ENVIRONMENTAL ASSESSMENT REPORT

LOT 2 HAROLD DOUGLAS DRIVE AND LOT 185 VENN ROAD, DARDANUP

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EXECUTIVE SUMMARY

The proponent (Dardanup Park Pty Ltd) is seeking to develop and subdivide Lot 2 Harold Douglas Drive and Lot 185 Venn Road, Dardanup West (herein referred to as the subject site). The subject site is approximately 84 hectares (ha) in size and is located in the municipality of the Shire of Dardanup.

This Environmental Assessment Report (EAR) ensures that environmental values and potential impacts associated with the proposed development can be managed in accordance with legislative and policy requirements.

The EAR demonstrates that the subject site is relatively unconstrained and is suitable for the proposed Rural small holdings development, based on the assessment of existing environmental factors and values. A summary of the key environmental factors and values are listed below, with management measures provided in **Table i**, where relevant:

- The majority of the subject site has been historically cleared or modified to allow for agricultural activities, primarily livestock grazing.
- The majority of the subject site is classified as having a 'moderate to low' risk of Acid Sulfate Soils occurring within 3 m of the ground level.
- The *Geomorphic Wetlands of the Swan Coastal Plain* dataset indicate that the subject site is contained within an area mapped as a Multiple Use (MU) wetland.
- Given historic clearing and associated agricultural land uses, flora and vegetation within the subject site has been significantly modified, with all areas containing remnant native vegetation considered to be in a 'Completely Degraded' condition.
- Based on the condition of vegetation and current land use, the presence of any vegetation communities or flora of conservation significance is considered very unlikely.
- No conservation significant fauna species were identified during the fauna survey, however some habitat (albeit marginal in quality) potentially suitable for western ringtail possums and the three black cockatoo species (Carnaby's, Baudin's and forest red-tailed) was identified within the subject site (Harewood 2021).
- No registered Aboriginal heritage sites have been identified within the subject site.

It has been determined that the limited environmental values of the subject site can be accommodated within the subdivision design, or can be managed appropriately through the future development phases in line with the relevant state and local government legislation, policies and guidelines and best management practices.

Table i: Summary of environmental management measures

Aspect	Objective	Management Measure	Timing
Acid Sulfate Soils	Prevent disturbance of ASS material.	• If determined necessary, undertake preliminary ASS investigation to determine the presence, extent and management requirements for any ASS present within the site, followed by the preparation of an ASSDMP, if required. The requirement for ASS investigation/management will be confirmed in accordance with any subdivision conditions and/or as part of future development once detailed design has progressed.	Prior to subdivision
Site contamination	To prevent adverse health related and/or environmental impacts to construction personnel from contamination.	• If any suspected contaminated material is encountered during project implementation, works should cease in the area and the site Project Manager be contacted for advice.	During construction
Wetlands	To maintain the integrity and ecological functions of the mapped MU wetlands.	• The proposed subdivision will be strategically designed to maintain existing hydrological functions, thereby complying with the management objectives associated with MU wetlands. The proposed integrated water management strategies will be documented in the LWMS.	Prior to subdivision
Hydrology	To maintain the quantity and quality of water so that existing and potential environmental values, including ecosystem function, are protected.	The LWMS will detail the integrated water management strategies to facilitate future urban water management planning. The LWMS will achieve integrated water management through the following design objectives: • Effectively manage the risk to property damage and environmental degradation from water contamination, flooding and waterlogging. • Maintain and if possible improve water quality (surface and groundwater) within the development in relation to predevelopment water quality. • Implement best management practices in regards to stormwater management. • Maintain existing local drainage patterns and minimise disruption and pollution from potential contaminants such as sediment and hydrocarbons from reaching natural drainage systems.	Prior to subdivision

Aspect	Objective	Management Measure	Timing
		• Ensure adequate culverts are installed to maintain existing surface water flows. • Construction in the vicinity of water bodies/courses should, if possible, be scheduled within the drier months of the year to avoid/minimise turbidity from erosion.	
Vegetation and Flora	To maintain the abundance, species diversity, geographic distribution and productivity of flora and fauna at species and ecosystem levels through the avoidance or management of adverse impacts and improvement in knowledge.	• Vegetation located along the watercourse will be retained within a drainage reserve and enhanced as part of the future development to improve the biodiversity values of the area (which is largely trees over paddock grasses). • Vegetation clearing management measures include: o Clearing operations should be conducted in accordance with the dieback/weed hygiene requirements. o Clearing should be kept to the minimum within the clearing envelope whilst having regard to bushfire management requirements. o The limits of clearing should be clearly marked on site and relevant plans to inform site personnel to contain all activities in the clearing envelope. o Trees to be removed should be felled in a manner that ensures they fall within the approved clearing envelope. o The remainder of cleared vegetation should be salvaged, chipped on site for in situ site rehabilitation and/or soil stabilisation (note: consider the dieback and weed status of the material and its location of dispersal). o Existing cleared areas should be utilised for locating site access, site offices and any temporary laydown areas (but not adjacent to waterways or drainage lines).	Subdivision design Construction
Fauna	To maintain the abundance, diversity, geographic distribution and productivity of native fauna at the species and ecosystem levels through the avoidance or management of adverse impacts and improvement in knowledge.	• Retain the four trees identified to contain at least one hollow considered potentially suitable for black cockatoos to use for nesting purposes. • Undertaken revegetation within the drainage reserve and strategic re-planting using endemic species (e.g. *Agonis flexuosa*) throughout the proposed subdivision. • Retain vegetation identified in the location of the WRP scats within the drainage reserve. • Management measures to minimise the impact to fauna and habitat during construction will include:	Subdivision design Construction

Aspect	Objective	Management Measure	Timing
		o Provide map and GPS co-ordinates of trees to be retained to the contractor to ensure no unapproved clearing is undertaken; o Clearly mark trees identified for retention with flagging tape and numbered tags; o Undertaking preclearing inspections of trees/vegetation proposed for removal/modification by suitably qualified and licensed fauna spotter; o Use a suitably qualified and licensed fauna spotter during demolition and clearing works to avoid impacts to fauna wherever possible and to rescue trans-locatable fauna that are disturbed during clearing works to assist them to disperse safely or capture them for later translocation as appropriate; o Contact the DBCA Wildcare Helpline 24 hour emergency hotline if sick or injured animals are encountered.	

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1 INTRODUCTION

1.1 Background

The proponent (Dardanup Park Pty Ltd) is seeking to develop and subdivide Lot 2 Harold Douglas Drive and Lot 185 Venn Road, Dardanup West (herein referred to as the subject site). The subject site is approximately 84 hectares (ha) in size and is located in the municipality of the Shire of Dardanup. It is situated approximately 12.4 kilometres (km) from the Bunbury Central Business District (refer to **Figure 1** and **Figure 2**).

Accendo Australia (Accendo) was commissioned to provide environmental services to determine the environmental impacts and management measures for the proposed subdivision.

1.2 Proposed Development

The proponent is proposing to develop 39 Rural small holdings lots encompassing 60 ha of the subject site throughout the western, northern and southern portions. The remaining 35.77 ha of the subject site will be retained as 'General Farming' (refer to **Figure 2**).

The subject site is currently zoned as 'General Farming' under the Shire of Dardanup *Local Planning Scheme No. 3* and will require rezoning to 'Rural' small holdings for the proposed subdivision lots.

1.3 Scope and Methodology

The purpose of this Environmental Assessment Report (EAR) is to demonstrate that all environmental values are understood and potential impacts associated with the future land use can be managed in accordance with legislative and policy requirements, and have been adequately considered in the design of the development.

The environmental assessment involved a review of relevant documentation already prepared for the site, databases and mapping, and relevant government environmental and planning policies. This information has informed the recommendations for the management plan associated with the subdivision.

Specifically, the environmental assessment involved the following:

- A site inspection undertaken on the 24th August 2021 by Accendo;
- Collation of existing information regarding the subject site and the existing environment including:
    - Regional flora and vegetation;
    - Declared Rare Flora and Threatened Ecological Communities (TECs);
    - Significant (Threatened) fauna;
    - Surface hydrology (including floodplains) and water quality;
    - Soil and landform mapping including a review of Acid Sulfate Soil (ASS) risk mapping;
    - Identify the presence or otherwise of geomorphic wetlands and/or protected lakes;
    - Identify the presence of waterways on or adjacent to the site, including any buffer requirements to protect these waterways;
    - Review registered Aboriginal Heritage sites and existing heritage investigation reports from the Department of Planning, Lands and Heritage's (DPLH's) Aboriginal Heritage Inquiry System (AHIS) and European Heritage records;
    - A review of the Department of Agriculture, Water and the Environment (DAWE's) *Matters of National Environmental Significance* database;

- A search of the Department of Water and Environmental Regulation's (DWER's) contaminated sites database to determine the contamination status of the subject site; and
- A review of existing environmental policy (Local Government, State and National) to assess any potential implications for the subject site.

Based on the findings of the assessment, environmental management measures have been developed to manage and mitigate potential impacts associated with the proposed subdivision.

2 RELEVANT LEGISLATION

2.1 Western Australian Legislation

This assessment has been undertaken in consideration of the relevant Western Australian State legislation which includes the following.

Biodiversity Conservation Act 2016 (BC Act)

The Department of Biodiversity, Conservation and Attractions (DBCA) lists flora and fauna taxa under the provisions of the BC Act as protected according to their need for protection. Flora is given Declared Rare status when their populations are geographically restricted or are threatened by local processes. In addition, under the BC Act, by Notice in the Western Australian Government Gazette of 9 October 1987, all native flora and fauna is protected throughout the State.

Environmental Protection Act 1986 (EP Act)

This EP Act is administered by the DWER and DBCA. The EP Act provides for conservation, preservation, protection, enhancement and management of the environment and for matters incidental to or connected with it. The Act establishes head powers to provide mechanisms for the development of Environmental Protection Policies (EPP), the referral and assessment of proposals (Environmental Impact Assessment - EIA), the control of pollution and enforcement. The Act also provides for an Environmental Protection Authority (EPA) that is a statutory authority and is the primary provider of independent environmental advice to Government (EPA 2005). The EPA is assisted by the EPA Service Unit comprising the Environmental Impact Assessment and Policy Divisions of the DWER.

Aboriginal Heritage Act 1972

The purpose of this legislation, regulated and enforced by the DPLH, is to protect relics and significant areas of land from undue interference, while at the same time leaving traditional Aboriginal cultural rights in relation to such objects or areas unaffected, consistent with the provisions of the Act. The Act establishes the Aboriginal Cultural Material Committee (ACMC). ACMC provides advice for the assessment of Section 18 Notices which developers are obliged to submit so the ACMC can determine whether or not an Aboriginal site should be disturbed by the development.

Rights in Water and Irrigation Act 1914 (RiWI Act)

The *Rights in Water and Irrigation Act 1914* is administered by the DWER and governs the management of surface and groundwater in Western Australia.

Heritage of Western Australia Act 1990

In accordance with the *Heritage of Western Australia Act 1990*, a place can be placed on the Register of Heritage Places if it is of cultural heritage significance or possesses a special interest related to or associated with cultural heritage.

Heritage places are protected under both State and Commonwealth legislation, with the Heritage Council of Western Australia administering the Register of Heritage Places. Heritage is also protected by local governments via the planning scheme system.

Biosecurity and Agriculture Management Act 2007

The Department of Primary Industries and Regional Development (DPIRD) is responsible for the administration of the *Biosecurity and Agriculture Management Act 2007*.

Two of the main purposes of the *Biosecurity and Agriculture Management Act 2007* are to prevent new animal and plant pests and diseases from entering Western Australia and to manage the impact and spread of those pests already present in the state.

2.2 Federal Legislation

Environmental federal legislation applicable to the subject site includes the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), which is described below.

EPBC Act

The EPBC Act aims to protect *Matters of National Environmental Significance*. Under the EPBC Act, the Commonwealth Department of Agriculture, Water and Environment (DAWE) lists Threatened species, Migratory species and Threatened Ecological Communities (TECs) in certain categories determined by criteria provided within the EPBC Act. Actions likely to cause a significant impact on *Matters of National Environmental Significance* should be referred to the DAWE for assessment pursuant to the EPBC Act.

3 EXISTING ENVIRONMENT

During the process of this investigation, a range of specific environmental and heritage issues were explored in relation to the subject site. These issues arise from the existing environment of the subject site, its surrounds and the prevailing State and Commonwealth environment policy and legislation.

3.1 Land Use

Historically, the subject site has been used for broad acre agriculture, with the subject site currently zoned 'General Farming'. Accordingly, the majority of the subject site has been modified and is largely devoid of remnant vegetation, consisting of paddock grasses for livestock grazing.

The subject site is bordered by other general farming and residential properties to the north, west and south. The eastern boundary is adjacent to the Dardanup township.

3.2 Topography

Online mapping from the DPIRD (2019) indicates that the topography of the subject site is undulating with a ridge in the centre, ranging from 22 m Australian Height Datum (AHD) on the western boundary to 26 m AHD on the eastern boundary.

3.3 Landforms and Soils

The landform and soil units of the areas underlying the subject site have previously been mapped within *The Geological Survey of Western Australia* (Belford 1987). The DPIRD's Natural Resource Information (NRInfo) maps the subject site as occurring on the Swan Coastal Plain and within multiple zones and systems. The Swan Coastal Plain extends from Perth to Capel and is described as a poorly drained coastal plain with variable alluvial and aeolian soils.

The northern and eastern portions of the subject site occur within the Pinjarra Zone whilst the central, western and southern portions occur in the Bassendean Zone (refer to **Figure 3**). Additionally, several soil Phases occur throughout the subject site, which are described below:

- Pinjarra P3 Phase: Flat to very gently undulating plain with deep, imperfect to poorly drained acidic gradational yellow or grey-brown earths and mottled yellow duplex soils, with loam to clay loam surface horizons;
- Bassendean B1 Phase: Extremely low to very low relief dunes, undulating sandplain and discrete sand rises with deep bleached grey sands sometimes with a pale yellow B horizon or a weak iron-organic hardpan at depths generally greater than 2 m;
- Bassendean B1a Phase: Extremely low to very low relief dunes, undulating sandplain and discrete sand rises with deep bleached grey sands with an intensely coloured yellow B horizon occurring within 1 m of the surface; marri and jarrah dominant;
- Bassendean B2 Phase: Flat to very gently undulating sandplain with well to moderately well drained deep bleached grey sands with a pale yellow B horizon or a weak iron-organic hardpan 1-2 m;
- Pinjarra P2 Phase: Flat to very gently undulating plain with deep alkaline mottled yellow duplex soils which generally consist of shallow pale sand to sandy loam over clay; and
- Sw – Swamp (Bassendean): Swamp.

3.4 Acid Sulfate Soils

Acid sulfate soils (ASS) is the name commonly given to naturally occurring soils and sediment containing iron sulphide (iron pyrite) materials. In their natural state, ASS are generally present in waterlogged and/or anoxic conditions and do not present any risk to the environment. ASS can pose issues when oxidised, producing sulphuric acid, which can present a range of risks for the surrounding environment, infrastructure and human health.

The DWER provides broad-scale mapping indicating areas of potential ASS risk (DWER 2019). A review of the DWER mapping indicates that majority of the subject site is classified as having a 'moderate to low risk' of ASS occurring within 3 m of the natural soil. A small portion to the southwest of the subject site (approximately 6,086 m^2) is classified as 'high to moderate risk' of ASS.

3.5 Site Contamination

A search of the DWER's known contaminated sites database (DWER 2021) identified that the subject site is not listed as a contaminated site. There are no known contaminated sites located within 5 km of the subject site.

Historic agricultural land uses, primarily low-intensity activities such as livestock grazing, are considered unlikely to raise any significant contamination risk concerns for the subject site.

3.6 Surface Water

The subject site is intersected by a small perennial creekline (Gavin's Gully) which is a tributary of the Preston River. The majority of native vegetation associated with the watercourse has been removed, excluding occasional mature peppermint (*Agonis flexuosa*), flooded gum (*Eucalyptus rudis*) and paperbark (*Melaleuca* spp.) trees (refer to **Plate 1**). The Preston River is located approximately 3 km to the southwest of the subject site and the Ferguson River is located approximately 1.6 km to the northeast of the subject site.

Plate 1. Vegetation along the watercourse.

3.7 Wetlands

Wetlands within Western Australia are classified on the basis of landform and water permanence pursuant to the Semeniuk (1995) classification system (refer to **Table 1**).

Table 1: Wetland classifications (Semeniuk 1995)

Water Longevity	Landform				
	Basin	Channel	Flat	Slope	Highland
Permanent Inundation	Lake	River	-	-	-
Seasonal Inundation	Sumpland	Creek	Floodplain	-	-
Intermittent Inundation	Playa	Wadi	Barlkarra	-	-
Seasonal Waterlogging	Dampland	Trough	Palusplain	Paluslope	Palusmont

Areas of wetlands have been mapped previously by Semenuik (1995) across the entire Swan Coastal Plain. This mapping has been converted into a digital dataset that is maintained by the DBCA and is referred to as the 'Geomorphic Wetland of the Swan Coastal Plain' dataset. This dataset contains information on geomorphic wetland types and assigns management categories that guide the recommended management approach for each wetland area. The wetland management categories and management objectives are listed in **Table 2**.

Table 2: DBCA wetland management categories (Semeniuk 1995)

Category	Description	Management Objectives
Conservation (C)	Wetlands support a high level of ecological attributes and functions.	Highest priority wetlands. Objective is to preserve and protect the existing conservation values of the wetlands through various mechanisms including: • Reservation in national parks, crown reserves and State-owned land, • Protection under Environmental Protection Policies, and • Wetland covenanting by landowners. No development or clearing is considered appropriate. These are the most valuable wetlands and any activity that may lead to further loss or degradation is inappropriate.
Resource Enhancement (RE)	Wetlands which may have been partially modified but still support substantial ecological attributes and functions.	Priority wetlands. Ultimate objective is to manage, restore and protect towards improving their conservation value. These wetlands have the potential to be restored to Conservation category. This can be achieved by restoring wetland function, structure and biodiversity.
Multiple Use (MU)	Wetlands with few remaining attributes and functions.	Use, development and management should be considered in the context of ecologically sustainable development and best management practice catchment planning through landcare.

The subject site contains three Multiple Use (MU) wetlands (UFI 14,329, 15,221 and 1,757) as depicted on **Figure 4**.

A search of the Ramsar *Convention on Wetlands* (1971) revealed that the subject site does not contain and is not in proximity to any wetlands of international importance.

3.8 Groundwater

The subject site is located within the proclaimed Bunbury Groundwater Management Area. Pursuant to the RiWI Act, in proclaimed areas it is an offence to take water without an appropriate licence.

To protect the State's drinking water resources the DWER has defined certain Priority Classification Areas within Public Drinking Water Source Areas (PDWSA), providing three levels of groundwater quality protection. These are based on the principles of risk avoidance (Priority 1), risk minimisation (Priority 2) and pollution limiting (Priority 3). The subject site does not lie within any existing or potential PDWSAs. The closest PDWSA to the subject site is located approximately 1 km to the southeast.

3.9 Flora and Vegetation

3.9.1 Vegetation

The subject site lies within the Swan Coastal Plain Biogeographic Region of the south-west Botanical Province (Thackway and Cresswell 1995), an area that extends from Jurien Bay to the north to Dunsborough to the south, and west of the Darling Scarp. Historically this biogeographic region has been extensively cleared for both urban and agricultural purposes.

Regional vegetation has been mapped by Mattiske and Havel (1998) at a scale of 1:250,000 based on major geomorphic units on the Swan Coastal Plain. The subject site includes one vegetation complex as defined by Mattiske and Havel (1998) including:

- Dardanup Complex: Mosaic of vegetation types from adjacent complexes, which includes the Southern River Complex and Guildford Complex. The Dardanup Complex is made up of a woodland with majority of *Eucalyptus marginata* (Jarrah), *Corymbia calophylla* (Marri) and *Eucaluptus wandoo* (Wandoo) species.

The mapped vegetation associations can be used to determine vegetation extent and status on the Swan Coastal Plain (refer to **Table 3**). The EPA recognises vegetation associations that are not well represented in reserves as being 'significant'.

Table 3: Extent of pre-European vegetation remaining the Swan Coastal Plain IBRA region

System	Pre-European (ha)	Current Extent (ha)	Remaining Extent (%)	Extent in Managed Lands (%)
IBRA Bioregion Swan Coastal Plain	1,501,221	579,813	39	38
Local Government Shire of Dardanup	52,827	25,302	47.9	82
Beard Vegetation Association 1182 – Pinjarra	4,267.32	1,096.72	25.7	14.9

The national objectives and targets for biodiversity conservation in Australia have a target to prevent clearance of ecological communities with an extent below 30% of their pre- European extent remaining. In consideration of **Table 3**, the vegetation association has less than 30% of its pre-European extent remaining, denoting that it is not well represented.

Based on site observations and analysis of aerial photography, the subject site is largely comprised of open grassland and a mosaic of scattered trees (refer to **Plates 2-3**). Native vegetation consists of the following species:

- Marri (*Corymbia calophylla*);
- Jarrah (*Eucalyptus marginata*);
- Peppermint (*Agonis flexuosa*);
- Flooded gum (*Eucalyptus rudis*); and
- Paperbark (*Melaleuca* spp.).

Given the limited species diversity, absence of mid and understorey species and high degree of weed invasion, the subject site is in a 'Completely Degraded' condition. Accordingly, the vegetation is not representative of the mapped associations (refer to **Table 3**), therefore the proposed subdivision will not impact these vegetation associations.

Plate 2. Grove of mature Peppermint (*Agonis flexuosa*) trees.

Plate 3. Cleared grassland with scattered trees (flooded gum, marri, peppermint and paperbark).

3.9.2 Threatened and Priority Ecological Communities

A search undertaken of the DBCA's Threatened Ecological Communities (TEC) database and the EPBC Act Matters of National Environmental Significance database indicated there are two TEC's within 2 km of the subject site.

The TEC's identified include the Banksia Woodlands of the Swan Coastal Plain ecological community which is mapped as 'likely to occur within the area' and the Tuart (*Eucalyptus gomphocephala*) Woodlands and Forests of the Swan Coastal Plain ecological community which is mapped as 'may occur within the area'. These TEC's have been listed as endangered and critically endangered, respectively under the EPBC Act.

To be considered as part of the Banksia Woodlands TEC, a patch of banksia woodland needs to meet the following criteria:

- Occurrence on the Swan Coastal Plain and immediately adjacent areas of the Whicher Scarp, Ridge Hill Shelf and Dandaragan Plateau in well-drained, low nutrient soils on sandplain landforms;
- The structure is that of a low woodland to forest;
- The canopy is commonly dominated by or co-dominated by *Banksia attenuata* and/or *Banksia menziesii*;
- The patch must include at least one of *Banksia attenuata*, *Banksia menziesii*, *Banksia ilicifolia* or *Banksia prionotes*; and
- The canopy may include emergent trees of *Eucalyptus marginata* or *Corymbia calophylla*.

The condition of the patch is also important in determining the presence of the Banksia Woodlands TEC. A patch must meet the criteria for 'Good' condition or better according to the Keighery (1994) condition scale. If a patch is rated as being in 'Good' condition, then it must also be at least 2 ha in size. Vegetation within the subject site is considered to be in a 'Completely Degraded' condition and Banksia spp. are absent. Accordingly, the Banksia Woodlands TEC is not present within the subject site.

To be considered as part of the Tuart Woodlands and Forest TEC, a patch of Tuart woodland needs to meet the following criteria:

- Occurrence on the Swan Coastal Plain;
- Primarily occurs on the Spearwood and Quindalup dune systems, but can also occur on the Bassendean dunes and Pinjarra Plain. It can occur on the banks of rivers and wetlands. It occurs below the Darling and Whicher escarpments where they define a plateau to the east of the Swan Coastal Plain;
- Most often occurs as a woodland but can occur in a variety of structural forms, including closed forest, open forest, woodland, open woodland, closed mallee forest, open mallee forest, mallee woodland and open mallee woodland;
- The dominant tree canopy species is tuart (*Eucalyptus gomphocephala*). While other tree species may be present in the canopy, they are less abundant than tuart; and
- For a patch of vegetation to be identified as the ecological community, there may be established tuart trees present, meeting the patch definition.

The condition of the patch is also important in determining the presence of the Tuart Woodlands and Forest TEC. A patch must meet the criteria for 'Good' condition or better according to the Keighery (1994) Condition Scale. If a patch is rated as being in 'Good' condition, then it must also be at least 2 ha in size. Vegetation within the subject site is considered to be in a 'Completely Degraded' condition and Tuarts are absent. Accordingly, the Tuart Woodlands TEC is not present within the subject site.

3.9.3 Environmentally Sensitive Areas

Section 51B of the EP Act allows the Minister to declare an Environmentally Sensitive Area (ESA). Once declared, the exemptions to clear native vegetation under the regulations do not apply in these areas. TECs, areas within 50 m of any Declared Rare Flora and defined wetland areas constitute ESAs. However, a number of other areas of environmental significance are also listed. Current declared ESAs are listed in the *Environmental Protection (Environmentally Sensitive Areas) Notice 2005*.

No environmentally sensitive areas have been identified within 2 km of the subject site.

3.9.4 Flora of Conservation Significance

A search for known rare and Priority flora within or in proximity to the subject site was undertaken through review of the following databases:

- DBCA's Threatened (Declared Rare) Flora database;
- DBCA's *Declared Rare and Priority Flora List*; and
- EPBC Act *Matters of National Environmental Significance* database.

In accordance with the DBCA's *Declared Rare and Priority Flora List*, two Threatened species, one Priority 2 species, two Priority 3 species and three Priority 4 species have been recorded within 5 km of the subject site. The EPBC Act *Matters of National Environmental Significance* database search identified an additional three 'Critically Endangered' and seven 'Endangered' flora species. A summary of the species and their likelihood of occurring within the subject site based on preferred soil types is provided within **Table 4**.

Table 4: Database search results for significant flora known to occur within proximity of the subject site

Species	DBCA Status	EPBC Act Status	Likelihood of Occurrence
Andersonia gracilis	-	Endangered	Prefers white/grey sand, sandy clay, gravelly loam. Winter-wet areas, near swamps. Unlikely given current and historical land use (grazing).
Acacia flagelliformis	P4	-	Prefers sandy soils and winter-wet areas. Unlikely given current and historical land use (grazing).
Acacia semitrullata	P4	-	Prefers white/grey sand, sometimes over laterite, clay. Sandplains, swampy areas. Unlikely given absence of suitable soil types.
Banksia nivea subsp. uliginosa	-	Endangered	Unlikely. Prefers sandy clay, gravel.
Banksia squarrosa subsp. argillacea	-	Vulnerable	Prefers white/grey sand, gravelly clay or loam. Winter-wet flats, clay flats. Unlikely given current and historical land use (grazing).
Brachyscias verecundus	-	Critically Endangered	Prefers a moss sward. On a granite outcrop. Unlikely given absence of suitable soil types.
Caladenia huegelii	-	Endangered	Prefers grey or brown sand, clay loam. Unlikely given current and historical land use (grazing).
Carex tereticaulis	P3	-	Prefers black peaty sand. Unlikely given absence of suitable soil types.
Chamelaucium sp. S coastal plain (R.D.Royce 4872)	-	Vulnerable	Prefers swamp margins. Dryandra shrubland in winter-wet sandy clay sites on a coastal plain. Unlikely given absence of suitable soil types.

Species	DBCA Status	EPBC Act Status	Likelihood of Occurrence
Chamelaucium sp. Yoongarillup (G.J. Keighery 3635)	P4	-	Prefers white/yellow sand supporting open low woodland. Unlikely given current and historical land use (grazing).
Diuris drummondii	-	Vulnerable	Prefers low-lying depressions, swamps. Unlikely given absence of suitable soil types.
Diuris micrantha	-	Vulnerable	Brown loamy clay. Winter-wet swamps, in shallow water. Unlikely given absence of suitable soil types.
Diuris purdiei	-	Endangered	Prefers grey-black sand, moist. Winter-wet swamps. Unlikely given absence of suitable soil types.
Drakaea elastica	-	Endangered	Prefers white or grey sand. Low-lying situations adjoining winter-wet swamps. Unlikely given absence of suitable soil types.
Drakaea micrantha	T	Vulnerable	Prefers white-grey sand. Unlikely given current and historical land use (grazing).
Elocharis keigheri	T	Vulnerable	Prefers clay or sandy loam. This species is emergent in freshwater creeks, and transient waterbodies such as drainage lines and claypans in water to approximately 15 cm deep. Unlikely given absence of suitable soil types.
Gastrolobium whicherense	P2	-	Prefers red-grey sandy clay over quartzite. Steep westerly slopes. Unlikely given absence of suitable soil types.
Lambertia echinata subsp. occidentalis	-	Endangered	Prefers white sandy soils over laterite, orange/brown-red clay over ironstone. Flats to foothills, winter-wet sites. Unlikely given absence of suitable soil types.
Synaphea sp. Fairbridge Farm (D. Papenfus 696)	-	Critically Endangered	Prefers sandy with lateritic pebbles. Near winter-wet flats, in low woodland with weedy grasses. Unlikely given absence of suitable soil types.
Synaphea sp. Pinjarra Plain (A.S. George 17182)	-	Endangered	Prefers grey sandy loam or clay, grey-brown clayey sand, brown clayey loam, laterite. Flats, seasonally wet areas, railroad reserves often with wet depressions or drains. Unlikely given absence of suitable soil types.
Synaphea hians	P3	-	Prefers sandy soils. Rises. Unlikely given current and historical land use (grazing).
Synaphea sp. Serpentine (G.R. Brand 103)	-	Critically Endangered	Prefers grey-brown sandy loams or clay in seasonally wet areas. Unlikely given current and historical land use (grazing).
Synaphea stenoloba	-	Endangered	Prefers sandy or sandy clay soils. Winter-wet flats, granite. Unlikely given absence of suitable soil types.

In consideration of the habitat requirements for the identified conservation significant species and the historical and ongoing anthropogenic disturbances, it is considered very unlikely for any flora species of conservation significance to occur within the subject site.

3.10 Fauna

A search of the DBCA's Threatened Fauna database (NatureMap) was undertaken to establish whether species declared as 'Rare or likely to become extinct' (Schedule 1), 'Birds protected under an international agreement' (Schedule 3) and 'Other specially protected fauna' (Schedule 4) as listed under the *Biodiversity Conservation Act 2016* have been recorded in proximity to the subject site. The NatureMap Report identified five threatened species, one Priority 3 species and one fauna species protected under international agreement (refer to **Table 5**), within a 5 km radius of the subject site. A search of the EPBC Act *Matters of National Environmental Significance* database identified an additional six species of conservation significance.

Table 5: Significant fauna potentially occurring within 5 km of the subject site as identified by State and Commonwealth database searches

Species	DBCA Status	EPBC Act Status	Likelihood of Occurrence
Botaurus poiciloptilus (Australasian Bittern)	-	Endangered	Unlikely, absence of suitable habitat
Calidris canutus (Red Knot)	-	Endangered	Unlikely, absence of suitable habitat
Calidris ferruginea (Curlew Sandpiper)	-	Critically Endangered	Unlikely, absence of suitable habitat
Calyptorhynchus banksii subsp. naso (Forest Red-tailed Black Cockatoo)	T	Vulnerable	Possible, presence of very limited habitat
Calyptorhynchus baudinii (Baudin's Cockatoo)	T	Endangered	Possible, presence of very limited habitat
Calyptorhynchus latirostris (Carnaby's Cockatoo)	T	Endangered	Possible, presence of very limited habitat
Dasyurus geoffroii (Western Quoll)	-	Vulnerable	Unlikely, absence of suitable habitat
Idiosoma sigillatum (Swan Coastal Plain shield-backed trapdoor spider)	P3	Vulnerable	Unlikely, absence of suitable habitat
Falco hypoleucos (Grey Falcon)	S3	Vulnerable	Unlikely, absence of suitable habitat
Falco peregrinus (Peregrine Falcon)	S7	-	Unlikely, uncommon in area
Falsistrellus mackenziei (Western False Pipistrelle)	P4	-	Unlikely, absence of suitable habitat
Numenius madagascariensis (Eastern Curlew)	-	Critically Endangered	Unlikely, absence of suitable habitat
Pandion cristatus (Eastern Osprey)	-	Endangered	Unlikely, absence of suitable habitat
Phascogale tapoatafa subsp. wambenger (South-western Brush-tailed Phascogale)	S	-	Possible, presence of limited potential habitat, but lack of habitat connectivity

Species	DBCA Status	EPBC Act Status	Likelihood of Occurrence
Pseudocheirus occidentalis (Western Ringtail Possum, ngwayir)	T	Critically Endangered	Possible, presence of potential habitat, but lack of habitat connectivity
Setonix brachyurus (Quokka)	-	Vulnerable	Unlikely, absence of suitable habitat
Sternula nereis nereis (Australian Fairy Tern)	-	Vulnerable	Unlikely, absence of suitable habitat
Tyto n. novaehollandiae (Masked Owl)	P3	-	Unlikely, uncommon in area
Westralunio Carteri (Carter's Freshwater Mussel)	T	Vulnerable	Unlikely, absence of suitable habitat

While migratory bird species may infrequently visit the subject site, they will not rely on it for their persistence in consideration of its degraded condition.

Of the abovementioned conservation significant species, based on preferred habitat types, five species have the potential to occur within the subject site. To determine the possible presence of these species, a level 1 fauna assessment was undertaken over the subject site (refer to **Appendix A**). The fauna assessment (Harewood 2021) involved a field survey undertaken on 5th, 6th and 7th October and the 15th November 2021 and consisted of a series of daytime reconnaissance surveys and nocturnal spotlighting.

The identified fauna habitats ranged from completely degraded (cleared pasture) to degraded, largely a consequence of historical clearing and ongoing livestock grazing. Given the degree of disturbance the original fauna assemblage within the subject site is likely to be depauperate in many aspects, in particular with respect to ground dwelling species which rely on dense native understory (midstorey and ground cover) vegetation, which is entirely absent (Harewood 2021).

Forty common fauna species (mainly common bird species) were observed or secondary evidence of their presence recorded during the field survey. A summary of the findings relating to the five species of conservation significance that have potential to occur in the subject site is provided below.

***Pseudocheirus occidentalis* (Western Ringtail Possum) (Critically Endangered)**

The Western Ringtail Possum (WRP) is endemic to the south- west of Western Australia. It was formerly patchily distributed through the near-coastal southwest from approximately 120 km southeast of Geraldton to the southern edge of the Nullabor Plain and its range has now substantially contracted (How *et al.*, 1978, de Tores *et al*., 2005, Jones 2004). Extant populations now occur mostly on the coastal strip from Yalgorup (100km south of Perth) to Waychinicup National Park (just east of Albany), with isolated inland populations in the lower Collie River valley, Harvey River valley and at Perup (Manjimup) (de Tores *et al.*, 2005, Jones 2004, Jones 2007).

With the exception of the few isolated inland populations in Eucalypt forests, the WRP generally occurs in coastal Peppermint (*Agonis flexuosa*) woodlands, Peppermint/Tuart (*Eucalyptus gomphocephala*) woodlands, and Peppermint/Eucalypt woodlands associations, with the highest density populations occurring within the Busselton to Dunsborough coastal strip *(de Tores et al.*, 2005; Jones *et al.*, 2007).

During the fauna survey, the only evidence of WRPs occurring within the subject site were a small number of old scats found under a tree along Gavin's Gully (refer to **Figure 5**). No dreys or WRP individuals were recorded (Harewood 2021).

At a superficial level, some of the contiguous remnant vegetation present within the subject site represents potential WRP habitat given the presence of preferential foraging species such as peppermint. The fact that the species appears to be absent (or at best present in very low numbers) does however suggest that the vegetation may have a low nutrient value (Harewood 2021).

Foliage nutrient levels are a major factor in explaining variation in abundance in WRPs and is also a key factor influencing fecundity. Nitrogen and to a lesser extent phosphorus levels are the most important determinant of browse quality and habitat suitability for WRPs. Accordingly, it appears that WRPs are avoiding the subject site due to inadequate nutrient content of the vegetation to maintain a viable breeding population. Any individuals that are recorded are likely to be transient individuals moving into the area from better quality habitat in adjoining areas (Harewood 2021).

Based on the findings of the targeted WRP survey (Harewood 2021), the subject site does not contain a persistent population of WRPs or provide habitat critical for the survival of the species.

Black Cockatoos

The Forest Red-tailed Black Cockatoo occurs in the south-west of Western Australia, approximately southwest of a line between Gingin and the Green Range (near Wellstead, east of Albany). The range of this sub-species is closes associated with the distribution of Marri (*Corymbia calophylla*); its favoured nesting and foraging trees species. This species typically breeds in tree hollows with a depth of 1 – 5 m primarily in Marri (*Corymbia calophylla*) and Jarrah *(Eucalyptus marginata*).

The Forest Red-tailed Black Cockatoo predominately forages on seeds of marri and jarrah. It has also been recorded foraging on *Eucalyptus caesia, E. erythrocorys*, river red gum (*E. camaldulensis*), flooded gum (*E. grandis*), *Allocasuarina* cones, fruits of snottygobble (*Personia longifolia*) and mountain marri (*Corymbia haematoxylon*) (SEWPaC 2012).

Carnaby's Black Cockatoo occurs in the south-west of Western Australia, approximately south-west of a line between the Murchison River (near Kalbarri) and Cape Arid National Park (east of Esperance).

Carnaby's Black Cockatoo generally nest in hollows in live or dead trees of Salmon Gum (*E. salmonophloia*), Wandoo (*E. Wandoo*), Tuart, Jarrah, Flooded Gum (*E. rudis*), York Gum (*E. loxophleba supsp. loxophleba*), Powderbark (*E. accedens*), Karri (*E. diversicolor*) and Marri (SEWPaC 2012).

Carnaby's Black Cockatoo forages in native shrubland, kwongan heathland and woodlands dominated by proteaceous plant species such as Banksia spp., Hakea spp. and Grevillea spp. (SEWPaC 2012).

Baudin's Black Cockatoo occurs in the south-west of Western Australia, approximately south-west of a line between Morangup (near Bullsbrook, north of Perth) and Waychinicup National Park (east of Albany). This species generally breeds in the Karri, Marri and Wandoo forests in the southern parts of the species' range and move north to the Darling Range and Swan Coastal Plain during autumn and winter.

During the breeding season, Baudin's Black Cockatoo primarily forage in Eucalypt woodlands, particularly Marri. Outside the breeding season, the species may feed in fruit orchards (mostly pear and apple, but also persimmon) and tips of Pinus spp. (SEWPaC 2012).

During the targeted black cockatoo habitat survey, a total of 204 trees within the subject site with a Diameter at Breast Height (DBH) of >50cm were identified (Harewood 2021). Most of these trees (149) appeared to not contain hollows of any size. Fifty one (51) trees contained apparent or obvious hollows, all of which were assessed as being unlikely to be suitable for black cockatoos to currently use for nesting purposes, due to the hollows apparent small size, unsuitable orientation and/or low height above ground level. Four trees (4) appear to contain at least one hollow considered potentially suitable for black

cockatoos to use for nesting purposes, but this was not confirmed in any instance and no actual signs of use were noted (Harewood 2021) (refer to **Figure 5**).

The following flora species are known to be or are potentially used as a direct food source (e.g. seeds, flowers, nectar, bark or grubs) by one or more species of black cockatoo were recorded within the subject site:

- Marri - *Corymbia calophylla*;
- Jarrah - *Eucalyptus marginata*;
- Flooded Gum - *Eucalyptus rudis*;
- Peppermint - *Agonis flexuosa*; and
- Planted non-endemic eucalypts (various unidentified species).

No evidence of black cockatoos foraging within the subject site was observed during the field survey (Harewood 2021). Furthermore, no evidence of black cockatoos roosting within trees located within the subject site was observed during the survey period (Harewood 2021).

The proposal will result in the clearing of approximately 1.64 ha. Some of this vegetation constitutes potential black cockatoo habitat (although no evidence of actual use of this habitat was recorded). Based on available mapping, there is approximately 13,000 ha of remnant native vegetation within 12 km of the subject site (DPIRD 2021). Much of this is likely to contain "potential" breeding and foraging habitat as defined by DAWE. Accordingly, the subject site only contains 0.01% of potential black cockatoo habitat within the local area, which based on survey results, is not preferential foraging or breeding habitat for the species. Accordingly, the subject site is unlikely to contain habitat critical to the survival of black cockatoos.

3.11 Aboriginal Heritage

All Aboriginal sites in Western Australia are provided protection under the *Aboriginal Heritage Act 1972* in which it is an offence for anyone to excavate, damage, destroy, conceal or in any way alter an Aboriginal site without the Minister's permission.

An online search for relevant Aboriginal heritage information was undertaken using the DPLH *Aboriginal Heritage Inquiry System* (AHIS) that incorporates both the heritage site register and the heritage survey database (DPLH 2021). The *Aboriginal Heritage Site Register* is maintained pursuant to Section 38 of the *Aboriginal Heritage Act 1972* and contains information on over 22,000 listed Aboriginal sites throughout Western Australia.

Results of the AHIS database search did not reveal the presence of any Aboriginal sites within the subject site however there are two mapped within 5 km. This includes the two nearby rivers, Preston River (ID 197995) and Ferguson River (ID 19796), which are both Mythological sites. The proposal will not result in any direct impacts to these sites.

4 POTENTIAL IMPACTS AND MANAGEMENT

4.1 Acid Sulfate Soils

4.1.1 Potential Impacts

Management of ASS is addressed by the DWER during the land use planning and development process. The objective of the DWER's ASS policy framework is to manage ASS appropriately to prevent the release of metals, nutrients and acidity into the soil and groundwater system that may adversely affect the natural and built environment and human health.

Based on the existing risk mapping there is a 'moderate to low' potential for ASS to occur within 3 m of natural soil surface, with a small portion to the southwest of the subject site (approximately 6,086 m^2) mapped as having a 'high to moderate risk'.

4.1.2 Management Measures

The principal management objective for ASS within the subject site is to ensure that any future development that may disturb ASS is appropriately managed to avoid impacts on the environment.

Accordingly, should the construction activities require dewatering or soil disturbance in excess of 100 m^3, a preliminary ASS investigation is recommended to confirm the presence and determine the extent of any ASS within the subject site. The requirement for ASS investigation/management will be confirmed in accordance with any subdivision conditions and/or as part of future development once detailed design has progressed.

4.2 Site Contamination

4.2.1 Potential Impacts

Historic agricultural land uses, primarily low-intensity activities such as livestock grazing, are considered unlikely to raise any significant contamination risk concerns for the subject site.

4.2.2 Management Measures

If any suspected contaminated material is encountered during project implementation, works should cease in the area and the site Project Manager be contacted for advice.

Domestic and site generated waste should not be disposed by burning. All waste associated with the project shall be disposed of at an authorized waste site, or as agreed with the Shire of Dardanup.

4.3 Wetlands

4.3.1 Potential Impacts

Three MU wetlands (UFI 14,329, 15,221 and 1,757) are located throughout the subject site (refer to **Figure 4**). MU wetlands are assessed as possessing few remaining ecological attributes and functions. While such wetlands can still contribute to regional or landscape ecosystem management, including hydrological function, they are considered to have low intrinsic ecological value. Typically, they have minimal or no native vegetation remaining (less than 10%). Accordingly, there is no legislative requirement to protect or retain them and as such MU wetlands do not usually preclude development.

4.3.2 Management Measures

The management objective for MU wetlands is to preserve the hydrological functions in the context of the proposed development (EPA 2008). The proposed subdivision will be strategically designed to maintain existing hydrological functions, thereby complying with the management objectives associated with MU wetlands.

In consideration of the above measures, there are not anticipated to be any direct impacts to wetlands of conservation significance as a result of the proposed development.

4.4 Hydrology

4.4.1 Potential Impacts

The development has the potential to impact upon the pre-development hydrological cycle and water quality, including:

- Groundwater recharge and aquifer levels; and
- Surface water characteristics.

In addition, subdivision design is also required to consider separation to groundwater to avoid flood damage in developed areas and to prevent erosion of waterways, slopes and banks.

4.4.2 Management Measures

A Local Water Management Strategy (LWMS) will be prepared for the subject site whereby the subdivision plan will be designed to accommodate flood mitigation, flow management and treatment of surface water by providing appropriately sized road and drainage reserves to convey and store stormwater.

The LWMS will provide a framework for the future delivery of a best practice approach to integrated water cycle management utilising water sensitive urban design (WSUD) principles and provides for the management of groundwater and surface water within the subject site. The LWMS will be a key document guiding future development and can be referred to for further detail, particularly with regard to determined water management criteria and water quality management objectives.

4.5 Wastewater Management

4.5.1 Potential Impacts

It is understood that no existing reticulated sewerage network is located in close proximity to the subject site. Accordingly, it is anticipated that reticulated sewer will not be available for the subject site in the near future and onsite wastewater management will be required.

The *Government Sewerage Policy* (DPLH 2019) provides a best practice approach to the provision of onsite sewage treatment and disposal and should be undertaken in accordance with *Australian/New Zealand Standard 1547 On-site domestic wastewater management.*

The subject site is located within a sewage sensitive area (specifically within the estuary catchments on the Swan and Scott Coastal Plains) (DPLH 2019). Therefore, all lots will be required to install a secondary treatment system (i.e. an ATU) for the management of waste from buildings/site offices consistent with the *Government Sewerage Policy* (DPLH 2019) to ensure discharge is of sufficient quality to protect downstream environments.

The principle management objective for wastewater is to enable the onsite treatment and disposal of both domestic and industrial wastewater without endangering public health or the environment.

4.5.2 Management Measures

A Site and Soil Evaluation (SSE) has been undertaken for the subject site in accordance with the *Government Sewerage Policy* (DPLH 2019) by WML Consultants (2021). Based on site specific results, the SSE provides recommendations relating to the required treatment systems and disposal area requirements.

4.6 Flora and Vegetation

4.6.1 Potential Impacts

The subject site's historical use for agriculture and grazing has resulted in vegetation in a 'Completely Degraded' condition, with no native understorey. Vegetation clearing will be restricted to the road reserves and building envelopes, with a total area of 1.64 ha. As discussed within **Section 3.9**, no flora or vegetation of conservation significance is likely to occur within the subject site.

Consequently, it is anticipated that the proposed development would have minimal impact on native vegetation at a regional or local scale.

4.6.2 Management Measures

Vegetation located along the watercourse will be retained within a drainage reserve (refer to **Figure 2**). The remnant vegetation proposed to be retained will be protected and enhanced as part of future development, to improve the biodiversity values of the area (which is largely trees over paddock grasses) and improve ecological linkages across the landscape.

In order to minimise the potential impacts associated with vegetation clearing, the following management measures are proposed:

- Clearing operations should be conducted in accordance with the dieback/weed hygiene requirements.
- Clearing should be kept to the minimum as far as reasonably practicable and in consideration of bushfire requirements.
- The limits of clearing should be clearly marked on site and relevant plans to inform site personnel to contain all activities in the clearing envelope.
- Trees to be removed should be felled in a manner that ensures they fall within the approved clearing envelope.
- The remainder of cleared vegetation should be salvaged, chipped on site for in situ site rehabilitation and/or soil stabilisation (note: consider the dieback and weed status of the material and its location of dispersal).
- Existing cleared areas should be utilised for locating site access, site offices and any temporary laydown areas (but not adjacent to waterways or drainage lines).
- No burning of cleared vegetation should be permitted on site.

4.7 Fauna

4.7.1 Potential Impacts

While potential habitat for conservation significant fauna species (WRPs and black cockatoos) has been identified within the subject site, it is considered to have low biodiversity value from a fauna perspective due to the 'Completely Degraded' nature of the vegetation (i.e. trees over paddock grasses). This is supported by the absence of any foraging or breeding evidence for black cockatoos; and only the presence of a few, old scats for WRPs.

Accordingly, the proposed development is unlikely to result in any significant impacts to fauna species of conservation significance.

4.7.2 Management Measures

The management objective for fauna within the subject site will be principally focused around maximising retention of existing vegetation values within the proposed lots and drainage reserve, and ensuring development works are undertaken in a manner that minimises harm to native fauna.

Particularly, the four trees identified to contain at least one hollow considered potentially suitable for black cockatoos to use for nesting purposes will be retained within the drainage reserve and within a proposed lot (outside of the building envelope) (refer to **Figure 5**). In addition, vegetation identified in the location of the WRP scats will be retained within the drainage reserve.

Further to revegetation within portions of the drainage reserve, strategic re-planting using endemic species (e.g. *Agonis flexuosa*) will be undertaken throughout the proposed subdivision.

Some areas of remnant vegetation will be modified or removed as part of the proposed development and fauna may be disturbed during this process. Management measures to minimise the impact to fauna and habitat will include:

- Provide a map and GPS co-ordinates of trees to be retained to the contractor to ensure no unapproved clearing is undertaken;
- Clearly mark trees identified for retention with flagging tape and numbered tags;
- Undertaking preclearing inspections of trees/vegetation proposed for removal/modification by suitably qualified and licensed fauna spotter;
- Use a suitably qualified and licensed fauna spotter during demolition and clearing works to avoid impacts to fauna wherever possible and to rescue trans-locatable fauna that are disturbed during clearing works to assist them to disperse safely or capture them for later translocation as appropriate;
- Contact the DBCA Wildcare Helpline 24 hour emergency hotline if sick or injured animals are encountered.

5 CONCLUSION

The key environmental issues and management measures associated with the proposed development are detailed within **Table i.** These include:

- ASS;
- Site contamination;
- Wetlands;
- Hydrology;
- Wastewater;
- Flora and vegetation; and
- Fauna.

The proposed development recognises the importance of the key environmental and landscape attributes of the subject site. Consequently, at this stage, none of the identified key environmental features present as being a constraint to the proposed development. This has been achieved with the avoidance and management measures summarised in **Table i** in the Executive Summary. The environmental outcomes of the proposed development include:

- Providing an improvement in groundwater and surface water quality through the proposed rural small holdings and implementation of water sensitive urban design and best stormwater drainage management practices;
- Retaining existing black cockatoo and WRP habitat within the drainage reserve and proposed lots; and
- Improving ecological linkages across the landscape through the revegetation of the drainage reserve and strategic re-planting of endemic species throughout the subdivision.

Overall, the known environmental attributes and values of the site can be accommodated through the subdivision plan design, or can be managed appropriately through the future development phases in line with the relevant state and local government legislation, policies and guidelines and best management practices.

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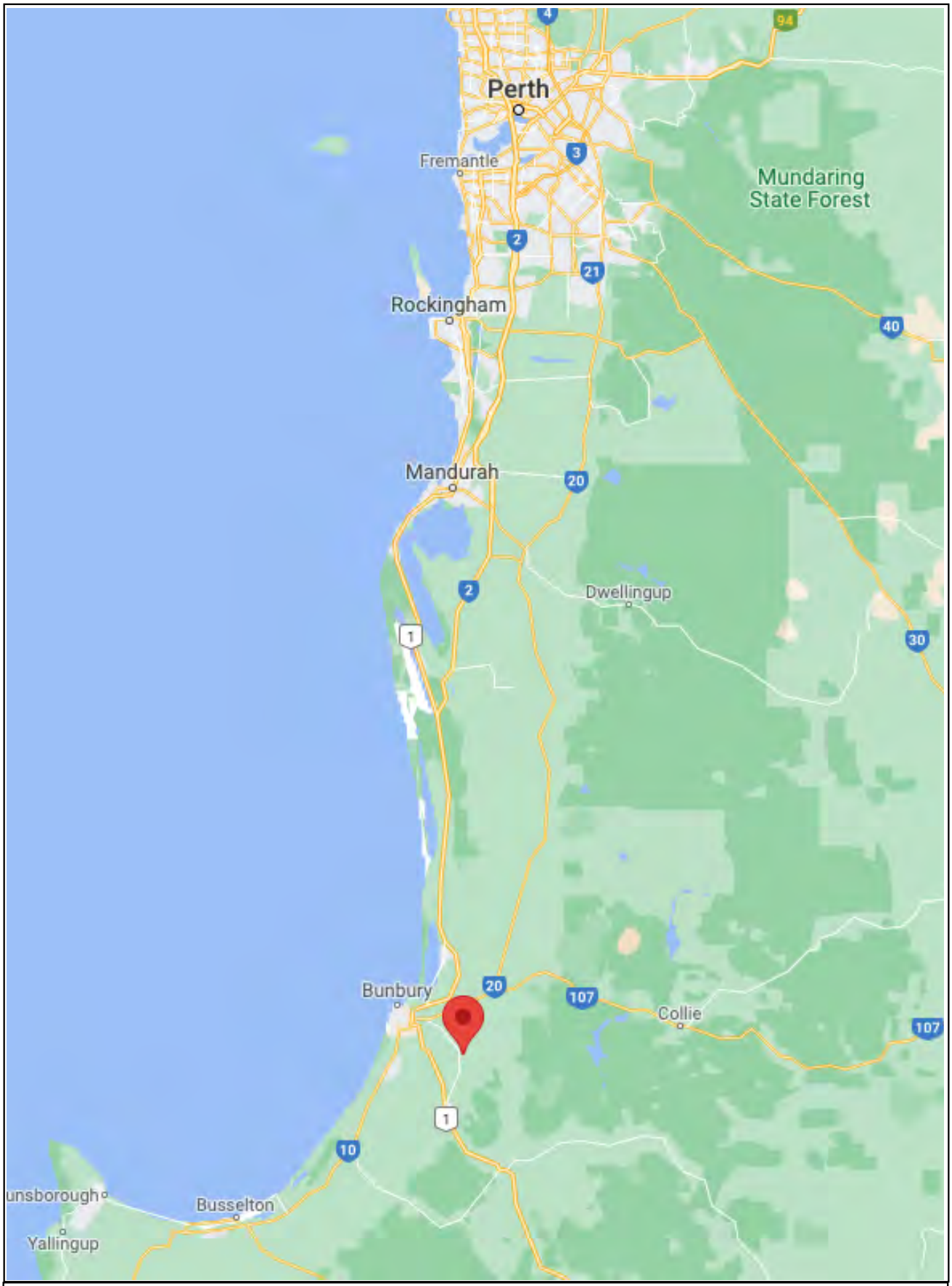
FIGURES



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		Drawn PN	Approved	
CLIENT	Dardanup Park Pty Ltd	Date	24/11/2021	
		Local Authority	Shire of Dardanup	
		Sheet 1 of 1		

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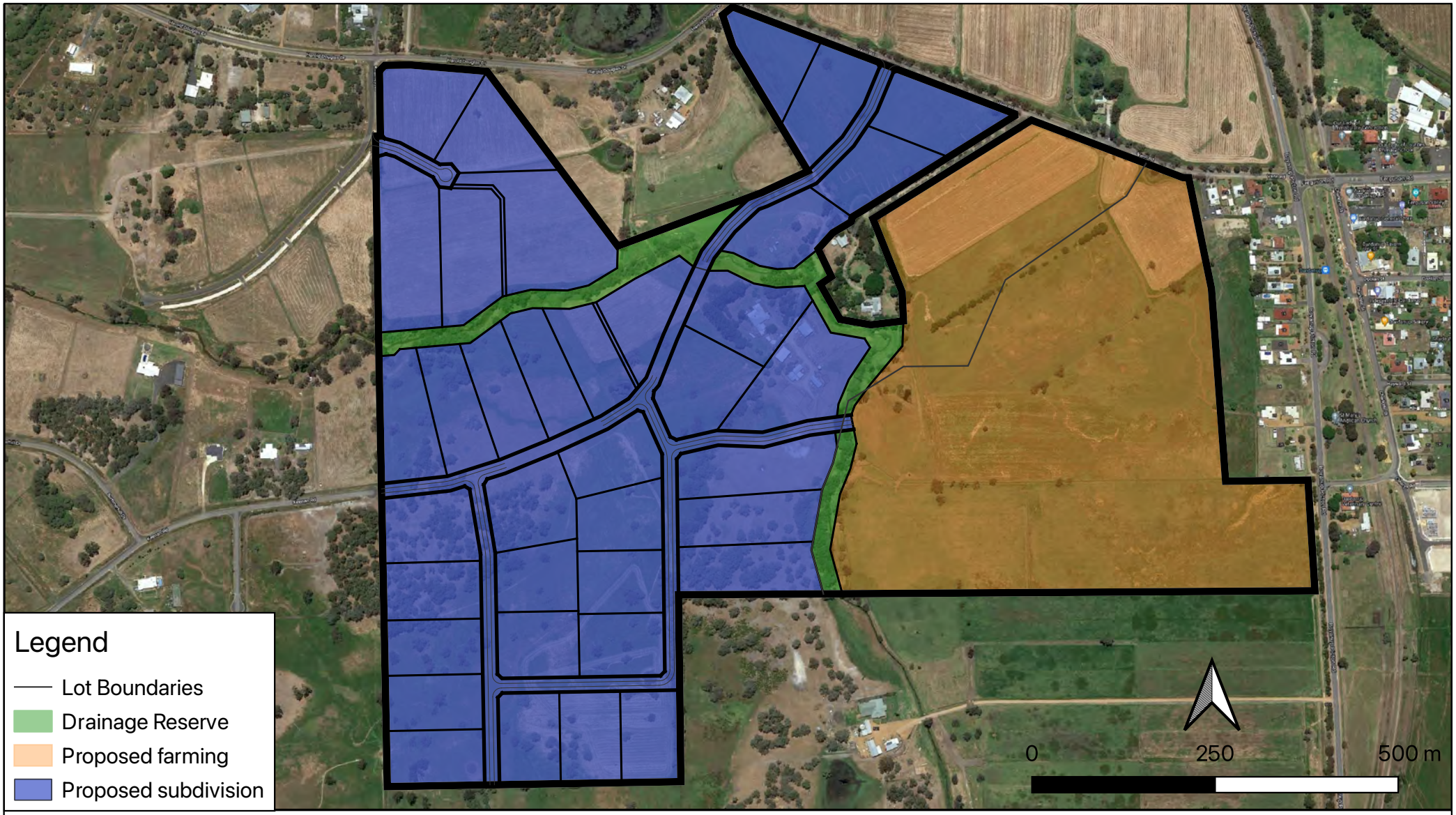

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CLIENT	Dardanup Park Pty Ltd

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Project Number	2138	Designed	HB
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Date	24/11/2021	Approved	
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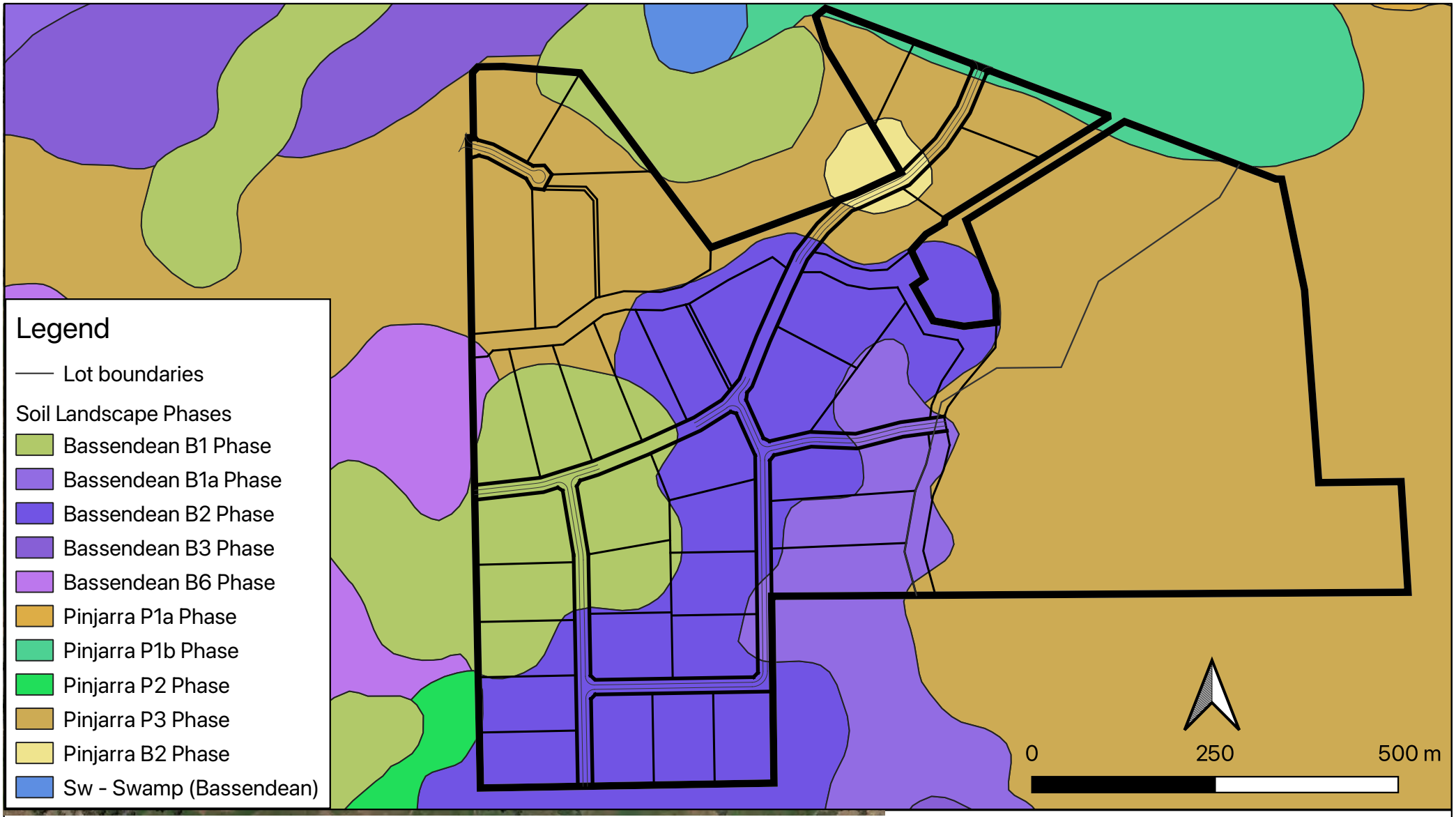

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CLIENT	Dardanup Park Pty Ltd

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Project Number	2138	Designed	HB
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Date	24/11/2021	Approved	
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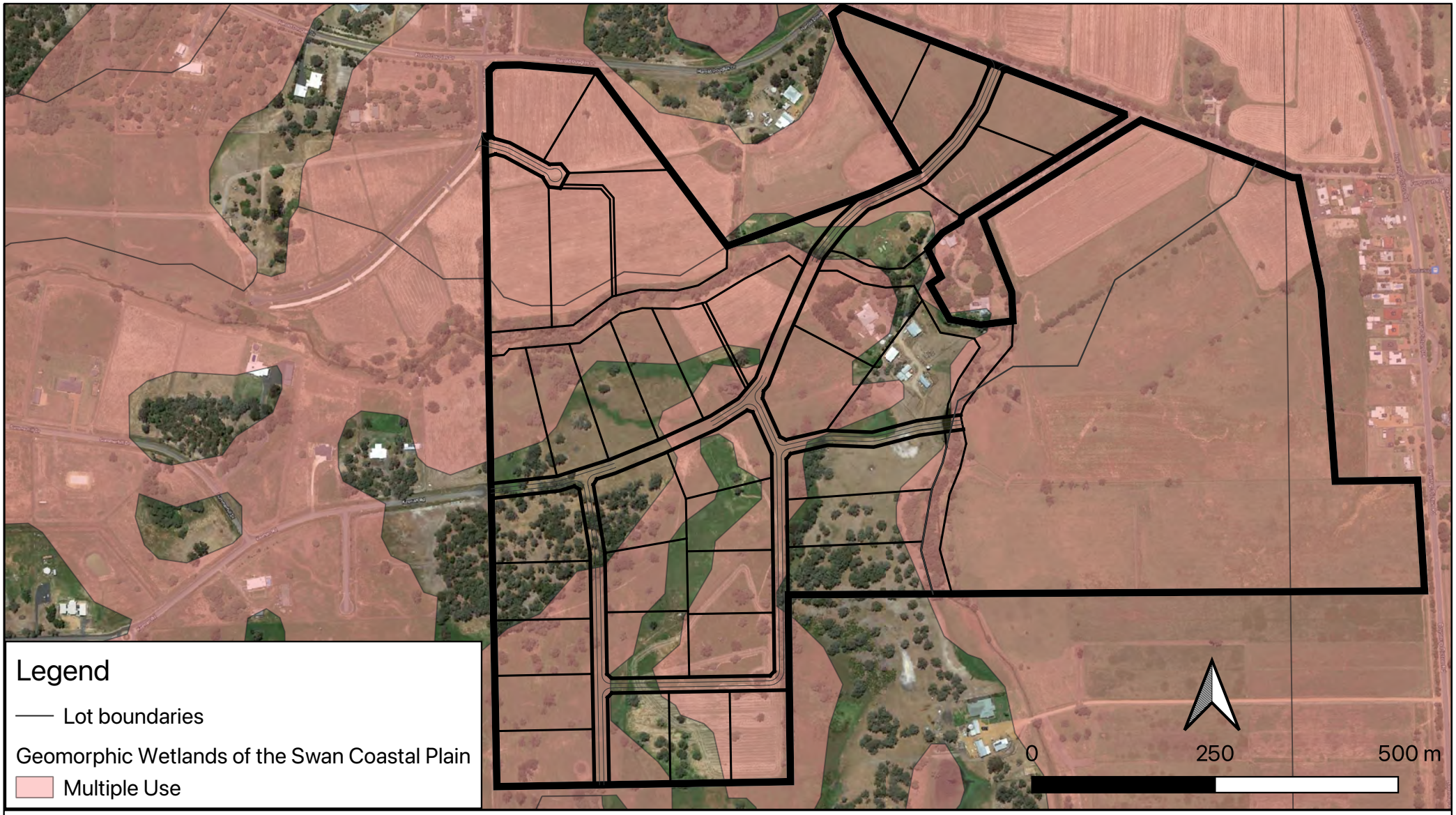

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DRAWING TITLE	Figure 4- Wetland Mapping
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Project Number	2138	Designed	HB
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Revision	A	Checked	
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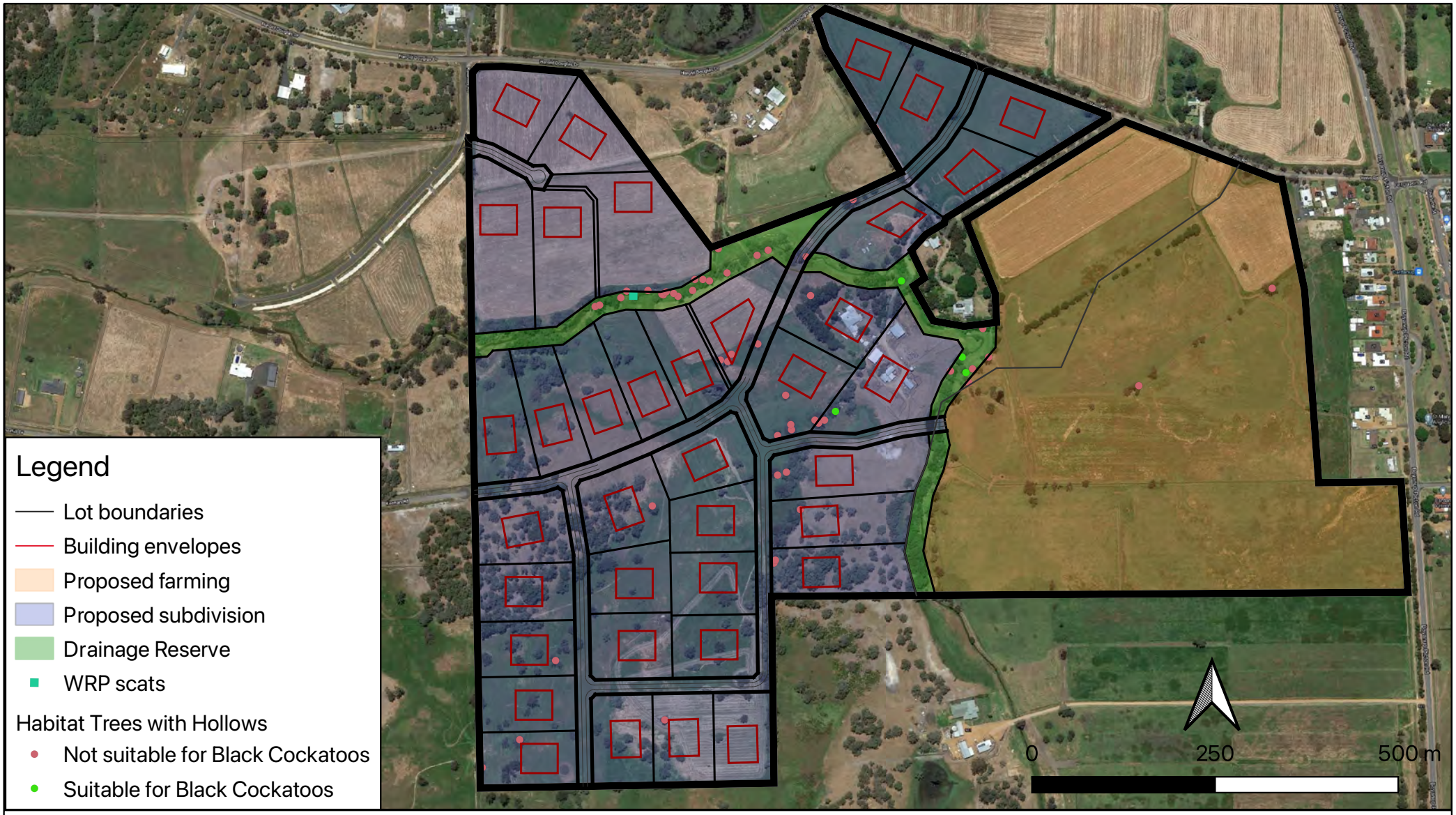

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DRAWING TITLE	Figure 5 - Fauna assessment and key habitat
CLIENT	Dardanup Park Pty Ltd

accendo AUSTRALIA
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Project Number	2138	Designed	HB
Drawing Number	Figure 7	Drawn	PN
Revision	A	Checked	
Date	24/11/2021	Approved	
Sheet 1 of 1		Local Authority	Shire of Dardanup

APPENDIX A – FAUNA SURVEY

Fauna Assessment

Lot 185 and Lot 2
Harold Douglas Drive

Dardanup

November 2021
V1

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SUMMARY

This report details the results of a fauna assessment over Lot 185 and Lot 2 Harold Douglas Drive, Dardanup (the survey area). The landowners are investigation the viability of subdividing the area into smaller lots and the removal/modification of small areas of vegetation potentially in use by native fauna is likely to be required.

Information obtained as part of this fauna assessment report will be used in conjunction with other environmental investigations to guide project planning which will aim to minimise potential environmental impacts.

The assessment has included a literature review, a series of daytime reconnaissance surveys and a nocturnal spotlighting survey. Field work at the site was carried out on various days and one night during October and November 2021. All survey work and reporting has been caried out by Greg Harewood (Zoologist).

Key Findings

The survey area has a total extent of about 82 ha and is largely comprised of open grassland. The remnant vegetation that is present is comprised of a mosaic of scattered trees, groves of trees, planted non-endemic eucalypts and small areas of planted revegetation and gardens (endemic and non-endemic species) around the existing house.

It is estimated that the extent of native vegetation (i.e. parkland cleared peppermint (*Agonis flexuosa*) low woodland and flooded gum (*Eucalyptus rudis*) woodland with scattered marri (*Corymbia calophylla*), jarrah (*Eucalyptus marginata*) and paperbark (*Melaleuca* spp.) makes up about 6.5 to 7.0 ha of the site with the other vegetation types covering less about 1.0 ha.

Most of remnant vegetation, which is mainly located in the western section of the survey area, consists of a low woodland/low open woodland of peppermint over grassland and weeds. This unit also contains a scattering of marri, jarrah and paperbark trees

A small perennial creek line (Gavin's Gully) runs across the survey area (and ultimately flows into the Preston River), is generally bordered by flooded gum (*Eucalyptus rudis*), with occasional marri, peppermint and paperbark also being present. The balance of the vegetation present consists of scattered paddock trees (mostly flooded gum with some marri, peppermint and paperbark). There also some planted non-endemic eucalyptus and some exotic tree species around the existing house and bordering some paddocks.

The fauna habitats present range from completely degraded (cleared pasture) to degraded, largely a consequence of historical clearing and livestock grazing over many years. Given the degree of disturbance the original fauna assemblage within the survey area is likely to be depauperate in many aspects, in particular with respect to ground dwelling species which rely on dense native understory (midstorey and ground cover) vegetation, which is almost absent or very sparse in most areas.

Despite the history of disturbance the areas of more coherent remnant vegetation are still likely to be utilised in some fashion be a reasonably wide range of species though most would be

relatively common and widespread bird species. Forty fauna species (mainly common bird species) were observed or secondary evidence of their presence recorded during the field survey.

A total of 204 potential black cockatoo breeding "habitat trees" were identified within the survey area. The vast majority of these trees (149) appeared to not contain hollows of any size. Fifty one (51) trees contained apparent or obvious hollows, all of which were assessed as being unlikely to be suitable for black cockatoos to currently use for nesting purposes, due to the hollows apparent small size, unsuitable orientation and/or low height above ground level. Four trees (4) appear to contain at least one hollow considered potentially suitable for black cockatoos to use for nesting purposes but this was not confirmed in any instance and no actual signs of use were noted.

Quality black cockatoo foraging habitat within the survey area can mainly be defined as the areas containing marri. It is not possible to define the area of this resource as the trees are generally scattered amongst other species such as peppermint and flooded gum, but the total area is likely to be relatively small. No evidence black cockatoos roosting within the survey area was noted.

The only evidence of western ringtail possums observed during the day and night surveys survey were a small number of old scats found under a tree along Gavin's Gully.

No evidence of any other fauna species of conservation significance identified during the literature review was observed. However, this does not eliminate the potential for some species to still occur, if only infrequently.

In summary one vertebrate fauna species of conservation significance were positively identified as utilising the survey area:

- Western Ringtail Possum – Critically Endangered (WA/Federal)

Several additional species of conservation significance may also utilise the survey area, though, as no evidence of their presence was identified during the field survey, their status in the area remains uncertain:

- Peregrine Falcon – Schedule 7 (WA);
- Masked Owl – Priority 3 (DBCA Priority Species);
- Forest Red-tailed Black Cockatoo – Vulnerable (WA/Federal);
- Baudin's Black Cockatoo – Endangered (WA/Federal);
- Carnaby's Black Cockatoo – Endangered (WA/Federal);
- South-western Brush-tailed Phascogale - Schedule 6 (WA).
- Western False Pipistrelle – Priority 4 (DBCA Priority Species).

While the actual nature of any proposed development has not been finalised the following conclusions have been drawn on likely impacts based on observations made. In cases where some habitat is present and available information indicates at least some probability of the species occurrence, likely impacts are anticipated to be low primarily due to likely low population densities and the relatively small total area of vegetation/habitat present.

No overall change in the conservation status of any fauna species currently utilising the survey area is therefore anticipated. While some small, localised residual loss of fauna habitat may occur for some species, regional impacts on the status of any one species are anticipated to be negligible/non-existent.

In this instance impacts are most likely to be related to the loss of habitat and the potential for some species to be killed or injured during clearing. Potential impacts on fauna should be reviewed as planning progresses.

1. INTRODUCTION

This report details the results of a fauna assessment over Lot 185 and Lot 2 Harold Douglas Drive, Dardanup (the survey area) (Figure 1). The survey area is approximately 82 hectares (ha) in size and contains a mosaic of cleared and partly cleared land (Figure 2). The survey area has up until recently been used for many years for the purpose of livestock grazing.

The landowners are investigation the viability of subdividing the area into smaller lots and the removal/modification of small areas of vegetation potentially in use by native fauna is likely to be required.

Information obtained as part of this fauna assessment report will be used in conjunction with other environmental investigations to guide project planning which will aim to minimise potential environmental impacts. The information presented may also be used by regulatory authorities to assess the potential impact of the proposal on fauna and fauna habitats at the site during the project evaluation and approval process if required.

2. SCOPE OF WORKS

The scope of works was to conduct a “basic” fauna assessment and carry out a targeted survey for black cockatoo habitat and western ringtail possums. The assessment has therefore involved:

1. A basic (Level 1) Fauna Assessment (EPA 2020);
2. Targeted searches for black cockatoo habitat/site use (habitat trees, existing and potential nest hollows, foraging and roosting habitat);
3. Targeted western ringtail possum (WRP) survey; and
4. Report for summarising methods and results.

Note: For the purposes of this proposal the term black cockatoo is in reference to Baudin’s black cockatoo *Calyptorhynchus baudinii*, Carnaby’s black cockatoo *Calyptorhynchus latirostris* and the forest red-tailed black cockatoo *Calyptorhynchus banksii naso.*

3. METHODS

3.1 LITERATURE REVIEW – FAUNA SPECIES OF CONSERVATION SIGNIFICANCE

A list of conservation significant fauna recorded or likely to occur within the survey area has been compiled by a review of available databases and literature including, but not limited to the following data sources:

- Department of Biodiversity, Conservation and Attractions (DBCA) Threatened Fauna Database (NatureMap) (DBCA 2021). A 20 km buffer around the survey area was applied to capture previous fauna records within the immediate vicinity;

- *EPBC Act* Protected Matters database for fauna of national environmental significance (DAWE 2021). The minimum buffer (1 km) was applied to this search as the databases contains distribution data (areas) and not actual fauna records; and

- Literature search and review of other fauna surveys in the vicinity.

The conservation status of each species has been based on current lists produced under Federal and State Acts (EPBC Act and the *Biodiversity Conservation Act 2016* (*BC Act*)), those species recognised under international treaties (CAMBA, JAMBA and the Bonn Convention) and Priority Fauna (as listed by the DBCA).

3.2 FIELD SURVEYS

The field component of the fauna assessment was carried out on 5, 6 and 7 October and the 15 November 2021 by Greg Harewood (Zoologist) and consisted of a series of daytime reconnaissance surveys and nocturnal spotlighting as described in the sections below.

3.2.1 FAUNA HABITAT ASSESSMENT

Vegetation units, landforms and soils observed during the site reconnaissance survey have been used to define broad fauna habitat types across the survey area.

The main objective of the assessment was to determine if it were likely that species of conservation significance would utilise the habitats identified as occurring within the survey area based on their documented habitat preference and current known distribution.

3.2.2 FAUNA OBSERVATIONS

Evidence of the presence or likely presence of fauna species of conservation significance (or suitable habitat) was searched for and recorded concurrent with other site surveys. Opportunistic observations of all fauna species were made during all field survey work and recorded where positive species identifications were made.

This aspect of the assessment included but was not limited to:

- Undertaking a series of transects across the survey area.

- Searching for evidence (i.e. individuals, tracks, scats, calls) of potential conservation significant species under logs, rocks and leaf litter.

- Observing bird species with binoculars.

3.2.3 BLACK COCKATOO HABITAT ASSESSMENT

The following methods were employed to comply with the defined scope of works and are based on Commonwealth of Australia (2012) guidelines which state that surveys for Carnaby's, Baudin's and forest red-tailed black cockatoo habitat should:

- be done by a suitably qualified person with experience in vegetation or cockatoo surveys, depending on the type of survey being undertaken;
- maximise the chance of detecting the species' habitat and/or signs of use;
- determine the context of the site within the broader landscape—for example, the amount and quality of habitat nearby and in the local region (for example, within 10 km);
- account for uncertainty and error (false presence and absences); and
- include collation of existing data on known locations of breeding and feeding birds and night roost locations.

The Commonwealth of Australia (2012) places habitats used by black cockatoos into the following three categories:

- Breeding Habitat;
- Foraging Habitat; and
- Night Roosting Habitat.

3.2.3.1 Breeding Habitat Assessment

The black cockatoo breeding habitat assessment identified all suitable breeding tree species within the survey area that have a diameter at breast height (DBH) equal to or greater than 50cm. The DBH of each tree was estimated using a pre-made "caliper".

Target tree species included marri, jarrah, tuart and flooded gum and any other *Corymbia/Eucalyptus* species of a suitable size that was present. Peppermints, *Banksia*, sheoak and *Melaleuca* tree species (for example) were not assessed as they typically do not develop hollows used by black cockatoos.

The location of each tree identified as being over the threshold DBH will be recorded with a GPS and details on tree species, number and size of hollows (if any) noted. Trees observed to contain hollows (of any size/type) will be marked with "H" using spray paint.

Hollow/potential hollows were placed into one of four categories, based on the size of the apparent hollow entrance, these being:

- Small = ~<5cm diameter (i.e. entrance too small for a black cockatoo);
- Medium = ~5cm-10cm diameter (i.e. entrance too small for a black cockatoo);

- Large = ~>10cm diameter (entrance large enough for a black cockatoo but hollow appears unsuitable for nesting i.e. wrong orientation, appears too small, too low or too shallow); or

- Large (cockatoo) = ~>10cm diameter (entrance and apparent hollow appears big enough and suitably sized/orientated for a black cockatoo to use for nesting).

Based on this assessment, trees present within the survey area were placed into one of four categories:

- Tree <50cm DBH or an unsuitable species (these were not assessed/recorded);

- Tree ≥50cm DBH, no hollows seen;

- Tree ≥50cm DBH, one or more hollows seen, none of which were considered suitable for black cockatoos to use for nesting; or

- Tree ≥50cm DBH, one or more hollows seen, with at least one considered suitable for black cockatoos to use for nesting.

For the purposes of this assessment, a tree containing a potential black cockatoo nest hollow was defined as:

Generally, any tree which is alive or dead that contains one or more visible hollows (cavities within the trunk or branches) or possible hollows suitable for occupation by black cockatoo for the purpose of nesting/breeding. Hollows that had an entrance greater than about 10cm in diameter and would allow the entry of a black cockatoo into a suitably orientated and sized branch/trunk, were recorded as a "potential nest hollow".

Identified hollows were examined using binoculars for evidence of actual use by black cockatoos (e.g. chewing around hollow entrance, scarring and scratch marks on trunks and branches). Details recorded included hollow size, height, type, orientation, comments on suitability and any evidence of use

Trees with possible nest hollows were also scratched and raked with a large stick in attempt to flush any sitting birds from hollows and calls of chicks were listened for. Where the assessment was inconclusive, and if possible, trees identified as having potential nest hollows were subsequently examined and photographed using a drone (DJI Mavic Air).

A review of available literature was carried out to determine the location/extent of any known/likely black cockatoo breeding habitat areas in the vicinity of the survey area.

3.2.3.2 Foraging Habitat Assessment

The location and nature of black cockatoo foraging evidence (e.g. chewed fruits around base of trees) observed during the field survey was recorded. The nature and extent of potential foraging habitat present was also documented irrespective of the presence of any actual foraging evidence. Foraging habitat is represented by plant species that are known to provide a food source for black cockatoos. This can be in the form of seeds, flowers and also boring grubs that are extracted from some plant species.

A review of available literature was carried out to determine the location/extent of any known/likely black cockatoo foraging habitat areas in the vicinity.

3.2.3.3 Night Roosting Habitat Assessment

Direct and indirect evidence of black cockatoos roosting within trees on site was noted where observed (e.g. branch clippings, droppings or moulted feathers).

A review of available literature was carried out to determine the location/extent of any known/likely black cockatoo roosting habitat areas in the vicinity.

3.2.4 WESTERN RINGTAIL POSSUM ASSESSMENT

3.2.4.1 Daytime Survey

A day time survey to locate and record dreys, obvious tree hollows, scats and individual WRPs was carried out during the day time field reconnaissance surveys and involved a series of traverses on foot across the survey area.

3.2.4.2 Night Time Survey

A single night time survey to locate and record individual WRPs was carried out. This involved a series of transect across the survey area, on foot using a LED head torch.

3.2.4.3 Habitat Assessment

Description and comments on the amount and quality of WRP habitat within the survey area are provided based on observations made during the site surveys.

4. SURVEY LIMITATIONS

No seasonal sampling was carried out as part of this fauna assessment. The conclusions presented are based upon field data and the environmental monitoring and/or testing carried out over a limited period of time and are therefore merely indicative of the environmental condition of the site at the time of the field assessments. It should be recognised that site conditions can change with time.

Lack of observational data on some species should also not necessarily be taken as an indication that a species is absent from the site or does not utilise it for some purpose at times.

During the survey, habitat trees with hollows were searched for. It should be noted that identifying hollows suitable for fauna species from ground level has limitations. Generally, the full characteristics of any hollow seen are not fully evident (e.g. internal dimensions). It is also difficult to locate all hollows within all trees as some are not observable from ground level.

The location of observations was recorded using a handheld GPS. The accuracy of the GPS cannot be guaranteed above a level of about 5 to 10 metres, though it should be

noted that in some circumstance the accuracy can increase or decrease beyond this range.

5. RESULTS

5.1 LITERATURE REVIEW – FAUNA SPECIES OF CONSERVATION SIGNIFICANCE

The literature review identified multiple fauna species of conservation significance as potentially occurring in the general area as listed in Table 1. The NatureMap (DBCA 2021) and Protected Matter Search Tool (DAWE 2021) results, used as a primary source for compiling this listing, are held within Appendix B. Because of the proximity of the survey area to the ocean a number of conservation significant marine species have appeared in database searches (Appendix B). These species have been excluded from the assessment as they would not under normal circumstances occur within the survey area.

Table 1: Conservation significant fauna previously recorded or potentially occurring within the general vicinity of survey area.

Species	Conservation Status[1]	
	BC Act/ DBCA Priority	*EPBC Act*
Carter's Freshwater Mussel *Westralunio carteri*	S3	VU
Western Pygmy Trapdoor Spider *Bertmainius opimus*	P3	-
Swan Coastal Plain Shield-backed Trapdoor Spider *Idiosoma sigillatum*	P3	-
Vasse Pachysaga (Busselton-Donnybrook), cricket *Pachysaga strobila*	P1	-
Pouched Lamprey *Geotria australis*	P3	-
Coastal Plains Skink *Ctenotus ora*	P3	-
Australasian Bittern *Botaurus poiciloptilus*	S2	EN
Migratory Shorebirds/Wetland Species	Various	Various
Eastern Osprey *Pandion cristatus*	S5	Mig, Ma
Peregrine Falcon *Falco peregrinus*	S7	-
Grey Falcon *Falco hypoleucos*	S3	VU
Masked Owl *Tyto novaehollandiae novaehollandiae*	P3	-
Blue-billed Duck *Oxyura australis*	P4	-

[1] See Appendix A for conservation status codes

Species	Conservation Status[1]	
	BC Act/ DBCA Priority	*EPBC Act*
Hooded Plover *Thinornis rubricollis*	P4	-
Carnaby`s Black Cockatoo *Zanda latirostris*	S2	EN
Baudin`s Black Cockatoo *Zanda baudinii*	S2	EN
Forest Red-tailed Black Cockatoo *Calyptorhynchus banksii naso*	S3	VU
Fork-tailed Swift *Apus pacificus*	S5	Mig
Grey Wagtail *Motacilla cinerea*	S5	Mig
Western Whipbird (western heath) *Psophodes nigrogularis nigrogularis*	S2	EN
Chuditch *Dasyurus geoffroii*	S3	VU
Quenda *Isoodon fusciventer*	P4	-
South-western Brush-tailed Phascogale *Phascogale tapoatafa wambenger*	S6	-
Numbat *Myrmecobius fasciatus*	EN	EN
Western Ringtail Possum *Pseudocheirus occidentalis*	S1	CR
Quokka *Setonix brachyurus*	S3	VU
Woylie *Bettongia penicillata*. *ogilbyi*	S1	EN
Western Brush Wallaby *Notamacropus irma*	P4	-
Water Rat *Hydromys chrysogaster*	P4	-
Western False Pipistrelle *Falsistrellus mackenziei*	P4	-

5.2 FIELD SURVEYS

5.2.1 FAUNA HABITAT ASSESSMENT

The survey area has a total extent of about 82 ha and is largely comprised of open grassland. The remnant vegetation that is present is comprised of a mosaic of scattered trees, groves of trees, planted non-endemic eucalypts and small areas of planted revegetation and gardens (endemic and non-endemic species) around the existing house.

It is estimated that the extent of native vegetation (i.e. parkland cleared peppermint (*Agonis flexuosa*) low woodland and flooded gum (*Eucalyptus rudis*) woodland with scattered marri (*Corymbia calophylla*), jarrah (*Eucalyptus marginata*) and paperbark (*Melaleuca* spp.) makes up about 6.5 to 7.0 ha of the site with the other vegetation types covering less about 1.0 ha. To put this area of vegetation into perspective there is

approximately 13,000 ha of remnant native vegetation within 12 km of the survey area (DPIRD 2021).

Most of remnant vegetation, which is mainly located in the western section of the survey area, consists of a low woodland/low open woodland of peppermint over grassland and weeds. This unit also contains a scattering of marri, jarrah and paperbark trees

A small perennial creek line (Gavin's Gully) runs across the survey area (and ultimately flows into the Preston River), is generally bordered by flooded gum (*Eucalyptus rudis*), with occasional marri, peppermint and paperbark also being present. The balance of the vegetation present consists of scattered paddock trees (mostly flooded gum with some marri, peppermint and paperbark). There also some planted non-endemic eucalyptus and some exotic tree species around the existing house and bordering some paddocks.

Example images of the various fauna habitats present are provided in Table 2.

Table 2: Example images of the fauna habitats within the survey area

Fauna Habitat Description	Example Image
Cleared grassland with scattered trees (flooded gum, marri, peppermint and paperbark).	
Low woodland/low open woodland of peppermint over grassland.	

Fauna Habitat Description	Example Image
Planted non-endemic eucalyptus.	
Small seasonal wetland with paperbark.	
Small perennial creek line (Gavin's Gully) bordered by scattered flooded gum, with occasional marri, peppermint and paperbark.	

Fauna Habitat Description	Example Image
Manmade dam.	

The fauna habitats present range from completely degraded (cleared pasture) to degraded, largely a consequence of historical clearing and ongoing livestock grazing. Given the degree of disturbance the original fauna assemblage within the survey area is likely to be depauperate in many aspects, in particular with respect to ground dwelling species which rely on dense native understory (midstorey and ground cover) vegetation, which is entirely absent.

Despite the history of disturbance, the areas of more coherent remnant vegetation are still likely to be utilised in some fashion be a reasonably wide range of species though most would be relatively common and widespread bird species. Exceptions to this generalised statement include black cockatoos, which may utilise the area, though no current evidence of this was observed during the survey period (see section 5.2.3). Some of the habitat present also appears, at least superficially, to be suitable for western ringtail possums though the level of occupancy appears to be very low (see section 5.2.4).

5.2.2 FAUNA OBSERVATIONS

Forty fauna species (mainly common bird species) were observed or secondary evidence of their presence recorded during the field survey. A full listing of the species observed is held on Appendix C.

Evidence of the western ringtail possum was detected during the day survey in the form of a few old scats at one location (see Section 5.2.4).

No evidence of any other fauna species of conservation significance was observed. However, this does not eliminate the potential for some species to still occur, if only infrequently.

5.2.3 BLACK COCKATOO HABITAT ASSESSMENT

5.2.3.1 Breeding Habitat Assessment

Trees considered potentially suitable for black cockatoos to use as nesting habitat (subject to a suitable hollow being present and other factors) found within the survey area comprised the following species:

- Marri – *Corymbia calophylla;*
- Jarrah – *Eucalyptus marginata*;
- Flooded Gum - *Eucalyptus rudis*;
- Dead Unidentified - *Eucalyptus* spp.*;* and
- Non-endemic eucalypts (planted - various unidentified species) - *Eucalyptus* spp.

A summary of the habitat trees observed is provided in Table 3. The locations of habitat trees are shown in Figure 4.

Table 3: Summary of potential habitat trees (DBH ≥50cm) within the survey area

Total Number of Habitat Trees (DBH > 50cm)	Number of Habitat Trees with No Hollows Observed	Number of Habitat Trees with Possible Hollows considered Unsuitable for Black Cockatoos	Number of Habitat Trees with Possible Hollows considered Potentially suitable for Black Cockatoos	Tree Species				
				Marri	Flooded Gum	Jarrah	Dead Unidentified	Non-Endemic Eucalyptus
204	149	51	4	21	169	2	1	11

The assessment identified 204 trees within the survey area with a DBH of ≥50cm. The vast majority of these trees (149) appeared to not contain hollows of any size. Fifty one (51) trees contained apparent or obvious hollows, all of which were assessed as being unlikely to be suitable for black cockatoos to currently use for nesting purposes, due to the hollows apparent small size, unsuitable orientation and/or low height above ground level. Four trees (4) appear to contain at least one hollow considered potentially suitable for black cockatoos to use for nesting purposes but this was not confirmed in any instance and no actual signs of use were noted.

Additional details on each habitat tree observed can be found in Appendix D.

Based on available mapping, there is approximately 13,000 ha of remnant native vegetation within 12 km of the survey area (DPIRD 2021). Much of this is likely to contain

"potential" breeding habitat as defined by DAWE (i.e. suitable tree species with a DBH ≥50cm).

5.2.3.2 Foraging Habitat Assessment

The following flora species are known to be or are potentially used as a direct food source (e.g. seeds, flowers, nectar, bark or grubs) by one or more species of black cockatoo were recorded within the survey area:

- Marri – *Corymbia calophylla*;
- Jarrah – *Eucalyptus marginata*;
- Flooded Gum - *Eucalyptus rudis*;
- Peppermint – *Agonis flexuosa*; and
- Planted non-endemic eucalypts (various unidentified species).

It should be noted that some of the above-mentioned species (e.g. non-endemic eucalypts, flooded gum and peppermint) while foraged upon on occasions would make up only a small proportion of any one bird's diet relative to more favoured plant species such as marri. Some tree species are also only represented by a small number of specimens (e.g. jarrah) and therefore in this instance do not contribute to the overall foraging resource to a significant degree. Marri is the favoured dietary item of all three species of black cockatoo known to frequent the area however this trees species is represented by a relatively small number of specimens widely scattered over the survey area.

No evidence of black cockatoos foraging within the survey area was observed during the field survey.

Quality foraging habitat within the survey area can mainly be defined as the areas containing marri. It is not possible to define the area of this resource as the trees are generally scattered amongst other species such as peppermint and flooded gum, but the total area is likely to be relatively small.

Based on available mapping there is about 13,000 ha of remnant native vegetation within 12 km of the survey area (DPIRD 2021). Much of this is likely to represent black cockatoo foraging habitat of some type.

5.2.3.3 Night Roosting Habitat Assessment

No evidence of Black Cockatoos roosting within trees located within the survey area was observed during the survey period. It is difficult to determine if trees or groves of trees within the survey area represent potential roosting habitat as a range of factors, not all of which can be observed, determine suitability. Some of the larger trees (including non-endemics) may be suitable for roosting but as indicated no actual evidence of use was seen.

A review of the 2019 Great Cocky Count database shows no documented roost sites within the survey area. The 2019 Great Cocky Count recorded the closest active roost,

approximately 7.6 kilometres south west of the survey area (Site ID: CAPFERR001). This roost was being used by 34 forest red-tailed black cockatoos during the April 2019 survey (Peck *et al.* 2019). Another 13 documented roost sites (but not necessarily in current use) occur within 12 km of the survey area.

5.2.4 WESTERN RINGTAIL POSSUM ASSESSMENT

5.2.4.1 Daytime Survey

The only evidence of western ringtail possum observed during the day survey were a small number of old scats found under a tree along Gavin's Gully (Figure 4).

No dreys or WRP individuals were recorded.

Fifty five "habitat trees" (i.e. DBH >50cm) were recorded within the survey area as containing hollows of various sizes. Some of these trees (and some additional trees with smaller DBHs) may have hollows suitable for WRPs to use for daytime refuge.

5.2.4.2 Night Time Survey

No WRPs were observed within the survey area during the nocturnal survey. Ten common brushtail possum were recorded (Figure 4).

5.2.4.3 Habitat Assessment

Superficially most the more coherent remnant vegetation present within the survey area represents potential WRP habitat given the presence of favoured foraging species such as peppermint. The fact that the species appears to be absent (or at best present in very low numbers) does however suggest that the vegetation may have a generally low nutrient value.

Foliage nutrient levels are a major factor in explaining variation in abundance in WRPS and also a key factor influencing fecundity. Nitrogen and to a lesser extent phosphorus levels are the most important determinant of browse quality and habitat suitability for possums. (Jones *et al*, 1994a, Wayne e*t al*, 2005). It appears therefore that WRPs are largely avoiding the survey area, most likely because if the vegetation not having the required nutrient levels to maintain a viable breeding population. Any individuals that are recorded are likely to be transient individuals moving into the area from better quality habitat in adjoining areas.

6. CONSERVATION SIGNIFICANT FAUNA SPECIES

Based on the information gathered during the site reconnaissance survey and the documented distribution and habitat preferences of the species of conservation significance identified as potentially being present in the general area, their likelihood of occurrence has been assessed. A summary of this assessment is presented in Table 4.

Some comments on the possible impacts of any proposed development are also provided though as no development plan has been put forwards these are preliminary comments that should be reviewed as planning progresses.

One vertebrate fauna species of conservation significance (listed as State or Federal threatened/migratory species or as DBCA priority species) was positively identified as utilising the survey area for some purpose during the survey period:

- Western Ringtail Possum *Pseudocheirus occidentalis* – Critically Endangered (*BC Act*), Critically Endangered (*EPBC Act*)
  WRP scats were located in one location. No other evidence of the species was observed. It appears that while there is some superficially suitable habitat (i.e. peppermint woodland) it is not being utilised possibly because of low nutrient levels in the foliage.

Several additional species of conservation significance may utilise the survey area for some purpose at times, but their status on-site and/or in the general area is difficult to determine because they were not sighted during the field survey, or evidence of use was not observed:

- Forest Red-tailed Black Cockatoo *Calyptorhynchus banksii naso* – S3 (*BC Act*), Vulnerable (*EPBC Act*). No evidence of this species recorded. The survey area contains areas of potential black cockatoo breeding habitat (trees with a DBH ≥50cm) but the number of possibly suitable hollows is low (four recorded). The majority of the native vegetation within the survey area represents marginal foraging habitat for this species. No evidence of roosting observed. Listed as a potential species based on available information.

- Baudin's Black-Cockatoo *Zanda baudinii* – S2 (*BC Act*), Endangered (*EPBC Act*). No evidence of this species recorded. The survey area contains areas of potential black cockatoo breeding habitat (trees with a DBH >50cm) but the number of possibly suitable hollows is low (four recorded). The majority of the native vegetation within the survey area represents marginal foraging habitat for this species. No evidence of roosting observed. Listed as a potential species based on available information.

- Carnaby`s Black-Cockatoo *Zanda* latirostris – S2 (*BC Act*), Endangered (*EPBC Act*).
  No evidence of this species recorded. The survey area contains areas of potential black cockatoo breeding habitat (trees with a DBH >50cm) but the number of possibly suitable hollows is low (four recorded). The majority of the native vegetation within the survey area represents marginal foraging habitat for this species. No evidence of roosting observed. Listed as a potential species based on available information.

- Peregrine Falcon *Falco peregrinus* – S7 (*BC Act*)
  This species potentially utilises some sections of the survey area as part of a much larger home range though it is only likely to occur infrequently. All areas represent potential foraging habitat for this species. Listed as a potential species based on available information. Listed as a potential species based on available information.

- Masked Owl *Tyto novaehollandae* – P3 (DBCA Priority Species)
  Status in the general area is difficult to determine. May utilise woodland areas within and near the survey area for roosting and may forage in more open areas. Probably only present occasionally and for short periods. Limited number of hollow bearing trees some of which may represent suitable nest sites. Listed as a potential species based on available information.

- South-western Brush-tailed Phascogale *Phascogale tapoatafa wambenger* – S6 (*BC Act*)
  This species has previously been recorded in the Dardanup area using parkland cleared vegetation in paddock areas (Greg Harewood pers. obs.) and so it may occur in the survey area despite its degraded nature. Listed as a potential species based on available information.

- Western False Pipistrelle *Falsistrellus mackenziei* – P4 (DBCA Priority Species)
  Status of this species within the survey area is difficult to determine, however, given the location is within its documented range, some recent nearby records (Dardanup Conservation Reserve) and the presence of habitat that appears suitable it must be assumed to be present. All sections of the survey area represent potential foraging habitat for this species and any hollow bearing trees represent possible day time roost sites. Listed as a potential species based on available information.

A number of other species of conservation significance (as listed in Table 4), while possibly present in the larger bush remnants in the wider area (e.g. State forest /reserve areas to the east) are not listed as potentially occurring within the survey area primarily due to a complete lack of suitable habitat (quality and extent) and/or known local/regional extinction.

While the actual nature of any proposed development has not been finalised the following conclusions have been drawn on likely impacts based on observations made. In cases where some habitat is present and available information indicates at least some probability of the species occurrence, likely impacts are anticipated to be low primarily due to likely low population densities and the relatively small total area of vegetation/habitat present.

No overall change in the conservation status of any fauna species currently utilising the survey area is therefore anticipated. While some small, localised residual loss of fauna habitat may occur for some species, regional impacts on the status of any one species are anticipated to be negligible/non-existent.

In this instance impacts are most likely to be related to the loss of habitat and the potential for some species to be killed or injured during clearing. Potential impacts on fauna should be reviewed as planning progresses.

Table 4: Likelihood of Occurrence – Fauna Species of Conservation Significance

Species	Conservation Status		Habitat Preferences	Habitat Present	Likelihood of Occurrence	Comments/Possible Impacts
	BC Act/ DBCA Priority	*EPBC Act*				
Carter's Freshwater Mussel *Westralunio carteri*	S3	VU	Occurs in greatest abundance in slower flowing streams with stable sediments that are soft enough for burrowing amongst woody debris and exposed tree roots.	No/Marginal	Unlikely to Occur.	Historical record nearby from 1905 however habitat (small perennial creek line) too degraded. Not observed during survey period. No impact on this species anticipated.
Pouched Lamprey *Geotria australis*	P3	-	This species lives in mud burrows in the upper reaches of coastal streams for the first four years of life until migrating to the sea. Adults migrate up to 60km upstream during spawning.	No/Marginal	Unlikely to Occur.	Habitat (small perennial creek line) too degraded. No impact on this species anticipated.
Swan Coastal Plain Shield-backed Trapdoor Spider *Idiosoma sigillatum*	P3	-	Burrows of this species usually found in *Banksia* woodland and heathland on sandy soils.	No/Marginal	Unlikely to Occur.	Completely degraded state of habitat within the survey area suggests this species is unlikely to persist. No impact on this species anticipated.
Western Pygmy Trapdoor Spider *Bertmainius opimus*	P3	-	Poorly documented - Found in mesic habitats. The species makes shallow burrows in the bark of trees and in the mossy banks of creeks.	No/Marginal	Unlikely to Occur.	Completely degraded state of habitat within the survey area suggests this species is unlikely to persist. No impact on this species anticipated.
Coastal Plains Skink *Ctenotus ora*	P3	-	Sandy substrates with low vegetation (including heath) in open *Eucalyptus/Corymbia* woodland over *Banksia*.	No/Marginal	Unlikely to Occur.	Completely degraded state of habitat within the survey area suggests this species is unlikely to persist. No impact on this species anticipated.
Australasian Bittern *Botaurus poiciloptilus*	S1	EN	Freshwater wetlands, occasionally estuarine; prefers heavy vegetation such as beds of tall dense *Typha, Baumea* and sedges in freshwater swamps.	No	Would Not Occur.	No suitable habitat. No impact on this species will occur.
Migratory Shorebirds/Wetland Species/Marine Species (various reptiles, birds and mammals)	S5, Various	Ma, Mig, Various	Varies between species but includes open ocean, beaches and permanent/temporary wetlands varying from billabongs, swamps, lakes, floodplains, sewerage farms, saltwork ponds, estuaries, lagoons, mudflats sandbars, pastures, airfields, sports fields and lawns.	No/Very Marginal	Unlikely to Occur.	Habitat (seasonally wet paddock/Dams) very marginal quality that would only very occasionally be used (if at all) by a small number of species. No impact on this range of species will occur.
Hooded Plover *Thinornis rubricollis*	P4	-	Broad sandy ocean beaches and bays, coastal and inland salt lakes.	No	Would Not Occur.	No suitable habitat. No impact on this species will occur.
Eastern Osprey *Pandion haliaetus*	S5	Ma, Mig	Coasts, estuaries, bays, inlets, islands, and surrounding waters, coral atolls, reefs, lagoons, rock cliffs and stacks. Ascends larger rivers.	No	Would Not Occur.	No suitable habitat. No impact on this species will occur.

Species	Conservation Status		Habitat Preferences	Habitat Present	Likelihood of Occurrence	Comments/Possible Impacts
	BC Act/ DBCA Priority	*EPBC Act*				
Peregrine Falcon *Falco peregrinus*	S7	-	Diverse from rainforest to arid shrublands, from coastal heath to alpine Mainly about cliffs along coasts, rivers and ranges and about wooded watercourses and lakes.	Yes	Possibly Occurs.	This species is uncommon but the survey area may represent part of a larger home range used by individuals of this species. No suitable nest sites observed. No significant impact on this species anticipated.
Grey Falcon *Falco hypoleucos*	S3	VU	Lightly treed plains, gibber deserts, sand ridges, pastoral lands, timbered water courses but seldom in driest deserts	No	Would Not Occur.	Rarely if ever recorded in the lower south west. No impact on this species will occur.
Masked Owl (SW population) *Tyto n. novaehollandiae*	P3	-	Roosts and nests in heavy forest, hunts over open woodlands and farmlands.	Yes	Possibly Occurs.	This species is uncommon but may occur, if only occasionally. No significant impact on this species anticipated
Blue-billed Duck *Oxyura australis*	P4	-	Well vegetated freshwater swamps, large dams and lakes, winters on more open water. Occasionally salt lakes and estuaries freshened by floodwaters.	No/Very Marginal	Unlikely to Occur.	No suitable habitat. No significant impact on this species anticipated
Carnaby`s Black Cockatoo *Calyptorhynchus latirostris*	S2	EN	Forests, woodlands, heathlands, farms; feeds on *Banksia*, *Hakea* and Marri.	Yes	Possibly Occurs.	Loss/modification of very small areas of habitat. Negligible impact anticipated.
Baudin`s Black Cockatoo *Calyptorhynchus baudinii*	S2	VU	Mainly eucalypt forests where it feeds primarily on the marri seeds.	Yes	Possibly Occurs.	Loss/modification of very small areas of habitat. Negligible impact anticipated.
Forest Red-tailed Black Cockatoo *Calyptorhynchus banksii naso*	S3	VU	Eucalypt forests, feeds on marri, jarrah, blackbutt, karri, sheoak and snottygobble.	Yes	Possibly Occurs.	Loss/modification of very small areas of habitat. Negligible impact anticipated.
Fork-tailed Swift *Apus pacificus*	S5	Ma, Mig	Low to very high airspace over varied habitat from rainforest to semi desert.	Yes	Unlikely to Occur, Flyover only on very rare occasions.	May occur very occasionally for brief periods. Entirely aerial. No impact on this species will occur.
Grey Wagtail *Motacilla cinerea*	S5	Mig, Ma	In Australia, near running water in disused quarries, sandy, rocky streams in escarpments and rainforest, sewerage ponds, ploughed fields and airfields.	No	Would Not Occur.	No suitable habitat. No impact on this species will occur.
Western Whipbird *Psophodes nigrogularis nigrogularis*	S2	EN	Dense shrubland with an open overstorey.	No	Would Not Occur.	Locally extinct. No impact on this species will occur.

Species	Conservation Status		Habitat Preferences	Habitat Present	Likelihood of Occurrence	Comments/Possible Impacts
	BC Act/ DBCA Priority	*EPBC Act*				
Chuditch *Dasyurus geoffroii*	S3	VU	Forest, mallee shrublands, woodland and desert. The densest populations have been found in riparian jarrah forest.	No	Would Not Occur.	Fragmented and degraded state of habitat within and around the survey area suggests this species is unlikely to persist. No impact on this species will occur.
Quenda *Isoodon fusciventer*	P4	-	Dense scrubby, often swampy, vegetation with dense cover.	No	Would Not Occur.	General lack of dense ground cover and the degraded state of habitat within the survey area suggests this species is unlikely to persist. No impact on this species will occur.
South-west Brush-tailed Phascogale *Phascogale tapoatafa wambenger*	S6	-	Dry sclerophyll forests and open woodlands that contain hollow-bearing trees but a sparse ground cover.	Yes	Possibly Occurs.	Loss/modification of very small areas of degraded habitat. Negligible impact on species status anticipated.
Numbat *Myrmecobius fasciatus*	S3	VU	Generally found in habitats dominated by eucalypts that provide hollow logs and branches for shelter and termites for food.	No	Would Not Occur.	Locally extinct. No impact on this species will occur.
Western Ringtail Possum *Pseudocheirus occidentalis*	S1	CE	Coastal peppermint, coastal peppermint-tuart, jarrah-marri associations, sheoak woodland, and eucalypt woodland and mallee.	Yes/Marginal	Possibly Occurs.	Loss/modification of very small areas of degraded habitat. Negligible impact on species status anticipated.
Quokka *Setonix brachyurus*	S3	VU	Currently restricted to densely vegetated coastal heaths, swamps, riverine habitats including tea-tree thickets on sandy soils along creek systems.	No	Would Not Occur.	This species is locally extinct. No impact on this species will occur.
Woylie *Bettongia penicillata ogibyi*	S1	EN	Open sclerophyll forest and woodland with a low, dense, understorey of tussock grasses or woody scrub.	No	Would Not Occur.	This species is locally extinct. No impact on this species will occur.
Western Brush Wallaby *Macropus irma*	P4	-	Open forest or woodland, particularly favouring open, seasonally wet flats with low grasses and open scrubby thickets.	No	Would Not Occur.	Fragmented and degraded state of habitat within and around the survey area suggests this species is unlikely to persist. No impact on this species will occur.
Western False Pipistrelle *Falsistrellus mackenziei*	P4	-	Wet sclerophyll forest dominated by karri and in high rainfall zones of the jarrah and marri forest.	Yes	Possibly Occurs.	Loss/modification of very small areas of degraded habitat. Negligible impact on species status anticipated.
Water Rat *Hydromys chrysogaster*	P4	-	Permanent water, fresh, brackish or marine.	No/Marginal	Unlikely to Occur.	Habitat (small perennial creek line) too degraded. No impact on this species anticipated.

See Appendix A for conservation status codes

7. CONCLUSION

The fauna assessment within the survey area was primarily undertaken to document black cockatoo habitat and to determine the possible presence of western ringtail possums and other conservation significant fauna species and/or their habitat.

The fauna habitats present range from completely degraded (cleared pasture) to degraded, largely a consequence of historical clearing and livestock grazing over many years. Given the degree of disturbance the original fauna assemblage within the survey area is likely to be depauperate in many aspects, in particular with respect to ground dwelling species which rely on dense native understory (midstorey and ground cover) vegetation, which is almost absent or very sparse in most areas.

Despite the history of disturbance the areas of more coherent remnant vegetation are still likely to be utilised in some fashion be a reasonably wide range of species though most would be relatively common and widespread bird species. Forty fauna species (mainly common bird species) were observed or secondary evidence of their presence recorded during the field survey.

A total of 204 potential black cockatoo breeding “habitat trees” were identified within the survey area. The vast majority of these trees (149) appeared to not contain hollows of any size. Fifty one (51) trees contained apparent or obvious hollows, all of which were assessed as being unlikely to be suitable for black cockatoos to currently use for nesting purposes, due to the hollows apparent small size, unsuitable orientation and/or low height above ground level. Four trees (4) appear to contain at least one hollow considered potentially suitable for black cockatoos to use for nesting purposes but this was not confirmed in any instance and no actual signs of use were noted.

Quality black cockatoo foraging habitat within the survey area can mainly be defined as the areas containing marri. It is not possible to define the area of this resource as the trees are generally scattered amongst other species such as peppermint and flooded gum, but the total area is likely to be relatively small. No evidence black cockatoos roosting within the survey area was noted.

The only evidence of western ringtail possums observed during the day and night surveys survey were a small number of old scats found under a tree along Gavin’s Gully.

No evidence of any other fauna species of conservation significance identified during the literature review was observed. However, this does not eliminate the potential for some species to still occur, if only infrequently.

In summary one vertebrate fauna species of conservation significance were positively identified as utilising the survey area:

- Western Ringtail Possum – Critically Endangered (WA/Federal)

Several additional species of conservation significance may also utilise the survey area, though, as no evidence of their presence was identified during the field survey, their status in the area remains uncertain:

- Peregrine Falcon – Schedule 7 (WA);
- Masked Owl – Priority 3 (DBCA Priority Species);
- Forest Red-tailed Black Cockatoo – Vulnerable (WA/Federal);
- Baudin's Black Cockatoo – Endangered (WA/Federal);
- Carnaby's Black Cockatoo – Endangered (WA/Federal);
- South-western Brush-tailed Phascogale - Schedule 6 (WA).
- Western False Pipistrelle – Priority 4 (DBCA Priority Species).

While the actual nature of any proposed development has not been finalised the following conclusions have been drawn on likely impacts based on observations made. In cases where some habitat is present and available information indicates at least some probability of the species occurrence, likely impacts are anticipated to be low primarily due to likely low population densities and the relatively small total area of vegetation/habitat present.

No overall change in the conservation status of any fauna species currently utilising the survey area is therefore anticipated. While some small, localised residual loss of fauna habitat may occur for some species, regional impacts on the status of any one species are anticipated to be negligible/non-existent.

In this instance impacts are most likely to be related to the loss of habitat and the potential for some species to be killed or injured during clearing. Potential impacts on fauna should be reviewed as planning progresses.

8. REFERENCES

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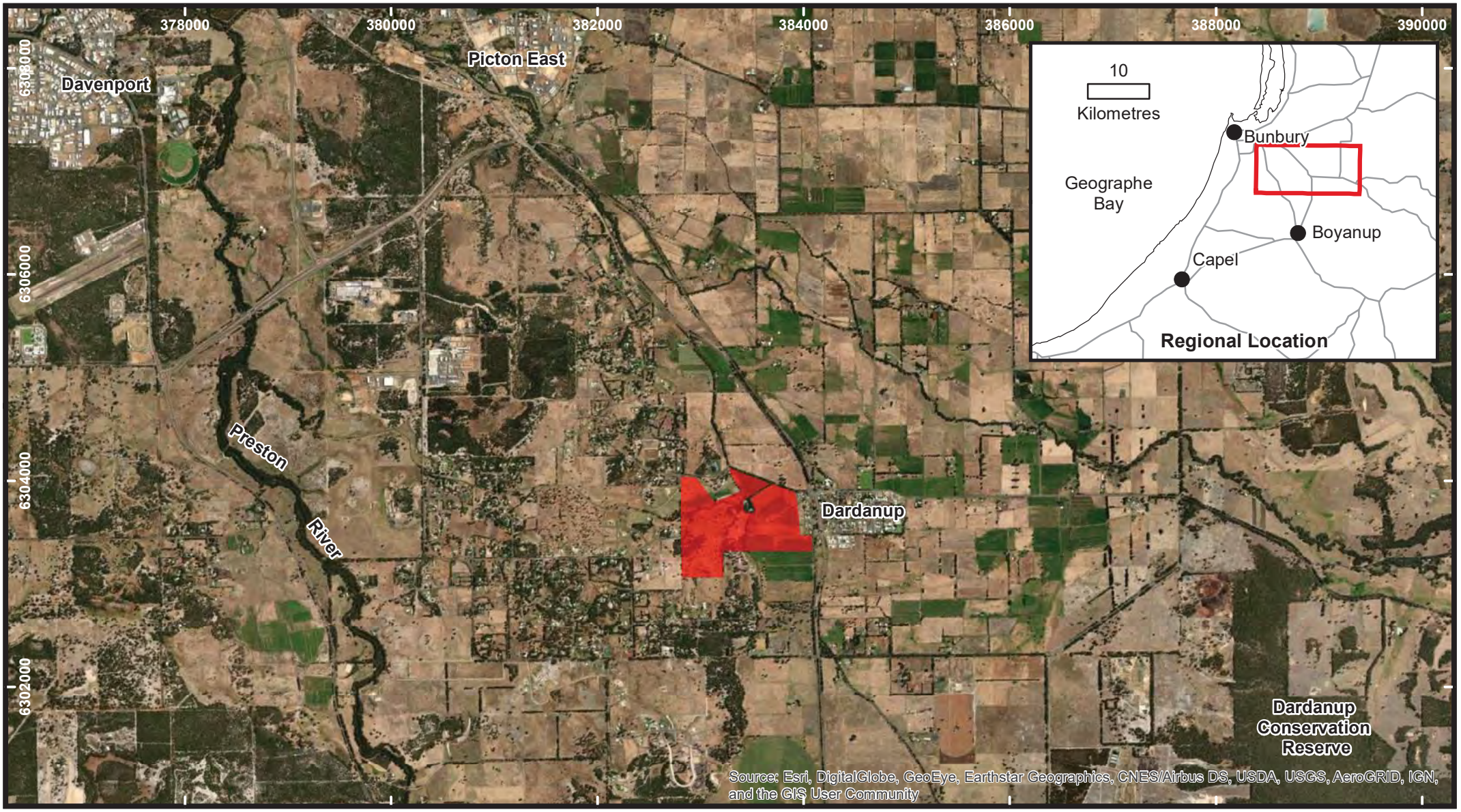
FIGURES



Legend

Survey Area

N

0 1 2 3 4 5

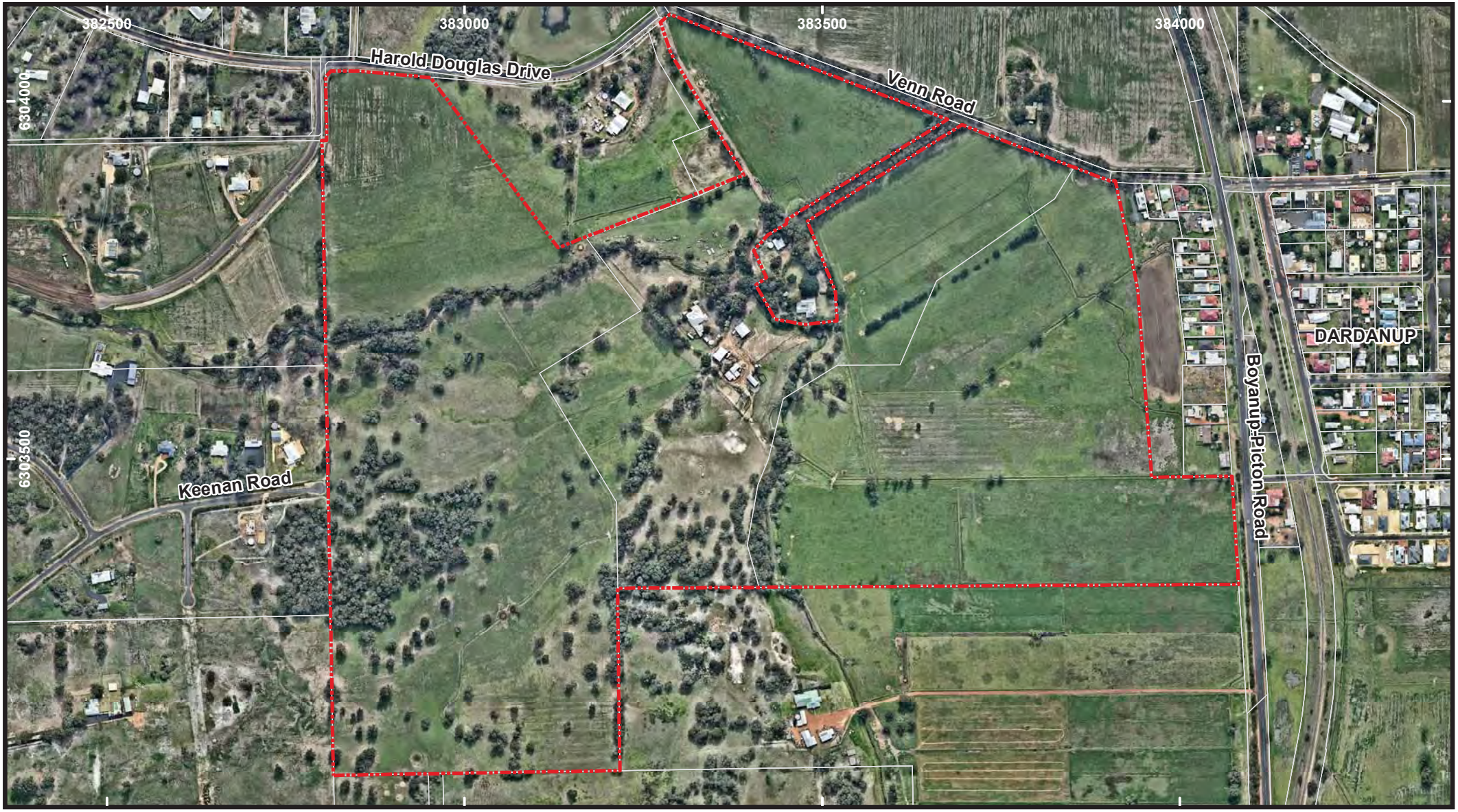
Kilometres

Fauna Survey

Lot 185 and Lot 2
Harold Douglas Drive
Dardanup

Survey Area and Surrounds

Drawn: G Harewood	
Date: 21-Nov-21	
Scale: 1:50,000	
Projection/Coordinate System: UTM/MGA Zone 50	Figure: 1



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Survey Area

0 100 200 300 400 500

Meters

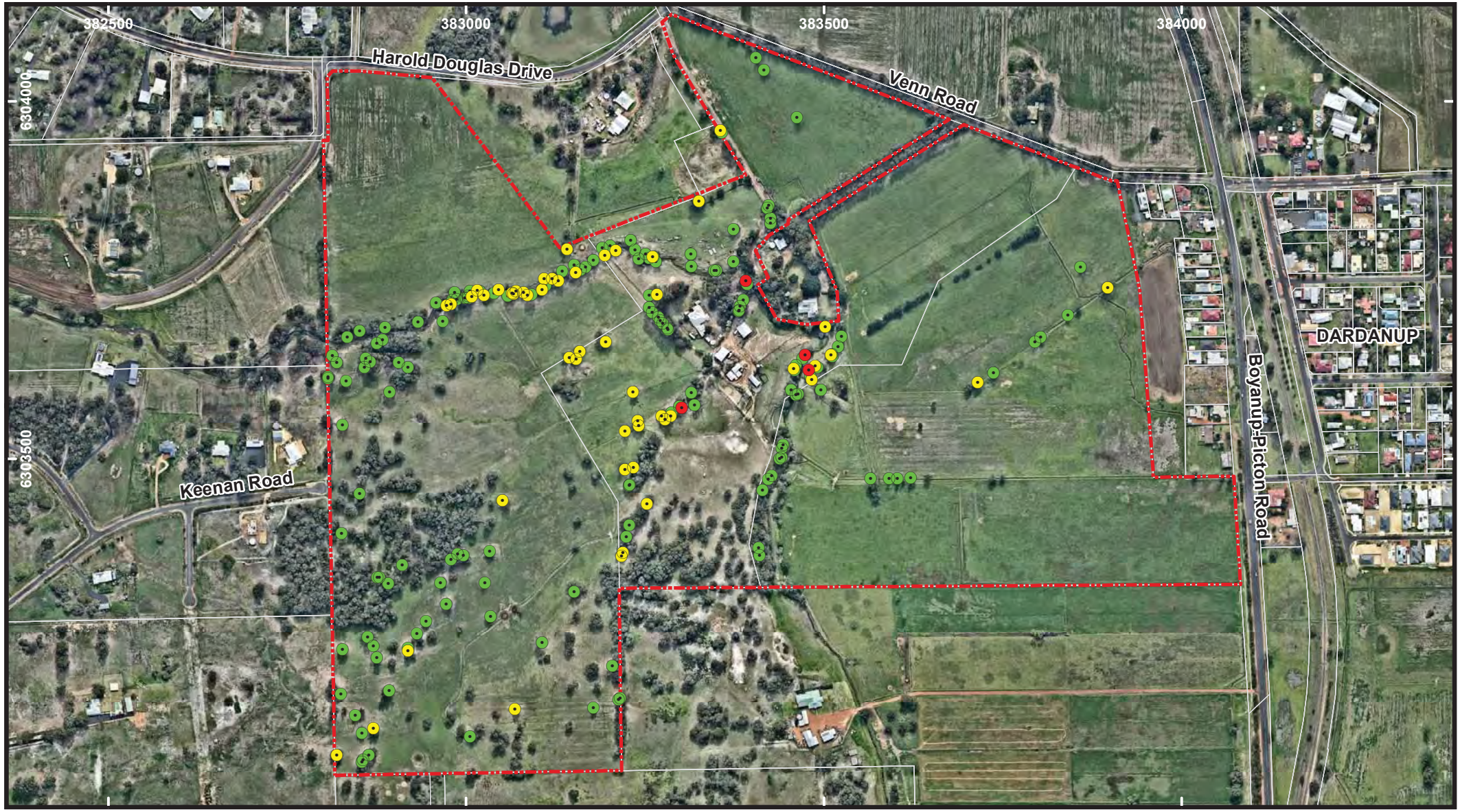
Fauna Survey

Lot 185 and Lot 2
Harold Douglas Drive
Dardanup

Survey Area Aerial Photograph

Drawn: G Harewood
Date: 22-Nov-21
Scale: 1:7,250
Projection/Coordinate System: UTM/MGA Zone 50

Figure: 2



Legend

- Survey Area
- Habitat Tree - One or more large hollows possibly suitable for black cockatoos
- Habitat Tree - One or more possible small/medium hollows
- Habitat Tree - No hollows seen

N

0 100 200 300 400 500

Meters

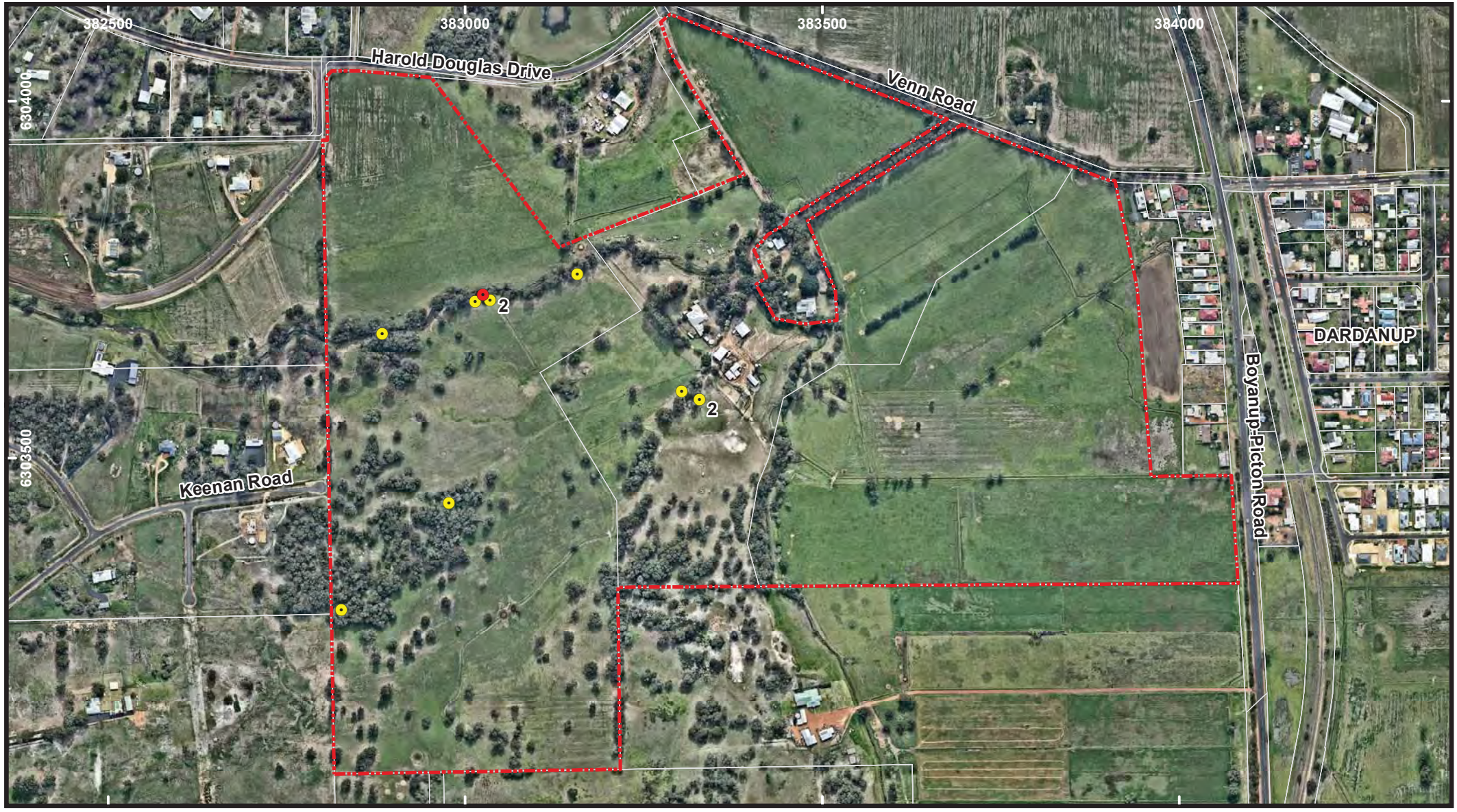
Fauna Survey

Lot 185 and Lot 2
Harold Douglas Drive
Dardanup

Habitat Trees (DBH >50cm)

Drawn: G Harewood
Date: 22-Nov-21
Scale: 1:7,250
Projection/Coordinate System: UTM/MGA Zone 50

Figure: 3



Legend

- Survey Area
- Scats - Western Ringtail Possum
- Common Brushtail Possum

N

0 100 200 300 400 500

Meters

Fauna Survey

Drawn: G Harewood	
Date: 22-Nov-21	
Scale: 1:7,250	
Projection/Coordinate System: UTM/MGA Zone 50	Figure: 4

Lot 185 and Lot 2
Harold Douglas Drive
Dardanup

Possum Observations

APPENDIX A

CONSERVATION CATEGORIES

***EPBC Act (1999)* Threatened Fauna Categories**

Threatened fauna may be listed under Section 178 of the *Environment Protection and Biodiversity Conservation Act 1999* (*EPBC Act*) in any one of the following categories:

Category	Code	Description
Extinct	E	There is no reasonable doubt that the last member of the species has died.
*Extinct in the wild	EW	A species (a) is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or (b) has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.
*Critically Endangered	CE	A species is facing an extremely high risk of extinction in the wild in the immediate future.
*Endangered	EN	A species: (a) is not critically endangered; and (b) is facing a very high risk of extinction in the wild in the near future.
*Vulnerable	VU	A species (a) is not critically endangered or endangered; and (b) is facing a high risk of extinction in the wild in the medium-term future.
Conservation Dependent	CD	A species is the focus of a specific conservation program the cessation of which would result in the species becoming vulnerable, endangered or critically endangered
*Migratory	Migratory	(a) all migratory species that are: (i) native species; and (ii) from time to time included in the appendices to the Bonn Convention; and (b) all migratory species from time to time included in annexes established under JAMBA, CAMBA and ROKAMBA; and (c) all native species from time to time identified in a list established under, or an instrument made under, an international agreement approved by the Minister.
Marine	Ma	Species in the list established under s248 of the *EPBC Act*

Note: Only species in those categories marked with an asterix are matters of national environmental significance (NES) under the *EPBC Act*.

Wildlife Conservation (Specially Protected Fauna) Notice 2018 Categories

Published as Specially Protected under the *Wildlife Conservation Act 1950*, and listed under Schedules 1 to 7 of the Wildlife Conservation (Specially Protected Fauna) Notice.

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.

Category	Code	Description
Schedule 1 (S1) Critically Endangered species	CR	Threatened species considered to be facing an extremely high risk of extinction in the wild in the immediate future.
Schedule 2 (S2) Endangered species	EN	Threatened species considered to be facing a very high risk of extinction in the wild in the near future.
Schedule 3 (S3) Vulnerable species	VU	Threatened species considered to be facing a high risk of extinction in the wild in the medium-term future.
Schedule 4 (S4) Presumed extinct species	EX	Species which have been adequately searched for and there is no reasonable doubt that the last member of the species has died.
Schedule 5 (S5) Migratory birds protected under an international agreement	MI	Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or 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 the Bonn Convention, relating to the protection of migratory birds.
Schedule 6 (S6) Fauna that is of special conservation need as 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.
Schedule 7 (S7) Other specially protected fauna.	OS	Fauna otherwise in need of special protection to ensure their conservation.

Western Australian DBCA Priority Fauna Categories

Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna 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 flora or fauna.

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 is 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.

Category	Code	Description
Priority 1 (P1) Poorly Known Species.	P1	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 (P2) Poorly Known Species.	P2	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.
Priority 3 (P3) Poorly Known Species.	P3	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 apparently 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 (P4) Rare, Near Threatened and other species in need of monitoring.	P4	(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.

*Species includes all taxa (plural of taxon - a classificatory group of any taxonomic rank, e.g. a family, genus, species or any infraspecific category i.e. subspecies or variety, or a distinct population).

***IUCN Red List* Threatened Species Categories**

The *IUCN Red List of Threatened Species*™ is a checklist of taxa that have undergone an extinction risk assessment using the *IUCN Red List Categories and Criteria*.

Categories are summarized below.

Category	Code	Description
Extinct	EX	Taxa for which there is no reasonable doubt that the last individual has died.
Extinct in the Wild	EW	Taxa which is known only to survive in cultivation, in captivity or and as a naturalised population well outside its past range and it has not been recorded in known or expected habitat despite exhaustive survey over a time frame appropriate to its life cycle and form.
Critically Endangered	CR	Taxa facing an extremely high risk of extinction in the wild.
Endangered	EN	Taxa facing a very high risk of extinction in the wild.
Vulnerable	VU	Taxa facing a high risk of extinction in the wild.
Near Threatened	NT	Taxa which has been evaluated but does not qualify for CR, EN or VU now but is close to qualifying or likely to qualify in the near future.
Least Concern	LC	Taxa which has been evaluated but does not qualify for CR, EN, VU, or NT but is likely to qualify for NT in the near future.
Data Deficient	DD	Taxa for which there is inadequate information to make a direct or indirect assessment of its risk of extinction based on its distribution and/or population status.
Not Evaluated	NE	Taxa which has not been evaluated.

A full list of categories and their meanings are available at:

http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria

APPENDIX B

NATUREMAP DATABASE SEARCH
AND
PROTECTED MATTERS SEARCH TOOL RESULTS

NatureMap
Mapping Western Australia's biodiversity

NatureMap - Dardanup - 20km Buffer

Created By Greg Harewood on 30/07/2021

Kingdom Animalia
Current Names Only Yes
Core Datasets Only Yes
Method 'By Circle'
Centre 115° 44' 46" E,33° 24' 02" S
Buffer 20km
Group By Species Group

Species Group	Species	Records
Amphibian	11	378
Bird	223	15771
Fish	68	121
Invertebrate	130	598
Mammal	52	4722
Reptile	48	551
TOTAL	**532**	**22141**

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Amphibian					
1.	25398	*Crinia georgiana (Quacking Frog)*			
2.	25399	*Crinia glauerti (Clicking Frog)*			
3.	25400	*Crinia insignifera (Squelching Froglet)*			
4.	25401	*Crinia pseudinsignifera (Bleating Froglet)*			
5.	25404	*Geocrinia leai (Ticking Frog)*			
6.	25410	*Heleioporus eyrei (Moaning Frog)*			
7.	25411	*Heleioporus inornatus (Whooping Frog)*			
8.	25415	*Limnodynastes dorsalis (Western Banjo Frog)*			
9.	25378	*Litoria adelaidensis (Slender Tree Frog)*			
10.	25388	*Litoria moorei (Motorbike Frog)*			
11.	25433	*Pseudophryne guentheri (Crawling Toadlet)*			
Bird					
12.	24260	*Acanthiza apicalis (Broad-tailed Thornbill, Inland Thornbill)*			
13.	24261	*Acanthiza chrysorrhoa (Yellow-rumped Thornbill)*			
14.	24262	*Acanthiza inornata (Western Thornbill)*			
15.	24560	*Acanthorhynchus superciliosus (Western Spinebill)*			
16.	25535	*Accipiter cirrocephalus (Collared Sparrowhawk)*			
17.	25536	*Accipiter fasciatus (Brown Goshawk)*			
18.	25537	*Accipiter novaehollandiae (Grey Goshawk)*			
19.	25755	*Acrocephalus australis (Australian Reed Warbler)*			
20.	41323	*Actitis hypoleucos (Common Sandpiper)*		IA	
21.	25544	*Aegotheles cristatus (Australian Owlet-nightjar)*			
22.	24301	*Aegotheles cristatus subsp. cristatus (Australian Owlet-nightjar)*			
23.	24310	*Anas castanea (Chestnut Teal)*			
24.	24312	*Anas gracilis (Grey Teal)*			
25.	24313	*Anas platyrhynchos (Mallard)*			
26.		*Anas platyrhynchos subsp. domesticus*			
27.	24315	*Anas rhynchotis (Australasian Shoveler)*			
28.	24316	*Anas superciliosa (Pacific Black Duck)*			
29.	47414	*Anhinga novaehollandiae (Australasian Darter)*			
30.	24506	*Anous tenuirostris subsp. melanops (Australian Lesser Noddy)*		T	
31.	24561	*Anthochaera carunculata (Red Wattlebird)*			
32.	24562	*Anthochaera lunulata (Western Little Wattlebird)*			
33.	24285	*Aquila audax (Wedge-tailed Eagle)*			
34.	25558	*Ardea ibis (Cattle Egret)*			
35.	41324	*Ardea modesta (great egret, white egret)*			
36.	24340	*Ardea novaehollandiae (White-faced Heron)*			
37.	24341	*Ardea pacifica (White-necked Heron)*			
38.	41326	*Ardenna carneipes (Flesh-footed Shearwater, Fleshy-footed Shearwater)*		T	
39.	24610	*Ardeotis australis (Australian Bustard)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
40.	25736	*Arenaria interpres (Ruddy Turnstone)*		IA	
41.	25566	*Artamus cinereus (Black-faced Woodswallow)*			
42.	24353	*Artamus cyanopterus (Dusky Woodswallow)*			
43.	24318	*Aythya australis (Hardhead)*			
44.		*Barnardius zonarius*			
45.	24319	*Biziura lobata (Musk Duck)*			
46.	24359	*Burhinus grallarius (Bush Stone-curlew)*			
47.	25714	*Cacatua pastinator (Western Long-billed Corella)*			
48.	25716	*Cacatua sanguinea (Little Corella)*			
49.	25598	*Cacomantis flabelliformis (Fan-tailed Cuckoo)*			
50.	42307	*Cacomantis pallidus (Pallid Cuckoo)*			
51.	24779	*Calidris acuminata (Sharp-tailed Sandpiper)*		IA	
52.	24780	*Calidris alba (Sanderling)*		IA	
53.	25738	*Calidris canutus (Red Knot, knot)*		IA	
54.	24784	*Calidris ferruginea (Curlew Sandpiper)*		T	
55.	24788	*Calidris ruficollis (Red-necked Stint)*		IA	
56.	24790	*Calidris tenuirostris (Great Knot)*		T	
57.	25717	*Calyptorhynchus banksii (Red-tailed Black-Cockatoo)*			
58.	24731	*Calyptorhynchus banksii subsp. naso (Forest Red-tailed Black Cockatoo)*		T	
59.	24733	*Calyptorhynchus baudinii (Baudin's Cockatoo, White-tailed Long-billed Black Cockatoo)*		T	
60.	24734	*Calyptorhynchus latirostris (Carnaby's Cockatoo, White-tailed Short-billed Black Cockatoo)*		T	
61.	48400	*Calyptorhynchus sp. (white-tailed black cockatoo)*		T	
62.	25575	*Charadrius leschenaultii (Greater Sand Plover)*		T	
63.	24377	*Charadrius ruficapillus (Red-capped Plover)*			
64.	24321	*Chenonetta jubata (Australian Wood Duck, Wood Duck)*			
65.		*Chroicocephalus novaehollandiae*			
66.	25601	*Chrysococcyx lucidus (Shining Bronze Cuckoo)*			
67.	24432	*Chrysococcyx lucidus subsp. plagosus (Shining Bronze Cuckoo)*			
68.	24288	*Circus approximans (Swamp Harrier)*			
69.	24774	*Cladorhynchus leucocephalus (Banded Stilt)*			
70.	47915	*Climacteris rufus (Black-tailed Treecreeper)*			
71.	25675	*Colluricincla harmonica (Grey Shrike-thrush)*			
72.	24399	*Columba livia (Domestic Pigeon)*	Y		
73.	25568	*Coracina novaehollandiae (Black-faced Cuckoo-shrike)*			
74.	25592	*Corvus coronoides (Australian Raven)*			
75.	24417	*Corvus coronoides subsp. perplexus (Australian Raven)*			
76.		*Corvus splendens subsp. protegatus*			
77.	24671	*Coturnix pectoralis (Stubble Quail)*			
78.	24420	*Cracticus nigrogularis (Pied Butcherbird)*			
79.	25595	*Cracticus tibicen (Australian Magpie)*			
80.		*Cracticus torquartus*			
81.	25596	*Cracticus torquatus (Grey Butcherbird)*			
82.	24322	*Cygnus atratus (Black Swan)*			
83.	30901	*Dacelo novaeguineae (Laughing Kookaburra)*	Y		
84.	25673	*Daphoenositta chrysoptera (Varied Sittella)*			
85.	25607	*Dicaeum hirundinaceum (Mistletoebird)*			
86.	25618	*Diomedea exulans (Wandering Albatross)*		T	
87.	30836	*Diomedea exulans subsp. exulans (Snowy Albatross)*		T	
88.	24470	*Dromaius novaehollandiae (Emu)*			
89.		*Egretta garzetta*			
90.		*Egretta novaehollandiae*			
91.		*Elanus axillaris*			
92.	47937	*Elseyornis melanops (Black-fronted Dotterel)*			
93.		*Eolophus roseicapillus*			
94.	24651	*Eopsaltria australis subsp. griseogularis (Western Yellow Robin)*			
95.	24652	*Eopsaltria georgiana (White-breasted Robin)*			
96.	24567	*Epthianura albifrons (White-fronted Chat)*			
97.	24813	*Eudyptes chrysocome subsp. filholi (Rockhopper Penguin)*			Y
98.	25746	*Eudyptula minor (Little Penguin)*			
99.	24368	*Eurostopodus argus (Spotted Nightjar)*			
100.	25621	*Falco berigora (Brown Falcon)*			
101.	25622	*Falco cenchroides (Australian Kestrel, Nankeen Kestrel)*			
102.	24472	*Falco cenchroides subsp. cenchroides (Australian Kestrel, Nankeen Kestrel)*			
103.	25623	*Falco longipennis (Australian Hobby)*			
104.	25624	*Falco peregrinus (Peregrine Falcon)*		S	
105.	24616	*Falcunculus frontatus subsp. leucogaster (Western Shrike-tit, Crested Shrike-tit)*			
106.	25727	*Fulica atra (Eurasian Coot)*			
107.	24761	*Fulica atra subsp. australis (Eurasian Coot)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
108.	25729	*Gallinula tenebrosa (Dusky Moorhen)*			
109.	24763	*Gallinula tenebrosa subsp. tenebrosa (Dusky Moorhen)*			
110.	25730	*Gallirallus philippensis (Buff-banded Rail)*			
111.	24765	*Gallirallus philippensis subsp. mellori (Buff-banded Rail)*			
112.	25530	*Gerygone fusca (Western Gerygone)*			
113.	24443	*Grallina cyanoleuca (Magpie-lark)*			
114.	24487	*Haematopus longirostris (Pied Oystercatcher)*			
115.	24293	*Haliaeetus leucogaster (White-bellied Sea-Eagle)*			
116.	24295	*Haliastur sphenurus (Whistling Kite)*			
117.	24689	*Halobaena caerulea (Blue Petrel)*			
118.	47965	*Hieraaetus morphnoides (Little Eagle)*			
119.	25734	*Himantopus himantopus (Black-winged Stilt)*			
120.	24491	*Hirundo neoxena (Welcome Swallow)*			
121.	48587	*Hydroprogne caspia (Caspian Tern)*		IA	
122.	24511	*Larus novaehollandiae subsp. novaehollandiae (Silver Gull)*			
123.	25638	*Larus pacificus (Pacific Gull)*			
124.	25661	*Lichmera indistincta (Brown Honeyeater)*			
125.	30932	*Limosa lapponica (Bar-tailed Godwit)*		IA	
126.	25741	*Limosa limosa (Black-tailed Godwit)*		IA	
127.	24690	*Macronectes giganteus (Southern Giant Petrel)*		IA	
128.	24326	*Malacorhynchus membranaceus (Pink-eared Duck)*			
129.	25650	*Malurus elegans (Red-winged Fairy-wren)*			
130.	25654	*Malurus splendens (Splendid Fairy-wren)*			
131.	25758	*Megalurus gramineus (Little Grassbird)*			
132.	25663	*Melithreptus brevirostris (Brown-headed Honeyeater)*			
133.	24598	*Merops ornatus (Rainbow Bee-eater)*			
134.		*Microcarbo melanoleucos*			
135.	48008	*Morus serrator (Australasian Gannet)*			
136.	25610	*Myiagra inquieta (Restless Flycatcher)*			
137.	24738	*Neophema elegans (Elegant Parrot)*			
138.	24739	*Neophema petrophila (Rock Parrot)*			
139.	24798	*Numenius madagascariensis (Eastern Curlew)*		T	
140.	25742	*Numenius phaeopus (Whimbrel)*		IA	
141.	25564	*Nycticorax caledonicus (Rufous Night Heron)*			
142.	24497	*Oceanites oceanicus (Wilson's Storm-petrel)*		IA	
143.	24407	*Ocyphaps lophotes (Crested Pigeon)*			
144.	41347	*Onychoprion anaethetus (Bridled Tern)*		IA	
145.	24328	*Oxyura australis (Blue-billed Duck)*		□4	
146.	25680	*Pachycephala rufiventris (Rufous Whistler)*			
147.	24692	*Pachyptila belcheri (Slender-billed Prion)*			
148.	24693	*Pachyptila desolata (Antarctic Prion)*			
149.	25707	*Pachyptila salvini (Salvin's Prion)*			
150.	48591	*Pandion cristatus (Osprey, Eastern Osprey)*		IA	
151.	25681	*Pardalotus punctatus (Spotted Pardalote)*			
152.	24626	*Pardalotus punctatus subsp. xanthopyge (Yellow-rumped Pardalote)*			
153.	25682	*Pardalotus striatus (Striated Pardalote)*			
154.	25687	*Passer domesticus (House Sparrow)*	Y		
155.	24642	*Passer montanus (Eurasian Tree Sparrow)*	Y		
156.	24649	*Pelecanoides urinatrix subsp. exsul (Common Diving Petrel)*			
157.	24648	*Pelecanus conspicillatus (Australian Pelican)*			
158.	48061	*Petrochelidon nigricans (Tree Martin)*			
159.	48066	*Petroica boodang (Scarlet Robin)*			
160.	24659	*Petroica goodenovii (Red-capped Robin)*			
161.	25697	*Phalacrocorax carbo (Great Cormorant)*			
162.	24664	*Phalacrocorax carbo subsp. novaehollandiae (Great Cormorant)*			
163.	24665	*Phalacrocorax fuscescens (Black-faced Cormorant)*			
164.	25698	*Phalacrocorax melanoleucos (Little Pied Cormorant)*			
165.	24667	*Phalacrocorax sulcirostris (Little Black Cormorant)*			
166.	25699	*Phalacrocorax varius (Pied Cormorant)*			
167.	24668	*Phalacrocorax varius subsp. hypoleucos (Pied Cormorant)*			
168.	24409	*Phaps chalcoptera (Common Bronzewing)*			
169.	25587	*Phaps elegans (Brush Bronzewing)*			
170.	48071	*Phylidonyris niger (White-cheeked Honeyeater)*			
171.	24596	*Phylidonyris novaehollandiae (New Holland Honeyeater)*			
172.	24841	*Platalea flavipes (Yellow-billed Spoonbill)*			
173.	24842	*Platalea regia (Royal Spoonbill)*			
174.	25720	*Platycercus icterotis (Western Rosella)*			
175.	24745	*Platycercus icterotis subsp. icterotis (Western Rosella)*			
176.	24747	*Platycercus spurius (Red-capped Parrot)*			
177.	25721	*Platycercus zonarius (Australian Ringneck, Ring-necked Parrot)*			

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178.	24843	*Plegadis falcinellus (Glossy Ibis)*		IA	
179.	24382	*Pluvialis fulva (Pacific Golden Plover)*		IA	
180.	24383	*Pluvialis squatarola (Grey Plover)*		IA	
181.	25703	*Podargus strigoides (Tawny Frogmouth)*			
182.	25704	*Podiceps cristatus (Great Crested Grebe)*			
183.	24681	*Poliocephalus poliocephalus (Hoary-headed Grebe)*			
184.	25722	*Polytelis anthopeplus (Regent Parrot)*			
185.	25731	*Porphyrio porphyrio (Purple Swamphen)*			
186.	24767	*Porphyrio porphyrio subsp. bellus (Purple Swamphen)*			
187.	24769	*Porzana fluminea (Australian Spotted Crake)*			
188.	24771	*Porzana tabuensis (Spotless Crake)*			
189.	24388	*Psophodes nigrogularis subsp. nigrogularis (Western Whipbird (western heath))*		T	
190.	24702	*Pterodroma brevirostris (Kerguelen Petrel)*			
191.	24703	*Pterodroma lessonii (White-headed Petrel)*			
192.		*Pterodroma macroptera subsp. macoptera*			
193.	25711	*Pterodroma mollis (Soft-plumaged Petrel)*			
194.	24711	*Puffinus assimilis subsp. assimilis (Little Shearwater)*			
195.		*Purpureicephalus spurius*			
196.	24776	*Recurvirostra novaehollandiae (Red-necked Avocet)*			
197.	48096	*Rhipidura albiscapa (Grey Fantail)*			
198.	25614	*Rhipidura leucophrys (Willie Wagtail)*			
199.	25616	*Rhipidura rufiventris (Northern Fantail)*			
200.	25534	*Sericornis frontalis (White-browed Scrubwren)*			
201.	30948	*Smicrornis brevirostris (Weebill)*			
202.	24645	*Stagonopleura oculata (Red-eared Firetail)*			
203.	24522	*Sterna bergii (Crested Tern)*			
204.	25642	*Sterna hirundo (Common Tern)*		IA	
205.	48594	*Sternula nereis (Fairy Tern)*			
206.	24329	*Stictonetta naevosa (Freckled Duck)*			
207.	25655	*Stipiturus malachurus (Southern Emu-wren)*			
208.	24554	*Stipiturus malachurus subsp. westernensis (Southern Emu-wren)*			
209.	25597	*Strepera versicolor (Grey Currawong)*			
210.	25589	*Streptopelia chinensis (Spotted Turtle-Dove)*	Y		
211.	25590	*Streptopelia senegalensis (Laughing Turtle-Dove)*	Y		
212.	25705	*Tachybaptus novaehollandiae (Australasian Grebe, Black-throated Grebe)*			
213.	24682	*Tachybaptus novaehollandiae subsp. novaehollandiae (Australasian Grebe, Black-throated Grebe)*			
214.	24331	*Tadorna tadornoides (Australian Shelduck, Mountain Duck)*			
215.	34134	*Thalassarche carteri (Indian Yellow-nosed Albatross)*		T	
216.	44607	*Thalassarche melanophris (Black-browed Albatross)*		T	
217.	48597	*Thalasseus bergii (Crested Tern)*		IA	
218.	48135	*Thinornis rubricollis (Hooded Plover, Hooded Dotterel)*		□4	
219.	24845	*Threskiornis spinicollis (Straw-necked Ibis)*			
220.	25549	*Todiramphus sanctus (Sacred Kingfisher)*			
221.	24309	*Todiramphus sanctus subsp. sanctus (Sacred Kingfisher)*			
222.	25723	*Trichoglossus haematodus (Rainbow Lorikeet)*			
223.	24755	*Trichoglossus haematodus subsp. moluccanus (Rainbow Lorikeet)*	Y		
224.	24803	*Tringa brevipes (Grey-tailed Tattler)*		□4	
225.	24806	*Tringa glareola (Wood Sandpiper)*		IA	
226.	24808	*Tringa nebularia (Common Greenshank, greenshank)*		IA	
227.	24809	*Tringa stagnatilis (Marsh Sandpiper, little greenshank)*		IA	
228.	48147	*Turnix varius (Painted Button-quail)*			
229.	24852	*Tyto alba subsp. delicatula (Barn Owl)*			
230.	24855	*Tyto novaehollandiae subsp. novaehollandiae (Masked Owl (southwest))*		□3	
231.	25577	*Vanellus miles (Masked Lapwing)*			
232.	24386	*Vanellus tricolor (Banded Lapwing)*			
233.	41351	*Xenus cinereus (Terek Sandpiper)*		IA	
234.	25765	*Zosterops lateralis (Grey-breasted White-eye, Silvereye)*			

□ish

235.		*Acentrogobius bifrenatus*
236.		*Aetapcus maculatus*
237.		*Aldrichetta forsteri*
238.		*Anoplocapros lenticularis*
239.		*Aracana aurita*
240.		*Arenigobius bifrenatus*
241.		*Arripis truttacea*
242.		*Asymbolus submaculatus*
243.		*Atherinosoma elongata*
244.		*Aulohalaelurus labiosus*
245.		*Auxis thazard*

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246.		*Carcharhinus sp.*			
247.		*Chelidonichthys kumu*			
248.		*Cleidopus gloriamaris*			
249.		*Dactylophora nigricans*			
250.		*Diodon nicthemerus*			
251.		*Diodon sp.*			
252.		*Echeneis naucrates*			
253.		*Elops hawaiensis*			
254.		*Eubalichthys sp.*			
255.		*Euleptorhamphus viridis*			
256.		*Furgaleus macki*			
257.	34028	*Galaxias occidentalis (Western Minnow)*			
258.		*Galeorhinus galeus*			
259.	34030	*Geotria australis (Pouched Lamprey)*		□3	
260.		*Gonorynchus greyi*			
261.		*Gymnapistes marmoratus*			
262.		*Gymnothorax woodwardi*			
263.		*Hemipristis elongata*			
264.		*Heterodontus portusjacksoni*			
265.		*Hippocampus sp.*			
266.		*Hyperlophus vittatus*			
267.		*Hyporhamphus melanochir*			
268.		*Ichthyscopus barbatus*			
269.		*Lagocephalus sceleratus*			
270.		*Macroramphosus scolopax*			
271.		*Makaira indica*			
272.		*Meuschenia freycineti*			
273.		*Mugil cephalus*			
274.		*Muraenichthys tasmaniensis*			
275.		*Myliobatis sp.*			
276.		*Nannoperca vittata*			
277.		*Nelusetta ayraudi*			
278.		*Omegophora armilla*			
279.		*Ophisurus serpens*			
280.		*Ophthalmolepis lineolatus*			
281.		*Parablennius postoculomaculatus*			
282.		*Parazanclistius hutchinsi*			
283.		*Phyllopteryx taeniolatus*			
284.		*Platycephalus speculator*			
285.		*Prionace glauca*			
286.		*Pristiophorus nudipinnis*			
287.		*Pseudogobius olorum*			
288.		*Pterygotrigla polyommata*			
289.		*Rachycentron canadum*			
290.		*Scomber australasicus*			
291.		*Sillago fraseri (invalid)*			Y
292.		*Sphyraena obtusata*			
293.		*Squalus megalops*			
294.		*Squatina australis*			
295.		*Stigmatopora argus*			
296.		*Thyrsites atun*			
297.		*Trachinotus baillonii*			
298.		*Trachurus novaezelandiae*			
299.		*Trichiurus lepturus*			
300.		*Trichiurus sp.*			
301.		*Trygonoptera mucosa*			
302.		*Urolophus sp.*			

Invertebrate

303.		*Acariformes sp.*			
304.		*Aeshnidae sp.*			
305.		*Akamptogonus novarae*			
306.		*Allothereua maculata*			
307.		*Amblyomma triguttatum*			
308.		*Aname mainae*			
309.		*Aname tepperi*			
310.		*Ancylidae sp.*			
311.		*Anisops sp.*			
312.		*Antichiropus nanus*			
313.		*Antiporus sp.*			
314.		*Arachnura higginsi*			

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315.		*Araneus senicaudatus*			
316.		*Araneus senicaudatus subsp. simplex*			Y
317.		*Argiope protensa*			
318.		*Argiope trifasciata*			
319.		*Arkys walckenaeri*			
320.		*Artoria linnaei*			
321.		*Artoriopsis expolita*			
322.		*Athericidae sp.*			
323.		*Austracantha minax*			
324.		*Backobourkia brounii*			
325.		*Backobourkia heroine*			
326.		*Badumna insignis*			
327.		*Baetidae sp.*			
328.		*Baiami tegenarioides*			
329.		*Baiami volucripes*			
330.		*Berosus discolor*			
331.		*Berosus munitipennis*			
332.	47873	*Bertmainius opimus (western pygmy trapdoor spider)*		□3	
333.		*Brentidae sp.*			
334.		*Caenidae sp.*			
335.		*Carabidae sp.*			
336.		*Ceinidae sp.*			
337.		*Celaenia excavata*			
338.		*Ceratopogonidae sp.*			
339.		*Cercophonius sulcatus*			
340.	33939	*Cherax cainii (Marron)*			
341.		*Cherax quinquecarinatus*			
342.		*Chironominae sp.*			
343.		*Chironomus aff. alternans (V24) (CB)*			
344.		*Chironomus tepperi*			
345.		*Corduliidae sp.*			
346.		*Corixidae sp.*			
347.		*Cormocephalus aurantiipes*			
348.		*Cormocephalus hartmeyeri*			
349.		*Cryptoerithus quobba*			
350.		*Culex (Culex) australicus*			
351.		*Culicidae sp.*			
352.		*Cyclosa trilobata*			
353.		*Cyrtophora parnasia*			
354.		*Dingosa serrata*			
355.		*Dugesiidae sp.*			
356.		*Dytiscidae sp.*			
357.		*Ecnomidae sp.*			
358.		*Empididae sp.*			
359.		*Erigone prominens*			
360.		*Eriophora biapicata*			
361.		*Gripopterygidae sp.*			
362.		*Gyrinidae sp.*			
363.		*Harrisius sp.*			
364.		*Helochares tenuistriatus*			
365.		*Henicops dentatus*			
366.		*Hogna crispipes*			
367.		*Hydrobiosidae sp.*			
368.		*Hydrophilidae sp.*			
369.		*Hydropsychidae sp.*			
370.		*Hydroptilidae sp.*			
371.	48935	*Idiosoma sigillatum (Swan Coastal Plain shield-backed trapdoor spider)*		□3	
372.		*Isopeda leishmanni*			
373.		*Isopedella castanea*			
374.		*Kangarosa properipes*			
375.		*Kiefferulus intertinctus*			
376.		*Lagynochthonius australicus*			
377.		*Lampona brevipes*			
378.		*Lampona cylindrata*			
379.		*Lampona punctigera*			
380.		*Lancetes lanceolatus*			
381.		*Latrodectus hasseltii*			
382.		*Leptoceridae sp.*			
383.		*Leptophlebiidae sp.*			
384.		*Limnoxenus zelandicus*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
385.		*Megapodagrionidae sp.*			
386.		*Microvelia sp.*			
387.		*Missulena granulosa*			
388.		*Missulena hoggi*			
389.		*Missulena occatoria*			
390.		*Mituliodon tarantulinus*			
391.		*Mitzoruga insularis*			
392.		*Neoniphargidae sp.*			
393.		*Nephila edulis*			
394.		*Nicodamus mainae*			
395.		*Nunciella aspera*			
396.		*Oligochaeta sp.*			
397.		*Ommatoiulus moreletii*			
398.		*Oniscidae sp.*			
399.		*Orthocladiinae sp.*			
400.	33989	*Pachysaga strobila (Vasse Pachysaga (Busselton-Donnybrook), cricket)*		□1	
401.		*Palaemonidae sp.*			
402.		*Paralimnophyes pullulus (V42)*			
403.		*Paramelitidae sp.*			
404.		*Parastacidae sp.*			
405.		*Perthiidae sp.*			
406.		*Philopotamidae sp.*			
407.		*Pholcus phalangioides*			
408.		*Phryganoporus candidus*			
409.		*Platorish gelorup*			
410.		*Polypedilum nr. convexum (SAP)*			
411.		*Rhantus suturalis*			
412.		*Scirtidae sp.*			
413.		*Scutigerella indecisa*			
414.		*Simuliidae sp.*			
415.		*Staphylinidae sp.*			
416.		*Steatoda capensis*			
417.		*Steatoda grossa*			
418.		*Sternopriscus sp.*			
419.		*Synsphyronus magnus*			
420.		*Tabanidae sp.*			
421.		*Tamopsis distinguenda*			
422.		*Tanypodinae sp.*			
423.		*Tasmanicosa leuckartii*			
424.		*Telephlebiidae sp.*			
425.		*Tetralycosa oraria*			
426.		*Tipulidae sp.*			
427.		*Urodacus novaehollandiae*			
428.		*Uvarus pictipes*			
429.		*Veliidae sp.*			
430.		*Venator immansueta*			
431.		*Venatrix pullastra*			
432.	34113	*Westralunio carteri (Carter's Freshwater Mussel)*		T	
Mammal					
433.	25449	*Antechinus flavipes (Yellow-footed Antechinus)*			
434.	24088	*Antechinus flavipes subsp. leucogaster (Yellow-footed Antechinus, Mardo)*			
435.	24208	*Arctocephalus forsteri (New Zealand Fur Seal, long-nosed fur-seal)*		S	
436.	24209	*Arctocephalus tropicalis (Subantarctic fur-seal)*		T	
437.	24044	*Balaenoptera acutorostrata (Dwarf Minke Whale)*			
438.	24162	*Bettongia penicillata subsp. ogilbyi (Woylie, Brush-tailed Bettong)*		T	
439.	24251	*Bos taurus (European Cattle)*	Y		
440.	24072	*Caperea marginata (Pygmy Right Whale)*			
441.	24086	*Cercartetus concinnus (Western Pygmy-possum, Mundarda)*			
442.	24186	*Chalinolobus gouldii (Gould's Wattled Bat)*			
443.	24187	*Chalinolobus morio (Chocolate Wattled Bat)*			
444.	24092	*Dasyurus geoffroii (Chuditch, Western Quoll)*		T	
445.	24043	*Eubalaena australis (Southern Right Whale)*		T	
446.	24189	*Falsistrellus mackenziei (Western False Pipistrelle, Western Falsistrelle)*		□4	
447.	24041	*Felis catus (Cat)*	Y		
448.	24215	*Hydromys chrysogaster (Water-rat, Rakali)*		□4	
449.	48588	*Isoodon fusciventer (Quenda, southwestern brown bandicoot)*		□4	
450.		*Lobodon carcinophaga*			
451.	24132	*Macropus fuliginosus (Western Grey Kangaroo)*			
452.	24051	*Megaptera novaeangliae (Humpback Whale)*		S	
453.	24076	*Mesoplodon bowdoini (Andrew's Beaked Whale)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
454.	24078	*Mesoplodon grayi (Gray's Beaked Whale)*			
455.	24081	*Mesoplodon mirus (True's Beaked Whale)*			
456.	24213	*Mirounga leonina (Southern Elephant Seal)*			
457.	48005	*Mormopterus kitcheneri (South-western Free-tailed Bat)*			
458.	24223	*Mus musculus (House Mouse)*	Y		
459.	24146	*Myrmecobius fasciatus (Numbat, Walpurti)*		T	
460.	24210	*Neophoca cinerea (Australian Sea-lion)*		T	
461.	48022	*Notamacropus irma (Western Brush Wallaby)*		□4	
462.	24194	*Nyctophilus geoffroyi (Lesser Long-eared Bat)*			
463.	24195	*Nyctophilus gouldi (Gould's Long-eared Bat)*			
464.	24085	*Oryctolagus cuniculus (Rabbit)*	Y		
465.	25508	*Phascogale tapoatafa (Brush-tailed Phascogale)*		S	
466.	48070	*Phascogale tapoatafa subsp. wambenger (South-western Brush-tailed Phascogale, Wambenger)*		S	
467.	24073	*Physeter macrocephalus (Sperm Whale)*		T	
468.	24166	*Pseudocheirus occidentalis (Western Ringtail Possum, ngwayir)*		T	
469.	24243	*Rattus fuscipes (Western Bush Rat)*			
470.	24244	*Rattus norvegicus (Brown Rat)*	Y		
471.	24245	*Rattus rattus (Black Rat)*	Y		
472.	24145	*Setonix brachyurus (Quokka)*		T	
473.		*Sminthopsis murina*			
474.	48113	*Stenella coeruleoalba (Striped Dophin)*			
475.	48114	*Stenella longirostris (Spinner Dolphin)*		□4	
476.	24259	*Sus scrofa (Pig)*	Y		
477.	24207	*Tachyglossus aculeatus (Short-beaked Echidna)*			
478.	24167	*Tarsipes rostratus (Honey Possum, Noolbenger)*			
479.	25521	*Trichosurus vulpecula (Common Brushtail Possum)*			
480.	24158	*Trichosurus vulpecula subsp. vulpecula (Common Brushtail Possum)*			
481.	30954	*Tursiops aduncus (Indo-Pacific Bottlenose Dolphin)*			
482.	24069	*Tursiops truncatus (Bottlenose Dolphin)*			
483.	24206	*Vespadelus regulus (Southern Forest Bat)*			
484.	24040	*Vulpes vulpes (Red Fox)*	Y		
Reptile					
485.	42368	*Acritoscincus trilineatus (Western Three-lined Skink)*			
486.	24990	*Aprasia pulchella (Granite Worm-lizard)*			
487.	24991	*Aprasia repens (Sand-plain Worm-lizard)*			
488.	25335	*Caretta caretta (Loggerhead Turtle)*		T	
489.	43380	*Chelodina colliei (South-western Snake-necked Turtle)*			
490.	25336	*Chelonia mydas (Green Turtle)*		T	
491.	24980	*Christinus marmoratus (Marbled Gecko)*			
492.	30893	*Cryptoblepharus buchananii*			
493.	25027	*Ctenotus australis*			
494.	25039	*Ctenotus fallens*			
495.	25047	*Ctenotus impar*			
496.	25049	*Ctenotus labillardieri*			
497.	41641	*Ctenotus ora (Coastal Plains Skink)*		□3	
498.	24939	*Diplodactylus polyophthalmus*			
499.	25251	*Echiopsis curta (Bardick)*			
500.	25096	*Egernia kingii (King's Skink)*			
501.	25100	*Egernia napoleonis*			
502.	25250	*Elapognathus coronatus (Crowned Snake)*			
503.	30919	*Hemiergis gracilipes (skink)*			
504.	25115	*Hemiergis initialis subsp. initialis*			
505.	25118	*Hemiergis peronii subsp. tridactyla*			
506.	25119	*Hemiergis quadrilineata*			
507.	44656	*Hydrophis major (Olive-headed seasnake, greater seasnake)*			
508.	42410	*Hydrophis ornatus (Ornate Reef Seasnake, Sea Snake)*			
509.	43384	*Hydrophis platurus (Yellow-bellied Seasnake)*			
510.	25131	*Lerista distinguenda*			
511.	25133	*Lerista elegans*			
512.	25154	*Lerista microtis subsp. microtis*			
513.	25005	*Lialis burtonis*			
514.	42413	*Lissolepis luctuosa (Western Swamp Skink)*			
515.	25184	*Menetia greyii*			
516.	25191	*Morethia lineoocellata*			
517.	25192	*Morethia obscura*			
518.	25344	*Natator depressus (Flatback Turtle)*		T	
519.	25248	*Neelaps bimaculatus (Black-naped Snake)*			
520.	25252	*Notechis scutatus (Tiger Snake)*			
521.	25253	*Parasuta gouldii*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
522.	25255	*Parasuta nigriceps*			
523.	25510	*Pogona minor (Dwarf Bearded Dragon)*			
524.	24907	*Pogona minor subsp. minor (Dwarf Bearded Dragon)*			
525.	25511	*Pseudonaja affinis (Dugite)*			
526.	25259	*Pseudonaja affinis subsp. affinis (Dugite)*			
527.	25266	*Simoselaps bertholdi (Jan's Banded Snake)*			
528.	25519	*Tiliqua rugosa*			
529.	25207	*Tiliqua rugosa subsp. rugosa*			
530.	24983	*Underwoodisaurus milii (Barking Gecko)*			
531.	25218	*Varanus gouldii (Bungarra or Sand Monitor)*			
532.	25225	*Varanus rosenbergi (Heath Monitor)*			

Conservation Codes
T □Rare or likely to become e□tinct
□ □□resumed e□tinct
IA □□rotected under international a□reement
S □□ther specially protected fauna
1 □□riority 1
2 □□riority 2
3 □□riority 3
4 □□riority 4
5 □□riority 5

[1] For NatureMap's purposes, species fla□□ed as endemic are those □hose records are □holely contained □ithin the search area. Note that only those records complyin□ □ith the search criterion are included in the calculation. For e□ample, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the □uery area.

Australian Government
Department of Agriculture, Water and the Environment

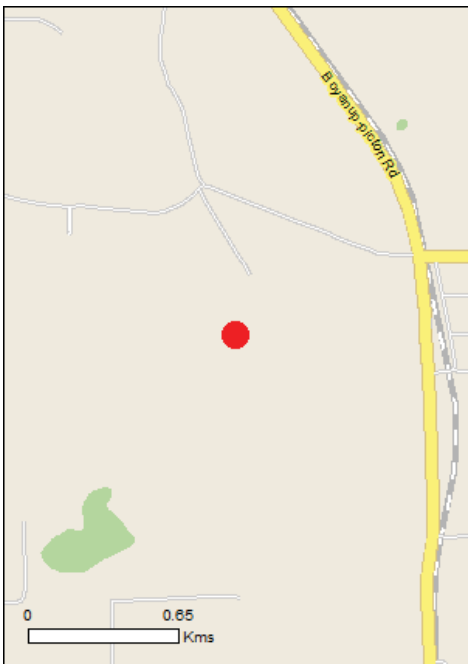
E□BC Act □rotected Matters Report

This report provides □eneral □uidance on matters of national environmental si□nificance and other matters protected by the E□BC Act in the area you have selected.

Information on the covera□e of this report and □ualifications on data supportin□ this report are contained in the caveat at the end of the report.

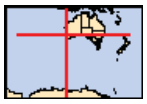
Information is available about Environment Assessments and the E□BC Act includin□ si□nificance □uidelines, forms and application process details.

Report created□30□07□21 13□23□59



This map may contain data □hich are □Common□ealth of Australia □Geoscience Australia□ □□SMA 2015

Coordinates
Buffer□0.0□m



Summary

Matters of National Environmental Si□nificance

This part of the report summarises the matters of national environmental si□nificance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, □hich can be accessed by scrollin□ or follo□in□ the links belo□. If you are proposin□ to undertake an activity that may have a si□nificant impact on one or more matters of national environmental si□nificance then you should consider the Administrative Guidelines on Si□nificance.

World □erita□e □roperties□	None
National □erita□e □laces□	None
Wetlands of International Importance□	None
Great Barrier Reef Marine □ark□	None
Common□ealth Marine Area□	None
□isted Threatened Ecolo□ical Communities□	2
□isted Threatened Species□	24
□isted Mi□ratory Species□	8

□ther Matters □rotected by the E□BC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be re□uired for a proposed activity that si□nificantly affects the environment on Common□ealth land, □hen the action is outside the Common□ealth land, or the environment any□here □hen the action is taken on Common□ealth land. Approval may also be re□uired for the Common□ealth or Common□ealth a□encies proposin□ to take an action that is likely to have a si□nificant impact on the environment any□here.

The E□BC Act protects the environment on Common□ealth land, the environment from the actions taken on Common□ealth land, and the environment from actions taken by Common□ealth a□encies. As herita□e values of a place are part of the 'environment', these aspects of the E□BC Act protect the Common□ealth □erita□e values of a Common□ealth □erita□e place. Information on the ne□ herita□e la□s can be found at http□□□□□.environment.□ov.au□herita□e

A permit may be re□uired for activities in or on a Common□ealth area that may affect a member of a listed threatened species or ecolo□ical community, a member of a listed mi□ratory species, □hales and other cetaceans, or a member of a listed marine species.

Common□ealth □and□	None
Common□ealth □erita□e □laces□	None
□isted Marine Species□	11
Whales and □ther Cetaceans□	None
Critical □abitats□	None
Common□ealth Reserves Terrestrial□	None
Australian Marine □arks□	None

E□ta Information

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

State and Territory Reserves□	None
Re□ional Forest A□reements□	None
Invasive Species□	25
Nationally Important Wetlands□	None
□ey Ecolo□ical Features □Marine□	None

Details

Matters of National Environmental Si□nificance

□isted Threatened Ecolo□ical Communities □Resource Information □

For threatened ecolo□ical communities □here the distribution is □ell kno□n, maps are derived from recovery plans, State ve□etation maps, remote sensin□ ima□ery and other sources. Where threatened ecolo□ical community distributions are less □ell kno□n, e□istin□ ve□etation maps and point location data are used to produce indicative distribution maps.

Name	Status	Type of □resence
Banksia Woodlands of the S□an Coastal □lain ecolo□ical community	Endan□ered	Community may occur □ithin area
Tuart □Eucalyptus □omphocephala□Woodlands and Forests of the S□an Coastal □lain ecolo□ical community	Critically Endan□ered	Community may occur □ithin area

□isted Threatened Species □Resource Information □

Name	Status	Type of □resence
Birds		
Botaurus poiciloptilus Australasian Bittern □1001□	Endan□ered	Species or species habitat likely to occur □ithin area
Calidris ferru□inea Curle□ Sandpiper □856□	Critically Endan□ered	Species or species habitat may occur □ithin area
Calyptorhynchus banksii naso Forest Red□tailed Black□Cockatoo, □arrak □67034□	□ulnerable	Species or species habitat likely to occur □ithin area
Calyptorhynchus baudinii Baudin's Cockatoo, □on□□billed Black□Cockatoo □769□	Endan□ered	Breedin□ kno□n to occur □ithin area
Calyptorhynchus latirostris Carnaby's Cockatoo, Short□billed Black□Cockatoo □59523□	Endan□ered	Breedin□ likely to occur □ithin area
Falco hypoleucos Grey Falcon □929□	□ulnerable	Species or species habitat may occur □ithin area
Numenius mada□ascariensis Eastern Curle□, Far Eastern Curle□ □847□	Critically Endan□ered	Species or species habitat may occur □ithin area
Mammals		
Dasyurus □eoffroii Chuditch, Western □uoll □330□	□ulnerable	Species or species habitat likely to occur □ithin area
□seudocheirus occidentalis Western Rin□tail □ossum, N□□ayir, Womp, Woder, N□oor, N□oolan□it □25911□	Critically Endan□ered	Fora□in□, feedin□ or related behaviour likely to occur □ithin area
□lants		
Andersonia □racilis Slender Andersonia □14470□	Endan□ered	Species or species habitat may occur □ithin

Name	Status	Type of □resence
		area
Banksia nivea subsp. uli□inosa S□amp □oneypot □82766□	Endan□ered	Species or species habitat may occur □ithin area
Banksia s□uarrosa subsp. ar□illacea Whicher Ran□e Dryandra □82769□	□ulnerable	Species or species habitat may occur □ithin area
Brachyscias verecundus Ironstone Brachyscias □81321□	Critically Endan□ered	Species or species habitat may occur □ithin area
Chamelaucium sp. S coastal plain □R.D.Royce 4872□ Royce's Wa□flo□er □87814□	□ulnerable	Species or species habitat may occur □ithin area
Diuris drummondii Tall Donkey □rchid □4365□	□ulnerable	Species or species habitat may occur □ithin area
Diuris micrantha D□arf Bee□orchid □55082□	□ulnerable	Species or species habitat likely to occur □ithin area
Diuris purdiei □urdie's Donkey□orchid □12950□	Endan□ered	Species or species habitat may occur □ithin area
Drakaea elastica Glossy□leafed □ammer □rchid, Glossy□leaved □ammer □rchid, Warty □ammer □rchid □16753□	Endan□ered	Species or species habitat likely to occur □ithin area
Drakaea micrantha D□arf □ammer□orchid □56755□	□ulnerable	Species or species habitat may occur □ithin area
Eleocharis kei□heryi □ei□hery's Eleocharis □64893□	□ulnerable	Species or species habitat likely to occur □ithin area
□ambertia echinata subsp. occidentalis Western □rickly □oneysuckle □64528□	Endan□ered	Species or species habitat may occur □ithin area
Synaphea sp. Fairbrid□e Farm □D. □apenfus 696□ Selena's Synaphea □82881□	Critically Endan□ered	Species or species habitat likely to occur □ithin area
Synaphea sp. Serpentine □G.R. Brand 103□ □86879□	Critically Endan□ered	Species or species habitat may occur □ithin area
Synaphea stenoloba D□ellin□up Synaphea □66311□	Endan□ered	Species or species habitat likely to occur □ithin area

□isted Mi□ratory Species

□Resource Information □

□Species is listed under a different scientific name on the E□BC Act □Threatened Species list.

Name	Threatened	Type of □resence
Mi□ratory Marine Birds		
Apus pacificus Fork□tailed S□ift □678□		Species or species habitat likely to occur □ithin area
Mi□ratory Terrestrial Species		
Motacilla cinerea Grey Wa□tail □642□		Species or species habitat may occur □ithin area
Mi□ratory Wetlands Species		

Name	Threatened	Type of □resence
Actitis hypoleucos Common Sandpiper □59309□		Species or species habitat may occur □ithin area
Calidris acuminata Sharp□tailed Sandpiper □874□		Species or species habitat may occur □ithin area
Calidris ferru□inea Curle□ Sandpiper □856□	Critically Endan□ered	Species or species habitat may occur □ithin area
Calidris melanotos □ectoral Sandpiper □858□		Species or species habitat may occur □ithin area
Numenius mada□ascariensis Eastern Curle□, Far Eastern Curle□ □847□	Critically Endan□ered	Species or species habitat may occur □ithin area
□andion haliaetus □sprey □952□		Species or species habitat may occur □ithin area

□ther Matters □rotected by the E□BC Act

□isted Marine Species	□Resource Information □
□Species is listed under a different scientific name on the E□BC Act □Threatened Species list.	

Name	Threatened	Type of □resence
Birds		
Actitis hypoleucos Common Sandpiper □59309□		Species or species habitat may occur □ithin area
Apus pacificus Fork□tailed S□ift □678□		Species or species habitat likely to occur □ithin area
Ardea ibis Cattle E□ret □59542□		Species or species habitat may occur □ithin area
Calidris acuminata Sharp□tailed Sandpiper □874□		Species or species habitat may occur □ithin area
Calidris ferru□inea Curle□ Sandpiper □856□	Critically Endan□ered	Species or species habitat may occur □ithin area
Calidris melanotos □ectoral Sandpiper □858□		Species or species habitat may occur □ithin area
□aliaeetus leuco□aster White□bellied Sea□Ea□le □943□		Species or species habitat likely to occur □ithin area
Merops ornatus Rainbo□ Bee□eater □670□		Species or species habitat may occur □ithin area
Motacilla cinerea Grey Wa□tail □642□		Species or species habitat may occur □ithin area

Name	Threatened	Type of □resence
Numenius mada□ascariensis Eastern Curle□, Far Eastern Curle□ □847□	Critically Endan□ered	Species or species habitat may occur □ithin area
□andion haliaetus □sprey □952□		Species or species habitat may occur □ithin area

E□ta Information

Invasive Species	□Resource Information □

Weeds reported here are the 20 species of national si□nificance □WoNS□, alon□ □ith other introduced plants that are considered by the States and Territories to pose a particularly si□nificant threat to biodiversity. The follo□in□ feral animals are reported□Goat, Red Fo□, Cat, Rabbit, □i□, Water Buffalo and Cane Toad. Maps from □andscape □ealth □roject, National □and and Water Resouces Audit, 2001.

Name	Status	Type of □resence
Birds		
Anas platyrhynchos Mallard □974□		Species or species habitat likely to occur □ithin area
Columba livia Rock □i□eon, Rock Dove, Domestic □i□eon □803□		Species or species habitat likely to occur □ithin area
□asser domesticus □ouse Sparro□ □405□		Species or species habitat likely to occur □ithin area
□asser montanus Eurasian Tree Sparro□ □406□		Species or species habitat likely to occur □ithin area
Streptopelia chinensis Spotted Turtle□Dove □780□		Species or species habitat likely to occur □ithin area
Streptopelia sene□alensis □au□hin□ Turtle□dove, □au□hin□ Dove □781□		Species or species habitat likely to occur □ithin area
Mammals		
Canis lupus familiaris Domestic Do□ □82654□		Species or species habitat likely to occur □ithin area
Felis catus Cat, □ouse Cat, Domestic Cat □19□		Species or species habitat likely to occur □ithin area
Feral deer Feral deer species in Australia □85733□		Species or species habitat likely to occur □ithin area
Mus musculus □ouse Mouse □120□		Species or species habitat likely to occur

Name	Status	Type of □resence
		□ithin area
□ryctola□us cuniculus Rabbit, European Rabbit □128□		Species or species habitat likely to occur □ithin area
Rattus rattus Black Rat, Ship Rat □84□		Species or species habitat likely to occur □ithin area
Sus scrofa □i□ □6□		Species or species habitat likely to occur □ithin area
□ulpes vulpes Red Fo□, Fo□ □18□		Species or species habitat likely to occur □ithin area
□lants		
Anredera cordifolia Madeira □ine, □alap, □amb's□ail, Mi□nonette □ine, Anredera, Gulf Madeiravine, □eartleaf Madeiravine, □otato □ine □2643□		Species or species habitat likely to occur □ithin area
Aspara□us aspara□oides Bridal Creeper, Bridal □eil Creeper, Smila□, Florist's Smila□, Smila□Aspara□us □22473□		Species or species habitat likely to occur □ithin area
Brachiaria mutica □ara Grass □5879□		Species or species habitat may occur □ithin area
Cenchrus ciliaris Buffel□□rass, Black Buffel□□rass □20213□		Species or species habitat may occur □ithin area
Chrysanthemoides monilifera Bitou Bush, Boneseed □18983□		Species or species habitat may occur □ithin area
Genista sp. □ Genista monspessulana Broom □67538□		Species or species habitat may occur □ithin area
□ycium ferocissimum African Bo□thorn, Bo□thorn □19235□		Species or species habitat likely to occur □ithin area
□lea europaea □live, Common □live □9160□		Species or species habitat may occur □ithin area
□inus radiata Radiata □ine Monterey □ine, Insi□nis □ine, Wildin□ □ine □20780□		Species or species habitat may occur □ithin area
Rubus fruticosus a□□re□ate Blackberry, European Blackberry □68406□		Species or species habitat likely to occur □ithin area
Sali□spp. e□cept S.babylonica, S.□calodendron □ S.□reichardtii Willo□s e□cept Weepin□ Willo□, □ussy Willo□ and Sterile □ussy Willo□ □68497□		Species or species habitat likely to occur □ithin area

Caveat

The information presented in this report has been provided by a ran□e of data sources as ackno□led□ed at the end of the report.

This report is desi□ned to assist in identifyin□ the locations of places □hich may be relevant in determinin□ obli□ations under the Environment □rotection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National □erita□e properties, Wetlands of International and National Importance, Common□ealth and State□Territory reserves, listed threatened, mi□ratory and marine species and listed threatened ecolo□ical communities. Mappin□ of Common□ealth land is not complete at this sta□e. Maps have been collated from a ran□e of sources at various resolutions.

Not all species listed under the E□BC Act have been mapped □see belo□□and therefore a report is a □eneral □uide only. Where available data supports mappin□, the type of presence that can be determined from the data is indicated in □eneral terms. □eople usin□ this information in makin□ a referral may need to consider the □ualifications belo□ and may need to seek and consider other information sources.

For threatened ecolo□ical communities □here the distribution is □ell kno□n, maps are derived from recovery plans, State ve□etation maps, remote sensin□ ima□ery and other sources. Where threatened ecolo□ical community distributions are less □ell kno□n, e□istin□ ve□etation maps and point location data are used to produce indicative distribution maps.

Threatened, mi□ratory and marine species distributions have been derived throu□h a variety of methods. Where distributions are □ell kno□n and if time permits, maps are derived usin□ either thematic spatial data □i.e. ve□etation, soils, □eolo□y, elevation, aspect, terrain, etc□to□ether □ith point locations and described habitat□or environmental modellin□ □MA□ENT or BI□C□IM habitat modellin□□usin□ point locations and environmental data layers.

Where very little information is available for species or lar□e number of maps are re□uired in a short time□frame, maps are derived either from 0.04 or 0.02 decimal de□ree cells□by an automated process usin□ poly□on capture techni□ues □static t□o kilometre □rid cells, alpha□hull and conve□hull□□ or captured manually or by usin□ topo□raphic features □national park boundaries, islands, etc□ In the early sta□es of the distribution mappin□ process □1999□early 2000s□distributions □ere defined by de□ree blocks, 100□ or 250□ map sheets to rapidly create distribution maps. More reliable distribution mappin□ methods are used to update these distributions as time permits.

□nly selected species covered by the follo□in□ provisions of the E□BC Act have been mapped□

- □mi□ratory and
- □marine

The follo□in□ species and ecolo□ical communities have not been mapped and do not appear in reports produced from this database□

- □threatened species listed as e□tinct or considered as va□rants
- □some species and ecolo□ical communities that have only recently been listed
- □some terrestrial species that overfly the Common□ealth marine area
- □mi□ratory species that are very □idespread, va□rant, or only occur in small numbers

The follo□in□ □roups have been mapped, but may not cover the complete distribution of the species□

- □non□threatened seabirds □hich have only been mapped for recorded breedin□ sites
- □seals □hich have only been mapped for breedin□ sites near the Australian continent

Such breedin□ sites may be important for the protection of the Common□ealth Marine environment.

Coordinates

□33.40062 115.74619

Ackno□led□ements

This database has been compiled from a ran□e of data sources. The department ackno□led□es the follo□in□ custodians □ho have contributed valuable data and advice□

- □□ffice of Environment and □erita□e, Ne□ South Wales
- □Department of Environment and □rimary Industries, □ictoria
- □Department of □rimary Industries, □arks, Water and Environment, Tasmania
- □Department of Environment, Water and Natural Resources, South Australia
- □Department of □and and Resource Mana□ement, Northern Territory
- □Department of Environmental and □erita□e □rotection, □ueensland
- □Department of □arks and Wildlife, Western Australia
- □Environment and □lannin□ Directorate, ACT
- □Birdlife Australia
- □Australian Bird and Bat Bandin□ Scheme
- □Australian National Wildlife Collection
- □Natural history museums of Australia
- □Museum □ictoria
- □Australian Museum
- □South Australian Museum
- □□ueensland Museum
- □□nline □oolo□ical Collections of Australian Museums
- □□ueensland □erbarium
- □National □erbarium of NSW
- □Royal Botanic Gardens and National □erbarium of □ictoria
- □Tasmanian □erbarium
- □State □erbarium of South Australia
- □Northern Territory □erbarium
- □Western Australian □erbarium
- □Australian National □erbarium, Canberra
- □□niversity of Ne□ En□land
- □□cean Bio□eo□raphic Information System
- □Australian Government, Department of Defence
- Forestry Corporation, NSW
- □Geoscience Australia
- □CSIR□
- □Australian Tropical □erbarium, Cairns
- □eBird Australia
- □Australian Government □Australian Antarctic Data Centre
- □Museum and Art Gallery of the Northern Territory
- □Australian Government National Environmental Science □ro□ram
- □Australian Institute of Marine Science
- □Reef □ife Survey Australia
- □American Museum of Natural □istory
- □□ueen □ictoria Museum and Art Gallery, Inveresk, Tasmania
- □Tasmanian Museum and Art Gallery, □obart, Tasmania
- □□ther □roups and individuals

The Department is e□tremely □rateful to the many or□anisations and individuals □ho provided e□pert advice and information on numerous draft distributions.

□lease feel free to provide feedback via the Contact □s pa□e.

□ Common□ealth of Australia
Department of A□riculture Water and the Environment
G□□ Bo□858
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APPENDIX C

OBSERVED FAUNA LISTING

Fauna Observed During Survey Period

Lot 185 and Lot 2 Harold Douglas Drive, Dardanup

Compiled by Greg Harewood - Nov 2021

Class **Family** *Species*	Common Name	Conservation Status
Osteichthyes		
Poeciliidae Livebearers		
Gambusia holbrooki	Mosquito Fish	Introduced
Amphibia		
Myobatrachidae Ground or Burrowing Frogs		
Crinia glauerti	Clicking Frog	LC
Crinia insignifera	Squelching Froglet	LC
Hylidae Tree or Water-Holding Frogs		
Litoria adelaidensis	Slender Tree Frog	LC
Litoria moorei	Motorbike Frog	LC
Reptilia		
Scincidae Skinks		
Egernia kingii	King's Skink	LC
Aves		
Anatidae Geese, Swans, Ducks		
Anas superciliosa	Pacific Black Duck	LC
Chenonetta jubata	Australian Wood Duck	LC
Phalacrocoracidae Cormorants		
Phalacrocorax melanoleucos	Little Pied Cormorant	LC
Ardeidae Herons, Egrets, Bitterns		
Ardea novaehollandiae	White-faced Heron	LC

BC Act Status - S1 to S7, EPBC Act Status - CR = Critically Endangered, EN = Endangered, VU = Vulnerable, EX = Extinct, DBCA Priority Status - P1 to P4, Bush Forever Decreaser Species - Bh = habitat specialists, Bp = wide ranging species, Be = extinct in Perth Coastal Plain Region, Int. Agmts - CA = CAMBA, JA = JAMBA, RK = ROKAMBA, IUCN Red List Category Definitions LC = Least Concern - see http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria for others.

Class **Family** *Species*	Common Name	Conservation Status
Threskiornithidae Ibises, Spoonbills		
Threskiornis molucca	Australian White Ibis	LC
Threskiornis spinicollis	Straw-necked Ibis	LC
Falconidae Falcons		
Falco cenchroides	Australian Kestrel	LC
Columbidae Pigeons, Doves		
Ocyphaps lophotes	Crested Pigeon	LC
Phaps chalcoptera	Common Bronzewing	Bh LC
Psittacidae Parrots		
Cacatua roseicapilla	Galah	LC
Platycercus spurius	Red-capped Parrot	LC
Platycercus zonarius	Australian Ringneck	LC
Cuculidae Parasitic Cuckoos		
Chrysococcyx lucidus	Shining Bronze Cuckoo	LC
Strigidae Hawk Owls		
Ninox novaeseelandiae	Boobook Owl	LC
Halcyonidae Tree Kingfishers		
Dacelo novaeguineae	Laughing Kookaburra	Introduced
Todiramphus sanctus	Sacred Kingfisher	LC
Acanthizidae Thornbills, Geryones, Fieldwrens & Whitefaces		
Acanthiza chrysorrhoa	Yellow-rumped Thornbill	Bh LC
Smicrornis brevirostris	Weebill	Bh LC

BC Act Status - S1 to S7, EPBC Act Status - CR = Critically Endangered, EN = Endangered, VU = Vulnerable, EX = Extinct, DBCA Priority Status - P1 to P4, Bush Forever Decreaser Species - Bh = habitat specialists, Bp = wide ranging species, Be = extinct in Perth Coastal Plain Region, Int. Agmts - CA = CAMBA, JA = JAMBA, RK = ROKAMBA, IUCN Red List Category Definitions LC = Least Concern - see http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria for others.

Class **Family** *Species*	Common Name	Conservation Status
Pardalotidae Pardalotes		
Pardalotus striatus	Striated Pardalote	LC
Meliphagidae Honeyeaters, Chats		
Anthochaera carunculata	Red Wattlebird	LC
Lichmera indistincta	Brown Honeyeater	LC
Dicruridae Monarchs, Magpie Lark, Flycatchers, Fantails, Drongo		
Grallina cyanoleuca	Magpie-lark	LC
Rhipidura fuliginosa	Grey Fantail	LC
Rhipidura leucophrys	Willie Wagtail	LC
Campephagidae Cuckoo-shrikes, Trillers		
Coracina novaehollandiae	Black-faced Cuckoo-shrike	LC
Cracticidae Currawongs, Magpies & Butcherbirds		
Cracticus tibicen	Australian Magpie	LC
Cracticus torquatus	Grey Butcherbird	LC
Corvidae Ravens, Crows		
Corvus coronoides	Australian Raven	LC
Hirundinidae Swallows, Martins		
Hirundo neoxena	Welcome Swallow	LC
Hirundo nigricans	Tree Martin	LC
Mammalia		
Phalangeridae Brushtail Possums, Cuscuses		
Trichosurus vulpecula vulpecula	Common Brushtail Possum	LC

BC Act Status - S1 to S7, EPBC Act Status - CR = Critically Endangered, EN = Endangered, VU = Vulnerable, EX = Extinct, DBCA Priority Status - P1 to P4, Bush Forever Decreaser Species - Bh = habitat specialists, Bp = wide ranging species, Be = extinct in Perth Coastal Plain Region, Int. Agmts - CA = CAMBA, JA = JAMBA, RK = ROKAMBA, IUCN Red List Category Definitions LC = Least Concern - see http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria for others.

Class **Family** *Species*	Common Name	Conservation Status
Pseudocheiridae Ringtail Posssums		
Pseudocheirus occidentalis	Western Ringtail Possum	S1 CR CE
Macropodidae Kangaroos, Wallabies		
Macropus fuliginosus	Western Grey Kangaroo	LC
Canidae Dogs, Foxes		
Vulpes vulpes	Red Fox	Introduced

BC Act Status - S1 to S7, EPBC Act Status - CR = Critically Endangered, EN = Endangered, VU = Vulnerable, EX = Extinct, DBCA Priority Status - P1 to P4, Bush Forever Decreaser Species - Bh = habitat specialists, Bp = wide ranging species, Be = extinct in Perth Coastal Plain Region, Int. Agmts - CA = CAMBA, JA = JAMBA, RK = ROKAMBA, IUCN Red List Category Definitions LC = Least Concern - see http://www.iucnredlist.org/technical-documents/categories-and-criteria/2001-categories-criteria for others.

APPENDIX D

HABITAT TREE DETAILS

Habitat Trees
DBH >50cm
Datum - GDA94
Entrance Size Ranges - Small = >5cm, Medium = 5 to 10cm, Large = >10cm

Waypoint Number	Zone	mE	mN	Tree Species	DBH (cm)	Tree Height (m)	Number of Hollows	Estimated Hollow Entrance Size Range (cm)	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt001	50H	382851	6303452	Marri	>50	15-20	0					
wpt002	50H	382826	6303396	Dead Jarrah	>50	15-20	0					
wpt003	50H	382876	6303335	Jarrah	>50	15-20	0					
wpt004	50H	382879	6303335	Marri	>50	15-20	0					
wpt005	50H	382891	6303326	Marri	>50	15-20	0					
wpt006	50H	382911	6303352	Marri	>50	20+	0					
wpt007	50H	382862	6303251	Marri	>50	15-20	0					
wpt008	50H	382870	6303239	Marri	>50	15-20	0					
wpt009	50H	382875	6303222	Flooded Gum	>50	15-20	0					
wpt010	50H	382827	6303234	Flooded Gum	>50	15-20	0					
wpt011	50H	382825	6303172	Flooded Gum	>50	15-20	0					
wpt012	50H	382845	6303142	Flooded Gum	>50	10-15	0					
wpt013	50H	382870	6303124	Flooded Gum	>50	10-15	1	Medium	No Signs	No Signs	No	
wpt014	50H	382854	6303117	Flooded Gum	>50	10-15	0					
wpt015	50H	382819	6303086	Flooded Gum	>50	10-15	2+	Small-Medium	No Signs	No Signs	No	
wpt016	50H	382854	6303077	Flooded Gum	>50	15-20	0					
wpt017	50H	382856	6303080	Flooded Gum	>50	15-20	0					
wpt018	50H	382864	6303086	Flooded Gum	>50	15-20	0					
wpt019	50H	382892	6303176	Flooded Gum	>50	15-20	0					
wpt020	50H	383005	6303112	Flooded Gum	>50	15-20	0					
wpt021	50H	383068	6303151	Flooded Gum	>50	10-15	1	Small	No Signs	No Signs	No	
wpt022	50H	383178	6303153	Flooded Gum	>50	10-15	0					
wpt023	50H	383213	6303164	Flooded Gum	>50	15-20	0					
wpt024	50H	383215	6303166	Flooded Gum	>50	15-20	0					
wpt025	50H	383204	6303211	Flooded Gum	>50	15-20	0					
wpt026	50H	383106	6303244	Flooded Gum	>50	15-20	0					
wpt027	50H	383151	6303315	Flooded Gum	>50	15-20	0					
wpt028	50H	383217	6303365	Flooded Gum	>50	15-20	2+	Small-Medium	No Signs	No Signs	No	
wpt029	50H	383219	6303369	Flooded Gum	>50	15-20	2+	Small-Medium	No Signs	No Signs	No	
wpt030	50H	383224	6303392	Flooded Gum	>50	15-20	0					
wpt031	50H	383228	6303408	Flooded Gum	>50	15-20	0					
wpt032	50H	383253	6303438	Flooded Gum	>50	15-20	2+	Small-Medium	No Signs	No Signs	No	
wpt033	50H	383410	6303366	Flooded Gum	>50	15-20	0					
wpt034	50H	383409	6303376	Flooded Gum	>50	15-20	0					
wpt035	50H	383414	6303457	Flooded Gum	>50	15-20	0					
wpt036	50H	383422	6303472	Flooded Gum	>50	15-20	0					

Waypoint Number	Zone	mE	mN	Tree Species	DBH (cm)	Tree Height (m)	Number of Hollows	Estimated Hollow Entrance Size Range (cm)	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt037	50H	383427	6303477	Flooded Gum	>50	15-20	0					
wpt038	50H	383438	6303501	Flooded Gum	>50	15-20	0					
wpt039	50H	383441	6303503	Flooded Gum	>50	15-20	0					
wpt040	50H	383441	6303515	Flooded Gum	>50	15-20	0					
wpt041	50H	383443	6303520	Flooded Gum	>50	15-20	0					
wpt042	50H	383565	6303473	Flooded Gum	>50	15-20	0					
wpt043	50H	383591	6303473	Flooded Gum	>50	10-15	0					
wpt044	50H	383603	6303473	Flooded Gum	>50	15-20	0					
wpt045	50H	383621	6303474	Flooded Gum	>50	10-15	0					
wpt046	50H	383897	6303740	Flooded Gum	>50	15-20	2+	Small-Medium	No Signs	No Signs	No	
wpt047	50H	383715	6303607	Flooded Gum	>50	15-20	2+	Small-Medium	No Signs	No Signs	No	
wpt048	50H	383737	6303621	Flooded Gum	>50	15-20	0					
wpt049	50H	383795	6303664	Flooded Gum	>50	10-15	0					
wpt050	50H	383803	6303671	Flooded Gum	>50	10-15	0					
wpt051	50H	383841	6303702	Flooded Gum	>50	10-15	0					
wpt052	50H	383859	6303768	Flooded Gum	>50	15-20	0					
wpt053	50H	383525	6303672	Flooded Gum	>50	15-20	0					
wpt054	50H	383502	6303685	Flooded Gum	>50	10-15	2+	Small-Medium	No Signs	No Signs	No	
wpt055	50H	383520	6303657	Flooded Gum	>50	15-20	0					
wpt056	50H	383510	6303646	Flooded Gum	>50	10-15	1	Medium	No Signs	No Signs	No	
wpt057	50H	383511	6303647	Flooded Gum	>50	15-20	0					
wpt058	50H	383512	6303644	Flooded Gum	>50	5-10	0					
wpt059	50H	383491	6303628	Flooded Gum	>50	15-20	0					
wpt060	50H	383488	6303630	Flooded Gum	>50	10-15	2+	Small-Medium	No Signs	No Signs	No	
wpt061	50H	383479	6303625	Flooded Gum	>50	15-20	1	Large (cockatoo)	No Signs	Rub marks	Yes	Side entry - possibly in use by possums
wpt062	50H	383481	6303616	Flooded Gum	>50	15-20	0					
wpt063	50H	383496	6303597	Flooded Gum	>50	15-20	0					
wpt064	50H	383483	6303611	Flooded Gum	>50	0-5	1	Medium	No Signs	No Signs	No	
wpt065	50H	383461	6303590	Flooded Gum	>50	15-20	0					
wpt066	50H	383464	6303591	Flooded Gum	>50	10-15	0					
wpt067	50H	383474	6303646	Flooded Gum	>50	15-20	2+	Medium-Large (cockatoo)	No Signs	No Signs	Yes	Chimney
wpt068	50H	383470	6303641	Flooded Gum	>50	15-20	0					
wpt069	50H	383461	6303631	Flooded Gum	>50	15-20	0					
wpt070	50H	383458	6303627	Flooded Gum	>50	0-5	1	Medium	No Signs	No Signs	No	
wpt071	50H	383459	6303625	Flooded Gum	>50	10-15	0					
wpt072	50H	383454	6303597	Flooded Gum	>50	20+	0					
wpt073	50H	383381	6303707	Unknown Euc	>50	15-20	0					Planted non-endemic
wpt074	50H	383382	6303708	Unknown Euc	>50	15-20	0					Planted non-endemic
wpt075	50H	383383	6303714	Unknown Euc	>50	15-20	0					Planted non-endemic
wpt076	50H	383387	6303722	Unknown Euc	>50	15-20	0					Planted non-endemic

Waypoint Number	Zone	mE	mN	Tree Species	DBH (cm)	Tree Height (m)	Number of Hollows	Estimated Hollow Entrance Size Range (cm)	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt077	50H	383393	6303745	Flooded Gum	>50	10-15	0					
wpt078	50H	383391	6303750	Flooded Gum	>50	15-20	1	Large (cockatoo)	No Signs	No Signs	Yes	Side entry
wpt079	50H	383267	6303730	Flooded Gum	>50	15-20	2+	Small-Medium	No Signs	No Signs	No	
wpt080	50H	383256	6303729	Flooded Gum	>50	5-10	0					
wpt081	50H	383256	6303712	Unknown Euc	>50	15-20	0					Planted non-endemic
wpt082	50H	383260	6303705	Unknown Euc	>50	15-20	0					Planted non-endemic
wpt083	50H	383269	6303698	Unknown Euc	>50	15-20	0					Planted non-endemic
wpt084	50H	383271	6303694	Unknown Euc	>50	15-20	0					Planted non-endemic
wpt085	50H	383275	6303690	Unknown Euc	>50	15-20	0					Planted non-endemic
wpt086	50H	383281	6303683	Unknown Euc	>50	15-20	0					Planted non-endemic
wpt087	50H	383282	6303681	Unknown Euc	>50	15-20	0					Planted non-endemic
wpt088	50H	383315	6303593	Flooded Gum	>50	20+	0					
wpt089	50H	383319	6303576	Flooded Gum	>50	5-10	0					
wpt090	50H	383301	6303572	Flooded Gum	>50	15-20	1	Large (cockatoo)	No Signs	No Signs	Yes	Side entry
wpt091	50H	383298	6303574	Flooded Gum	>50	10-15	0					
wpt092	50H	383287	6303565	Flooded Gum	>50	20+	0					
wpt093	50H	383286	6303560	Flooded Gum	>50	20+	2+	Small-Medium	No Signs	No Signs	No	
wpt0930	50H	383195	6303664	Flooded Gum	>50	15-20	1	Large	No Signs	No Signs	No	Fissure, appears unsuitablefor BCs
wpt094	50H	383278	6303556	Flooded Gum	>50	10-15	2+	Small-Medium	No Signs	No Signs	No	
wpt0940	50H	383159	6303650	Flooded Gum	>50	10-15	2+	Small-Medium	No Signs	No Signs	No	
wpt095	50H	383273	6303560	Flooded Gum	>50	10-15	1	Medium	No Signs	No Signs	No	
wpt0950	50H	383154	6303640	Flooded Gum	>50	15-20	2+	Small-Medium	No Signs	No Signs	No	
wpt096	50H	383233	6303594	Flooded Gum	>50	15-20	2+	Small	No Signs	No Signs	No	
wpt0960	50H	383144	6303642	Flooded Gum	>50	15-20	2+	Small	No Signs	No Signs	No	
wpt097	50H	383241	6303547	Flooded Gum	>50	15-20	2+	Small-Medium	No Signs	No Signs	No	
wpt098	50H	383240	6303554	Flooded Gum	>50	15-20	2+	Small-Medium	No Signs	No Signs	No	
wpt099	50H	383222	6303539	Flooded Gum	>50	15-20	2+	Small-Medium	No Signs	No Signs	No	
wpt100	50H	383228	6303463	Flooded Gum	>50	10-15	0					
wpt101	50H	383229	6303465	Flooded Gum	>50	15-20	0					
wpt102	50H	383222	6303485	Flooded Gum	>50	15-20	2+	Small-Medium	No Signs	No Signs	No	
wpt103	50H	383234	6303489	Dead Flooded Gum	>50	10-15	2+	Medium	No Signs	No Signs	No	
wpt104	50H	383051	6303443	Dead Flooded Gum	>50	10-15	2+	Medium	No Signs	No Signs	No	
wpt105	50H	383033	6303371	Dead Flooded Gum	>50	10-15	0					
wpt106	50H	383026	6303327	Flooded Gum	>50	15-20	0					
wpt107	50H	383034	6303280	Flooded Gum	>50	10-15	0					
wpt108	50H	382972	6303298	Flooded Gum	>50	10-15	0					
wpt109	50H	382944	6303274	Flooded Gum	>50	10-15	0					
wpt110	50H	382931	6303256	Flooded Gum	>50	10-15	0					
wpt111	50H	382919	6303236	Flooded Gum	>50	10-15	0					
wpt112	50H	382919	6303232	Flooded Gum	>50	15-20	2+	Small-Medium	No Signs	No Signs	No	

Waypoint Number	Zone	mE	mN	Tree Species	DBH (cm)	Tree Height (m)	Number of Hollows	Estimated Hollow Entrance Size Range (cm)	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt113	50H	382964	6303327	Flooded Gum	>50	15-20	0					
wpt114	50H	382979	6303360	Flooded Gum	>50	15-20	0					
wpt115	50H	382988	6303367	Flooded Gum	>50	15-20	0					
wpt116	50H	382996	6303366	Flooded Gum	>50	15-20	0					
wpt117	50H	382893	6303594	Flooded Gum	>50	15-20	0					
wpt118	50H	382858	6303628	Marri	>50	15-20	0					
wpt119	50H	382866	6303636	Flooded Gum	>50	20+	0					
wpt120	50H	382860	6303641	Marri	>50	15-20	0					
wpt121	50H	382875	6303662	Marri	>50	15-20	0					
wpt122	50H	382883	6303667	Flooded Gum	>50	15-20	0					
wpt123	50H	382813	6303645	Marri	>50	15-20	0					
wpt124	50H	382819	6303635	Flooded Gum	>50	5-10	0					
wpt125	50H	382807	6303615	Marri	>50	15-20	0					
wpt126	50H	382807	6303613	Flooded Gum	>50	15-20	0					
wpt127	50H	382832	6303610	Flooded Gum	>50	15-20	0					
wpt128	50H	382827	6303548	Flooded Gum	>50	15-20	0					
wpt129	50H	382906	6303635	Flooded Gum	>50	15-20	0					
wpt130	50H	382919	6303629	Flooded Gum	>50	15-20	0					
wpt131	50H	382967	6303693	Flooded Gum	>50	15-20	0					
wpt132	50H	382973	6303715	Marri	>50	15-20	1	Medium	No Signs	No Signs	No	
wpt133	50H	382979	6303717	Marri	>50	20+	1	Medium	No Signs	No Signs	No	
wpt134	50H	382978	6303719	Marri	>50	15-20	0					
wpt135	50H	382981	6303722	Flooded Gum	>50	15-20	0					
wpt136	50H	382987	6303724	Marri	>50	15-20	0					
wpt137	50H	382998	6303725	Marri	>50	15-20	0					
wpt138	50H	383000	6303726	Marri	>50	15-20	0					
wpt139	50H	383003	6303728	Marri	>50	15-20	0					
wpt140	50H	383003	6303726	Flooded Gum	>50	15-20	0					
wpt141	50H	383008	6303727	Flooded Gum	>50	15-20	2+	Small-Medium	No Signs	No Signs	No	
wpt142	50H	383025	6303729	Flooded Gum	>50	10-15	2+	Small-Medium	No Signs	No Signs	No	
wpt143	50H	383058	6303728	Flooded Gum	>50	15-20	0					
wpt144	50H	383066	6303731	Flooded Gum	>50	10-15	2+	Small-Medium	No Signs	No Signs	No	
wpt145	50H	383064	6303732	Flooded Gum	>50	10-15	2+	Small-Medium	No Signs	No Signs	No	
wpt146	50H	383086	6303729	Flooded Gum	>50	15-20	2+	Small-Medium	No Signs	No Signs	No	
wpt147	50H	383091	6303730	Flooded Gum	>50	15-20	0					
wpt148	50H	383106	6303737	Flooded Gum	>50	15-20	2+	Small	No Signs	No Signs	No	
wpt149	50H	383111	6303743	Flooded Gum	>50	15-20	0					
wpt150	50H	383129	6303750	Flooded Gum	>50	15-20	2+	Small	No Signs	No Signs	No	
wpt151	50H	383153	6303761	Flooded Gum	>50	15-20	2+	Small-Medium	No Signs	No Signs	No	
wpt152	50H	383160	6303765	Flooded Gum	>50	15-20	0					

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wpt153	50H	383167	6303768	Flooded Gum	>50	15-20	0					
wpt154	50H	383178	6303778	Flooded Gum	>50	15-20	0					
wpt155	50H	383194	6303785	Flooded Gum	>50	15-20	2+	Small	No Signs	No Signs	No	
wpt156	50H	383190	6303796	Flooded Gum	>50	10-15	0					
wpt157	50H	383201	6303798	Flooded Gum	>50	10-15	0					
wpt158	50H	383209	6303792	Flooded Gum	>50	10-15	2+	Small-Medium	No Signs	No Signs	No	Two trees together
wpt159	50H	383230	6303806	Flooded Gum	>50	15-20	0					
wpt160	50H	383236	6303793	Flooded Gum	>50	15-20	0					
wpt161	50H	383251	6303787	Flooded Gum	>50	10-15	0					
wpt162	50H	383241	6303780	Flooded Gum	>50	10-15	0					
wpt163	50H	383256	6303781	Flooded Gum	>50	15-20	0					
wpt164	50H	383261	6303783	Flooded Gum	>50	15-20	1	Large	No Signs	No Signs	No	Too low/shallow
wpt165	50H	383262	6303783	Flooded Gum	>50	15-20	0					
wpt166	50H	383265	6303776	Flooded Gum	>50	10-15	0					
wpt167	50H	383314	6303787	Flooded Gum	>50	15-20	0					
wpt168	50H	383315	6303770	Flooded Gum	>50	15-20	0					
wpt169	50H	383347	6303764	Flooded Gum	>50	15-20	0					
wpt170	50H	383350	6303764	Flooded Gum	>50	10-15	0					
wpt171	50H	383374	6303777	Flooded Gum	>50	15-20	0					
wpt172	50H	383374	6303821	Flooded Gum	>50	15-20	0					
wpt173	50H	383425	6303830	Flooded Gum	>50	15-20	0					
wpt174	50H	383425	6303837	Flooded Gum	>50	15-20	0					
wpt175	50H	383421	6303851	Flooded Gum	>50	15-20	0					
wpt176	50H	383423	6303855	Flooded Gum	>50	15-20	0					
wpt177	50H	383462	6303978	Flooded Gum	>50	15-20	0					
wpt178	50H	383416	6304044	Flooded Gum	>50	15-20	0					
wpt179	50H	383325	6303861	Flooded Gum	>50	20+	2+	Small-Medium	No Signs	No Signs	No	
wpt180	50H	383141	6303794	Flooded Gum	>50	15-20	2+	Small-Medium	No Signs	No Signs	No	
wpt181	50H	383151	6303771	Flooded Gum	>50	15-20	0					
wpt182	50H	383134	6303763	Flooded Gum	>50	10-15	0					
wpt183	50H	383120	6303752	Flooded Gum	>50	10-15	2+	Small-Medium	No Signs	No Signs	No	
wpt184	50H	383109	6303752	Flooded Gum	>50	10-15	2+	Small-Medium	No Signs	No Signs	No	
wpt185	50H	383080	6303733	Flooded Gum	>50	10-15	2+	Small-Medium	No Signs	No Signs	No	
wpt186	50H	383070	6303735	Flooded Gum	>50	10-15	2+	Small-Medium	No Signs	No Signs	No	
wpt187	50H	383045	6303737	Flooded Gum	>50	0-5	1	Medium	No Signs	No Signs	No	
wpt188	50H	383039	6303732	Flooded Gum	>50	10-15	0					
wpt189	50H	383019	6303735	Flooded Gum	>50	15-20	0					
wpt190	50H	383016	6303736	Flooded Gum	>50	10-15	2+	Small-Medium	No Signs	No Signs	No	
wpt191	50H	383005	6303735	Flooded Gum	>50	15-20	0					
wpt192	50H	382984	6303733	Flooded Gum	>50	15-20	0					

Waypoint Number	Zone	mE	mN	Tree Species	DBH (cm)	Tree Height (m)	Number of Hollows	Estimated Hollow Entrance Size Range (cm)	Occupancy	Chew Marks	Potential Cockatoo Nest Hollow	Comments
wpt193	50H	382958	6303719	Flooded Gum	>50	10-15	0					
wpt194	50H	382933	6303692	Marri	>50	15-20	0					
wpt195	50H	382887	6303684	Marri	>50	15-20	0					
wpt196	50H	382851	6303680	Marri	>50	15-20	0					
wpt197	50H	382834	6303671	Dead Unknown	>50	15-20	0					
wpt198	50H	383355	6303959	Flooded Gum	>50	15-20	2+	Small-Medium	No Signs	No Signs	No	
wpt199	50H	383357	6303957	Flooded Gum	>50	10-15	0					
wpt200	50H	383405	6304061	Flooded Gum	>50	10-15	0					

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