ecosystem solutions
PO Box 685
DUNSBOROUGH WA 6281
Ph: +61 8 9759 1960
Fax: +61 8 9759 1920
Mobile: 0427 591 960
info@ecosystemsolutions.com.au
www.ecosystemsolutions.com.au

Targeted Survey and Updated Flora and Fauna Assessment

Leeuwin Trail, from Dead Finish to the Cape Leeuwin Lighthouse, Augusta

Prepared for:
Shire of Augusta Margaret River
C/- Hayley Bain & Kay Lehman
18 April 2024

Limitations Statement

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Document Control

Shire of Augusta Margaret River

Leeuwin Trail, from Dead Finish to the Cape Leeuwin Lighthouse, Augusta

Version	Revision	Purpose	Author	Reviewer	Submitted	
					Form	Date
Draft Report	Rev A	Draft Report	HD	KP/DP	Electronic (email)	16/10/2023
Report	Rev B	Initial Report	HD	KP/DP	Electronic (email)	15/12/2023
Report	Rev C	Update to PEC mapping	KP	HD	Electronic (email)	31/01/2024
Report	Rev D	Amendment to Section 7.3	HD	HD	Electronic (email)	18/04/2024

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1 Introduction

Ecosystem Solutions were contracted by the Shire of Augusta-Margaret River to survey the Leeuwin Trail from Dead Finish to the Cape Leeuwin Lighthouse, Augusta (hereafter called the "Site") within the Shire of Augusta-Margaret River (Figure 1). The Shire is planning to expand the current Leeuwin Walk/Cycle Trail by 2.7 km within Shire Reserves 25141 and 29219 in order to provide pedestrians and cyclists the opportunity to travel safely from Dead Finish to the Cape Leeuwin Lighthouse. There are very significant environmental and cultural constraints that require careful evaluation against the impacts of path establishment and ongoing use.

Flora and vegetation, and fauna and habitat surveys were undertaken in 2019 by Litoria Ecoservices to help inform trail design and support an anticipated clearing permit application. Due to significant community interest and constraints, further investigations have been required since 2019 to confirm a suitable alignment and project scope. This included the Taalinup Boya Healthy Country Plan 2022, which identified culturally sensitive areas within the narrow coastal strip and recommendations for alternative design and ongoing management considerations, and a Supplementary Flora and Vegetation Assessment by Litoria Ecoservices in 2021. Common Ground Trails was engaged to undertake an options analysis report of the trail alignment, and Council endorsed the recommended alignment in June 2023.

The scope of this report was to undertake a targeted survey and an updated flora and fauna assessment for the proposed Leeuwin Trail alignment. This includes assessing and targeting the presence and distribution of threatened and priority flora, fauna, and ecological communities. The flora portion of this survey was conducted in spring and the team was limited to observing species present during the time of the surveys. The results of this survey complement and update the 2019 surveys and provide additional information for the Shire's clearing permit application for the proposal.

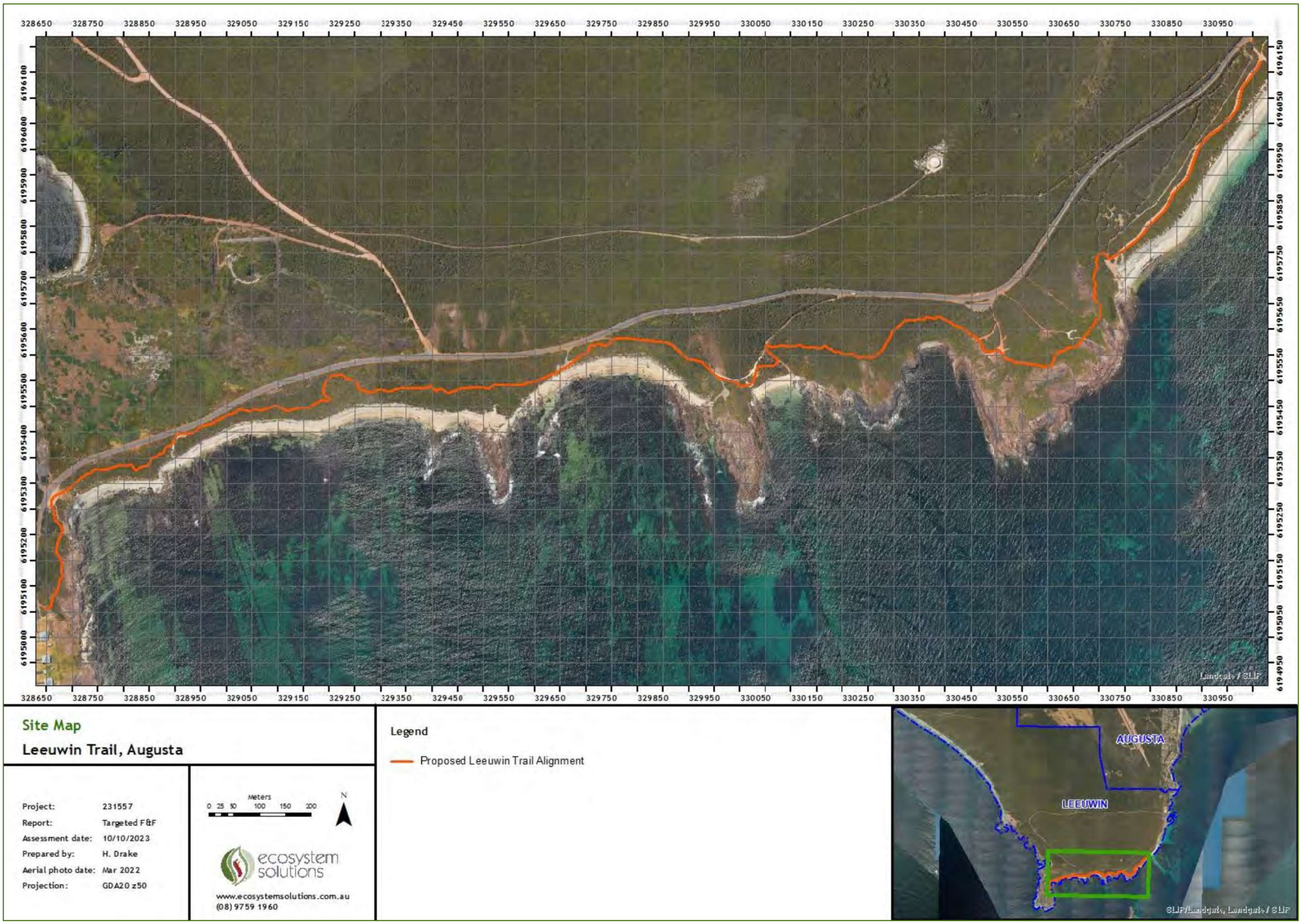

Figure 1 Site Map of Leeuwin Trail, from Dead Finish to the Cape Leeuwin Lighthouse, Augusta

2 Site Details

The Site is between the end of the Cape-to-Cape Track, Margaret River, and Coastal Walk Trail, Augusta. The proposed alignment will expand the current Leeuwin Walk/Cycle Trail by 2.7 km within Shire Reserves 25141 and 29219. The trail will connect the above trails from Dead Finish to the Cape Leeuwin Lighthouse for pedestrians and cyclists. The Cape Leeuwin Lighthouse will be its most western extent and Dead Finish trail will be the most eastern extent. The assessment of the Site included a 5m buffer each side of the trail, to allow for the trail's width and, any minor diversions required to minimise potential impact to adjacent ecological values.

The Site is 5.3 km south of Augusta town centre. Leeuwin Road sits just north, and the Southern Ocean is to the south of the Site. It gently undulates, sitting at an elevation of between 5-25 m Australian Height Datum (AHD), with the highest point being at the eastern/Dead Finish end. The surrounding landscape slopes down to sea level in the south and rises in the north. The location of the proposal is within a variety of different vegetation with minor cleared areas when it crosses existing paths and carparks, consisting of a combination of soft sand, granite rocks and compacted limestone. Further details about the landscape and vegetation at which the Site is on is provided below in Section 3.1.

3 Flora and Vegetation

3.1 Desktop analysis

3.1.1 Landscape, Soils and Vegetation

Soil Landscape systems are areas with recurring patterns of landforms, soils and vegetation and are used by the Department of Agriculture to maintain a consistent approach to land resource surveys. The Department of Primary Industries and Regional Development (DPIRD) Natural Resource Information (WA) database was used to identify the soil and vegetation mapping within the Site.

The Site is entirely located within the Leeuwin Zone (216) that is summarised as Leeuwin Block (tectonic geology), moderately dissected lateritic plateau on granite with colluvial soils in the valleys. On the western margin the granite is overlain by Tamala Limestone and there are some coastal dunes. (DPIRD-017).

Zones are further classified into soil systems. The Site is located within the Gracetown Ridge System (216Gr), which is along the coast from just above Gracetown to Augusta. It is described as Limestone ridge, in the coastal edge of the Leeuwin Zone, yellow deep sand and red deep sand, and consisting of coastal scrub, peppermint woodland and jarrah-marri-karri forest (DPIRD-064).

These systems are further classified into soil subsystems. The Site is situated across three soil landscape mapping units. The majority of the Site is situated over the Wilyabrup granitic headland phase and Gracetown exposed slopes phase, with the eastern end located on the Wilyabrup exposed slopes phase (Figure 2). These soil landscape units are described as (DPIRD-027):

- Wilyabrup granitic headland phase (216GrWLRE) - Areas on the west coast dominated by granitic outcrop.
- Gracetown exposed slopes phase (216GrGTEe) - Moderate slopes (gradients 10-15%) on the west coast exposed to prevailing wind directly off the ocean, with deep and shallow yellow brown siliceous sands over limestone (i.e., Spearwood Sands).
- Wilyabrup exposed slopes phase (216GrWLe3) - Low slopes (gradients generally 5-10%) exposed to strong winds off ocean.

The below soil subsystems are within the surrounding landscape of the Site, they are summarised as (Figure 2):

- Wilyabrup exposed swamps phase (216GrWLEw) - Swamp on granitic headland at Cape Leeuwin.
- Kilcarnup exposed rocky dunes phase (216GrKPrE) - Steep dunes (gradients usually more than 20%) with dark calcareous sands containing limestone rubble, on the west coast exposed to prevailing winds directly off the ocean.

Native Vegetation Extent mapping (DPIRD-005) indicates the Site is located within a large patch of native vegetation. The vegetation mapping of Havel and Mattiske (2000) identifies the Site is located within three vegetation complexes (Figure 3). These vegetation complexes are described as (Government of Western Australia, 2019):

- Wilyabrup (WE) – Mosaic of coastal heath and low woodland to woodland of *Corymbia calophylla-Eucalyptus marginata* subsp. *marginata-Banksia* spp. on westward slope in hyperhumid to humid zones.
- Gracetwon (GE) - Closed heath of *Olearia axillaris-Rhagodia baccata-Agonis flexuosa* on seaward slopes in hyperhumid to humid zones.
- Wilyabrup (Wr) – Woodland of *Corymbia calophylla-Eucalyptus marginata* subsp. *marginata* with closed heath of Myrtaceae-Proteaceae-*Papilionaceae* spp. on steep rocky slopes in the hyperhumid zone.

The following vegetation complexes are within close proximity, to the north of the Site (Figure 3):

- Wilyabrup (WEw) – Sedgeland of Cyperaceae-Restionaceae spp. on depressions by coast in the hyperhumid zone.
- Kilcarnup (Kr) – Tall shrubland of *Agonis flexuosa-Acacia saligna* on leeside of calcareous dunes in hyperhumid to humid zones.
- Gracetown (Ge) - Low woodland of *Agonis flexuosa* with some *Corymbia calophylla* on crests of calcareous dunes in hyperhumid to humid zones.

The 2018 South West Vegetation Complex Statistics (Government of Western Australia, 2019) for the vegetation complexes the Site is situated on are shown in Table 1. The National Objectives and Targets for Biodiversity Conservation 2001-2005 (Commonwealth of Australia, 2001) aims to retain and protect those vegetation communities with below 30% remaining. All three vegetation complexes have over 30% of the pre-European extent remaining both in the south west and the Shire of Augusta-Margaret River. The Wilyabrup (WE) and Gracetown (GE) have over 50% within lands protected for conservation, whereas the Wilyabrup (Wr) has less than 10% secured. Assessing the complexes with the Addendum for the South West

Biodiversity Project Area by Molloy *et al.* (2007) identifies that both the Wilyabrup complexes (WE and Wr) are both Locally Significant Natural Areas (LSNA) as they meet all four criteria to be classed as an LSNA. Both complexes also meet the Regional Representation and Rarity Local Significance Criteria. Whereas the Gracetown (GE) is not a LSNA and does not meet the Regional Representation and Rarity Local Significance Criteria.

Table 1 Vegetation Complex Statistics (Government of Western Australia, 2019)

Vegetation Complex	Pre-European Extent Remaining	Extent within Shire of Augusta-Margaret River	Current % remaining within lands protected (IUCN I-IV) for conservation
Wilyabrup (WE)	214.11 ha / 84.01 %	154.91 ha / 82.16 %	61.31 %
Gracetwon (GE)	4,791.22 ha / 94.61 %	2,585.03 ha / 94.78 %	82.49 %
Wilyabrup (Wr)	777.47 ha / 70.04 %	296.76 ha / 67.65 %	8.96 %

The vegetation on the Site has most recently been surveyed by Litroia Ecoservices in 2019. Litroia Ecoservices survey mapped six vegetation units from Leeuwin Road to the coast line, based on structural and floristic characteristics. The 2019 survey identified that most of the site is closed heath, closed scrub, and low closed Peppermint Forest and that the condition of the vegetation ranged from excellent through to degraded.

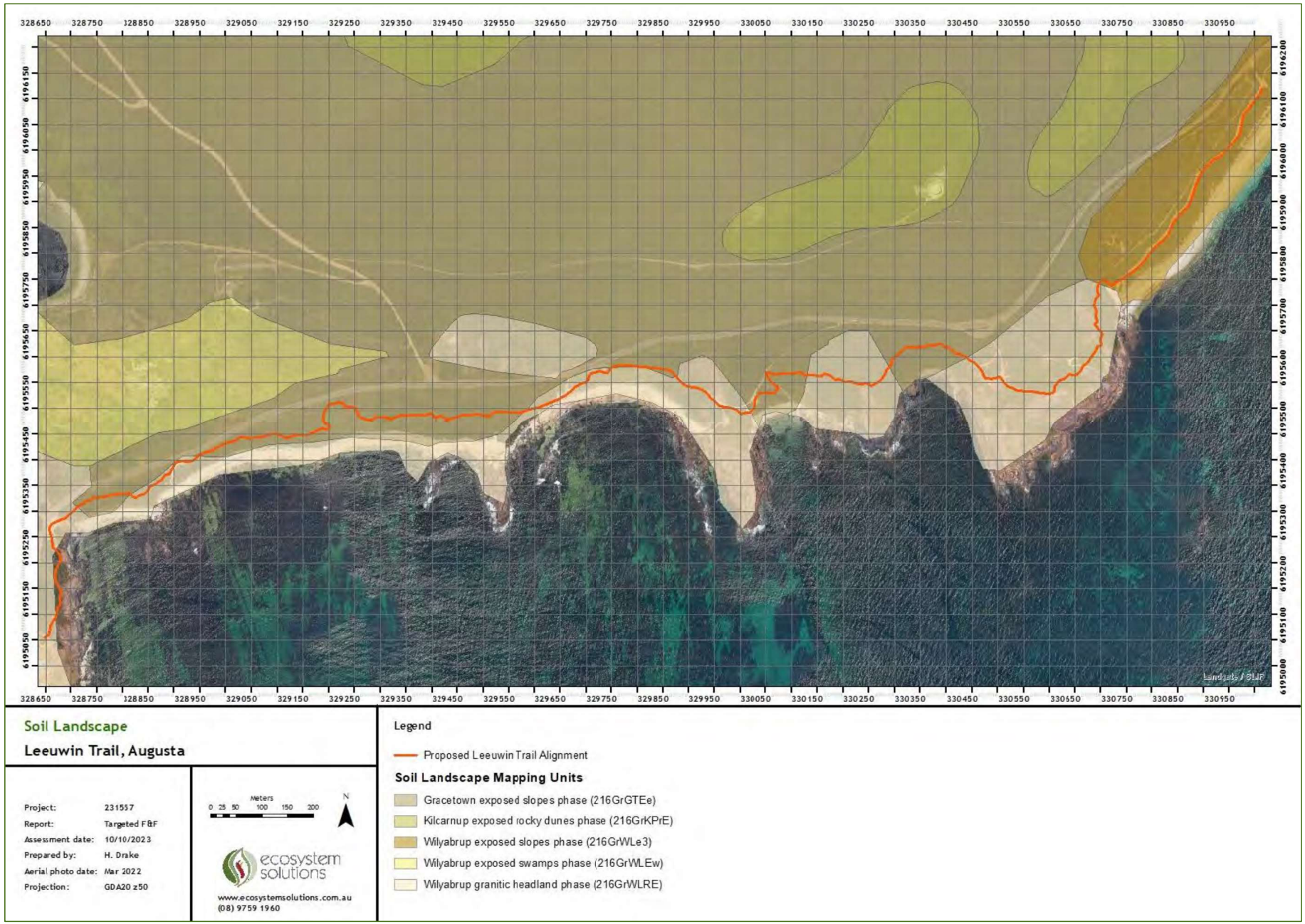

Figure 2 Soil Landscape of the Leeuwin Trail, from Dead Finish to the Cape Leeuwin Lighthouse, Augusta

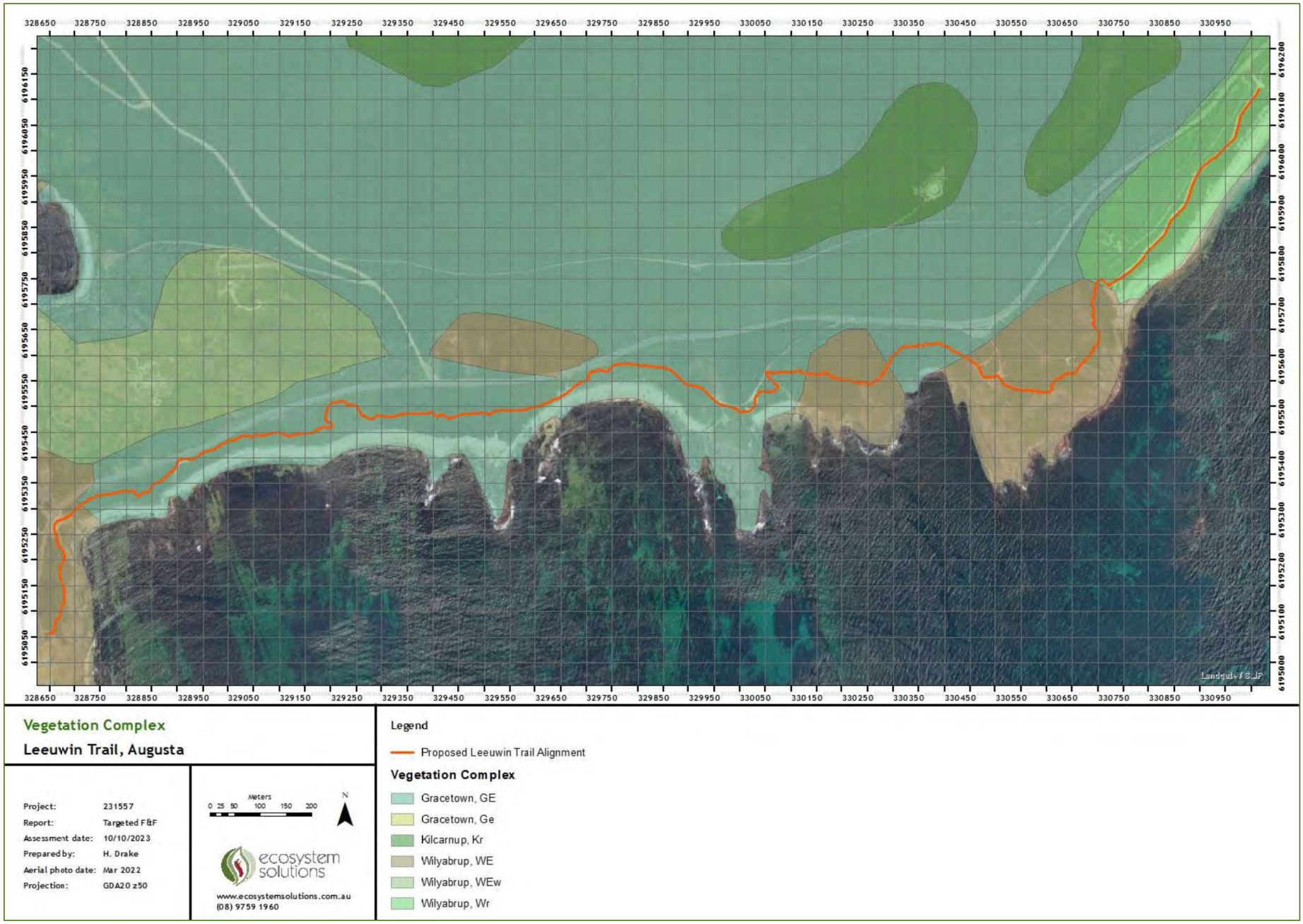

Figure 3 Vegetation Complex of the Leeuwin Trail, from Dead Finish to the Cape Leeuwin Lighthouse, Augusta

3.1.2 Threatened and Priority Flora

A review of available flora and vegetation data was undertaken. This included obtaining extracts (15km search radius) from the DBCA Significant Flora databases (WA Herb & TPFL) (DBCA, 2023), the DBCA NatureMap Database (Appendix A) and the Commonwealth Environmental Protection and Biodiversity Conservation (EPBC) Protected Matters Search Tool (Appendix B). This information was used to determine any existing records of threatened or priority flora within the boundary of, or in close proximity to, the Site and assist with determining the likelihood of a species occurring in the Site.

The NatureMap Database identified 11 Threatened species, which are rare or are likely to become extinct, 46 Priority listed species and one extinct species within a 15 km radius of the Site. The Protected Matters Search Tool identified 16 threatened species, within a 15 km radius of the Site. Two of those are considered Critically Endangered species, 10 Endangered species and four Vulnerable species (Appendix A & B), summarised in Table 2.

Species of flora and fauna are protected as defined in Appendix C, have been determined that their populations are restricted geographically or threatened by local processes. DBCA recognizes these threats of extinction and consequently applies regulations towards population and species protection. Protected species are gazetted under the *Biodiversity Conservation Act 2016* and therefore it is an offence to "take" or damage rare flora without Ministerial approval. The act defines "to take" as "… to gather, pick, cut, pull up, destroy, dig up, remove or injure the flora or to cause or permit the same to be done by any means". Appendix C presents the definitions for conservation codes under the *Biodiversity Conservation Act 2016* which was previously the *Wildlife Conservation Act 1950*.

A review of previous surveys conducted of the Site, provided by the Shire of Augusta-Margaret River, was undertaken. The flora and vegetation surveys conducted by Litroia Ecoservices in 2019b identified an estimated over 50 individuals of *Banksia sessilis* var. *cordata* (P4) just east of Groper Bay. It was also noted by Litroia Ecoservices that the Threatened (Endangered) species *Kennedia lateritia* within 2 kilometres of the Site.

Table 2 Conservation significant flora species recorded within 15 km of the Site.

Species	Conservation Status*	Life Form	Habitat / Known Distribution	Likelihood of occurrence within the Site	Data Source
Caladenia lodgeana	T/CR	Herb	Sandy -clay and clay soils in seasonally damp flats. Found between Augusta and Margaret River.	Unlikely. Habitat preference is not present within the Site. Closest record is just over 1 km north.	PMST, Naturemap, TPFL, WAHerb
Calectasia cyanea	T/CR	Herb	White, grey, or yellow sand, gravel.	Unlikely. Habitat preference is not present within the Site.	PMST
Banksia mimica	T/EN	Shrub	White or grey sand over laterite, sandy loam.	Unlikely. Habitat preference is not present within the Site.	PMST
Banksia nivea subsp. uliginosa	T/EN	Shrub	Sandy clay, gravel.	Unlikely. Habitat preference is not present within the Site. Closest record is approximately 11.9 km northeast.	PMST, Naturemap, WAHerb
Boronia exilis	T/EN	Herb	Seasonally wet heath.	Unlikely. Habitat preference is not present within the Site. Closest record is over 11 km northeast.	PMST, Naturemap, WAHerb
Caladenia excelsa	T/EN	Herb	Sandy soils in forests and woodlands. Found between Dunsborough and Karridale.	Unlikely. Habitat preference is not present within the Site. Closest record is over 5 km north.	Naturemap, WAHerb
Caladenia hoffmanii	T/EN	Herb	Sandy -clay oil in rocky hills and breakaways. Found between Geraldton and Murchinson River,	Unlikely. Habitat preference is not present within the Site.	PMST
Darwinia ferricola	T/EN	Shrub	Red, sandy, shallow loams over ironstone, around winter wet areas near the coast. Occurs from east of Augusta to Walpole.	Unlikely. Habitat preference is not present within the Site. Closest record is over 2 km north.	PMST, Naturemap, WAHerb
Gastrolobium papilio	T/EN	Shrub	Sandy clay over ironstone and laterite. Flat plains.	Unlikely. Habitat preference is not present within the Site.	PMST
Kennedia lateritia	T/EN	Climber	Close to the coast in black humus-rich sand, often amongst granite outcrops. Typically, the vegetation is low coastal heath, but sometimes Peppermints or Karris are present. The mean annual rainfall is approximately 1000 mm.	Potential. Known to occur within 2 kilometres of the Site (Litroia Ecoservices, 2019). Closest record is less than 1 km northwest and north of the Site (DBCA, 2023).	PMST, Naturemap, TPFL, WAHerb

Species	Conservation Status*	Life Form	Habitat / Known Distribution	Likelihood of occurrence within the Site	Data Source
Lambertia echinata subsp. occidentalis	T/EN	Shrub	White sandy soils over laterite, orange/brown-red clay over ironstone. Flats to foothills, winter-wet sites.	Unlikely. Habitat preference is not present within the Site.	PMST
Lambertia orbifolia subsp. vespera	T/EN	Shrub	Yellow-brown sandy clay, grey sand, sandy gravel, laterite.	Potential, habitat preference present within the Site. Closest record is over 11 km northeast.	Naturemap, WAHerb
Verticordia plumosa var. vassensis	T/EN	Shrub	White/grey sand. Winter-wet flats.	Unlikely. Habitat preference is not present within the Site.	PMST & Naturemap
Banksia squarrosa subsp. argillacea	T/VU	Shrub	White/grey sand, gravelly clay, or loam. Winter-wet flats, clay flats.	Unlikely. Habitat preference is not present within the Site.	PMST
Diuris drummondii	T/VU	Herb	Sandy-clay and clay soils im seasonally wet flats, flowering best in season following a summer fire. Found mainly between Perth and Albany, rare, scattered populations as far north as Northampton.	Unlikely. Habitat preference is not present within the Site. Closest record is over 8 km north.	Naturemap, TPFL
Drakaea micrantha	T/VU	Herb	Sandy soil in forests and woodlands. Found between Perth and Albany.	Unlikely. Habitat preference is not present within the Site.	PMST
Grevillea brachystylis subsp. australis	T/VU	Shrub	Sand, sandy clay. Swampy situations, stream banks.	Unlikely. Habitat preference is not present within the Site. Closest record is over 4 km north.	PMST, Naturemap, WAHerb
Leptomeria dielsiana	T/VU/X	Shrub	Locality & description unknown. Only known from one type collection and has not been relocated since the first collection in scrubby heath in the Scott River area. Presumed extinct.	Unlikely. Preumed extinct.	PMST, Naturemap, WAHerb
Caladenia pholcoidea subsp. augustensis	P1	Herb	Clay and sandy-clay soils in seasonally wet flats, flowers only in season following a summer fire. Found near Augusta.	Unlikely. Habitat preference is not present within the Site. Closest record is approximately 3.3 km north.	Naturemap, WAHerb
Darwinia terricola	P1	Shrub	Shallow sandy clay over granite, in winter damp flats under a Mallee shrubland dominated by Eucalyptus marginata. Confined to the Black-wood Plateau.	Unlikely. Habitat preference is not present within the Site. Closest record is over 2 km north.	Naturemap, WAHerb

Species	Conservation Status*	Life Form	Habitat / Known Distribution	Likelihood of occurrence within the Site	Data Source
Philydrella pygmaea subsp. minima	P1	Herb	Damp sites.	Unlikely. Habitat preference is not present within the Site. Closest record is over 10 km northeast.	Naturemap, TPFL, WAHerb
Schoenus indutus	P1	Sedge	Gravelly sand.	Unlikely. Habitat preference is not present within the Site. Closest record is over 14 km northeast.	Naturemap, WAHerb
Stylidium sp. Scott River Plain (N.G. Marchant 74/23)	P1	Herb	No information available. Only known from one collection/location.	Unlikely, Scott River Plain further north east of the Site. Closest record is over 13 km northeast.	Naturemap, WAHerb
Conospermum quadripetalum	P2	Shrub	Sandy clay, grey sand. Flats behind coastal hills.	Unlikely. Habitat preference is not present within the Site. Closest record is approximately 11.8 km northeast.	Naturemap, TPFL, WAHerb
Diuris heberlei	P2	Herb	Sandy-clay and peaty soils in seasonally damp coastal flats. Found between Augusta and Two Peoples Bay.	Unlikely. Habitat preference is not present within the Site. Closest record is just over 1.5km north.	Naturemap, TPFL
Hemigenia sp. Nillup (R.D. Royce 98)	P2	Shrub	No information available.	Potential, habitat preference present within the Site. Closest record is over 11 km northeast.	Naturemap, WAHerb
Leptomeria furtiva	P2	Shrub	Grey or black peaty sand. Winter-wet flats.	Unlikely. Habitat preference is not present within the Site. Closest record is over 9 km northeast.	Naturemap, TPFL, WAHerb
Pigea volubilis	P2	Herb	Clay or sandy clay. River banks.	Unlikely. Habitat preference is not present within the Site. Closest record is over 13 km northeast.	Naturemap, TPFL, WAHerb
Schoenus loliaceus	P2	Sedge	Sandy soils. Winter-wet depressions.	Unlikely. Habitat preference is not present within the Site. Closest record is over 11 km northeast.	Naturemap, TPFL, WAHerb
Schoenus sp. Grassy (E. Gude & J. Harvey 250)	P2	Sedge	Black silt. Swamps.	Unlikely. Habitat preference is not present within the Site. Closest record is over just over 1.5 km north.	Naturemap, WAHerb

Species	Conservation Status*	Life Form	Habitat / Known Distribution	Likelihood of occurrence within the Site	Data Source
Stenanthemum sublineare	P2	Shrub	Littered white sand. Coastal plain.	Unlikely. Habitat preference is not present within the Site. Closest record is over 11 km northeast.	Naturemap, WAHerb
Acacia lateriticola var. Glabrous variant (B.R. Maslin 6765)	P3	Shrub	Lateritic soils.	Unlikely. Habitat preference is not present within or surrounding the Site. Closest record is over 14 km northeast.	Naturemap, WAHerb
Amanita fibrillopes	P3	Fungi	Sandy or gravelly soil in dry sclerophyll forest and Banksia woodland, or in humus rich soil in seasonally wet eucalypt and paperbark woodland, often associated with Eucalyptus marginata, E. jacksonii, Allocasuarina fraseriana, Corymbia calophylla, Melaleuca preissiana and Agonis sp..	Unlikely. Habitat preference is not present within the Site. Closest record is over 13 km northeast.	Naturemap, WAHerb
Andersonia sp. Amabile (N. Gibson & M. Lyons 355)	P3	Shrub	Black sand in seasonally wet swamps in heath.	Unlikely. Habitat preference is not present within the Site. Closest record is over 1 km northeast.	Naturemap, WAHerb
Blennospora doliiformis	P3	Herb	Grey or red clay soils over ironstone. Seasonally wet flats.	Unlikely. Habitat preference is not present within the Site. Closest record is approximately 11.9 km northeast.	Naturemap, TPFL, WAHerb
Boronia anceps	P3	Herb	White sand, gravelly laterite. Seasonally swampy heaths.	Unlikely. Habitat preference is not present within the Site. Closest record is approximately 4.5 km north.	Naturemap, WAHerb
Caladenia abbreviata	P3	Herb	Deep sandy soils in coastal woodlands and shrublands. Abundant in disturbed areas along edges of graded racks and firebreaks. Found between Yallingup and William Bay.	Unlikely. Habitat preference is not present within the Site. Closest record is over 7 km north.	Naturemap, TPFL, WAHerb
Calothamnus lateralis var. crassus	P3	Shrub	Sand, clay or peat in swamps and winter-wet depressions.	Unlikely. Habitat preference is not present within the Site. Closest record is over 4 km north.	Naturemap, WAHerb
Chordifex gracilior	P3	Herb	Peaty sand. Swamps.	Unlikely. Habitat preference is not present within the Site. Closest record is over 9 km northeast.	Naturemap, TPFL, WAHerb

Species	Conservation Status*	Life Form	Habitat / Known Distribution	Likelihood of occurrence within the Site	Data Source
Cyathochaeta stipoides	P3	Sedge	Grey or red-brown sand. Seasonally wet flats.	Unlikely. Habitat preference is not present within the Site. Closest record is approximately 9.9 km northeast.	Naturemap, TPFL, WAHerb
Dampiera heteroptera	P3	Herb or shrub	Sandy soils. Swampy areas.	Unlikely. Habitat preference is not present within the Site. Closest record is over 4 km north.	Naturemap, WAHerb
Galium leptogonium	P3	Herb	Forest, woodland, and grassland, often growing from rock crevices. Found in scattered populations from Cape Leeuwin to Eucla.	Unlikely. Habitat preference is not present within the Site. However, a population is known less than 1km to the northwest and southwest.	Naturemap, TPFL, WAHerb
Gastrolobium formosum	P3	Shrub	Clay loam. Along river banks or in swamps.	Unlikely. Habitat preference is not present within the Site. Closest record is over 4 km north.	Naturemap, TPFL, WAHerb
Grevillea manglesioides subsp. ferricola	P3	Shrub	Red sandy clay over ironstone. Winter wet flats.	Unlikely. Habitat preference is not present within the Site. Closest record is over 9 km northeast.	Naturemap, WAHerb
Grevillea papillosa	P3	Shrub	Brown or peaty sand, sandy clay, loam. Seasonally wet areas, swamps.	Unlikely. Habitat preference is not present within the Site. Closest record is over 11 km northeast.	Naturemap, TPFL, WAHerb
Hemiandra sp. Windy Harbour (B.J. Conn & J.A. Scott BJC 3344)	P3	Shrub	Granite outcrops. Poorly known.	Potential, habitat preference present within the Site. Closest record is over 7 km north.	Naturemap, TPFL, WAHerb
Isopogon formosus subsp. dasylepis	P3	Shrub	Sand, sandy clay, gravelly sandy soils over laterite. Often swampy areas.	Unlikely. Habitat preference is not present within the Site. Closest record is over 11 km northeast.	Naturemap, TPFL, WAHerb
Leucopogon wheelerae	P3	Shrub	Restricted to heath or woodland edge on seasonally wet flats. Occurs in the far south-west corner of Western Australia between the Hardy Inlet, near Augusta, and the Donnelly River.	Unlikely. Habitat preference is not present within the Site. Closest record is over 10 km northeast.	Naturemap, WAHerb

Species	Conservation Status*	Life Form	Habitat / Known Distribution	Likelihood of occurrence within the Site	Data Source
Loxocarya magna	P3	Herb	Sand, loam, clay, ironstone. Seasonally inundated or damp habitats.	Unlikely. Habitat preference is not present within the Site. Closest record is over 11 km northeast.	Naturemap, TPFL, WAHerb
Pultenaea pinifolia	P3	Shrub	Loam or clay. Floodplains, swampy areas.	Unlikely. Habitat preference is not present within the Site. Closest record is over 14 km northwest.	Naturemap, WAHerb
Stylidium trudgenii	P3	Herb	Grey sand, dark grey to black sandy peat. Margins of winter-wet swamps, depressions.	Unlikely. Habitat preference is not present within the Site. Closest record is over 11 km northeast.	Naturemap, WAHerb
Adenanthos detmoldii	P4	Shrub	Grey or black peaty sand, wet. Swamps, roadsides.	Unlikely. Habitat preference is not present within the Site. Closest record is approximately 4.5 km north.	Naturemap, WAHerb
Adenanthos x pamela	P4	Shrub	Grey sand, laterite. Damp flats, roadsides.	Unlikely. Habitat preference is not present within the Site. Closest record is over 9 km northeast.	Naturemap, WAHerb
Aotus carinata	P4	Shrub	Sandy soils. Seasonally wet flats.	Unlikely. Habitat preference is not present within the Site. Closest record is over 3 km north.	Naturemap, WAHerb
Astartea onycis	P4	Shrub	Seasonally inundated swamps, winter-wet, low-lying, or damp areas, woodlands, sedgelands. Sandy clay, loam, or peat.	Unlikely. Habitat preference is not present within the Site. Closest record is over 9 km northeast.	Naturemap, WAHerb
Banksia meisneri subsp. ascendens	P4	Shrub	White or grey sand. Swampy flats.	Unlikely. Habitat preference is not present within the Site. Closest record is over 4 km north.	Naturemap, TPFL, WAHerb
Banksia sessilis var. cordata	P4	Shrub	White/grey sand. Coastal limestone.	Present, species previously recorded within the Site (Litroia Ecoservices, 2019b) and a record in 1986 (DBCA, 2023).	Naturemap, TPFL, WAHerb
Franklandia triaristata	P4	Shrub	White or grey sand.	Potential, habitat preference present within the Site. Closest record is over 4 km north.	Naturemap, WAHerb

Species	Conservation Status*	Life Form	Habitat / Known Distribution	Likelihood of occurrence within the Site	Data Source
Gonocarpus pusillus	P4	Herb	Grey sandy clay. Winter-wet swamps.	Unlikely. Habitat preference is not present within the Site. Closest record is over 9 km northeast.	Naturemap, TPFL, WAHerb
Melaleuca basicephala	P4	Shrub	Black peaty sand, clay. Winter-wet flats, swamps.	Unlikely. Habitat preference is not present within the Site. Closest record is over 9 km northeast.	Naturemap, WAHerb
Pultenaea skinneri	P4	Shrub	Sandy or clayey soils. Winter-wet depressions.	Unlikely. Habitat preference is not present within the Site. Closest record is over 12 km northeast.	Naturemap, WAHerb
Stylidium ireneae	P4	Herb	Sandy loam. Valleys near creek lines, woodland, often with Agonis.	Unlikely. Habitat preference is not present within the Site. Closest record is over 6 km north.	Naturemap, WAHerb
Tripterococcus sp. Brachylobus (A.S. George 14234)	P4	Herb	Grey sandy loam, Eucalypt woodland. Grey sand, plain, wetland with wet grey clay.	Unlikely. Habitat preference is not present within the Site. Closest record is over 14 km northeast.	Naturemap, TPFL, WAHerb
Verticordia lehmannii	P4	Shrub	Sandy clay. Winter-wet flats.	Unlikely. Habitat preference is not present within the Site. Closest record is over 10 km northeast.	Naturemap, WAHerb

* BC Act: T = Threatened, P = Priority / EPBC Act: CR = Critically Endangered, EN = Endangered, VU = Vulnerable

3.1.3 Threatened and Priority Ecological Communities

An ecological community is a naturally occurring biological assemblage that occurs in a particular type of habitat. A Threatened Ecological Community (TEC) is one which is found to fit into one of the following categories: Presumed Totally Destroyed; Critically Endangered; Endangered, or Vulnerable. Possible TECs that do not meet survey criteria are added to the Department of Parks and Wildlife's Priority Ecological Community (PEC) Lists, under Priority 1, 2 and 3. These are ranked in order of priority for survey and/or definition of the community type and evaluation of its conservation status.

The Protected Matters Search Tool identified four Threatened Ecological Communities (TECs) to likely/may occur within the 15 km area:

- Aquatic Root Mat Community 1 in Caves of the Leeuwin Naturaliste Ridge (Endangered),
- Empodisma peatlands of southwestern Australia (Endangered),
- Scott River Ironstone Association (Endangered), and
- Subtropical and Temperate Coastal Saltmarsh (Vulnerable).

In addition to the PMST search, a DBCA database extract was obtained to determine occurrences of Threatened and Priority Ecological Communities protected under Western Australian legislation (BC Act) (DBCA, 2023). Five conservation significant Ecological Communities (Three TECs and two PECs) occur within 15 km of the Site:

- Aquatic Root Mat Community Number 1 of Caves of the Leeuwin-Naturaliste Ridge (Easter and Jewel Caves) (Critically Endangered under BC Act, Endangered under EPBC Act),
- Rimstone pools and cave structures formed by microbial activity on marine shorelines (Augusta mircrobialites) (Endangered under BC Act),
- Subtropical and Temperate Coastal Saltmarsh (P3 under BC Act, Vulnerable under EPBC Act),
- Scott River Ironstone Association (Critically Endangered under BC Act, Endangered under EPBS Act), and
- Tall closed sedgeland on shallow soils derived from granite gneiss on the Leeuwin Naturaliste Ridge ('Sedgelands of the Cape Leeuwin Spring') (Priority 1 under BC Act).

The Augusta Microbial and Sedgelands of Cape Leeuwin Spring Ecological Communities associated buffers occur within the Site (DBCA, 2023). The centre of the Augusta Microbial appear to occur just south of the Site and the Sedgelands of Cape Leeuwin Spring Ecological Communities seems to occur on the other side of Leeuwin Road.

From a review of the previous surveys of the Site, provided by the Shire of Augusta-Margaret River, there is one Priority Ecological Community and one Threatened Ecological Community within the Site (Litoria Ecoservices, 2019b). The Rimstone Pools and Cave structures formed by microbial activity on the marine shoreline: Augusta Microbial - (Aquatic root mat community Number 1 in caves of the Leeuwin - Naturalist Ridge.) was identified and confirmed on Site and registered on the applicable databases (Litoria Ecoservices, 2019b). The *Melaleuca lanceolata* forests (*Melaleuca lanceolata* forests, Leeuwin Naturaliste Ridge) was also recorded from the western most portion of the Site (Litoria Ecoservices, 2019b). The survey also noted the regionally significant granitic outcrop vegetation of the Margaret River plateau that is of significant conservation value (Webb 2013) within the Site and the TEC listed Tufa communities that is adjacent to the Site (Litoria Ecoservices, 2019b).

3.2 Field Survey

3.2.1 Survey Method

The Site was surveyed for flora and vegetation in spring over two dates, 16 and 19 October 2023, consistent with the Technical Guidance for Flora and Vegetation Surveys (Environmental Protection Authority, 2016) by staff member from Ecosystem Solutions (Table3).

The Site was walked in a systematic manner focusing on the 5m buffer of the trail to cover the entire area. The survey included targeted searches for significant flora and vegetation communities identified in the desktop analysis and 10 floristic sampling relevé within the Site, to document and understand the floristics, vegetation communities and condition of the survey area. The vegetation communities have been determined according to Keighery, 1994, adapted from Muir (1977) and Aplin (1979) and with the vegetation communities established by Litoria Ecoservices (2019b). Vegetation condition has been assessed using the Keighery (1994) scale, provided in Table 5. Significant flora, vegetation and fauna/habitat sightings were recorded opportunistically. Additional data including introduced flora were also recorded when opportunistically observed (Table 5). Recordings were marked by using Global Positioning System (GPS) and ArcPad© (Version 8- ESRI). Field observations were analysed and mapped also with ArcGis (ArcMap V10.6.1©).

3.2.2 Project Team and Licensing

The Project Manager / Field Team leader for the current survey has extensive experience in conducting flora and vegetation surveys in the south-west of WA (>10 years, Table 3 below). Other personnel have experience in assisting with flora and vegetation surveys in this area.

Table 3 Flora and Vegetation Team and Licencing

Team member	Role	Qualifications	Flora Licence Number
Kelly Lamp	Project Manager / Field Team leader / Plant identifications	B.Sc. Hons. Nat Rs Mgmt.	FB62000182 TFL 54-2021
Danae Plowman	Field survey	B.Sc. Post Grad Dip. Engy & Env	FB62000342
Dani Cuthbert	Field survey	Dip Bus & Dip TM	N/A
Hayley Drake	Field survey	B.Sc. Cons & Wildlife Bio and Molecular Bio	FB62000348

3.3 Results

3.3.1 Threatened, Priority and Significant Flora

There were no threatened flora species observed within the Site.

There was one priority flora species, *Banksia sessilis* var. *cordata* (Priority 4) observed within the Site which aligns with the location of the population provided by Litoria Ecoservices (2019b). This species is recorded within a portion of the vegetation community, 3 Closed Scrub, as defined by Litoria Ecoservices and discussed further in Section 3.3.2 below. *Banksia sessilis* var. *cordata* (Figure 4) is a non-lignotuberous shrub to 2.5 m high with cream to yellow flowers appearing in July to October on white/grey sand (Western Australian Herbarium, 1998-). The leaves of the cordata variant are larger than the other varieties being 35-65 mm long to 20-35 mm wide. The population within the Site is approximately 0.06 ha, located in the eastern extent, with a map provided in Figure 6, which also borders the regionally significant granite vegetation community. The proposed trail does impact a small portion of the *Banksia sessilis* var. *cordata* however it has been reduced as much as practical by using an existing trail and to also balance the impact on the granite community.

Figure 4 Banksia sessilis var. cordata (Priority 4) within the Site

There was one significant flora species, *Melaleuca lanceolata* (Figure 5), that is an indicator species for '*Melaleuca lanceolata* forests, Leeuwin Naturaliste Ridge'. This Priority 2 ecological community is further described in section 3.3.2 below. *Melaleuca lanceolata* was found only in a small area of the most western portion of the Site, at the Cape Leeuwin Lighthouse end of the trail (Figure 8). The main patch of the species sits outside of the Site. The species was less than 10 m in height on dark brown loamy sand. And is known to occur on limestone, clay, or loam, brown or grey or white sand on limestone ridges, coastal cliffs and dunes, salt flats, and near salt lakes (Western Australian Herbarium, 1998-).

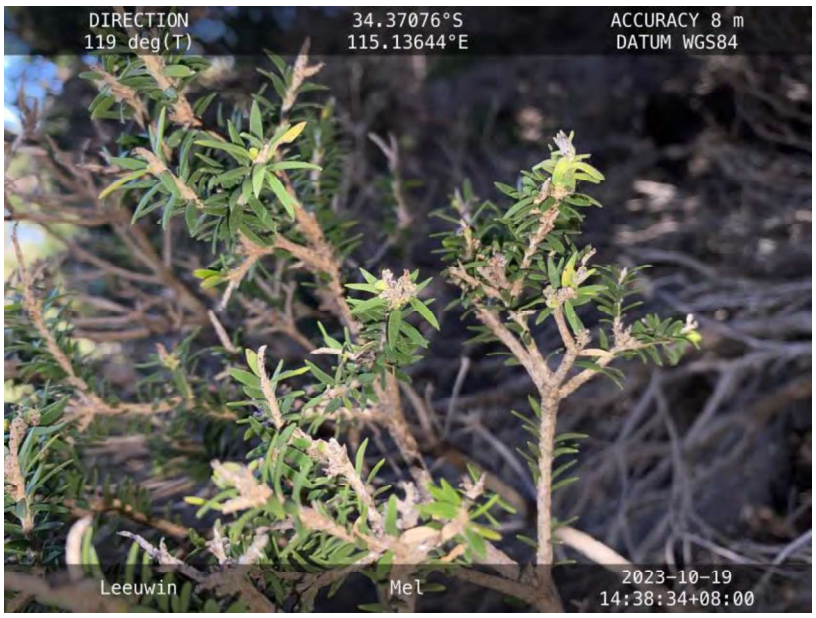

Figure 5 Melaleuca lanceolata, a significant flora species, within the Site

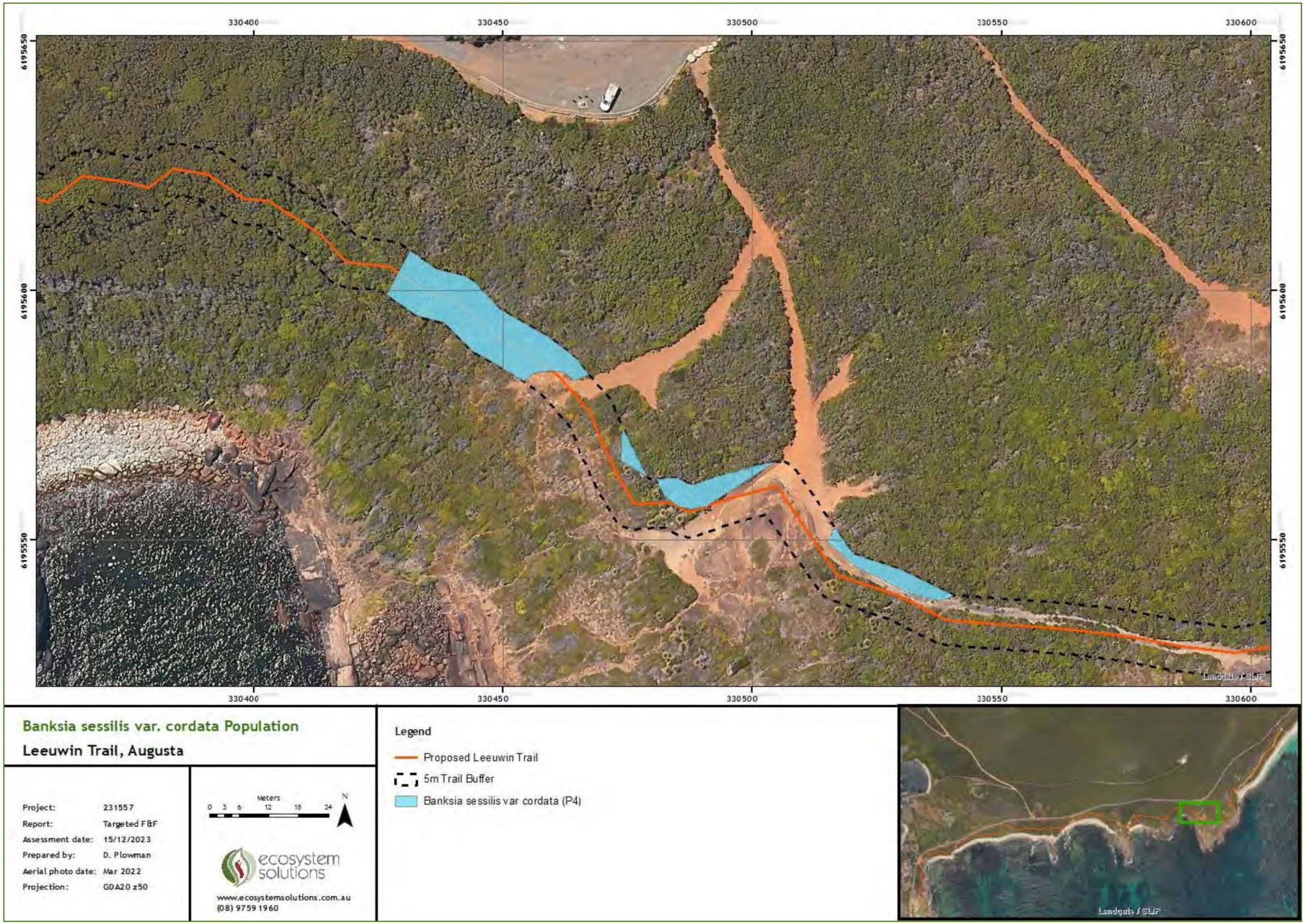

Figure 6 Banksia sessilis var. cordata Population along the Leeuwin Trail, from Dead Finish to the Cape Leeuwin Lighthouse, Augusta

3.3.2 Vegetation Communities

As mentioned in section 3.1.3 the Augusta Microbial (Aquatic root mat community Number 1 in caves of the Leeuwin - Naturalist Ridge., listed as Critically Endangered/Endangered) was located in the survey area for Litoria Ecoservices during the 2019 survey, however the trail alignment has been changed to avoid this occurrence. The Augusta Microbial community is located outside, and south of the Site for the current survey area.

The Sedgelands of Cape Leeuwin Spring Ecological Community buffer is within the Site, with the exact location occurring outside of the Site and to the north. During the field survey this ecological community was not observed in the Site.

The *Melaleuca lanceolata* forests (*Melaleuca lanceolata* forests, Leeuwin Naturaliste Ridge, Priority 2) that was recorded by Litoria Ecoservices (2019b) in the western most portion of the Site was also rerecorded by the survey team and a floristic relevé was conducted within it. This community was not identified in the database searches (10 km buffer of the Site), as was also the case in the 2019 survey. The vegetation was assessed as *Melaleuca lanceolata* low closed forest over *Leucopogon parviflorus* and *Melaleuca lanceolata* scattered tall shrubs over *Lepidosperma gladiatum* scattered sedgeland on a gentle slope and dark brown loamy sand (Appendix D).

The vegetation communities of the Site were mapped based on the previously described six vegetation units by Litorea Ecoservices in 2019b (Table 4). Litroia Ecoservices mapping extended from Leeuwin Road and south, to the coast line, covering the proposed trail alignment. This survey focused only on the trail alignment and a 5 m buffer of the trail to get more detailed mapping of the Site (Figure 7 & 8). There were 10 floristic relevés conducted within the Site to capture as many of the vegetation units as possible.

Most of the vegetation within the Site is within the Low Closed Forest, 1.47 ha or 45.76% of the Site, with the majority concentrated at the eastern half of the trail (Figure 8). The Dense Heath vegetation unit mostly occurs within the western half of the Site, 0.98 ha or 30.44% (Figure 7). The Closed Scrub vegetation is 0.46 ha, or 14.35 % of the Site and occurs within the eastern half of the Site concentrated along the existing track at the start of the proposed trail and the vegetation to the east of Groper Bay (Figure 8). The Granite vegetation unit is 0.25 ha or 9% of the Site, with small pockets scattered within the Closed Scrub vegetation in the eastern half (Figure 8) and between the *Melaleuca lanceolata* vegetation at the western end of the trail (Figure 7). There is a one very small portion of the Low Shrubland on the edge of the Site (0.0068 ha or 0.21 %), west of Ringbolt Bay, north of Point Matthew and east of Sarge Bay (Figure 8). There are two small areas of the *Melaleuca lanceolata* vegetation unit, approximately 0.054 ha or 1.95% of the Site, that intersect with the trail at the Cape Leeuwin Lighthouse end of the trail (Figure 7).

Table 4 Vegetation Units within the Site (Litoria Ecoservices, 2019b)

Vegetation Unit	Description	Area
1 Low Closed Forest	*Agonis flexuosa* over open grassland/ sedgeland/herbland of *Lepidosperma gladiatum*, *Rhagodia baccata*, *Dichondra repens*, *Microlaena stipoides*, *Pteridium esculentum*, *Muehlenbeckia adpressa* and *Acanthocarpus preissii*.	1.47 ha, 45.76 %
2 Dense (Closed) Heath	*Spyridium globulosum, Olearia axillaris, Scaevola crassifolia, Agonis flexuosa* and *Leucopogon parviflorus* over a predominantly sedgeland/herbland of *Lepidosperma gladiatum, Rhagodia baccata, Muehlenbeckia adpressa, Acanthocarpus preissii, Senecio elegans, Phyllanthus calycinus, Ficinia nodosa, Lagurus ovatus* and *Carpobrotus viresecens*.	0.98 ha, 30.44 %
3 (Tall) Closed Scrub	*Spyridium globulosum, Olearia axillaris,* and *Leucopogon parviflorus, Corymbia callophylla, Banksia sessilis var. cordata* with scattered *Agonis flexuosa,* over an open grassland/ sedgeland of *Lepidosperma gladiatum, Hibbertia grossularifolia, Dichondra repens, Clematis pubescen, Dianella revoluta* and *Hardenbergia comptoniana*	0.46 ha, 14.35 %
4 Low Closed Heath/Granite	*Eutaxia myrtifolia, Pimelea ferrugineae, Agonis flexuosa, Acacia saligna, Dodonaea ceratophylla, Xanthorrea preissi, Hakea oliefolia, Acacia pulchella, Spyridium globulosum* and *Leucopogon parviflorus* over a sedgeland/grassland/herbland of *Lepidosperma gladiatum, Lepidosperma squamatum,* introduced annual grasses and *Carpobrotus virescens* interspersed with patches of exposed granite.	0.25 ha, 9 %
5 Low Shrubland	*Dodonaea ceratophylla, Eutaxia myrtifolia, Pimelea ferrugineae* and *Agonis flexuosa,* over a grassland of introduced annual and perennial grasses. interspersed with patches of exposed granite.	0.0068 ha, 0.21 %
6 *Melaleuca lanceolata*	Low closed forest of *Melaleuca lanceolata* over sparse *Rhagodia baccata, Lepidosperma gladiatum, Spyridium globulosum*.	0.054 ha, 1.95 %

Figure 7 Vegetation Units Map of the Western Half of the Leeuwin Trail, from Dead Finish to the Cape Leeuwin Lighthouse, Augusta

Figure 8 Vegetation Units Map of the Eastern Half of the Leeuwin Trail, from Dead Finish to the Cape Leeuwin Lighthouse, Augusta

3.3.3 Vegetation Condition

The vegetation condition within the Site was determined according to the scale of condition developed by Keighery (1994, Table 5), with the condition mapping by Litroia Ecoservices (2019b) used as a guide. Litroia Ecoservices mapping extended from Leeuwin Road to the coast line covering the proposed trail alignment. This survey focused only on the trail alignment and a 5 m buffer of the trail to get more detailed mapping of the Site. The areas of vegetation were ranked from excellent to completely degraded (Table 5, Figure 9 & 10).

Excellent vegetation represents approximately 0.96 ha or 28 % of the Site. It was concentrated on the eastern half of the trail, typically in vegetation that had limited to no accessibility for vehicles and pedestrians. These areas have some weeds occur, mostly along the edges of where the proposed trail meets existing tracks, but these are not notably aggressive. This vegetation was variable in some sections ranging from very good to excellent, as Litoria Environmental (2019b) mapped, but these areas in this survey have been deemed as excellent in comparison to other vegetation in the Site that is in very good condition.

The majority of the Site is ranked as very good condition, which is approximately 1.6 ha or 47% of the Site. These areas have signs that the vegetation structure has been slightly altered with a greater number of more aggressive weeds, especially where the proposed trail meets or runs alongside existing tracks. This vegetation was also variable in some sections, with abundance of weeds changing throughout.

The Site comprises of 0.14 ha of good condition vegetation, approximately 4% of the Site. These were areas that were on the edge of vegetation in better but being impacted by more disturbances such as human trampling and weeds were observed within wider areas of the vegetation, not just confined to the trial edge.

Degraded vegetation, comprising of 0.06 ha or 1.78 % of the trail. The vegetation structure is severely impacted by disturbance, such as human tramping, past clearing and high impact from aggressive weeds. These areas were concentrated where human impacts were more prevalent.

Completely degraded areas consist of the already cleared tracks, mostly for vehicle access, and carparks that the trail intersects, encompassing of 0.64 ha or 18.89 % of the Site. It should be noted that Litroia Environmental (2019b) did not map these areas in their assessment but due to the finer scale of this survey these areas have been mapped.

There were 15 introduced flora species, weeds, opportunistically observed within the Site (Table 6). Abundance and density of these weeds were not recorded as this was not part of the targeted focus of the survey. The extremely dense nature of the vegetation made it difficult to make observations through the dense foliage cover and there is the potential other weed species are present within the Site but were missed. There were two declared pests, *Zantedeschia aethiopica* (Arum Lily) and *Asparagus asparagoides*

(Bridal creeper), listed under Section 22 of the *Biosecurity and Agriculture Management Act 2007*, observed within the Site. *Asparagus asparagoides* is also a Weed of National Significance (WoNS) (Table 6).

Table 5 Keighery Condition Scale (Keighery, 1994)

Category	Description	Area
Pristine	Pristine or nearly so, no obvious signs of destruction.	Not observed within the Site.
Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species. For example, damage to trees caused by fire, the presence of non-aggressive weeds and occasional vehicle track.	0.96 ha, 28.19 %
Very Good	Vegetation structure altered, No obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging, and grazing.	1.60 ha, 47.00 %
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate to it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback, and grazing.	0.14 ha, 4.13 %
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration, but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback, and grazing.	0.06 ha, 1.78 %
Completely Degraded	The structure of the vegetation in no longer intact and the area is completely or almost completely without native species. These areas are often described as “parkland cleared” with the flora composing weed or crop species with isolated native trees or shrubs.	0.64 ha, 18.89 %

Table 6 Introduced flora species opportunistically identified within the Site, including status (Government of Western Australia, 2023), ecological impact and invasiveness (DPAW, 2014).

Species Name	Common Name	Status[1]	Ecological Impact[2]	Invasiveness[2]
Acacia elata	Peppertree Wattle	Permitted - s11	Low	Slow
Arctotheca calendula	Cape Weed	Permitted - s11	Medium	Moderate
Asparagus asparagoides	Bridal Creeper	Declared Pest - s22(2) & WoNS	High	Rapid
Avena fatua	Wild Oat	Permitted - s11	High	Rapid
Briza maxima	Blowfly Grass	Permitted - s11	Unknown	Rapid
Catapodium rigidum	Rigid Festcue	Permitted - s11	N/A	N/A
Cynodon dactylon	Couch	Permitted - s11	High	Rapid
Hypochaeris sp.	Flat weed	N/A	Moderate	Rapid
Lagurus ovatus	Hare's Tail Grass	Permitted - s11	Unknown	Moderate
Lotus sp.	Trefoil	Permitted - s11	Unknown	Rapid
Orobanche minor	Broom Rape	Permitted - s11	Unknown	Rapid
Romulea rosea	Guildford Grass	Permitted - s11	High	Unknown
Senecio elegans	Purple Groundsel	Permitted - s11	Low	Moderate
Trachyandra divaricata	Dune Onion Weed	Permitted - s11	Unknown	Rapid
Zantedeschia aethiopica	Arum Lily	Declared Pest - s22(2)	High	Moderate

[1] Western Australian Organism List (WAOL) for declared pests in WA as per Department of Primary Industries and Regional Development and Biosecurity and Agriculture Management Act 2007 (Government of Western Australia, 2023).
[2] Ecological Impact and invasiveness ratings as per Department of Parks and Wildlife Southwest Region Species Prioritisation Process (DPAW, 2014).

Figure 9 Vegetation Condition Map of the Western Half of the Leeuwin Trail, from Dead Finish to the Cape Leeuwin Lighthouse, Augusta

Figure 10 Vegetation Condition Map of the Eastern Half of the Leeuwin Trail, from Dead Finish to the Cape Leeuwin Lighthouse, Augusta

4 Fauna

4.1 Desktop Analysis

The conservation status of fauna within WA is determined by two acts of legislation, the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and the State Western Australian *Biodiversity Conservation Act 2016* (WA) (BC Act). The conservation codes for fauna under the BC Act are presented in Appendix C. These categories are consistent with the International Union for Conservation of Nature (IUCN) classifications and link into a global ranking system for taxa at risk of extinction.

A desktop study and analysis of the extracts obtained from DBCA Significant Fauna database (DBCA, 2023), the DBCA NatureMap Database (Appendix A) and the Commonwealth Environmental Protection and Biodiversity Conservation (EPBC) Protected Matters Search Tool (Appendix B) were completed. This was done to determine the presence or likely presence of fauna or fauna assemblages within and around the Site and assist with determining the likelihood of a species occurring in the Site. The analysis primarily targeted terrestrial threatened vertebrate species listed under the *Biodiversity Conservation Act 2016* (WA) and *Environmental Protection Biodiversity Conservation Act 1999* (Commonwealth). A list of fauna expected to occur within a 15-kilometre radius of the Site was compiled and likelihood of occurrence determined (Table 7). Certain marine species and freshwater fish have been excluded due to the location of the Site with migratory (MI) bird species provided in Table 8.

The NatureMap Database identified 34 Threatened (T) species, which are rare or are likely to become extinct, 12 Priority (P) listed species, two Conservation Dependent (CD) species, one other specifically protected (OS) species and 23 migratory bird species (MI) within a 15 km radius of the Site. The Protected Matters Search Tool identified 34 Threatened (T) species, within a 15 km radius of the Site. Six of which is a Critically endangered (CR) species, 10 Endangered (EN) species and 18 Vulnerable (VU) species.

The requested DBCA data identified one Black Cockatoo breeding and/or roosting site within 15km of the Site (DBCA, 2023) The Black Cockatoo roosting site is approximately 8.5km north of the trail.

A review of previous surveys conducted of the Site, provided by the Shire of Augusta-Margaret River, was undertaken. The fauna and habitat assessment conducted by Litroia Ecoservices in 2019a identified Western Ringtail Possum (*Pseudocheirus occidentalis*, CR), Baudin's Black Cockatoo (*Zanda/Calyptorhynchus baudinii*, EN), Leeuwin Freshwater Snail (*Austroassiminea letha*, VU), Chuditch (*Dasyurus geoffroii*, VU), Quenda (*Isoodon fusciventer*, P4) and Hooded Plover (*Thinornis rubricollis*, P4). The survey also identified that portions of the Site contained potentially suitable habitat for Western Ringtail Possum.

Table 7 Conservation significant fauna species recorded within 15 km of the Site.

Species and Common Name	Conservation Status*	Habitat	Likelihood of occurrence within the Site	Data Source
Engaewa pseudoreducta Margaret River Burrowing Crayfish	T/CR	Narrow, creek tributaries of the Margaret River and Carbunup River. Heavy grey-yellow clays in areas of narrow, sloping depressions, with a dense shrub strata, minimal tree strata.	Unlikely. Habitat is not present within the Site.	PMST
Pezoporus flaviventris Western Ground Parrot	T/CR	Low, dry, or swampy near-coastal heathland, remained unburnt for long periods of time.	Unlikely. Habitat is not present within the Site.	Naturemap, DBCA
Potorous gilbertii Gilbert's Potoroo	T/CR	Dense, long unburnt shrubland.	Potential. Habitat is present within the Site.	Naturemap, DBCA
Pseudocheirus occidentalis Western Ringtail Possum	T/CR	Coastal Areas of peppermint woodland and peppermint woodland and peppermint / tuart associations.	Likely, habitat is present within the Site. Previously recorded in the Site (Litroia Ecoservices, 2019a).	PMST, Naturemap, DBCA
Atrichornis clamosus Noisy Scrub-bird	T/EN	Unburnt dense vegetation, including low forest, scrub/thicket and (rarely) heath that occur in gullies, drainage lines and lowland areas, and small, open areas with a thick accumulation of leaf litter.	Potential. Habitat is present within the Site.	Naturemap, DBCA
Bettongia penicillata ogilbyi Woylie, Brush-tailed Bettong	T/EN	Open forest and woodland with low understory of woody scrub. Woodlands and adjacent heaths with a dense understorey of shrubs. Tall eucalypt forest and woodland, dense myrtaceous shrubland, kwongan or mallee heath.	Unlikely. Habitat is not present within the Site.	Naturemap, DBCA
Botaurus poiciloptilus Australasian Bittern	T/EN	Wetlands with tall, dense vegetation, favours permanent and seasonal freshwater habitats, dominated by sedges rushes and reeds, growing over a muggy or peaty substrate.	Unlikely. Habitat is not present within the Site.	PMST, Naturemap, DBCA
Dasyornis longirostris Western Bristlebird	T/EN	Variety, most dense in riparian jarrah forests. Require large, unfragmented habitats.	Unlikely. Habitat is not present within the Site.	Naturemap, DBCA

Myrmecobius fasciatus Numbat	T/EN	*Acacia aneura* (mulga) woodland and sand plain and sand dune areas dominated by *Triodia* spp. (spinifex) hummock grassland in the arid zone to eucalypt woodlands and forests in south-west.	Unlikely. Habitat is not present within the Site.	PMST
Petrogale lateralis lateralis Black-flanked/footed Rock-wallaby	T/EN	Rocky habitat with caves and crevices.	Unlikely. Habitat is not present within the Site.	Naturemap, DBCA
Zanda/Calyptorhynchus baudinii Baudin's Cockatoo	T/EN	Dense Jarrah, Karri, and Marri forests. Species nest in large hollows in these species.	Potential however preferred habitat is not present within the Site. Habitat is not present within the Site. Previously recorded near the Site (Litroia Ecoservices, 2019a).	PMST, Naturemap, DBCA
Zanda/Calyptorhynchus latirostris Carnaby's Black Cockatoo	T/EN	Dense Jarrah, Karri, and Marri forests. Species nest in large hollows in these species.	Potential however preferred habitat is not present within the Site.	PMST, Naturemap, DBCA
Austroassiminea letha Cape Leeuwin Freshwater Snail	T/VU	Short range endemic. Wet and humid environments, seepage films and splash zones near small freshwater streams and springs. Requires perennially moist or highly humid conditions. May inhabit rocks, leaves, soil, and litter.	Potential however habitat does not present within the Site. Multiple records within 1 km of the Site and recorded by Litroia Ecoservices, 2019a near the Site.	Naturemap, DBCA
Calyptorhynchus banksii naso Forest Red-tailed Black-Cockatoo	T/VU	Dense Jarrah, Karri, and Marri forests. Species nest in large hollows in these species.	Potential however preferred habitat is not present within the Site.	PMST, Naturemap, DBCA
Dasyurus geoffroii Chuditch, Western Quoll	T/VU	Variety, most dense in riparian jarrah forests. Require large, unfragmented habitats.	Likely. Previously recorded near the Site (Litroia Ecoservices, 2019a).	PMST, Naturemap, DBCA
Leipoa ocellata Malleefowl	T/VU	Semi-arid to arid shrublands and low woodlands dominated by mallee and/or acacia.	Unlikely. Habitat is not present within the Site.	Naturemap, DBCA
Pseud*omys fieldi* Shark Bay Mouse	T/VU	Typically, coastal sandy areas, deep sandy soil supporting Spinifex and Triodia species or Acacia heath.	Unlikely. Habitat is not present within the Site.	Naturemap, DBCA
Pseudomys shortridgei Heath Mouse	T/VU	Heathlands. Dry heathland, and open woodland and forest habitats with a heath understorey.	Unlikely. Habitat is not present within the Site.	Naturemap, DBCA

Setonix brachyurus Quokka	T/VU	Mainly dense riparian vegetation, other areas with dense vegetated understory with close proximity to freshwater	Potential. Habitat is present within the Site.	PMST, Naturemap, DBCA
Westralunio carteri Carter's Freshwater Mussel	T/VU	Coastal freshwater rivers and lakes of the south-west region. Also occurs in water supply and farm dams. Prefers slower flowing waters where sediments stable. Species has low salinity tolerance.	Unlikely. Habitat is not present within the Site.	PMST, Naturemap, DBCA
Elapognathus minor Short-nosed Snake	P2	Heath, swamps, and wet sclerophyll forest.	Unlikely. Habitat is not present within the Site.	Naturemap, DBCA
Tyto novaehollandiae novaehollandiae Masked Owl (Southwest)	P3	Tall forests, woodlands, timbered waterways, and open country on the fringe of these areas.	Unlikely. Habitat is not present within the Site.	Naturemap, DBCA
Falsistrellus mackenziei Western False Pipistrelle	P4	Wet sclerophyll forests of Karri, Jarrah, and Tuart eucalypts. Roost in hollows in old trees, branches, and stumps.	Unlikely. Habitat is not present within the Site.	Naturemap, DBCA
Hydromys chrysogaster Water-rat, Rakali	P4	Found Near permanent fresh or brackish waters, Areas of permanent fresh or brackish water, drainage swamps.	Unlikely. Habitat is not present within the Site.	Naturemap, DBCA
Isoodon fusciventer Quenda, Southwestern Brown Bandicoot	P4	Forest, woodland, shrub, and heath, usually in sandy soils with dense healthy vegetation in lower stratum.	Likely, habitat present within the Site. Previously recorded in the Site (Litroia Ecoservices, 2019a).	Naturemap, DBCA
Notamacropus eugenii derbianus Tammar Wallaby	P4	Scrub and grassland.	Unlikely. Habitat is not present within the Site.	Naturemap, DBCA
Notamacropus irma Western Brush Wallaby	P4	Favours open, seasonal damp areas with low grasses and open scrubby brush.	Unlikely. Habitat is not present within the Site.	Naturemap, DBCA
Oxyura australis Blue-billed Duck	P4	Deep freshwater areas with dense vegetation.	Unlikely. Habitat is not present within the Site.	Naturemap, DBCA
Falco peregrinus Peregrine Falcon	OS	Wide variety. Prefers coastal and inland cliffs or open woodlands near water.	Unlikely. Habitat is not present within the Site.	Naturemap, DBCA
Potorous platyops Broad-faced Potoroo	EX	Unknown.	Unlikely. Habitat is not present within the Site.	Naturemap, DBCA

Cacatua pastinator pastinator Muir's Corella	CD	Large live or dead eucalypts, particularly *Corymbia calophylla* and *Eucalyptus marginata*, *rudis*, *Eucalyptus cornuta* and *Melaleuca preissiana* in forested areas or as lone trees in paddocks and along roadsides.	Unlikely. Habitat is not present within the Site.	Naturemap, DBCA
Phascogale tapoatafa wambenger South-western Brush-tailed Phascogale	CD	Highly arboreal, prefers open forest with sparse groundcover.	Unlikely. Habitat is not present within the Site.	Naturemap, DBCA

* BC Act: T = Threatened, P = Priority; CD = Conservation Dependent; OS = Other specifically protected / EPBC Act: CR = Critically Endangered, EN= Endangered, VU = Vulnerable

Table 8 Migratory bird species recorded within 15 km of the Site.

Species	Conservation Status*	Species	Conservation Status*
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover	T/VU/MI	*Stercorarius antarcticus lonnbergi* Brown Skua	MI &P4
Diomedea epomophora Southern Royal Albatross	T/VU/MI	*Thinornis rubricollis* Hooded Plover	MI &P4
Diomedea exulans Wandering Albatross	T/VU/MI	*Ardenna carneipes* Flesh-footed Shearwater	MI/VU
Hirundapus caudacutus White-throated Needletail	T/VU/MI	*Tringa brevipes* Grey-tailed Tattler	MI & P4
Macronectes halli Northern Giant Petrel	T/VU/MI	*Actitis hypoleucos* Common Sandpiper	MI
Phoebetria fusca Sooty Albatross	T/VU/MI	*Ardenna pacifica* Wedge-tailed Shearwater	MI
Thalassarche carteri Indian Yellow-nosed Albatross	T/VU/MI	*Ardenna tenuirostris* Short-tailed Shearwater	MI
Thalassarche chlororhynchos Atlantic Yellow-nosed Albatross	T/VU/MI	*Arenaria interpres* Ruddy Turnstone	MI
Thalassarche impavida Campbell Albatross	T/VU/MI	*Calidris acuminata* Sharp-tailed Sandpiper	MI
Thalassarche melanophris Black-browed Albatross	T/VU/MI	*Calidris alba* Sanderling	MI
Thalassarche steadi White-capped Albatross	T/VU/MI	*Calidris ruficollis* Red-necked Stint	MI
Anous tenuirostris melanops Australian Lesser Noddy	T/VU/MI	*Calidris subminuta* Long-toed Stint	MI
Halobaena caerulea Blue Petrel	T/VU/MI	*Charadrius bicinctus* Double-banded Plover	MI
Pachyptila turtur subantarctica Fairy Prion	T/VU/MI	*Hydroprogne caspia* Caspian Tern	MI
Pterodroma mollis Soft-plumaged Petrel	T/VU/MI	*Limicola falcinellus.* Broad-billed Sandpiper	MI
Sternula nereis nereis Australian Fairy Tern	T/VU/MI	*Limosa lapponica* Bar-tailed Godwit	MI
Calidris canutus Red Knot, Knot	T/EN/MI	*Limosa limosa* Black-tailed Godwit	MI
Diomedea amsterdamensis Amsterdam Albatross	T/EN/MI	*Numenius phaeopus* Whimbrel	MI
Diomedea dabbenena Tristan Albatross	T/EN/MI	*Onychoprion anaethetus* Bridled Tern	MI
Diomedea sanfordi Northern Royal Albatross	T/EN/MI	*Pandion haliaetus* Osprey	MI

Species	Conservation Status*	Species	Conservation Status*
Macronectes giganteus Southern Giant-Petrel	T/EN/MI	*Plegadis falcinellus* Glossy Ibis	MI
Thalassarche cauta Shy Albatross	T/EN/MI	*Pluvialis fulva* Pacific Golden Plover	MI
Puffinus huttoni Hutton's Shearwater	T/EN/MI	*Pluvialis squatarola* Grey Plover	MI
Calidris ferruginea Curlew Sandpiper	T/CR/MI	*Stercorarius parasiticus* Arctic Jaeger/Skua	MI
Calidris tenuirostris Great Knot	T/CR/MI	*Thalasseus bergii* Crested Tern	MI
Numenius madagascariensis Pachyptila Turtur Subantarctica	T/CR/MI	*Tringa nebularia* Common Greenshank	MI
Limosa lapponica menzbieri Northern Siberian Bar-tailed Godwit	T/CR/MI	*Tringa stagnatilis* Marsh Sandpiper	MI

* BC Act: T = Threatened, P = Priority; EPBC Act: CR = Critically Endangered, EN= Endangered, VU = Vulnerable; MI = Migratory

4.2 Survey Method

Ecosystem Solutions conducted a Level 1 fauna survey, consistent with the EPA's Technical Guidance: Terrestrial Fauna Surveys (2020). This method specifies a minimum requirement of a desktop study to gather information on the subject site and a reconnaissance survey to verify the accuracy of the background study and delineate fauna and faunal assemblages.

This survey has minimal impact on the fauna within the property and provides sufficient data on the presence and relative abundance and distribution of taxa. During the field surveys, the habitat within the survey area was assessed to determine its potential suitability to host any of the anticipated threatened or rare species.

With the species in Table 6 in mind, the survey method included the following:

- Satellite Image of the Site was acquired.
- Direct observations of fauna and signs of fauna were recorded using a Trimble Global Positioning System (GPS) and ArcPad© (Version 8- ESRI). Field observations were analysed and mapped with ArcGis (ArcMap V10.6.1©).
- **Roosting survey:** two dawn and two dusk surveys were completed, to record observations of any Black Cockatoos as they leave from or return to roost sites.

  For dawn surveys the Site was attended at least one hour prior to sunrise and monitored for a minimum of two hours. For dusk surveys the Site was attended at least one hour prior to sunset and monitored for a minimum of two hours. The total time allocated for this targeted search is a minimum of eight hours over four days, which aligns with the recommended survey effort for Black Cockatoos (Department of the Environment, Water, Heritage, and the Arts, 2017). This survey ensures optimal opportunity to observe flocks leaving or returning to roost.

  The Site was monitored for birds and their calls using audio and visual observations. Potential roosting trees were inspected via a physical inspection for hollows or signs of Black Cockatoo usage. A flock count was conducted of any observed roost sites.
- **Nocturnal survey:** a spotlight survey was conducted while walking through the Site to detect nocturnal species. This occurred over two non-consecutive nights, post sunset until after or close to last light with a total survey time of approximately 8 hours. The canopy of trees was rigorously observed for eye shine to detect fauna with a spotlight and head torch. The presence of Western Ringtail Possums or any other conservation listed species was recorded. A 40 w LightForce hand-held spotlight was used with white light to observe nocturnal mammals. Observations were recorded using GPS and ArcPad©.

Non-consecutive nocturnal surveys are conducted to better understand the extent of the Western Ringtail Possum home range, as an individuals may stay in close proximity for a few nights if particularly good foraging habitat is present.

- **Habitat tree survey**: recorded all suitable hollow bearing trees, deemed as those greater than 30 cm DBH, recorded with a GPS, noting the tree species, height and presence or likelihood of hollows. A broad assessment of tree health including signs of plant disease has also been made.

  All hollows were inspected for any signs of use by Black Cockatoos. These include wear around the hollow, chewing, scarring and scratch marks on the trunks or branches. Old or recent evidence of cockatoo's feeding or roosting sites (feathers, droppings etc.) were also searched for with an assessment of potential hollows recorded.

  Not all hollows recorded will be suitable for use by Black Cockatoos. The entrance to a hollow must be a minimum diameter of at least 100 mm to be suitable for Black Cockatoo species (Saunders, 1982) and between 2-10m in height, with an average between 5-7m (Saunders, 1979).

  Tree hollows can also be used as rest sites by Western Ringtail Possums and other species, their potential use was also noted. Tree hollows are important across the range of the species and hollow abundance has been positively correlated with possum abundance (Shedley and Williams, 2014). In the Jarrah Forest, tree hollows can comprise more than 70% of the rest sites.

- **Habitat assessment**: a day survey was completed to record the presence of flora known to be foraging species for Western Ringtail Possums and Black Cockatoos, with an assessment of area and quality of vegetation. Actual foraging evidence observed or any other secondary signs of fauna (e.g., scats, diggings, dreys, nests, burrows, feeding signs) were noted.

  The Black Cockatoo foraging quality assessment score has been determined based on methodology provided in the Referral Guideline for three WA threatened black cockatoo species (Appendix H) (DAWE, 2022).

- The survey's protocol is also consistent with the requirements outlined in the Development Planning Guidelines for Western Ringtail Possums (CALM 2003, now DBCA).

- The referral guidelines for the three threatened black cockatoo species (Department of Agriculture, Water and The Environment, 2022) outline requirements for appropriate level of surveys for these species. This survey's intensity and design comply with these guidelines.

4.3 Results

The Site was surveyed for fauna over two-day, two dusk and two-night surveys from October 2023 by staff members from Ecosystem Solutions (Table 9). Kelly Paterson, Danae Plowman, Dani Cuthbert, and Hayley Drake conducted two-day surveys on the 16 and 19 October 2023. The Site was traversed in a systematic manner, focussing on the vegetated areas. Dawn and dusk surveys were conducted by Gary McMahon (B.Sc. M. Env Mgmt., PG Dip Bushfire CEnvP) for any sign of Black Cockatoos, Western Ringtail Possums or other conservation listed species, as described in Table 9.

Table 9 Fauna survey times and observations

Survey Type	Personnel	Date and Time	Sunrise / Sunset Time	Observations
Day	KP, DP, DC & HD	16 & 19 October 2023	N/A	No threatened fauna was directly observed. Secondary signs were observed, with one drey and some quenda diggings.
Dusk / Nocturnal 1	GM	30 October 2023 5:30 pm to 12:45 am	Sunset 6:45 pm Last light 7:12 pm	No threatened fauna observed.
Dawn 1	GM	4 November 2023 4:25 am to 7:00 am	First Light 4:48 am Sunrise 5:15 am	No threatened fauna observed.
Dusk / Nocturnal 2	GM	4 November 2023 5:10 pm to 11:20 pm	Sunset 6:50 pm Last light 7:17 pm	No threatened fauna observed.
Dawn 2	GM	7 November 2023 4:00 am to 6:30 am	First Light 4:45 am Sunrise 5:12 am	No threatened fauna observed.

While no animals of conservation significance were observed directly and limited signs observed, the lack of data should not be taken directly as an indication that those species are absent from the Site.

4.3.1 Black Cockatoos: Carnaby's Cockatoo (*Zanda latirostris*), Baudin's Cockatoo (*Zanda baudinii*) and Forest Red-tailed Black-Cockatoo (*Calyptorhynchus banksia naso*)

The Site is located within the South Coast, Region 4, as defined by the Referral Guidelines for the three Black Cockatoo Species (DAWE, 2022). This region supports foraging for all three black cockatoo species, as well as some critical breeding habitat for Carnaby's and Baudin's Cockatoos. Black Cockatoo rely on this region to provide a range of foraging resources, such as Jarrah-Marri Forest, Karri and areas of low heath including *Banksia* spp. and *Hakea* spp, including those associated with breeding habitat (DAWE, 2022).

The modelled distribution maps in the referral guidelines indicate that the Site is indicates that the Site is within the predicted breeding range of Baudin's Cockatoo (Map 2 DAWE, 2022), the non-breeding range for Carnaby's Cockatoo (Map 3 DAWE, 2022), and outside but immediately adjacent to the likely to occur area for Forest Red-tailed Cockatoo (Map 4 DAWE, 2022). There have been no identified Black Cockatoo breeding sites within 15km of the Site (DBCA, 2023) and two known Black Cockatoo roosting sites within 20km of the Site (DBCA-064 & DBCA, 2023). The DBCA Threatened and Priority Fauna Database records have 165 Black Cockatoo observations within 15km of the Site, of those three were Forest Red-tailed Black Cockatoo, 74 were Baudin's, 19 were Carnaby's and 67 were *Zanda* sp. 'white-tailed black cockatoo' observations (DBCA, 2023). Most of the observations are more north of the Site, however there are two, a Carnaby's and Zanda sp., less than 100m from the Site at Dead Finish, in 2000 and 2016 (DBCA, 2023). During the day, dawn, and dusk surveys there was no direct or secondary signs of Black Cockatoos within the Site.

The Site surveys occurred within October. This timing occurs within the best survey timing for breeding habitat and foraging in proximity for Baudin's and Forest Red-tailed Black Cockatoos, and as well as breeding habitat for Carnaby's Cockatoo. The survey timing occurred in the peak time for Forest Red-tailed Black Cockatoo. The survey timing did however occur outside the timing for foraging habitat for Baudin's (March to September) and foraging habitat and night roosts for Carnaby's (January to July) (DAWE, 2022).

One of the objectives during the day surveys is to measure and record habitat trees on the Site that have a diameter at breast height (DBH) over 30 cm, as they have the potential to be suitable to support nesting of Black Cockatoo species. There were no trees with a DBH over 30 cm within the Site.

Marri is the primary food source for Black Cockatoos which is not present within the Site. Some areas of the Site provide supporting foraging habitat for Black Cockatoos, containing *Banksia sessilis* var. *cordata* and *Hakea oleifolia*. These two species are foraging resources for Baudin's and Carnaby's Cockatoos and only *Hakea oleifolia* for Forest Red-tailed Black Cockatoos. The approximate Black Cockatoo foraging habitat on Site has been estimated to be 0.7 ha, located within the eastern extent only (Figure 11). As the area of foraging habitat is less than 1 ha, the foraging quality scoring tool has not been applied.

The Site is within the Leeuwin-Naturaliste National Park that contains vast expanses of remanent vegetation with Jarrah-Marri and Karri forests. These areas, also with more proteaceous species, represent suitable foraging habitats for all three Black Cockatoo species and potential breeding and roosting sites. It is unlikely Black Cockatoos are relying on the supporting foraging habitat within the Site.

Litoria Ecoservices (2019a) assessment also stated the Site does not contain habitat suitable for roosting or nesting and there is a potential that the Site is utilised for feeding but not likely representative of significant feeding source for these species.

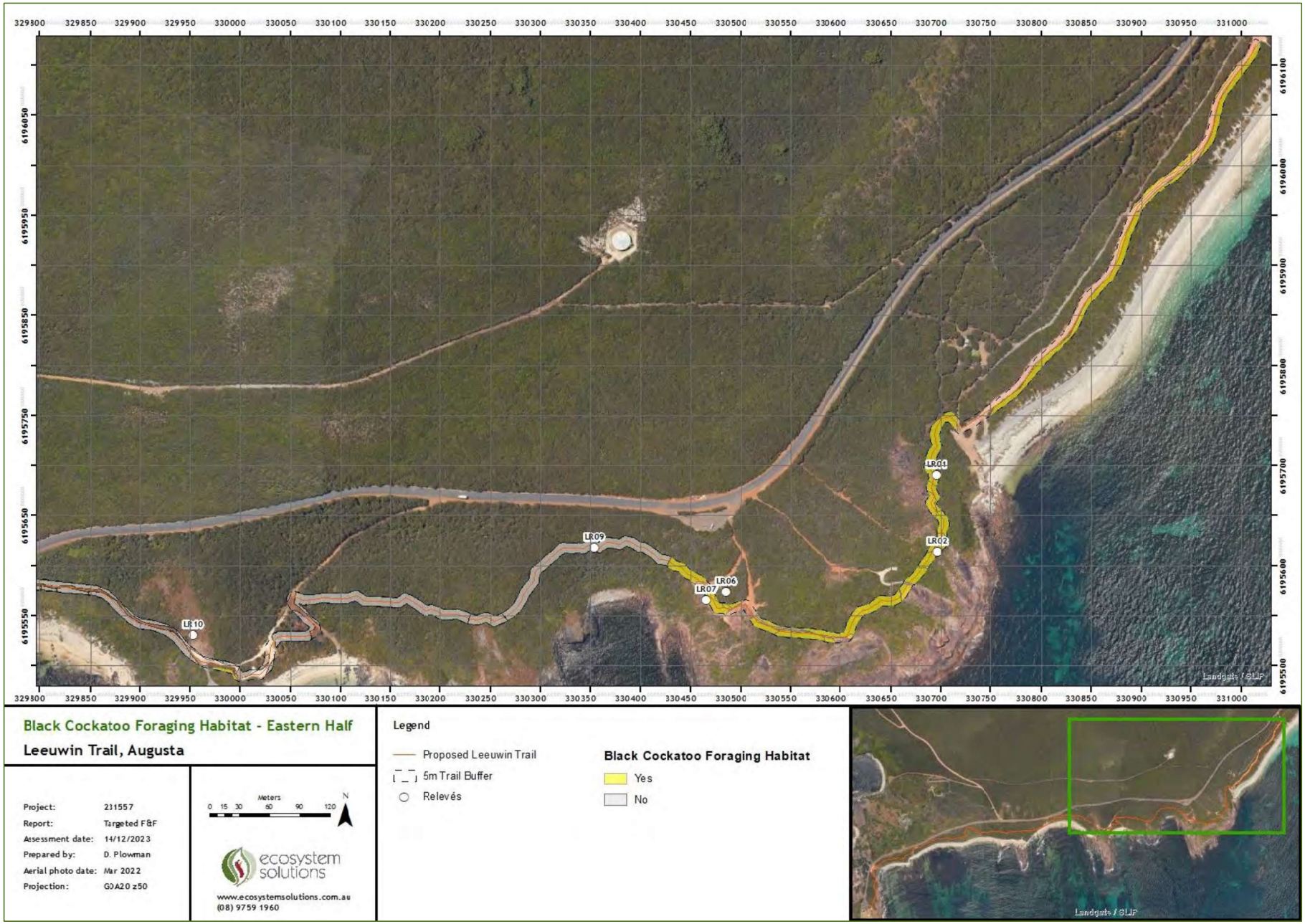

Figure 11 Black Cockatoo Foraging Habitat Map of the Eastern Half of the Leeuwin Trail, from Dead Finish to the Cape Leeuwin Lighthouse, Augusta

4.3.2 Western Ringtail Possum (*Pseudocheirus occidentalis*)

The Site is located outside the known distribution for Western Ringtail Possums, as shown by the Western Ringtail Possum (*Pseudocheirus occidentalis*) Recovery Plan (Department of Parks and Wildlife, 2017). The Site is outside of the Swan Coastal Plain where efforts have been focused with the development of policy guidelines for the protection and enhancement of WRP habitat and habitat connections (Shedley and Williams, 2014). While the Site is outside the Swan Coastal Plain, it can be considered Supporting habitat (Area 3) according to the Significant Impact Guidelines for Western Ringtail Possums on the Swan Coastal Plain (Department of the Environment, Water, Heritage, and the Arts, 2009). According, to Shedley & Williams (2014) there are small, scattered occurrences of Western Ringtail Possums around Augusta. The DBCA Threatened and Priority Fauna Database records includes 325 WRP observations within 15 km of the Site (DBCA, 2023). These records are mostly concentrated from Augusta townsite continuing north, however there are two records of scats at the Dead Finish end of the trail in 2017. The survey conducted by Litoria Ecoservices in 2019 along the Site found WRP scats, dreys and 14 WRP within the eastern half of the Site.

There was one drey (secondary sign) observed during one of the day surveys outside of the survey area (Figure 12). The drey was adjacent to Leeuwin Road, within the Dense Heath mapped by Litoria Ecoservices (2019). There was no dreys observed within the survey area. During the nocturnal surveys of the Site there was also no direct WRP observations. It should be noted that the extremely dense nature of the vegetation provided challenges especially for spotting fauna signs and Western Ringtail Possums have an approximate home range of less than 5 hectares (Wayne *et al.*, 2005).

Western Ringtail Possums predominately forage on the leaves of myrtaceous plants, being Peppermint, Marri and Jarrah and a range of shrub species (Department of Parks and Wildlife, 2014). Most of the vegetation within the Site represents potentially suitable foraging habitat for Western Ringtail Possums, with large areas of wind pruned *Agonis flexuosa*. There is no Marri or Jarrah within the Site to provide additional rest sites or foraging species. A number of the vegetation units had the potential to provide WRP habitat, especially the Low Closed Forest of *Agonis flexuosa* and Closed Scrub, as identified by Litoria Ecoservices (2019a).

4.3.3 Quenda (*Isoodon fusciventer*)

Two locations of Quenda diggings, a Priority 4 species under the Biodiversity Conservation Act 2016 (WA), were observed to the west of the lookout and north of Groper Bay, within the Low Closed Forest mapped in this survey and by Litoria Ecoservices (2019a) (Figure 12). It should be noted that the extremely dense nature of the vegetation provided challenges especially for spotting fauna signs, with the ground unable to be seen through the dense foliage cover. These indirect sightings indicate that the species utilises the Site as habitat. The DBCA Threatened and Priority Fauna Database includes 161 Quenda records within 15 km of the Site (DBCA, 2023). These records are scattered in the surrounding landscape, with two records within

1km of the Site, one at the Cape Leeuwin Lighthouse end of the trail and the other at the eastern end on the other side of Leeuwin Road.

Quendas rely on the protection that the surrounding dense understory vegetation provides from predators. It is recommended trail monitoring and maintenance ensures the surrounding vegetation supports habitat for Quenda with the implementation of revegetation of any erosion or disturbed areas that may occur adjacent to the trail.

Figure 12 Fauna Observations Map of the Leeuwin Trail, from Dead Finish to the Cape Leeuwin Lighthouse, Augusta

5 Survey Constraints

Survey limitations are summarised in Table 10 and 11 below:

Table 10 Summary of flora survey limitations

Constraint	Impact	Comment
Availability of contextual information at a regional and local scale	Nil	Broad scale vegetation and soil mapping data were available. DBCA Threatened and Priority Flora, and Ecological Communities database, NatureMap interim database and PMST database extracts for conservation significant flora and ecological communities were obtained. A search of other relevant databases also occurred.
Competency / experience of the survey team	Nil	The ecologist leading the field survey has conducted numerous flora surveys across the southwest of WA and has over 10 years' experience. The ecologist completing the flora identifications has over 10 years' experience identifying Western Australian flora, specialising in southwest flora. Any potential conservation significant flora have been submitted to the Western Australian Herbarium for formal identification.
Proportion of flora recorded and/or collected, any identification issues	Nil	A focus was placed on identifying any potential conservation significant flora species, with these collections all identified to species level. Specimens that were not potentially conservation significant species have been identified to genus level, or species where this can be easily ascertained.
Was the appropriate area fully surveyed (effort and extent)	Nil	10 relevés were conducted within the Site within each of the vegetation communities identified by Litoria Ecoservices in 2019b. Most areas, where accessible (see below) were surveyed on foot for Conservation Significant vegetation communities and flora species.
Access restrictions within the survey area	Minor	Most parts of the Site were accessible by foot, the extremely dense nature of parts of the vegetation provided challenges and some small areas were impenetrable and were diverted around and observed from the edge.
Survey timing, rainfall, season of survey	Nil	The survey was conducted in Spring (October) which is the optimal time to observe all conservation significant flora species. Weather conditions did not impact surveys. The team was limited to observing species present during the time of the surveys.
Inconsistent flowering habit of some species	Moderate	Some species do not flower every season and may require environmental triggers to promote flowering such as rainfall, fire, presence of suitable pollinators etc.

Constraint	Impact	Comment
Disturbance that may have affected the results of the survey, such as fire, flood or clearing	Nil	There were no recent disturbances that constrained the survey of the Site.

Table 11 Summary of fauna survey limitations

Constraint	Impact	Comment
Availability of data and information	Nil	DBCA Threatened and Priority Fauna database, NatureMap interim database, and PMST database extracts for conservation significant fauna were obtained.
Competency / experience of the survey team, including experience in the bioregion surveyed	Nil	The ecologist leading the field surveys has conducted numerous fauna surveys across the southwest of Western Australia and has over 20 years' experience.
Scope of the survey, e.g., where faunal groups were excluded from the survey	Minor	This survey focussed on birds, mammals, and other vertebrate species. Aquatic species were not included as habitat was not present. Invertebrates were not included in the scope of this survey.
Timing, weather, and season	Minor	The surveys were conducted in Spring (October and November), with September being an optimum time for bird and mammal surveys in the southwest. Weather conditions did not impact surveys.
Timing Western Ringtail Possums (WRP) may arise from rest sites & likelihood of rest sites being located outside the Site	Moderate	As WRP use up to 2-7 rest sites at any one time and up to 20 throughout the year there is potential that they are not observed on Site at the time of survey, even though they are utilising the Site. The time WRP arise from a rest Site is also variable and may prevent WRP being observed during survey times.
Disturbance that may have affected results, e.g., fire, flood	Nil	There were no disturbances that constrained the survey of the Site.
The proportion of fauna identified, recorded, or collected	Nil	Any potential conservation significant fauna species observed during the surveys have been identified.
Adequacy of the survey intensity and proportion of survey achieved, e.g., the extent to which the area was surveyed	Nil	Most areas, where accessible (see below), of the Site were surveyed on foot for Conservation Significant fauna species, during day, dawn, and dusk / nocturnal surveys.
Access problems	Minor	Most parts of the Site were accessible by foot, the extremely dense nature of parts of the vegetation provided challenges and some small areas were impenetrable, diverted around and observed from the edge.

6 Significance

The EPBC Act considers matters of 'National Environmental Significance', including species listed as threatened (including critically endangered, endangered, and vulnerable categories). The Act also considers actions that may have any potential negative impacts on Matters of National Significance. These are referred to as 'Significant Impacts'.

A proposal that is likely to result in a 'Significant Impact' to a threatened species has been determined against the following guidelines for Black Cockatoos and Western Ringtail Possum:

- Matters of National Environmental Significance - Significant impact guidelines 1.1 *Environmental Protection and Biodiversity Conservation Act 1999*, Australian Government, Department of Environment, 2013.

- Referral guidelines for 3 WA threatened black cockatoo species: Carnaby's Cockatoo (*Zanda latirostris)*, Baudin's Black Cockatoo (*Zanda baudinii)* and the Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii* subsp. *naso),* Department of Agriculture, Water, and the Environment (DAWE), 2022.

The significant impact guidelines for the vulnerable Western Ringtail Possum (*Pseudocheirus occidentalis*) in the southern Swan Coastal Plain, Western Australia, nationally threatened species, and ecological communities, EPBC policy statement 3.10, Department of Environment, Water, Heritage, and the Arts, 2009[3] has been determined to not be appropriate to be used to determine significance for this Site as the Site is located outside the Swan Coastal Plain.

Table 12 and Table 13 discuss the referral triggers and the likely impact on Black Cockatoos and Western Ringtail Possums respectively.

[3] The Site is outside the Swan Coastal Plain and there are no relevant referral guidelines for the survey area in relation to Western Ringtail Possums. It is noted that this document includes the previous listing of Vulnerable for the species instead of the current listing of Critically Endangered.

Table 12 Referral thresholds for Black Cockatoos

Attribute	Referral threshold & Reason	Threshold triggered by this proposal?
Breeding	**Threshold:** Any loss of / impact upon known, suitable or potential nesting trees, and the habitat around these trees, is highly likely to require a referral to the minister. **Reason:** Clearing of breeding habitat is a known threat to the three species[a] as a lack of tree hollows is a limiting factor. Habitat loss, habitat degradation, lack of recruitment, fire and competition are causing the scarcity of nesting resource[b].	**Does not meet threshold.** There are no nesting trees within the Site. The vegetation within the Site does not have any Marri, Jarrah, or other hollow bearing trees.
Night roosting habitat	**Threshold:** Removal of any part of a known night roosting site is likely to require referral to the minister. **Reason:** Clearing of night roosting habitat is a known threat to the three species.	**Does not meet threshold.** Night roosting was not observed within the Site. There are also no tall trees above 10 m high or potential roosting trees, which is defined as a tall tree of any species within close proximity to water (DAWE, 2022).
High-quality native foraging habitat	**Threshold:** Loss of greater than or equal to **1 ha** of foraging habitat scoring 5-10 using the foraging quality scoring tool is likely to require referral to the minister. Foraging habitat quality is determined using the foraging quality scoring tool (Appendix H) and considers context i.e., proximity of the impact site to important attributes. **Reason**: Clearing of foraging habitat is a known threat to the three species. Habitat loss, habitat modification, climate change and fire are increasingly causing the scarcity of foraging resources. These resources are critical at all stages of life for the species.	**Does not meet threshold.** The total amount of clearing required of suitable foraging habitat is 0.7 ha and therefore under 1 ha.

Attribute	Referral threshold & Reason	Threshold triggered by this proposal?
Lower-quality native foraging habitat	**Threshold:** Loss of greater than or equal to 10 ha of foraging habitat scoring 0-4 using the foraging quality scoring tool is likely to require referral to the minister. Foraging habitat quality is determined using the foraging quality scoring tool (Appendix H) and takes into account context i.e., proximity of the impact site to important attributes. **Reason**: Clearing of foraging habitat is a known threat to the three species. Habitat loss, habitat modification, climate change and fire are increasingly causing the scarcity of foraging resources. These resources are critical at all stages of life for the species.	**Does not meet threshold.** The total amount of clearing required of suitable foraging habitat is 0.7 ha and therefore under 10 ha.
Exotic foraging habitat	**Threshold:** Loss of greater than or equal to 1 ha of predominantly exotic habitat (e.g., Cape Lilac trees and pine trees) known to be utilised by black cockatoos is likely to require a referral to the minister. **Reason:** Clearing of exotic foraging habitat is a known threat to the three species, noting that its value in comparison to native habitat depends upon the context	**Not applicable.** The total amount of clearing required of suitable foraging habitat is 0.7 ha and therefore under 1 ha.
A referral under the EPBC Act is not to be required as the proposal does not trigger any threshold for referral, as there is no proposed removal of potential nesting trees and roosting sites, and minimal impact is expected to foraging habitat as there is limited foraging species on the Site with no direct or secondary signs of foraging.		

Table 13 Actions likely to have a significant impact on Western Ringtail Possums

Actions likely to have a significant impact	Is this action likely under this proposal?
Lead to a long-term decrease in the size of a population	**Unlikely** The survey area is approximately 3.4 ha however the area is greater than the area required for the trail which has occurred to allow for any minor diversions the trail is required to do to support ecological function. The trail is utilising existing breaks where possible and the surrounding habitat will continue to contain suitable foraging habitat to support any population utilising the Site. It is recommended that a DBCA approved fauna spotter and handler is present during the clearing of the trail to manage any disturbed animals.
Reduce the area of occupancy of the species	**Unlikely** The survey area is approximately 3.4 ha however the area is greater than the area required for the trail which has occurred to allow for any minor diversions the trail is required to do to support ecological function. The trail is utilising existing breaks where possible, and the surrounding habitat will continue to contain suitable foraging habitat to support any population utilising the Site.
Fragment an existing population into two or more populations	**Unlikely** The trail will be a minimal break in vegetation from the foraging habitat with the trail utilising existing breaks, particularly within the eastern section. Wherever possible it is recommended to maintain branch and canopy connectivity over the trail, which is more possible in the closed forest vegetation community, to support Western Ringtail Possum habitat.

Actions likely to have a significant impact	Is this action likely under this proposal?
Adversely affect habitat critical to the survival of a species	**Unlikely** The Site is located outside the known distribution for Western Ringtail Possums, as shown by the Western Ringtail Possum Recovery Plan (Department of Parks and Wildlife, 2017) and is outside the Swan Coastal Plain where a critical population resides, and efforts have been focused for conservation. Scattered observations of Western Ringtail Possums have been recorded around Augusta, north of the Site, and therefore it is unlikely the Site is critical to the survival of the species.
Disrupt the breeding cycle of a population	**Unlikely** As discussed above, it is unlikely the Site is critical to the survival of the species. It is recommended to conduct the clearing outside of breeding periods to reduce the stress on any breeding in the area.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	**Unlikely** As discussed above, it is unlikely the Site is critical to the survival of the species with the main population occurring on the Swan Coastal Plain.
Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	**Unlikely** It is unlikely an invasive species will be introduced that will prevent Western Ringtail Possums to become established in the Site. It is recommended to implement weed management along the trail to ensure the surrounding Western Ringtail Possum habitat remains intact.
Introduce disease that may cause the species to decline	**Unlikely** *Agonis flexuosa* is the predominant habitat and food source for Western Ringtail Possums within the Site which can be affected *by Phytophthora* species, including *P. cinnamomi* which is also known as dieback. It is recommended that hygienic practices are implemented for any equipment and material used to construct the trail.

Actions likely to have a significant impact	Is this action likely under this proposal?
Interfere with the recovery of the species	**Unlikely** As discussed above, it is unlikely the Site is critical to the survival of the species with the main population occurring on the Swan Coastal Plain. Recovery efforts are focused on the population within the Swan Coastal Plain, which this proposal will not affect.
A referral under the EPBC Act is not recommended for this Site as the clearing unlikely to significantly impact the population utilising the Site with the implementation of the recommended actions.	

7 Conclusion

Based on the results of the analysis of Site, the following conclusions and recommendations are made.

7.1 Vegetation

- There was no Threatened Ecological Communities (TEC) within the Site.
- There was one Priority Ecological Community (PEC) within the Site, *Melaleuca lanceolata* forests, Leeuwin Naturaliste Ridge, which listed as Priority 2. This was also recorded by Litoria Ecoservices during the 2019b survey and is present at the western extent, Cape Leeuwin Lighthouse end of the Site. It is recommended that, where possible, the trail is deviated around the *Melaleuca lanceolata* to limit the impact on this ecological community.
- There were 10 floristic relevés conducted within the Site to capture the vegetation communities. The vegetation communities were mapped based on the previously described six vegetation units identified by Litroia Ecoservices in 2019b. The majority of the vegetation within the Site is Low Closed Forest (37%) and Dense Heath 35%, followed by the Closed Scrub (16%) vegetation unit. There are also small, scattered areas of Granite vegetation (9%), one very small portion of the Low Shrubland (0.24%) and two small areas of the *Melaleuca lanceolata* vegetation (1.72%).
- The areas of vegetation were ranked from excellent to completely degraded using Keighery Condition Scale (Keighery, 1994). Very good condition vegetation represents the largest portion of the Site (47%), followed by excellent (28%), completely degraded (18.89 %), good (4%), and degraded vegetation (1.78%). Disturbance factors identified includes past clearing, weeds ranging in aggression and human trampling, with easily accessible areas for pedestrians and vehicles and edges of vegetation the most effected.
- There were 15 introduced flora species opportunistically observed within the Site. There were two declared pests, *Zantedeschia aethiopica* (Arum Lily) and *Asparagus asparagoides* (Bridal creeper), which is also a Weed of National Significance (WoNS), within the Site. It is recommended to undertake ongoing weed control along and adjacent to the trail with a focus on declared pests and WoNS.

7.2 Conservation Significant Flora

- There were no threatened flora species observed within the Site.
- There was one priority flora species recorded within the Site, *Banksia sessilis* var. *cordata* (Priority 4) which was also identified by Litoria Ecoservices during the 2019b survey. The area of this species

within the Site is approximately 0.06 ha. It is recommended for the trail to divert around this plant where possible within the survey area.

- There was one significant flora species, *Melaleuca lanceolata*, that is an indicator species for the Priority listed 'Melaleuca lanceolata forests, Leeuwin Naturaliste Ridge' ecological community, that occurs at the Cape Leeuwin Lighthouse end of the Site. It is recommended for the trail to divert around these trees where possible within the survey area.

7.3 Conservation Significant Fauna

- **Black Cockatoos (T):** The Site is located within the South Coast, Region 4, as defined by the Referral Guidelines for the three Black Cockatoo Species (DAWE, 2022). During the day, dawn, and dusk surveys there was no direct or secondary signs of Black Cockatoos within the Site. There were no trees habitat trees (DBH over 30 cm) within the Site. Some areas of the Site provide potential foraging habitat for Black Cockatoos, containing *Banksia sessilis* and *Hakea oleifolia*. The Site does not contain habitat suitable for roosting or nesting and there is a potential that the Site is utilised for feeding but not likely representative of significant feeding source for these species. A referral under the EPBC Act is not likely to be required.

- **Western Ringtail Possums (*Pseudocheirus occidentalis*, T):** The Site is outside the main population of the species, which is located on the Swan Coastal Plain where efforts have been focused with the development of policy guidelines for the protection and enhancement of WRP habitat and habitat connections. There was one drey opportunistically observed outside of the survey area, however there were no dreys or Western Ringtail Possums observed within the survey area. Most of the vegetation within the Site represents potentially suitable foraging habitat for Western Ringtail Possums, with large areas of wind prune *Agonis flexuosa*. There is no Marri or Jarrah with the Site to provide additional rest sites or foraging species. The Low Closed Forest of *Agonis flexuosa* and closed scrub, as identified by Litoria Ecoservices (2019a), provide the main Western Ringtail Possum habitat. Due to the relatively small area of impact and with the implementation of the following actions, referral under the EPBC Act is not recommended as the proposal is unlikely to cause as a significant impact to any population using the Site:

    - A DBCA approved fauna spotter and handler is present during the clearing of the trail to manage any disturbed animals.

    - Wherever possible, maintain branch and canopy connectivity over the trail, which is more possible in the closed forest vegetation community, to support Western Ringtail Possum habitat.

- Conduct the clearing outside of the breeding period of Western Ringtail Possums to reduce the stress on any breeding in the area.
- Implement weed management along the trail to ensure the surrounding Western Ringtail Possum habitat remains intact.
- Complete hygienic practices for any equipment and material used to construct the trail to reduce the risk of the introduction of disease, particularly *Phytophthora cinnamomi*, dieback.

- **Quenda (*Isoodon fusciventer*, P4):** There were Quenda diggings observed indicating the presence of the species within the Site. Quendas rely on the protection that the surrounding dense understory vegetation provides from predators. It is recommended trail monitoring and maintenance ensures the surrounding vegetation supports habitat for Quenda with the implementation of revegetation of any erosion or disturbed areas that may occur adjacent to the trail.

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Appendix A Interim Naturemap Extract

Interim Naturemap Extract of Flora Recorded within 15km of the Site (DBCA, 2023)

Taxon	Cons. Status	WA Status
Acacia lateriticola var. Glabrous variant (B.R. Maslin 6765)	3	
Adenanthos detmoldii	4	
Adenanthos x pamela	4	
Amanita fibrillopes	3	
Andersonia sp. Amabile (N. Gibson & M. Lyons 355)	3	
Aotus carinata	4	
Astartea onycis	4	
Banksia meisneri subsp. *ascendens*	4	
Banksia nivea subsp. *uliginosa*	T	
Banksia sessilis var. *cordata*	4	
Blennospora doliiformis	3	
Boronia anceps	3	
Boronia exilis	T	
Caladenia abbreviata	3	
Caladenia excelsa	T	
Caladenia lodgeana	T	CR
Caladenia lodgeana	T	
Caladenia pholcoidea subsp. *augustensis*	1	
Calothamnus lateralis var. *crassus*	3	
Chordifex gracilior	3	
Conospermum quadripetalum	2	
Cyathochaeta stipoides	3	
Dampiera heteroptera	3	
Darwinia ferricola	T	
Darwinia terricola	1	
Diuris drummondii	T	VU
Diuris heberlei	2	
Franklandia triaristata	4	
Galium leptogonium	3	
Gastrolobium formosum	3	
Gonocarpus pusillus	4	
Grevillea brachystylis subsp. *australis*	T	
Grevillea manglesioides subsp. *ferricola*	3	
Grevillea papillosa	3	
Hemiandra sp. Windy Harbour (B.J. Conn & J.A. Scott BJC 3344)	3	

Taxon	Cons. Status	WA Status
Hemigenia sp. Nillup (R.D. Royce 98)	2	
Isopogon formosus subsp. *dasylepis*	3	
Kennedia lateritia	T	EN
Kennedia lateritia	T	
Lambertia orbifolia subsp. *vespera*	T	
Leptomeria dielsiana	X	
Leptomeria furtiva	2	
Leucopogon wheelerae	3	
Loxocarya magna	3	
Melaleuca basicephala	4	
Philydrella pygmaea subsp. *minima*	1	
Pigea volubilis	2	
Pultenaea pinifolia	3	
Pultenaea skinneri	4	
Schoenus indutus	1	
Schoenus loliaceus	2	
Schoenus sp. Grassy (E. Gude & J. Harvey 250)	2	
Stenanthemum sublineare	2	
Stylidium ireneae	4	
Stylidium sp. Scott River Plain (N.G. Marchant 74/23)	1	
Stylidium trudgenii	3	
Tripterococcus sp. Brachylobus (A.S. George 14234)	4	
Verticordia lehmannii	4	
Verticordia plumosa var. *vassensis*	T	EN

Naturemap Extract of Fauna Recorded within 15km of the Site (DBCA, 2023)

Taxon	Common Name	Class	WA Status	EPBC Status
Actitis hypoleucos	Common Sandpiper	Bird	MI	MI
Arctocephalus forsteri	New Zealand Fur Seal, Long-Nosed Fur Seal	Mammal	OS	
Arctocephalus tropicalis	Subantarctic Fur Seal	Mammal	VU	EN
Ardenna carneipes	Flesh-Footed Shearwater	Bird	VU	MI
Ardenna pacifica	Wedge-Tailed Shearwater	Bird	MI	MI
Ardenna tenuirostris	Short-Tailed Shearwater	Bird	MI	MI
Arenaria interpres	Ruddy Turnstone	Bird	MI	MI
Atrichornis clamosus	Noisy Scrub-Bird, Tjimiluk	Bird	EN	EN
Austroassiminea letha	Cape Leeuwin Freshwater Snail	Invertebrate	VU	
Bettongia penicillata ogilbyi	Woylie, Brush-Tailed Bettong	Mammal	CR	EN
Botaurus poiciloptilus	Australasian Bittern	Bird	EN	EN
Cacatua pastinator pastinator	Muir's Corella	Bird	CD	
Calidris acuminata	Sharp-Tailed Sandpiper	Bird	MI	MI
Calidris alba	Sanderling	Bird	MI	MI
Calidris canutus	Red Knot	Bird	EN	EN
Calidris ferruginea	Curlew Sandpiper	Bird	CR	MI
Calidris ruficollis	Red-Necked Stint	Bird	MI	MI
Calidris subminuta	Long-Toed Stint	Bird	MI	MI
Calidris tenuirostris	Great Knot	Bird	CR	MI
Calyptorhynchus banksii naso	Forest Red-Tailed Black Cockatoo	Bird	VU	VU
Calyptorhynchus baudinii	Baudin's Cockatoo	Bird	EN	EN
Calyptorhynchus latirostris	Carnaby's Cockatoo	Bird	EN	EN
Calyptorhynchus sp. 'white-tailed black cockatoo'	White-Tailed Black Cockatoo	Bird	EN	EN
Caretta caretta	Loggerhead Turtle	Reptile	EN	EN
Charadrius bicinctus	Double-Banded Plover	Bird	MI	MI
Charadrius leschenaultii	Greater Sand Plover, Large Sand Plover	Bird	VU	MI
Dasyornis longirostris	Western Bristlebird	Bird	EN	EN
Dasyurus geoffroii	Chuditch, Western Quoll	Mammal	VU	VU
Dermochelys coriacea	Leatherback Turtle	Reptile	VU	EN
Diomedea exulans	Wandering Albatross	Bird	VU	VU
Elapognathus minor	Short-Nosed Snake	Reptile	P2	
Eubalaena australis	Southern Right Whale	Mammal	VU	EN

Taxon	Common Name	Class	WA Status	EPBC Status
Falco peregrinus	Peregrine Falcon	Bird	OS	
Falsistrellus mackenziei	Western False Pipistrelle, Western Falsistrelle	Mammal	P4	
Galaxiella munda	Mud Minnow, Western Dwarf Galaxias	Fish	VU	
Galaxiella nigrostriata	Black-Stripe Minnow, Black-Striped Dwarf Galaxias	Fish	EN	EN
Geotria australis	Pouched Lamprey	Fish	P3	
Hirundapus caudacutus	White-Throated Needletail	Bird	MI	VU
Hydromys chrysogaster	Water-Rat, Rakali	Mammal	P4	
Hydroprogne caspia	Caspian Tern	Bird	MI	MI
Isoodon fusciventer	Quenda, Southwestern Brown Bandicoot	Mammal	P4	
Leipoa ocellata	Malleefowl	Bird	VU	VU
Lepidogalaxias salamandroides	Salamanderfish	Fish	EN	
Limicola falcinellus	Broad-Billed Sandpiper	Bird	MI	MI
Limosa lapponica	Bar-Tailed Godwit	Bird	MI	MI
Limosa limosa	Black-Tailed Godwit	Bird	MI	MI
Macronectes giganteus	Southern Giant Petrel	Bird	MI	EN
Megaptera novaeangliae	Humpback Whale	Mammal	CD & MI	VU
Megaptera novaeangliae	Humpback Whale	Mammal	CD & MI	MI
Nannatherina balstoni	Balston's Pygmy Perch	Fish	VU	VU
Notamacropus eugenii derbianus	Tammar Wallaby	Mammal	P4	
Notamacropus irma	Western Brush Wallaby	Mammal	P4	
Numenius madagascariensis	Eastern Curlew	Bird	CR	CR
Numenius phaeopus	Whimbrel	Bird	MI	MI
Onychoprion anaethetus	Bridled Tern	Bird	MI	MI
Oxyura australis	Blue-Billed Duck	Bird	P4	
Pandion haliaetus	Osprey	Bird	MI	MI
Petrogale lateralis lateralis	Black-Flanked Rock-Wallaby, Black-Footed Rock-Wallaby	Mammal	EN	EN
Pezoporus flaviventris	Western Ground Parrot	Bird	CR	CR
Phascogale tapoatafa wambenger	South-Western Brush-Tailed Phascogale, Wambenger	Mammal	CD	
Physeter macrocephalus	Sperm Whale	Mammal	VU	MI
Plegadis falcinellus	Glossy Ibis	Bird	MI	MI

Taxon	Common Name	Class	WA Status	EPBC Status
Pluvialis fulva	Pacific Golden Plover	Bird	MI	MI
Pluvialis squatarola	Grey Plover	Bird	MI	MI
Potorous gilbertii	Gilbert's Potoroo	Mammal	CR	CR
Potorous platyops	Broad-Faced Potoroo	Mammal	EX	EX
Pseudocheirus occidentalis	Western Ringtail Possum, Ngwayir	Mammal	CR	CR
Pseudomys fieldi	Shark Bay Mouse, Djoongari	Mammal	VU	VU
Pseudomys shortridgei	Heath Mouse, Heath Rat, Dayang	Mammal	VU	EN
Puffinus huttoni	Hutton's Shearwater	Bird	EN	
Setonix brachyurus	Quokka	Mammal	VU	VU
Stercorarius antarcticus lonnbergi	Brown Skua, Subantarctic Skua	Bird	P4	
Stercorarius parasiticus	Arctic Jaeger, Arctic Skua	Bird	MI	MI
Sternula nereis nereis	Fairy Tern	Bird	VU	VU
Thalassarche carteri	Indian Yellow-Nosed Albatross	Bird	EN	VU
Thalassarche cauta cauta	Shy Albatross	Bird	VU	MI
Thalassarche chlororhynchos	Atlantic Yellow-Nosed Albatross	Bird	VU	MI
Thalassarche melanophris	Black-Browed Albatross	Bird	EN	MI
Thalasseus bergii	Crested Tern	Bird	MI	MI
Thinornis rubricollis	Hooded Plover, Hooded Dotterel	Bird	P4	
Tringa brevipes	Grey-Tailed Tattler	Bird	MI & P4	MI
Tringa nebularia	Common Greenshank	Bird	MI	MI
Tringa stagnatilis	Marsh Sandpiper	Bird	MI	MI
Tyto novaehollandiae novaehollandiae	Masked Owl (Southwest)	Bird	P3	
Westralunio carteri	Carter's Freshwater Mussel	Invertebrate	VU	VU

Appendix B Protected Matters Search Tool Extract

Australian Government

Department of Climate Change, Energy, the Environment and Water

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: 08-Sep-2023

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	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	1
Listed Threatened Ecological Communities:	4
Listed Threatened Species:	66
Listed Migratory Species:	52

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 environment anywhere.

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 https://www.dcceew.gov.au/parks-heritage/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:	3
Commonwealth Heritage Places:	1
Listed Marine Species:	79
Whales and Other Cetaceans:	14
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	1
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:	9
Regional Forest Agreements:	1
Nationally Important Wetlands:	2
EPBC Act Referrals:	9
Key Ecological Features (Marine):	1
Biologically Important Areas:	12
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Commonwealth Marine Area [Resource Information]

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name	Buffer Status
Commonwealth Marine Areas (EPBC Act)	In buffer area only

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	Buffer Status
Aquatic Root Mat Community 1 in Caves of the Leeuwin Naturaliste Ridge	Endangered	Community known to occur within area	In buffer area only
Empodisma peatlands of southwestern Australia	Endangered	Community likely to occur within area	In feature area
Scott River Ironstone Association	Endangered	Community likely to occur within area	In buffer area only
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area	In buffer area only

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	Buffer Status
BIRD			
Anous tenuirostris melanops Australian Lesser Noddy [26000]	Vulnerable	Species or species habitat may occur within area	In feature area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Calidris tenuirostris Great Knot [862]	Critically Endangered	Species or species habitat known to occur within area	In buffer area only
Calyptorhynchus banksii naso Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat known to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Diomedea amsterdamensis Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area	In feature area
Diomedea dabbenena Tristan Albatross [66471]	Endangered	Species or species habitat may occur within area	In feature area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In feature area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In feature area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Limosa lapponica menzbieri Northern Siberian Bar-tailed Godwit, Russkoye Bar-tailed Godwit [86432]	Critically Endangered	Species or species habitat may occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In feature area
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thalassarche melanophris			
Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche steadi			
White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In feature area
Zanda baudinii listed as Calyptorhynchus baudinii			
Baudin's Cockatoo, Baudin's Black-Cockatoo, Long-billed Black-cockatoo [87736]	Endangered	Breeding known to occur within area	In feature area
Zanda latirostris listed as Calyptorhynchus latirostris			
Carnaby's Black Cockatoo, Short-billed Black-cockatoo [87737]	Endangered	Species or species habitat known to occur within area	In feature area
CRUSTACEAN			
Engaewa pseudoreducta			
Margaret River Burrowing Crayfish [82674]	Critically Endangered	Species or species habitat may occur within area	In buffer area only
FISH			
Galaxiella nigrostriata			
Blackstriped Dwarf Galaxias, Black-stripe Minnow [88677]	Endangered	Species or species habitat known to occur within area	In buffer area only
Nannatherina balstoni			
Balston's Pygmy Perch [66698]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Thunnus maccoyii			
Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat likely to occur within area	In feature area
MAMMAL			
Balaenoptera borealis			
Sei Whale [34]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Balaenoptera musculus			
Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Balaenoptera physalus Fin Whale [37]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Dasyurus geoffroii Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat known to occur within area	In feature area
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area	In feature area
Myrmecobius fasciatus Numbat [294]	Endangered	Species or species habitat may occur within area	In buffer area only
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area	In feature area
Pseudocheirus occidentalis Western Ringtail Possum, Ngwayir, Womp, Woder, Ngoor, Ngoolangit [25911]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Setonix brachyurus Quokka [229]	Vulnerable	Species or species habitat may occur within area	In buffer area only
OTHER			
Westralunio carteri Carter's Freshwater Mussel, Freshwater Mussel [86266]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
PLANT			
Banksia mimica Summer Honeypot [82765]	Endangered	Species or species habitat may occur within area	In buffer area only
Banksia nivea subsp. uliginosa Swamp Honeypot [82766]	Endangered	Species or species habitat known to occur within area	In buffer area only
Banksia squarrosa subsp. argillacea Whicher Range Dryandra [82769]	Vulnerable	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Boronia exilis Scott River Boronia [64844]	Endangered	Species or species habitat known to occur within area	In buffer area only
Caladenia hoffmanii Hoffman's Spider-orchid [56719]	Endangered	Species or species habitat may occur within area	In buffer area only
Caladenia lodgeana Lodge's Spider-orchid [68664]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calectasia cyanea Blue Tinsel Lily [7669]	Critically Endangered	Species or species habitat may occur within area	In buffer area only
Darwinia ferricola Scott River Darwinia [56706]	Endangered	Species or species habitat known to occur within area	In buffer area only
Drakaea micrantha Dwarf Hammer-orchid [56755]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Gastrolobium papilio Butterfly-leaved Gastrolobium [78415]	Endangered	Species or species habitat may occur within area	In buffer area only
Grevillea brachystylis subsp. australis [55525]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Kennedia lateritia Augusta Kennedia [45985]	Endangered	Species or species habitat likely to occur within area	In feature area
Lambertia echinata subsp. occidentalis Western Prickly Honeysuckle [64528]	Endangered	Species or species habitat may occur within area	In buffer area only
Lambertia orbifolia Roundleaf Honeysuckle [15725]	Endangered	Species or species habitat known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Leptomeria dielsiana Diels' Currant Bush [5146]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Verticordia plumosa var. vassensis Vasse Featherflower [55804]	Endangered	Species or species habitat may occur within area	In buffer area only
REPTILE			
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area	In feature area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area	In feature area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area	In feature area
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area	In feature area
SHARK			
Carcharias taurus (west coast population) Grey Nurse Shark (west coast population) [68752]	Vulnerable	Species or species habitat known to occur within area	In feature area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Galeorhinus galeus School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat may occur within area	In buffer area only
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In feature area

Listed Migratory Species		[Resource Information]	
Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Breeding known to occur within area	In feature area
Ardenna grisea Sooty Shearwater [82651]		Species or species habitat may occur within area	In feature area
Diomedea amsterdamensis Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area	In feature area
Diomedea dabbenena Tristan Albatross [66471]	Endangered	Species or species habitat may occur within area	In feature area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In feature area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In feature area
Hydroprogne caspia Caspian Tern [808]		Foraging, feeding or related behaviour known to occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Onychoprion anaethetus Bridled Tern [82845]		Breeding known to occur within area	In feature area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In feature area
Migratory Marine Species			
Balaenoptera borealis Sei Whale [34]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area	In feature area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In feature area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Caperea marginata Pygmy Right Whale [39]		Species or species habitat may occur within area	In feature area
Carcharhinus longimanus Oceanic Whitetip Shark [84108]		Species or species habitat may occur within area	In feature area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area	In feature area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area	In feature area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area	In feature area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Breeding known to occur within area	In feature area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area	In feature area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area	In feature area
Megaptera novaeangliae Humpback Whale [38]		Foraging, feeding or related behaviour known to occur within area	In feature area
Mobula alfredi as Manta alfredi Reef Manta Ray, Coastal Manta Ray [90033]		Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Mobula birostris as Manta birostris Giant Manta Ray [90034]		Species or species habitat likely to occur within area	In feature area
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area	In feature area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area	In feature area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area	In feature area
Calidris alba Sanderling [875]		Species or species habitat known to occur within area	In buffer area only
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris tenuirostris Great Knot [862]	Critically Endangered	Species or species habitat known to occur within area	In buffer area only
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat may occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Pandion haliaetus Osprey [952]		Breeding known to occur within area	In feature area
Pluvialis fulva Pacific Golden Plover [25545]		Species or species habitat likely to occur within area	In buffer area only
Thalasseus bergii Greater Crested Tern [83000]		Breeding known to occur within area	In buffer area only
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area	In buffer area only

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State	Buffer Status
Unknown		
Commonwealth Land - [50386]	WA	In buffer area only
Commonwealth Land - [52112]	WA	In buffer area only
Commonwealth Land - [51483]	WA	In buffer area only

Commonwealth Heritage Places [Resource Information]

Name	State	Status	Buffer Status
Historic			
Cape Leeuwin Lighthouse	WA	Listed place	In feature area

Listed Marine Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Anous tenuirostris melanops Australian Lesser Noddy [26000]	Vulnerable	Species or species habitat may occur within area	In feature area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Ardenna carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Breeding known to occur within area	In feature area
Ardenna grisea as Puffinus griseus Sooty Shearwater [82651]		Species or species habitat may occur within area	In feature area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area	In feature area
Calidris alba Sanderling [875]		Species or species habitat known to occur within area	In buffer area only
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Calidris tenuirostris Great Knot [862]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In buffer area only
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Charadrius ruficapillus Red-capped Plover [881]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Chroicocephalus novaehollandiae as Larus novaehollandiae Silver Gull [82326]		Breeding known to occur within area	In buffer area only
Diomedea amsterdamensis Amsterdam Albatross [64405]	Endangered	Species or species habitat may occur within area	In feature area
Diomedea dabbenena Tristan Albatross [66471]	Endangered	Species or species habitat may occur within area	In feature area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In feature area
Eudyptula minor Little Penguin [1085]		Breeding known to occur within area	In buffer area only
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area	In feature area
Halobaena caerulea Blue Petrel [1059]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Hydroprogne caspia as Sterna caspia Caspian Tern [808]		Foraging, feeding or related behaviour known to occur within area	In feature area
Larus pacificus Pacific Gull [811]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat may occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Onychoprion anaethetus as Sterna anaethetus Bridled Tern [82845]		Breeding known to occur within area	In feature area
Onychoprion fuscatus as Sterna fuscata Sooty Tern [90682]		Breeding known to occur within area	In buffer area only
Pachyptila turtur Fairy Prion [1066]		Species or species habitat likely to occur within area	In feature area
Pandion haliaetus Osprey [952]		Breeding known to occur within area	In feature area
Pelagodroma marina White-faced Storm-Petrel [1016]		Breeding known to occur within area	In buffer area only
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In feature area
Pluvialis fulva Pacific Golden Plover [25545]		Species or species habitat likely to occur within area	In buffer area only
Pterodroma mollis Soft-plumaged Petrel [1036]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Puffinus assimilis Little Shearwater [59363]		Breeding known to occur within area	In feature area
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Sternula nereis as Sterna nereis Fairy Tern [82949]		Breeding known to occur within area	In buffer area only
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalasseus bergii as Sterna bergii Greater Crested Tern [83000]		Breeding known to occur within area	In buffer area only
Thinornis cucullatus as Thinornis rubricollis Hooded Plover, Hooded Dotterel [87735]		Species or species habitat known to occur within area overfly marine area	In feature area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area overfly marine area	In buffer area only
Fish			
Acentronura australe Southern Pygmy Pipehorse [66185]		Species or species habitat may occur within area	In feature area
Campichthys galei Gale's Pipefish [66191]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area	In feature area
Hippocampus angustus Western Spiny Seahorse, Narrow-bellied Seahorse [66234]		Species or species habitat may occur within area	In feature area
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area	In feature area
Hippocampus subelongatus West Australian Seahorse [66722]		Species or species habitat may occur within area	In feature area
Histiogamphelus cristatus Rhino Pipefish, Macleay's Crested Pipefish, Ring-back Pipefish [66243]		Species or species habitat may occur within area	In feature area
Lissocampus caudalis Australian Smooth Pipefish, Smooth Pipefish [66249]		Species or species habitat may occur within area	In feature area
Lissocampus fatiloquus Prophet's Pipefish [66250]		Species or species habitat may occur within area	In feature area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area	In feature area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area	In feature area
Mitotichthys meraculus Western Crested Pipefish [66259]		Species or species habitat may occur within area	In feature area
Nannocampus subosseus Bonyhead Pipefish, Bony-headed Pipefish [66264]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Phycodurus eques Leafy Seadragon [66267]		Species or species habitat may occur within area	In feature area
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area	In feature area
Pugnaso curtirostris Pugnose Pipefish, Pug-nosed Pipefish [66269]		Species or species habitat may occur within area	In feature area
Solegnathus lettiensis Gunther's Pipehorse, Indonesian Pipefish [66273]		Species or species habitat may occur within area	In feature area
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area	In feature area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area	In feature area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area	In feature area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area	In feature area
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area	In feature area
Vanacampus poecilolaemus Longsnout Pipefish, Australian Long-snout Pipefish, Long-snouted Pipefish [66285]		Species or species habitat may occur within area	In feature area
Mammal			
Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Breeding known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Neophoca cinerea Australian Sea-lion, Australian Sea Lion [22]	Endangered	Species or species habitat may occur within area	In feature area
Reptile			
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area	In feature area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat may occur within area	In feature area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area	In feature area
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area	In feature area

Whales and Other Cetaceans		[Resource Information]	
Current Scientific Name	Status	Type of Presence	Buffer Status
Mammal			
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area	In feature area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area	In feature area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat likely to occur within area	In feature area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Caperea marginata Pygmy Right Whale [39]		Species or species habitat may occur within area	In feature area

Current Scientific Name	Status	Type of Presence	Buffer Status
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area	In feature area
Eubalaena australis Southern Right Whale [40]	Endangered	Breeding known to occur within area	In feature area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area	In feature area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area	In feature area
Megaptera novaeangliae Humpback Whale [38]		Foraging, feeding or related behaviour known to occur within area	In feature area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area	In feature area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area	In feature area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area	In feature area

Australian Marine Parks		[Resource Information]
Park Name	Zone & IUCN Categories	Buffer Status
South-west Corner	Special Purpose Zone (Mining Exclusion) (IUCN VI)	In buffer area only

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	Buffer Status
Flinders Bay	Nature Reserve	WA	In buffer area only
Leeuwin-Naturaliste	National Park	WA	In feature area

Protected Area Name	Reserve Type	State	Buffer Status
Ngari Capes	Marine Park	WA	In feature area
Scott	National Park	WA	In buffer area only
Seal Island (WA25645)	Nature Reserve	WA	In buffer area only
St Alouarn Island	Nature Reserve	WA	In buffer area only
Stockdill Road	Nature Reserve	WA	In buffer area only
Unnamed WA15185	Nature Reserve	WA	In buffer area only
Unnamed WA42942	Nature Reserve	WA	In buffer area only

Regional Forest Agreements [Resource Information]

Note that all areas with completed RFAs have been included. Please see the associated resource information for specific caveats and use limitations associated with RFA boundary information.

RFA Name	State	Buffer Status
South West WA RFA	Western Australia	In feature area

Nationally Important Wetlands [Resource Information]

Wetland Name	State	Buffer Status
Blackwood River (Lower Reaches) and Tributaries System	WA	In buffer area only
Cape Leeuwin System	WA	In feature area

EPBC Act Referrals [Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Flat Rock boating facility	2008/4506	Controlled Action	Post-Approval	In buffer area only
Not controlled action				
Busselton to Flinders Bay Rails to Trails Project, WA	2013/6835	Not Controlled Action	Completed	In buffer area only
CTBT - Cape Leeuwin Hydroacoustic Station Proposal	2000/27	Not Controlled Action	Completed	In buffer area only
Geo-science Investigations	2005/2069	Not Controlled Action	Completed	In feature area
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed	In feature area
Residential-Rural Subdivision, Lot 1 Kudardup Rd, Kudardup, WA	2012/6471	Not Controlled Action	Completed	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Vegetation clearing for sand extraction, Lot 268 Leeuwin Road, Augusta	2013/6860	Not Controlled Action	Completed	In buffer area only
Not controlled action (particular manner)				
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval	In feature area

Key Ecological Features [Resource Information]

Key Ecological Features are the parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of the Commonwealth Marine Area.

Name	Region	Buffer Status
Western rock lobster	South-west	In buffer area only

Biologically Important Areas

Scientific Name	Behaviour	Presence	Buffer Status
Seabirds			
Ardenna carneipes Flesh-footed Shearwater [82404]	Foraging (in high numbers)	Known to occur	In feature area
Eudyptula minor Little Penguin [1085]	Foraging (provisioning young)	Known to occur	In feature area
Hydroprogne caspia Caspian Tern [808]	Foraging (provisioning young)	Known to occur	In feature area
Larus pacificus Pacific Gull [811]	Foraging (in high numbers)	Known to occur	In buffer area only
Onychoprion anaethetus Bridled Tern [82845]	Foraging (in high numbers)	Known to occur	In feature area
Puffinus assimilis tunneyi Little Shearwater [59363]	Foraging (in high numbers)	Known to occur	In feature area
Sternula nereis Fairy Tern [82949]	Foraging (in high	Known to occur	In feature area

Scientific Name	Behaviour	Presence	Buffer Status
	numbers)		
Thalassarche chlororhynchos bassi Indian Yellow-nosed Albatross [85249]	Foraging (in high numbers)	Known to occur	In buffer area only
Sharks			
Carcharodon carcharias White Shark [64470]	Foraging	Known to occur	In feature area
Whales			
Balaenoptera musculus brevicauda Pygmy Blue Whale [81317]	Distribution	Known to occur	In feature area
Megaptera novaeangliae Humpback Whale [38]	Migration (north)	Known to occur	In feature area
Megaptera novaeangliae Humpback Whale [38]	Migration (north and south)	Known to occur	In buffer area only

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.

Please feel free to provide feedback via the Contact us page.

Department of Climate Change, Energy, the Environment and Water
GPO Box 3090
Canberra ACT 2601 Australia
+61 2 6274 1111

Appendix C Conservation Codes for Western Australia Flora

Conservation Code	Category
Threatened species (T)	Listed by order of the Minister as Threatened in the category of critically endangered, endangered, or vulnerable under Section 19(1), or is a rediscovered species to be regarded as threatened species under section 26(2) of the *Biodiversity Conservation Act 2016* (BC Act). ***Threated fauna*** is that subset of 'Specially Protected Fauna' listed under Schedules 1 to 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for Threatened Fauna. ***Threatened flora*** is that subset of 'Rare Flora' listed under schedules 1 to 3 of the *Wildlife Conservation (Rare Flora) Notice 2018* for Threated Flora. The Assessment of the conservation status of these species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria as detailed below
Critically endangered species (CR)	Threatened species considered to be *"facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the criteria set out in the ministerial guidelines"*. Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines. Published under schedule 1 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for critically endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for critically endangered flora.
Endangered species (EN)	Threatened species considered to be *"facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines"*. Listed as endangered under Section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines. Published under schedule 2 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for endangered flora.

Conservation Code	Category
Vulnerable species (VU)	Threatened species considered to *be "facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines".* Listed as endangered under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines. Published under schedule 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for vulnerable fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for vulnerable flora.
Extinct species (EX)	Species where *"there is no reasonable doubt that the last member of the species has died",* and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act). Published as presumed extinct under schedule 4 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for extinct fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for extinct flora.
Extinct in the wild species (EW)	Species that *"is known only to survive in cultivation, captivity or as a naturalised population well outside its part range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form",* and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act). Currently there are no threated fauna or flora species listed as extinct in the wild. If listing of a species as extinct in the wild occurs, then a schedule will be added to the applicable notice.
Specially protected species	Listed by order of the Minister as specially protected under section 13(1) of the BC Act. Meeting one or more of the following categories: species of special conservation interest; migratory species; cetaceans; species subject to international agreement; or species otherwise in need of special protection. Species that are listed as threatened species (critically endangered, endangered, or vulnerable) or extinct species under the BC Act cannot also be listed as Specially Protected species.

Conservation Code	Category
Migratory species (MI)	Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; and listing is otherwise in accordance with the ministerial guidelines (Section 15 of the BC Act). Includes birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and the Republic of Korea (ROKAMBA), and fauna subject to the *Convention on the Conservation of Migratory Species of Wild Animals* (Bonn Convention), an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals, that are known to visit Western Australia, protected under the international agreements of treaties, excluding species that are listed as Threated species. Published as migratory birds protected under an international agreement under schedule 5 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.
Species of special conservation interest (conservation dependent fauna) (CD)	Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened, and listing is otherwise in accordance with the ministerial guidelines (section 14 of the BC Act). Published as conservation dependent fauna under schedule 6 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.
Other specially protected species (OS)	Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act). Published as other specially protected fauna under schedule 7 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

Conservation Code	Category
Priority species (P)	Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened fauna or flora. Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been recently removed from the threatened species or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring. Assessment of Priority codes in based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations.
Priority 1 – Poorly-known species	Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g., agricultural, or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases, or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.
Priority 2 – Poorly-known species	Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g., national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.

Conservation Code	Category
Priority 3 – Poorly-known species	Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.
Priority 4 – Rare, Near Threatened and other species in need of monitoring	(a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These species are usually represented on conservation lands. (b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for vulnerable but are not listed as Conservation Dependent. (c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

Appendix D Relevé Sheets