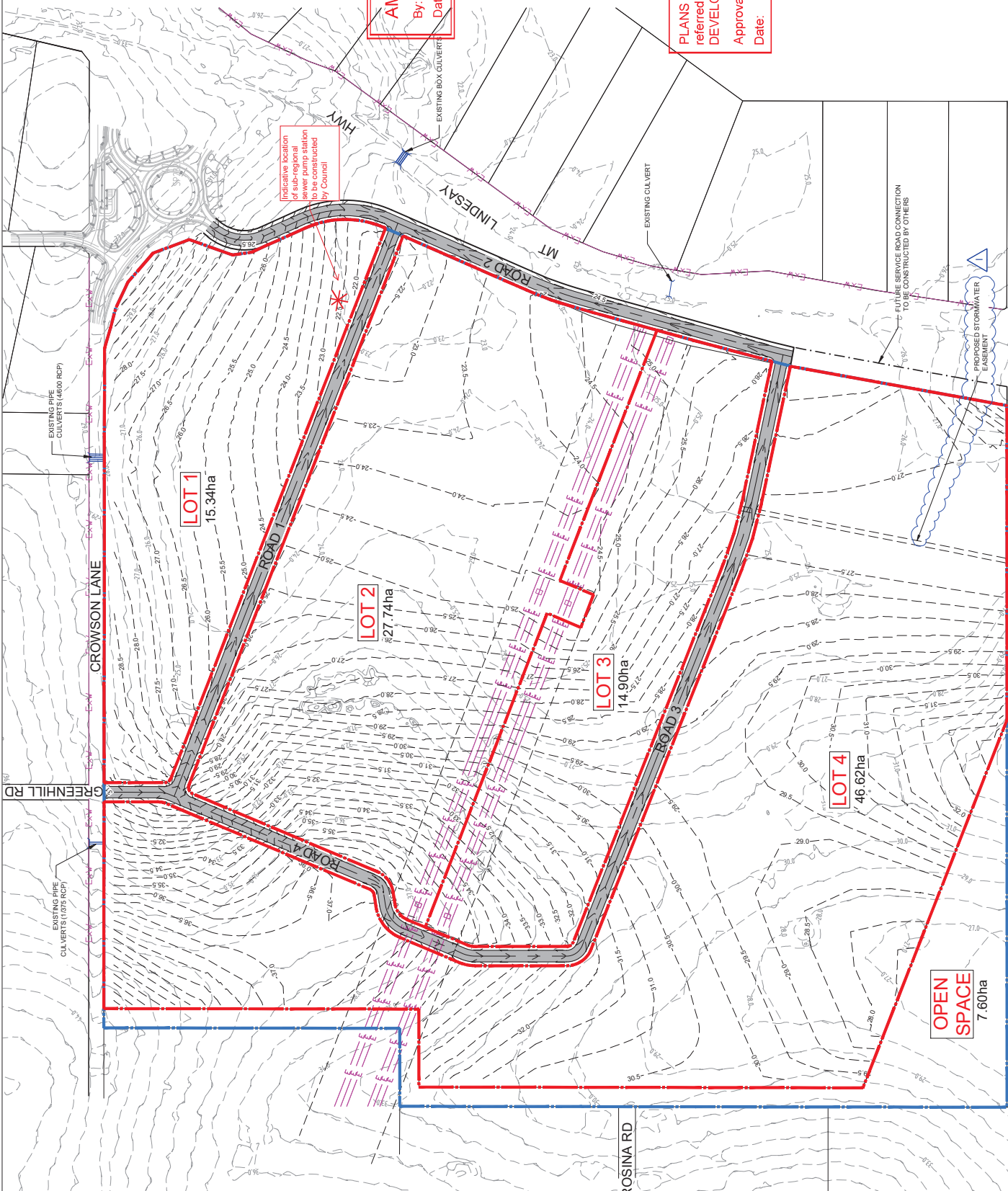


LEGEND

- SITE BOUNDARY
- LOT BOUNDARY
- OVERHEAD TRANSMISSION POWER LINES
- EXISTING CONTOURS
- DESIGN CONTOUR
- ROAD RESERVE
- PROPOSED STORMWATER EASEMENT
- EXISTING WATERMAIN

AMENDED IN RED
 By: Brandon Bouda
 Date: 03 September 2021

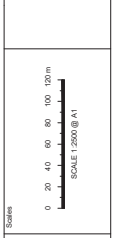
PLANS AND DOCUMENTS referred to in the PDA DEVELOPMENT APPROVAL
 Approval no: DEV2018/961
 Date: 10 September 2021



Drawing Title: PROPOSED DEVELOPMENT LAYOUT PLAN
 Project: PROPOSED BUSINESS PARK 4499-4651 MT LINDESAY HIGHWAY, NORTH MACLEAN QLD
 Scale: 1:2500
 Project No: TEL202159.CIV.DA
 Issue: 010

Telford CIVIL
 DESIGN & CONSTRUCTION EXCELLENCE
 Level 4, 471 Church Street, Parramatta NSW 2150
 PHONE: 02 7939 4931
 PO BOX 3577 Parramatta NSW 2124

Surveyor: Wearco Pty Ltd
 42 South Street, Jimboomba QLD 4280



Issue	Description	Date	Design	Check
H	ISSUE FOR DEVELOPMENT APPLICATION	07/07/2021	M.M.	J.B.
G	ISSUE FOR DEVELOPMENT APPLICATION	18/12/2020	M.M.	J.B.
F	ISSUE FOR DEVELOPMENT APPLICATION	28/11/2019	M.M.	J.B.
E	ISSUE FOR DEVELOPMENT APPLICATION	01/03/2019	M.M.	J.B.
D	ISSUE FOR DEVELOPMENT APPLICATION	11/07/2018	M.M.	J.B.
C	ISSUE FOR DEVELOPMENT APPLICATION	02/06/2018	M.M.	J.B.

PLANS AND DOCUMENTS
referred to in the PDA
DEVELOPMENT APPROVAL
Approval no: DEV2018/961
Date: 10 September 2021

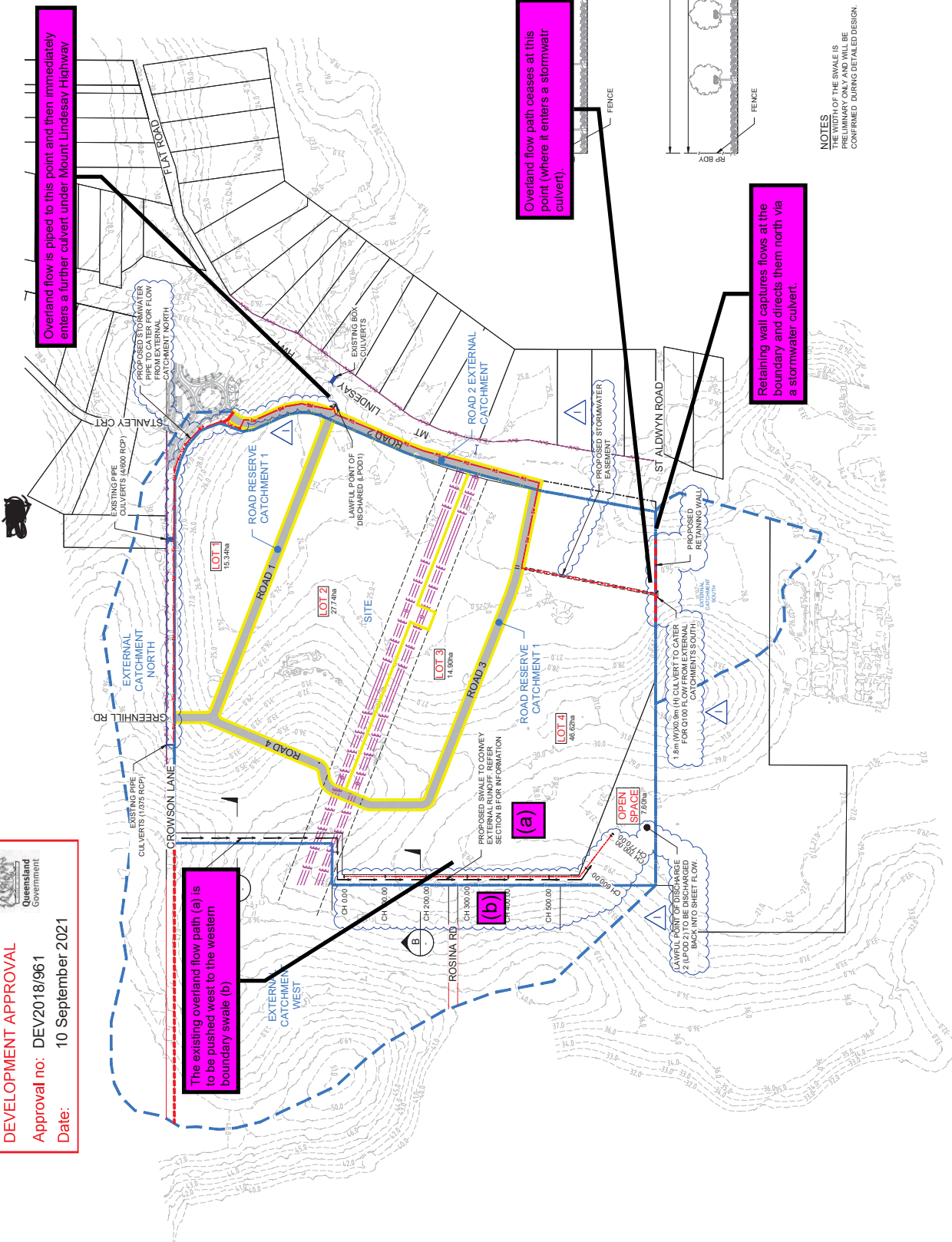


LEGEND

- OVERHEAD TRANSMISSION POWER LINES
- EXISTING CONTOURS
- EXISTING TABLE DRAIN
- EXTERNAL CATCHMENT BOUNDARY
- SITE BOUNDARY
- ROAD RESERVE BOUNDARY
- ROAD RESERVE
- EXISTING WATER MAIN
- PROPOSED STORMWATER FOR EXTERNAL FLOW
- PROPOSED STORMWATER EASEMENT
- PROPOSED SWALE CONTROL LINE

CATCHMENT TABLE

CATCHMENT	AREA (ha)
SITE	117.9
EXTERNAL CATCHMENT WEST	46.54
EXTERNAL CATCHMENT NORTH	21.23
EXTERNAL CATCHMENT SOUTH	13.44
ROAD 2 EXTERNAL CATCHMENT	2.00
ROAD RESERVE CATCHMENT 1	7.7



Overland flow is piped to this point and then immediately enters a further culvert under Mount Lindesay Highway

The existing overland flow path (a) is to be pushed west to the western boundary swale (b)

Overland flow path ceases at this point (where it enters a stormwater culvert).

Retaining wall captures flows at the boundary and directs them north via a stormwater culvert.

SECTION A
N.T.S

SECTION B
N.T.S

NOTES
THE LOCATION OF THE SWALE IS PRELIMINARY ONLY AND WILL BE CONFIRMED DURING DETAILED DESIGN.

<p>Telford CIVIL DESIGN & CONSTRUCTION EXCELLENCE Level 4, 470 Church Street, Parramatta NSW 2150 PHONE: 02 7809 4831 PO BOX 5879 Parramatta 2124</p>		<p>Project: PROPOSED BUSINESS PARK 4499-4651 MT LINDESAY HIGHWAY, NORTH MACLEAN QLD</p>	
<p>Scale: 1:5000 Drawing No: TEL202159 CIV.DA Issue: 1</p>		<p>Drawing Title: CONCEPT CATCHMENT LAYOUT PLAN</p>	
<p>Surveyor: Wearco Pty Ltd 42 South Street, Jimboomba QLD 4280</p>		<p>Scale: 1:500 @ A1</p>	
<p>Date: 07/07/2021 M.M.</p>		<p>Design/Check:</p>	
<p>18/12/2020 M.M.</p>		<p>09/07/2020 M.M.</p>	
<p>28/11/2019 M.M.</p>		<p>01/03/2019 M.M.</p>	
<p>11/07/2018 M.M.</p>		<p>11/07/2018 M.M.</p>	

NOTE:

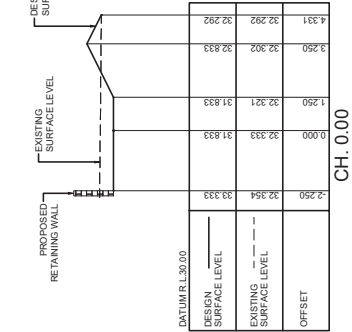
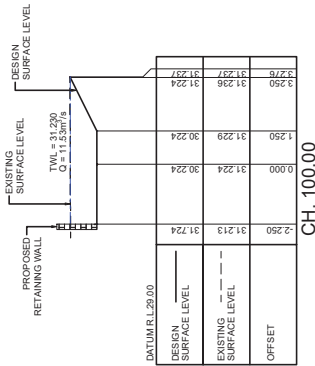
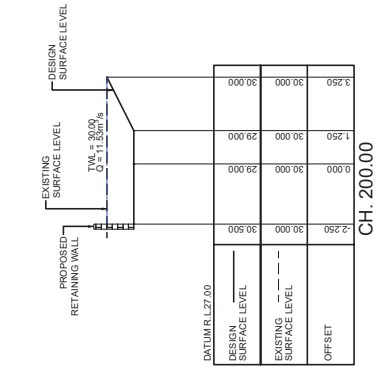
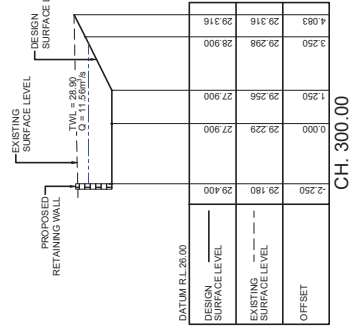
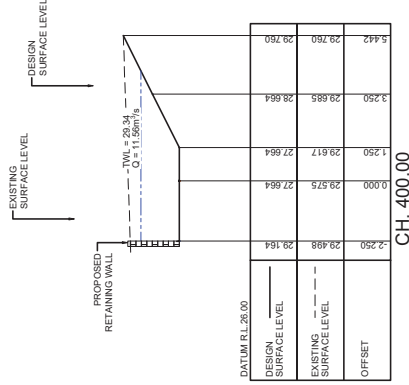
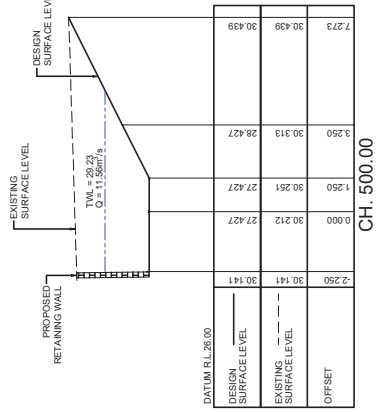
- TWL = TOP WATER LEVEL
- Q = 100 YEAR FLOW
- REFER TO REPORT REF: 1805 Q1/19/D1/ISSUE 1 FOR SWALE CALCULATION
- REFER TO REPORT REF: 1805 Q1/19/D1/ISSUE 1 FOR SWALE CALCULATION



PLANS AND DOCUMENTS referred to in the PDA DEVELOPMENT APPROVAL

Approval no: DEV20181961

Date: 10 September 2021



NOT FOR CONSTRUCTION

Project: SWALE CROSS SECTIONS
 4489-4651 MT LINDESAY HIGHWAY,
 NORTH MACLEAN QLD

TELFORD CIVIL
 DESIGN & CONSTRUCTION EXCELLENCE
 Level 4, 470 Church Street,
 Parramatta NSW 2150
 PHONE: 02 7899 4831
 Email: info@telfordcivil.com.au

Scale: 1:100
 Date: 11/02/2020
 Design: J.B.
 Check: J.B.



Client: Wearco Pty Ltd
 47 South Street, Jimboomba QLD 4280

Issue	Description	Date	Design	Check
C	ISSUE FOR DEVELOPMENT APPLICATION	07/07/2021	M.M.	J.B.
A	ISSUE FOR DEVELOPMENT APPLICATION	09/07/2020	M.M.	J.B.
B	ISSUE FOR DEVELOPMENT APPLICATION	11/02/2020	M.M.	J.B.



**Attachment 2 – Waterway for Waterway Barrier Works Map,
and EDQ acknowledgement regarding a lack of waterway
values**

Queensland waterways for waterway barrier works

-  Major
-  High
-  Moderate
-  Low

Land parcel

-  Parcel

Land parcel - gt 1 ha

-  Parcel

Land parcel - gt 10 ha

-  Parcel

Land parcel - gt 1000 ha

-  Parcel

Places: My Places

-  My Place 1

Cities and Towns

- 




Railway

- 

Road crossing

-  Bridge
-  Tunnel

Road

-  Highway
-  Main
-  Local
-  Private

Maxar

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SARA reference: 2110-25591 SPL

8 November 2021

CSC Project Pty Ltd
C/- 28 South Environmental
Suite 17D, Martin Street
FORTITUDE VALLEY QLD 4006
alissa@28south.com.au

Attention: Ms Alissa Roxburgh

Dear Ms Roxburgh

SARA Pre-lodgement advice—4499-4651 Mount Lindesay Highway, North Maclean

I refer to your pre-lodgement request received on 28 October 2021 in which you sought pre-lodgement advice from the State Assessment and Referral Agency (SARA) regarding the proposed development at the above address. This notice provides advice on aspects of the proposal that are of relevance to SARA.

SARA's understanding of the project

The development site, being located at 4499-4651 Mount Lindesay Highway, North Maclean and formally described as Lot 39 on SP258739, contains approval for a Development Permit for Reconfiguring a Lot – 1 lot into 4 lots, plus roads and open space. As the site is located within the Greater Flagstone Priority Development Area, the development approval was granted on 10 September 2021 by the Minister for Economic Development Queensland under the *Economic Development Act 2012* (ref. DEV2018/961).

The development site contains a mapped low-risk (green) waterway, as per the *Queensland waterways for waterway barrier works* spatial data layer. The northern portion of the site also contains an unmapped drainage feature. SARA understands that you are seeking an alternative determination of the mapped waterway, in that you consider that the feature is not a waterway for fish passage.

Supporting information

The advice in this letter is based on the following documentation that was submitted with the pre-lodgement request.

Drawing/report title	Prepared by	Date
Cover Letter – Request to amend Queensland Waterways for Waterway Barrier Works mapping over 4499-4651 Mt Lindsay Highway, North Maclean	28 South Environmental	28 October 2021
2154.001V2 – North Maclean – Waterway Assessment	Ecological Service Professionals Pty Ltd	28 October 2021

Pre-lodgement advice

The following advice outlines the aspects of the proposal that are of relevance to SARA.

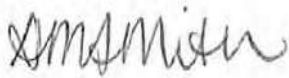
Waterway barrier works	
1.	<p>SARA acknowledges your position that the extent of the mapped green waterway within Lot 39, west of the Mount Lindesay Highway, lacks the physical and hydrological features of a waterway, as per the Department of Agriculture and Fisheries' factsheet What is a waterway?.</p> <p>SARA has considered the information you have provided and accepts that the mapped waterway within Lot 39, from the downstream end of the culvert under the Mount Lindesay Highway (coordinates -27.76096,153.02118), is not considered to be a waterway providing fish passage for the following reasons:</p> <ul style="list-style-type: none"> • There is no evidence of: <ul style="list-style-type: none"> o continuous defined bed and banks o an extended period of flow o flow adequacy • There is a lack of fish habitat within, and upstream of, the feature • There is a lack of connectivity throughout the feature. <p>Further, for completeness, SARA advises that the unmapped drainage feature within the northern portion of Lot 39 is also not considered to be a waterway providing fish passage for the reasons listed above.</p> <p>Consequently, works within the identified mapped and unmapped waterways within Lot 39 are not considered to constitute assessable development being operational work for constructing or raising waterway barrier works under Schedule 10, Part 6, Division 4, Subdivision 1, Section 12 of the Planning Regulation 2017. SARA advises that any future update of the spatial data layer <i>Queensland waterways for waterway barrier works</i> will reflect this determination.</p>

This advice outlines aspects of the proposed development that are relevant from the jurisdiction of SARA. This advice is provided in good faith and is:

- based on the material and information provided to SARA
- current at the time of issue
- not applicable if the proposal is changed from that which formed the basis of this advice.

If you require further information please contact Jackie Larrarte, Senior Planning Officer, on 07 4122 0408 or via email SEQSouthPlanning@dcdilgp.qld.gov.au who will be pleased to assist.

Yours sincerely

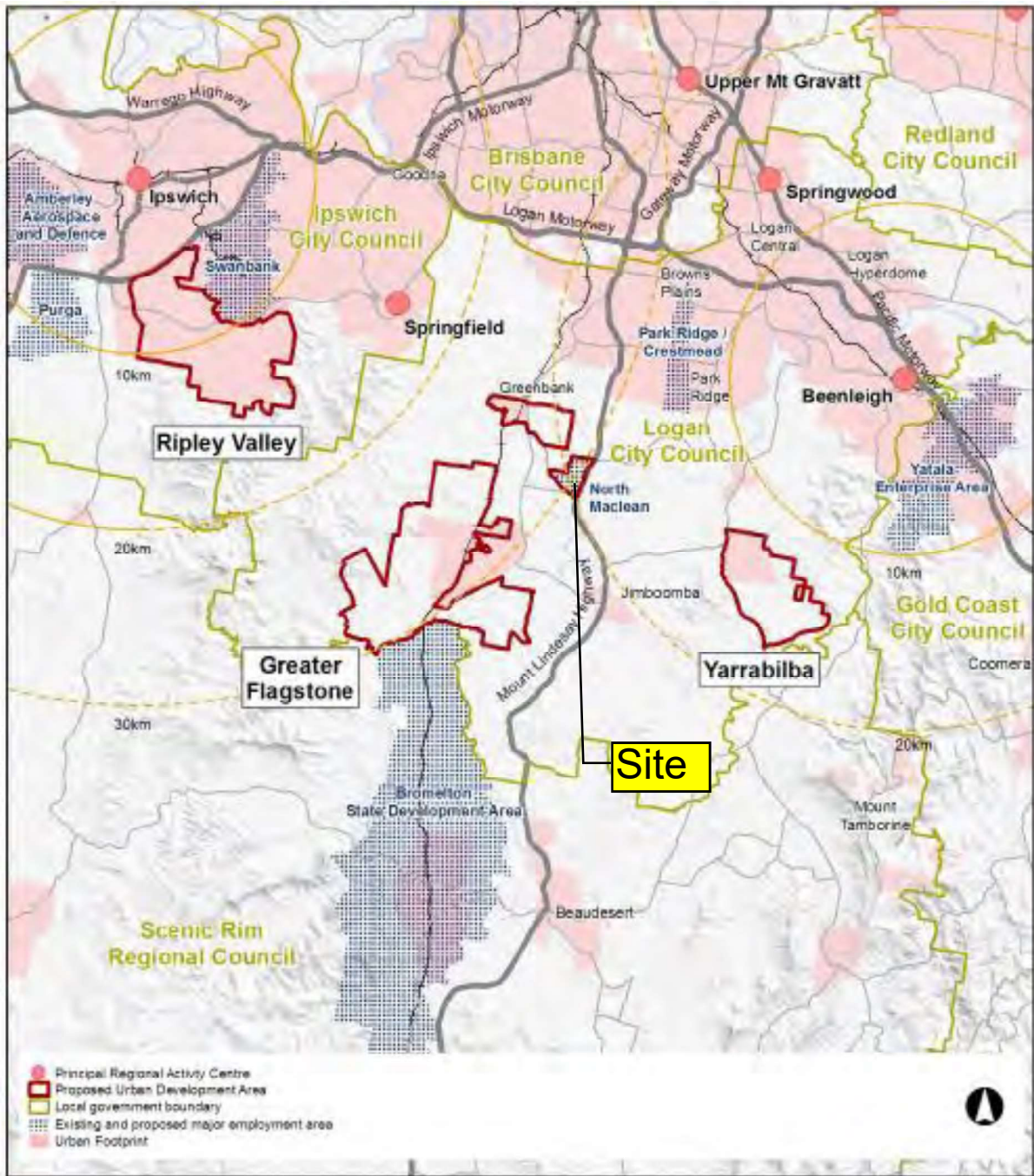


Susan Kidd
Manager (Program Improvement)

Development details	
Street address:	4499-4651 Mount Lindesay Highway, North Maclean
Real property description:	Lot 39 on SP258739
SARA role:	Nil
Assessment criteria:	Nil
Existing use:	Vacant land, subject to Priority Development Area development approval



Attachment 3 – Greater Flagstone ILP Mapping





**Attachment 4 – North Maclean Enterprise Area Context
Plan**

- North Maclean FDA - Industry and Business Precinct
- Subject site
- Precincts (excluding high impact and noxious and hazardous industries)
- Business, research and technology precinct (subject to future application)
- Industry and warehouse precinct (subject to future application)
- Biodiversity corridor
- Indicative future biodiversity corridor
- Industry and business zone
- Approved land uses
- Surrounding business land uses
- Road Layout
- Industrial connector
- Mt Lindesay Highway widening
- Indicative new roads by others
- Existing road network, highway, roundabout and overpass
- Future Crowson Lane 8m road widening (subject to acquisition by Logan City Council)
- 820 Greenbank Road Subdivision Approval
- Road Layout
- Other features
- Buffer to adjoining rural residential area (minimum 25m) with no vegetation clearing permitted unless required for stormwater infrastructure and access track
- Potential deep planting screening buffer to be assessed as part of future applications
- Proposed stormwater infrastructure and access track
- High voltage powerlines
- Bushfire Protection Zone
- 5m contours

REFERENCES

Cadastral - (c) The State of Queensland (DNRM DCD8)

Coordinate System: GDA 1984 MGA Zone 56

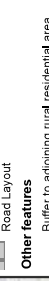
Images are not orthorectified, overlays are best fit. Features are based on topographical data and may vary. Contains digitised data.

Nearmap imagery 06/11/2020.

Layout: sourced from Australian Consulting Engineers, 22/01/2019, Issue B.

Note: Indicative only

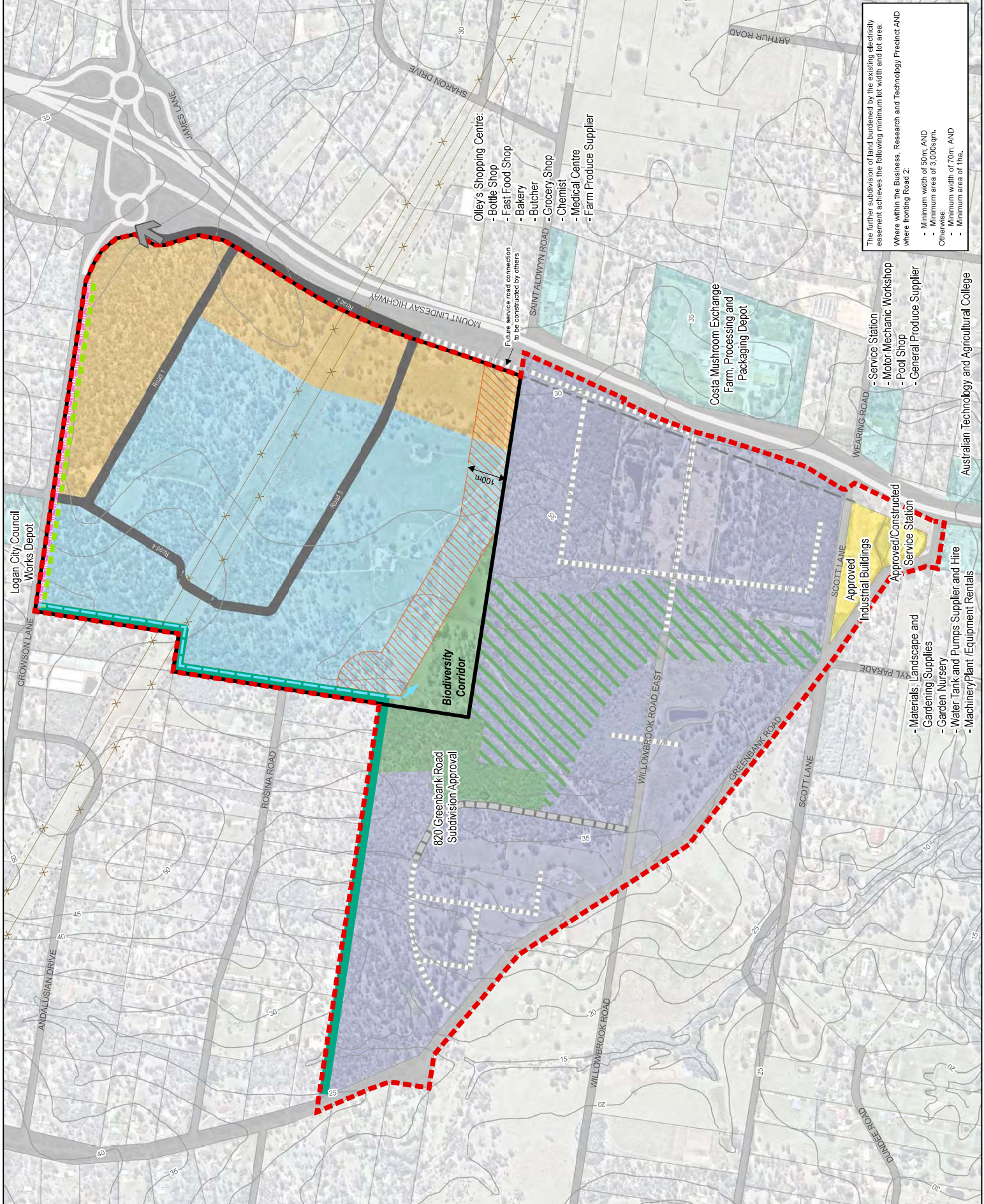
Date: 11/12/2020



TITLE
**NORTH MACLEAN ENTERPRISE
 CONTEXT PLAN LAND USE AND
 ROAD NETWORK**

PROJECT
**4499 - 4651 MT
 LINDESAY HIGHWAY,
 NORTH MACLEAN**

CLIENT: WEARCO PTY LTD



The further subdivision of land burdened by the existing electricity easement achieves the following minimum lot width and lot area where fronting Road 2:

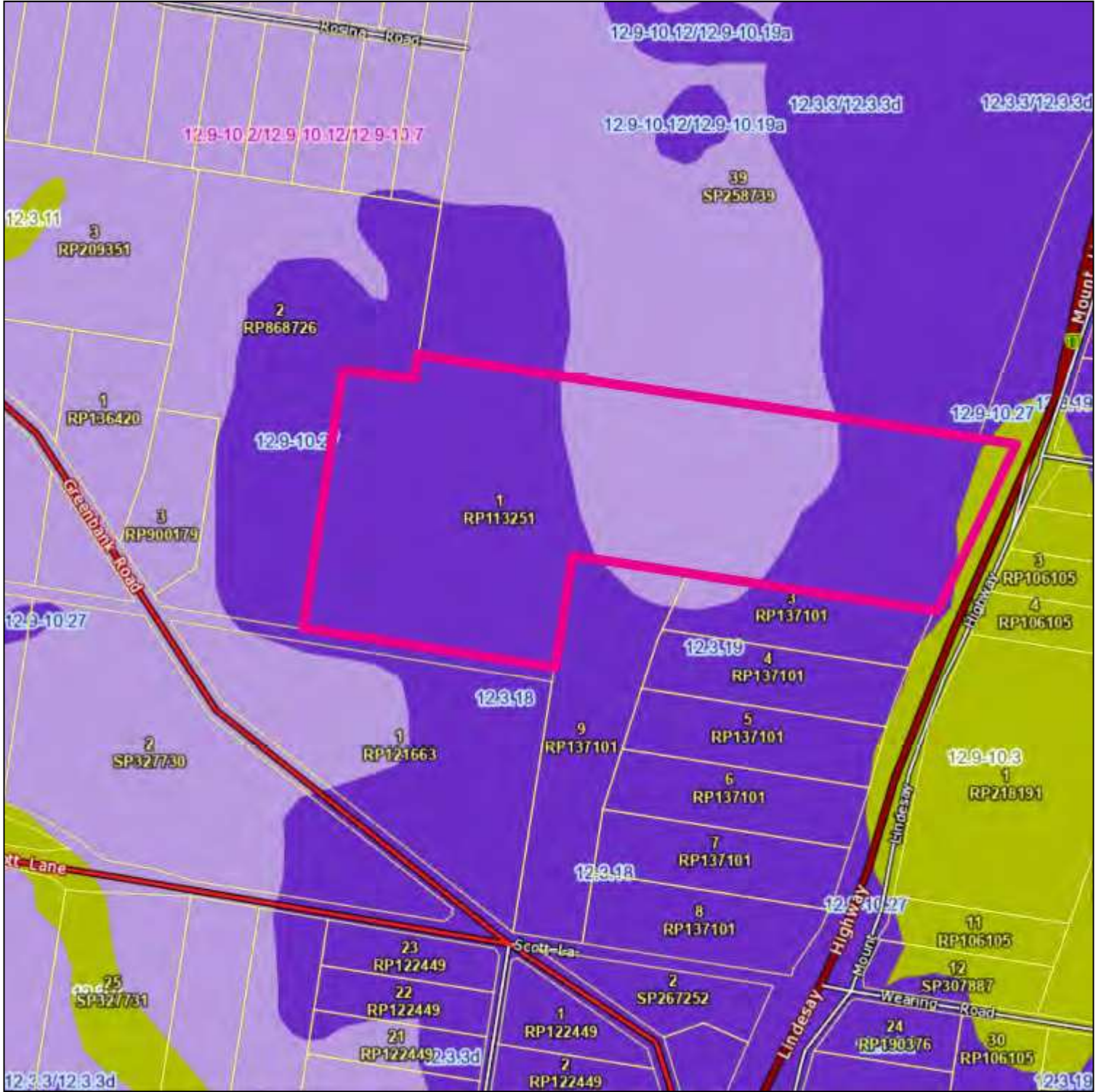
- Minimum width of 50m; AND
- Minimum area of 3,000sqm.

Otherwise:

- Minimum width of 70m; AND
- Minimum area of 1ha.

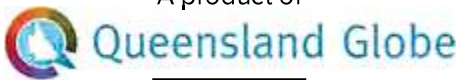


Attachment 5 – Preclear Mapping



A product of

Legend located on next page



Scale: 1:10000

Printed at: A4

Print date: 28/6/2022

Projection: Web Mercator EPSG 102100 (3857)

For more information, visit
<https://qldglobe.information.qld.gov.au/help-info/Contact-us.html>



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**Regional biodiversity corridor
- SEQ Regional Plan 2017
[ShapingSEQ]**



Land parcel



Land parcel - gt 1 ha



Land parcel - gt 10 ha



Land parcel - gt 1000 ha



Land parcel label

Land parcel label - gt 1 ha







Land parcel label - gt 10 ha

Land parcel label - gt 1000 ha

Railway







Biodiversity status - preclear

-  Endangered - Dominant vegetation
-  Endangered - Sub-dominant
-  Of Concern - Dominant
-  Of Concern - Sub-dominant
-  No concern at present
-  Estuary, ocean

Road Crossing

-  Bridge
-  Tunnel

Road

-  Highway
-  Main
-  Local
-  Private

Cities and Towns



Maxar

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Queensland Herbarium (2022) Biodiversity Status of Pre-clearing Regional Ecosystems of Queensland. State of Queensland (Department of Environment and Science).

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Attachment 6 – Regional Ecosystem Descriptions



Queensland Government home > For Queenslanders > Environment, land and water > Plants and animals > Plants > Regional ecosystems > Regional ecosystem descriptions > **Regional ecosystem details for 12.3.18**

Regional ecosystem details for 12.3.18

Regional ecosystem	12.3.18
Vegetation Management Act class	Endangered
Wetlands	Palustrine
Biodiversity status	Endangered
Subregion	2, (5)
Estimated extent ¹	Pre-clearing 2000 ha; Remnant 2019 100 ha
Extent in reserves	No representation
Short description	Melaleuca irbyana low open forest on alluvial plains
Structure category	Mid-dense
Description	Melaleuca irbyana low open forest or thicket. Emergent Eucalyptus moluccana, E. crebra, E. tereticornis or Corymbia citriodora subsp. variegata may be present. Occurs on Quaternary alluvial plains where drainage of soils is impeded. (BVG1M: 21b)
Supplementary description	Bean et al. (1998), C5

Special values Habitat for listed plant species *Melaleuca irbyana* and *Marsdenia coronata*. This ecosystem is known to provide suitable habitat for koalas (*Phascolarctos cinereus*).

Fire management guidelines SEASON: Summer to late-autumn. INTENSITY: Low. INTERVAL: 3-6 years. STRATEGY: Aim to burn 40-60% of any given area. Spot ignition in cooler or moister periods encourages mosaics. ISSUES: Control of weeds is a major focus of planned burning in most areas. Maintain ground litter and fallen timber habitats by burning only with sufficient soil moisture. Burning should aim to produce fine scale mosaics of unburnt areas.

Comments Previously mapped as 12.3.3c. This floristic association on land zone 9-10 is mapped as 12.9-10.11. Restricted to the Ipswich and Jimboomba regions and the Lockyer and Fassifern Valleys.

¹ Estimated extent is from version 12.1 pre-clearing and 2019 remnant regional ecosystem mapping. Figures are rounded for simplicity. For more precise estimates, including breakdowns by tenure and other themes see [remnant vegetation in Queensland \(https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/remnant-vegetation/\)](https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/remnant-vegetation/).

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Queensland Government home > For Queenslanders > Environment, land and water > Plants and animals > Plants > Regional ecosystems > Regional ecosystem descriptions > **Regional ecosystem details for 12.3.19**

Regional ecosystem details for 12.3.19

Regional ecosystem	12.3.19
Vegetation Management Act class	Endangered
Wetlands	Not a Wetland
Biodiversity status	Endangered
Subregion	2
Estimated extent ¹	Pre-clearing 3000 ha; Remnant 2019 300 ha
Extent in reserves	No representation
Short description	Eucalyptus moluccana and/or Eucalyptus tereticornis and E. crebra open forest to woodland, with a sparse to mid-dense understorey of Melaleuca irbyana on alluvial plains
Structure category	Mid-dense
Description	Eucalyptus moluccana and/or Eucalyptus tereticornis and E. crebra open forest to woodland, with a sparse to mid-dense understorey of Melaleuca irbyana. Occurs on margins of Quaternary alluvial plains. (BVG1M: 13d)
Supplementary description	DERM (2010), C5a

Special values Habitat for listed plant species *Melaleuca irbyana*. This ecosystem is known to provide suitable habitat for koalas (*Phascolarctos cinereus*).

Fire management guidelines SEASON: Summer to late-autumn. INTENSITY: Low. INTERVAL: 3-6 years. STRATEGY: Aim to burn 40-60% of any given area. Spot ignition in cooler or moister periods encourages mosaics. ISSUES: Control of weeds is a major focus of planned burning in most areas. Maintain ground litter and fallen timber habitats by burning only with sufficient soil moisture. Burning should aim to produce fine scale mosaics of unburnt areas.

Comments Previously mapped as 12.3.3b. This floristic association on land zone 9-10 is mapped as 12.9-10.27. Restricted to the Ipswich, Jimboomba and Green Swamp regions.

¹ Estimated extent is from version 12.1 pre-clearing and 2019 remnant regional ecosystem mapping. Figures are rounded for simplicity. For more precise estimates, including breakdowns by tenure and other themes see [remnant vegetation in Queensland](https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/remnant-vegetation/) (<https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/remnant-vegetation/>).

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Queensland Government home > For Queenslanders > Environment, land and water > Plants and animals > Plants > Regional ecosystems > Regional ecosystem descriptions > **Regional ecosystem details for 12.9-10.2**

Regional ecosystem details for 12.9-10.2

Regional ecosystem	12.9-10.2
Vegetation Management Act class	Least concern
Wetlands	Not a Wetland
Biodiversity status	No concern at present
Subregion	2, 7, 8, (5), (1), (1), (11.18), (6), (11.31), (3)
Estimated extent ¹	Pre-clearing 222000 ha; Remnant 2019 87000 ha
Extent in reserves	Low
Short description	<i>Corymbia citriodora</i> subsp. <i>variegata</i> +/- <i>Eucalyptus crebra</i> open forest on sedimentary rocks
Structure category	Mid-dense
Description	<i>Corymbia citriodora</i> subsp. <i>variegata</i> open forest or woodland usually with <i>Eucalyptus crebra</i> . Other species such as <i>Eucalyptus tereticornis</i> , <i>E. moluccana</i> , <i>E. acmenoides</i> and <i>E. siderophloia</i> may be present in scattered patches or in low densities. Understorey can be grassy or shrubby. Shrubby understorey of <i>Lophostemon confertus</i> (whipstick form) often present in northern parts of bioregion. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 10b)
Supplementary	Ryan, T.S. (ed.) (2012); Bean et al. (1998), H19

description	
Protected areas	Wongi NP, Mount Barney NP, Cordalba NP, Lockyer NP, Gatton NP, Glenbar NP, Mount Perry CP, White Rock CP, Knapp Creek CP, Tenthill CP, Lockyer RR, Fairlies Knob NP, Moogerah Peaks NP, Flagstone Creek CP, Littabella NP, Flinders Peak CP, Littabella CP, Dawes NP, Denmark Hill CP, Woocoo NP
Special values	Habitat for threatened plant species including <i>Notelaea lloydii</i> , <i>Grevillea quadricauda</i> , <i>Westringia sericea</i> , <i>Coleus habrophyllus</i> . This ecosystem is known to provide suitable habitat for koalas (<i>Phascolarctos cinereus</i>).
Fire management guidelines	SEASON: Summer to winter. INTENSITY: Low to moderate. INTERVAL: 4-25 years. STRATEGY: Aim for 40-60% mosaic burn. Burn with soil moisture and with a spot ignition strategy so that a patchwork of burnt/unburnt country is achieved. ISSUES: The fire regime should maintain a mosaic of grassy and shrubby understoreys. Control of weeds is a major focus of planned burning in most areas. Careful thought should be given to maintaining ground litter and fallen timber habitats by burning only with sufficient soil moisture. Burning should aim to produce fine scale mosaics of unburnt areas. Variability in season and fire intensity is important, as well as spot ignition in cooler or moister periods to encourage mosaics. There is evidence that the spiral leaf <i>Macrozamia</i> (e.g. <i>M. parcifolia</i>) decline in health if fire interval is greater than 6 years.
Comments	Typically occurs in drier sub-coastal environments and is less species rich than 12.9-10.17b.

¹ Estimated extent is from version 12.1 pre-clearing and 2019 remnant regional ecosystem mapping. Figures are rounded for simplicity. For more precise estimates, including breakdowns by tenure and other themes see [remnant vegetation in Queensland \(https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/remnant-vegetation/\)](https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/remnant-vegetation/).

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Queensland Government home > For Queenslanders > Environment, land and water > Plants and animals > Plants > Regional ecosystems > Regional ecosystem descriptions > **Regional ecosystem details for 12.9-10.3**

Regional ecosystem details for 12.9-10.3

Regional ecosystem	12.9-10.3
Vegetation Management Act class	Of concern
Wetlands	Not a Wetland
Biodiversity status	Of concern
Subregion	8, 7, 2, 6, (5), (1), (11.31), (1), (11.22), (3)
Estimated extent ¹	Pre-clearing 91000 ha; Remnant 2019 27000 ha
Extent in reserves	Low
Short description	Eucalyptus moluccana open forest on sedimentary rocks
Structure category	Mid-dense
Description	Eucalyptus moluccana open forest. Other canopy species include Eucalyptus siderophloia or E. crebra, E. tereticornis and Corymbia citriodora subsp. variegata. Understorey generally sparse but can become shrubby in absence of fire. Occurs on Cainozoic and Mesozoic sediments, especially shales. Prefers lower slopes. (BVG1M: 13d)
Supplementary description	Ryan, T.S. (ed.) (2012); Bean et al. (1998), E7

Protected areas	Wongi NP, Nour Nour NP, Cordalba NP, Kroombit Tops NP, Cherbourg NP, Littabella NP, Littabella CP, Dwyers Scrub CP, Burrum Coast NP, Bottle Creek CP, Mount Binga NP, Mount Barney NP, Moogerah Peaks NP, Knapp Creek CP, Gatton NP, Fairlies Knob NP, Cherbourg CP, Daisy Hill CP
Special values	Potential habitat for NCA listed species: <i>Callitris baileyi</i> , <i>Haloragis exalata</i> subsp. <i>velutina</i> , <i>Picris conyzoides</i> , <i>Sophora fraseri</i> . This ecosystem is known to provide suitable habitat for koalas (<i>Phascolarctos cinereus</i>).
Fire management guidelines	SEASON: Summer to winter. INTENSITY: Low to moderate. INTERVAL: 4-25 years. STRATEGY: Aim for 40-60% mosaic burn. Burn with soil moisture and with a spot ignition strategy so that a patchwork of burnt/unburnt country is achieved. ISSUES: The fire regime should maintain a mosaic of grassy and shrubby understoreys. Control of weeds is a major focus of planned burning in most areas. Careful thought should be given to maintaining ground litter and fallen timber habitats by burning only with sufficient soil moisture. Burning should aim to produce fine scale mosaics of unburnt areas. Variability in season and fire intensity is important, as well as spot ignition in cooler or moister periods to encourage mosaics. There is evidence that the spiral leaf <i>Macrozamia</i> s (e.g. <i>M. parcifolia</i>) decline in health if fire interval is greater than 6 years.
Comments	Extensively cleared or thinned for grazing.

¹ Estimated extent is from version 12.1 pre-clearing and 2019 remnant regional ecosystem mapping. Figures are rounded for simplicity. For more precise estimates, including breakdowns by tenure and other themes see [remnant vegetation in Queensland](https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/remnant-vegetation/) (<https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/remnant-vegetation/>).

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Queensland Government home > For Queenslanders > Environment, land and water > Plants and animals > Plants > Regional ecosystems > Regional ecosystem descriptions > **Regional ecosystem details for 12.9-10.7**

Regional ecosystem details for 12.9-10.7

Regional ecosystem	12.9-10.7
Vegetation Management Act class	Of concern
Wetlands	Not a Wetland
Biodiversity status	Of concern
Subregion	2, 5, 6, 8, (7), (1), (11.31), (3), (1), (11.22), (4), (9)
Estimated extent ¹	Pre-clearing 245000 ha; Remnant 2019 40000 ha
Extent in reserves	Low
Short description	Eucalyptus crebra +/- E. tereticornis, Corymbia tessellaris, Angophora spp. and E. melanophloia woodland on sedimentary rocks
Structure category	Sparse

Description Eucalyptus crebra +/- E. tereticornis, Corymbia tessellaris, Angophora leiocarpa, E. melanophloia woodland. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 13c)

Vegetation communities in this regional ecosystem include:

12.9-10.7a: Eucalyptus siderophloia, Corymbia intermedia +/- E. tereticornis and Lophostemon confertus open forest. Occurs on Cainozoic and Mesozoic sediments in near coastal areas. Not a Wetland (BVG1M: 12a)

Supplementary description	Ryan, T.S. (ed.) (2012); Bean et al. (1998), I13
Protected areas	Main Range NP, Mount Barney NP, Wongi NP, Cherbourg NP, Benarkin NP, Conondale NP, Mount Binga NP, Flagstone Creek CP, Kroombit Tops NP, White Rock CP, Lamington NP, Mount Perry CP, Southern Moreton Bay Islands NP, Moogerah Peaks NP, Gatton NP, Great Sandy NP, Mount Coolum NP, Flinders Peak CP, Dwyers Scrub CP, Woocoo NP, Cherbourg CP, Knapp Creek CP, Pidna NP
Special values	Potential habitat for NCA listed species: <i>Callitris baileyi</i> , <i>Graptophyllum reticulatum</i> , <i>Melaleuca formosa</i> , <i>Melaleuca irbyana</i> , <i>Paspalidium grandispiculatum</i> , <i>Coleus habrophyllus</i> , <i>Polianthion minutiflorum</i> and <i>Zieria inexpectata</i> . This ecosystem is known to provide suitable habitat for koalas (<i>Phascolarctos cinereus</i>). 12.9-10.7a: This ecosystem is known to provide suitable habitat for koalas (<i>Phascolarctos cinereus</i>).
Fire management guidelines	SEASON: Summer to winter. INTENSITY: Low to moderate. INTERVAL: 4-25 years. STRATEGY: Aim for 40-60% mosaic burn. Burn with soil moisture and with a spot ignition strategy so that a patchwork of burnt/unburnt country is achieved. ISSUES: The fire regime should maintain a mosaic of grassy and shrubby understoreys. Control of weeds is a major focus of planned burning in most areas. Careful thought should be given to maintaining ground litter and fallen timber habitats by burning only with sufficient soil moisture. Burning should aim to produce fine scale mosaics of unburnt areas. Variability in season and fire intensity is important, as well as spot ignition in cooler or moister periods to encourage mosaics.
Comments	12.9-10.7: A sub coastal population of <i>Callitris columellaris</i> is associated with this RE near Coominya in the Lockyer Valley. Extensively cleared for pasture. 12.9-10.7a: Extensively cleared for pasture. This regional ecosystem is a coastal mesic variant of 12.9-10.7.

¹ Estimated extent is from version 12.1 pre-clearing and 2019 remnant regional ecosystem mapping. Figures are rounded for simplicity. For more precise estimates, including breakdowns by tenure and other themes see [remnant vegetation in Queensland](https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/remnant-vegetation/) (<https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/remnant-vegetation/>).

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Queensland Government home > For Queenslanders > Environment, land and water > Plants and animals > Plants > Regional ecosystems > Regional ecosystem descriptions > **Regional ecosystem details for 12.9-10.12**

Regional ecosystem details for 12.9-10.12

Regional ecosystem	12.9-10.12
Vegetation Management Act class	Endangered
Wetlands	Not a Wetland
Biodiversity status	Endangered
Subregion	2, (3), (4)
Estimated extent ¹	Pre-clearing 15000 ha; Remnant 2019 3000 ha
Extent in reserves	No representation
Short description	Mixed woodland usually containing <i>Corymbia intermedia</i> , <i>Angophora leiocarpa</i> and at least the presence of <i>Eucalyptus seeana</i> on sedimentary rocks
Structure category	Sparse

Description Mixed woodland to open forest usually containing *Corymbia intermedia*, *Angophora leiocarpa* and at least a presence of *Eucalyptus seeana*. Other commonly associated species include *E. siderophloia*, *E. tereticornis*, *E. racemosa* subsp. *Racemosa* and *C. citriodora* subsp. *Variegata*. *E. seeana* and *Lophostemon suaveolens* are often present as sub-canopy or understorey trees. Occasional *Melaleuca quinquenervia* on lower slopes. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 9g)

Vegetation communities in this regional ecosystem include:

12.9-10.12a: [Not in RE version 12.1]²: This vegetation community is now mapped as 12.11.27. *Angophora leiocarpa*, *Eucalyptus interstans* +/- *Corymbia intermedia*, *E. tereticornis* *C. tessellaris*, *E. siderophloia*, *C. citriodora* subsp. *variegata* woodland to open forest. *Lophostemon suaveolens* is often present as a sub-canopy or understorey tree. Occasional *Melaleuca quinquenervia* on lower slopes. Occurs on Cainozoic and Mesozoic sediments. Not a Wetland (BVG1M: 9g)

Supplementary description	Bean et al. (1998), H36, H39j, H7
Special values	This ecosystem is known to provide suitable habitat for koalas (<i>Phascolarctos cinereus</i>).
Fire management guidelines	SEASON: Summer to winter. INTENSITY: Low to moderate. INTERVAL: 4-25 years. STRATEGY: Aim for 40-60% mosaic burn. Burn with soil moisture and with a spot ignition strategy so that a patchwork of burnt/unburnt country is achieved. ISSUES: The fire regime should maintain a mosaic of grassy and shrubby understoreys. Control of weeds is a major focus of planned burning in most areas. Careful thought should be given to maintaining ground litter and fallen timber habitats by burning only with sufficient soil moisture. Burning should aim to produce fine scale mosaics of unburnt areas. Variability in season and fire intensity is important, as well as spot ignition in cooler or moister periods to encourage mosaics.
Comments	12.9-10.12: <i>Eucalyptus seeana</i> is the diagnostic species for this regional ecosystem. It often occurs as a relatively minor component, but there must at least be a presence of <i>E. seeana</i> to be classified as 12.9-10.12. Areas of this regional ecosystem on remnant Tertiary surfaces that are mappable (>2ha) are defined as 12.5.3a. Subject to increasing fragmentation and urbanisation. Occurs on south-west outskirts of Brisbane and into Logan City. 12.9-10.12a: Occurs near Esk. Subject to increasing fragmentation and urbanisation. <i>Eucalyptus interstans</i> is the diagnostic species of this regional ecosystem. It often occurs as a subdominant component.

¹ Estimated extent is from version 12.1 pre-clearing and 2019 remnant regional ecosystem mapping. Figures are rounded for simplicity. For more precise estimates, including breakdowns by tenure and other themes see [remnant vegetation in Queensland](https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/remnant-vegetation/) (<https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/remnant-vegetation/>).

² Superseded: Revision of the regional ecosystem classification removed this regional ecosystem code from use. It is included in the regional ecosystem description database because the RE code may appear in older versions of RE mapping and the Vegetation Management regulation.

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Queensland Government home > For Queenslanders > Environment, land and water > Plants and animals > Plants > Regional ecosystems > Regional ecosystem descriptions > **Regional ecosystem details for 12.9-10.27**

Regional ecosystem details for 12.9-10.27

Regional ecosystem	12.9-10.27
Vegetation Management Act class	Endangered
Wetlands	Not a Wetland
Biodiversity status	Endangered
Subregion	2
Estimated extent ¹	Pre-clearing 5000 ha; Remnant 2019 400 ha
Extent in reserves	No representation
Short description	<i>Corymbia citriodora</i> subsp. <i>variegata</i> and/or <i>E. moluccana</i> , <i>E. tereticornis</i> , <i>E. crebra</i> open forest with <i>Melaleuca irbyana</i> understorey on sedimentary rocks
Structure category	Mid-dense
Description	<i>Corymbia citriodora</i> subsp. <i>variegata</i> , <i>Eucalyptus crebra</i> and/or <i>E. moluccana</i> , <i>E. tereticornis</i> open forest with a very sparse to mid-dense understorey of <i>Melaleuca irbyana</i> . Occurs on lower slopes and elevated flats with impeded drainage on Mesozoic sediments. (BVG1M: 10b)
Supplementary description	Bean et al. (1998), C5a

Special values

Habitat for listed plant species *Melaleuca irbyana*. This ecosystem is known to provide suitable habitat for koalas (*Phascolarctos cinereus*).

Fire management guidelines

SEASON: Late summer to mid-winter (after rain). **INTENSITY:** Planned and occasional unplanned burns (typically of higher intensity) influence the ecology of melaleuca ecosystems. **INTERVAL:** Mixed grass/shrub 6-20 years. **STRATEGY:** Aim for a 25-70% burn mosaic (in association with surrounding ecosystems, as melaleuca ecosystems often just occur in patches or along natural drainage lines). Fires may, depending on the conditions and type of vegetation, burn areas larger than just the melaleuca ecosystem. Ensure secure boundaries from non fire-regime adapted ecosystems. High soil moisture (or presence of water on the ground) is required, as avoidance of peat-type fires must be maintained. **ISSUES:** *M. irbyana* may be managed differently to the rest. This is a low melaleuca forest with eucalypt overstorey. Fire regimes for melaleuca ecosystems in general require further fire research. Melaleuca forests are fire-adapted, but too high an intensity or frequent fire will slow or prevent regeneration and lead to lower species richness (since these communities contain numerous obligate seed regenerating species that require sufficient fire intervals to produce seed). High intensity fires may kill trees and lead to whipstick regeneration. Too frequent fire may result in a net loss of nutrients over time from an already nutrient poor system. Fire associations are significantly influenced by understorey composition. Mixed understorey communities burn in a similar way to dry sclerophyll, in association with the surrounding dry sclerophyll, though somewhat less frequently due to the additional moisture present in melaleuca communities.

Comments

Previously mapped as 12.9-10.11a. Generally the *Melaleuca irbyana* understorey ranges from sparse when associated with *C. citriodora* subsp. *variegata* and *E. crebra* to mid-dense when associated with *E. moluccana* & *E. tereticornis*. This floristic association on land zone 3 is mapped as 12.3.19. Being cleared for rural residential development. Restricted to the Ipswich, Jimboomba and Lockyer valley regions.

¹ Estimated extent is from version 12.1 pre-clearing and 2019 remnant regional ecosystem mapping. Figures are rounded for simplicity. For more precise estimates, including breakdowns by tenure and other themes see [remnant vegetation in Queensland \(https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/remnant-vegetation/\)](https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/remnant-vegetation/).

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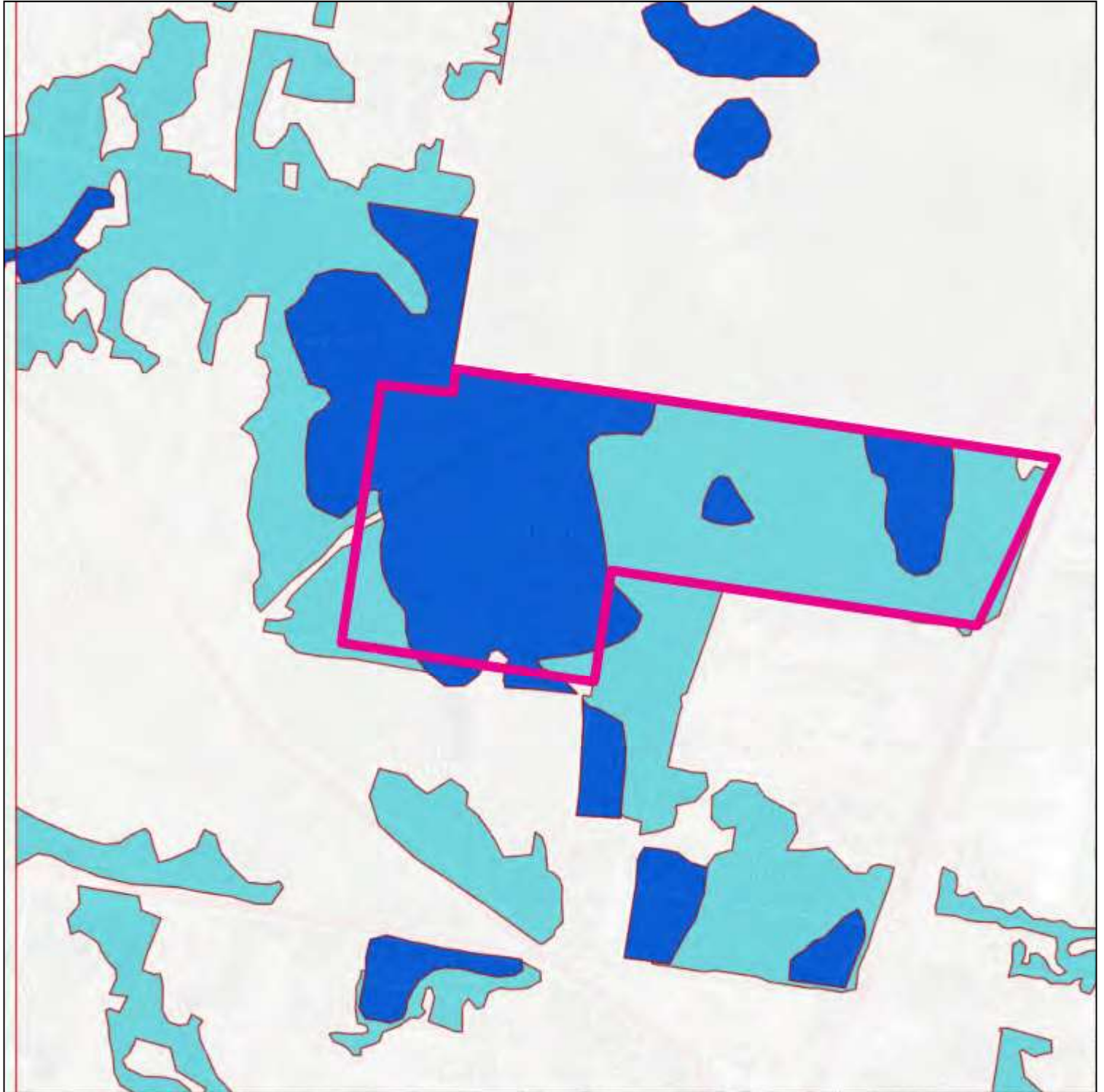
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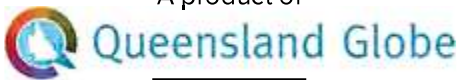


Attachment 7 – Regulated Vegetation Management Map



A product of

Legend located on next page



Scale: 1:10000

Printed at: A4

Print date: 28/6/2022

Projection: Web Mercator EPSG 102100 (3857)

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RVM category A - vegetation offsets; compliance notices; VDecs



RVM category B - remnant vegetation



RVM category C - high-value regrowth vegetation



RVM category R - reef-regrowth watercourse vegetation



RVM category X - exempt clearing work on Freehold/Indigenous/Leasehold land



RVM water



RVM area not categorised



RVM - all



Category A

Category B

Category C

Category R

Category X

Water

Not Categorised

Land parcel



Land parcel - gt 1 ha



Land parcel - gt 10 ha



Land parcel - gt 1000 ha



Land parcel label

Land parcel label - gt 1 ha

Land parcel label - gt 10 ha

Land parcel label - gt 1000 ha

Railway



Cities and Towns

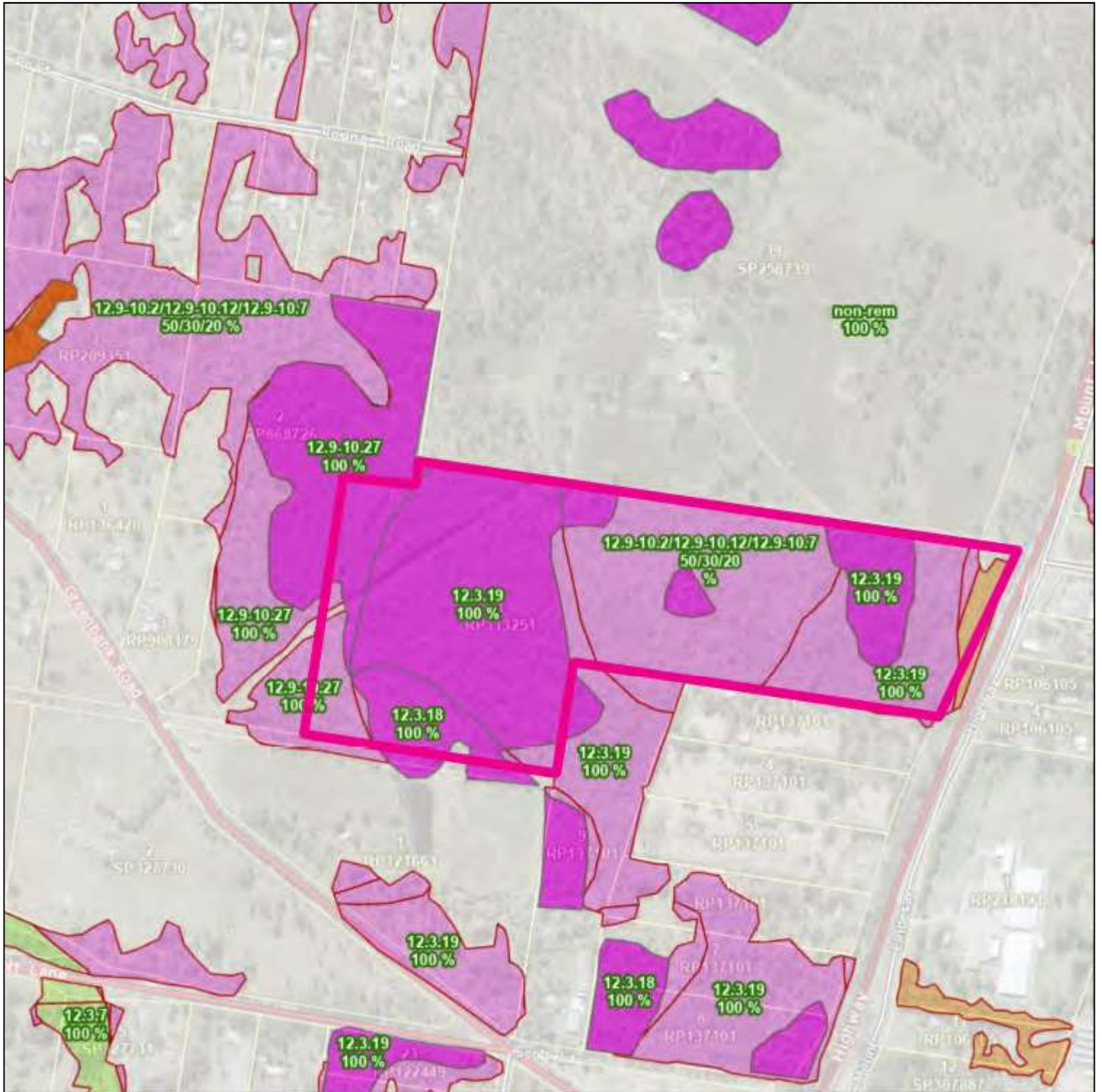


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Vegetation management regional ecosystem map labels

Category A or B area containing endangered



Category A or B area containing of concern



Category A or B area that is least concern



Category C or R area containing endangered



Category C or R area containing of concern



Category C or R area that is of least concern



Water





Non-remnant


Land parcel





Vegetation management regional ecosystem - all

 Category A or B area containing endangered

 Category A or B area containing of concern

 Category A or B area that is least concern

 Category C or R area containing endangered

 Category C or R area containing of concern

 Category C or R area that is of least concern

 Water

Non-remnant

Land parcel - gt 1 ha

 Parcel

Land parcel - gt 10 ha

 Parcel

Land parcel - gt 1000 ha

 Parcel

Land parcel label

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Attachment 8 – Koala Map



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0 250 metres

Scale: 1:10000

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Projection: Web Mercator EPSG 102100 (3857)

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Land parcel

 Parcel

Land parcel - gt 1 ha

 Parcel

Land parcel - gt 10 ha

 Parcel

Land parcel - gt 1000 ha

 Parcel

Land parcel label

Land parcel label - gt 1 ha

Land parcel label - gt 10 ha

Land parcel label - gt 1000 ha

Core koala habitat area



Locally refined koala habitat area



Road Crossing

 Bridge

 Tunnel

Road

 Highway

 Main

 Local

 Private

Railway



Cities and Towns



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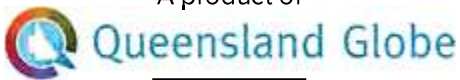


Attachment 9 – MSES Mapping



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MSES regulated vegetation
[category B - endangered or
of concern]



MSES regulated vegetation
[category C- endangered or
of concern]



MSES regulated vegetation
[category R- GBR riverine]



MSES regulated vegetation
[essential habitat]



MSES regulated vegetation
[100m from wetland]



MSES wildlife habitat
[endangered or vulnerable]



MSES wildlife habitat [special
least concern animal]



MSES wildlife habitat [SEQ
koala habitat - core]



MSES wildlife habitat [SEQ
koala habitat - locally refined]



Land parcel

Land parcel - gt 1 ha



Land parcel - gt 10 ha



Land parcel - gt 1000 ha



Land parcel label

Land parcel label - gt 1 ha

Land parcel label - gt 10 ha

Land parcel label - gt 1000 ha

Road Crossing



Tunnel

Railway



Maxar

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Attachment 10 – Protected Matters Search Tool



EPBC Act Protected Matters Report

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

Report created: 10-May-2022

[Summary](#)

[Details](#)

[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)

Summary

Matters of National Environment Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar)	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	6
Listed Threatened Species:	38
Listed Migratory Species:	16

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	21
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

State and Territory Reserves:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	4
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	1
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar Wetlands) [\[Resource Information \]](#)

Ramsar Site Name	Proximity
Moreton bay	20 - 30km upstream from Ramsar site

Listed Threatened Ecological Communities [\[Resource Information \]](#)

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

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

Community Name	Threatened Category	Presence Text
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community	Endangered	Community may occur within area
Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland	Endangered	Community likely to occur within area
Lowland Rainforest of Subtropical Australia	Critically Endangered	Community may occur within area
Poplar Box Grassy Woodland on Alluvial Plains	Endangered	Community may occur within area
Swamp Tea-tree (Melaleuca irbyana) Forest of South-east Queensland	Critically Endangered	Community likely to occur within area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community may occur within area

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

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act. Number is the current name ID.

Scientific Name	Threatened Category	Presence Text
BIRD		
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Foraging, feeding or related behaviour likely to occur within area

Scientific Name	Threatened Category	Presence Text
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat may occur within area
Cyclopsitta diophthalma coxeni Coxen's Fig-Parrot [59714]	Endangered	Species or species habitat may occur within area
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat likely to occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area
Geophaps scripta scripta Squatter Pigeon (southern) [64440]	Vulnerable	Species or species habitat may occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
Turnix melanogaster Black-breasted Button-quail [923]	Vulnerable	Species or species habitat likely to occur within area
FISH		
Maccullochella mariensis Mary River Cod [83806]	Endangered	Translocated population known to occur within area
INSECT		
Argynnis hyperbius inconstans Australian Fritillary [88056]	Critically Endangered	Species or species habitat may occur within area
MAMMAL		
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat may occur within area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area
Macroderma gigas Ghost Bat [174]	Vulnerable	Species or species habitat may occur within area
Petauroides volans Greater Glider [254]	Vulnerable	Species or species habitat likely to occur within area
Petaurus australis australis Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat likely to occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
Potorous tridactylus tridactylus Long-nosed Potoroo (northern) [66645]	Vulnerable	Species or species habitat may occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
PLANT		
Arthraxon hispidus Hairy-joint Grass [9338]	Vulnerable	Species or species habitat may occur within area
Bosistoa transversa Three-leaved Bosistoa, Yellow Satinheart [16091]	Vulnerable	Species or species habitat likely to occur within area
Dichanthium setosum bluegrass [14159]	Vulnerable	Species or species habitat likely to occur within area
Fontainea venosa [24040]	Vulnerable	Species or species habitat may occur within area
Macadamia integrifolia Macadamia Nut, Queensland Nut Tree, Smooth-shelled Macadamia, Bush Nut, Nut Oak [7326]	Vulnerable	Species or species habitat likely to occur within area
Macadamia tetraphylla Rough-shelled Bush Nut, Macadamia Nut, Rough-shelled Macadamia, Rough-leaved Queensland Nut [6581]	Vulnerable	Species or species habitat may occur within area
Notelaea ipsviciensis Cooneana Olive [81858]	Critically Endangered	Species or species habitat may occur within area
Rhodamnia rubescens Scrub Turpentine, Brown Malletwood [15763]	Critically Endangered	Species or species habitat may occur within area
Rhodomyrtus psidioides Native Guava [19162]	Critically Endangered	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Samadera bidwillii Quassia [29708]	Vulnerable	Species or species habitat likely to occur within area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat may occur within area

REPTILE

Coeranoscincus reticulatus Three-toed Snake-tooth Skink [59628]	Vulnerable	Species or species habitat may occur within area
Delma torquata Adorned Delma, Collared Delma [1656]	Vulnerable	Species or species habitat may occur within area
Furina dunmalli Dunmall's Snake [59254]	Vulnerable	Species or species habitat may occur within area

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

Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area

Migratory Terrestrial Species

Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat likely to occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat likely to occur within area
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat likely to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Anseranas semipalmata Magpie Goose [978]		Species or species habitat may occur within area overfly marine area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat likely to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area overfly marine area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat likely to occur within area overfly marine area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat likely to occur within area overfly marine area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat likely to occur within area overfly marine area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area overfly marine area

Extra Information

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

Title of referral	Reference	Referral Outcome	Assessment Status
Controlled action			
Cedar Grove Connector Pipeline	2011/6013	Controlled Action	Completed
Industrial Development in the Greater Flagstone Urban Development Area 4499-4651 Mount Lindesay Hwy, Nth Maclean (Lot 39) Qld	2013/6941	Controlled Action	Post-Approval
Not controlled action			
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed
Not controlled action (particular manner)			
Construction & Operation 275/330kV Transmission Line	2006/2820	Not Controlled Action (Particular Manner)	Post-Approval

Bioregional Assessments

SubRegion	BioRegion	Website
Clarence-Moreton	Clarence-Moreton	BA website

Caveat

1 PURPOSE

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

The report contains the mapped locations of:

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

2 DISCLAIMER

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

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

3 DATA SOURCES

Threatened ecological communities

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

Threatened, migratory and marine species

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

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

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

4 LIMITATIONS

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

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

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

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

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

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

Acknowledgements

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

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

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



Attachment 11 – Wildlife Online Data



Queensland Government

WildNet species list

Search Criteria: Species List for a Specified Point
Species: All
Type: Native
Queensland status: All
Records: Confirmed
Date: Since 1980
Latitude: -27.768
Longitude: 153.011
Distance: 5
Email: wayne@28south.com.au
Date submitted: Tuesday 10 May 2022 16:39:30
Date extracted: Tuesday 10 May 2022 16:40:02

The number of records retrieved = 192

Disclaimer

Information presented on this product is distributed by the Queensland Government as an information source only. While every care is taken to ensure the accuracy of this data, the State of Queensland makes no statements, representations or warranties about the accuracy, reliability, completeness or suitability of any information contained in this product.
The State of Queensland disclaims all responsibility for information contained in this product and all liability (including liability in negligence) for all expenses, losses, damages and costs you may incur as a result of the information being inaccurate or incomplete in any way for any reason. Information about your Species lists request is logged for quality assurance, user support and product enhancement purposes only.
The information provided should be appropriately acknowledged as being derived from WildNet database when it is used. As the WildNet Program is still in a process of collating and vetting data, it is possible the information given is not complete. Go to the WildNet database webpage (<https://www.qld.gov.au/environment/plants-animals/species-information/wildnet>) to find out more about WildNet and where to access other WildNet information products approved for publication. Feedback about WildNet species lists should be emailed to wildlife.online@des.qld.gov.au.

Kingdom Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	Hylidae	<i>Litoria balatus</i>	slender bleating tree frog	C			1
animals	Hylidae	<i>Litoria brevipalmata</i>	green thighed frog	C			1
animals	Hylidae	<i>Litoria caerulea</i>	common green treefrog	C			13
animals	Hylidae	<i>Litoria fallax</i>	eastern sedgefrog	C			24
animals	Hylidae	<i>Litoria gracilentata</i>	graceful treefrog	C			3
animals	Hylidae	<i>Litoria latopalmata</i>	broad palmed rocketfrog	C			4
animals	Hylidae	<i>Litoria nasuta</i>	striped rocketfrog	C			5
animals	Hylidae	<i>Litoria peronii</i>	emerald spotted treefrog	C			1
animals	Hylidae	<i>Litoria rubella</i>	ruddy treefrog	C			6
animals	Hylidae	<i>Litoria wilcoxii</i>	eastern stony creek frog	C			1
animals	Limnodynastidae	<i>Adelotus brevis</i>	tusked frog	V			1
animals	Limnodynastidae	<i>Limnodynastes peronii</i>	striped marshfrog	C			11
animals	Limnodynastidae	<i>Limnodynastes tasmaniensis</i>	spotted grassfrog	C			3
animals	Limnodynastidae	<i>Limnodynastes terraereginae</i>	scarlet sided pobblebonk	C			8
animals	Limnodynastidae	<i>Platyplectrum ornatum</i>	ornate burrowing frog	C			3
animals	Myobatrachidae	<i>Crinia parinsignifera</i>	beeping froglet	C			10
animals	Myobatrachidae	<i>Mixophyes fasciolatus</i>	great barred frog	C			3
animals	Myobatrachidae	<i>Pseudophryne coriacea</i>	red backed broodfrog	C			2
animals	Myobatrachidae	<i>Pseudophryne raveni</i>	copper backed broodfrog	C			1
animals	Myobatrachidae	<i>Uperoleia rugosa</i>	chubby gungan	C			3
animals	Acanthizidae	<i>Acanthiza pusilla</i>	brown thornbill	C			1
animals	Acanthizidae	<i>Gerygone olivacea</i>	white-throated gerygone	C			1
animals	Acanthizidae	<i>Sericornis frontalis</i>	white-browed scrubwren	C			1
animals	Accipitridae	<i>Accipiter cirrocephalus</i>	collared sparrowhawk	C			2
animals	Accipitridae	<i>Accipiter novaehollandiae</i>	grey goshawk	C			1
animals	Accipitridae	<i>Aquila audax</i>	wedge-tailed eagle	C			1
animals	Accipitridae	<i>Aviceda subcristata</i>	Pacific baza	C			3
animals	Accipitridae	<i>Haliastur spheonurus</i>	whistling kite	C			1
animals	Aegothelidae	<i>Aegotheles cristatus</i>	Australian owl-nightjar	C			1
animals	Anatidae	<i>Anas superciliosa</i>	Pacific black duck	C			1
animals	Anatidae	<i>Chenonetta jubata</i>	Australian wood duck	C			4
animals	Anhingidae	<i>Anhinga novaehollandiae</i>	Australasian darter	C			1
animals	Ardeidae	<i>Ardea alba modesta</i>	eastern great egret	C			2
animals	Ardeidae	<i>Ardea intermedia</i>	intermediate egret	C			1
animals	Ardeidae	<i>Bubulcus ibis</i>	cattle egret	C			3
animals	Ardeidae	<i>Egretta novaehollandiae</i>	white-faced heron	C			3
animals	Ardeidae	<i>Nycticorax caledonicus</i>	nankeen night-heron	C			1
animals	Artamidae	<i>Cracticus nigrogularis</i>	pied butcherbird	C			6
animals	Artamidae	<i>Cracticus torquatus</i>	grey butcherbird	C			3
animals	Artamidae	<i>Gymnorhina tibicen</i>	Australian magpie	C			9
animals	Artamidae	<i>Strepera graculina</i>	pied currawong	C			2
animals	Cacatuidae	<i>Cacatua galerita</i>	sulphur-crested cockatoo	C			5
animals	Cacatuidae	<i>Eolophus roseicapilla</i>	galah	C			5
animals	Campephagidae	<i>Coracina novaehollandiae</i>	black-faced cuckoo-shrike	C			5
animals	Campephagidae	<i>Edolisoma tenuirostre</i>	common cicadabird	C			5
animals	Campephagidae	<i>Lalage leucomela</i>	varied triller	C			3
animals				C			1

Kingdom Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	Charadriidae	<i>Vanellus miles novaehollandiae</i>	masked lapwing (southern subspecies)	C			5
animals	Ciconiidae	<i>Ephippiorhynchus asiaticus</i>	black-necked stork	C			1
animals	Cisticolidae	<i>Cisticola exilis</i>	golden-headed cisticola	C			1
animals	Climacteridae	<i>Cormobates leucophaea metastasis</i>	white-throated treecreeper (southern)	C			1
animals	Columbidae	<i>Geopelia humeralis</i>	bar-shouldered dove	C			2
animals	Columbidae	<i>Geopelia placida</i>	peaceful dove	C			1
animals	Columbidae	<i>Macropygia amboinensis</i>	brown cuckoo-dove	C			1
animals	Columbidae	<i>Ocyphaps lophotes</i>	crested pigeon	C			3
animals	Coraciidae	<i>Eurystomus orientalis</i>	dollarbird	C			2
animals	Corvidae	<i>Corvus orru</i>	Torresian crow	C			10
animals	Cuculidae	<i>Cacomantis flabelliformis</i>	fan-tailed cuckoo	C			1
animals	Cuculidae	<i>Centropus phasianinus</i>	pheasant coucal	C			1
animals	Dicruridae	<i>Dicrurus bracteatus</i>	spangled drongo	C			1
animals	Estrildidae	<i>Neochmia temporalis</i>	red-browed finch	C			1
animals	Estrildidae	<i>Taeniopygia bichenovii</i>	double-barred finch	C			1
animals	Falconidae	<i>Falco berigora</i>	brown falcon	C			1
animals	Falconidae	<i>Falco cenchroides</i>	nankeen kestrel	C			1
animals	Falconidae	<i>Falco longipennis</i>	Australian hobby	C			1
animals	Halcyonidae	<i>Dacelo novaeguineae</i>	laughing kookaburra	C			7
animals	Halcyonidae	<i>Todiramphus macleayii</i>	forest kingfisher	C			2
animals	Halcyonidae	<i>Todiramphus sanctus</i>	sacred kingfisher	C			3
animals	Hirundinidae	<i>Hirundo neoxena</i>	welcome swallow	C			2
animals	Hirundinidae	<i>Petrochelidon ariel</i>	fairy martin	C			1
animals	Maluridae	<i>Malurus cyaneus</i>	superb fairy-wren	C			2
animals	Maluridae	<i>Malurus melanocephalus</i>	red-backed fairy-wren	C			2
animals	Meliphagidae	<i>Anthochaera chrysoptera</i>	little wattlebird	C			1
animals	Meliphagidae	<i>Caligavis chrysops</i>	yellow-faced honeyeater	C			1
animals	Meliphagidae	<i>Entomyzon cyanotis</i>	blue-faced honeyeater	C			6
animals	Meliphagidae	<i>Lichmera indistincta</i>	brown honeyeater	C			1
animals	Meliphagidae	<i>Manorina melanocephala</i>	noisy miner	C			5
animals	Meliphagidae	<i>Meliphaga lewinii</i>	Lewin's honeyeater	C			2
animals	Meliphagidae	<i>Melithreptus albogularis</i>	white-throated honeyeater	C			2
animals	Meliphagidae	<i>Myzomela sanguinolenta</i>	scarlet honeyeater	C			1
animals	Meliphagidae	<i>Philemon citreogularis</i>	little friarbird	C			1
animals	Meliphagidae	<i>Philemon corniculatus</i>	noisy friarbird	C			7
animals	Meliphagidae	<i>Plectorhyncha lanceolata</i>	striped honeyeater	C			1
animals	Meropidae	<i>Merops ornatus</i>	rainbow bee-eater	C			2
animals	Monarchidae	<i>Grallina cyanoleuca</i>	magpie-lark	C			2
animals	Monarchidae	<i>Myiagra rubecula</i>	leaden flycatcher	C			1
animals	Nectariniidae	<i>Dicaeum hirundinaceum</i>	mistletoebird	C			1
animals	Neosittidae	<i>Daphoenositta chrysoptera</i>	varied sittella	C			1
animals	Oriolidae	<i>Oriolus sagittatus</i>	olive-backed oriole	C			3
animals	Oriolidae	<i>Sphecotheres vieilloti</i>	Australasian figbird	C			1
animals	Pachycephalidae	<i>Colluricincla harmonica</i>	grey shrike-thrush	C			2
animals	Pachycephalidae	<i>Pachycephala pectoralis</i>	golden whistler	C			1
animals	Pachycephalidae	<i>Pachycephala rufiventris</i>	rufous whistler	C			1

Kingdom Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	Pardalotidae	<i>Pardalotus striatus</i>	striated pardalote		C		4
animals	Petroicidae	<i>Eopsaltria australis</i>	eastern yellow robin		C		2
animals	Petroicidae	<i>Petroica boodang</i>	scarlet robin		C		1
animals	Petroicidae	<i>Petroica rosea</i>	rose robin		C		1
animals	Phalacrocoracidae	<i>Microcarbo melanoleucos</i>	little pied cormorant		C		1
animals	Phalacrocoracidae	<i>Phalacrocorax sulcirostris</i>	little black cormorant		C		2
animals	Phasianidae	<i>Synoicus ypsilophorus</i>	brown quail		C		1
animals	Podargidae	<i>Podargus strigoides</i>	tawny frogmouth		C		4
animals	Pomatostomidae	<i>Pomatostomus temporalis</i>	grey-crowned babbler		C		1
animals	Psittacidae	<i>Alisterus scapularis</i>	Australian king-parrot		C		3
animals	Psittacidae	<i>Parvipsitta pusilla</i>	little lorikeet		C		1
animals	Psittacidae	<i>Platycercus adscitus</i>	pale-headed rosella		C		6
animals	Psittacidae	<i>Trichoglossus chlorolepidotus</i>	scaly-breasted lorikeet		C		2
animals	Psittacidae	<i>Trichoglossus moluccanus</i>	rainbow lorikeet		C		7
animals	Psophodidae	<i>Psophodes olivaceus</i>	eastern whiplbird		C		1
animals	Ptilonorhynchidae	<i>Ailuroedus crassirostris</i>	green catbird		C		1
animals	Rallidae	<i>Gallinula tenebrosa</i>	dusky moorhen		C		1
animals	Rallidae	<i>Porphyrio melanotus</i>	purple swamphen		C		1
animals	Rhipiduridae	<i>Rhipidura albiscapa</i>	grey fantail		C		2
animals	Rhipiduridae	<i>Rhipidura leucophrys</i>	willie wagtail		C		2
animals	Rhipiduridae	<i>Rhipidura leucophrys leucophrys</i>	willie wagtail (southern)		C		1
animals	Rhipiduridae	<i>Rhipidura rufifrons</i>	rufous fantail		SL		2
animals	Strigidae	<i>Ninox boobook</i>	southern boobook		C		2
animals	Strigidae	<i>Ninox connivens</i>	barking owl		C		1
animals	Strigidae	<i>Ninox strenua</i>	powerful owl		V		2
animals	Threskiornithidae	<i>Threskiornis molucca</i>	Australian white ibis		C		2
animals	Threskiornithidae	<i>Threskiornis spinicollis</i>	straw-necked ibis		C		7
animals	Timaliidae	<i>Zosterops lateralis</i>	silveryeye		C		2
animals	Tytonidae	<i>Tyto novaehollandiae</i>	masked owl		C		1
insects	Nymphalidae	<i>Euploea corinna</i>	common crow				2
insects	Nymphalidae	<i>Tirumala hamata hamata</i>	blue tiger				1
insects	Papilionidae	<i>Papilio aegaeus aegaeus</i>	orchard swallowtail (Australian subspecies)				1
insects	Papilionidae	<i>Papilio aegaeus aegaeus</i>	yellow-footed antechinus				1
animals	Dasyuridae	<i>Antechinus flavipes sensu lato</i>	spotted-tailed quoll (southern subspecies)		C		1
animals	Dasyuridae	<i>Antechinus sp.</i>	yellow-footed antechinus		C		1
animals	Dasyuridae	<i>Dasyurus maculatus maculatus</i>	spotted-tailed quoll (southern subspecies)		E	E	1
animals	Dasyuridae	<i>Phascogale tapoatafa tapoatafa</i>	brush-tailed phascogale		C		1
animals	Dasyuridae	<i>Sminthopsis murina</i>	common dunnart		C		1
animals	Macropodidae	<i>Macropus giganteus</i>	eastern grey kangaroo		C		16
animals	Macropodidae	<i>Notamacropus rufogriseus</i>	red-necked wallaby		C		7
animals	Macropodidae	<i>Wallabia bicolor</i>	swamp wallaby		C		3
animals	Molossidae	<i>Austronomus australis</i>	white-striped freetail bat		C		1
animals	Molossidae	<i>Mormopterus norfolkensis</i>	east coast freetail bat		C		1
animals	Peramelidae	<i>Isodon macrourus</i>	northern brown bandicoot		C		3
animals	Petauridae	<i>Petaurus australis australis</i>	yellow-bellied glider (southern subspecies)		V	V	1

Kingdom Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	Petauridae	<i>Petaurus norfolcensis</i>	squirrel glider		C	C	2
animals	Phalangeridae	<i>Trichosurus vulpecula</i>	common brushtail possum		C	C	10
animals	Phascolarctidae	<i>Phascolarctos cinereus</i>	koala		E	E	147
animals	Pseudocheiridae	<i>Petauroides armillatus</i>	central greater glider		E	V	1/1
animals	Pseudocheiridae	<i>Pseudocheirus peregrinus</i>	common ringtail possum		C	C	4
animals	Pteropodidae	<i>Pteropus alecto</i>	black flying-fox		C	C	1
animals	Pteropodidae	<i>Pteropus sp.</i>			C	C	1
animals	Tachyglossidae	<i>Tachyglossus aculeatus</i>	short-beaked echidna		C	C	4
animals	Vespertilionidae	<i>Scotorepens greyii</i>	little broad-nosed bat		SL		4
animals	Ambassidae	<i>Ambassis agassizii</i>	Agassiz's glassfish		C		1
ray-finned fishes	Anguillidae	<i>Anguilla reinhardtii</i>	longfin eel				1
ray-finned fishes	Eleotridae	<i>Gobiomorphus australis</i>	striped gudgeon				1
ray-finned fishes	Eleotridae	<i>Hypseleotris compressa</i>	empire gudgeon				5
ray-finned fishes	Eleotridae	<i>Hypseleotris gali</i>	firetail gudgeon				6
ray-finned fishes	Eleotridae	<i>Hypseleotris sp.</i>					3
ray-finned fishes	Eleotridae	<i>Mogurnda adspersa</i>	southern purplespotted gudgeon				1
reptiles	Agamidae	<i>Diporiphora australis</i>	tommy roundhead		C		3
reptiles	Agamidae	<i>Intellagama lesueurii</i>	eastern water dragon		C		8
reptiles	Agamidae	<i>Pogona barbata</i>	bearded dragon		C		7
reptiles	Boidae	<i>Morelia spilota</i>	carpet python		C		3
reptiles	Chelidae	<i>Chelodina expansa</i>	broad-shelled river turtle		C		1/1
reptiles	Chelidae	<i>Emydura macquarii macquarii</i>	Murray turtle		C		1
reptiles	Chelidae	<i>Wollumbinia latisternum</i>	saw-shelled turtle		C		1
reptiles	Colubridae	<i>Dendrelaphis punctulatus</i>	green tree snake		C		3
reptiles	Colubridae	<i>Tropidonophis mairii</i>	freshwater snake		C		1
reptiles	Diplodactylidae	<i>Amalosia jacovae</i>	clouded gecko		C		1
reptiles	Elapidae	<i>Brachyurophis australis</i>	coral snake		C		1
reptiles	Elapidae	<i>Cryptophis nigrescens</i>	eastern small-eyed snake		C		2
reptiles	Elapidae	<i>Demansia psammophis</i>	yellow-faced whipsnake		C		2
reptiles	Elapidae	<i>Pseudechis porphyriacus</i>	red-bellied black snake		C		1
reptiles	Elapidae	<i>Pseudonaja textilis</i>	eastern brown snake		C		1
reptiles	Elapidae	<i>Vermicella annulata</i>	bandy-bandy		C		1
reptiles	Gekkonidae	<i>Gehyra dubia</i>	dubious dtella		C		2
reptiles	Pygopodidae	<i>Lialis burtonis</i>	Burton's legless lizard		C		1
reptiles	Scincidae	<i>Anomalopus verreauxii</i>	three-clawed worm-skink		C		2
reptiles	Scincidae	<i>Calyptotis scutirostrum</i>	scute-snouted calyptotis		C		1
reptiles	Scincidae	<i>Carlia vivax</i>	tussock rainbow-skink		C		4
reptiles	Scincidae	<i>Cryptoblepharus pulcher pulcher</i>	elegant snake-eyed skink		C		4
reptiles	Scincidae	<i>Ctenotus spaldingi</i>	straight-browed ctenotus		C		1
reptiles	Scincidae	<i>Eulamprus quoyii</i>	eastern water skink		C		1
reptiles	Scincidae	<i>Lampropholis amacula</i>	friendly sunskink		C		1
reptiles	Scincidae	<i>Lampropholis delicata</i>	dark-flecked garden sunskink		C		4
reptiles	Scincidae	<i>Lygisaurus foliorum</i>	tree-base litter-skink		C		1
reptiles	Varanidae	<i>Varanus varius</i>	lace monitor		C		2
uncertain	Indeterminate	<i>Indeterminate</i>	Unknown or Code Pending		C		2
Agaricomycetes	Hyphodermataceae	<i>Hyphoderma setigerum</i>			C		1/1

Kingdom Class	Family	Scientific Name	Common Name	I	Q	A	Records
fungi	Agaricomycetes	<i>Pycnoporus coccineus</i>			C		1/1
plants	land plants	Polyporaceae	water snowflake		SL		1/1
plants	land plants	Myrsinaceae			E		12/3
plants	land plants	Myrtaceae			SL		1/1
plants	land plants	Najadaceae	water nymph		SL		1/1
plants	land plants	Najadaceae			C		1
plants	land plants	Onagraceae			C		1
plants	land plants	Polygonaceae			C		1/1
plants	land plants	Rutaceae	beach acronychia		C		1/1
plants	land plants	Sematiophyllaceae			C		1/1
plants	land plants	Viscaceae			C		1/1

CODES

I - Y indicates that the taxon is introduced to Queensland and has naturalised.

Q - Indicates the Queensland conservation status of each taxon under the *Nature Conservation Act 1992*.

The codes are Extinct (EX), Extinct in the Wild (EW), Critically Endangered (CR), Endangered (E), Vulnerable (V), Near Threatened (NT), Special Least Concern (SL) and Least Concern (C).

A - Indicates the Australian conservation status of each taxon under the *Environment Protection and Biodiversity Conservation Act 1999*.

The values of EPBC are Extinct (EX), Extinct in the Wild (EW), Critically Endangered (CE), Endangered (E), Vulnerable (V) and Conservation Dependent (CD).

Records - The first number indicates the total number of records of the taxon (wildlife records and species listings for selected areas).

This number is output as 99999 if it equals or exceeds this value. A second number located after a / indicates the number of specimen records for the taxon.

This number is output as 999 if it equals or exceeds this value.



Attachment 12 – EcoSmart Ecology Assessment

3 June 2022

Wayne Moffitt
28 South Environmental Pty Ltd
U11/24 Martin Street,
Fortitude Valley, Qld, 4006

Dear Wayne

RE: Fauna Survey of Lot 1, RP 113251, North Maclean

Field surveys for fauna species and their habitats was conducted on the aforementioned site on the 25th and 26th of May and the 3rd of June. Our survey methods, conditions and results are provided below.

Survey Methods

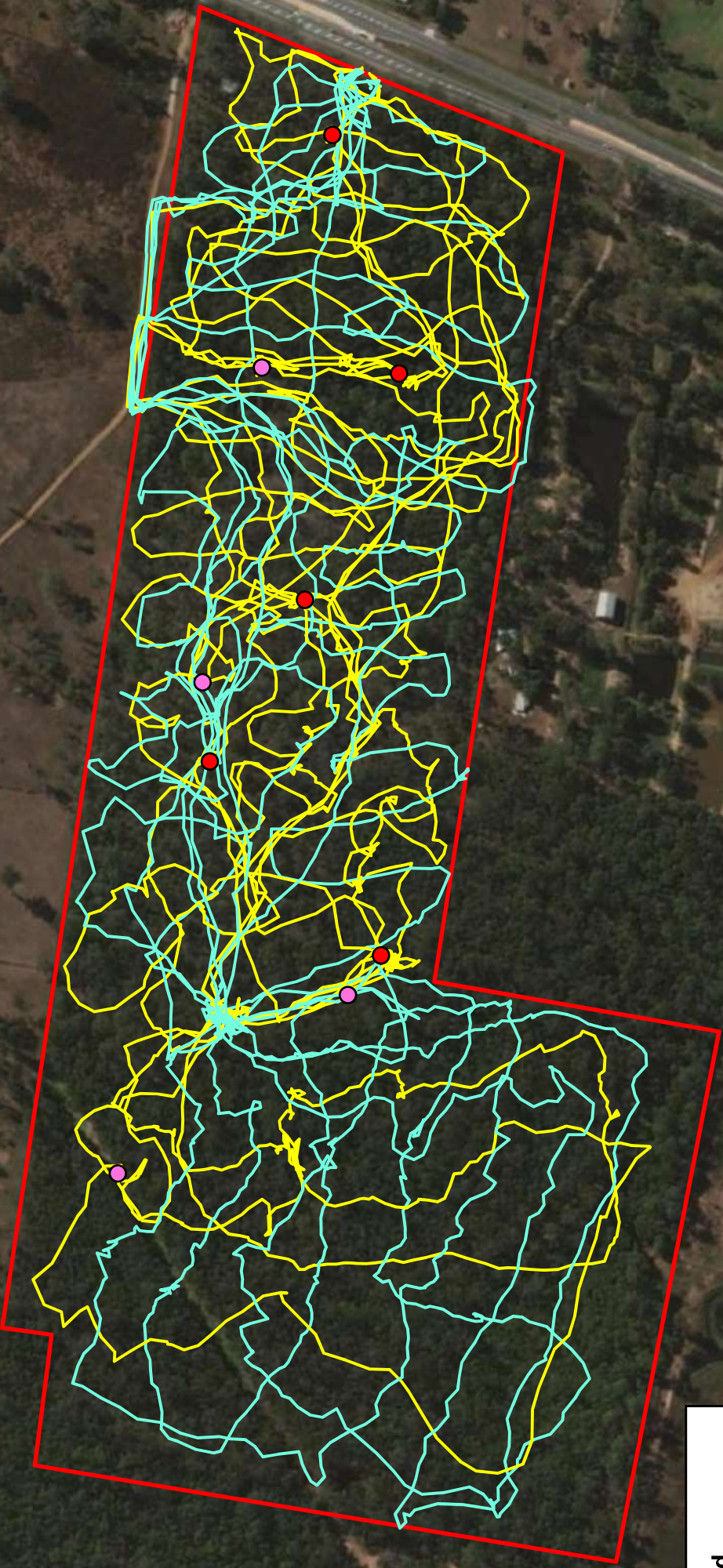
Surveys conducted on the 25th and 26th of May included grid searches for large hollow-bearing trees, ultrasonic bat call detection, bird observations and spotlighting. The survey on the 3rd of June included early morning bird observations. When encountered, logs and rocks were shifted to locate possible sheltering vertebrates though, in general, these features were scarce at the site. The lack of ground shelter opportunities likely reflects the sites disturbance history. Survey effort for the various techniques is provided in Table 1 and Figure 1 shows traverses and equipment locations.

Table 1. Total survey effort for each survey technique

Survey Technique	Effort unit	Total effort
Hollow-bearing tree grid search/bird observations/scat and ort searches	Person hours	22 hrs
Bird observations	Person hours	22 hrs
Spotlighting	Person hours	10 hrs
Remote field cameras	Camera nights	50 nights
Ultrasonic bat call detection	Detector nights	4 nights

Hollow-bearing tree grid search

Grid searches were conducted to visually assess the abundance of trees containing large hollows that might be suitable for significant species such as Greater Glider and Powerful Owl. These searches included two staff weaving backwards and forwards throughout the site in tandem. Typically, the two observers kept a minimum distance of 10-20m apart and a similar distance from previous traverses. The western one-third of the site is currently inundated by water ranging between 0.5 and 1 m in depth, this created difficult conditions for searching. All located hollows ≥ 20 cm in diameter were marked using hand-held Garmin GPS units and the species of tree recorded.



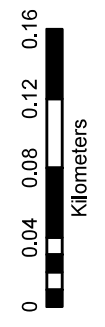
Legend

- Anabat
- IR Cam
- Diurnal Search
- Nocturnal Search
- Study site

Figure 1

Survey traverses and equipment locations

Scale:



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

Bird observations

Bird species were identified by both direct observation and call. Pishing and call playback was used periodically to attract and confirm identification. As the site is relatively small in extent (approx. 37 ha) bird observations were undertaken continuously throughout the hollow-bearing tree searches.

Scat/ort searches

Searches for koala scats and Glossy Black Cockatoo feeding remains (called orts) were undertaken under suitable forage tree species. Once Koala was confirmed as present searching for Koala scats was reduced to opportunistic checks under random trees. It is understood a more thorough Spot Assessment Survey (or similar) will be conducted for this species in the future.

Spotlighting

Spotlighting was undertaken by two ecologists moving in a grid search pattern throughout the site. Observations were aided by moderately-powered head-torches to initially locate fauna by eye-shine, followed by high-powered lighting once located (and as needed). Binoculars also aided long-distance identification.

Remote field cameras

Five remote field cameras, four black-flash (infra-red) and one white-flash camera, were located throughout the eastern two-thirds of the site. No cameras were placed in the swamp due to excessive water. Camera were mounted on a tree facing an attractant on the ground of chicken necks and peanut butter. Cameras were set to take three images on each trigger.

Ultrasonic bat detection

Two Anabat Swift units were located at intervals across the site on the 25th and 26th May. Flyways or areas of vegetation consistent with high bat use were selected where possible, though these were uncommon. Each unit was set to record calls from dusk to dawn.

Survey Conditions

Surveys were conducted during an above average rainfall year with heavy rainfalls experienced in the month of May approximating 245 mm (BOM data for Macleans Bridge station). Average rainfall for the month of May at this station is approximately 61 mm.

Maximum daily temperatures on the 25th, 26th and 3rd were 22.8, 24.3 and 19.9 respectively (BOM data for Greenbank defence). Minimum overnight temperatures for the same period were 15.0, 14.9 and 5.9°C.

Survey Results

Large hollow-bearing trees

Trees or stags bearing large hollows (>20cm in diameter) were scarce on the site and largely absent from the eastern two-thirds. Hollows of these dimensions were only observed in the western swamp area (Figure 2). While searches in the eastern two-thirds of the site were comprehensive, additional hollows are likely in the swamp area where the search grid was more spread.

Observed Fauna

A total of 57 fauna species were recorded during the survey including eight amphibians, 33 birds and 16 mammals. No reptiles were noted. All recorded species are considered common/least concern under legislation except six introduced species and one Endangered species, the Koala (Table 2).

Potential MNES

A total of 38 taxa considered to be Matters of National Environmental Significance (MNES) have been identified as having potential to occur at the site in the EPBC online search tool (as provided in 28S Environmental, Letter to Referrals Gateway Team, 10 May 2022). One of these species, the Koala, has been confirmed present with two individuals observed during the current survey and widespread scat evidence (Figure 2). Another two species have potential to occur.

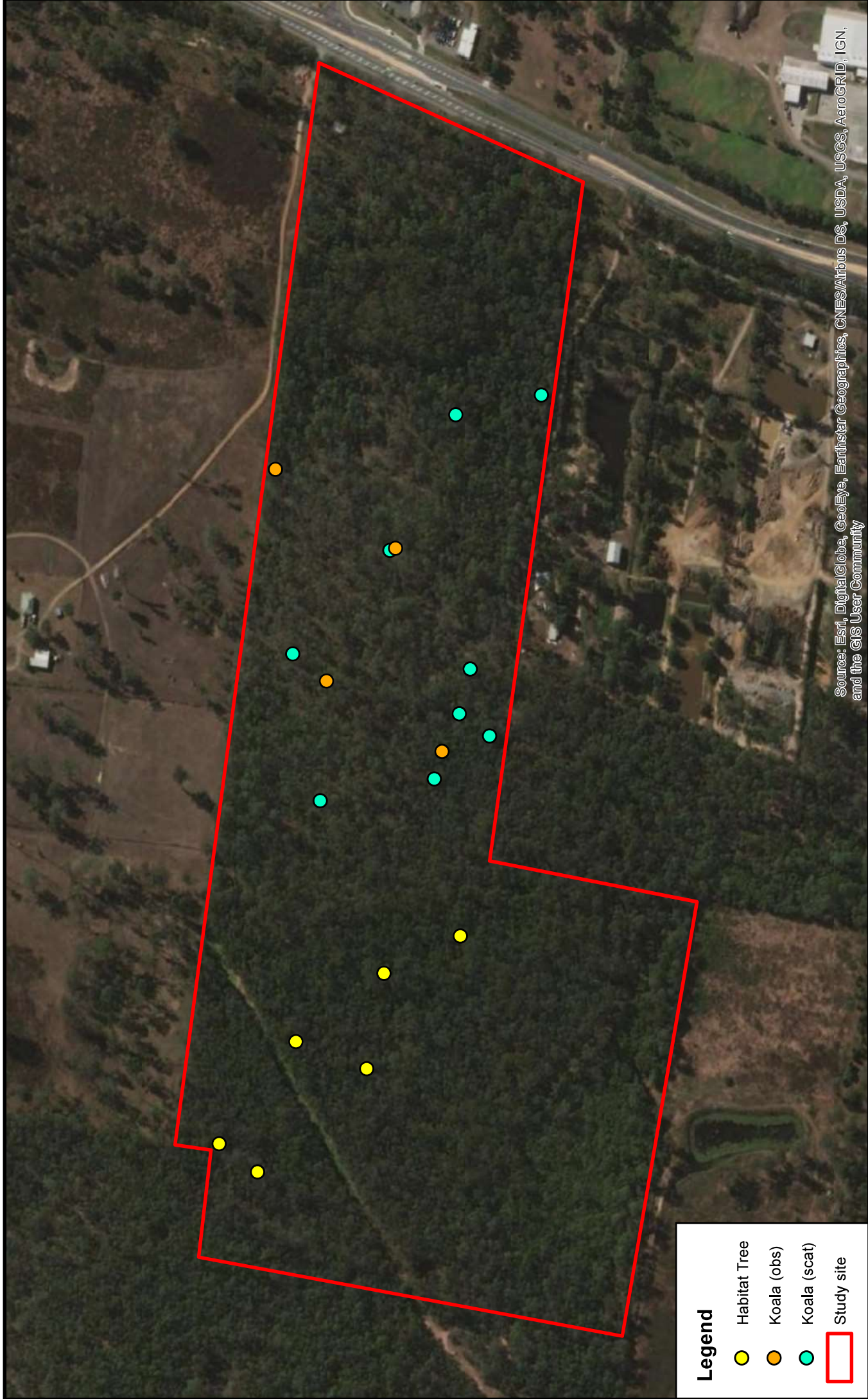
White-throated Needletail (Hirundapus caudacutus)

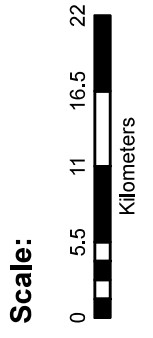
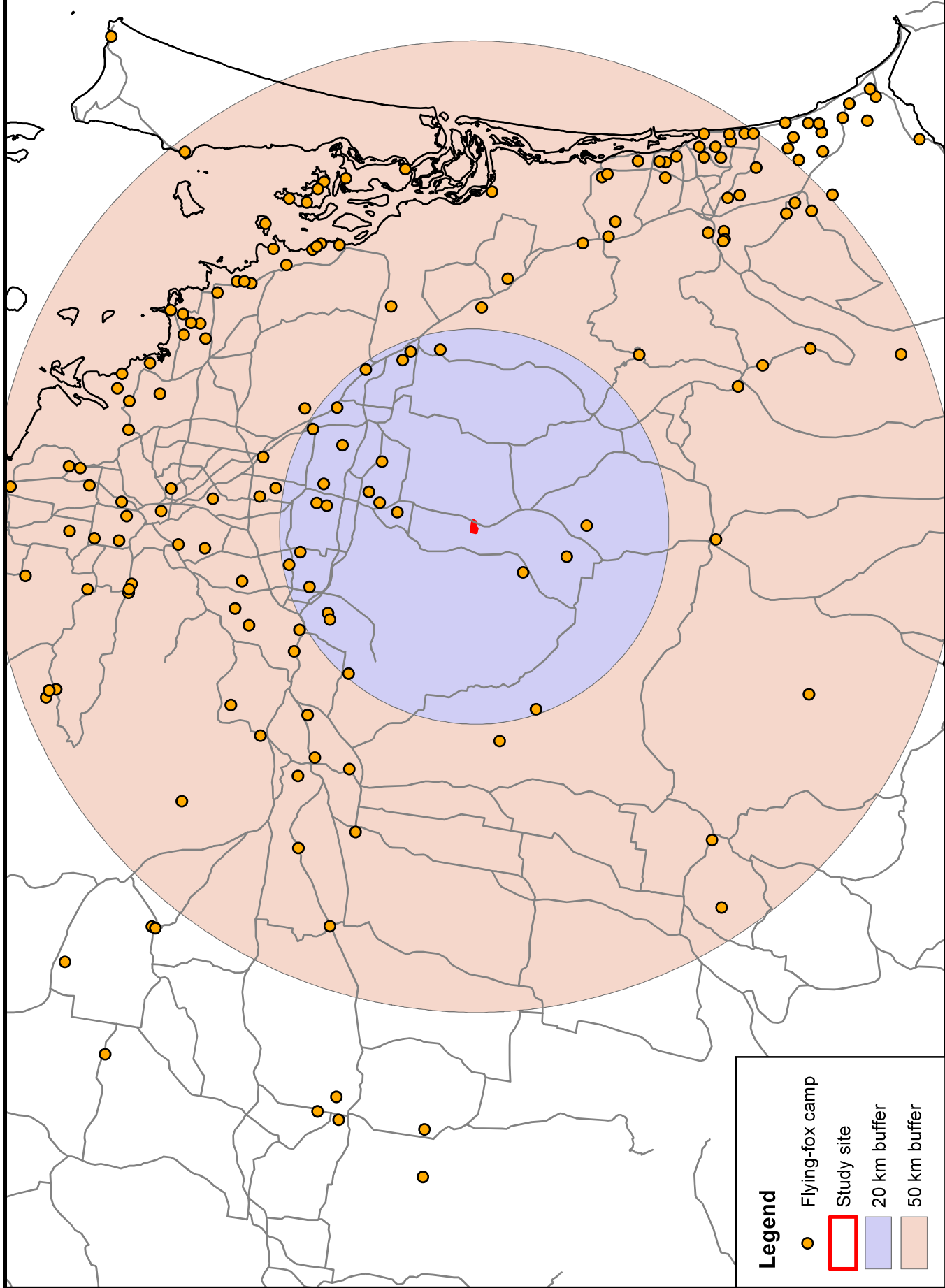
White-throated Needletails are aerial foragers and can be observed over all types of terrestrial habitats including large-scale agriculture or urbanisation and, as such, ground activities do not impact on the species occurrence. Breeding occurs outside Australia. It is regularly observed over Brisbane, Gold Coast suburbs and their hinterlands. It seems likely this species would occur over the site for foraging purposes, potentially multiple times, over a 50 year period.

Grey-headed Flying-fox (Pteropus poliocephalus)

The Grey-headed Flying-fox roosts in camps from which it disperses at night to find foraging resources. Most movements are within a 20 km radius of the camp, though movements up to 50 km have been recorded. Many camps are known in proximity to the study site, three are less than < 10 km away and 23 occur within 20 km (QLD Flying-fox Monitoring data, downloaded 3rd June 2022, Figure 3).

The species favours feeding on flowering eucalypts, though fruit may also be taken. On site *Eucalyptus tereticornis* could provide an important foraging resource as moderately sized examples (~10+ m in height) occur in proximity to the low-lying drainage line in the eastern half of the site and large examples (~25+m high) are scattered throughout the western swamp. The presence of these trees in close proximity to known flying-fox roosts indicate the species should be expected at the study site most years during suitable flowering events. No Flying-fox camps occur at the site.





Legend





-  Flying-fox camp
-  Study site
-  20 km buffer
-  50 km buffer

Figure 3
Flying-fox camps surrounding the study site

Table 2. Observed and detected fauna species

GROUP (total species)		Status	
Scientific Name	Common Name	NC Act	EPBC Act
AMPHIBIANS (8)			
<i>Crinia parinsignifera</i>	Beeping Froglet	Least concern	
<i>Limnodynastes peronii</i>	Striped Marsh Frog	Least concern	
<i>Limnodynastes terraereginae</i>	Scarlet-sided Pobblebonk	Least concern	
<i>Litoria balatus</i>	Bleating Tree Frog	Least concern	
<i>Litoria fallax</i>	Common Sedge Frog	Least concern	
<i>Litoria gracilentia</i>	Graceful Tree Frog	Least concern	
<i>Platyplectrum ornatum</i>	Ornate Burrowing Frog	Least concern	
<i>Rhinella marinus</i>	Cane Toad	Introduced	
BIRDS (33)			
<i>Anas superciliosa</i>	Pacific Black Duck	Least concern	
<i>Cacomantis flabelliformis</i>	Fan-tailed Cuckoo	Least concern	
<i>Colluricincla harmonica</i>	Grey Shrike-thrush	Least concern	
<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike	Least concern	
<i>Corvus orru</i>	Torresian Crow	Least concern	
<i>Cracticus nigrogularis</i>	Pied Butcherbird	Least concern	
<i>Cracticus torquatus</i>	Grey Butcherbird	Least concern	
<i>Dacelo novaeguineae</i>	Laughing Kookaburra	Least concern	
<i>Dicrurus bracteatus</i>	Spangled Drongo	Least concern	
<i>Entomyzon cyanotis</i>	Blue-faced Honeyeater	Least concern	
<i>Geopelia humeralis</i>	Bar-shouldered Dove	Least concern	
<i>Geopelia striata</i>	Peaceful Dove	Least concern	
<i>Gymnorhina tibicen</i>	Australian Magpie	Least concern	
<i>Lichenostomus chrysops</i>	Yellow-faced Honeyeater	Least concern	
<i>Malurus lamberti</i>	Variiegated Fairy-wren	Least concern	
<i>Melithreptus albobularis</i>	White-throated Honeyeater	Least concern	
<i>Merops ornatus</i>	Rainbow Bee-eater	Least concern	
<i>Myzomela sanguinolenta</i>	Scarlet Honeyeater	Least concern	
<i>Pachycephala pectoralis</i>	Golden Whistler	Least concern	
<i>Pachycephala rufiventris</i>	Rufous Whistler	Least concern	
<i>Pardalotus punctatus</i>	Spotted Pardalote	Least concern	
<i>Pardalotus striatus</i>	Striated Pardalote	Least concern	
<i>Petrochelidon nigricans</i>	Tree Martin	Least concern	
<i>Platycercus adscitus</i>	Pale-headed Rosella	Least concern	
<i>Podargus strigoides</i>	Tawny Frogmouth	Least concern	
<i>Porphyrio porphyrio</i>	Purple Swamphen	Least concern	
<i>Psophodes olivaceus</i>	Eastern Whipbird	Least concern	
<i>Pyrrholaemus sagittatus</i>	Speckled Warbler	Least concern	
<i>Rhipidura fuliginosa</i>	Grey Fantail	Least concern	
<i>Rhipidura leucophrys</i>	Willie Wagtail	Least concern	
<i>Strepera graculina</i>	Pied Currawong	Least concern	
<i>Trichoglossus haematodus</i>	Rainbow Lorikeet	Least concern	
<i>Zosterops lateralis</i>	Silvereye	Least concern	

GROUP (total species)		Status	
Scientific Name	Common Name	NC Act	EPBC Act
MAMMALS (16)			
<i>Macropus giganteus</i>	Eastern Grey Kangaroo	Least concern	
<i>Wallabia bicolor</i>	Swamp Wallaby	Least concern	
<i>Notamacropus rufogriseus</i>	Red-necked Wallaby	Least concern	
<i>Phascolarctos cinereus</i>	Koala	Endangered	Endangered
<i>Ozimops ridei</i>		Least concern	
<i>Miniopterus australis</i>	Little Bentwing Bat	Least concern	
<i>Miniopterus oceanensis</i>	Large Bentwing Bat	Least concern	
<i>Vespadelus pumilus</i>		Least concern	
<i>Myotis macropus</i> or <i>Nyctophilus sp*</i>		Least concern	
<i>Pseudocheirus peregrinus</i>	Common Ringtail Possum	Least concern	
<i>Trichosurus vulpecula</i>	Common Brushtail Possum	Least concern	
<i>Rattus rattus</i>	Black Rat	Introduced	
<i>Vulpes vulpes</i>	Red Fox	Introduced	
<i>Lepus europaeus</i>	European Hare	Introduced	
<i>Cervus elaphus</i>	Red Deer	Introduced	
<i>Felis catus</i>	Feral Cat	Introduced	

*Likely *Myotis macropus* based on habitat

Potential MSES

A list of all terrestrial vertebrate species known within 25 km of the study site was generated using the WildNet online search tool. It identified 30 species listed as Near Threatened or higher. Of these taxa only the below species were considered likely or have a possibility of occurring. All other taxa are unlikely due to poor reporting frequency (indicating the species is vagrant) or the absence of suitable habitat. Notably, the Glossy Black Cockatoo is not considered a likely species as, while *Allocasuarina* trees were present, none contained fruiting cones. Suitable hollow-bearing trees for nesting were also absent.

Tusked Frog (Adelotus brevis)

The Tusked Frog will inhabit a variety of waterbodies in eucalypt forest, rainforest and riparian vegetation. It has been regularly recorded in the local area include a record from 2011 approximately 4.5 km to the north-west. Potential habitat on-site is likely restricted to two areas, the low-lying drainage feature running through the eastern portion of the site and the swamp area to the west. Of these, the swamp area contains highest value, especially in association with a small dam near the western boundary. Other locations are unlikely to contain water for sufficient periods during the dry season, or in drought years. While no frogs were located during these surveys, the species calls during spring and summer and is unlikely to have been active in late May.

Powerful Owl (Ninox strenua)

The Powerful Owl has been recorded as recently as 2020 approximately 2.3 km to the north-north-west of the site and ~5.3 km to the south-west. There are frequent records in

association with Oxley Creek and its tributaries. The proximity of these records and the occupation of the site by prey species such as Common Brushtail Possum and Common Ringtail Possum suggest the site has value for hunting Powerful Owls. Further, if birds were foraging in the local area, on-site vegetation might be used for roosting purposes though in general other areas within the local area are likely to provide better shelter/cover.

References

Queensland Flying Fox Monitoring data. Available at:
<https://data.des.qld.gov.au/data/assets/excel/doc/0031/83398/flying-fox-camps-qld.xlsx>

Please do not hesitate to call if you have any questions regarding the above.

Regards,



Mark Sanders

ECOSMART ECOLOGY

mb: 0407 025 553

48 Streeton Parade
Everton Park, Qld, 4053

Mark.Sanders@EcoSmartEcology.com.au



Attachment 13 – Spotted-tailed quoll survey

North Maclean Enterprise Precinct
4499-4651 Mount Lindesay Highway, North
Maclean, Queensland
(EPBC Referral No. 2013/6941)
Results of Targeted Survey for Spotted-tailed quoll

13 August 2015

Report to Wearco Pty Ltd

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- ATTACHMENT 1. LACA RESULTS MAPPED
- ATTACHMENT 2. SITE ASSESSMENT SURVEY LOCATIONS
- ATTACHMENT 3. WPSQ 2012 SURVEY
- ATTACHMENT 4. WEATHER DATA
- ATTACHMENT 5. EXAMPLE PHOTOS
- ATTACHMENT 6. HAIRTUBE ANALYSIS

1 Background

In the Controlled Action referral for the Proposed Action, we identified the Spotted-tailed quoll (*Dasyurus maculatus*)¹ as a potential occurrence at the Site, but concluded that the Proposed Action would not give rise to a Significant Impact on this species² (28 South Environmental 2013). This position was reiterated in the Initial Preliminary Documentation Report (28 South Environmental 2014).

A common theme in submissions opposing the Proposed Action was Spotted-tailed quoll, including: (a) the species' potential occurrence at the Site; (b) need for seasonal surveys; and (c) impact of the Proposed Action. In particular, Logan and Albert Conservation Association Inc. (LACA) in its submission provided anecdotal evidence of spotted-tail quoll occurrence in the locality. Table 1 of the submission lists pre-2006 records, and Table 2 lists records from 2006-2012. LACA used the data to contend that there are further records of the spotted tail quoll in the locality than suggested by the Initial Preliminary Documentation Report. The location of sightings in relation to the Site is shown in **Attachment 1**.

While not a requirement for the submission of the Supplementary Preliminary Documentation Report, the Proponent having regard to the seasonal conditions and, on its own volition, commissioned 28 South Environmental to complete further targeted survey for Spotted-tailed quoll.

2 Survey Methods Employed

2.1 Searches for Optimal Habitat (target survey sites)

Site assessment since 2013 has provided us with a thorough understanding of the Site's general characters, and specific microhabitats. Before the commencement of survey, we were aware that the Site did not contain: (a) areas of rock outcrop; (b) large fallen logs³; (c) a significant number of large hollow-bearing trees or stags; or (d) dense areas of lantana (*Lantana camara*) or other weedy thickets. As such, a scoping survey was undertaken to identify the "best on offer" survey sites. Twelve survey sites were selected in the more heavily vegetated northern and western parts of the Site (**Attachment 2** and following plates showing the character of the survey sites).

2.2 Remote detection camera survey

Remote detection camera units were set at each of the survey sites. Cameras were attached to a tree, and baits⁴ were attached to a plastic stake within the camera's detection range. Baits were refreshed every three days, and data downloaded approximately weekly. The survey ran from 18 June until 12 July 2015 inclusive (25 Days).

Despite best efforts to conceal the cameras, two were stolen during the survey period. At the day 6 bait change, the camera from Site 3 was found to be stolen. The camera was replaced immediately and remained operational for the remainder of the survey. Six days of survey data was lost. At the day 9 bait change, the camera from Site 12 was found to be stolen. Data from the first 6 days of survey was collected, but data from the remaining three days was not. Due to the level of theft being experienced; inability to conceal the cameras any further; and what we considered to be otherwise very good coverage of the Site, we decided that a camera would not be re-set at Site 12.

¹ Listed as Endangered under the EPBC Act.

² Within the meaning established by the Significant Impact Guideline 1.1 (DoE 2013).

³ The property has been historically logged, and all large fallen timber was taken off site (*Pers. comm.* D Wearing).

⁴ A mix of sardines, tuna oil, flour, and chicken necks.

275 equivalent camera detection nights were achieved, whereby: (a) 10 units detected for the full 25 nights; (b) one unit collected for 6 nights; and (c) one replacement unit collected for 19 nights. Despite the thefts, our surveys have achieved a high camera density over a reasonable period of time, which we consider provides an adequate survey. We note that the survey ran for a longer period of time than the other recent survey in the locality completed by the Wildlife Preservation Society of Queensland (**Attachment 3**), which did not target areas in close proximity to the Site.

2.3 Hairtube survey

Two Faunatech hairtubes were placed in optimised locations (under lantana or beside logs⁵) at each of the survey sites. The hairtubes were left in place for 25 days, achieving an equivalent 600 sample nights. The Hairtube survey samples were analysed by Barbara Triggs of *Dead Finish*.

2.4 Weather conditions prior to and during the survey

Bureau of Meteorology weather data for the survey period shows that the conditions were mild to warm, with calm winds and periods of light rain. The weather experienced is characteristic of winter conditions in this part of Southeast Queensland⁶. Data is provided in **Attachment 4**. Abnormal weather conditions did not unduly influence the survey results.

3 Results

3.1 Remote detection camera survey

A range of common rural / peri-urban mammals and birds were recorded by the survey (refer below). Most species were frequently detected across the suite of cameras deployed, indicating widespread occurrence at the Site. A selection of detection photos is provided in **Attachment 5**. It is relevant to note that the suite of species recorded is similar to species recorded by the Wildlife Preservation Society of Queensland data for the broader locality⁷ (**Attachment 3**).

Mammals

Brush-tailed possum (*Trichosurus vulpecula*);

Eastern grey kangaroo (*Macropus giganteus*);

European hare (*Lepus europaeus*);

Koala (*Phascolarctos cinereus*);

Red fox (*Vulpes vulpes*);

Domestic cattle (*Bos taurus*);

Horse (*Equus caballus*);

Domestic dog (*Canis lupus familiaris*);

⁵ Note: survey sites were chosen on the basis of having such structure available. The sites chosen were “best on offer”.

⁶ Comparisons were made with longer term weather data.

⁷ The greater number of species recorded perhaps representing a greater diversity of habitats sampled by the WPSQ surveys.

Birds

Toressian crow (*Corvus orru*);
Tawny frogmouth (*Podargus strigoides*);
Australian magpie (*Cracticus tibicen*);
Straw-necked ibis (*Theskiornis spinicollis*);
Cattle egret (*Ardea ibis*);
Grey butcherbird (*Cracticus torquatus*);
Kookaburra (*Dacelo novaeguineae*);
Whistling kite (*Haliastur sphenurus*);

3.2 Hairtube Survey

The Hairtube survey recorded only Brush-tailed possum (*Trichosurus vulpecula*). Spotted-tailed quoll was not detected. Survey results are provided in **Attachment 6**.

4 Summary and Conclusion

- LACA data submitted to the public notification of the Initial Preliminary Documentation Report demonstrates that there are no recent reliable records of Spotted-tailed quoll in close proximity to the Site. All of the more recent (post 2006) records occur to the north and west of the Site.
- Recent camera detection and hairtube sampling surveys have failed to locate Spotted-tailed quoll at the Site. The sampling density and duration of survey exceeded the required survey effort, and the survey effort expended by Wildlife Preservation Society of Queensland in its attempts to locate Spotted-tailed quoll in the nearby locality.

The background material and this survey indicate that the Site may provide very occasional dispersal habitat for Spotted-tailed quoll, but is unlikely to provide habitat critical to the species' survival. We draw a similar conclusion to that reached by the Wildlife Preservation Society of Queensland in its Spotted-tailed quoll survey report from 2012, which notes that the lack of quolls caught on camera by that survey "may be an indication urbanisation and lack of suitable habitat is pushing them further afield. Or, the population has declined, and feral species such as foxes, dogs and cats are out-competing them..." (refer Page 2 of **Attachment 5**).

5 References and Other Sources

28 South Environmental. 2013. *Referral Under the EPBC Act in Regard to a Proposed Industrial Development – North Maclean, South East Queensland*: Report to Wearing Developments

28 South Environmental. 2014. *North Maclean Enterprise Precinct – 4499-4651 Mount Lindesay Highway, North Maclean, Queensland (EPBC Referral No. 2013/6941) Initial Preliminary Documentation Report*: Prepared for Wearco Pty Ltd.

28 South Environmental. 2015a. *North Maclean Enterprise Precinct – 4499-4651 Mount Lindesay Highway, North Maclean, Queensland (EPBC Referral No. 2013/6941) Response to Submissions Received from Exhibition of the Initial Preliminary Documentation Report*: Prepared for Wearco Pty Ltd.

28 South Environmental. 2015b. *North Maclean Enterprise Precinct – 4499-4651 Mount Lindesay Highway, North Maclean, Queensland (EPBC Referral No. 2013/6941) Final Preliminary Documentation Report*: Prepared for Wearco Pty Ltd.

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Department of the Environment (2013) *Matters of National Environmental Significance – Significant Impact Guidelines 1.1*: Commonwealth of Australia.

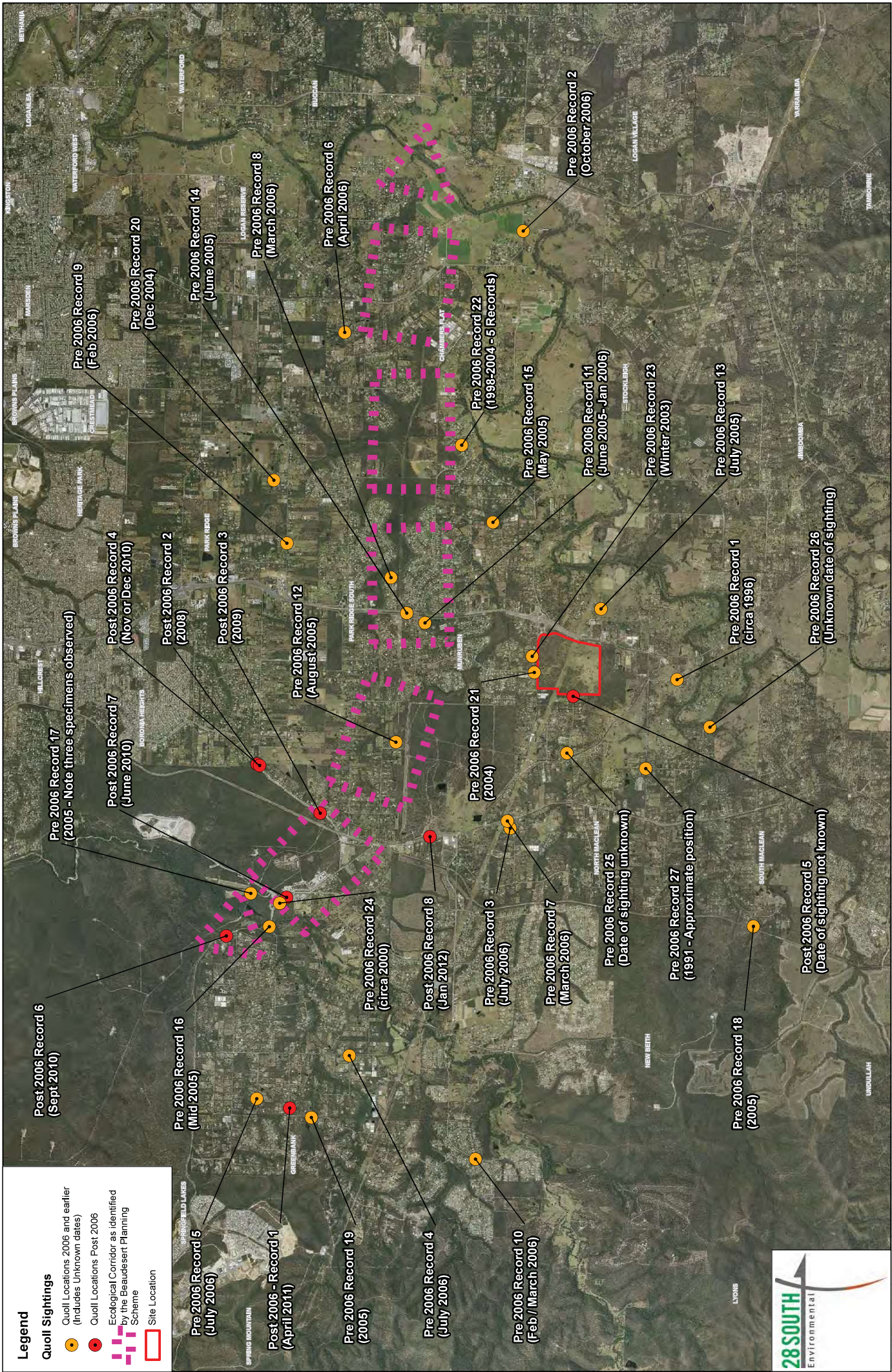
Department of the Environment (2015). *Dasyurus maculatus maculatus (SE mainland population)* in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: <http://www.environment.gov.au/sprat>. Accessed Fri, 29 May 2015 14:44:17 +1000.

Department of Environment and Heritage Protection (2015) Flinders Karawatha Corridor: Queensland Government: Accessed at on 2 July 2015 at <https://www.ehp.qld.gov.au/land/natural-resource/flinders-karawatha/index.html>

Wildlife Preservation Society of Queensland. 2013. *Looking out for Quolls in Logan – summary of survey results, October 2012*.



ATTACHMENT 1. LACA RESULTS MAPPED

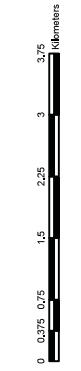


Legend

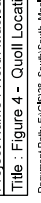
- Quoll Locations 2006 and earlier (Includes Unknown dates)
- Quoll Locations Post 2006
- Ecological Corridor as identified by the Beaudesert Planning Scheme
- Site Location

Client: Reel Planning
 Date: Tuesday, May 12, 2015

Background Imagery is supplied by Queensland Government, and is not to be used for measurement. For visualisation purposes only.

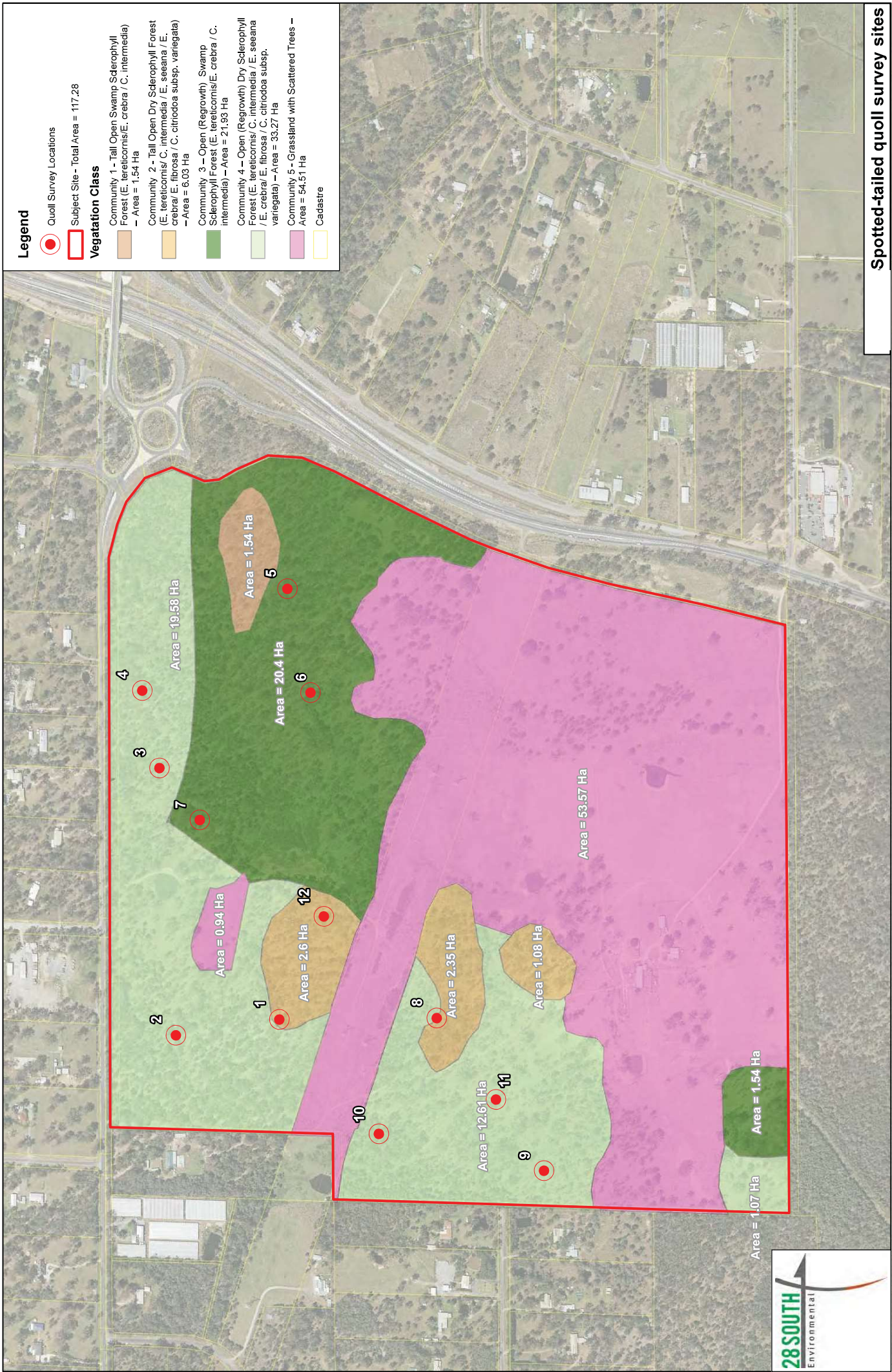


Coordinate System: GDA 1984 MGA Zone 56
 Reference Scale: 1:65,000
 Project Name: North Maclean
 Title: Figure 4 - Quoll Locations





ATTACHMENT 2. SITE ASSESSMENT SURVEY LOCATIONS



Legend

- Quoll Survey Locations
 - Subject Site - Total Area = 117.28
- Vegetation Class**
- Community 1 - Tall Open Swamp Sclerophyll Forest (E. tereticornis/E. crebra / C. intermedia) - Area = 1.54 Ha
 - Community 2 - Tall Open Dry Sclerophyll Forest (E. tereticornis/ C. intermedia / E. seaiana / E. crebra/ E. fibrosa / C. citriodora subsp. variegata) - Area = 6.03 Ha
 - Community 3 - Open (Regrowth) Swamp Sclerophyll Forest (E. tereticornis/E. crebra / C. intermedia) - Area = 21.93 Ha
 - Community 4 - Open (Regrowth) Dry Sclerophyll Forest (E. tereticornis/ C. intermedia / E. seaiana / E. crebra/ E. fibrosa / C. citriodora subsp. variegata) - Area = 33.27 Ha
 - Community 5 - Grassland with Scattered Trees - Area = 54.51 Ha
 - Cadastral

Spotted-tailed quoll survey sites

Client: Reel Planning
Date: Monday August 10, 2015
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Background imagery is supplied by Qld Govt, and is not to be used for measurement. For visualisation purposes only.



Coordinate System: GCS WGS 1984
Reference Scale: 1:6,000
Project Name: North Maclean
Title: Figure 5 - Spotted-tailed quoll survey sites

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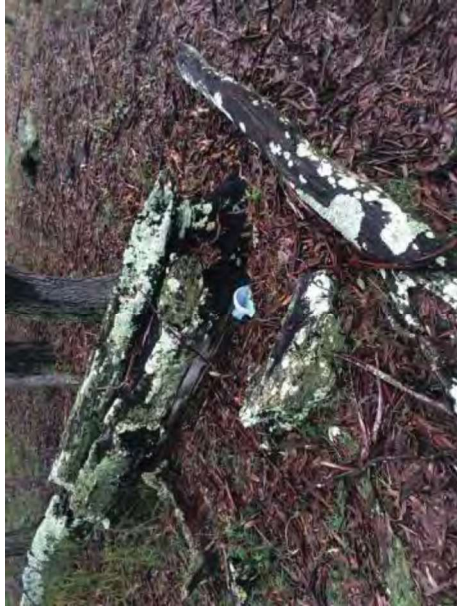
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VIEW SOUTH



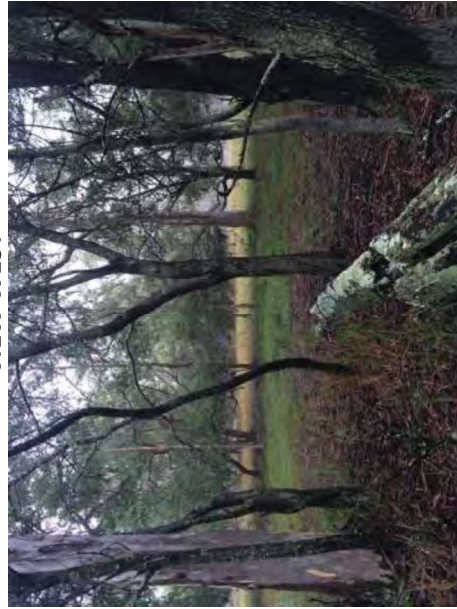
HAIRTUBE 1



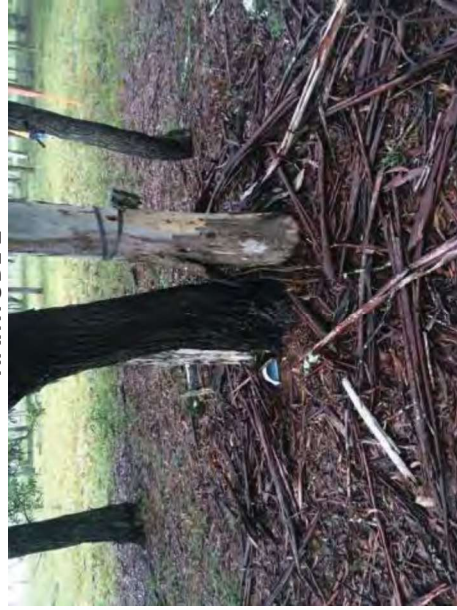
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VIEW WEST



HAIRTUBE 2



SITE 2

VIEW NORTH



VIEW SOUTH



HAIRTUBE 1



VIEW EAST



VIEW WEST



HAIRTUBE 2

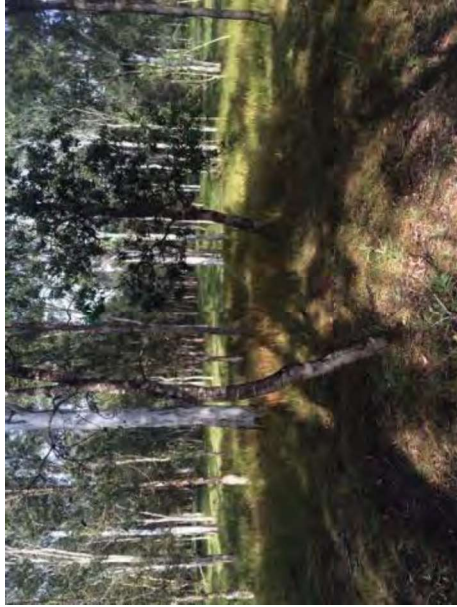


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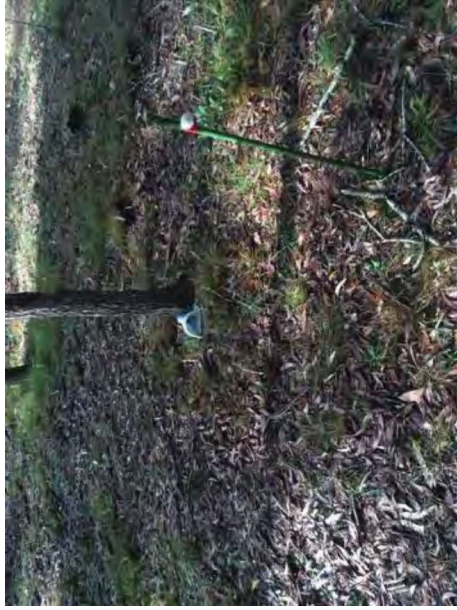
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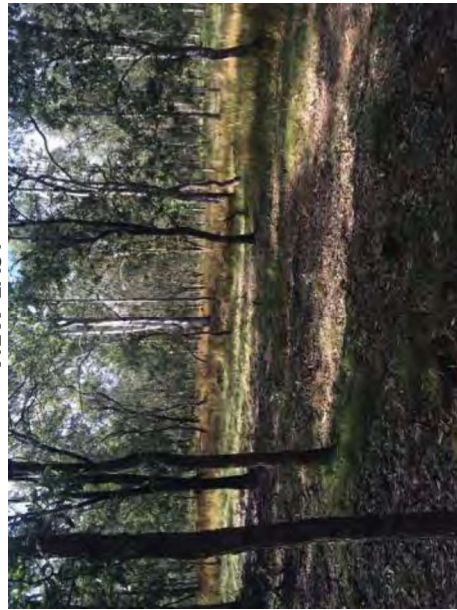
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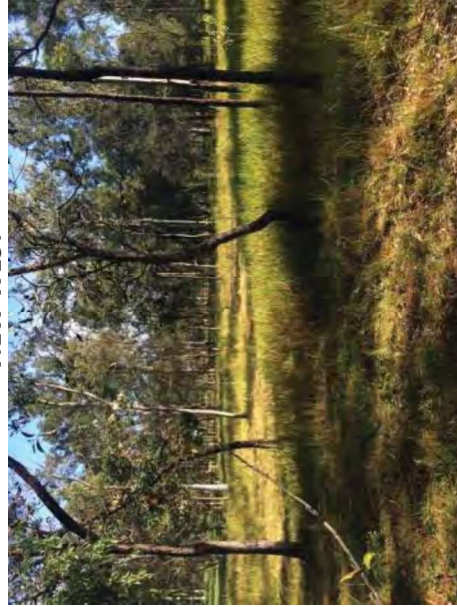
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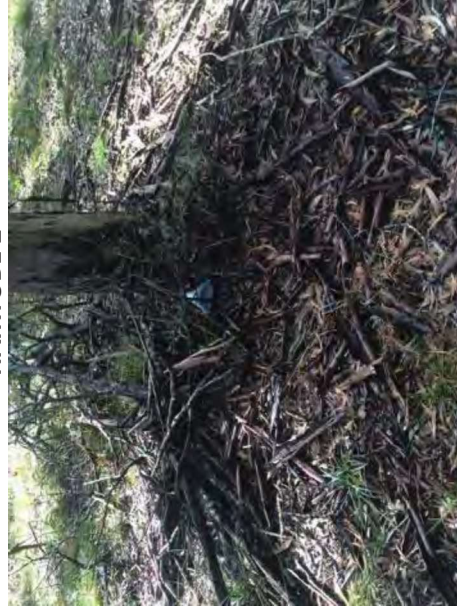
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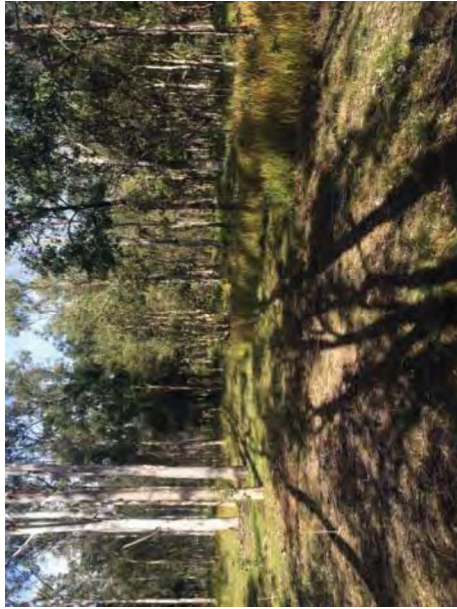


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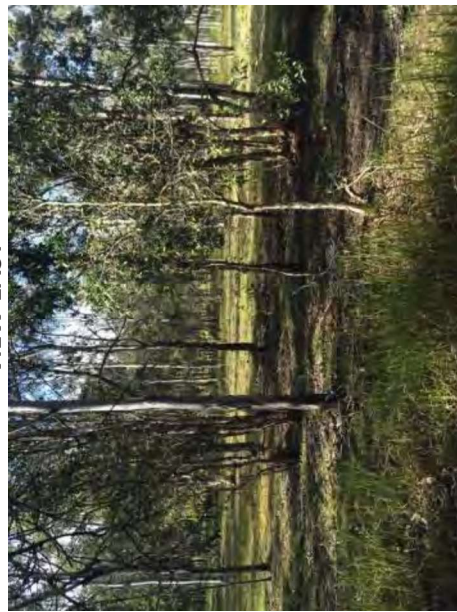
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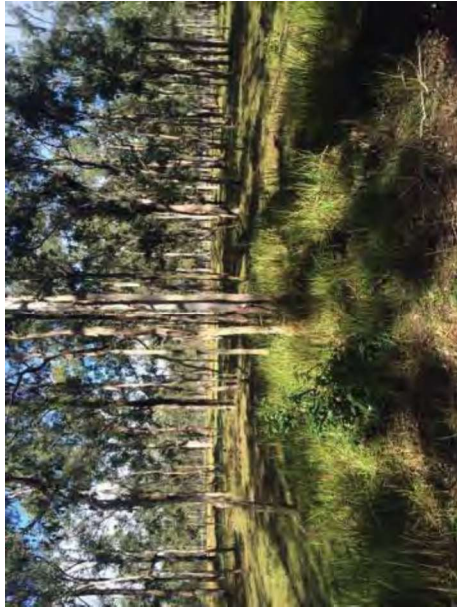


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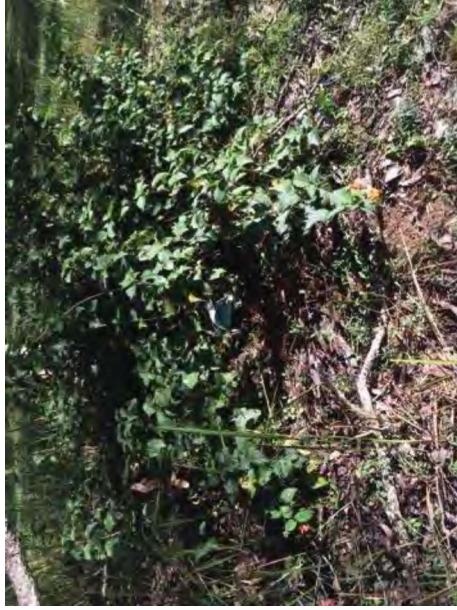
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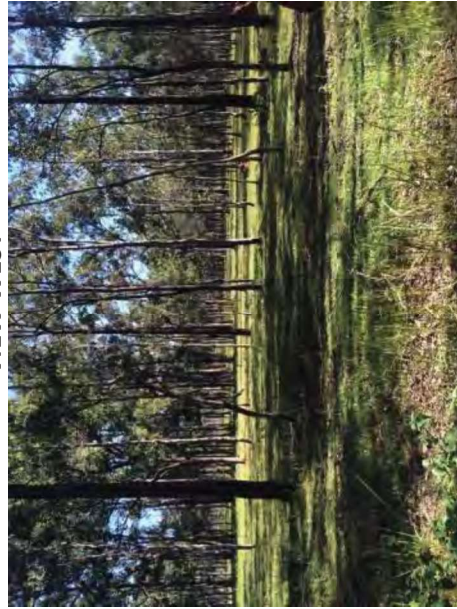
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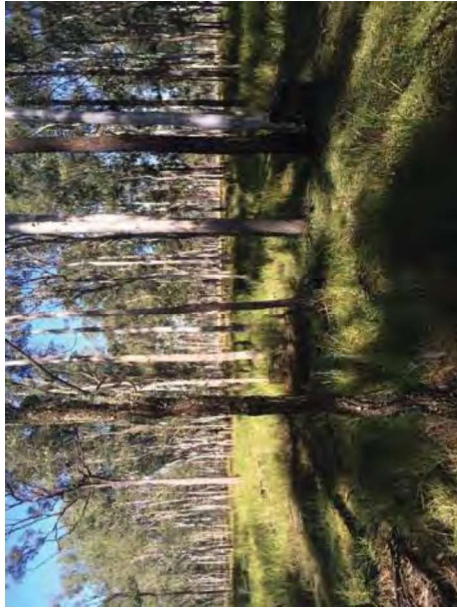


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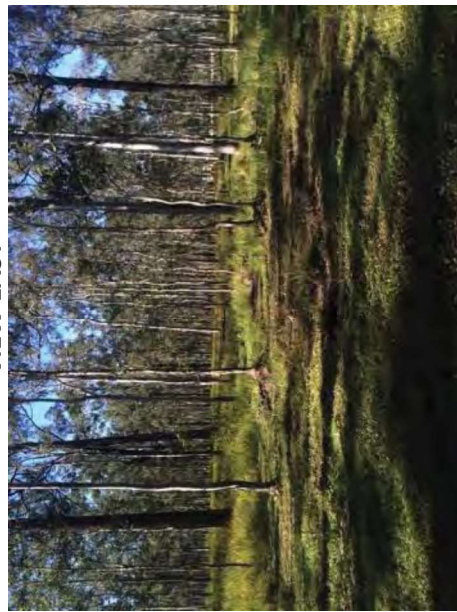
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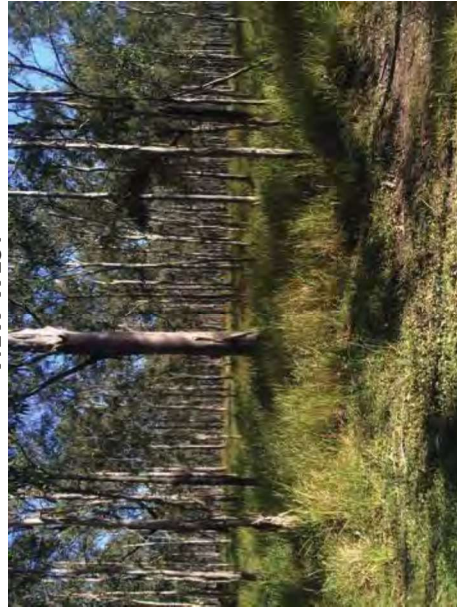
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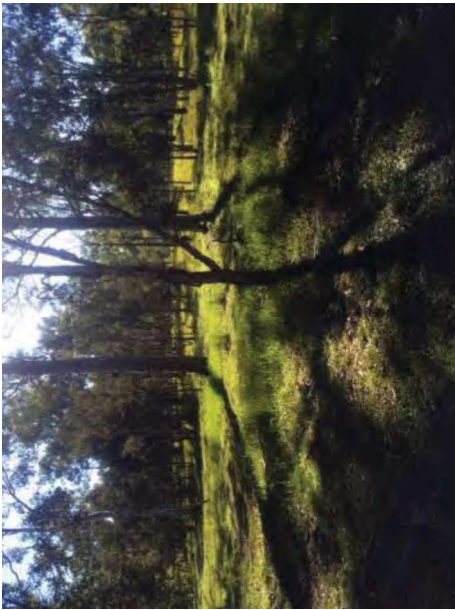


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SITE 7

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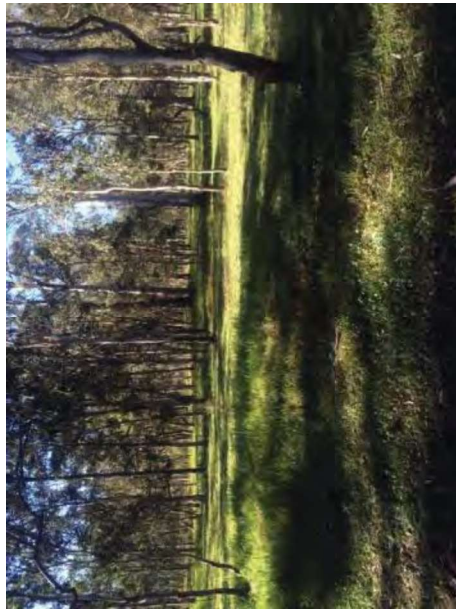
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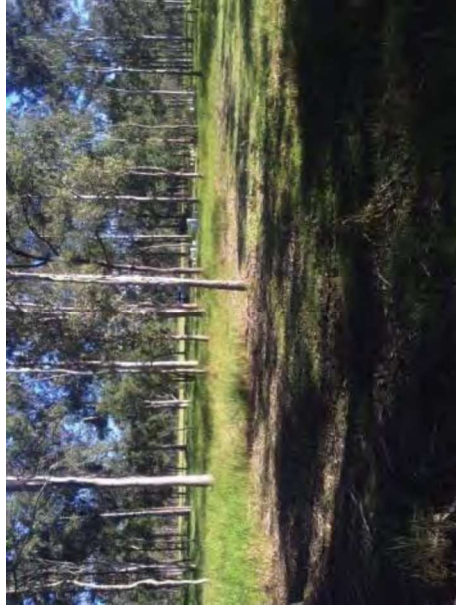
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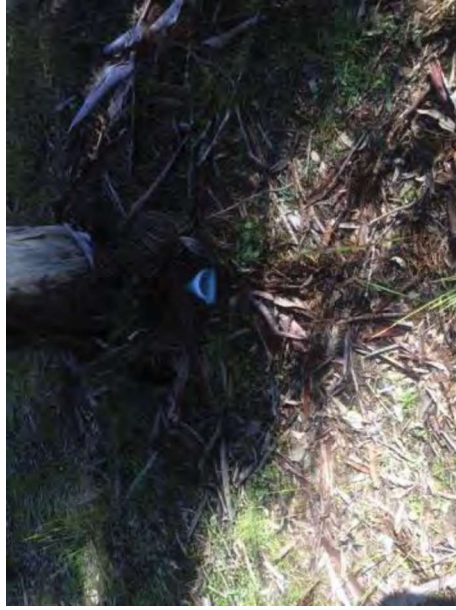
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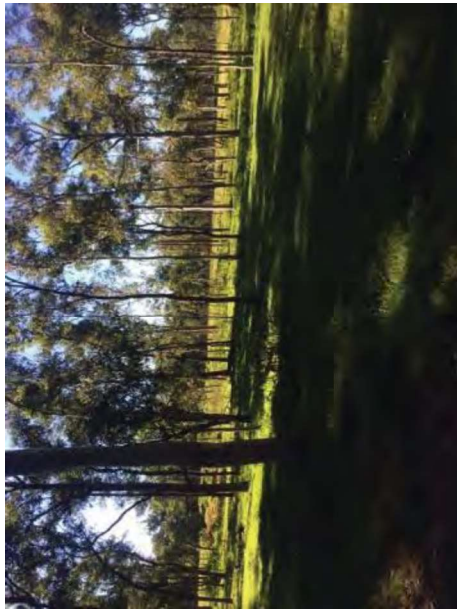


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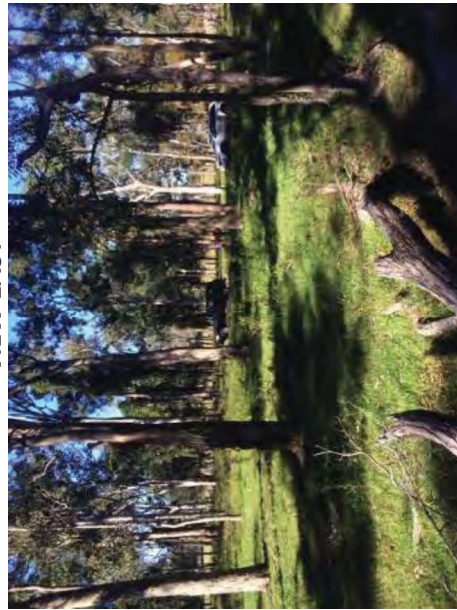
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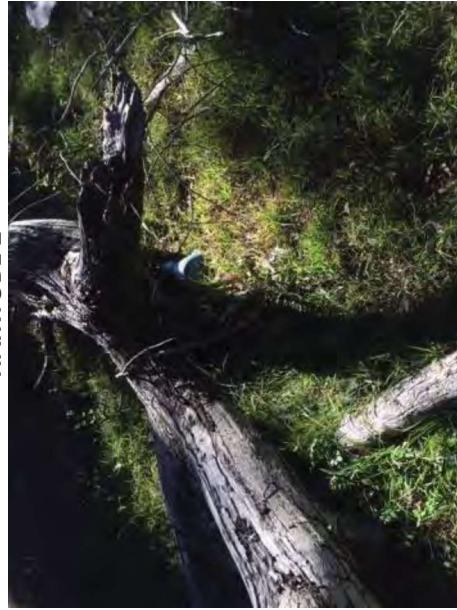
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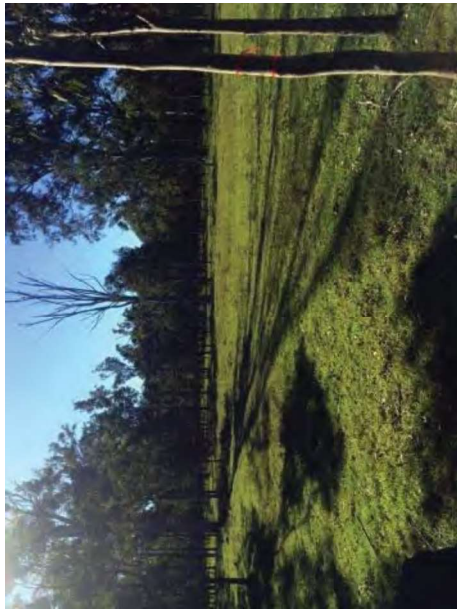


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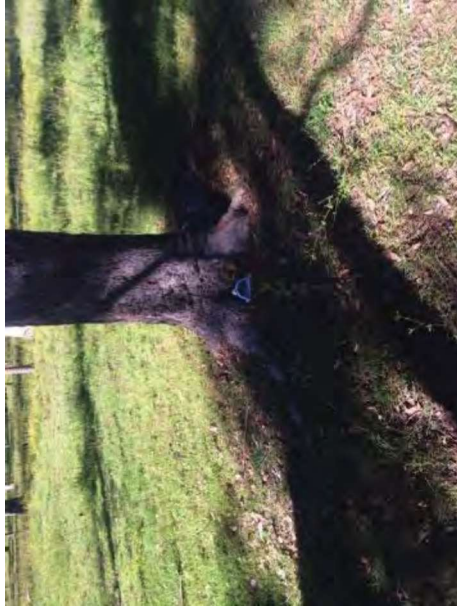
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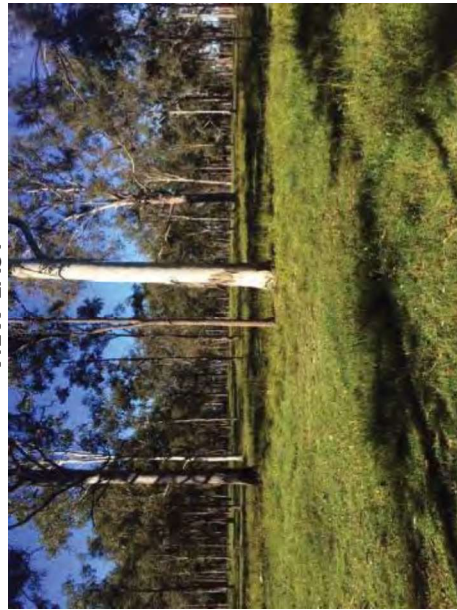
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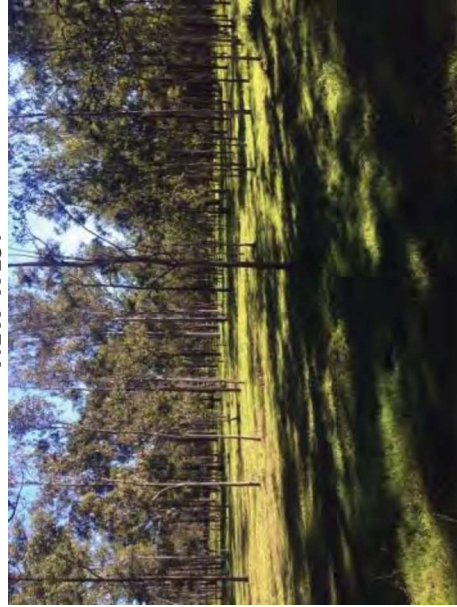
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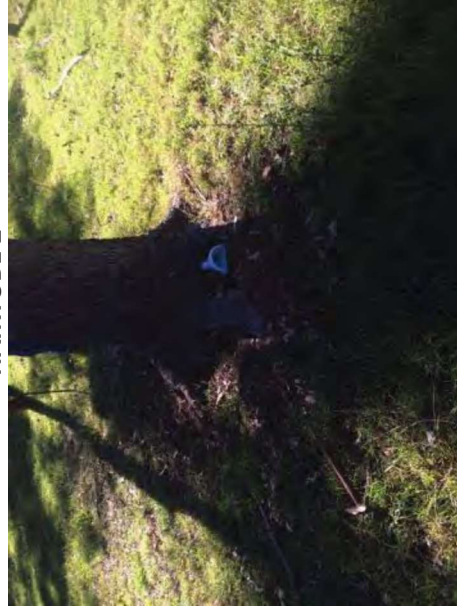
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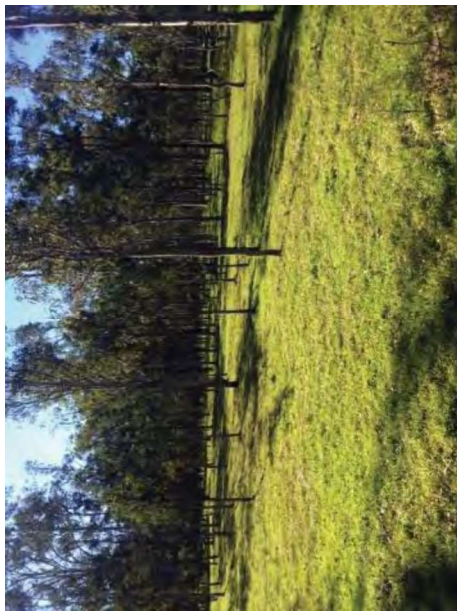


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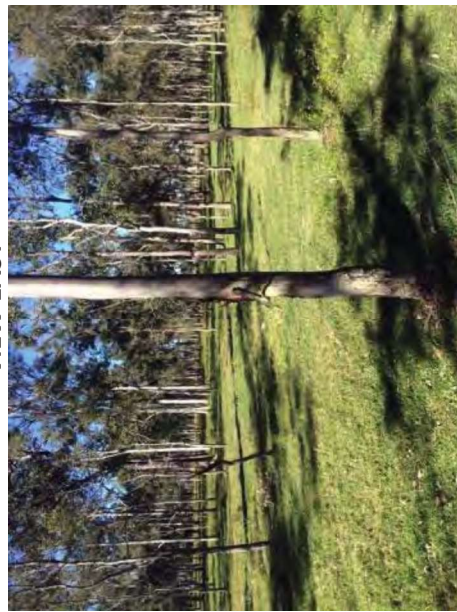
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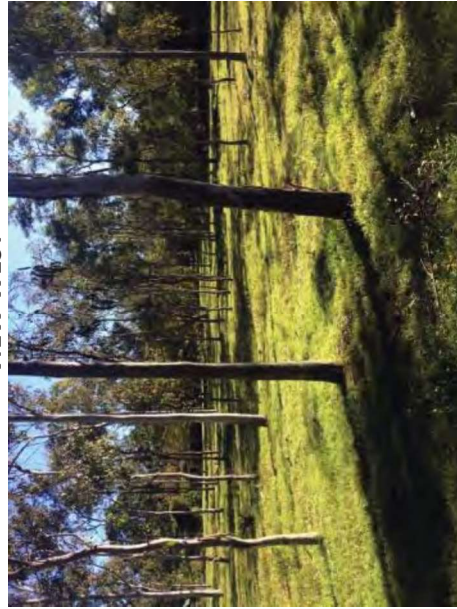
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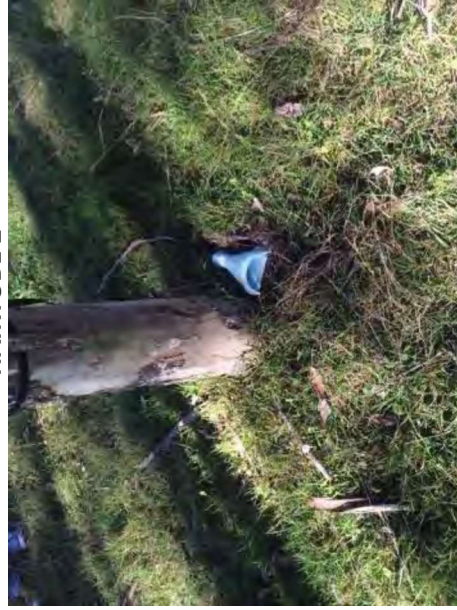
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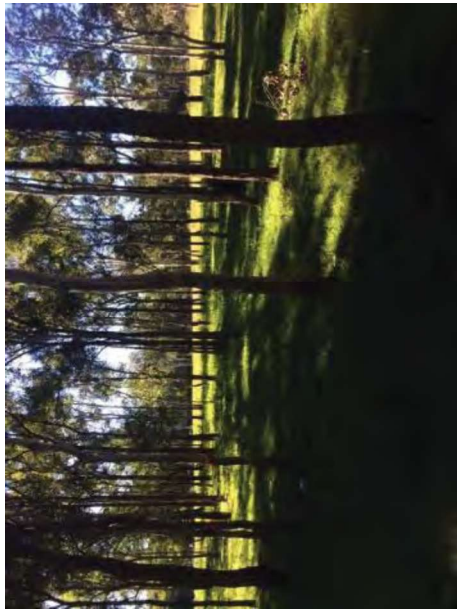
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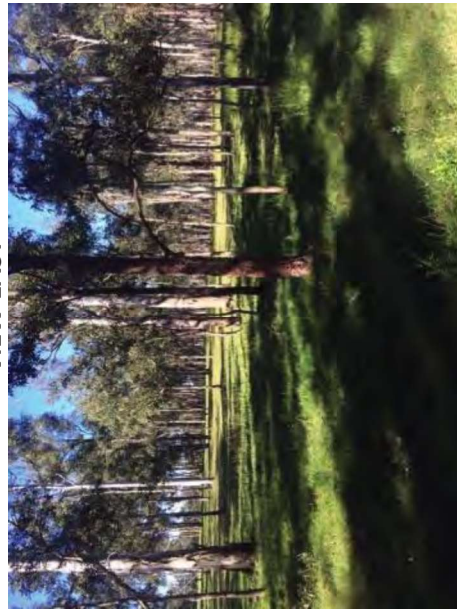
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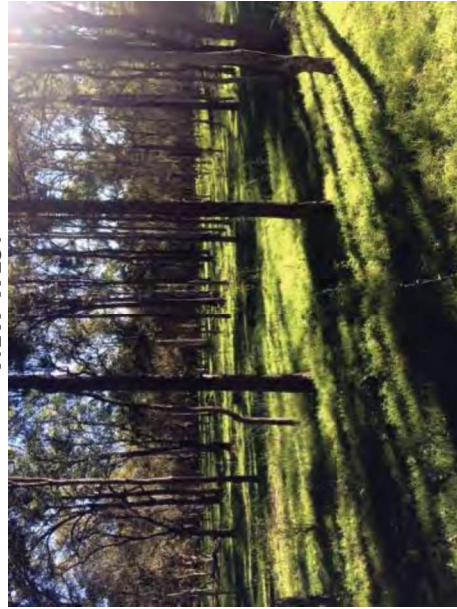
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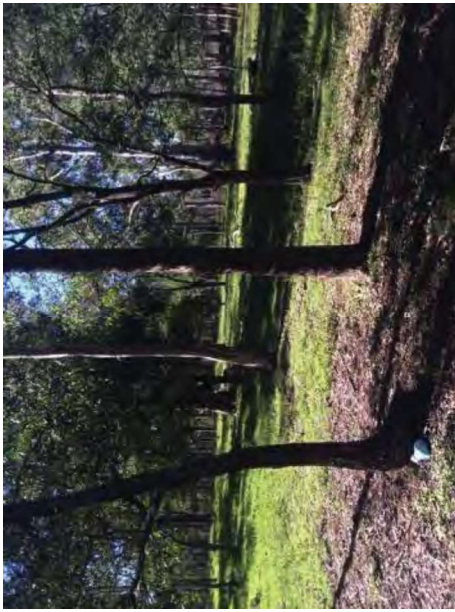
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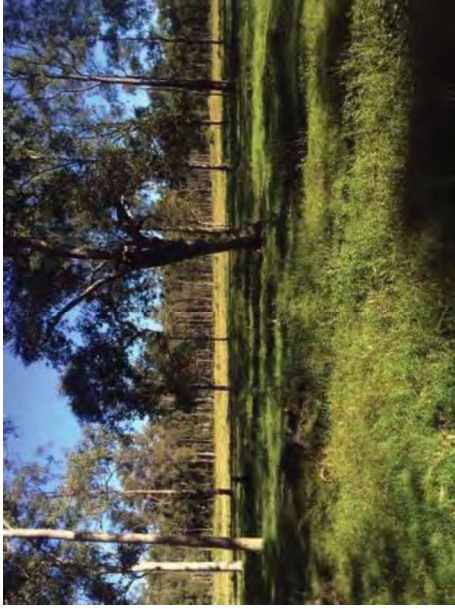
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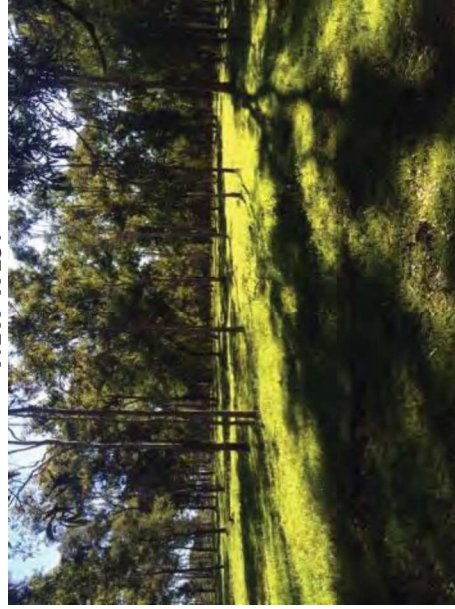
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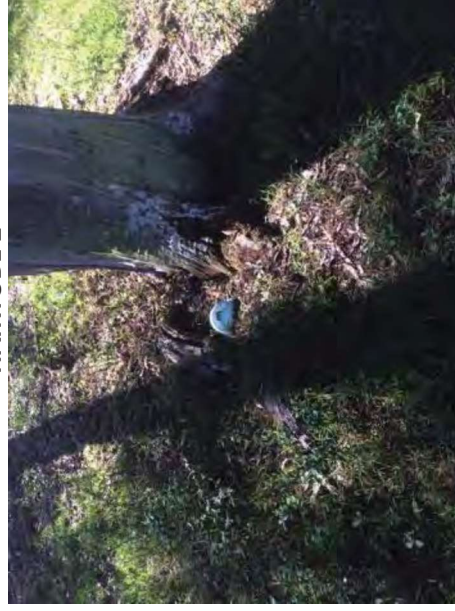
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HAIRTUBE 2





ATTACHMENT 3. WPSQ 2012 SURVEY

Looking out for Quolls in Logan – summary of survey results, October 2012

The surveys for this year's Envirogrant from the Logan City Council have been completed. During the period from April – July 2012, a total of 15 sites were surveyed including:

- Private residences: 3 locations within Greenbank, 1 in Berrinba and 1 in Park Ridge, 2 in Undullah, 1 in Jimboomba
- Reserve X, Greenbank
- Spring Mountain Forest Park
- Campbell Park, Greenbank
- Blackwood, Henderson, and Edelston Reserve – Jimboomba

Depending on the size of the property, between 2 and 6 cameras were deployed for 3 weeks at a time (see map below). In larger areas such as Spring Mountain Forest Park, cameras were deployed in a number of locations.



A total of 115,033 images were taken, and 27 different species were captured. The most common captured species included: crows, then foxes, followed by *Rattus* sp., and Brush-tailed possums.

List of species caught on camera

Torresian crow	Red-necked wallaby
Northern brown bandicoot	Crow
Brushtail possum	Brown goshawk
Rattus sp.,	Brush-tailed phascogale
Wedge-tailed eagle	Fantailed cuckoo
Pied & grey butcherbird	Currawong
Bush rat	Lace monitor
Fox	Echidna
Cat	Black-striped wallaby
Magpie	Squirrel glider
Swamp wallaby	Dog & dingo
Cows & sheep	Eastern grey kangaroo

Despite a number of sighting records that continue to be reported to us from these areas by the community, no quolls were caught on camera. This may be an indication urbanisation and lack of suitable habitat is pushing them further afield. Or, the population has declined, and feral species such as foxes, dogs and cats are out-competing them, necessitating urgent conservation action.

We hope next year's result will prove us wrong!

Wildlife Queensland would like to thank the following people who assisted with this year's surveys:

Alina Zwar
Ivell & Jim Whyte
Kate Payne
Brenden Ward
Olivia Muller



Brushtail possum

Brush-tailed phascogale

Wedge-tailed eagle



Ivell Whyte (left) and Alina Zwar setting up a camera



ATTACHMENT 4. WEATHER DATA

Logan City, Queensland June 2015 Daily Weather Observations

Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9am						3pm						
		Min	Max				Dirn	Spd	Time	Temp	RH	Cld	Dirn	Spd	MSLP	Temp	RH	Cld	Dirn	Spd	MSLP	
		°C	°C	mm	mm	hours	Dirn	Spd	Time	°C	%	eighths	Dirn	Spd	hPa	°C	%	eighths	Dirn	Spd	hPa	
1	Mo	16.7	21.8	0	1.2					18.5	75	6	W	4		20.4	51	6	SW	2		
2	Tu	7.8		0	3.8					12.5	66	1	WSW	2		20.4	45	0	W	2		
3	We		20.6	0												18.3	51	7	SW	2		
4	Th	6.5	21.8	0.2	0.6					11.0	81	0	W	6		21.4	46	0	W	6		
5	Fr	3.9	22.1	0	1.4					10.6	76	0	SW	4		21.5	34	1	NW	6		
6	Sa	7.1	21.6	0	2.6					13.3	67	1	WNW	2								
7	Su	10.5	22.4	0	2.2					15.1	84	4	WNW	2								
8	Mo	9.9	23.0	0	3.2					14.1	88	1	SW	4		23.0	56	8	SW	7		
9	Tu	11.6	24.8	0	1.2					15.0	84	7	W	9		22.5	59	6	E	15		
10	We	11.0	23.6	0	2.9					14.5	90	6				18.7	75	6	S	19		
11	Th	13.7	20.1	1.6	2.4					19.9	76	7	SSE	22		18.4	78	7	SSE	9		
12	Fr	11.9	20.2	0.8						15.5	88	5	S	4								
13	Sa	13.1	19.9	0.4	3.2					18.5	76	8	SE	19								
14	Su	14.7	20.7	4.2	1.4					16.8	94	7	SW	2								
15	Mo	14.7	22.3	12.4	0.4					17.0	98	5				22.1	62	2	S	7		
16	Tu	14.5	21.4	6.4	2.6					16.7	99	8	SSE	4		21.0	87	8		Calm		
17	We	15.5	20.6	10.6	7.4					19.9	89	7	W	6		18.2	93	8	S	6		
18	Th	11.2	23.0	2.0	1.8					13.5	99	8				21.9	51	3	SW	7		
19	Fr	9.6	22.0	0	4.0					14.5	74	4	SW	4		20.8	41	4	SW	4		
20	Sa	6.5	20.7	0	0.2					11.0	81	0	W	4								
21	Su	7.0	20.2	0	1.0					12.6	76	0	W	2								
22	Mo		20.0	0	3.1					15.0	77	3	WNW	2		19.5	59	6	E	7		
23	Tu	11.5	20.6	0	4.0					15.0	85	7	W	2		20.0	63	7	SE	2		
24	We	11.0	18.1	1.4	1.2					14.9	93	8	N	2		17.4	83	8	ESE	4		
25	Th	9.5	20.5	0	0.8					11.8	92	5	WSW	7		19.3	74	8	SW	13		
26	Fr	10.6	21.5	0.9	0.1					18.3	73	2	S	11		20.4	62	3	S	19		
27	Sa	12.6	22.0	0	2.4					17.5	74	2	SW	9								
28	Su	13.0	22.2	2.4	3.0					16.0	97	3	SSW	4								
29	Mo	14.6	18.5	5.8	2.6					16.4	96	8	SSW	6		18.4	88	8	N	6		
30	Tu	12.7	22.2	4.4	1.6					15.7	93	4	SW	2		21.6	60	3	E	9		
Statistics for June 2015																						
Mean		11.2	21.3		2.2					15.2	84	4		5		20.2	62	5		7		
Lowest		3.9	18.1		0.1					10.6	66	0		Calm		17.4	34	0		Calm		
Highest		16.7	24.8	12.4	7.4					19.9	99	8	SSE	22		23.0	93	8	S	19		
Total				53.5	62.3																	

Observations were drawn from Logan City Water Treatment Plant (station 040854)

IDC:JDW4073:201506 Prepared at 16:05 UTC on 2 Aug 2015
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Logan City, Queensland July 2015 Daily Weather Observations

Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9am						3pm								
		Min	Max				Dirn	Spd	Time	Temp	RH	Cld	Dirn	Spd	MSLP	Temp	RH	Cld	Dirn	Spd	MSLP			
		°C	°C	mm	mm	hours	km/h	local	°C	%	eighths	°C	%	eighths	°C	%	eighths	km/h	hPa	°C	%	eighths	km/h	hPa
1	We	11.1	23.5	0	1.6				13.8	97	5	13.8	97	5	22.9	64	4	9	64	22.9	64	4	Calm	
2	Th	9.5	20.7	0	2.2				13.0	86	1	13.0	86	1	20.3	44	6	9	44	20.3	44	6	WSW	6
3	Fr	5.0	19.3	0	2.4				9.8	69	8	9.8	69	8	18.6	45	4	7	45	18.6	45	4	S	6
4	Sa	8.9	21.4	0	0.6				12.1	80	2	12.1	80	2				6						
5	Su	9.6	23.1	0	2.8				12.8	92	2	12.8	92	2				4						
6	Mo	8.0	24.3	0	2.4				11.9	89	0	11.9	89	0	23.9	43	1	2	43	23.9	43	1	W	11
7	Tu	8.1	22.0	0	0.2				13.0	78	0	13.0	78	0	19.8		0	4		19.8		0	E	9
8	We	6.5	18.6	0	3.0				14.1	88	2	14.1	88	2				2						
9	Th	10.6	17.7	0	2.4				14.5	90	3	14.5	90	3				4						
10	Fr	8.4	20.4	0	1.6				12.5	88	6	12.5	88	6	18.8	74	8	2	74	18.8	74	8	NNE	2
11	Sa	10.0	21.9	1.2	0.2				12.8	97	4	12.8	97	4				2						
12	Su	10.9	18.9	0.6	2.4				13.0	51	0	13.0	51	0				9						
13	Mo	6.4	17.9	0	3.0				11.8	55	0	11.8	55	0	17.5	40	1	7	40	17.5	40	1	WSW	13
14	Tu	7.5	19.7	0	2.9				11.6	60	0	11.6	60	0	19.7	39	0	7	39	19.7	39	0	WSW	6
15	We	4.0	17.9	0	1.8				7.7	79	6	7.7	79	6	17.5	51	7	9	51	17.5	51	7	NW	2
16	Th	6.4	18.6	0	3.2				10.0	83	7	10.0	83	7	17.2	51	7	2	51	17.2	51	7	W	2
17	Fr	5.3	16.1	0	0.2				9.0	68	1	9.0	68	1	15.5	46	1	2	46	15.5	46	1	SW	22
18	Sa	4.2	18.5	0	3.4				8.4	70	1	8.4	70	1				13						
19	Su	6.9	19.1	0	0.8				12.5	73	2	12.5	73	2				7						
20	Mo	9.8	20.6	0	2.0				14.5	78	2	14.5	78	2	17.9	61	5	2	61	17.9	61	5	S	37
21	Tu	10.4	20.1	1.6	0.8				13.9	97	7	13.9	97	7	16.9	79	8	Calm	79	16.9	79	8	Calm	
22	We	9.0	17.4	2.0	0.6				11.7	97	8	11.7	97	8	17.1	95	8	4	95	17.1	95	8	E	6
23	Th	11.0	21.9	8.8	2.2				15.7	98	7	15.7	98	7	19.8	82	5	Calm	82	19.8	82	5	E	4
24	Fr	13.1	23.2	0.4	0.2				17.1	99	7	17.1	99	7	22.4	76	7	Calm	76	22.4	76	7	ENE	4
25	Sa	15.2	23.7	4.4	1.8				16.2	90	8	16.2	90	8				4						
26	Su	12.1	24.1	0.2	1.0				15.0	91	7	15.0	91	7	21.9	42	6	2	42	21.9	42	6	S	6
27	Mo	10.6	22.4	0	1.0				15.5	75	1	15.5	75	1	19.4	50	4	2	50	19.4	50	4	ESE	15
28	Tu	8.2	20.0	0	0.6				12.2	75	5	12.2	75	5	19.8	47	2	4	47	19.8	47	2	SE	7
29	We	6.4	21.2	0	4.6				14.0	62	0	14.0	62	0	20.0	67	3	9	67	20.0	67	3	ENE	2
30	Th	11.0	22.0	0	4.0				15.1	78	2	15.1	78	2	23.1	40	0	2	40	23.1	40	0	WSW	2
31	Fr	8.2	23.5	0	0.8				12.8	92	0	12.8	92	0				7						
Statistics for July 2015																								
Mean		8.8	20.6		1.8				12.8	81	3	12.8	81	3	19.5	56	4	4	56	19.5	56	4		7
Lowest		4.0	16.1		0.2				7.7	51	0	7.7	51	0	15.5	39	0	Calm	39	15.5	39	0	Calm	
Highest		15.2	24.3	8.8	4.6				17.1	99	8	17.1	99	8	23.9	95	8	13	95	23.9	95	8	S	37
Total				19.2	56.7																			

Observations were drawn from Logan City Water Treatment Plant (station 040854)

IDCJDW4073201507 Prepared at 13:05 UTC on 7 Aug 2015
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ATTACHMENT 5. EXAMPLE PHOTOS

Brush-tailed possum sample photos



KeepGuard

07-01-2015 21:11:55



KeepGuard

06-22-2015 22:51:10

Eastern grey kangaroo sample photos



KeepGuard

06-27-2015 10:35:32



KeepGuard

06-21-2015 05:50:55



KeepGuard

06-20-2015 07:20:37

Dog sample photo



ScoutGuard

04.30.2009 06:00:22

Red fox sample photos



KeepGuard

06-27-2015 04:39:10



KeepGuard

06-21-2015 17:54:07



KeepGuard

07-04-2015 22:23:06



KeepGuard

06-25-2015 04:10:15

European Hare sample photos



KeepGuard

06-20-2015 06:00:46



KeepGuard

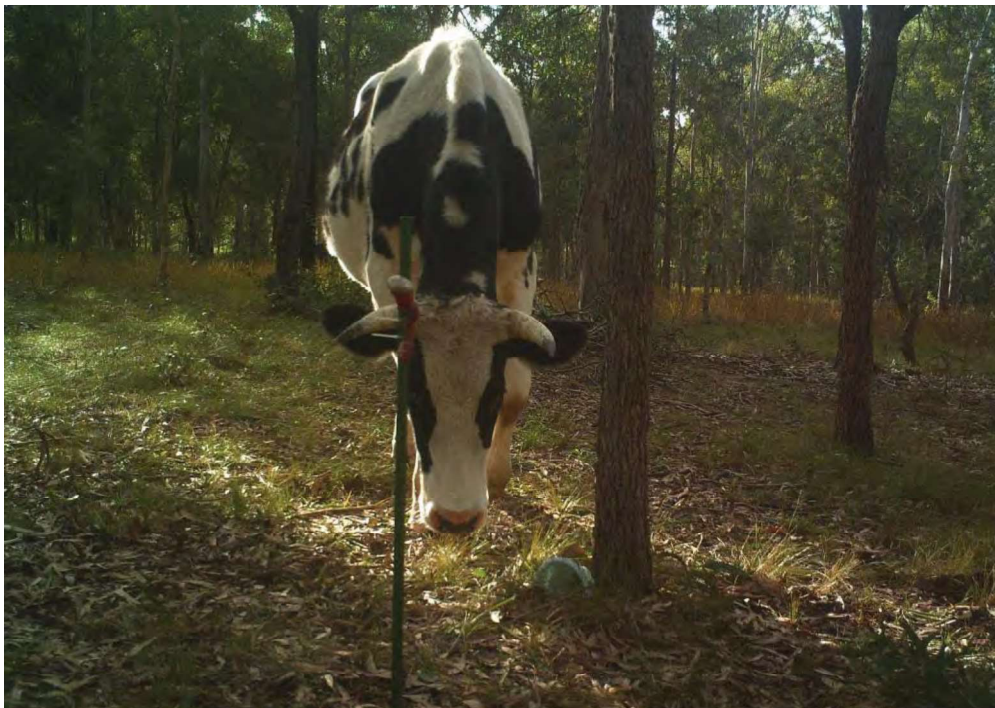
07-03-2015 04:59:48

Cattle sample photos



KeepGuard

06-26-2015 08:27:21



KeepGuard

06-23-2015 08:29:24

Horse sample photo



KeepGuard

01-01-2011 02:53:55

Grey butcherbird sample photo



KeepGuard

01-01-2011 02:34:07

Magpie sample photo



KeepGuard

08-03-2011 06:13:45

Straw-necked ibis sample photo



KeepGuard

07-03-2015 14:02:55

Crow sample photos



KeepGuard

07-05-2015 15:54:28



KeepGuard

07-05-2015 16:02:23

Whistling kite sample photo



Kookaburra sample photo





ATTACHMENT 6. HAIRTUBE ANALYSIS

Wayne Mofitt

From: Mitch Taylor <ma.taylor@hotmail.com>
Sent: Monday, 20 July 2015 7:54 AM
To: Wayne Mofitt
Subject: Fwd: Analysis results
Attachments: SOUTHENVIRONMENTAL20715.xlsx; ATT00001.htm; 68South Environmental Invoice #5791.docx; ATT00002.htm

FYI

Sent from my iPad

Begin forwarded message:

From: <barbarat@skymesh.com.au>
Date: 19 July 2015 4:05:38 pm AEST
To: <ma.taylor@hotmail.com>
Subject: Analysis results

Hi Mitch,
I'll attach the results of the hair tube analysis. Not a very exciting result – lots of wafers had no hairs on them.
Please let me know if you have any queries.
I will also attach the invoice.

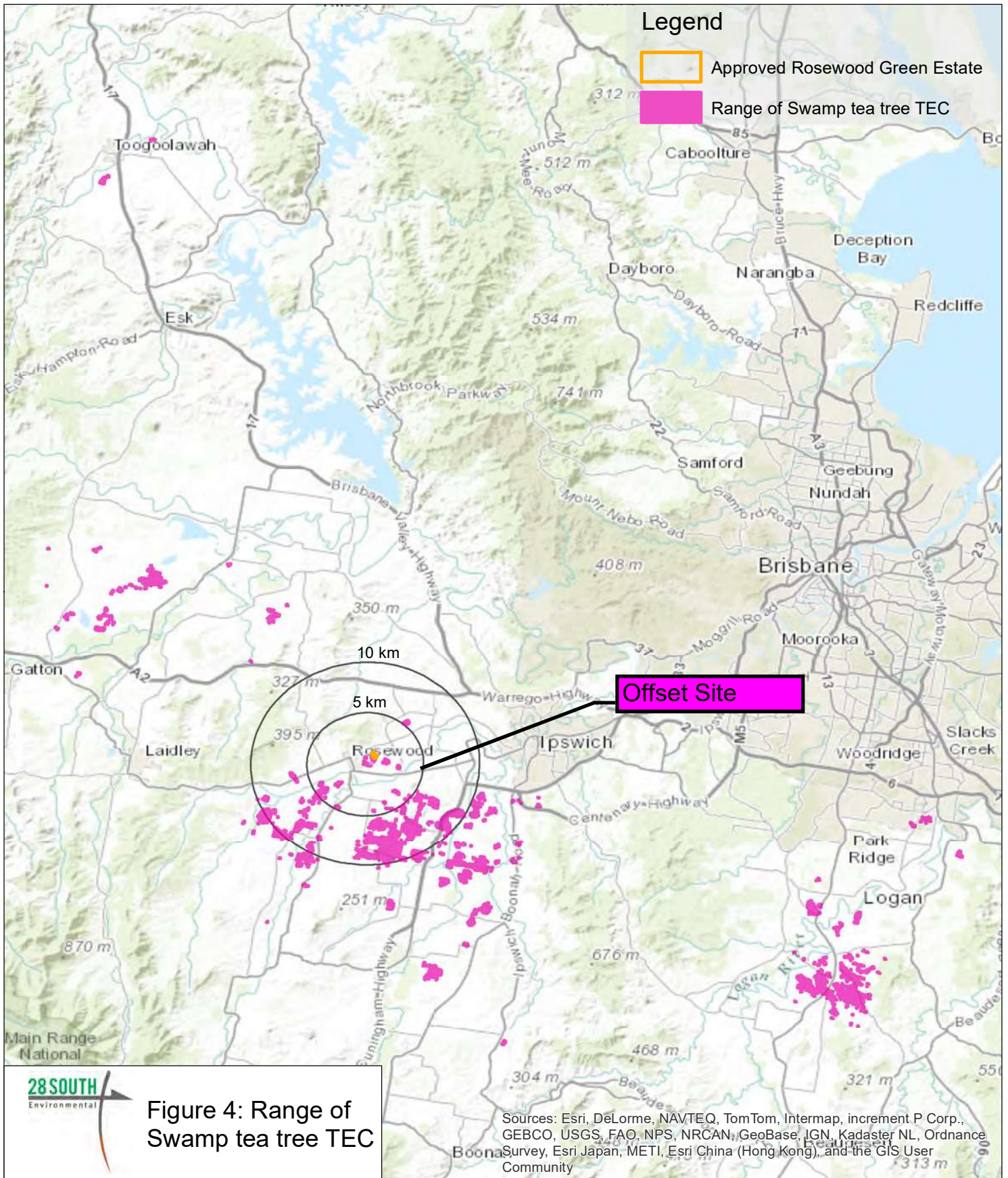
Regards,
Barbara

Hair tube analysis North McLean Dairy Farm 12/7/2015

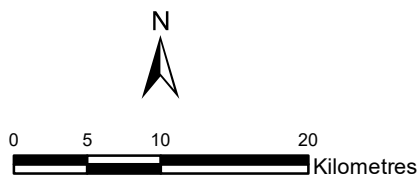
No.	Location	Mammal ID - definite	Mammal ID - probable
1	1	no hairs - plant fibres	
2	2	Trichosurus sp.	T. vulpecula
3	2	no hairs - insect material	
4	3	no hairs - insect material	
5	4	no hairs - insect material	
6	4	no hairs - insect material	
7	5	no hairs - caterpillar setae	
8	5	no hairs - insect material	
9	5	no hairs - insect material	
10	6	Trichosurus sp.	T. vulpecula
11	6	no hairs - insect material	
12	7	Trichosurus sp.	T. vulpecula
13	7	no hairs - insect material	
14	7	no hairs - plant fibres	
15	8	Trichosurus sp.	T. vulpecula
16	8	no hairs - plant fibres	
17	9	no hairs - insect material	
18	10	no hairs - insect material	
19	10	no hairs - insect material	
20	11	no hairs - insect material	
21	11	human hair	
22	12	no hairs - insect material	
23	12	no hairs - plant fibres	



Attachment 14 – Offset Site (Swamp Tea-tree context)



Project Name: Rosewood Green External Sewer
 Client: Diverse Property Solutions
 Title: Figure 4 - Range of Swamp tea tree TEC
 Date: 1st November 2013
 Coordinate System: GDA 1994 MGA Zone 56
 Reference Scale: 1:500,000
 © 28 South Environmental. www.28South.com.au



Reference: M.Irbayana Data - Queensland Herbarium, Biodiversity and Ecosystem Sciences 2009

Basemap - Refer to data frame, not to be used for measurement. For visualisation purposes only.

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