360 environmental

Mogumber Poultry Farm
Access Road

Application for a Native Vegetation Clearing Permit – Area Permit

Prepared for:
Santrev Ptd Ltd

September 2018

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Table of Contents

List of Tables

List of Figures

List of Appendices

1 Introduction

360 Environmental Pty Ltd (360 Environmental) was commissioned by Santrev Pty Ltd (Santrev) to prepare a Native Vegetation Clearing Permit (NVCP) application to support clearing for an access road between poultry farms ('the Project'). The Project is located at Lot 10 Mogumber Road West, Mogumber ('the site') and will involve clearing to widen an existing access track between an existing Poultry Farm (Farm 1) and a Poultry Farm in development (Farm 2) that will support expanded operations. It is important to note that this NVCP application is only for the upgrade of the connecting track.

Lot 10 Mogumber Road West, Mogumber has received planning approval on 20 April 2017 for the development of six broiler poultry farms with internal access roads as per the Joint Development Assessment Panel (JDAP) determination attached to the C1 Application Form.

The NVCP application area is approximately 0.83 ha of which includes 0.52 ha of an existing cleared track and 0.31 ha of native vegetation, which is proposed to be cleared to support the Project.

The site is zoned 'Rural' under the Shire of Victoria Plains Local Planning Scheme No. 5 (LPS 5).

1.1 Purpose of Document

The purpose of this document is to present the results of an assessment of the clearing aspects of the Proposal against the ten clearing principles as outlined in the (then) Department of Environment Regulation (DER) *Guide to Assessment: Clearing of Native Vegetation under the Environmental Protection Act 1986* (EP Act). This report identifies the potential environmental impacts associated with the Proposal based on the best available data. This NVCP will be submitted to the (now) Department of Water and Environmental Regulation (DWER) for assessment.

1.2 Responsible Person

Santrev is responsible for implementation of the clearing described within this document. Correspondence relating to this NVCP application should be addressed to:

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2 Site Overview

2.1 Location

The site location is within Lot 10 Mogumber Road West, Mogumber situated approximately 61 km east of the town of Lancelin, Western Australia (Figure 1). The application area for the access road is approximately 0.83 ha in size (Figure 2).

2.2 Bioregion

The proposed access track is located within one bioregion, the Swan Coastal Plain of the Interim Biogeographic Regionalisation of Australia (IBRA).

The Swan Coastal Plain 1 *Dandaragan Plateau* subregion is a plateau bordered by Derby and Dandaragan Faults. Cretaceous marine sediments are mantled by sands and laterites. Characterised by *Banksia* low woodland, Jarrah – Marri woodland, Marri woodland, and by scrub-heaths on laterite pavement and on gravelly sandplains. The climate is warm Mediterranean and the annual rainfall for the subregion is 700 mm (Desmond 2001).

2.3 Topography

The topography of the site is gently undulating with elevations between 171 m Australian Height Datum (AHD) to 183 AHD, sloping towards the east.

2.4 Geology

1:250,000 surface geology profile mapping indicates the geology of the site is typically Sand Plain 38499 characterised as sand or gravel plains; quartz sand sheets commonly with ferruginous pisoliths or pebbles, minor clay; local calcrete, laterite, siltrate, silt, clay, alluvium, colluvium, aeolian sand (GSWA 2008).

Soil landscapes and land system mapping has identified the entire application area as within the following land system:

- **222Cp – Capitella System:** Subdued stripped lateritic plateau, undulating to gently undulating low rises with gently undulating plain including dunes; pale and yellow deep sands, sandy gravels, some duplex (DAFWA 2012).

Soil subsystem mapping has identified the application area is within the following subsystems:

- **222Cp_3b – Capitella 3 gentle slope Phase:** Very gently inclined slopes, plain, some dunes; peel deep and gravelly deep sand;
- **222Cp_6a – Capitella 6 low dunes Phase:** plain with very low dunes; pale and yellow deep sands;

- **222Cp_5a – Capitella 5 dry Phase:** low dunes in sand filled drainage depressions, no shallow groundwater influence; pale and yellow deep sands (DAFWA 2008) (Figure 3).

2.5 Broad Vegetation Associations

Mapping of the vegetation of the Perth of WA was completed on a broad scale (1:250,000) by Beard (1981). These vegetation units were re-assessed by Shepherd *et al.* (2001) to account for clearing in the intensive land use zone, dividing some larger vegetation units into smaller units.

There are two Beard/Shepherd vegetation units within the application area (Figure 4). The Shepherd *et al.* (2001) vegetation types are described below and its representation within the State, IBRA region, subregions and Local Government area are shown in Table 1:

- **Gingin 949:** Low woodland or open woodland; and
- **Gingin 1015:** Scrub-heath/heath.

Table 1: Shepherd *et al.* 2001 Broad Vegetation Types and its State and Regional Representation (Government of Western Australia 2017)

	Pre-European (ha)	Current Extent (ha)	Remaining (%)	Remaining in DBCA reserves (%)
IBRA Region Total Swan Coastal Plain	1,501,221.93	578,997.37	38.57	38.47
Statewide				
Beard Veg Assoc. 949	218,193.94	122,966.39	56.36	55.90
Beard Veg Assoc. 1015	19,556.98	6,639.02	33.95	44.09
In IBRA Region SWA1				
Beard Veg Assoc. 949	25,507.44	16,134.07	63.25	39.77
Beard Veg Assoc. 1015	15,871.79	6,240.65	39.32	46.20
Local Government Authority – Shire of Victoria Plains				
Beard Veg Assoc. 949	925.23	387.02	41.83	-
Beard Veg Assoc. 1015	1,230.29	503.29	40.93	-

Mapping by Heddle *et al*. (1980) used landform-soil units determined by Churchward and McArthur (1978) and has identified two vegetation complexes occurring within the application area (Figure 4):

- **Mogumber Complex – North:** Open woodland of *Corymbia calophylla* with some *Eucalyptus marginata subsp. thalassaca* and *Eucalyptus todtiana*; and
- **Cullula Complex:** Low woodland of *Banksia menziesii, Banksia attenuata, Banksia ilicifolia, Nuytsia floribunda, Eucalyptus todtiana* with taller emergent of *Corymbia calophylla*.

The pre-European and current extents of these vegetation complexes are presented in Table 2.

Table 2: Vegetation Complex Representation Statistics (Webb *et al.* 2016)

	Pre-European (ha)	Current Extent (ha)	Remaining (%)
Mogumber Complex – North	21,879.99	10,437.86	47.70
Callula Complex	25,620.59	13,264.84	51.80

2.6 Hydrology

Review of available surface water feature mapping did not identify any known water bodies or watercourses that impinge, traverse through or are within close proximity to the application area. The nearest watercourse is Moore River East branch located approximately 2.0 km northeast of the site (DoW 2012).

Wetlands of the Swan Coastal Plain have been described and mapped by Hill *et al.* (1996) and assigned a management category reflecting their condition. No geomorphic wetlands were mapped occurring across the application area. A Conservation Category Wetland (CCW) (ID: 11493) is located approximately 250 m north of the application area and a Multiple Use Wetland (MUW) (ID: 11491) is located approximately 60 m northeast of the application area (Figure 5) (DBCA 2018a).

CCWs are characterised as having high conservation value for both natural and human use with the management objective of preserving wetland attributes and functions. MUWs are characterised as wetlands that score poorly on both natural and human use attributes with their management objective to use, develop and manage wetlands in the context of water, town and environmental planning (WAPC 2005).

The application area is not located within or in the vicinity of any Public Drinking Water Source Areas (PDWSA) (DoW 2016).

Groundwater and salinity levels across the site are unknown. However, a nearby WIN Bore located approximately 980 m north of the site has some available data. The drill depths of this bore is 9.14 m below ground level (mbgl), however, no static water level has been reported. The depth to groundwater is potentially around the drill depth in this area (DWER 2018a).

2.7 Conservation Features

Environmentally Sensitive Areas (ESAs) are identified and protected under the *Environmental Protection (Environmentally Sensitive Areas) Notice 2005*. Under the Notice, it is an offence to kill or destroy vegetation within an ESA. Mapping undertaken by the Department of Water and Environmental Regulation (DWER) has identified the application area is not impinged by an ESA (Figure 6). However, several ESAs exist to the north and west of the site referring to the presence of Declared Rare Flora (DRF) and geomorphic wetlands of the Swan Coastal Plain (DWER 2018b).

The application area is not within any conservation areas, including; Bush Forever Sites, Regional Reserves and Department of Biodiversity Conservation and Attractions (DBCA) Managed Lands. One DBCA Managed Land, Mogumber West Nature Reserve, is located approximately 1.78 km northeast of the application area (DBCA 2018b).

2.8 Climate

The nearest official Bureau of Meteorology (BoM) weather station currently in operation is the Walebing Station (Station number 00815) located approximately 50 km northeast of the application area. The climate is described as warm Mediterranean with warm summers with cool winters. The annual mean maximum temperature is 24.9°C and the annual mean minimum temperature is 10.8°C. The annual average rainfall is 475.4 mm (BoM 2018).

3 Assessment Methodology

3.1 Desktop Assessment

An initial desktop assessment was undertaken which included a review of current and relevant tenure and land ownership details, literature sources, database and GIS information to determine:

- Possible environmental survey and approvals requirements; and
- The location of areas with minimal environmental sensitivities/constraints and any highly constrained areas.

The desktop study provided background information on the flora and vegetation of the Application area. Database searches of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Protected Matters Search Tool (PMST) and DBCA's NatureMap Search Tool were undertaken to compile a list of expected Threatened or Priority species and Threatened and Priority Ecological Communities (TECs and PECs) that may occur in the area. These database searches are described in Table 3.

Table 3: Database Searches Undertaken to Identify Potential Environmental Constraints

Potential Environmental Constraint(s)	Database Searches
Matters of National Environmental Significance (MNES)	EPBC Act PMST Search (DEE 2018), 5 km radial search
Declared Rare Flora (DRF) and Priority species	DBCA NatureMap search, 5 km radial search (DBCA 2018c) Threatened and Priority Flora search, 5 km radial search (DBCA 2018d)
TECs and / or PECs	DBCA TEC/PEC search, EPBC Act PMST (DEE 2018e), 5 km radial search
Conservation Significant Fauna	DBCA NatureMap search, 5 km radial search (DBCA 2018c) DBCA Threatened Fauna Species search, 5 km radial search (DBCA 2018f) DBCA Black Cockatoo Species Search, 5 km radial search (DBCA 2018g)

3.2 Flora and Vegetation Field Survey

360 Environmental undertook a single season Detailed Flora and Vegetation Survey (out of season) was undertaken on 28-29 March 2018 (Appendix A). The Detailed Flora and

Vegetation survey was completed across an area of 274.37 ha with the following objectives:

- Conduct a desktop study and background research of relevant literature, databases and spatial datasets to determine the environmental values and any potential issues, such as Threatened/Rare significant species and TECs that may be present;
- Conduct an out of season detailed flora and vegetation survey;
- Development of a flora list;
- Production of maps, showing condition, vegetation communities, locations of any suspected significant flora species or communities, weeds, quadrat locations, and background information; and
- Produce a combined flora, vegetation and fauna report.

3.3 Fauna

A Level 1 Fauna Survey was undertaken by 360 Environmental on 23 March 2018 with the purpose of verifying the accuracy of a desktop assessment and to further delineate and characterise the fauna assemblages and fauna habitat within the surveyed area (Appendix A). The survey covered an area of 39.85 ha and consisted primarily of fauna habitat assessments, systematic bird searches and opportunistic observations.

3.4 Black Cockatoo Habitat Assessment

A Black Cockatoo Habitat Assessment was undertaken by 360 Environmental on 23 March 2018 and reported in Appendix A. The assessment comprised of a significant tree survey which involved the identification of suitable species with a Diameter at Breast Height (DBH) exceeding 500 mm suitable for Black Cockatoo breeding.

The Black Cockatoo Assessment involved traversing the limited survey area of 39.85 ha by foot and trees meeting the following criteria for potential breeding were recorded, marked and electronically logged using a handheld Global Positioning System (GPS) unit:

- Native trees (e.g. Tuart, Jarrah, Marri etc.);
- Diameter at Breast Height (DBH) > 500 mm (300 mm for Wandoo and Salmon Gum); and
- Hollows > 120 mm diameter.

The Black Cockatoo assessment also involved assessing the habitat for tree and shrub species known to be important dietary items and included looking for:

- Evidence of feeding (chewed cones, seed and nut materials); and
- Opportunistic observations of Black Cockatoos in the Survey Area.

Opportunistic searches for roosting evidence were undertaken during the field assessment. Evidence of roosting includes the observation of bird scat in a specific area and evidence of tree limb damage throughout the canopy and on ground.

4 Results

4.1 Database Results

4.1.1 Flora

The database searches identified 85 conservation significant flora species as potentially occurring within a 5 km radius of the Survey Area. Of these, 51 species were Priority and 34 are listed as Threatened. The 51 Priority flora included two Priority 1 (P1), three Priority 2 (P2), 35 Priority 3 (P3) and 11 Priority 4 (P4) (DEE 2018; DBCA 2018c; d).

4.1.2 Fauna

A total of 19 conservation significant vertebrate species (including Priority species) were retrieved from the database searches. This consisted of two reptile species, 11 bird species and 6 mammal species (DEE 2018; DBCA 2018c; f; g). The above total was determined after the omission of several species that are not applicable to the Survey Area.

4.2 Survey Results

4.2.1 Overview of Flora

A total of 119 flora species (including species, subspecies, varieties and forms) from 23 families and 64 genera were recorded in the Survey Area. The most commonly occurring families were Proteaceae (27 taxa), Myrtaceae (18 taxa) Fabaceae (14 taxa) and Cyperaceae (13 taxa). The most frequently recorded genus was Banksia (360 Environmental 2018).

Of the 129 specimens collected, 10 could not be confidently identified to species level due to lack of identifying features such as flowering or fruiting parts. Of particular interest were the following specimens:

- *Synaphea* ? *sparsiflora*, which has the potential to be a Priority 2 (P2) species;
- *Xanthorrhoea drummondii sans lat*. is a species of interest as the specimen has features that are similar to *X. drummondii*, but did not match current known collections from the WA herbarium. This specimen is potentially a new species, however, the taxonomy of the genus group it not currently being studied by a taxonomist to determine its name. This species was considered common and widespread within the survey area; and
- *Banksia dallanneyi* var? *dallanneyi* was collected as well as *Banksia dallanneyi* subsp. *pollosta* which is a Priority 3. *Banksia dallanneyi* was a dominant species across the entire Survey Area and the subspecies was not always distinguishable. It is important to note that all the specimens collected, all but one was identified as *Banksia dallanneyi* subsp. *pollosta* (P3) (360 Environmental 2018).

The remaining specimens unable to be identified down to species level are not thought to represent significant species.

4.2.2 Flora of Conservation Significance

One Threatened species pursuant to the EPBC Act and gazetted as DRF pursuant to the WC Act was recorded in the site (Figure 7) (360 Environmental 2018):

- *Banksia mimica* (DRF/T) is listed under the EPBC Act as Endangered and gazetted as Threatened pursuant to the WC Act. 84 individuals were recorded in the entire Survey Area in 34 locations. 25 individuals across 18 locations were recorded along the proposed access track. The vegetation within the buffers of these conservation significant plants are considered critical habitat and therefore are regarded as Environmentally Sensitive Areas (ESAs).

Six State Priority listed species were also recorded within the site:

- *Synaphea ? sparsiflora* (P2) was found at three locations within the Survey Area. 3 individuals were recorded in the Survey Area in 3 locations. Due to the timing of the survey, the specimen was sterile and couldn't be confidently identified to species level. Until further specimens can be collected of the plant in flower (August – September) the individuals should be managed as a significant species. No individuals were recorded along the proposed access track;
- *Banksia dallanneyi* subsp. *pollosta* (P3) was found throughout the Survey Area in high numbers. 42 individuals were recorded in the Survey Area in 42 locations, with 25 individuals were recorded along the proposed access track;
- *Banksia pteridifolia* subsp. *vernalis* (P3) was found at one location with seven individuals were recorded in the Survey Area however it was not recorded within the proposed area of the access track only occurring in the surrounding vegetation. (Appendix G of Appendix A of this report);
- *Stylidium nonscandens* (P3) was found at one location within the Survey Area. No individuals were recorded along the proposed access track;
- *Isopogon drummondii* (P3) was found at eight locations with 12 individuals within the Survey Area. However, no individuals were recorded along the proposed access track; and
- *Banksia chamaephyton* (P4) was found at five locations with 39 individuals within the Survey Area. None of the species was found within the proposed access track area and only occurred in the surrounding vegetation.

4.2.3 Vegetation Associations

The Detailed Flora and Vegetation survey identified three natural vegetation associations and one mapping unit within the survey area (Figure 8a). These are described below and their extent within the application area is presented in Table 4 (360 Environmental 2018).

- **AhEp:** Mid Sparse heathland of *Allocasuarina humilis*, *Eremaea pauciflora* and *Xanthorrhoea* sp. over Mid sparse sedgeland of *Mesomelaena pseudostygia*, *Mesomelaena tetragona* and *Chordifex sinuosus* over low sparse forbland of *Patersonia occidentalis* var. *latifolia*, *Schoenus pleiostemoneus*, *Conostylis teretifolia* subsp. *teretifolia* and *Caustis dioica*;
- **EtBa:** Low open woodland of *Eucalyptus todtiana*, *Banksia attenuata* and *Nuytsia floribunda* over low open shrubland of *Allocasuarina humilis*, *Eremaea pauciflora* and *Xanthorrhoea* sp. over Mid sparse sedgeland of *Caustis dioica* and *Mesomelaena pseudostygia; and*
- **Cc:** *Corymbia calophylla* over low open shrubland of *Allocasuarina humilis*, *Eremaea pauciflora* and *Xanthorrhoea* sp. over Mid sparse sedgeland *of Caustis dioica* and *Mesomelaena pseudostygia*.

Table 4: Surveyed Vegetation Associations within the Application Area (360 Environmental 2018).

Vegetation Association Code	Name	Description	Extent (ha)	Extent (%)
AhEp	Mid Sparse heathland of Allocasuarina humilis, Eremaea pauciflora	Mid Sparse heathland of *Allocasuarina humilis*, *Eremaea pauciflora* and *Xanthorrhoea* sp. over Mid sparse sedgeland of *Mesomelaena pseudostygia*, *Mesomelaena tetragona* and *Chordifex sinuosus* over low sparse forbland of *Patersonia occidentalis* var. *latifolia*, *Schoenus pleiostemoneus*, *Conostylis teretifolia* subsp. *teretifolia* and *Caustis dioica*.	0.14	16.86
EtBa	*Low open woodland of Eucalyptus todtiana, Banksia attenuata*	Low open woodland of *Eucalyptus todtiana*, *Banksia attenuata* and *Nuytsia floribunda* over low open shrubland of *Allocasuarina humilis*, *Eremaea pauciflora* and *Xanthorrhoea* sp. over Mid sparse sedgeland of *Caustis dioica* and *Mesomelaena pseudostygia.*	0.16	19.28
Cl	Cleared	Cleared – tracks	0.53	63.86

4.2.4 Floristic Community Types

Statistical analysis (multivariate analysis) and data interpretation was undertaken to help determine the Floristic Community Types (FCTs) represented by the vegetation in the Survey Area. This involves reviewing site data for other factors that are diagnostic for FCTs, including the presence of indicator species, soil types and landform position. Results from the statistical analyses and the site information, identified two FCTs as occurring in the Survey Area (360 Environmental 2018).

Statistical analysis and data interpretation of the survey results identified the following floristic community type (FCT) as occurring in the application area (360 Environmental 2018):

- **FCT SCP 20d** – Dandaragan plateau shrublands and woodlands;
- **FCT SCP 23b** – Northern *Banksia attenuata – Banksia menziesii* woodlands; and
- **FCT SCP 23c** – North – eastern *Banksia attenuata – Banksia menziesii* woodlands.

4.2.5 Vegetation Condition

The vegetation within the site is in the following conditions:

- Excellent (241.82 ha);
- Degraded (0.73 ha); and
- Completely Degraded/Cleared (30.98 ha) (Figure 8b) (360 Environmental 2018).

The vegetation within the application area is in mostly Completely Degraded/Cleared condition (0.53 ha) and the remaining is in Excellent condition (0.30 ha).

4.2.6 Threatened / Priority Ecological Communities

A search of the PMST and DBCA's TEC and PEC database has identified the following as occurring within a 5 km radius of the application area (DEE 2018; DBCA 2018f):

- Banksia Woodlands of the Swan Coastal Plain ecological community (Endangered); and
- Clay Pans of the Swan Coastal Plain (Critically Endangered).

The Clay Pans of the Swan Coastal Plain is an ecological community that occurs where clay soils form an impermeable layer close to the landscape surface, and wetlands form that rely solely on rainfall to fill and then dry to impervious pans in summer. This TEC was only identified under the PMST search report and not the DBCA's TEC and PEC database search. The PMST report is based on 'Likely' to occur areas while the DBCA's databases are based on actual data.

The Banksia Woodlands of the Swan Coastal Plain ecological community is woodland with a key prominent tree layer of Banksia with scattered eucalypts. This ecological community is characterised by a high endemism and considerable localised variation in species composition across its range. Both the PMST and the DBCA TEC and PEC database reports identified the Banksia Woodlands TEC as potentially occurring within the application area. It is to be noted that the DBCA's mapping of the Banksia Woodlands TEC is an indicative representation based on the DEE's 'Likely to Occur' areas and does not represent actual occurrences of the TEC.

Desktop analysis of the survey results has identified the vegetation association **EtBa:** Low open woodland of *Eucalyptus todtiana, Banksia attenuata* as representative of the Banksia Woodlands of the Swan Coastal Plain ecological community.

Vegetation condition threshold mapping using the DEE's Approved Conservation Advice for the Banksia Woodlands of the Swan Coastal Plain (2016) has identified the site contains a total of 129.35 ha of the Banksia Woodlands TEC, of which 0.16 ha is within the application area proposed to be cleared (Figure 9).

4.2.7 Fauna

The survey recorded 26 species from 21 families through direct or indirect observations. The following is a summary of the key findings from the field survey:

- No amphibian species were recorded during the field survey;
- Eighteen (18) bird species were recorded from 13 families;
- Three reptile species were recorded from three families; and
- Five mammal species were recorded from five families.

No conservation significant fauna species were recorded during the survey (360 Environmental 2018).

4.2.8 Black Cockatoos

The site is within the known distribution of the Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*) listed as Endangered under the EPBC Act and WC Act. The species was returned in all the PMST, NatureMap and DBCA database searches (DEE 2018).

During the Black Cockatoo Assessment, 5.84 ha of foraging habitat was identified within the site consisting of *Banksia attenuata, B. menziesii*, *Corymbia calophylla* and *Eucalyptus todtiana*. In addition, a total of 27 Marri trees and two *Eucalyptus todtiana* trees were recorded and identified as potential breeding trees (360 Environmental 2018). No Black Cockatoos were observed or heard during the survey.

Foraging Habitat

Carnaby's Cockatoo feed on a wide range of foods including seeds, flower buds, flowers and nectar of *Banksia* spp. *Eucalyptus* spp. and *Acacia* spp. (Johnstone & Kirkby 2011). The Forest Red-tailed Black Cockatoo fees mostly on Jarrah and Marri seeds, *Allocasuarina* cones and some introduced Eucalypts. Baudin's Cockatoos mainly feed on Marri, nectar, introduced fruits and insect larvae and the tips of *Pinus* spp (DSEWPaC 2012).

During the survey a total of 5.84 ha of Black Cockatoo foraging habitat was recorded within the survey area, with approximately 3.19 ha being predominantly *Banksia attenuata* and *B. menziesii* heath habitat in Excellent condition. A total of 2.35 ha consisted of isolated Marri (*Corymbia calophylla*) trees and 0.30 ha consisted of isolated *Eucalyptus todtiana* trees (Figure 10a).

Potential foraging evidence was recorded at four locations near the proposed access road in the form of chewed Banksia fruit. All identified foraging habitat was identified as

'potential' evidence due to the age, level of decomposition and the lack of identified Black Cockatoo indentations to the fruit to accurately confirm as Black Cockatoo foraging (Figure 10a) (360 Environmental 2018).

A total of 0.22 ha of Black Cockatoo habitat in Excellent condition is within the application area and proposed to be cleared for the Project (Figure 10c).

Breeding Habitat

Black Cockatoos breed in large hollow-bearing trees, generally within woodlands or forests (Johnstone *et al.* 2013). The size of the tree can be a useful indication of the hollow-bearing potential. Trees of a suitable Diameter at Breast Height (DBH) are potentially important for maintaining breeding in the long-term, through maintaining the integrity of the habitat and allowing trees to provide future nest hollows. Maintaining the long term supply of trees of a size to provide suitable nest hollows is particularly important in woodland stands known to support Black Cockatoo breeding (DSEWPaC 2012).

The Black Cockatoo habitat assessment identified the site contains a total of 27 Marri trees and two *Eucalyptus todtiana* trees with a DBH > 500 mm and therefore considered to be potential breeding trees. Three of the Marri trees contained hollows that were large enough to support Black Cockatoo breeding however, two of these were occupied by feral bees and one was too decomposed to support the species. None of the *Eucalyptus todtiana* trees contained hollows (Figure 10b) (360 Environmental 2018).

No evidence of breeding or roosting was observed during the survey (360 Environmental 2018).

One significant *Eucalyptus todtiana* tree is within the application area and proposed to be cleared. The remaining recorded 28 Black Cockatoo potential breeding trees (including 27 Marri and one *Eucalyptus todtiana*) will be retained (Figure 10c).

5 Proposed Clearing and Environmental Outcomes

The Project footprint has a total area of 0.83 ha, of which 0.52 ha is an existing cleared track and 0.31 ha consists of native vegetation proposed to be cleared.

The Project will involve:

- **Banksia Woodlands TEC:** Clearing of 0.16 ha and retention of 129.19 ha;
- **Black Cockatoo Foraging Habitat:** Clearing of 0.22 ha and retention of 5.69 ha;
- **Potential Black Cockatoo Breeding Habitat:** Clearing of one *Eucalyptus todtiana* tree and retention of 28 potential breeding trees (including 27 Marri trees and one *Eucalyptus todtiana* tree);
- ***Banksia mimica:*** Taking of 25 individuals and retention of 59 recorded individuals,; and
- ***Banksia dallanneyi* subsp. *pollosta* (P3):** Clearing of 25 individuals and retention of 17 recorded individuals.

The Project has been referred to the Federal Department of the Environment and Energy (DEE) for assessment under the *Environment Protection and Biodiversity Conservation Act 1999* and is pending a decision.

A Permit to take DRF has also been applied for with the DBCA to be assessed concurrently with this NVCP.

6 Environmental Management Measures and Rehabilitation

Environmental management measures in place to minimise the risk of impact from the activities associated with the Proposal include:

- Utilising an existing cleared access track for the proposed access road, rather than creating new tracks to limit unnecessary clearing of native vegetation;
- Appropriate speed limits will be set, signposted and adhered to on all site access roads to avoid fauna strike. Speed restrictions will apply in areas between dusk and dawn where there is a high risk of fauna/vehicle collision;
- Larger trees will be avoided where possible, mulching tractors will preferentially clear areas of shrubs and trees less than 100 mm DBH;
- Dieback and weed control will be in place to minimise the risk of spread or introduction of dieback or new weed species; and
- Vegetation clearing will be scheduled to occur immediately before planned earthworks to minimise the potential for dust, where practicable.

7 Assessment Against the Ten Clearing Principles

The proposed clearing activities have been assessed against the ten clearing principles as defined in DER's *Guide to Assessment: Clearing of Native Vegetation under the Environmental Protection Act 1986*, taking into account the current extent and condition of the native vegetation on the site. This assessment is presented in Table 5.

Table 5: Assessment Against the 10 Clearing Principles

PRINCIPLE	ASSESSMENT
Principle (a) – Native vegetation should not be cleared if it comprises a high level of biological diversity	The PMST, NatureMap and DBCA databases identified a total of 85 conservation significant flora species as potentially occurring within a 5 km radius of the site. Of these, 51 species are State listed Priority and 34 are Threatened pursuant to the WC Act. Of the 51 Priority species, two are listed as Priority 1, three listed as Priority 2, 35 listed as Priority 3 and 11 listed as Priority 4 (DEE 2018; DBCA 2018c; d). An out-of-season Detailed Flora and Vegetation Survey was conducted in March 2018. A total of 119 flora species (including subspecies, species, varieties and forms) from 23 families and 64 genera were recorded within the survey area. The most The most commonly occurring families were Proteaceae (27 taxa), Myrtaceae (18 taxa) Fabaceae (14 taxa) and Cyperaceae (13 taxa). The most frequently recorded genus was *Banksia* (360 Environmental 2018). The flora inventory is provided in Appendix E of the attached Flora, Vegetation and Fauna report in Appendix A of this report. The survey identified a total of 84 *Banksia mimica* (DRF), 42 *Banksia dallanneyi* subsp. *pollosta* (Priority 2), 39 *Banksia chamaephyton* individuals (Priority 4), seven *Banksia pteridifolia* subsp. *vernalis* individuals (Priority 3), 12 *Isopogon drummondii* individuals (Priority 3), three *Synaphea* ? *sparsiflora* individuals (Priority 2) and one *Stylidium nonscandens* individual (Priority 4) that were opportunistically recorded near proposed disturbance areas and while traversing to established quadrats in the survey area (360 Environmental 2018). Of 89 recorded *Banksia mimica* individuals, 25 are located within the disturbance footprint and are proposed

PRINCIPLE	ASSESSMENT
	to be taken under a Permit to Take DRF in consultation with the DBCA. Of the 42 *Banksia dallanneyi* subsp. *pollosta*, 25 individuals are located within the disturbance footprint and proposed to be cleared. The disturbance footprint falls within two Beard/Shepherd vegetation units; **Gingin 949:** Low woodland or open woodland and **Gingin 1015:** Scrub-heath/heath. These units have 63.25% and 39.32% of its pre-European vegetation extent remaining in the SWA01 sub-region respectively (Government of Western Australia 2017). The vegetation condition within the disturbance footprint was 'Excellent' (0.31 ha) and 'Completely Degraded/Cleared' (0.52 ha). A total of 0.31 ha of native vegetation within the disturbance footprint in 'Excellent' condition will be cleared. The entire site contains 129.35 ha of the Banksia Woodlands of the Swan Coastal Plain TEC and it is proposed that 0.16 ha of this TEC is cleared to support the facilitate the proposed access road between Farm 1 and Farm 2. A search of the PMST, NatureMap and DBCA's Threatened and Priority Fauna databases has identified a total of 19 conservation significant vertebrate fauna species. This included eight Threatened fauna species pursuant to the WC Act and EPBC Act, three Priority 4 listed species, one Priority 3 listed species, six species listed as protected under International Agreement and one listed as Other Specially protected fauna (DEE 2018; DBCA 2018c; f; g) (Appendix B, C). A likelihood assessment of the database results identified two species as having a high likelihood of occurrence, six species having a medium likelihood of occurrence and 11 species having a low likelihood of occurrence (Appendix D).

PRINCIPLE	ASSESSMENT
	The Level 1 Fauna and Black Cockatoo Survey covered a limited area of the site. No conservation significant fauna species or Black Cockatoos were observed during the survey (360 Environmental 2018). The entire fauna survey area contains 5.84 ha of recorded Black Cockatoo foraging habitat and 29 potential breeding trees (consisting of 27 Marri trees and 2 *Eucalyptus todtiana* trees). Three hollows were observed in the Marri trees, however, two of the hollows were occupied by feral bees and one was too decomposed for utilisation by the Black Cockatoos. None of the *Eucalyptus todtiana* trees contained hollows. The disturbance footprint contains 0.22 ha of foraging habitat and one significant *Eucalyptus todtiana* tree to be cleared. Some potential evidence of foraging was recorded, however the evidence could not be confirmed as Black Cockatoo foraging (360 Environmental 2018). The disturbance footprint is in mostly 'Completely Degraded/Cleared' condition (63%) which is reminiscent of an existing cleared track. The remainder of the disturbance footprint is in 'Excellent' condition (37%) proposed to be cleared. **Assessed Outcome:** May be at variance with this Principle.
Principle (b) – Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a significant habitat for fauna indigenous to	The PMST search and a subsequent likelihood assessment identified nine conservation significant fauna species listed under the EPBC Act as potentially occurring within 5 km of the site. The search identified three Endangered fauna species (Western Spiny-tailed Skink, *Egernia stokesii* subsp. *Badia*; Baudin's Cockatoo, *Calyptorhynchus baudinii;* and Carnaby's Cockatoo, *Calyptorhynchus latirostris*), three Vulnerable species (Malleefowl, *Leipoa ocellata*; Chuditch, *Dasyurus geoffroii*; and Red-tailed Phascogale, *Phascogale calura*) and five listed as Migratory and/or Marine (White-bellied Sea Eagle, *Haliaeetus leucogaster*; Fork-tailed Swift, *Apus pacificus*; Rainbow Bee-eater, *Merops ornatus*; Grey Wagtail, *Motacilla cinerea*; and Osprey, *Pandion haliaetus*) (DEE 2018).

PRINCIPLE	ASSESSMENT
Western Australia	The NatureMap search and subsequent likelihood assessment identified four conservation significant fauna species as potentially occurring within the site. Of these, one is listed as Threatened (Malleefowl, *Leipoa ocellata*), one listed under an International Agreement (Rainbow Bee-eater, *Merops ornatus*) and two listed as Priority 4 (Western Brush Wallaby, *Notamacropus irma*; and Southern Brown Bandicoot, *Isoodon obesulus* subsp. *fusciventer*) (DBCA 2018c). The DBCA Threatened and Priority database search identified a total of 13 conservation significant fauna records within 5 km of the site. The search identified seven Threatened species (Carnaby's Cockatoo, *Calyptorhynchus latirostris*; Baudin's Cockatoo, *Calyptorhynchus baudinii*; Forest Red-tailed Black Cockatoo, *Calyptorhynchus banksii naso*; Western Spiny-tailed Skink, *Egernia stokesii* subsp. *Badia*; Malleefowl, *Leipoa ocellata*; Chuditch, *Dasyurus geoffroii*; and South-western Brush-tailed Phascogale, *Phascogale tapoatafa* subsp. *wambenger)*, one Priority 3 species (Black-striped Snake, *Neelaps calonotos*), three Priority 4 species (Western Brush Wallaby, *Notamacropus irma*; Water-rat, *Hydromys chrysogaster*; Southern Brown Bandicoot, *Isoodon obesulus* subsp. *fusciventer*), one Other Specially Protected Fauna (Peregrine Falcon, *Falco peregrinus*) and one listed under International Agreement (Glossy Ibis, *Plegadis falcinellus*) (DBCA 2018f). The fauna survey area contains approximately 5.84 ha of recorded Black Cockatoo foraging habitat and 29 potential Black Cockatoo breeding trees. The disturbance footprint contains 0.22 ha of Black Cockatoo foraging habitat consisting of *Banksia attenuata* and *B. menziesii* woodland considered suitable for Carnaby's Cockatoos and Forest Red-tailed Black Cockatoos (360 Environmental 2018). The survey area contains a total of 29 Black Cockatoo potential breeding trees consisting of 27 Marri (*Corymbia calophylla*) and two *Eucalyptus todtiana* with a DBH greater than 500 mm. Three of the Marri trees were observed containing hollows greater than 120 mm. Of these three hollows, two were occupied by feral

PRINCIPLE	ASSESSMENT
	bees and one was considered too decomposed to be suitable for Black Cockatoo breeding. None of the trees containing hollows are located within the disturbance footprint. No evidence of breeding or roosting habitat was identified. Potential Black Cockatoo foraging evidence was recorded, however this could not be confirmed as Black Cockatoo foraging (360 Environmental 2018). Only one potential breeding tree (*Eucalyptus todtiana*) with a DBH > 500 mm is within the disturbance footprint to be cleared. The clearing of 0.22 ha of Black Cockatoo foraging habitat and one significant *Eucalyptus todtiana* tree is considered to have a negligible reduction in habitat, with 5.62 ha of recorded Black Cockatoo habitat to be retained. Furthermore, extrapolation of the Flora and Vegetation survey data suggests that Black Cockatoo foraging habitat is represented across approximately 130.97 ha of the site to be retained. The clearing of 0.22 ha of Black Cockatoo foraging habitat is not considered a significant part of the habitat available for Black Cockatoos within the site. The wider Mogumber area is consists of patches of cleared rural land and large patches of remnant native vegetation. These patches in the wider Mogumber area may provide additional habitat suitable for Black Cockatoos. Given the minor clearing of 0.22 ha of foraging habitat and one significant *Eucalyptus todtiana* tree, it is not expected this clearing will represent a significant loss of foraging or future breeding habitat for the Black Cockatoos. The ground dwelling conservation significant fauna species identified in the database searches include the Black-striped Snake, Western Spiny-tailed Skink, Malleefowl, Chuditch, Red-tailed Phascogale, Western Brush Wallaby, South-western Brush-tailed Phascogale and the Southern Brown Bandicoot (DEE 2018; DBCA 2018f). The presence of these species ranged from having a high to low likelihood of occurrence within

PRINCIPLE	ASSESSMENT
	the site. None of these fauna species were recorded, however, should these species be present within the disturbance footprint, they are not likely to be significantly impacted by the Proposal. These fauna species are generally mobile and will utilise a larger area than the disturbance footprint for habitat use. Furthermore, the disturbance footprint contains an existing cleared track and these fauna species are more likely to utilise the intact vegetation of the wider site. It is therefore not expected that the clearing of 0.31 ha of native vegetation within the disturbance footprint will have a major impact to fauna or fauna habitat. The clearing of 0.22 ha of Black Cockatoo foraging habitat and one significant *Eucalyptus todtiana* tree is not likely to cause significant habitat loss for the species, as the site contains a large area of suitable habitat available. **Assessed Outcome:** As the Proposal will involve the clearing of 0.22 ha of Black Cockatoo foraging habitat and one significant *Eucalyptus todtiana* tree, the Proposal may be at variance with this Principle. However, the clearing of 0.22 ha of foraging habitat and the one significant tree is considered to represent a negligible loss for the Black Cockatoos, given the site will retain 130.97 ha of foraging habitat (including surveyed and extrapolated data) and the 28 recorded potential breeding trees. The vegetation within the disturbance footprint is not considered necessary for the maintenance of significance habitat for the Black Cockatoos at a regional or local scale.
Principle (c) – Native vegetation should not be cleared if it includes, or is necessary for the continued existence of rare flora.	One Threatened species, pursuant to the EPBC Act and gazetted as DRF pursuant to the WC Act, and six State Priority listed species were recorded within the site. Two of these conservation significant flora species were recorded within the disturbance footprint, these included: ● *Banksia mimica* (DRF/T), 84 individuals were recorded within the site, of these 25 individuals were recorded within the disturbance footprint. ● *Banksia dallanneyi* subsp. *pollosta* (Priority 2), 42 individuals were recorded within the site, of these

PRINCIPLE	ASSESSMENT
	25 were recorded within the disturbance footprint. The Flora and Vegetation Survey did not include a Targeted Flora search of the threatened flora and their extent within the entire site. The *Banksia mimica* individuals were opportunistically recorded while traversing to established quadrats. Therefore the number of *Banksia mimica* individuals recorded is likely to be an under-representation of the species within the wider site. As such, the taking of 25 *Banksia mimica* individuals represents 29 % of the recorded individuals only, not taking into consideration the potential under-representation of the species within the entire site. Therefore, the recording of 84 individuals opportunistically demonstrates the site potentially contains a large population of *Banksia mimica*. **Assessed Outcome:** The Proposal will include the clearing of 0.31 ha of native vegetation that includes DRF and Priority listed flora. The Proposal may be at variance with this Principle, however the impacts associated with the Project is considered to be low as the flora species are widely distributed in the local area.
PRINCIPLE	**ASSESSMENT**
Principle (d) – Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a Threatened Ecological Community (TEC).	Using the condition thresholds under the DEE's Approved Conservation Advice for the Banksia Woodlands TEC (2016), the site contains a total of 129.35 ha of the TEC and the Proposal will involve the clearing of 0.16 ha of this TEC within the proposed disturbance area (Figure 9). The access road has been designed to avoid unnecessary clearing of native vegetation where possible by utilising an existing cleared track. The Proposal involves the clearing of only 0.16 ha of the Banksia Woodlands TEC representing only 0.12% of the total TEC on site. Given the small area of clearing and the retention of over 99.8% of the TEC onsite, the clearing is not considered to represent a significant part of the TEC and is not considered to be significantly at variance with this Principle.

PRINCIPLE	ASSESSMENT
	Assessed Outcome: As the vegetation within the Proposed Disturbance Area represents the Banksia Woodlands TEC, it is likely that the clearing of this vegetation will be at variance with this Principle. However, the clearing of 0.16 ha of the Banksia Woodlands TEC is not expected to represent a significant loss of native vegetation necessary for the maintenance of the TEC at a local or regional level.
Principle (e) – Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared	The proposed disturbance area is located within the Swan Coastal Plain IBRA bioregion which has approximately 38.57 % of its pre-European vegetation extent remaining (Government of Western Australia 2017). The proposed disturbance area is also mapped as within both the Mogumber – North and Callula Heddle *et al*. (1980) vegetation complexes, which have approximately 47.70% and 51.80% of their pre-European extents remaining, respectively (Webb *et al*. 2016). The proposed disturbance area falls within two Beard/Shepherd vegetation units; Gingin 949 and Gingin 1015. These units have 63.25% and 39.32% of their pre-European extents remaining within the SWA1 subregion (Government of Western Australia 2017). The *National Objectives and Targets for Biodiversity Conservation 2001-2005* include a target to have clearing controls in place that prevent clearance of ecological communities with an extent below 30% pre-1750 (Commonwealth of Australia 2000). Using these targets as an indicator of vegetation that has been extensively cleared, the vegetation within the State and bioregion is not considered to be extensively cleared as they do not fall below this aforementioned threshold. The Proposal involves the clearing of up to 0.31 ha of native vegetation which is considered significant remnant due to the presence of Black Cockatoo habitat, Banksia Woodlands TEC and DRF species. However, the proposed disturbance footprint is not considered to be within an area that has been extensively cleared and it is not likely that the Proposal would be at variance with this Principle.

PRINCIPLE	ASSESSMENT
	Assessed Outcome: Clearing for the Proposal is not considered to have a significant impact on the State or IBRA bioregion's representation of the Beard/Shepherd vegetation types or the Heddle *et al.* (1980) vegetation complexes on local or regional levels. The Proposal is not likely to be at variance with this Principle.
Principle (f) – Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.	The proposed disturbance area is not within or in the immediate vicinity of any watercourses or surface water features. Desktop mapping of DBCA's wetland mapping and DWER's hydrography mapping has identified some wetlands and surface water features located in excess of 60 m to the north and northeast of the proposed disturbance area. The nearest surface water feature is a Multiple Use wetland located approximately 60 m north east of the proposed disturbance area. Multiple Use wetlands are described as having few remaining important ecological attributes and functions (DPaW 2015). No typical wetland indicator species were identified during the Flora and Vegetation survey within the proposed disturbance area **Assessed Outcome:** The Site does not contain any vegetation associated with watercourses or wetlands and therefore the Proposal is unlikely to be at variance with this Principle.
Principle (g) – Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation	The (then) Department of Environment Regulation (DER) has defined land degradation as including the following (DER 2014): ● the clearing of vegetation; ● decline in vegetation condition; ● soil erosion and soil acidity (caused by wind and water erosion due to vegetation clearing);

PRINCIPLE	ASSESSMENT
	• salinity; or • Waterlogging/flooding. The proposed disturbance area does contain 0.31 ha of high quality vegetation in Excellent condition. However, the remaining 242.55 ha of vegetation is in mostly Excellent condition and will be retained within the balance of title. The sandy nature of the soils at the site may cause some short term dust problems or localised wind erosion, dependent on the weather conditions at the time of clearing. However, given the access track footprint is 0.83 ha that is predominantly an existing cleared track, the clearing of 0.31 ha of vegetation is not likely to significantly elevate erosion from the present state. Regardless, management measures will be implemented where required, to ensure mobilisation of sand is minimised, including dampening of soil if clearing is undertaken in dry months. The elevation of the proposed disturbance footprint ranges between 171 m AHD and 183 m AHD over a distance of approximately 835 m, sloping towards the east. Majority of the footprint has been previously cleared and further clearing of up to 0.31 ha of native vegetation is not likely to cause a significant increase in erosion as a result. Excessive stormwater runoff within the Site is unlikely given the porous nature of the sandy soils within the Site. However, any potential surface runoff during construction will be managed in accordance with Best Practice Management where necessary. Groundwater and salinity levels across the site are unknown. However, a nearby WIN Bore located approximately 980 m north of the site has some available data. The drill depths of this bore is 9.14 m below ground level (mbgl), however, no static water level has been reported. The depth to groundwater is potentially

PRINCIPLE	ASSESSMENT
	around the drill depth in this area (DWER 2018a). Waterlogging and flooding is not considered likely to become an issue. The potential depth to groundwater, based on drill depths of nearby WIN bores, suggests the water level is potentially around 9.14 mbgl (DWER 2018a). **Assessed Outcome:** The Proposal does involve the clearing of high quality native vegetation, however, it is not considered the clearing of 0.31 ha of native vegetation would cause appreciable land degradation.
Principle (h) – Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area	The site is not immediately adjacent to any conservation areas. The nearest conservation area is Mogumber West Nature Reserve which is located approximately 1.19 km northeast of the site (DBCA 2017). The Nature Reserve and the site are separated by Mogumber Road West and patches of cleared vegetation. Given the distance from the site to the Nature Reserve, the proposed clearing is unlikely to impact upon the conservation value of this reserve through the spread of weeds or dieback. **Assessed Outcome:** The Proposal is unlikely to be at variance with this Principle.
Principle (i) – Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water	The annual mean rainfall for the area is approximately 583.7 mm as recorded at the nearest Bureau of Meteorology station (Wannamal station #9040) located approximately 19 km southeast of the site (BoM 2018). Most of the rain falls between May and September. It is not likely that the natural surface water hydrology would be significantly altered by the proposal given the porous nature of sandy soils and limited vegetation clearing proposed along the existing cleared track. No watercourses have been mapped as occurring within the proposed disturbance area. The nearest watercourse is the Moore River East Branch located approximately 1.45 km northeast of the proposed disturbance area (DoW 2012).

PRINCIPLE	ASSESSMENT
	The proposed disturbance area is not located within or in the vicinity of any Public Drinking Water Source Areas (PDWSAs) (DWER 2018a). As the site is already predominantly cleared of vegetation (62%), it is unlikely that the clearing of 0.31 ha of native vegetation would have a serious impact that would cause the deterioration in the quality of surface water. **Assessed Outcome:** The Proposal is unlikely to be at variance with this Principle.
Principle (j) – Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence of flooding	No known watercourses exist or are mapped within or in the vicinity of the site. Regional soil mapping has identified the site as comprised of pale and yellow deep sands (GSWA 2008). The majority of the proposed disturbance footprint is cleared (0.52 ha), and therefore clearing of 0.31 ha of native vegetation within these areas are unlikely to significantly alter the current characteristics of the site. The development of the access road and the Poultry Farm would be in line with the (then) Department of Water (DoW)'s Guidelines for Better Urban Water Management (2008) to ensure the development would not alter the existing water regimes of the site. Given the relatively small disturbance footprint and the permeable nature of the soil, the proposed clearing is not likely to cause or exacerbate the incidence, or intensity of flooding. **Assessed Outcome:** The Proposal is unlikely to be at variance with this Principle.

8 Summary of Assessment and Conclusion

In summary, after desktop and field assessments of the environmental values of the Proposed Disturbance Area, it is considered that the proposal to clear a maximum area of 0.31 ha of native vegetation comprised of the following, may be at variance with Clearing Principles A, B, C and D:

- 0.16 ha of Banksia Woodlands TEC;
- 0.22 ha of Black Cockatoo Foraging Habitat;
- One significant *Eucalyptus todtiana* tree;
- 25 *Banksia mimica* individuals; and
- 25 *Banksia dallanneyi* subsp. *pollosta* individuals.

However, these impacts are considered to have a low significance. The mitigation hierarchy was used in the design of the access road to limit native vegetation clearing to the smallest area practicable.

The Proposed Disturbance Area predominantly consists of a cleared track (0.52 ha) with only 0.31 ha of native vegetation proposed to be cleared in Excellent condition.

Principle (a) states that vegetation should not be cleared if comprises a high level of biological diversity. The vegetation is representative of the Banksia Woodlands TEC, Black Cockatoo habitat and contains DRF and Priority flora species. However, the clearing of 0.31 ha of native vegetation is not considered to have a significant impact to or loss of biodiversity in a local and regional context.

Principle (b) states that native vegetation should not be cleared if it comprises the whole, part of vegetation, or necessary for the maintenance of a significant habitat for fauna indigenous to Western Australia. Although the Proposed Disturbance Area contains 0.22 ha of Black Cockatoo foraging habitat and one significant *Eucalyptus todtiana* tree, it is not considered to be a significant loss of habitat with high ecological value for the species compared to quality and area of vegetation within the remaining site and potentially the wider Mogumber region. The DEE's *EPBC Act Referral Guidelines for three threatened Black Cockatoo species* identifies the clearing of more than 1 ha of quality foraging habitat is considered to potentially be a significant impact (DSEWPaC 2012). As such, the removal of 0.22 ha of Black Cockatoo foraging habitat and one significant tree is not considered to represent a significant loss for the species within a site, local or regional context.

Principle (c) states that native vegetation should not be cleared if it includes or is necessary for the continued existence of rare flora. The Proposed Disturbance Area does contain 25 *Banksia mimica* individuals, listed as DRF and Endangered under State and

Federal legislation and 25 *Banksia dallanneyi* subsp. *pollosta* listed as State Priority 3. Although the 0.31 ha of native vegetation comprises rare flora, the remainder of the site consists of 59 recorded *Banksia mimica* individuals and 25 recorded *Banksia dallanneyi* subsp. *pollosta* individuals that will be retained. It is likely that the wider site contains more individuals of these species than recorded as the survey focussed on the areas proposed for clearing rather than a site-wide census.

Principle (d) states that native vegetation should not be cleared if it comprises the whole or part of, or is necessary for the maintenance of a TEC. The entire site contains 129.35 ha of the Banksia Woodlands of the Swan Coastal Plain TEC, however, the Project involves the clearing of 0.16 ha within the Proposed Disturbance Area and the remaining 129.19 ha of the TEC will be retained within the balance of title. It is not considered that the clearing of 0.16 ha of the Banksia Woodlands TEC represents a significant reduction of the TEC on a local or regional context.

Although the proposed clearing may be at variance with four of the 10 Clearing Principles it is not considered that the impacts associated with the clearing of 0.31 ha of native vegetation to be significant on a site, local or regional context. The habitats and species to be cleared are represented within the remainder of the site and the surrounding region. The clearing footprint has been minimised by utilising an existing cleared track which represents over 62% of the footprint to avoid unnecessary clearing of native vegetation where possible.

9 Limitations

This report is produced strictly in accordance with the scope of services set out in the contract or otherwise agreed in accordance with the contract. 360 Environmental makes no representations or warranties in relation to the nature and quality of soil and water other than the visual observation and analytical data in this report.

In the preparation of this report, 360 Environmental has relied upon documents, information, data and analyses ("client's information") provided by the client and other individuals and entities. In most cases where client's information has been relied upon, such reliance has been indicated in this report. Unless expressly set out in this report, 360 Environmental has not verified that the client's information is accurate, exhaustive or current and the validity and accuracy of any aspect of the report including, or based upon, any part of the client's information is contingent upon the accuracy, exhaustiveness and currency of the client's information. 360 Environmental shall not be liable to the client or any other person in connection with any invalid or inaccurate aspect of this report where that invalidity or inaccuracy arose because the client's information was not accurate, exhaustive and current or arose because of any information or condition that was concealed, withheld, misrepresented, or otherwise not fully disclosed or available to 360 Environmental.

Aspects of this report, including the opinions, conclusions and recommendations it contains, are based on the results of the investigation, sampling and testing set out in the contract and otherwise in accordance with normal practices and standards. The investigation, sampling and testing are designed to produce results that represent a reasonable interpretation of the general conditions of the site that is the subject of this report. However, due to the characteristics of the site, including natural variations in site conditions, the results of the investigation, sampling and testing may not accurately represent the actual state of the whole site at all points.

It is important to recognise that site conditions, including the extent and concentration of contaminants, can change with time. This is particularly relevant if this report, including the data, opinions, conclusions and recommendations it contains, are to be used a considerable time after it was prepared. In these circumstances, further investigation of the site may be necessary.

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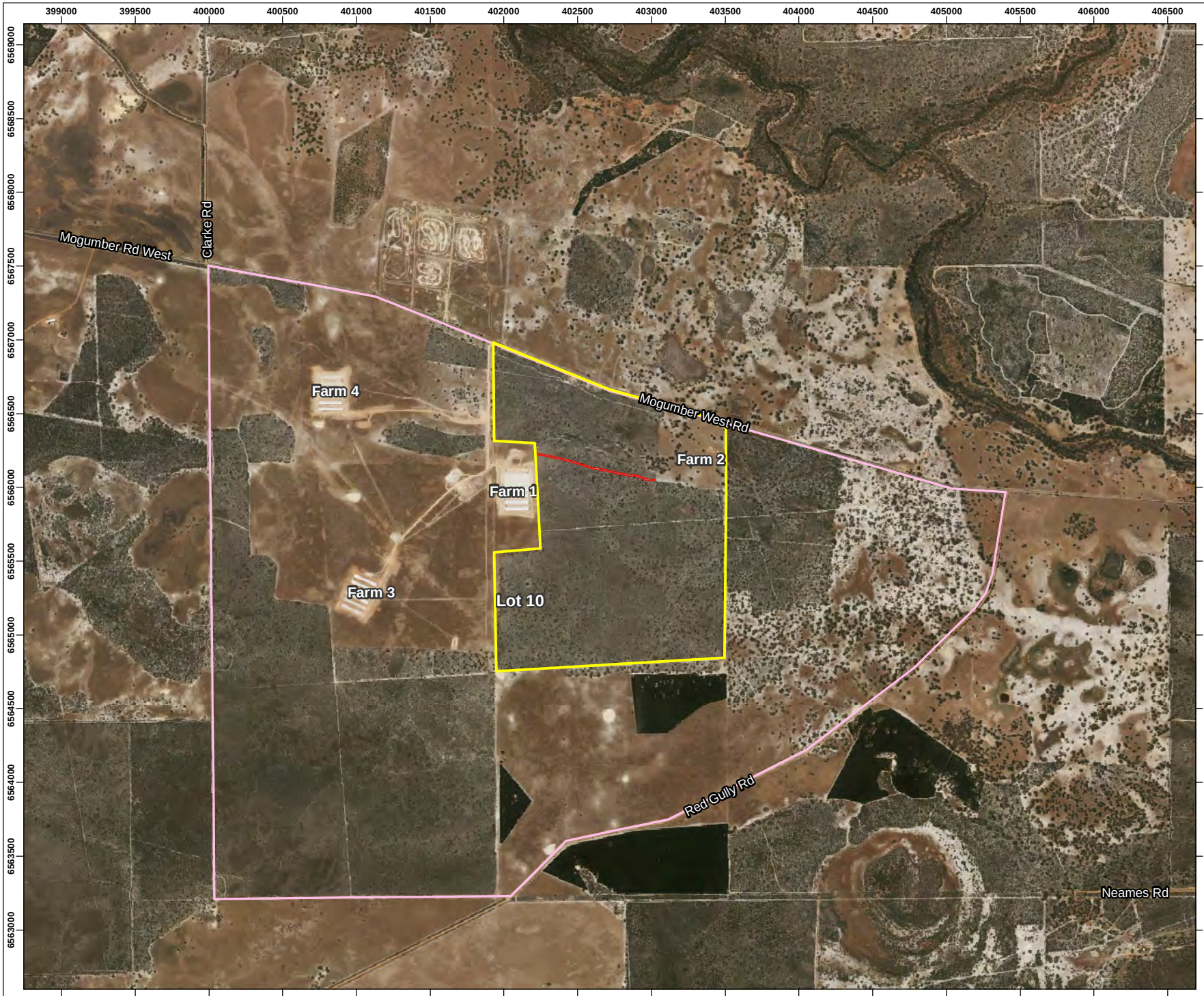
FIGURES



Legend

- Site Boundary (274.37ha)
- Lot Boundary

Disturbance Footprint

- Access Road (0.83ha)

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS
- CADASTRE SOURCED LANDGATE 2018
- LOCALITY MAP SOURCED LANDGATE 2018
- AERIAL PHOTOGRAPHY SOURCED LANDGATE 2018
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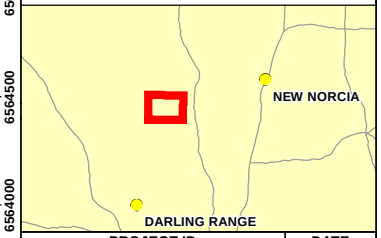

PROJECT ID	DATE
2704	7/08/2018

HORIZONTAL DATUM AND PROJECTION
GDA 1994 MGA Zone 50

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DV	CM	CM	1

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Mogumber Farm 2 Access Track

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Figure 1
Site Location

K:\Projects\9.0 APP\2704 Mogumber Farm II EPBC\EPBC Referral\2704 Figure 1 - Site Location.mxd

Legend

- Site Boundary (274.37ha)
- Access Road (0.83ha)

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS
- LOCALITY MAP SOURCED LANDGATE 2017
- CONTOURS SOURCED GEOSCIENCE AUSTRALIA 2018
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LOCALITY MAP

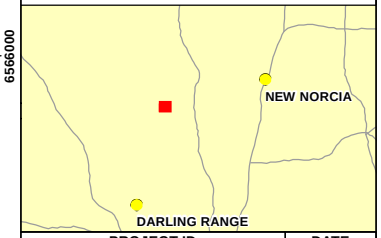

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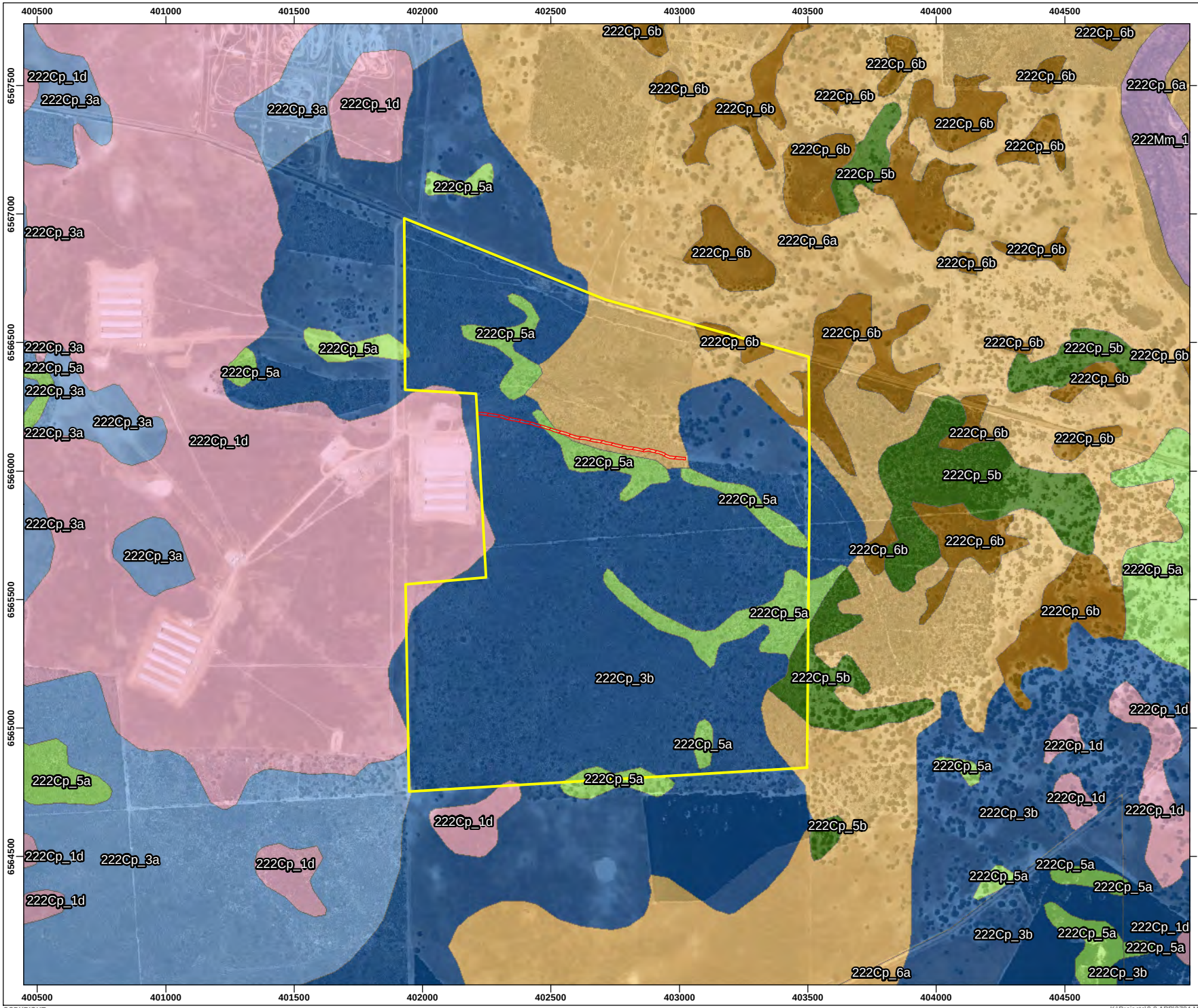
Figure 2
Proposed Clearing Footprint

K:\Projects\9.0 APP\2704 Mogumber Farm II EPBC\EPBC Referral\2704 Figure 2 - Proposed Clearing Footprint.mxd



Legend

Site Boundary (274.37ha)

Disturbance Footprint

Access Road (0.83ha)

Soils Subsystem North Descriptions

- 222Cp_1d: Capitella 1 minor rises Phase
- 222Cp_3a: Capitella 3 plain Phase
- 222Cp_3b: Capitella 3 gentle slope Phase
- 222Cp_5a: Capitella 5 dry Phase
- 222Cp_5b: Capitella 5 damp Phase
- 222Cp_6a: Capitella 6 low dunes Phase
- 222Cp_6b: Capitella 6 plain Phase
- 222Mm_1: Moochamulla 1 Subsystem

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS
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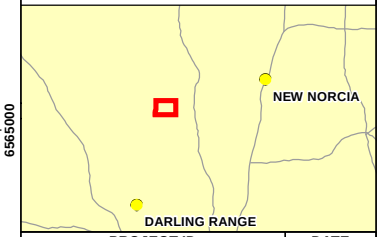

PROJECT ID	DATE
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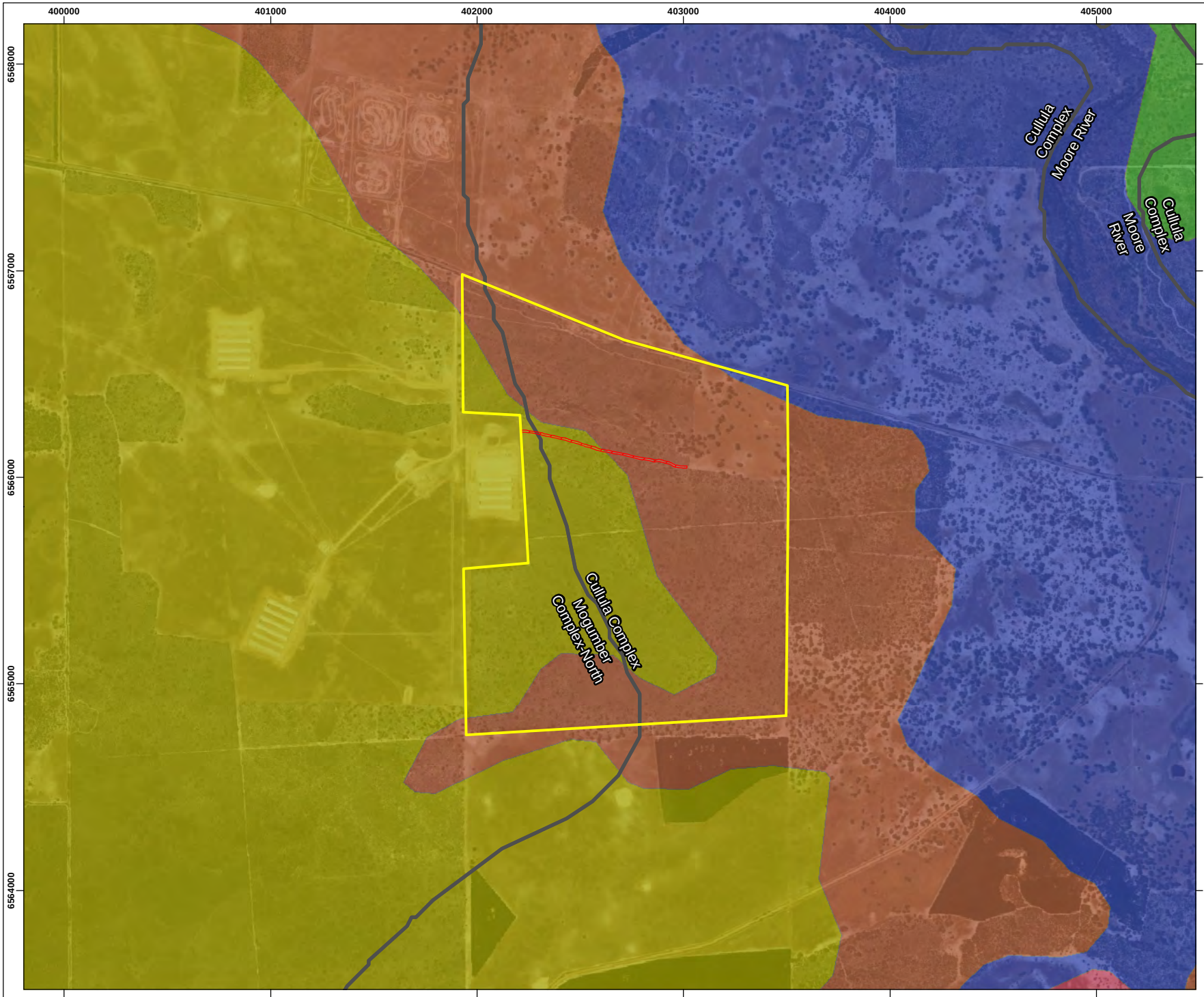
Figure 3
Geology and Soils

K:\Projects\9.0 APP\2704 Mogumber Farm II EPBC\EPBC Referral\2704 Figure 6 - Geology and Soils.mxd



Legend

- Survey Area
- Access Road

Broad Vegetation Associations

- Heddle Complexes

Pre-European Vegetation

- GINGIN_1015
- GINGIN_949
- KOOJAN_1030
- MOGUMBER_37
- MOGUMBER_4

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS
- LOCALITY MAP SOURCED LANDGATE 2017
- VEGETATION COMPLEXES SOURCED DBCA 2018
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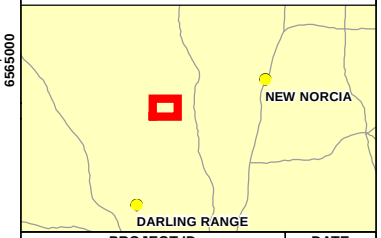

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HORIZONTAL DATUM AND PROJECTION
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DV	CM	CM	1

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Mogumber Farm 2

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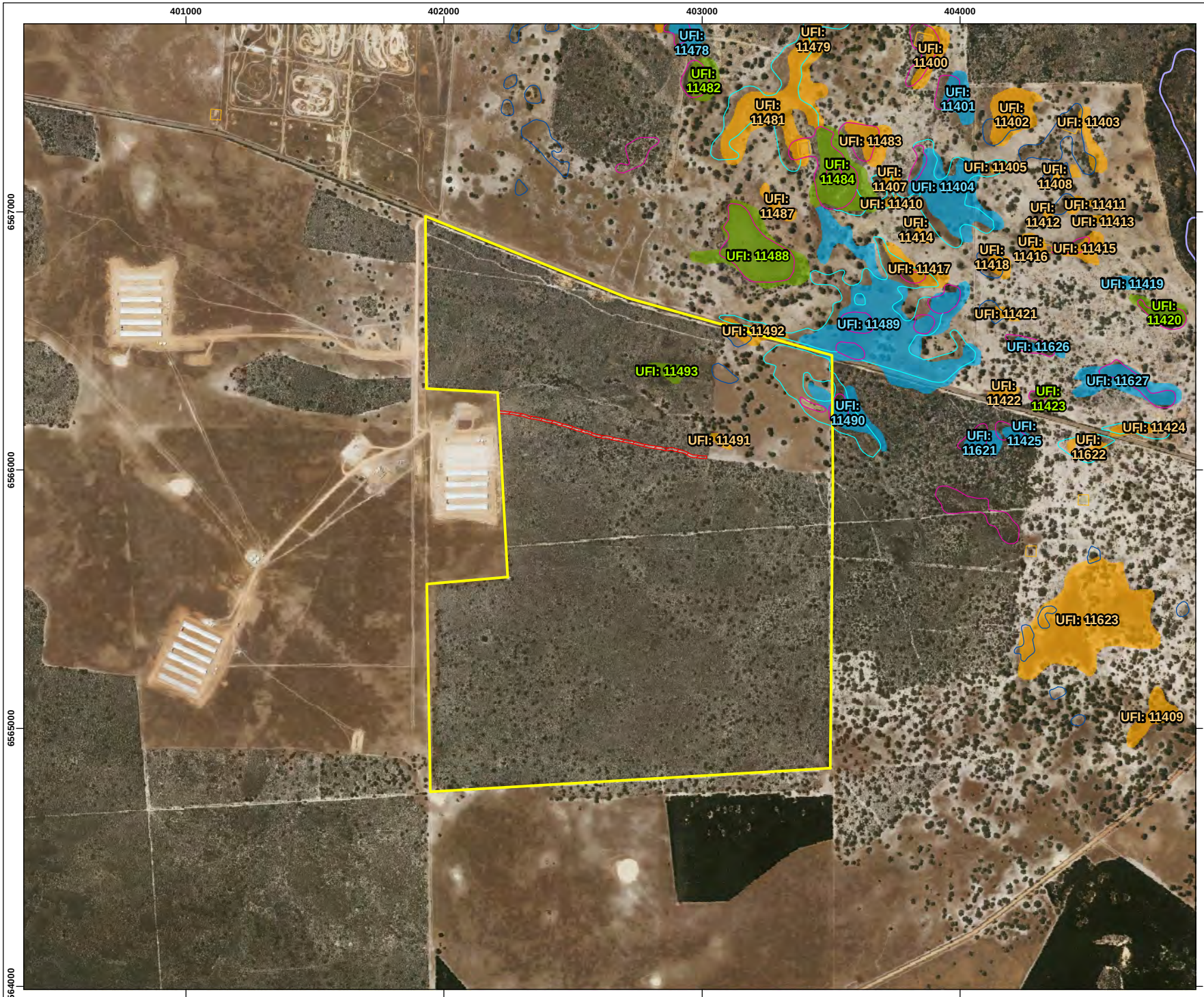
Figure 4
Broad Vegetation Associations

K:\Projects\9.0 APP\2704 Mogumber Farm II EPBC\NVCP\2704 Figure 3 - Broad Vegetation Associations.mxd



Legend

- Site Boundary (274.37ha)
- Access Road (0.83 ha)

Geomorphic Wetlands

- Conservation Category
- Resource Enhancement Category
- Multiple Use Category

Hydrography

- Watercourse - minor, perennial
- Swamp - perennial
- Flood Limit Area
- Area Subject to Inundation
- Earth Dam

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS
- LOCALITY MAP SOURCED LANDGATE 2018
- GEOMORPHIC WETLANDS SOURCED DBCA 2018
- HYDROGRAPHY SOURCED DWER 2018
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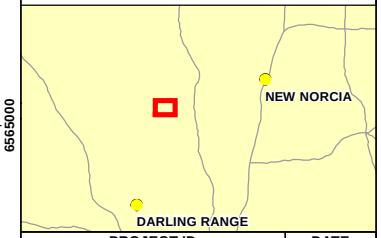
LOCALITY MAP



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HORIZONTAL DATUM AND PROJECTION
GDA 1994 MGA Zone 50

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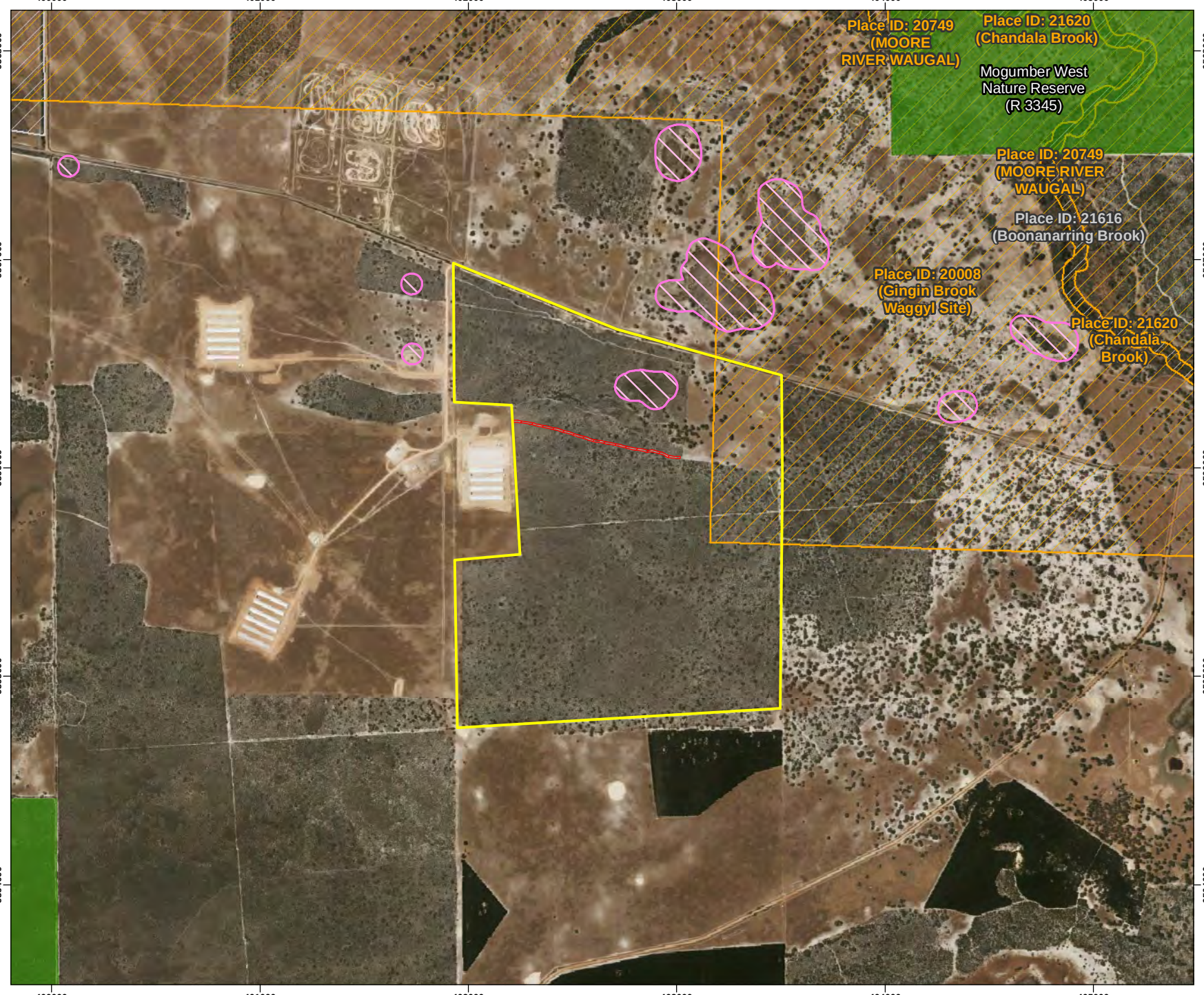
Figure 5
Wetlands and Hydrology

K:\Projects\9.0 APP\2704 Mogumber Farm II EPBC\EPBC Referral\2704 Figure 5 - Wetlands and Hydrology.mxd



Legend

- Site Boundary (274.37ha)
- Access Road

Aboriginal Heritage Sites

- Registered Sites
- Lodged Sites

Conservation Areas

- Environmentally Sensitive Areas
- DBCA Managed Land

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS
- LOCALITY MAP SOURCED LANDGATE 2017
- ESA SOURCED DWER 2018
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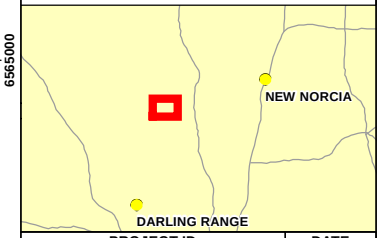

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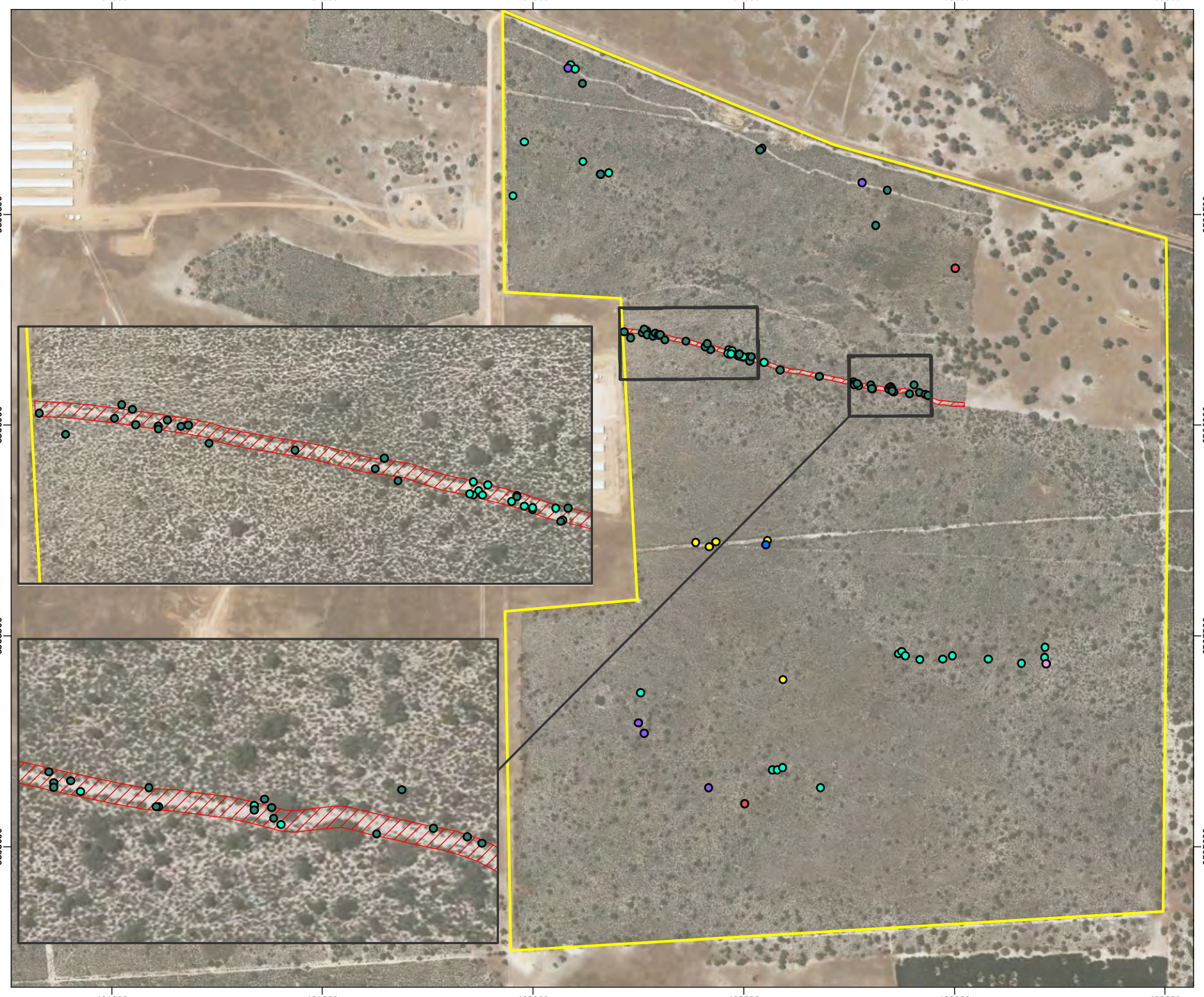
Figure 6
Conservation Areas

K:\Projects\9.0 APP\2704 Mogumber Farm II EPBC\EPBC Referral\2704 Figure 10 - Conservation Areas and Heritage.mxd



Legend

- Site Boundary (274.37ha)
- Access Road (0.83ha)

Threatened Flora Locations

- *Banksia mimica* - T
- *Synaphea ? sparsiflora* - P2
- *Banksia dallanneyi subsp. pollosta* - P3
- *Banksia pteridifolia* subsp. *vernalis* - P3
- *Isopogon drummondii* - P3
- *Stylidium nonscandens* - P3
- *Banksia chamaephyton* - P4

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS
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- AERIAL PHOTOGRAPHY SOURCED LANDGATE 2017
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LOCALITY MAP

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Figure 7
Threatened Flora Locations

K:\Projects\9.0 APP\2704 Mogumber Farm II EPBC\EPBC Referral\2704 Figure 3 - Threatened Flora Location.mxd

AhEp: Mid Sparse heathland of *Allocasuarina humilis*, *Eremaea pauciflora* and *Xanthorrhoea* sp. (MF10-01, MF05-01) over Mid sparse sedgeland of *Mesomelaena pseudostygia*, *Mesomelaena tetragona* and *Chordifex sinuosus* over low sparse forbland of *Patersonia occidentalis* var. *latifolia*, *Schoenus pleiostemoneus*, *Conostylis teretifolia* subsp. *teretifolia* and *Caustis dioica*.

EtBa: Low open woodland of *Eucalyptus todtiana*, *Banksia attenuata* and *Nuytsia floribunda* over low open shrubland of *Allocasuarina humilis*, *Eremaea pauciflora* and *Xanthorrhoea* sp. (MF10-01, MF05-01) over Mid sparse sedgeland of *Caustis dioica* and *Mesomelaena pseudostygia*.

McHm: Mid open shrubland of *Melaleuca carrii*, *Hakea marginata* and *Acacia huegelii* over Mid sparse sedgeland of *Leptocarpus canus* and *Chordifex sinuosus* over low sparse forbland of *Patersonia occidentalis* var. *latifolia*.

Cc: *Corymbia calophylla* over low open shrubland of *Allocasuarina humilis*, *Eremaea pauciflora* and *Xanthorrhoea* sp. (MF10-01, MF05-01) over Mid sparse sedgeland of *Caustis dioica* and *Mesomelaena pseudostygia*.

Cleared: Tracks and paddock.

Legend

Site Boundary (274.37ha)

Disturbance Footprint

Access Road (0.83ha)

Vegetation Associations

AhEp (109.91 ha)

EtBa (129.35 ha)

McHm (1.82 ha)

Cc (1.78 ha)

Cleared (31.51 ha)

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS
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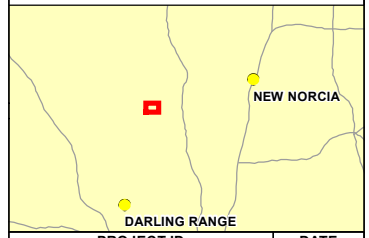

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Figure 8a
Surveyed Vegetation Associations

K:\Projects\9.0 APP\2704 Mogumber Farm II EPBC\EPBC Referral\2704 Figure 7 - Surveyed Vegetation Association.mxd

Legend

- Site Boundary (274.37ha)
- Quadrat
- Releve

Disturbance Footprint

- Access Road (0.83ha)

Vegetation Condition

- **E:** Excellent (242.13 ha)
- **D:** Degraded (0.73 ha)
- **CD:** Completely Degraded (31.51 ha)

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS
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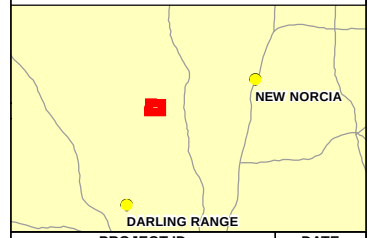

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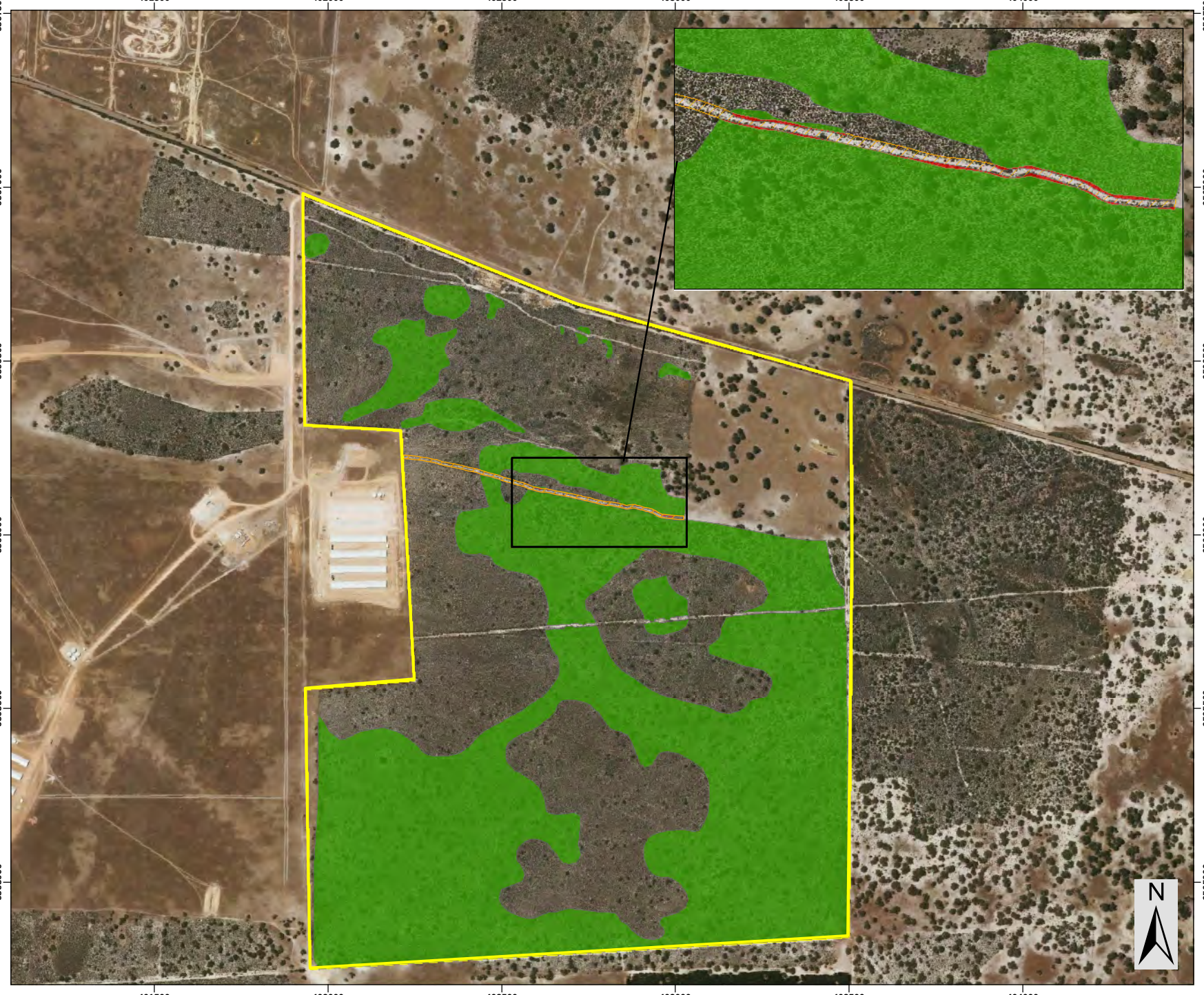
Figure 8b
Vegetation Condition

K:\Projects\9.0 APP\2704 Mogumber Farm II EPBC\EPBC Referral\2704 Figure 8 - Vegetation Condition.mxd



Legend

- Site Boundary (274.37ha)

Disturbance Footprint

- Access Road (0.83ha)

TECs and PECs

- Banksia Woodlands TEC to be cleared (0.16ha)
- Banksia Woodlands TEC to be retained (129.19ha)

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS
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LOCALITY MAP

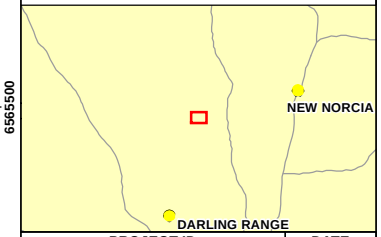

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Figure 9 Banksia Woodlands TEC Disturbance

K:\Projects\9.0 APP\2704 Mogumber Farm II EPBC\EPBC Referral\2704 Figure 12 - Banksia WoodlandsTEC Disturbance 2.mxd

Legend

- Site Boundary (274.37ha)
- Black Cockatoo Survey Area (39.85ha)
- Foraging Habitat (5.84ha)
- Potential Black Cockatoo Foraging Evidence

Disturbance Footprint

- Access Road (0.83ha)

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS
- LOCALITY MAP SOURCED LANDGATE 2006
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LOCALITY MAP

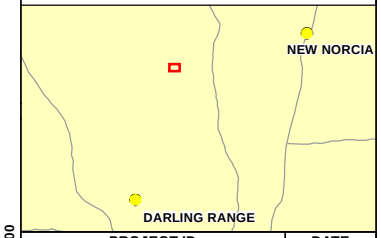

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Figure 10a
Black Cockatoo Foraging Habitat

Legend

- Site Boundary (274.37ha)
- Black Cockatoo Survey Area (39.85ha)

Disturbance Footprint

- Access Road (0.83ha)

Trees with DBH >500 mm

Eucalyptus todtiana

- 500 - 750 mm
- 750 - 1000 mm

Marri (Corymbia calophylla)

- 500 - 750 mm
- 750 - 1000 mm
- 1000 - 1250 mm
- Hollow is present in tree

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS
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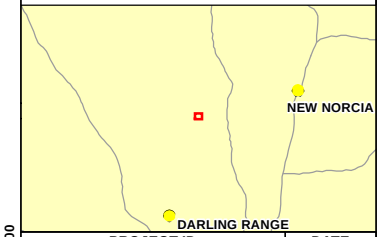

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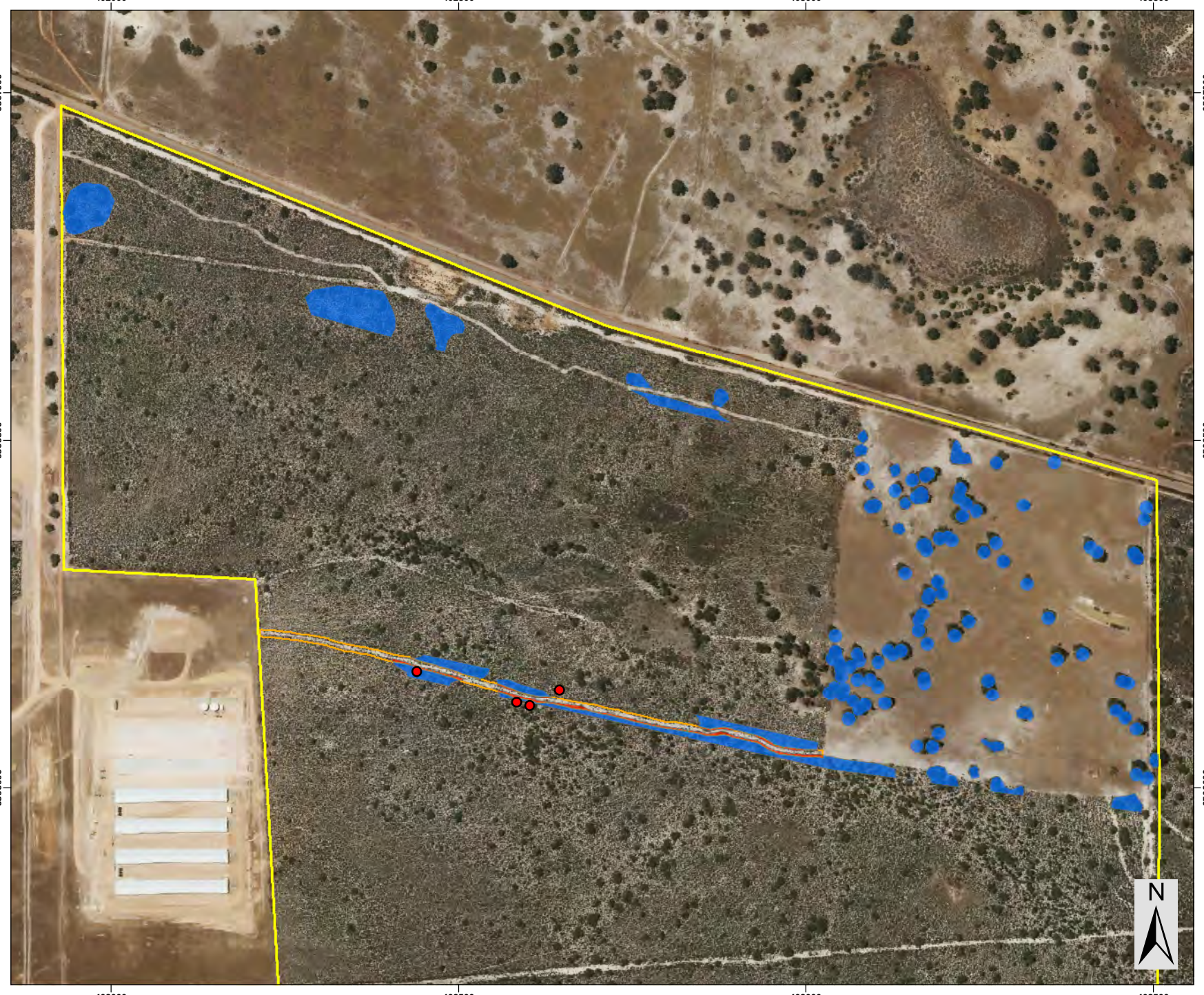
Figure 10b Black Cockatoo Potential Breeding Trees

K:\Projects\9.0 APP\2704 Mogumber Farm II EPBC\EPBC Referral\2704 Figure 4b - BC Potential Breeding Trees.mxd



Legend

- Site Boundary (274.37ha)
- Potential Black Cockatoo Foraging Evidence

Disturbance Footprint

- Access Road (0.83ha)

Black Cockatoo Habitat Disturbance

- Within Proposed Disturbance Footprint (0.22ha)
- Remaining (5.62ha)

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS
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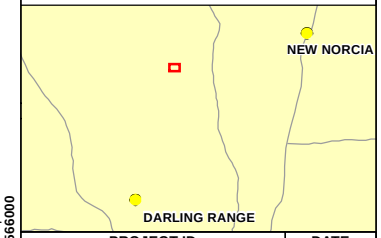

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EPBC Referral

Figure 13 Black Cockatoo Habitat Disturbance

K:\Projects\9.0 APP\2704 Mogumber Farm II EPBC\EPBC Referral\2704 Figure 13 - Black Cockatoo Habitat Disturbance.mxd

APPENDIX A

Flora, Vegetation and Black Cockatoo Survey Report

360 environmental

Mogumber Poultry Farm II Development

Flora, Vegetation, Fauna and Black Cockatoo Assessment

Prepared for:
SBT Property Pty Ltd

September 2018

people • planet • professional

Document Reference	Revision	Prepared by	Reviewed by	Admin Review	Submitted to Client	
					Copies	Date
2668AB	A INTERNAL DRAFT	EW/AH/SF/NW	SW	NL	1 Electronic (email)	12/07/18
2668AB	B CLIENT DRAFT	360 ENV	SBT PROPERTY	-	1 Electronic (email)	3/08/18
2668AB	0 CLIENT FINAL	NW/AH	-	SH	1 Electronic (email)	27/09/18

Executive Summary

SBT Property Pty Ltd (SBT Property) commissioned 360 Environmental Pty Ltd (360 Environmental) in March 2018 to undertake an out of season Detailed Flora and Vegetation Survey and a Level 1 Terrestrial Vertebrate Fauna and Targeted Black Cockatoo Survey for the Mogumber Poultry Farm II Development (herein known as the Survey Area).

The Survey Area covers 274.6 ha and is located within Mogumber, approximately 100 km north-northeast of the Perth, Western Australia.

Key findings from the Reconnaissance flora and vegetation survey:

- A total of 119 flora taxa from 64 genera and 23 families were identified within the Survey Area;
- One Threatened flora species - *Banksia mimica* - pursuant to the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and/or gazetted as Threatened/ Declared Rare Flora pursuant to the *Wildlife Conservation Act 1950* was recorded at multiple locations within the Survey Area;
- Six Priority species were found during the survey; *Banksia chamaephyton* (P4), *Banksia dallanneyi* subsp. *pollosta* (P3), *Banksia pteridifolia* subsp. *vernalis* (P3), *Isopogon drummondii* (P3), *Stylidium nonscandens* (P3) and *Synaphea* ? *sparsiflora* (P2);
- A likelihood of occurrence assessment was undertaken for the 85 species of conservation significance with the potential to occur within the Survey Area, and determined that;
- A total of three introduced taxa were recorded during the survey. None of these are listed as a Declared Pest or Weed of National Significance under the *Biosecurity and Agriculture Management Act 2007*; and
- Three Vegetation Types and one mapping unit were recorded within the Survey Area;
    - AhEp - Mid Sparse heathland of *Allocasuarina humilis, Eremaea pauciflora* and *Xanthorrhoea* sp. over Mid sparse sedgeland of *Mesomelaena pseudostygia, Mesomelaena tetragona* and *Chordifex sinuosus* over low sparse forbland of *Patersonia occidentalis* var. *latifolia*, *Schoenus pleiostemoneus*, *Conostylis teretifolia* subsp. *teretifolia* and *Caustis dioica*;
    - EtBa - Low open woodland of *Eucalyptus todtiana*, *Banksia attenuata* and *Nuytsia floribunda* over low open shrubland of *Allocasuarina humilis*, *Eremaea pauciflora* and *Xanthorrhoea* sp. over Mid sparse sedgeland of *Caustis dioica* and *Mesomelaena pseudostygia;*

- McHm - Mid open shrubland of *Melaleuca carrii*, *Hakea marginata* and *Acacia huegelii* over Mid sparse sedgeland of *Leptocarpus canus* and *Chordifex sinuosus* over low sparse forbland of *Patersonia occidentalis* var. *latifolia* and
- Cc - *Corymbia calophylla* over low open shrubland of *Allocasuarina humilis, Eremaea pauciflora* and *Xanthorrhoea* sp. over Mid sparse sedgeland of *Caustis dioica* and *Mesomelaena pseudostygia*.

Key Findings from the Level 1 Vertebrate Fauna and Targeted Black Cockatoo Survey:

- The DBCA database search identified 19 conservation significant species as having either a 'Recorded', 'High', 'Medium', or 'Low' likelihood of occurrence within the Survey Area. Of these 19 conservation significant species:
  - Two species are considered as having a 'High' Likelihood of Occurrence within the Survey Area in Carnaby's Black Cockatoo and Quenda;
  - Six are considered as having a 'Medium' Likelihood of Occurrence within the Survey Area; and
  - Eleven (11) are considered as having a 'Low' Likelihood of Occurrence within the Survey Area.
- The field survey recorded 56 terrestrial vertebrate fauna species in 18 birds, three reptiles and five mammals. No species of conservation significance were recorded.
- Two broad fauna habitats were mapped within the Survey Area as:
  - Heath (15.21 ha); and
  - Paddock (22.23 ha).
- The Targeted Black Cockatoo survey recorded:
  - Evidence of Carnaby's Black Cockatoo foraging within the Survey Area;
  - No evidence of breeding or roosting within the Survey Area;
  - 5.84 ha of Black Cockatoo foraging habitat within the Survey Area; and
  - 29 trees were identified as Black Cockatoo potential breeding trees; three of which had hollows of sufficient size (>120 mm) for Black Cockatoos.

Table of Contents

List of Figures

List of Tables

List of Plates

List of Appendices

1 Introduction

1.1 The Project

SBT Property Pty Ltd (SBT Property) commissioned 360 Environmental Pty Ltd (360 Environmental) to undertake a Detailed Flora and Vegetation Survey and a Level 1 Terrestrial Vertebrate Fauna and Targeted Black Cockatoo Survey for the Mogumber Poultry Farm II Development (herein known as the Survey Area) (Figure 1).

The Survey Area was 274.6 ha and is located approximately 6 km east of Mogumber town site, and approximately 100 km north-northeast of the Perth, Western Australia (Figure 1).

Three of the quadrats are along the preferred road (Option A) and services route, three along the alternate route (Option B) and the remaining six are distributed in the adjacent vegetation to collect data from representative vegetation communities. The two proposed options for the road are along existing cleared tracks to minimise vegetation clearing.

The entire Survey Area was surveyed for flora and vegetation values. Quadrats were positioned within the proposed disturbance area, along the preferred road and services route as well as along the alternate route. Additional quadrats were distributed in the adjacent vegetation to collect data from representative vegetation communities.

Terrestrial fauna values were surveyed within three delineated areas within the Survey Area and comprised of (Figure 1):

- Farm II – proposed development (24.1 ha);
- Access Track – Option A (3.0 ha); and
- Access Track – Option B (12.7 ha).

1.2 Objectives and Scope

The purpose of the biological survey is to delineate key environmental and biological values within the predetermined Survey Area that included flora, vegetation and terrestrial fauna. The baseline information will then be used in the required environmental approvals processes to allow for clearing of vegetation and progression of the proposed development.

The following scope of works was completed to support the overarching objectives in:

Flora and Vegetation

- Conduct a desktop assessment of relevant literature, databases and spatial datasets to determine the environmental values and any potential issues, such as Threatened/Rare and significant species, Threatened Ecological Communities

(TECs) and Priority Ecological Communities (PECs), that may be present in the Survey Area and the surrounding areas;

- Undertake a field survey including the use of quadrats along with targeted searches for species of conservation significance where required to verify the accuracy of the desktop assessment;
- Delineate and characterise the flora and the range of vegetation units present in the Survey Area;
- Assess and map the vegetation condition in the Survey Area; and
- Production of maps, showing vegetation condition, vegetation communities, location of any suspected significant flora species or communities, weeds, quadrat locations, and background information.

Terrestrial Fauna and Black Cockatoo

- Background research and a desktop assessment;
- Record opportunistically observed Black Cockatoos occurring within the Survey Area;
- Identify and determine the type and extent of habitat (breeding, foraging and roosting) suitable for Black Cockatoos in the Survey Area with reference to the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) and referral guidelines for three threatened Black Cockatoo species (Department of Sustainability Environment Water Population and Communities, 2012); and
- Undertake a Level 1 Terrestrial Vertebrate Fauna and Black Cockatoo Habitat Survey within the delineated Survey Area boundary (displayed in Figure 1).

Reporting

- Deliver a combined report on the findings of the Survey with recommendations based on the legislative requirements and best practice.

1.3 Protection of Flora and Vegetation

Flora and vegetation is governed formally and informally by various legislative and non-legislative measures. The Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) aims to protect matters of national environmental significance (MNES) including listed flora, fauna and ecological communities and heritage places. Under the EPBC Act, the Commonwealth Department of the Environment and Energy (DEE) lists Threatened flora species in categories determined by criteria set out in the EPBC Act. These categories are described in Appendix A.

The WA Department of Biodiversity, Conservation and Attractions (DBCA) (formerly the WA Department of Parks and Wildlife) lists flora under the provisions of the Wildlife Conservation Act 1950 (WC Act) as protected according to their need for protection (Appendix A). Flora is given Declared Rare status when populations are geographically

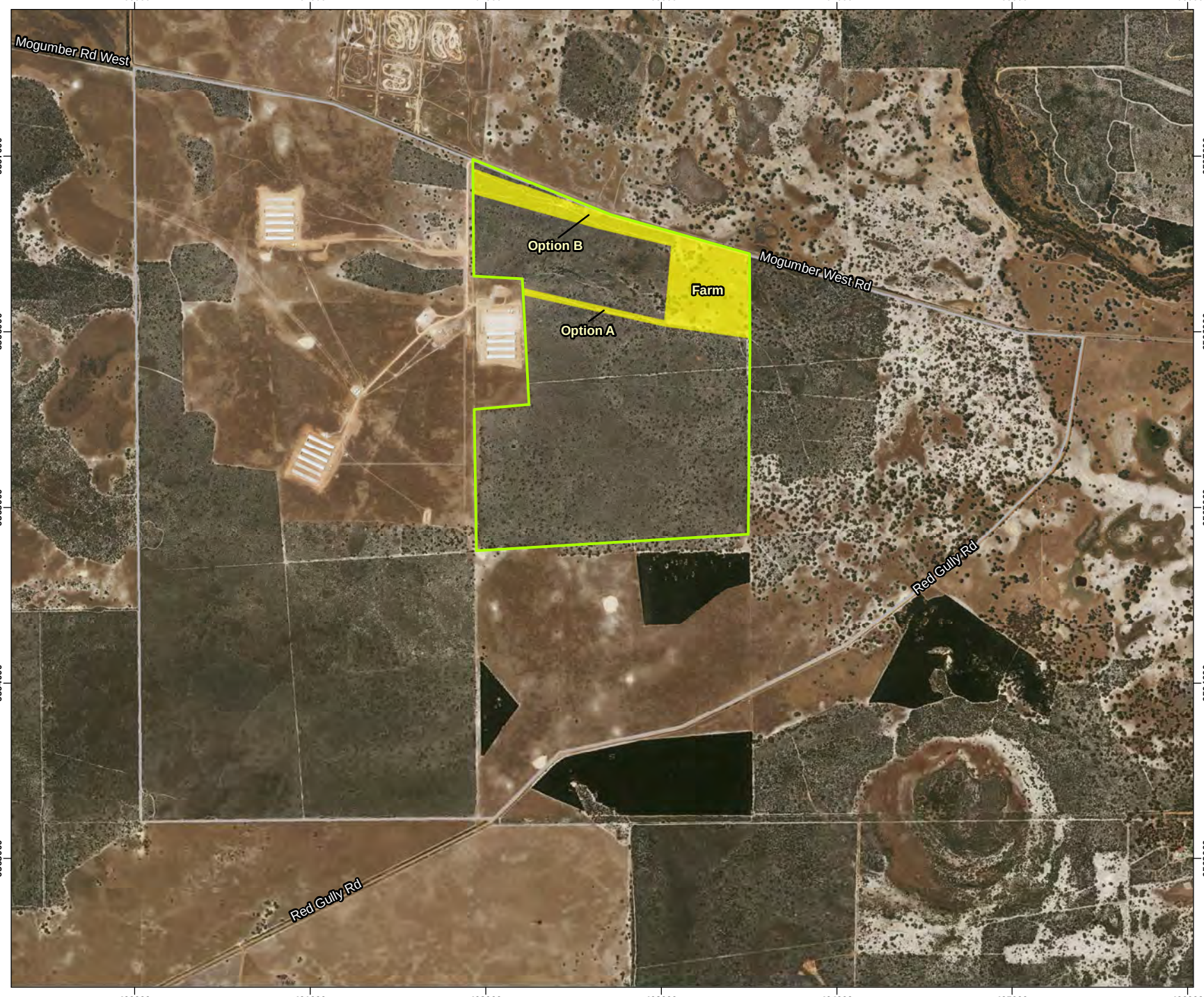
restricted or are threatened by local processes. In addition, The DBCA lists 'Priority' flora that have not been assigned statutory protection as Declared Rare or 'Scheduled' under the WC Act, but which are under consideration for declaration as DRF. This list is for species that may be rare or threatened, but cannot be considered as Declared Rare until further surveys have been undertaken. Priority floras are listed according to the conservation categories described in Appendix A.

Certain populations or communities of flora may be of local significance or interest because of their patterns of distribution and abundance. For example, specific locations of flora may be locally significant because they are range extensions to the previously known distribution, or are newly discovered taxa (and have the potential to be of more than local significance). In addition, many species are in decline as a result of threatening processes (land clearing, grazing, changed fire regimes), and relict populations of such species assume local importance for the DBCA.

Threatened Ecological Communities (TECs) refer to communities that may be subject to processes that threaten to destroy or significantly modify it across much of its range. TECs are listed at both Commonwealth level, under to EPBC Act, and State level, by the Western Australian (WA) Minister for Environment. Conservation categories for TECs are presented in Appendix A.

A list of Priority Ecological Communities (PECs) is also kept by the WA DBCA. This list consists of communities with insufficient information available to be considered a TEC, or which are rare but not currently threatened. PECs are assigned to one of four Priority rankings according to the criteria presented in Appendix A.

Environmentally Sensitive Areas (ESAs) are declared to prevent degradation of important environmental values such as Threatened flora, TECs or significant wetlands.



Legend

- Fauna Survey Area
- Flora Survey Area
- Lot 10 Boundary

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS
- CADASTRE SOURCED LANDGATE 2018
- LOCALITY MAP SOURCED LANDGATE 2017
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LOCALITY MAP

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GDA 1994 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
SL	NW	SW	1

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Farm 2 Mogumber

Mogumber Farm II Biological Surveys

Figure 1
Location of the Survey Area

K:\Projects\1.0 EBS\2668 Mogumber Farm II Biological Surveys\2668 Figure 1 - Site Location.mxd

2 Background

2.1 Biophysical Environment

2.1.1 Climate

The most representative long-term official Bureau of Meteorology weather station currently operating near the Survey Area is Wongan Hills (Station Number 8137), located approximately 70 km east-northeast of the Survey Area.

The Wongan Hills weather station received 290.4 mm of rain in the 12 months prior to the survey (April 2017 – March 2018) (Bureau of Meteorology, 2018). This is 97.8 mm below the long-term average rainfall for the same period. For the three months prior to the survey (January – March 2018), the Wongan Hills weather station recorded 58.6 mm of rainfall which is 16.6 mm above the long-term average rainfall for the same period (Figure 2) (Bureau of Meteorology, 2018).

The average maximum and minimum temperatures for March 2018 were 32.6°C and 17.3°C respectively (Bureau of Meteorology, 2018). The average temperatures for March 2018 were slightly above the long-term averages; the long-term mean maximum temperature for March is 30.9°C and the long-term mean minimum temperature is 16.4°C (Bureau of Meteorology, 2018). During the survey, the daily maximum temperatures ranged from 28.7°C to 31.7°C and daily minimum temperatures ranged from 12.0°C to 16.8°C. No rainfall was recorded during the survey (Bureau of Meteorology, 2018).

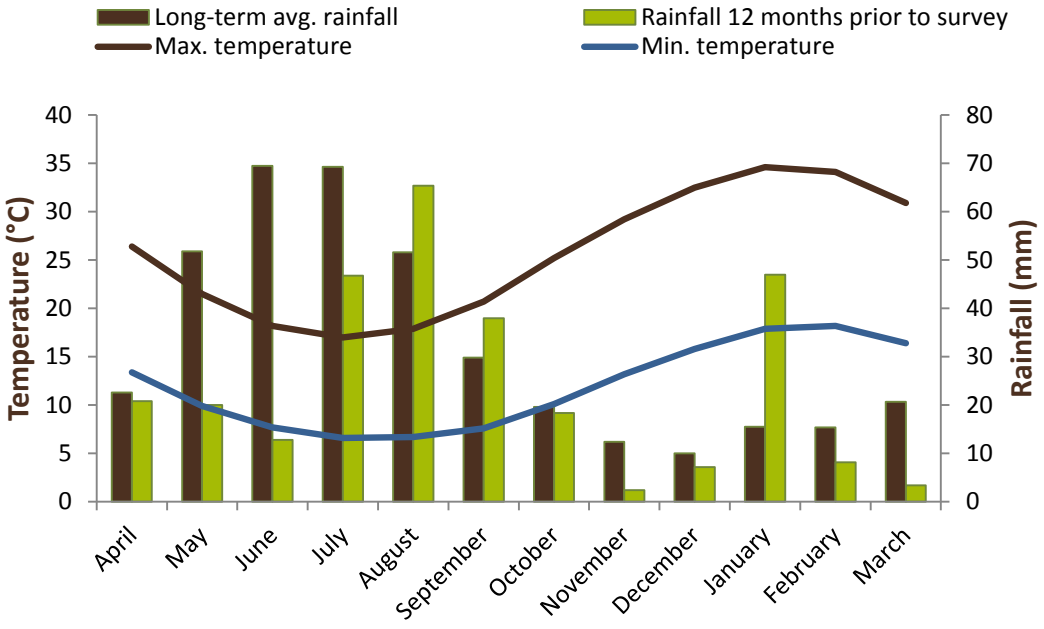


Figure 1: Long-term monthly average rainfall and maximum and minimum temperatures (from 1966 to 2017) as well as monthly rainfall data for the 12 months prior to the survey recorded in Wongan Hills (8137) (Bureau of Meteorology, 2018)

2.1.2 Hydrology

A review of GIS datasets has identified that the nearest watercourse is the Moore River, located 1.7 km to the north of the Survey Area (Department of Water and Environmental Regulation, 2016).

The Geomorphic Wetlands dataset is identified and utilised by the Environmental Protection Authority (EPA), Department of Water and Environmental Regulation (DWER) and the Department of Planning, Lands and Heritage as a basis for planning and decision making. Mapping undertaken by Department of Biodiversity Conservation and Attractions (DBCA) has identified one unnamed Conservation Category Wetland (CCW), UFI 11493, occurring within the northern portion of the Survey Area. One resource enhancement wetland, UFI 11490, and two multiple use wetlands, UFI 11491 and UFI 11492, also intersect or occur within the northern portion of the Survey Area (Figure 3) (Department of Biodiversity Conservation and Attractions, 2017b).

2.1.3 Land Systems and Surface Geology

Soil-landscape system mapping of Western Australia describes broad soil and landscape characteristics from regional to local scales. The Survey Area is within the Capitella System, characterised as subdued stripped lateritic plateau, undulating to gently undulating low rises with gently undulating plain including dunes; pale and yellow deep sands, sandy gravels, some duplex; from sandstones plus alluvial and aeolian deposits (Figure 4), (Department of Agriculture and Food WA, 2012).

The 1:1,000,000 surface geology mapping indicates the geology of the Survey Area falls within the Sand Plain 38499 surface geology unit, which is characterised by sand or gravel plains; quartz sand sheets commonly with ferruginous pisoliths or pebbles, minor clay; local calcrete, laterite, silcrete, silt, clay, alluvium, colluvium, aeolian sand (Geoscience Australia, 2008).

2.2 Biological Environment

2.2.1 Interim Biogeographic Regionalisation of Australia

The Interim Biogeographic Regionalisation of Australia (IBRA) divides Australia into 89 bioregions based on major biological, geographical and geological attributes. These bioregions are subdivided into 419 subregions as part of a refinement of the IBRA framework. The Survey Area lies on border of the Dandaragan Plateau subregion of the Swan Coastal Plain bioregion and the Northern Jarrah Forest subregion of the Jarrah Forest bioregion (Department of the Environment and Energy, 2016) (Figure 5).

The Dandaragan Plateau subregion is bordered by the Dandaragan and Derby Faults. It is made up of Cretaceous marine sediments mantled by laterites and sands. The vegetation is characterised by Marri woodland, Jarrah and Marri woodland, Banksia low woodland and scrub-heaths on gravelly sandplains and laterite pavement (Desmond, 2001).

The Northern Jarrah Forest subregion is located on a duricrust plateau of the Yilgarn Craton. The vegetation is characterised by Jarrah and Marri forest on laterite gravels and, in the east of the subregion's extent, by woodlands of Wandoo and Marri on clayey soils. Peppermint tree (*Agonis*) shrublands are supported by alluvial and eluvial deposits. Jarrah forests occur in a mosaic with a variety of species-rich shrublands in areas of Mesozoic sediments (Williams and Mitchell, 2001).

2.2.2 Broad Vegetation Types

Mapping of the vegetation of the Swan Coastal Plain region which included the Survey Area was completed on a broad scale (1:1,000,000) by (Beard, 1981). These vegetation units were later re-assessed by Shepherd, Beeston and Hopkins (2002) to account for clearing in the intensive land use zone, dividing some larger vegetation units into smaller units. This pre-European database contains a total of 819 vegetation types within Western Australia.

There are three Shepherd, Beeston and Hopkins (2002) broad vegetation types mapped over the Survey Area. The vegetation types are described below and their representation in the local government, region and state is shown in Table 1.

- **Mogumber 4:** Medium woodland; marri and wandoo;
- **Gingin 949:** Low woodland; banksia; and
- **Gingin 1015:** Mosaic; mixed scrub-heath and shrublands; dryandra thicket.

Table 1: Broad Vegetation Types Within the Survey Area, the State and Regional Representation (Government of Western Australia, 2018).

Vegetation Type	Pre-European Extent (ha)	Current Extent (ha)	Remaining (%)	Current Extent Managed in DBCA Lands (%)
Vegetation Types (Shepherd, Beeston and Hopkins, 2002) in WA				
4	1,054,279.89	287,300.55	27.25	23.59
949	218,193.94	122,966.39	56.36	55.90
1015	19,556.98	6,639.02	33.95	44.09
Vegetation Types (Shepherd, Beeston and Hopkins, 2002) in Jarrah Forest bioregion				
4	1,022,712.70	280,312.43	27.41	23.53
949	1,462.42	531.22	36.32	6.09
1015	-	-	-	-
Vegetation Types (Shepherd, Beeston and Hopkins, 2002) in Swan Coastal Plain bioregion				
4	15,897.08	3,002.61	18.89	14.60
949	209,983.26	120,150.30	57.22	56.45
1015	19,556.98	6,639.02	33.95	44.09

Vegetation Type	Pre-European Extent (ha)	Current Extent (ha)	Remaining (%)	Current Extent Managed in DBCA Lands (%)
Vegetation Types (Shepherd, Beeston and Hopkins, 2002) in Shire of Victoria Plains				
4	64,094.37	14,633.44	22.83	3.25
949	925.23	387.02	41.83	-
1015	1,230.29	503.59	40.93	-

Mapping by Heddle, Loneragan and Havel (1980) used landform-soil units determined by Churchward and McArthur (1978) and has identified two vegetation complexes occurring within the Survey Area. The delineation of vegetation complexes is based on the concept of a series of plant communities forming regularly repeating complexes associated with a particular soil unit. Two Heddle, Loneragan and Havel (1980) vegetation complexes occur within the Survey Area and are described below and described below:

- **Mogumber Complex – North:** Open Woodland of *Corymbia calophylla*, with some *Eucalyptus marginata* subsp. *thalassica* and *Eucalyptus todtiana*; and
- **Cullula Complex:** Low Woodland of *Banksia menziesii*, *Banksia attenuata*, *Banksia ilicifolia*, *Nuytsia floribunda*, *Eucalyptus todtiana* with taller emergents of *Corymbia calophylla*.

2.2.3 Environmentally Sensitive Areas

Environmentally Sensitive Areas (ESAs) are declared to prevent degradation of important environmental values such as Threatened flora, TECs or significant wetlands. Exemptions contained in the *Environmental Protection (Clearing of Native vegetation) Regulations 2004* for low impact land clearing do not apply in ESAs and a clearing permit is required.

One ESA identified as a Swan Coastal Plain wetland and associated 50 m buffer occurs within the northern portion of the Survey Area. Five nearby ESAs identified as Swan Coastal Plain wetlands and associated 50 m buffers are located within 100 m to the north and 750 m to the west of the Survey Area. Additionally, two ESAs identified as declared rare flora and associated 50 m buffers are located approximately 150 m west of the Survey Area (Figure 6) (Department of Water and Environmental Regulation, 2018).

2.2.4 Conservation Areas

There are no conservation areas within the Survey Area. The nearest conservation areas are the Mogumber West Nature Reserve, located approximately 1 km northeast of the Survey Area, the Mogumber Nature Reserve, located approximately 5 km east-southeast of the Survey Area and the Wannamal Nature Reserve, located approximately 6 km southeast of the Survey Area (Department of Biodiversity Conservation and Attractions, 2017a).

2.2.5 Introduced Flora

The Australian Weed Strategy identifies Weeds of National Significance (WONS) based on four major criteria (Appendix B) (Thorp and Lynch, 2000). Each WONS has a national strategy and a national coordinator, responsible for implementing the strategy. WONS are regarded as the worst weeds in Australia because of their invasiveness, potential for spread, and economic and environmental impacts (Thorp and Lynch, 2000).

Plants may also be 'Declared' under the *Biosecurity and Agriculture Management Act 2007* (BAM Act) through the provisions of the Western Australian Organism List (WAOL). The WAOL contains information on the area(s) in which a plant is Declared and the control and keeping categories to which it has been assigned in Western Australia (Department of Primary Industries and Regional Development, 2018) Species listed as Declared under the BAM Act are allocated to one of three categories which are described in Appendix B.

2.2.6 Black Cockatoo Species

Three species of Black Cockatoo are found in south-west WA; Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*), Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksia naso*) and Baudin's Black Cockatoo (*Calyptorhynchus baudinii*). All three Black Cockatoos have suffered a substantial decline in numbers and breeding distribution in the past 50 years (Johnstone and Storr, 1998). Direct causes of population decline include the large numbers shot by orchardists (mainly associated with Baudin's Black Cockatoo), clearing and fragmentation of habitat (especially the loss of breeding hollows), the impact of hollow competitors including the Galah (*Cacatua roseicapilla*), corellas including Butler's Corella (*Cacatua pastinator butleri*), Australian Shelduck (*Tadorna tadornoides*), Australian Wood Duck (*Chenonetta jubata*), the feral European honey bee (*Apis mellifera*), and also vehicle strikes. Around 60% of the original vegetation on the Swan Coastal Plain has been cleared and up to 85% in other parts of the south-west region for agriculture (crops), meat production, dairying, farms, orchards, vineyards, pine plantations, mining, timber and wood chipping, cities and towns. At present, extensive tracts of uncleared land only remain in State forest and conservation reserves and what is left of remnant vegetation (in roadside verges etc.) is often disturbed to a varying degree (Johnstone and Kirkby, 2011).

The south-west region is now a severely fragmented landscape and the further loss of foraging habitat, the lack of suitable breeding sites, climate change, and alterations in the landscape has led to significant changes in forest structure. Almost every part of the Jarrah-Marri forest has been logged in the past, and most present-day trees are too young to form hollows, and competition with exotic species, exacerbate the future conservation of Carnaby's Black Cockatoo, Forest Red-tailed Black Cockatoo and Baudin's Black Cockatoo (Johnstone and Kirkby, 2011).

Black cockatoos breed in large hollow-bearing trees, generally within woodlands or forests (Johnstone and Kirkby, 2011). The size of the tree can be a useful indication of

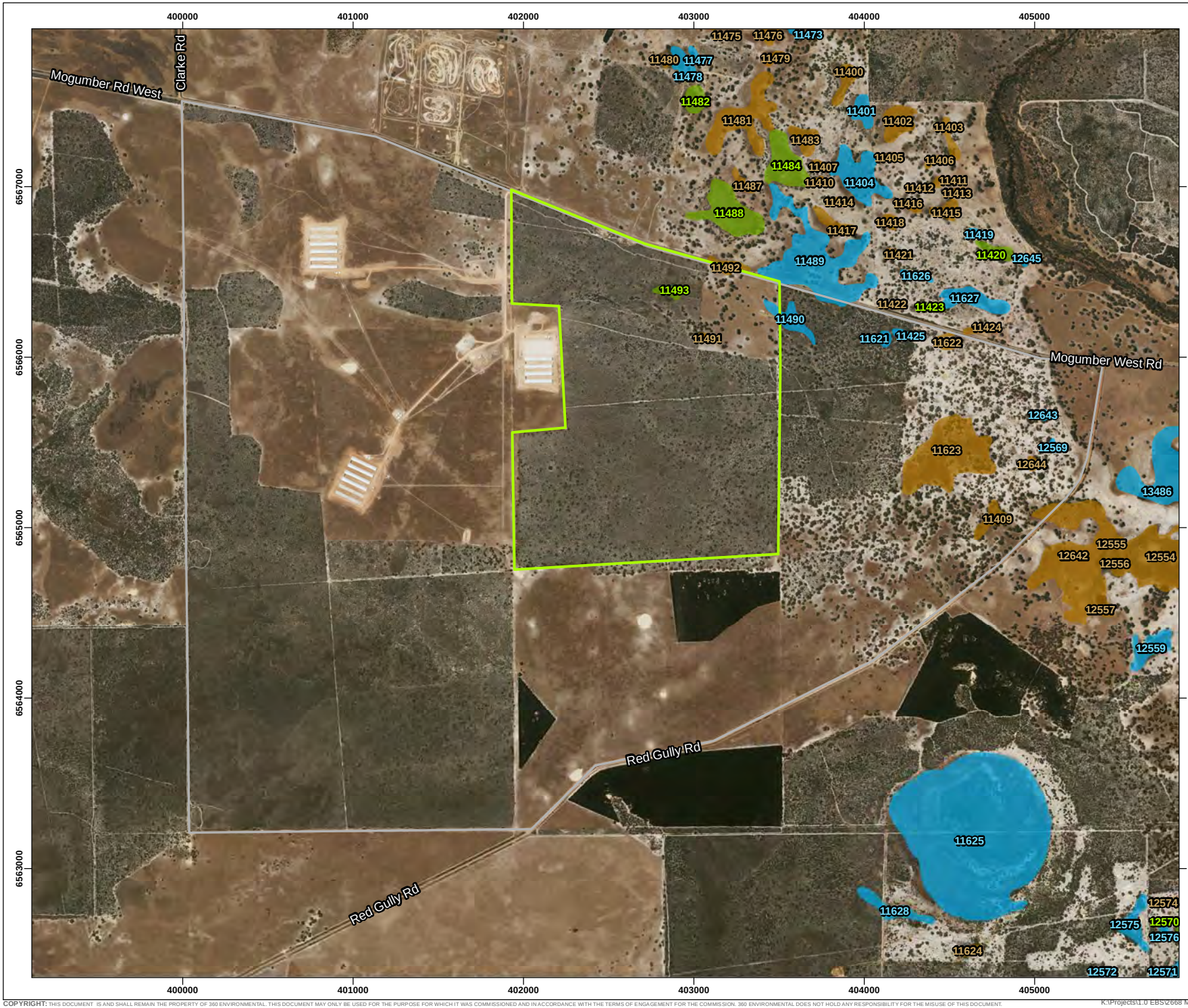
the hollow-bearing potential of the tree. Trees of suitable Diameter at Breast Height (DBH) are potentially important for maintaining breeding in the long-term, through maintaining the integrity of the habitat and allowing trees to provide future nest hollows. Maintaining the long-term supply of trees of a size to provide suitable nest hollows is particularly important in woodland stands that are known to support Black Cockatoo breeding (Department of Sustainability Environment Water Population and Communities, 2012).

The distribution of all three Black Cockatoo species can be seen in the 2014 and 2017 distribution maps in Appendix H. The Survey Area is only within the known distribution of the Carnaby's Black Cockatoo, therefore the Forest Red-tailed Black Cockatoo and Baudin's Black Cockatoo will not be discussed at length in this report.

Carnaby's Black Cockatoo

Carnaby's Black Cockatoo is endemic to south-west WA, and is distributed from the Murchison River to Esperance and inland to Coorow, Kellerberrin and Lake Cronin (Cale, 2003). The species was once common, but the population has declined significantly in the last half century, and is now locally extinct in some areas (Johnstone and Storr, 1998; Shah, 2006). In the last 45 years the species has suffered a 50% reduction in its abundance (Cale, 2003). This reduction is due to the clearing of core breeding habitat in the Wheatbelt, the deterioration of nesting hollows, and clearing of food resources on the Swan Coastal Plain (Cale, 2003). The total population of Carnaby's Black Cockatoo is currently estimated at 40,000 (Johnstone and Kirkby, 2011). Breeding has been recorded from early July to mid-December, and primarily occurs in the Wheatbelt in the semi-arid and subhumid interior (Johnstone and Storr, 1998).

Carnaby's Black Cockatoos feed on seeds, nuts and flowers of a variety of native and exotic plants. Food plants include *Banksia* sp. (including those previously included in the genus *Dryandra*), Pine trees (*Pinus* sp.), Marri, Jarrah, *Grevillea*, *Allocasuarina*, and *Hakea* species (Shah, 2006). As Carnaby's Black Cockatoos are less efficient at extracting Marri seeds than the other two Black Cockatoo species, the seeds from seed pods of Banksia and the cones of Pine trees provide the Carnaby's Black Cockatoo with the highest energetic yield (Cooper *et al.*, 2002).



Legend

- Flora Survey Area
- Lot 10 Boundary

Geomorphic Wetlands

- Conservation
- Resource Enhancement
- Multiple Use

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS
- CADASTRE SOURCED LANDGATE 2018
- WETLAND SOURCEDS DPAW 2017
- LOCALITY MAP SOURCED LANDGATE 2017
- AERIAL PHOTOGRAPHY SOURCED LANDGATE 2017
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LOCALITY MAP

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HORIZONTAL DATUM AND PROJECTION
GDA 1994 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
SL	NW	SW	2

Santrev
Farm 2 Mogumber

Mogumber Farm II Biological Surveys

Figure 3
Geomorphic Wetlands

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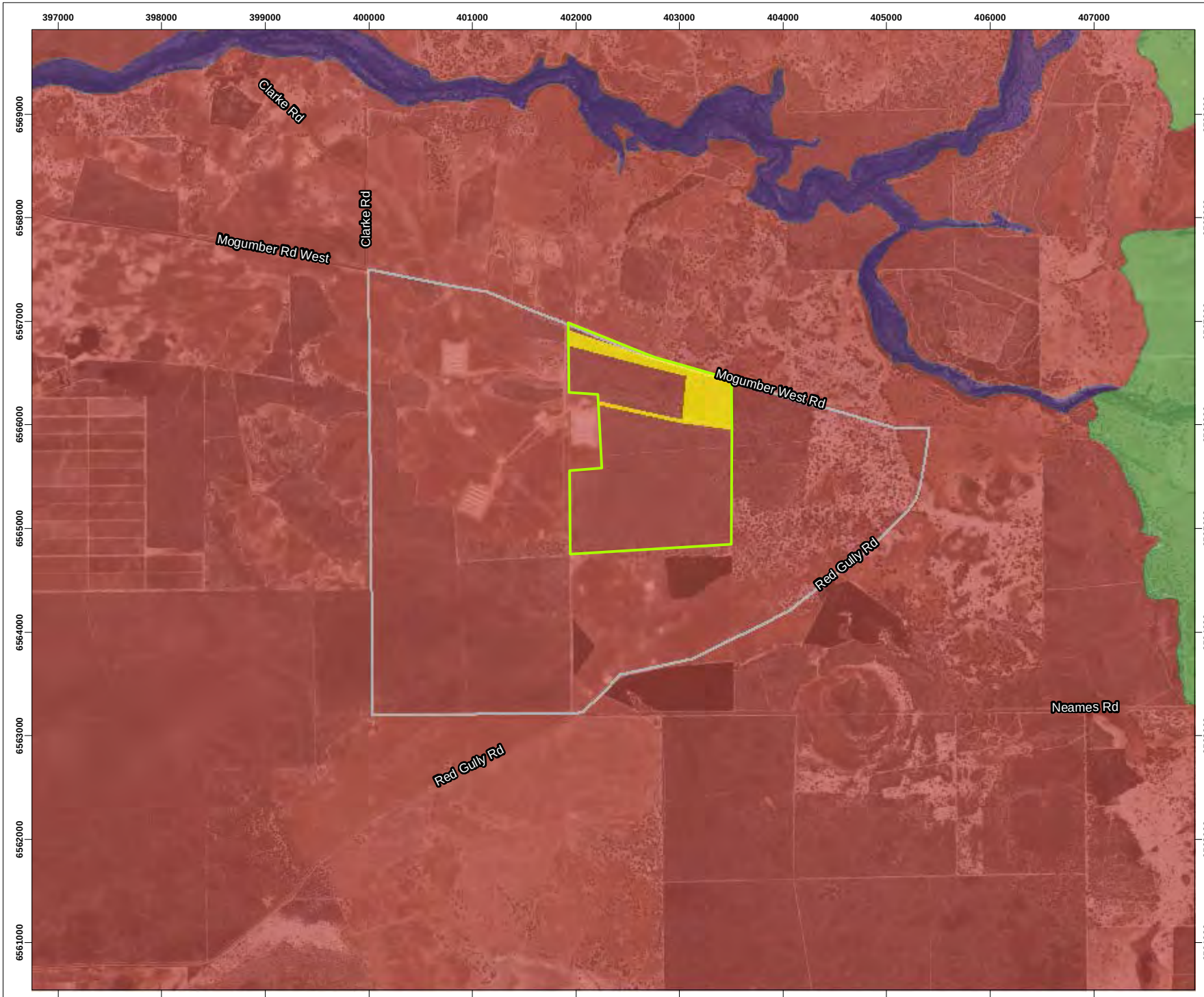

Legend

- Flora Survey Area
- Fauna Survey Area
- Lot 10 Boundary

Soils and Landsystems

- 222Cp: Subdued stripped lateritic plateau, undulating to gently undulating low rises with gently undulating plain including dunes; pale and yellow deep sands, sandy gravels, some duplex; from sandsto*
- 222Mm: Level to gently undulating plain being a relict flood plain, partially rejuvenated; sandy duplex, sandy earth, some sandy gravel; alluvium and weathered sandstone
- 253Wa: Alluvial plain and fans; Brown and red loamy earths, Yellow/brown sandy duplexes, loamy duplexes

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS
- CADASTRE SOURCED LANDGATE 2018
- SOILS AND LAND SYSTEMS SOURCED DPIRD 2012
- LOCALITY MAP SOURCED LANDGATE 2017
- AERIAL PHOTOGRAPHY SOURCED LANDGATE 2017
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LOCALITY MAP

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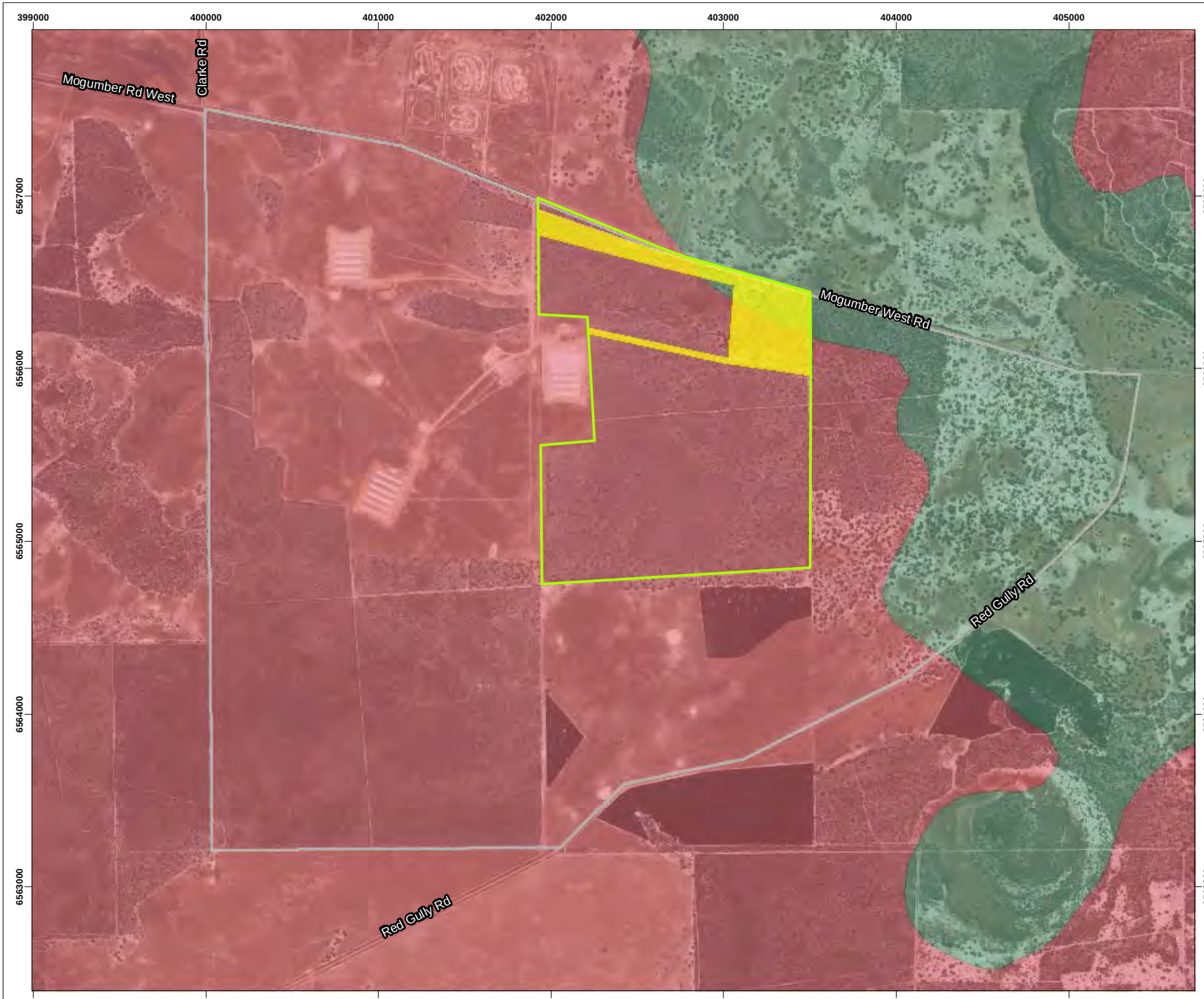
HORIZONTAL DATUM AND PROJECTION
GDA 1994 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
SL	NW	SW	1

Santrev
Farm 2 Mogumber

Mogumber Farm II Biological Surveys

Figure 4
Soils and Landsystems



Legend

- Flora Survey Area
- Fauna Survey Area
- Lot 10 Boundary

IBRA Subregions

- Dandaragan Plateau
- Northern Jarrah Forest

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS
- CADASTRE SOURCED LANDGATE 2018
- IBRA SOURCED DOEE 2018
- LOCALITY MAP SOURCED LANDGATE 2017
- AERIAL PHOTOGRAPHY SOURCED LANDGATE 2017
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CREATED	CHECKED	APPROVED	REVISION
SL	NW	SW	1

Santrev
Farm 2 Mogumber

Mogumber Farm II Biological Surveys

Figure 5
IBRA Subregions

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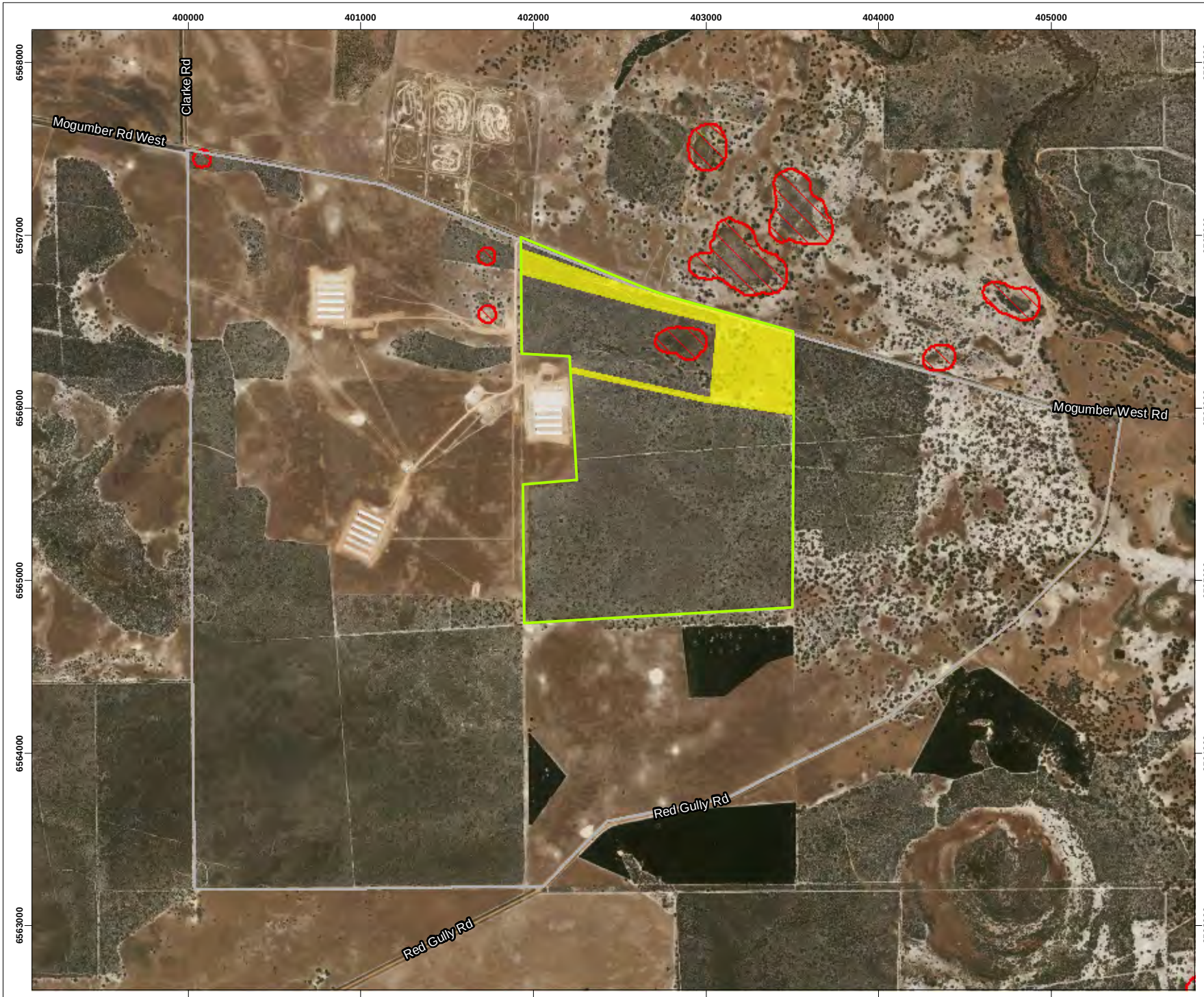

Legend

- Flora Survey Area
- Fauna Survey Area
- Lot 10 Boundary
- Environmentally Sensitive Areas

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS
- CADASTRE SOURCED LANDGATE 2018
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Mogumber Farm II Biological Surveys

Figure 6
Environmentally Sensitive Areas

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3 Methods

3.1 Flora and Vegetation

The flora and vegetation assessment was consistent with an out of season Detailed Flora survey, as per the Environmental Protection Authority (EPA) requirements for environmental surveying and reporting for flora and vegetation in WA, where practicable, as set out in the following documents:

- Technical Guidance – Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment (Environmental Protection Authority, 2016a).

3.1.1 Desktop Assessment

The following government databases were reviewed to provide background information on the flora and vegetation of the Survey Area:

- DBCA Threatened and Priority Flora database (5 km radial search)(Department of Biodiversity Conservation and Attractions, 2018e);
- DBCA Threatened and Priority Ecological Communities database (5 km radial search) (Department of Biodiversity Conservation and Attractions, 2018c);
- NatureMap (5 km radial search)(Department of Biodiversity Conservation and Attractions, 2018b);
- DEE Protected Matters Search Tool (5 km radial search) (Department of the Environment and Energy, 2018d); and
- Relevant biological surveys.

3.1.1.1 Likelihood of Occurrence

Prior to the field survey, the Threatened and Priority flora species returned from the database searches were assessed to determine the likely potential of them occurring within the Survey Area. This assessment was based on the following criteria:

- Likely to occur - Previously recorded within Survey Area or within 5 km and suitable habitat potentially occurs in the Survey Area;
- Possible to occur - Previously recorded within 10 to 15 km of the Survey Area and/or suitable habitat potentially occurs in the Survey Area; and
- Unlikely to occur - No suitable habitat appears to be present in the Survey Area.

The conservation significant species identified in the desktop assessment as being likely to occur within the Survey Area, yet were not recorded during the field survey, were re-assessed. This likelihood of occurrence post-survey was based on a greater knowledge of the habitat types within the survey area and following a targeted survey effort.

3.1.1.2 Literature Review

The following reports have been conducted within and in the vicinity of the Survey Area and were reviewed as part of the desktop study:

- Mogumber Chicken Farms Biological Assessment (Focused Vision Consulting Pty Ltd, 2016); and
- Floristic Survey of Northern Sandplains between Perth and Geraldton (Griffin, 1994).

3.1.2 Field Survey

The field survey was conducted between the 28th and 29th of March 2018 by 360 Environmental botanists, Narelle Whittington (flora licence SL012191 and declared rare flora permit 75-1718) and Sophie Fox (Flora licence number SL012192 and declared rare flora permit 74-1718).

The field survey included the instalment and assessment of 12 quadrats, targeted flora searches, compilation of a systematic flora species list, vegetation association mapping and vegetation condition mapping (Figure 10). Three of the quadrats are along the preferred road and services route, three along the alternate route and the remaining six are distributed in the adjacent vegetation to collect data from representative vegetation communities.

In addition to the data collected from quadrats, traverses throughout the preferred access tracks options (A) and (B) were undertaken for vegetation significant flora searches, including but not limited to Threatened flora, Priority flora and introduced flora (in particular declared taxa). Opportunistic searches were also undertaken in the adjacent vegetation.

Quadrats were accurately measured using measuring tapes, with the location of the north-west corner of each quadrat permanently marked using a metal fence dropper and flagging tape and recorded using a handheld Garmin GPS unit. Quadrats were 10 m x 10 m in size or the equivalent to 100 m^2; this is considered the standard for the Swan Coastal Plain and Jarrah Forest bioregions (Environmental Protection Authority, 2016a). At each quadrat the following data was recorded:

- Site code - a unique identifier allocated to each quadrat;
- Date and recorder – a record of the date of quadrat sample and a list of the personnel involved in sampling the quadrat;
- Location – GPS coordinates (MGA94) measured from the north west corner of the quadrat;
- Dimensions – the size and shape of the quadrat;
- Landform and soil description – a description of the quadrat habitat;

- Additional site descriptors – location information that might be useful in vegetation classification including, slope, aspect, litter cover, bare ground cover and fire history;
- Species list – a comprehensive vascular flora species list, including weeds;
- Foliar cover – the estimated total percentage foliar cover for each species recorded;
- Height – the average height (in meters) of each species recorded;
- Vegetation description – a description of the vegetation according to the National Vegetation Information System (NVIS), Level V. According to this level, vegetation at a local scale is classified to 'Type', where the dominant growth form, height, cover and species (three species) for the three traditional strata (upper, mid and ground) are described;
- Vegetation condition – assessed according to the vegetation condition scale (Environmental Protection Authority, 2016a) (Appendix C)); and
- Photographs – a photograph from the north west corner looking toward the south east corner was taken.

3.1.2.1 Taxonomy and Nomenclature

Where field identification of plant taxa was not possible, specimens were collected systematically for later identification utilising resources of the Western Australian Herbarium (WAH).

The finalised species list was checked against FloraBase (Department of Biodiversity Conservation and Attractions, 2018a) to determine the species' conservation status. Threatened and Priority Flora were verified against the EPBC Act listing of threatened species to determine Commonwealth listing. Introduced flora species were compared to the WONS list (Thorp and Lynch, 2000) and the DAFWA list to determine if any are listed as Declared (Department of Primary Industries and Regional Development, 2018).

3.1.2.2 Statistical Analyses

Quadrats were classified on the basis of similarity in species composition using Primer-E version 6.1.5. Species presence/absence quadrat data was pre-treated and transformed and then computed using Bray-Curtis similarity analysis.

A Bray-Curtis similarity analysis was undertaken on the floristic composition of the quadrats recorded during the survey with weed and native flora quadrat data compiled between 1990 - 1996 for the Southern Swan Coastal Plain (Gibson *et al.*, 1994). The (Gibson *et al.*, 1994) data set combines a total of 1098 sites from numerous studies on the swan coastal plain.

The purpose of the similarity analysis was to help clarify the assignment of Floristic Community type (FCT) to the quadrat sites recorded during the current survey. The end

assignment of FCTs to the survey quadrats was made by the nearest neighbour method. The nearest neighbour method involved determination of sites most similar from the (Gibson *et al.*, 1994) data set to quadrats recorded during this survey.

3.2 Vertebrate Fauna and Black Cockatoos

The level 1 vertebrate fauna survey was compliant with the EPA and WA regulatory requirements for undertaking an environmental survey and reporting of terrestrial vertebrate fauna. The Black Cockatoo Survey was undertaken in accordance with the EPBC Act referral guidelines for Black Cockatoos. The relevant guidelines are represented by:

- Technical Guidance – Terrestrial Fauna Surveys (Environmental Protection Authority, 2016c), previously represented by Guidance Statement No. 56 (Environmental Protection Authority, 2004);
- Technical Guidance – Sampling Methods for Terrestrial Vertebrate Fauna (Environmental Protection Authority, 2016b), previously represented by Technical Guide – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment (Environmental Protection Authority and Department of Environment and Conservation, 2010); and
- EPBC Act referral guidelines for three threatened black cockatoo species (Department of Sustainability Environment Water Population and Communities, 2012).

3.2.1 Desktop Study

The desktop assessment provided background information on the vertebrate fauna of the Survey Area. This included information from database searches, available literature and previous surveys in the surrounding area if available.

Searches of the DBCA Threatened and Priority Fauna database (40 km radial buffer), NatureMap (20 km radial buffer) and EPBC Protected Matters Search Tool (PMST) (20 km radial buffer) were undertaken to identify fauna species of conservation significance potentially occurring in the Survey Areas (Department of the Environment and Energy, 2017; Department of Biodiversity Conservation and Attractions, 2018d, 2018b).

3.2.2 Field Survey

A level 1 vertebrate fauna survey, in conjunction with a targeted Black Cockatoo Survey, was undertaken to provide a representative spatial assessment. The field survey was undertaken on 23rd March 2018 by Senior Zoologist Andrew Hide. The purpose of the field survey was to verify the accuracy of the desktop assessment and to further delineate and characterise the fauna assemblages and fauna habitat in the Survey Areas. The field survey consisted primarily of fauna habitat assessments, systematic bird searches and opportunistic observations.

3.2.2.1 Fauna Habitat Assessment

Vegetation associations and distinctive landforms *'component of the landscape with characteristic shape produced by natural processes'* (Environmental Protection Authority, 2016c) were used to identify the broad faunal habitats in the Survey Areas. These fauna habitats were then assessed for their potential to support species of conservation significance and the quality of habitat they provide to a wider suite of fauna.

Each broad habitat type description includes information on:

- Location of the broad habitat type within the Survey Area (GPS co-ordinate) and its relative percentage;
- Habitat condition was assessed at each trap site using the EPA vegetation condition scale (Appendix C) (Environmental Protection Authority, 2016a);
- Dominant vegetation and structure (e.g. number of vegetation strata);
- Hollow-bearing trees and dead stags (e.g. average size and abundance of hollows);
- Description of any rock and rocky outcrops;
- Logs (e.g. abundance and size);
- Substrate (e.g. leaf litter);
- Wetlands, creeks, rivers, dams and other water bodies;
- Description of any observed nests and roosts (if present);
- Subterranean roosts (e.g. caves, disused mineshafts and/or adits);
- Associated fauna species observed using the habitat;
- Disturbance (e.g. cattle grazing, fire); and
- Photo showing a typical example of the broad fauna habitat type.

3.2.2.2 Area Bird Searches

Area bird surveys were undertaken within the Survey Area, which involved undertaking an area bird survey at each of the fauna habitat types identified within the Survey Area for a minimum of 20 minutes per each identified faunal habitat (Environmental Protection Authority, 2016b).

3.2.2.3 Opportunistic Observation

Fauna were opportunistically observed and recorded at each Survey Area. Opportunistic observations involved targeted searches of habitats in the Survey Area that potentially support fauna of conservation significance as well as systematic searches which included looking through leaf litter, overturning rocks, looking under decorticating bark and searches for scats, tracks, burrows and other traces of animals throughout the Survey

Area. If conservation significant species were located, the coordinates were recorded with a GPS.

In addition, opportunistic records of fauna species encountered while travelling throughout the Survey Area were documented. Opportunistic data comprises records of fauna species by GPS location throughout the Survey Area, particularly important in the case of conservation significant fauna.

3.2.2.4 Taxonomy

Where there was doubt on species names identified in the desktop assessment (through subsequent name changes or taxonomic reviews), an effort was made to determine the current scientific name for each taxon. Taxonomy and nomenclature in this report follows the 2018 checklist of terrestrial vertebrates (Western Australian Museum, 2018) where relevant.

3.2.2.5 Black Cockatoo Foraging Habitat

The foraging habitat assessment involved assessing the habitat for tree and shrub species known to be important dietary items as listed in the EPBC referral guidelines (Department of Sustainability Environment Water Population and Communities, 2012). It also included looking for:

- Evidence of feeding (chewed cones, seed and nut material) around tree and shrub species suitable for foraging); and
- Opportunistic observations of Black Cockatoos in the Survey Area.

The locations of trees and shrubs around which searching for foraging evidence occurred were recorded and electronically logged using a hand-held GPS unit. Intermittent photographic evidence of habitat was also captured throughout the Survey Area.

3.2.2.6 Black Cockatoo Breeding Habitat

A breeding habitat assessment involved the onsite assessment and measurement of potential breeding trees based on being:

- Native trees known to support Black Cockatoo species as listed in the EPBC referral guidelines (Department of Sustainability Environment Water Population and Communities, 2012); and
- Diameter at breast height (DBH) > 500 mm regardless of the presence or absence of hollows (DBH > 300 mm for Wandoo and Salmon Gum).

Any trees, within the Survey Area, meeting the above criteria were recorded and electronically logged using a hand held Global Positioning System (GPS) unit. Key measurements of each tree were recorded including the location, species, tree Diameter at Breast Height (DBH), the presence of hollows and any other important descriptive information.

Trees with multiple stems, swellings or forking/branching at breast height were measured separately. When this occurred, the diameter was measured just above breast height to gain a more accurate measurement of diameter.

Measured trees were then placed into the following size class categories for mapping:

- 500 – 750 mm DBH;
- 750 – 1,000 mm DBH; and
- 1,000 – 1,250 mm DBH.

Any potential breeding trees with hollows were also visually assessed from the ground for evidence of past or present occupancy, and/or current activity of Black Cockatoos or other bird species.

3.2.2.7 Roosting Habitat

Opportunistic searches for roosting evidence were undertaken during the field assessment. Evidence of roosting usually involved the observation of bird scat in a specific area and evidence of tree limb damage throughout the canopy and on the ground.

3.2.3 Likelihood of Occurrence - Conservation Significant Fauna

The Likelihood of Occurrence for each conservation significant fauna species retrieved from the database searches is classified as either 'Recorded', 'High', 'Medium' or Low' likelihood of occurring within the Survey Area based on the following criteria:

Recorded

- The species was recorded during the field assessment.

High

- Preferred habitat is present in the Survey Area and known species distribution has been recorded on more than one occasion within 20 km of the Survey Area in the last 15 years.

Medium

- Limited suitable habitat occurs in the Survey Area, but preferred habitat is nearby and the species has good dispersal abilities and is known from the general area; or
- preferred habitat occurs but the species has not been recorded within the vicinity within the last 15 years.

Low

- No suitable habitat is present in the Survey Area; or
- the Survey Area is outside the species known distribution or the species is known from the general area but has poor dispersal abilities.

Only species 'Recorded' or considered as having a 'High' or 'Medium' Likelihood of Occurrence within the Survey Area will be discussed in detail. Species classified as having a 'Low' likelihood of occurrence based on the above criteria will not be discussed unless a justification for this classification is required.

4 Results

4.1 Limitations and Constraints

Survey constraints are often difficult to predict, as is the extent to which they influence survey effort. Survey limitations and constraints of the flora and vegetation assessment are detailed in Table 2.

Table 2: Limitations and Constraints Associated with the Survey Area

VARIABLE	IMPACT ON SURVEY OUTCOMES
Access	The Survey Area was accessible via vehicle and/or on foot. Particular focus was given to areas expected to be impacted and areas that may have species of conservation significance.
Experience	The personnel who executed the survey were practitioners suitably qualified in their respective fields: • Field Staff: Narelle Whittington (Principal Botanist), Sophie Fox (Botanist) and Andrew Hide (Senior Zoologist); • Flora Taxonomy: Frank Obbens (Taxonomist); • Data Interpretation and Reporting: Narelle Whittington, Sophie Fox, Andrew Hide and Evan Webb (Graduate Ecologist); and • Report Review: Scott Walker (Principal Ecologist/ Group Leader).
Timing, weather, season	The survey was conducted during March which is outside of the recommended flora survey period for the South-West province (Spring, September - November). For the three months prior to the survey, the Wongan Hills weather station recorded 58.6 mm of rainfall which is 16.6 mm above the long-term average rainfall for the same period (refer to Section 2.1.1). The average temperatures for March 2018 were slightly higher than the long-term averages. During the survey, daily maximum temperatures ranged from 28.7°C to 31.7°C and daily minimum temperatures ranged from 12.0°C to 16.8°C. No rainfall was recorded during the survey. Flora composition changes with time, particularly seasonally as a result of changes in conditions such as rainfall. Therefore,

VARIABLE	IMPACT ON SURVEY OUTCOMES
	botanical surveys completed at different times of the year will often produce varying results.
Scope: Life forms sampled	An appropriate number of life forms were sampled in relation to the level of survey undertaken, however as the survey was completed out of season, some species were not flowering which made identification to species level difficult.
Sources of information	Relevant DBCA and EPBC searches were undertaken for the Survey Area. Relevant DBCA database searches were undertaken for the Survey Area and are listed in Appendix L (Excluding GPS coordinates). The desktop analyses used several sources to produce a list of fauna species previously recorded in the vicinity of the Survey Area. These included DBCA Threatened Fauna Database Search (Department of Biodiversity Conservation and Attractions, 2018d), NatureMap (Department of Biodiversity Conservation and Attractions, 2018b), records from the EPBC PMST (Department of the Environment and Energy, 2017), field guides and other scientific literature. In addition, previous flora and fauna survey reports for the area were sourced proving sufficient information to accurately undertake the survey.
Completeness	The entire Survey Area was accessed during the field survey. Eight specimens were unable to be identified with certainty at species level, due to the specimens lacking identifying features on the specimens. Five of these specimens are not thought to be of conservation significance as their features do not resemble any of the Priority or Threatened listed species identified in the database searches. The remaining three have the potential to be significant flora (see section 4.2.2.1). Two have the potential to be priority species and one could be a new species that has not been given a taxonomic name. The seasonal timing of the survey is likely the reason for the lack of identifiable material with some of the collected flora specimens.

4.2 Flora and Vegetation

4.2.1 Desktop Study

4.2.1.1 Database Searches

The database searches identified 85 conservation significant flora species as potentially occurring within a 5 km radius of the Survey Area. Of these, 51 species were Priority and 34 are Threatened (Department of the Environment and Energy, 2017; Department of Biodiversity Conservation and Attractions, 2018e, 2018c, 2018b). The 51 Priority flora included two Priority 1 (P1), three Priority 2 (P2), 35 Priority 3 (P3) and 11 Priority 4 (P4) (Figure 7, Appendix L).

One Priority Ecological Community (PEC) listed by the State was within a 5 km radius of the Survey Area (Figure 8), this community is also listed as a Threatened Ecological Community (TEC) under the EPBC Act:

- Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region (Priority 3 [DBCA], Endangered [EPBC]).

4.2.1.2 Likelihood

Based on the post-survey assessment of the likelihood of the 85 species occurring in the Survey Area 17 species have the potential to occur in the Survey Area (Table 3, Appendix D).

Table 3: Conservation Significant Species with the Potential to Occur in the Survey Area

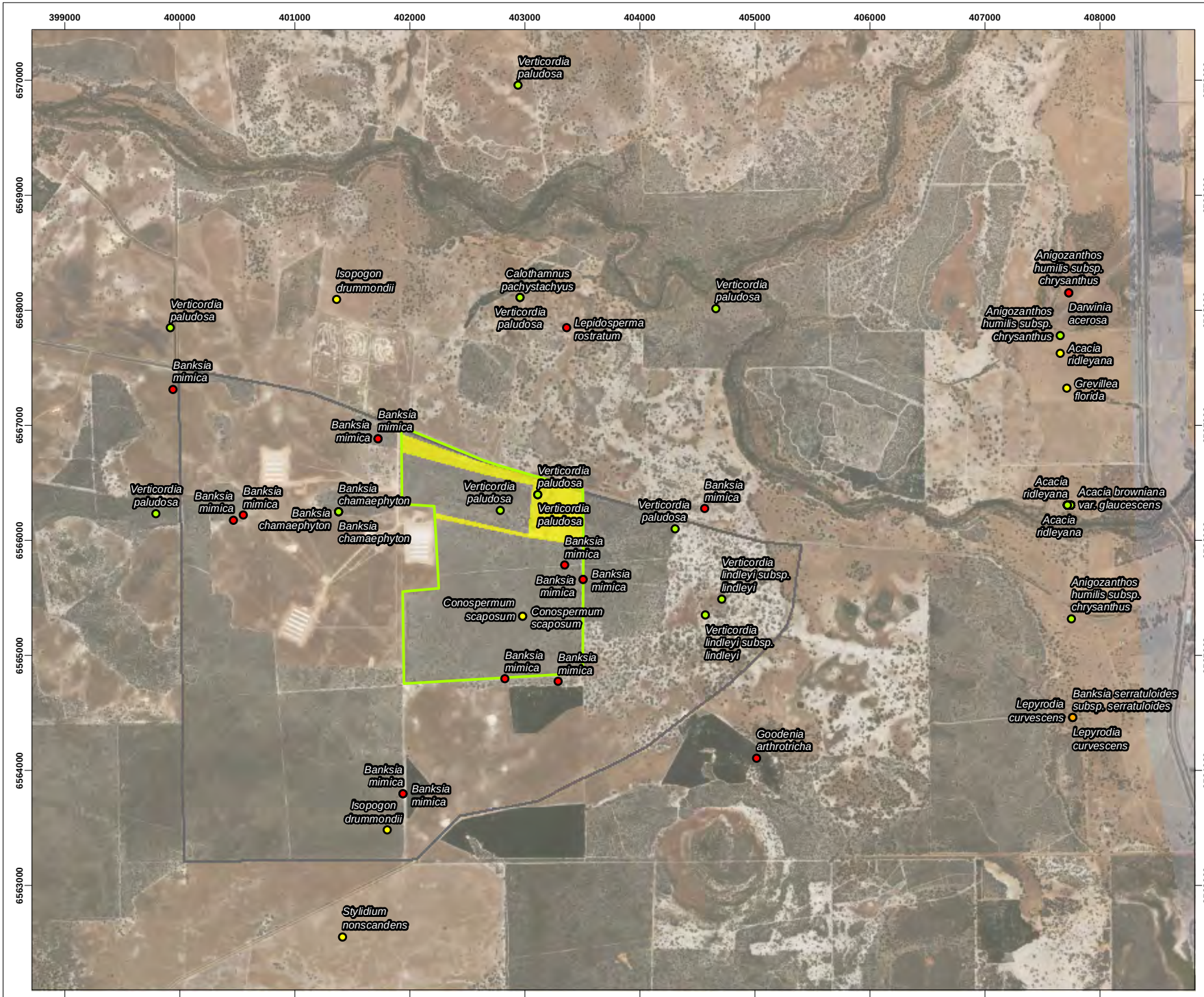
SPECIES	CONSERVATION STATUS	SPECIES	CONSERVATION STATUS
Eremophila glabra subsp. *chlorella*	T	*Persoonia rudis*	P3
Spirogardnera rubescens	T	*Petrophile biternata*	P3
Acacia cummingiana	P3	*Schoenus benthamii*	P3
Acacia ridleyana	P3	*Styphelia filifolia*	P3
Allocasuarina grevilleoides	P3	*Anigozanthos humilis* subsp. *chrysanthus*	P4
Grevillea florida	P3	*Thelymitra apiculata*	P4
Haemodorum loratum	P3	*Thysanotus glaucus*	P4
Leucopogon allittii	P3	*Verticordia lindleyi* subsp. *lindleyi*	P4
		Verticordia paludosa	P4

4.2.1.3 Literature Review

A summary of the two previous reports is provided in Table 4.

Table 4:Summary of Previous Survey Reports

REPORT TITLE	SURVEY AREA	CONSERVATION SIGNIFICANT FLORA AND COMMUNITIES	INTRODUCED FLORA
Mogumber Chicken Farms Biological Assessment	Building envelopes and buffers of chicken sheds	One Specimen of *Banksia mimica* (T) was found. Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region was considered likely to be present	6
Floristic Survey of Northern Sandplains between Perth and Geraldton	Northern Sandplains between Perth and Geraldton but not actually within the Survey Area	Due to the scale of the study detailed assessment of community conservation significance was not possible, however mention was given to the vegetation around Dandaragan being poorly reserved. Significant flora was not mentioned	262



Legend

- Fauna Survey Area
- Flora Survey Area
- Lot 10 Boundary

DBCA Threatened and Priority Flora Records

- Threatened
- Priority 2
- Priority 3
- Priority 4

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS
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Mogumber Farm II Biological Surveys

Figure 7
DBCA Threatened and Priority Flora Records

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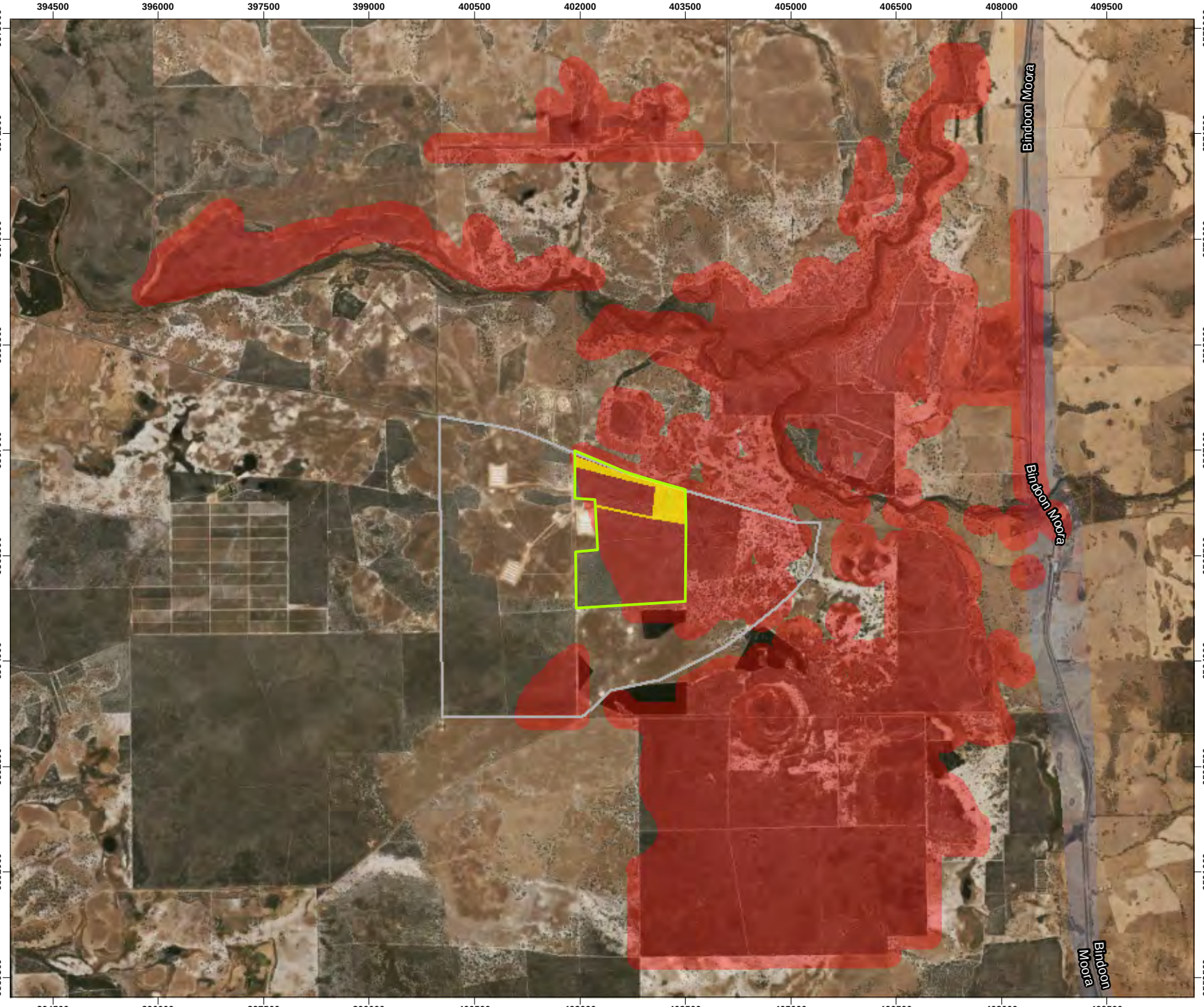

Legend

- Flora Survey
- Fauna Survey
- Lot 10 Boundary

TECs and PECs

- Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS
- CADASTRE SOURCED LANDGATE 2018
- TEC AND PEC SOURCED DBCA 2018
- LOCALITY MAP SOURCED LANDGATE 2017
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Mogumber Farm II Biological Surveys

Figure 8
TECs and PECs

4.2.2 Field Survey

4.2.2.1 Flora

A total of 119 flora species (including species, subspecies, varieties and forms) from 23 families and 64 genera were recorded in the Survey Area. The most commonly occurring families were Proteaceae (27 taxa), Myrtaceae (18 taxa) Fabaceae (14 taxa) and Cyperaceae (13 taxa). The most frequently recorded genus was *Banksia*. A complete flora species list is presented in Appendix E and each survey site sheet is provided in Appendix F.

Of the 129 specimens collected, 10 could not be confidently identified to species level due to lack of identifying features such as flowering or fruiting parts. Of particular interest were the following specimens:

- *Synaphea* ? *sparsiflora*, which has the potential to be a Priority 2 (P2) species;
- *Xanthorrhoea drummondii sans lat.* is a species of interest as the specimen has features that are similar to *X. drummondii* but did not match current known collections from the WA herbarium. This specimen is potentially a new species, however, the taxonomy of the genus group it not currently being studied by a taxonomist to determine its name; and
- *Banksia dallanneyi* var? *dallanneyi* was collected as well as *Banksia dallanneyi* subsp. *pollosta* which is a Priority 3. *Banksia dallanneyi* was a dominant species across the entire Survey Area and the subspecies was not always distinguishable. It is important to note that all the specimens collected, all but one was identified as *Banksia dallanneyi* subsp. *pollosta* (P3).

The remaining specimens unable to be identified down to species level are not thought to represent significant species.

4.2.2.2 Flora of Conservation Significance

One Threatened species listed under the EPBC Act and gazetted as Declared Rare Flora (Threatened) pursuant to the WC Act was recorded in the Survey Area and Six Priority species Figure 9).

Banskia mimica (DRF/T) is listed under the EPBC Act as Endangered and gazetted as Threatened pursuant to the WC Act. 84 individuals were recorded in the Survey Area in 34 locations (Appendix G, Plate 1). The vegetation within the buffers of these conservation significant plants are considered critical habitat and therefore are regarded as Environmentally Sensitive Areas (ESAs).

Plate 1: *Banksia mimica*

***Synaphea ? sparsiflora* (P2)** was found at three locations within the Survey Area. 3 individuals were recorded in the Survey Area in 3 locations (Appendix G, Plate 2). Due to the timing of the survey, the specimen was sterile and couldn't be confidently identified to species level. Until further specimens can be collected of the plant in flower (August – September) the individuals should be managed as a significant species.

Plate 2: *Synaphea ? sparsiflora* P2

***Banksia dallanneyi* subsp. *pollosta* (P3)** was found throughout the Survey Area in high numbers, both in the area of proposed impact and the surrounding vegetation. 42 individuals were recorded in the Survey Area in 42 locations, with 25 of these within the proposed area of disturbance (Appendix G, Plate 3)

Plate 3: *Banksia dallanneyi* subsp. *pollosta* P3

***Banksia pteridifolia* subsp. *vernalis* (P3)** was found at one location however it was not recorded within the proposed area of disturbance and only occurred in the surrounding vegetation. Seven individuals were recorded in the Survey Area in 1 location (Appendix G, Plate 4)

Plate 4: *Banksia pteridifolia* subsp. *vernalis* P3

***Stylidium nonscandens* (P3)** was found at one location within the Survey Area, within quadrat 12 (Appendix G, Plate 5).

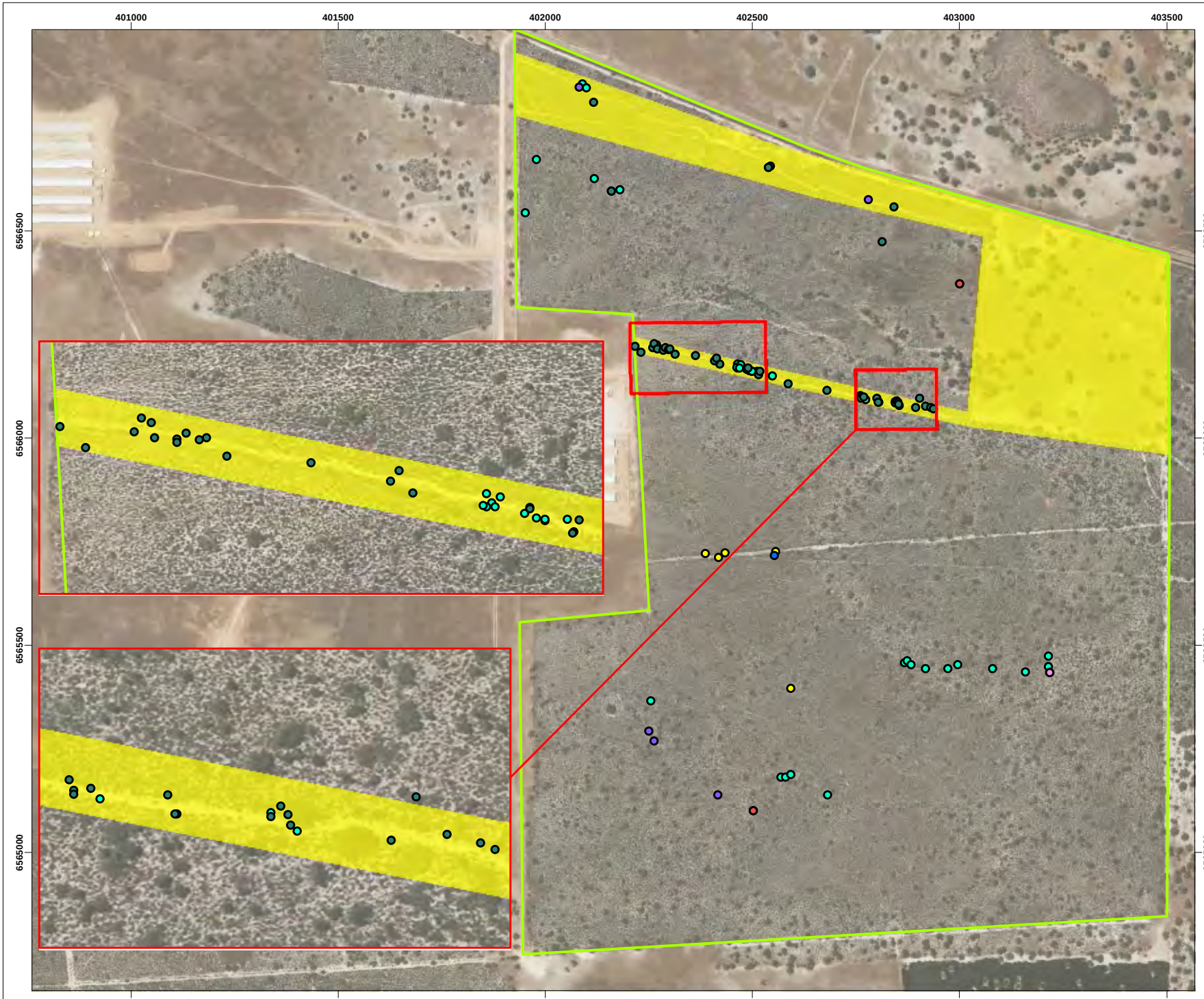
Plate 5: *Stylidium nonscandens* P3 (Florabase 2018).

***Isopogon drummondii* (P3)** was found at eight locations with 12 individuals within the Survey Area (Appendix G, Plate 6).

Plate 6: *Isopogon drummondii*

Banksia chamaephyton (P4) was found at five locations with 39 individuals within the Survey Area. None of the species was found within the proposed area of disturbance and only occurred in the surrounding vegetation (Appendix G, Plate 7).

Plate 7: *Banksia chamaephyton*



Legend

- Flora Survey Area
- Fauna Survey Area

Significant Flora

- *Banksia mimica* - T
- *Synaphea ? sparsiflora* - P2
- *Banksia dallanneyi subsp. pollosta* - P3
- *Banksia pteridifolia* subsp. *vernalis* - P3
- *Isopogon drummondii* - P3
- *Stylidium nonscandens* - P3
- *Banksia chamaephyton* - P4

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Mogumber Farm II Biological Surveys

Figure 9
Significant Flora Locations

K:\Projects\1.0 EBS\2668 Mogumber Farm II Biological Surveys\2668 Figure 7 - Significant Flora Locations.mxd

4.2.2.3 Flora of Interest

One species collected during the Survey, *Xanthorrhoea drummondii sats lat*, is a species of interest as its features do not fit into current known collections of *Xanthorrhoea drummondii* at the WA Herbarium.

4.2.2.4 Introduced Flora

A total of three introduced species were recorded during the survey, representing approximately 2.5% of the total taxa. None of these are listed as Declared Pests or WONS under the BAM Act (Table 5).

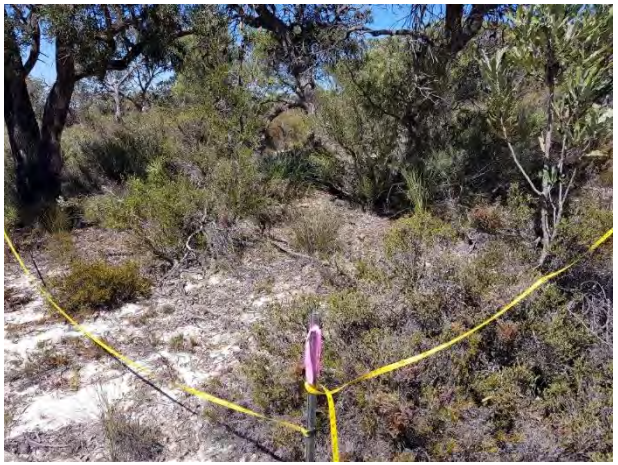
Table 5: Introduced Flora Recorded in the Survey Area

TAXA	COMMON NAME
**Briza maxima*	Blowfly Grass
**Gladiolus caryophyllaceus*	Wild Gladiolus
**Ursinia anthemoides*	Ursinia

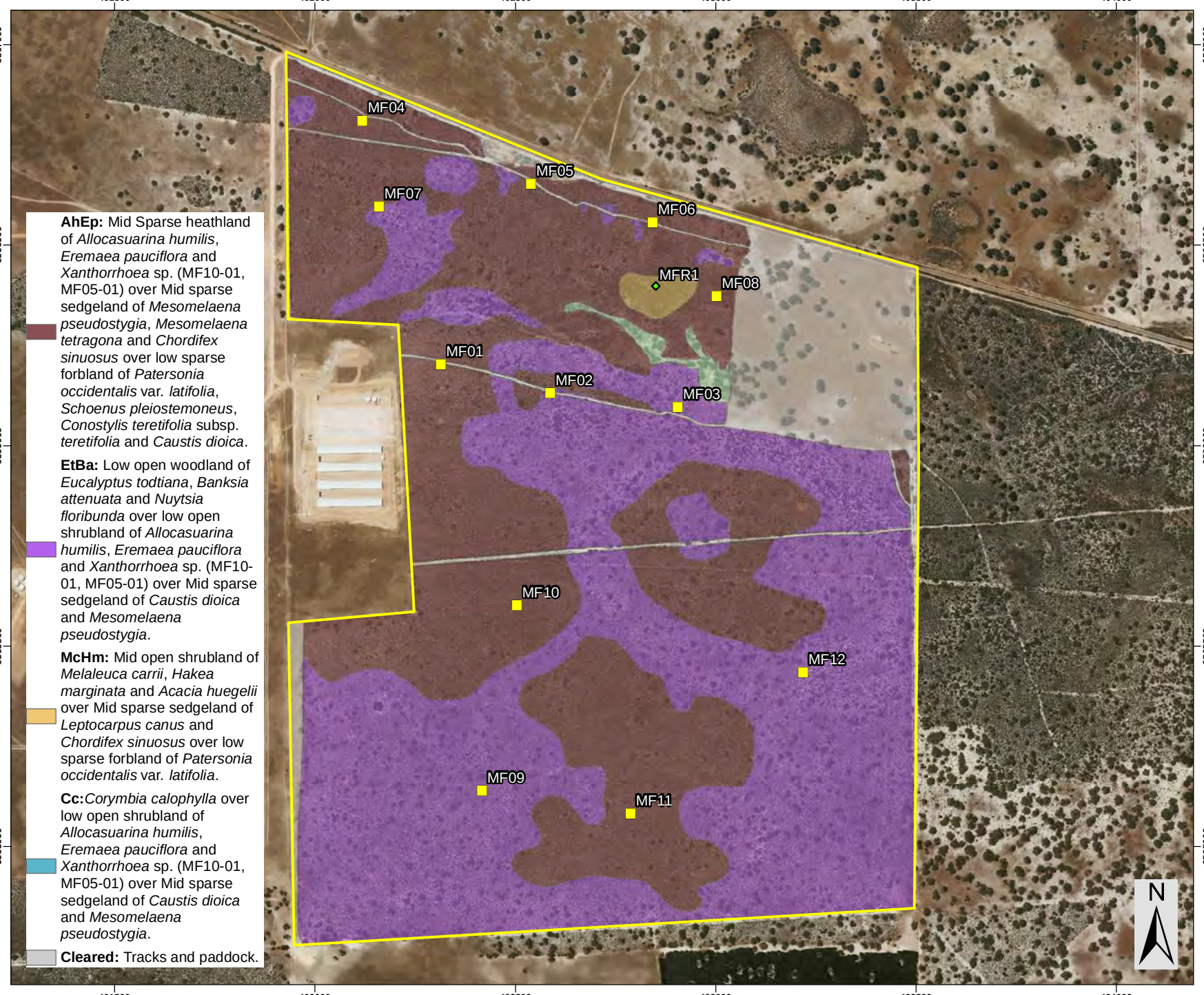
4.2.2.5 Vegetation Associations

Three vegetation associations and one mapping unit was recorded for the Survey Area (Table, Figure). The data collected from each quadrat/relevé is presented in Appendix F.

Table 6: Vegetation Associations Recorded Within the Survey Area

Vegetation association code and Description	Sites	Total Area (ha) and percentage (%)	Representative Site Photograph
AhEp; Mid Sparse heathland of *Allocasuarina humilis*, *Eremaea pauciflora* and *Xanthorrhoea* sp. (MF10-01, MF05-01) over Mid sparse sedgeland of *Mesomelaena pseudostygia*, *Mesomelaena tetragona* and *Chordifex sinuosus* over low sparse forbland of *Patersonia occidentalis* var. *latifolia*, *Schoenus pleiostemoneus*, *Conostylis teretifolia* subsp. *teretifolia* and *Caustis dioica*.	MF01, MF04, MF05, MF06, MF08, MF10, MF11	109.9 (44.9%)	
EtBa: Low open woodland of *Eucalyptus todtiana*, *Banksia attenuata* and *Nuytsia floribunda* over low open shrubland of *Allocasuarina humilis*, *Eremaea pauciflora* and *Xanthorrhoea* sp. (MF10-01, MF05-01) over Mid sparse sedgeland of *Caustis dioica* and *Mesomelaena pseudostygia*.	MF02, MF03, MF07, MF09, MF12	129.3 (52.8%)	

Vegetation association code and Description	Sites	Total Area (ha) and percentage (%)	Representative Site Photograph
McHm: Mid open shrubland of *Melaleuca carrii*, *Hakea marginata* and *Acacia huegelii* over Mid sparse sedgeland of *Leptocarpus canus* and *Chordifex* sinuosus over low sparse forbland of *Patersonia occidentalis* var. l*atifolia*.	MFR1	1.8 (0.73%)	
Cc: *Corymbia calophylla* over low open shrubland of *Allocasuarina humilis*, *Eremaea pauciflora* and *Xanthorrhoea* sp. (MF10-01, MF05-01) over Mid sparse sedgeland of *Caustis dioica* and *Mesomelaena pseudostygia*.	Mapping notes	1.7 (0.69%)	-



AhEp: Mid Sparse heathland of *Allocasuarina humilis*, *Eremaea pauciflora* and *Xanthorrhoea* sp. (MF10-01, MF05-01) over Mid sparse sedgeland of *Mesomelaena pseudostygia*, *Mesomelaena tetragona* and *Chordifex sinuosus* over low sparse forbland of *Patersonia occidentalis* var. *latifolia*, *Schoenus pleiostemoneus*, *Conostylis teretifolia* subsp. *teretifolia* and *Caustis dioica*.

EtBa: Low open woodland of *Eucalyptus todtiana*, *Banksia attenuata* and *Nuytsia floribunda* over low open shrubland of *Allocasuarina humilis*, *Eremaea pauciflora* and *Xanthorrhoea* sp. (MF10-01, MF05-01) over Mid sparse sedgeland of *Caustis dioica* and *Mesomelaena pseudostygia*.

McHm: Mid open shrubland of *Melaleuca carrii*, *Hakea marginata* and *Acacia huegelii* over Mid sparse sedgeland of *Leptocarpus canus* and *Chordifex sinuosus* over low sparse forbland of *Patersonia occidentalis* var. *latifolia*.

Cc:*Corymbia calophylla* over low open shrubland of *Allocasuarina humilis*, *Eremaea pauciflora* and *Xanthorrhoea* sp. (MF10-01, MF05-01) over Mid sparse sedgeland of *Caustis dioica* and *Mesomelaena pseudostygia*.

Cleared: Tracks and paddock.

Legend

- Survey Area
- Quadrat
- Releve

Vegetation Associations

- AhEp (109.91 ha)
- EtBa (129.35 ha)
- McHm (1.82 ha)
- Cc (1.78 ha)
- Cleared (31.51 ha)

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS
- LOCALITY MAP SOURCED LANDGATE 2006
- AERIAL PHOTOGRAPHY SOURCED LANDGATE 2017
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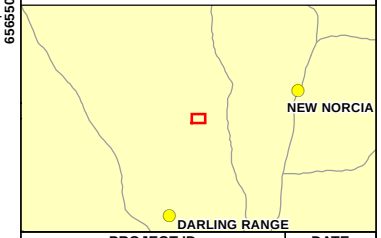

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GCS GDA 1994

CREATED	CHECKED	APPROVED	REVISION
EW	NW	NW	0

Santrev
Farm 2 Mogumber

Mogumber Farm II Biological Surveys

Figure 10
Vegetation Associations

K:\Projects\1.0 EBS\2668 Mogumber Farm II Biological Surveys\2668 Figure X - Vegetation Associations.mxd

4.2.3 Floristic Community Types

Statistical analysis (multivariate analysis) and data interpretation, as shown in Table 7was undertaken to help determine the Floristic Community Types (FCTs) represented by the vegetation in the Survey Area. This involves reviewing site data for other factors that are diagnostic for FCTs, including the presence of indicator species, soil types and landform position. Results from the statistical analyses and the site information, identified two FCTs as occurring in the Survey Area.

There was one releve (MFR1) recorded, which, was within the geomorphic wetland located in the northern section of the Survey Area. A quadrat was not established within the wetland due to the small size and distance from the proposed area of impact. Based on the indicator species, soil types and hydrology, this vegetation type was inferred as SCP S06 Northern dense low shrublands.

Table 7: Floristic Analysis for the Survey Area

Quadrat	Nearest neighbour analysis Similarity %	Site	FCT	Notes	FCT Comparison
MF01 (AhEp)	42.4	MNP03	S09	There is an absence of tree species and given its location on the Dandaragan plateau the vegetation is more likely to be 20d rather than S09, which typically has a Banksia overstorey	FCT SCP 20d
	39.02	MWR01	20d		
	37.33	RGR06	20d		
	35.29	MOOR02	S09		
	34.21	RGR05	S09		
MF02 (EtBa)	50	WN100WNR	23b	The vegetation has a sparse overstorey of *Banksia attenuata* and *Eucalyptus todtiana*. Despite the highest similarity with 23b the location of the survey Area on the eastern side of the SCP and typical species listed for 23c being present also makes the FCT a possibility	FCT SCP 23b or FCT SCP 23c
	48.71	MHR02	S09		
	44.44	BNR31	23b		
	44.44	RGR01	23b		
	43.83	MNP01	23b		
MF03 (EtBa)	43.58	WN086CHE	23b		
	43.24	WN093HED	23b		
	40.62	MWR04	23b		
	38.80	MWR08	23b		
	36.66	RGR01	23b		
MF04 (AhEp)	38.46	MWR01	20d	There is an absence of tree species and given its location on the Dandaragan plateau the vegetation is likely to be 20d.	FCT SCP 20d
	36.61	RGR06	20d		
	32.25	MNP03	S09		
	30.76	WN086CHE	23b		
	30.61	MOOR02	S09		
MF05 (AhEp)	42.85	RGR06	20d	There is an absence of tree species and given its location on the Dandaragan	FCT SCP 20d
	33.80	RGR05	S09		
	33.80	MWR07	S09		

Quadrat	Nearest neighbour analysis Similarity %	Site	FCT	Notes	FCT Comparison
	33.76	MWR01	20d	plateau the vegetation is more likely to be 20d rather than S09, which typically has a Banksia overstorey	
	32.43	MWR03	S06		
MF06 (AhEp)	29.50	MWR07	S09	There is an absence of tree species and given its location on the Dandaragan plateau the vegetation is more likely to be 20d rather than S09, which typically has a Banksia overstorey. The vegetation is not likely to be S06 which is has been identified under the seasonal wetland supergroup.	FCT SCP 20d
	25	MWR03	S06		
	23.88	MWR01	20d		
	23.33	RGR06	20d		
	22.58	CH057ASH	S10		
MF07 (EtBa)	52.05	MWR03	S06	The vegetation has a sparse overstorey of *Banksia attenuata* and *Eucalyptus todtiana*. Despite the highest similarity with S06 and S09 the species present makes it more analogous to 23b and 23c.	FCT SCP 23b or FCT SCP 23c
	45.71	RGR05	S09		
	42.62	MHR01	23b		
	41.09	MHR02	S09		
	40.57	5C04	23b		
MF08 (AhEp)	25.35	MHR02	S09	There is an absence of tree species and given its location on the Dandaragan plateau the vegetation is more likely to be 20d rather than S09, which typically has a Banksia overstorey.	FCT SCP 20d
	24.13	WN115MOR	S09		
	23.88	WN085CHE	S09		
	23.52	MWR07	S09		
	23.33	WN117MOR	S16		
MF09 (EtBa)	43.33	MHR01	23b	The vegetation has a sparse overstorey of *Banksia attenuata* and *Eucalyptus todtiana*.	FCT SCP 23b or FCT SCP 23c
	41.66	MWR03	S06		
	41.17	RGR06	20d		
	37.83	5C03	20a		
	37.14	BNR19	23b		
MF10 (AhEp)	36.61	MWR02	20d	There is an absence of tree species and given its location on the Dandaragan plateau the vegetation is more likely to be 20d.	FCT SCP 20d
	35.89	MWR01	20d		
	35.61	FYR03	S10		
	35.48	MNP03	S09		
	33.89	MWR09	S10		

Quadrat	Nearest neighbour analysis Similarity %	Site	FCT	Notes	FCT Comparison
MF11 (AhEp)	33.33	MHR01	23b	There is an absence of tree species and given its location on the Dandaragan plateau the vegetation is more likely to be 20d.	FCT SCP 20d
	28.57	RGR06	20d		
	27.27	MWR09	S10		
	25.31	Quinn09	20d		
	24.56	MWR07	S09		
MF12 (EtBa)	42.62	YUR02	23c	The vegetation has a sparse overstorey of *Banksia attenuata* and *Eucalyptus todtiana*.	FCT SCP 23b or FCT SCP 23c
	41.50	RGR01	23b		
	39.28	MHR01	23b		
	38.88	WN098WNR	S04		
	37.68	WN084CHE	23b		

Floristic Community types identified by Statistical Analysis

- FCT SCP S04 – *Regelia ciliata* Dandaragan Plateau wetlands;
- FCT SCP S06 – Northern dense low shrublands;
- FCT SCP S09 – *Banksia attenuata* woodlands over dense low shrublands;
- FCT SCP S10 – *Calothamnus sanguineus* dense low shrublands on sandy laterites;
- FCT SCP S16 – Mixed dense shrublands on yellow brown sands;
- FCT SCP 20a – *Banksia attenuata* woodlands over species rich dense shrublands;
- FCT SCP 20d – Dandaragan plateau shrublands and woodlands;
- FCT SCP 23b – Northern *Banksia attenuata* – *Banksia menziesii* woodlands; and
- FCT SCP 23c – North – eastern *Banksia attenuata* – *Banksia menziesii* woodlands.

4.2.3.1 Threatened and Priority Ecological Communities

The FCTs identified as occurring in the Survey Area from the statistical analysis, FCT SCP20d - Dandaragan plateau shrublands and woodlands, FCT SCP23b - Central *Banksia attenuata* – *Banksia menziesii* woodlands and FCT SCP 23c – North – eastern *Banksia attenuata* – *Banksia menziesii* woodlands are not listed as TECs under The EBPC Act. These FCTs, however, have been listed as sub-communities under the EPBC Act listed Banksia woodlands of the Swan Coastal Plain, therefore have the potential to be listed and protected under the EPBC Act (DEE 2016). Banksia woodlands of the Swan Coastal Plain are also listed as a Priority 3 by the State. FCT SCP 23b is also listed as a Priority 3 by the State.

4.2.3.2 Regional Representation

Vegetation mapping units described in the Survey Area were correlated with the Beard (1981) and Shepherd, Beeston and Hopkins (2002) broad vegetation types to determine similarities in vegetation descriptions (Table 8). Differences exist with the terminology used in the descriptions as they are based on different methods of categorising and characterising vegetation types, and the different spatial scale of the mapping (i.e. region vs. local scale).

Table 8: Representation of Broad Vegetation Types and Corresponding Vegetation Types

Vegetation Type and Description (Shepherd *et al.* 2001/Beard 1978)	Corresponding Vegetation Association (Current Survey)	Vegetation Association Extent in Survey Area (ha)
Mogumber 4: Medium woodland; marri and wandoo	Cc	1.7
Gingin 949: Low woodland; banksia	EtBa	129.3
Gingin 1015: Mosaic; mixed scrub-heath and shrublands; Banksia thicket.	McHm, AhEp	111.7

4.2.3.3 Vegetation Condition

The majority of the Survey Area is considered to be in Excellent condition. There is a small patch (0.73 ha) of *Corymbia calophylla* (marri) that's in Degraded condition. The paddock (location of Farm 2), tracks and a small clearing on the northern boundary adjacent to the fire break are Completely Degraded. Disturbance to the vegetation in the Survey Area has been the informal tracks, powerlines and firebreaks. As the tracks have had minimal use, they have not been a major source of weed infestation. Another minor disturbance is the occasional grazing by livestock that has been historically kept on the property. Both options for the location of the proposed road are along existing tracks to minimise the amount of vegetation clearing needed. The vegetation condition mapping is presented in Figure 11 and a summary of vegetation condition extent within the Survey Area is outlined in Table 9.

Table 9: Vegetation Condition Extent within the Survey Area.

Condition	Extent in Survey Area (ha)	Proportion in Survey Area (%)
Excellent	242.1	88.2
Degraded	0.7	0.2
Completed Degraded	31.5	11.4
Total	**274.3**	**100**

Legend

- Survey Area
- Quadrat
- Releve

Vegetation Condition

- **E:** Excellent (242.13 ha)
- **D:** Degraded (0.73 ha)
- **CD:** Completely Degraded (31.51 ha)

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS
- LOCALITY MAP SOURCED LANDGATE 2006
- AERIAL PHOTOGRAPHY SOURCED LANDGATE 2017
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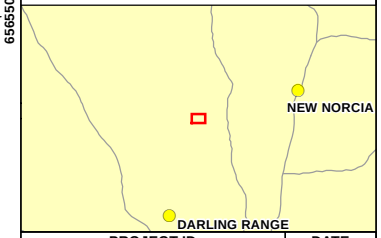
LOCALITY MAP



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EW	NW	NW	1

Santrev
Farm 2 Mogumber

Mogumber Farm II Biological Surveys

Figure 11
Vegetation Condition

K:\Projects\1.0 EBS\2668 Mogumber Farm II Biological Surveys\2668 Figure X - Vegetation Condition.mxd

4.3 Vertebrate Fauna and Black Cockatoos

4.3.1 Desktop Study

4.3.1.1 Conservation Significant Fauna

Conservation significant fauna species identified within the database search will be discussed below. A brief species profile for each identified conservation significant fauna species can be found within Appendix K.

Nineteen (19) conservation significant fauna species retrieved from the database searches were considered for their Likelihood of Occurrence and classified as having either a 'High', 'Medium' or 'Low' Likelihood of Occurrence within the Survey Areas. This consisted of two reptile species, 11 bird species and six (6) mammal species. Of these 19 conservation significant species:

- Two (2) species are considered as having a 'High' Likelihood of Occurrence within the Survey Area;
- Six (6) are considered as having a 'Medium' Likelihood of Occurrence within the Survey Area; and
- Eleven (11) are considered as having a 'Low' Likelihood of Occurrence within the Survey Area.

The conservation significant fauna species and their determined Likelihood of Occurrence are discussed in detail below and displayed in Table 10.

The above total was determined after the omission of several species that are not applicable to the Survey Area. These omissions are described in Appendix L. The spatial distribution of the DBCA Priority Fauna database search results (Department of Biodiversity Conservation and Attractions, 2018d) is displayed in Figure 12.

4.3.1.2 Species Considered to Have a High Likelihood of Occurrence

Two species are considered to have a 'High' Likelihood of Occurrence within the Survey Area and includes:

Carnaby's Black Cockatoo - *Calyptorhynchus latirostris* (Endangered)

The Survey Area is within the known distribution of the Carnaby's Black Cockatoo. The foraging species present, and known records of Carnaby's Black Cockatoo mean that the Carnaby's Black Cockatoo is considered to have a 'High' Likelihood of Occurrence within the Survey Area. The species database results are further discussed below in Section 4.3.1.5.

Quenda - *Isoodon obesulus fusciventer* (Priority 4)

The DBCA Threatened and Priority Fauna database search returned three records of the species, one of which was an undated historical record and the others were recorded in 2011 and 2014. The species was also returned in the NatureMap database search. Given the species widespread distribution and habitat preference it is considered to have a 'High' Likelihood of Occurrence within the Survey Area.

4.3.1.3 Species Considered to Have a Medium Likelihood of Occurrence

Six species are considered to have a 'Medium' Likelihood of Occurrence within the Survey Area.

Black-striped Snake - *Neelaps calonotos* (Priority 3)

The DBCA Threatened and Priority Fauna database search returned four species records within the Survey Area recorded between 1984 and 1986. Despite limited recent records within the surrounding area, the Survey Area contains appropriate habitat and occurs within the species' known distribution, therefore the species occurrence within the Survey Area is considered 'Medium'.

Fork-tailed Swift - *Apus pacificus* (Migratory and Marine)

The species was only returned in the EPBC Protected Matters database search. As the species can occur above any terrestrial habitat it may utilise the Survey Area for aerial foraging, however is unlikely to depend on the habitat. Due to the lack of recent records the likelihood of the species occurring within the Survey Area is considered 'Medium'.

Peregrine Falcon - *Falco peregrinus* (Other Specially Protected Fauna)

A total of four records of the species were returned from the DBCA Threatened and Priority Fauna database search occurring in close proximity to the Survey Area, one of which was recorded in the last 15 years. The Survey Area falls within the known distribution of the species and contains habitat that may be used for hunting, however, it is unlikely that the species will be depend on this habitat. Due to the low number of recent records of the species occurring in close proximity to the Survey Area, the likelihood of the species occurring within the Survey Area is considered 'Medium'.

Rainbow Bee-eater - *Merops ornatus* (Marine)

The DBCA database search did not return any records of the Rainbow Bee-eater within a 40 km radius of the site. The species was returned in both the EPBC Protected Matters and NatureMap database searches. The Survey Area is within the current distribution of the species and contains suitable habitat, however, due to the lack of recent records the species is only considered to have a 'Medium' Likelihood of Occurrence within the Survey Area.

Western Quoll, Chuditch - *Dasyurus geoffroii* (Vulnerable)

The DBCA Threatened and Priority Fauna database search returned six records of the species, however only one was recorded in the past 15 years, in 2007. It was also returned in the EPBC Protected Matters database search. The Survey Area contains suitable habitat and falls within the known distribution of the species, therefore the Western Quoll is considered to have a 'Medium' likelihood of occurrence within the Survey Area.

Western Brush Wallaby - *Notamacropus irma* (Priority 4)

The species was only returned from the DBCA Priority Fauna database search, with the most recent of 11 records occurring in 1986. The Survey Area contains suitable habitat for the species and occurs within the species' known distribution but due to the lack of recent records the species is only considered to have a 'Medium' Likelihood of Occurrence within the Survey Area.

4.3.1.4 Species Considered to Have a Low Likelihood of Occurrence

Eleven (11) species are considered to have a Low likelihood of occurrence within the Survey Area.

Western Spiny-tailed Skink - *Egernia stokesii badia* (Endangered)

The DBCA Threatened and Priority Fauna database search returned one record of the species from 2009. Despite this single recent record, the Survey Area falls outside the known distribution of the species (Department of the Environment and Energy, 2018b), and no preferred habitat occurs within the Survey Area, therefore the likelihood of the species occurring within the Survey Area is considered Low. Development within the Survey Area is unlikely to impact the Western Spiny-tailed Skink at a local or regional level.

White-bellied Sea-Eagle - *Haliaeetus leucogaster* (Marine)

The species was only returned in the EPBC Protected Matters database search. The Survey Area does not contain any suitable habitat, therefore the likelihood of the species occurring within the Survey Area is considered Low. Development within the Survey Area is unlikely to impact the White-bellied Sea-Eagle at a local or regional level.

Forest Red-tailed Black Cockatoo - *Calyptorhynchus banksii naso* (Vulnerable)

The Survey Area is approximately 35 km north of the known distribution of the Forest Red-tailed Black Cockatoo (Department of the Environment and Energy, 2018a). Due to the distance of known records being over 30 km from the Survey Area, the Forest Red-tailed Black Cockatoo is considered to have a 'Low' Likelihood of Occurrence within the Survey Area. The species database results are further discussed below in Section 4.3.1.5

Baudin's Black Cockatoo - *Calyptorhynchus baudinii* (Endangered)

The Survey Area is outside the known distribution of the Baudin's Black Cockatoo and the likelihood of the species occurring within the Survey Area is considered 'Low'. The species database results are further discussed below in Section 4.3.1.5.

Malleefowl - *Leipoa ocellate* (Vulnerable)

Two records of the species were returned in the DBCA database search, recorded in 1973 and 2005. The species was also returned in the EPBC Protected Matters and NatureMap database searches. The Survey Area is within the current distribution of the species, however, due to the lack of recent records and the lack of wattle or mallee species the likelihood of the species occurring within the Survey Area is considered Low. Development within the Survey Area is unlikely to impact the Malleefowl at a local or regional level.

Grey Wagtail - *Motacilla cinereal* (Migratory and Marine)

The species was only recorded via the EPBC Protected Matters database search. The species has no known records within close proximity to the Survey Area. Given the species rarity, habitat preferences and occurrence within coastal island or coastal locations it is therefore considered to have a Low likelihood of occurrence within the Survey Area, and if it did would not be dependent on that habitat. Development within the Survey Area is unlikely to impact the Grey Wagtail at a local or regional level.

Osprey - *Pandion haliaetus* (Migratory and Marine)

The Osprey was only returned in the EPBC Protected Matters database search. The Survey Area falls within the known distribution of the species but does not contain any suitable habitat, therefore the species is considered to have a Low likelihood of occurrence within the Survey Area. Development within the Survey Area is unlikely to impact the Osprey at a local or regional level.

Glossy Ibis - *Plegadis falcinellus* (Migratory and Marine)

Only one record of the species was returned from the DBCA Threatened and Priority Fauna database search, which was recorded in 2004. The Survey Area is within the current distribution of the species, however, due to the lack of a nearby water source and no records within the last 15 years the species is considered to have a Low likelihood of occurrence within the Survey Area. Development within the Survey Area is unlikely to impact the Glossy Ibis at a local or regional level.

Red-tailed Phascogale - *Phascogale calura* (Vulnerable)

The Red-tailed Phascogale was only returned in the EPBC Protected Matters database search. The Survey Area is outside the known distribution of the species, therefore it is considered to have a Low likelihood of occurrence with in the Survey Area. Development

within the Survey Area is unlikely to impact the Red-tailed Phascogale at a local or regional level.

South-western Brush-tailed Phascogale - *Phascogale tapoatafa wambenger* (Vulnerable)

The DBCA Threatened and Priority Fauna database search returned two records of the species from 1899 and 2001. It was not returned in the NatureMap or EPBC Protected Matters database search. The Survey Area does not contain preferred habitat; the Heath habitat does not have abundant trees and the Paddock habitat lacks continuous canopy. Additionally, due to the lack of recent records, the species is considered to have a Low likelihood of occurrence within the Survey Area. Development within the Survey Area is unlikely to impact the Southern Brush-tailed Phascogale at a local or regional level.

Water-rat, Rakali - *Hydromys chrysogaster* (Priority 4)

Two records of the species were returned from the DBCA Priority Fauna database search, recorded just west of the Survey Area in 1972. The Survey Area does not contain suitable habitat for the species, therefore it is considered to have a Low likelihood of occurrence with in the Survey Area. Development within the Survey Area is unlikely to impact the Water-rat at a local or regional level.

4.3.1.5 Black Cockatoo

The DBCA database search identified 241 records of Carnaby's Black Cockatoo within a 40 km radius of the Survey Area, recorded between 1909 and 2016. Only two records of Forest Red-tailed Black Cockatoo were recorded, to the south of the Survey Area in 2005 and 2014. One historical record of Baudin's Black Cockatoo was recorded in 1948. The EPBC Protected Matters Search Tool only identified the Carnaby's Black Cockatoo as occurring in the vicinity of the Survey area (Appendix L).

According to the DBCA database search, the Survey Area does not occur within the buffer of any confirmed Carnaby's Black Cockatoo breeding areas (containing a 12 km radial buffer). Several occur nearby with the nearest occurring to the north, with the Survey Area located 3.5 km outside of the buffer.

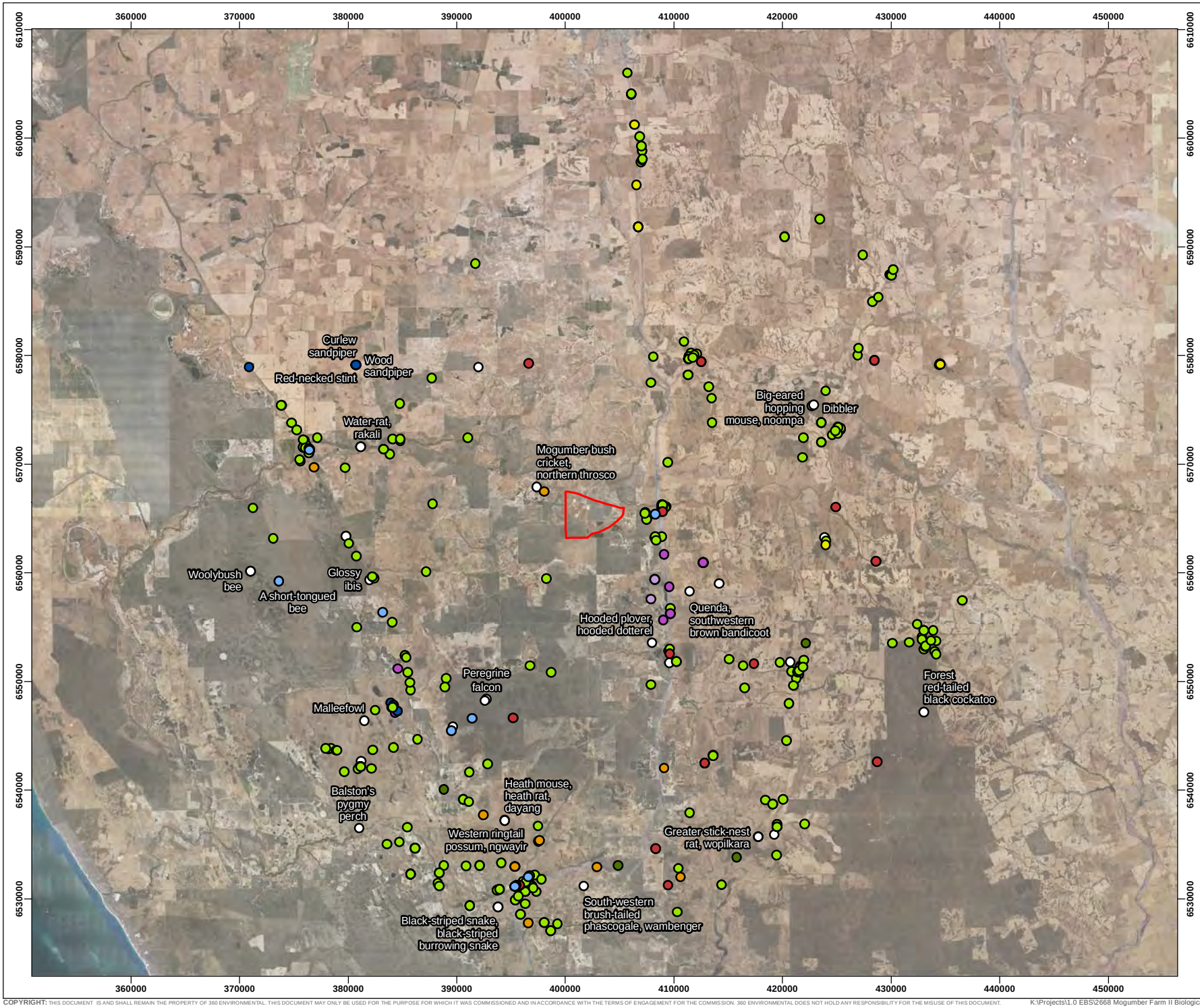
The Survey Area does not occur within the buffer of any confirmed Carnaby's Black Cockatoo roosting areas (containing a 6 km radial buffer). The two closest occur to the west and south of the Survey Area located 21.5 km and 30 km outside of the buffer zone.

Table 12: Conservation Significant Fauna Potentially Occurring in the Survey Areas

Key: EPBC = Environmental Protection and Biodiversity Conservation Act 1999, WC = Wildlife Conservation Act 1950, DBCA = Department of Biodiversity, Conservation and Attractions Priority Code, A = Listed in Naturemap Search, B = EPBC Protected Matters Search, C = DBCA Threatened and Priority Fauna Search, D = Current Survey;

CR = Critically Endangered, EN = Listed as Endangered, VU = Listed as Vulnerable, IA = International Agreement, Mi = Listed as Migratory, CD = Consrvation dependent fauna, S = Specially protected fauna, OS = Other specially protected fauna under the EBPC Act, Ma = Listed as Marine under the EBPC Act, P = Listed as Priority by the DBCA.

		Conservation Codes							Likelihood of
Scientific Name	Common Name	EPBC	WC	DBCA	A	B	C	D	Occurrence
REPTILIAN									
ELAPIDAE									
Neelaps calonotos	Black-striped Snake			P3			X		Medium
SCINCIDAE									
Egernia stokesii supsp. Badia	Western Spiny-tailed Skink	EN	VU				X		Low
AVIAN									
ACCIPITRIDAE									
Haliaeetus leucogaster	White-bellied Sea-Eagle	Ma	IA			X			Low
APODIDAE									
Apus pacificus	Fork-tailed Swift	MiMa	IA			X			Medium
CACATUIDAE									
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU				X		Low
Calyptorhynchus baudinii	Baudin's Cockatoo	EN	EN				X		Low
Calyptorhynchus latirostris	Carnaby's Cockatoo (short-billed black-cockatoo), Carnaby's Cockatoo	EN	EN			X	X		High
FALCONIDAE									
Falco peregrinus	Peregrine Falcon		S	OS			X		Medium
MEGAPODIIDAE									
Leipoa ocellata	Malleefowl	VU	VU		X	X	X		Low
MEROPIDAE									
Merops ornatus	Rainbow Bee-eater	Ma	IA		X	X			Medium
MOTACILLIDAE									
Motacilla cinerea	Grey Wagtail	MiMa	IA			X			Low
PANDIONIDAE									
Pandion haliaetus	Osprey	MiMa	IA			X			Low
THRESKIORNITHIDAE									
Plegadis falcinellus	Glossy Ibis	MiMa	IA				X		Low
MAMMALIAN									
DASYURIDAE									
Dasyurus geoffroii	Western Quoll, Chuditch	VU	VU			X	X		Medium
Phascogale calura	Red-tailed Phascogale, Red-tailed Wambenger	VU	CD			X			Low
Phascogale tapoatafa subsp. wambenger	South-western Brush-tailed Phascogale		VU				X		Low
MACROPODIDAE									
Notamacropus irma	Western Brush Wallaby			P4	X		X		Medium
MURIDAE									
Hydromys chrysogaster	Water-rat, Rakali			P4			X		Low
PERAMELIDAE									
Isoodon obesulus subsp. fusciventer	Southern Brown Bandicoot, Quenda			P4	X		X		High



Legend

- Lot 10 Boundary

DBCA Threatened and Priority Fauna Records

- Blue-billed duck (P4)
- Carnaby's cockatoo (EN)
- Carter's freshwater mussel (VU)
- Chuditch, western quoll (VU)
- Common greenshank, greenshank (IA)
- Shield-backed trapdoor spider (EN)
- Western brush wallaby (P4)
- Western swamp tortoise (CR)
- White-tailed black cockatoo (EN)
- Other

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS
- CADASTRE SOURCED LANDGATE 2018
- FAUNA RECORDS SOURCED DBCA 2018
- LOCALITY MAP SOURCED LANDGATE 2017
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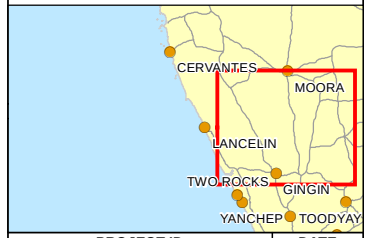
LOCALITY MAP



PROJECT ID	DATE
2668	17/05/2018

HORIZONTAL DATUM AND PROJECTION
GDA 1994 MGA Zone 50

CREATED	CHECKED	APPROVED	REVISION
DV	NW	SW	1

Santrev
Farm 2 Mogumber

Mogumber Farm II Biological Surveys

Figure 12
DBCA Threatened and Priority Fauna Records

K:\Projects\1.0 EBS\2668 Mogumber Farm II Biological Surveys\2668 Figure 8 - DBCA Threatened & Priority Fauna Records.mxd

4.3.2 Field Survey

The field survey recorded 26 species from 21 families through direct or indirect observations. A summary of each species recorded during the survey is presented in Table , including the total count of each and the fauna habitat type the species was inhabiting when the species was recorded. The following is a summary of the key findings from the field survey:

- No amphibian species were recorded during the field survey;
- Eighteen (18) bird species were recorded from 13 families;
- Three (3) reptile species were recorded from three families; and
- Five (5) mammal species were recorded from five families.

Table 11: Total Fauna Species Recorded During the Field Survey

COMMON NAME	SPECIES	COUNT	HABITAT
Avifauna			
Australian Magpie	*Cracticus tibicen*	5	Heath (3), Paddock (2)
Australian Pipit	*Anthus australis*	7	Heath
Australian Raven	*Corvus coronoides*	5	Heath
Australian Ringneck	*Platycercus zonarius*	16	Heath (13), Paddock (3)
Black-faced Cuckoo-shrike	*Coracina novaehollandiae*	1	Heath
Brown Honeyeater	*Lichmera indistincta*	20	Heath (15), Paddock (5)
Emu	*Dromaius novaehollandiae*	1	Heath
Galah	*Cacatua roseicapilla*	6	Paddock
Grey Fantail	*Rhipidura albiscapa*	2	Heath (1), Paddock (1)
Laughing Kookaburra	*Dacelo novaeguineae*	2	Paddock
Magpie-lark	*Grallina cyanoleuca*	1	Paddock
Red-capped Parrot	*Platycercus spurius*	1	Paddock
Singing Honeyeater	*Gavicalis virescens*	3	Paddock
Western Gerygone	*Gerygone fusca*	7	Paddock
White-cheeked Honeyeater	*Phylidonyris niger*	10	Heath (8), Paddock (2)
White-winged Fairy-wren	*Malurus leucopterus*	27	Heath (3), Paddock (24)
Willie Wagtail	*Rhipidura leucophrys*	1	Paddock
Yellow-rumped Thornbill	*Acanthiza chrysorrhoa*	3	Paddock
Reptile			
Gould's Goanna	*Varanus gouldii*	1	Heath
Lerista sp.	*Lerista sp.*	3	Heath
Spotted Military Dragon	*Ctenophorus maculatus*	1	Heath
Mammal			
European Cattle	*Bos taurus*	5	Heath (1), Paddock (4)
House Mouse	*Mus musculus*	1	Heath
Rabbit	*Oryctolagus cuniculus*	10	Heath (4), Paddock (6)

COMMON NAME	SPECIES	COUNT	HABITAT
Red Fox	*Vulpes vulpes*	9	Heath (2), Paddock (7)
Western Grey Kangaroo	*Macropus fuliginosus*	17	Heath

4.3.2.1 Fauna Habitat

Six fauna habitat assessments were undertaken during the survey and a total of two broad fauna habitats were identified within the Survey Area (Table 12, Figure 13; Appendix I).

Table 12: Fauna Habitat Types and Extent in the Survey Area

FAUNA HABITAT	AREA (HA)	AREA (%)
Heath	15.21	38
Paddock	22.23	56
Cleared/Track	2.41	6
Total	**39.85**	**100**

Heath

The Heath habitat was comprised primarily of isolated *Eucalyptus todtiana* trees over a midstorey of scattered *Banksia attenuata* and *B. menziesii*, with a dense understorey of shrubs (Plate 8). Trees were small with an average height of approximately 3 m. The ground was predominately covered by the dense understorey vegetation with small amounts of leaf litter and woody debris. The soil was composed of soft white sand.

No water sources were present, and the majority of the habitat type appeared to have been unburnt for at least five years. The vegetation condition within this habitat type was considered to be Excellent condition.

Plate 8: Heath Fauna Habitat

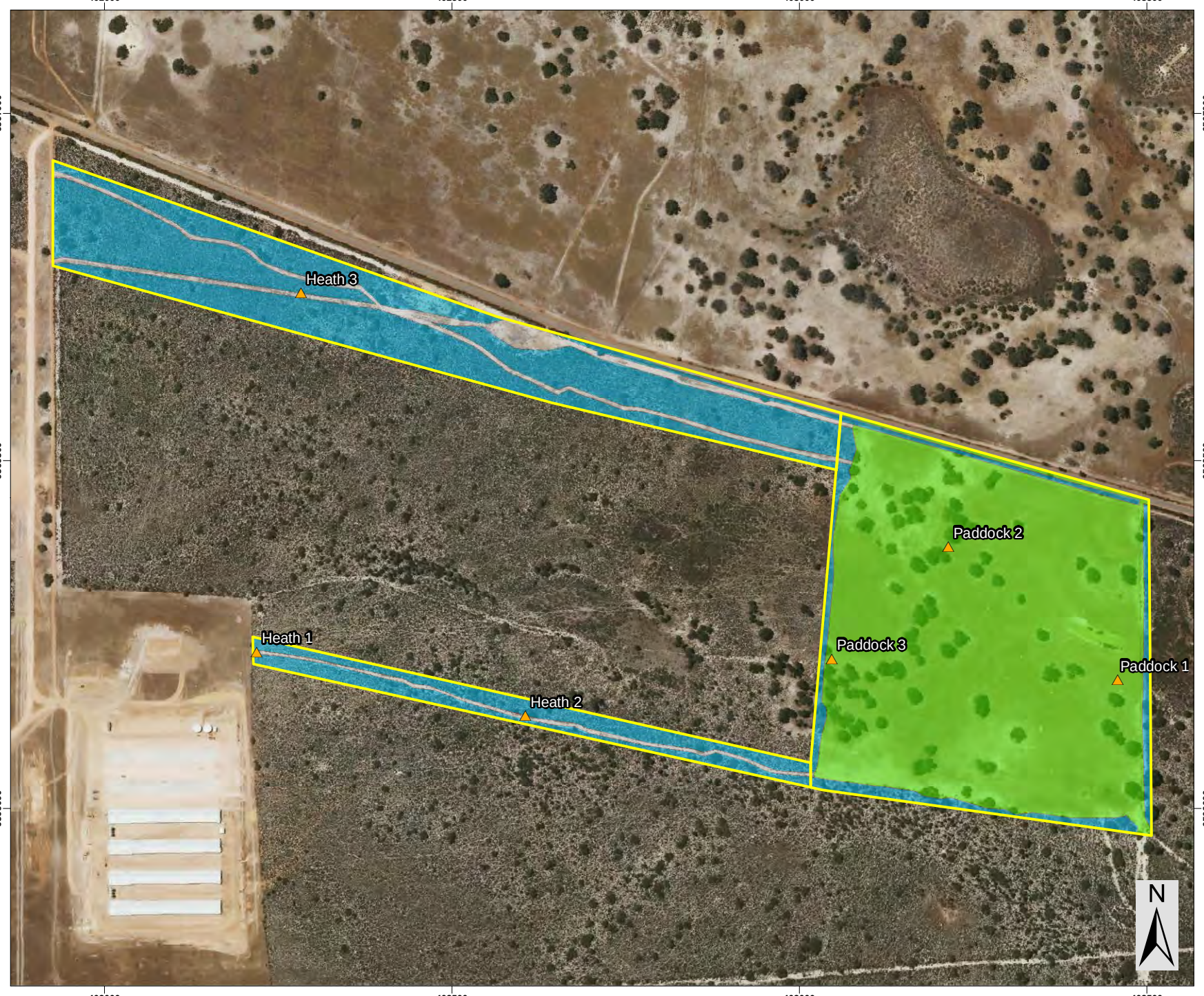
Paddock

The Paddock habitat was comprised primarily of Marri (*Corymbia Calophylla*) and *Eucalyptus todtiana* with no midstorey or understorey (Plate 9). Trees were predominately large with an average height of approximately 14 m.

Most of this habitat contained bare ground with no form of ground cover, although some areas had moderate amounts of leaf litter. The soil was composed of soft white sand.

No water sources were present, and the majority of the habitat type appeared to have been unburnt for at least five years. The vegetation condition within this habitat type was Degraded due to the lack of midstorey and understorey.

Plate 9: Paddock Fauna Habitat



Legend

- Fauna Survey Area
- Habitat Assessments
- Heath
- Paddock
- Track (Cleared)

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS
- LOCALITY MAP SOURCED LANDGATE 2006
- AERIAL PHOTOGRAPHY SOURCED LANDGATE 2017
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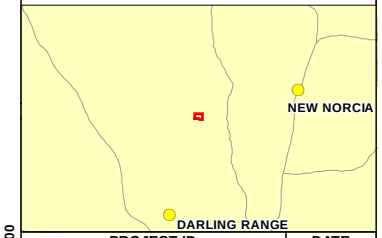

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2668	10/05/2018

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GCS GDA 1994

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EW	AH	AH	0

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Mogumber Farm II Biological Surveys

Figure 13
Fauna Habitat

4.3.2.2 Conservation Significant Fauna

No conservation significant fauna species were recorded during the field survey.

4.3.2.3 Black Cockatoo Foraging Habitat

A total of 5.84 ha of Black Cockatoo foraging habitat was identified within the fauna Survey Area with 3.19 ha being predominantly *Banksia attenuata* and *B. menziesii* heath habitat type (Figure 14). A total of 2.35 ha consisted of isolated Marri (*Corymbia calophylla*) trees and 0.30 ha consisted of isolated *Eucalyptus todtiana* trees occurring within the Paddock habitat type.

Potential evidence of Black Cockatoo foraging was identified at four locations within the 'Option A – Access Track' section of the Survey Area in the form of chewed *Banksia* fruit (Plate; Figure 14). All identified foraging evidence was determined to be 'potential' evidence due to the age, level of decomposition and the lack of identified Black Cockatoo indentations on the fruit, to accurately confirm as Black Cockatoo foraging.

Plate 10: Potential Black Cockatoo foraging evidence on *Banksia* fruit

4.3.2.4 Black Cockatoo Breeding Habitat

No evidence of breeding was identified within the Survey Area.

A total of 27 Marri trees were recorded that met the criteria to be classed as potential breeding trees (Figure). Three of these potential breeding trees were observed as containing a hollow greater than 120 mm. Of these three hollows, two were occupied by feral bees and one appeared to be too decomposed within the hollow itself to be of use to Black Cockatoos.

Two *Eucalyptus todtiana* trees were recorded based on having a diameter greater than 500 mm. None of these two trees were found to contain hollows.

The raw data for Black Cockatoo potential breeding trees are provided in Appendix J.

4.3.2.5 Roosting Habitat

No evidence of roosting was found within the Survey Area.

Legend

- Fauna Survey Area
- Foraging Habitat
- Potential Black Cockatoo Foraging Evidence

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS
- LOCALITY MAP SOURCED LANDGATE 2006
- AERIAL PHOTOGRAPHY SOURCED LANDGATE 2017
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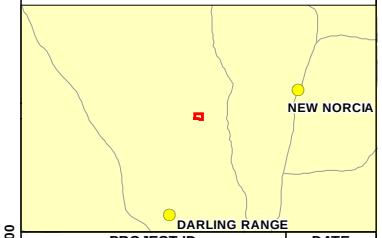

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EW	AH	AH	0

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Farm 2 Mogumber

Mogumber Farm II Biological Surveys

Figure 14
Black Cockatoo Foraging Habitat

K:\Projects\1.0 EBS\2668 Mogumber Farm II Biological Surveys\2668 Figure X - BC Foraging Habitat.mxd

Legend

Fauna Survey Area

Trees with DBH >500 mm

Eucalyptus todtiana

- 500 - 750 mm
- 750 - 1000 mm

Marri (Corymbia calophylla)

- 500 - 750 mm
- 750 - 1000 mm
- 1000 - 1250 mm
- Hollow is present in tree

- NOTE THAT POSITION ERRORS CAN BE >5M IN SOME AREAS
- LOCALITY MAP SOURCED LANDGATE 2006
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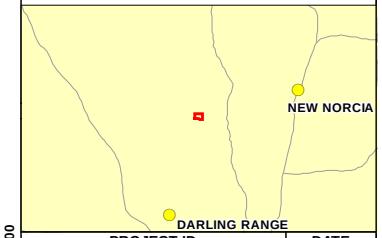

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GCS GDA 1994

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Mogumber Farm II Biological Surveys

Figure 15 Black Cockatoo Potential Breeding Trees

K:\Projects\1.0 EBS\2668 Mogumber Farm II Biological Surveys\2668 Figure X - BC Potential Breeding Trees.mxd

5 Discussion

5.1 Flora and Vegetation

5.1.1 Flora of Conservation Significance

The review of the database searches identified 34 T/DRF flora species potentially occurring in the vicinity of the Survey Area. Of these potential Threatened species, 30 are unlikely, based on the habitat type present and known distribution. One is possible and one is likely (and one was located). Both potential species, *Eremophila glabra* subsp. *chlorella* and *Spirogardnera rubescens*, are perennial so would have been detectable at the time of the survey.

A total of 84 individuals of the Threatened species, *Banksia mimica* (DRF/T) were recorded in the Survey Area with 25 of these within the proposed area of disturbance (Option A). The species is a prostrate shrub with underground stems and leaves up to 41 cm long. The species produces yellow flowers that have a tuft of long, white hairs at the apex and are grouped into erect heads at ground level. The species is known from three disjunct localities over a 300 km range from Mogumber to the north of Perth, the Darling Range, east of Perth, and the Whicher Range, south-east of Busselton, in south-western Western Australia (Brown, Thomson-Dans and Marchant, 1998; Patrick and Brown, 2001). It occurs within the South West, Swan and Northern Agricultural (Western Australia) Natural Resource Management Regions. *Banksia mimica* grows on flat to gentle slopes in grey and white sand in open woodlands.

The specimens found in the Survey Area were within intact native vegetation of Banksia and Eucalyptus woodland in Excellent Condition. The specimens were not only found in the area of proposed disturbance but also in adjacent vegetation. The vegetation within the buffers of the species are considered critical habitat and therefore are regarded as ESAs.

Six Priority species were recorded in the Survey Area, *Synaphea* ? *sparsiflora* (P2) was found at three locations within the Survey Area, however, outside of the proposed disturbance area, *Banksia dallanneyi* subsp. *pollosta* (P3) was considered common in the Survey Area, both in the proposed disturbance area and in surrounding vegetation. *Banksia pteridifolia* subsp. *vernalis* (P3) was found at one location outside of the proposed disturbance area, *Stylidium nonscandens* (P3) was found at one location outside of the proposed disturbance area, *Banksia chamaephyton* (P4) was located outside of the proposed disturbance area and *Isopogon drummondii* (P3) was found in the in surrounding vegetation and within Option B disturbance area. The presence of these Priority species does not form a statutory constraint. There is no written policy on how to respond to the presence of priority flora species within proposed development sites. The presence of the species is dealt with by DER on a case by case basis.

Of the remaining Priority Flora identified as potentially occurring within the Survey Area during the desktop assessment, 31 are unlikely based on the habitat type present and known distribution, five are possible and ten are likely. Twelve of the potential species are perennial so would have been able to be located at the time of the survey. The presence of the remaining three, *Anigozanthos humilis* subsp. *chrysanthus* (P4), *Haemodorum loratum* (P3) and *Thelymitra apiculata* (P4) would not have been present at the time of the survey, therefore, it cannot be confirmed whether they are in the Survey Area.

5.1.2 Vegetation of Conservation Significance

A desktop search identified one PEC listed by the State as being within a five km radius of the Survey Area; *Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region*. This community is also listed as a Threatened Ecological Community (TEC) under the EPBC Act.

Three vegetation associations were mapped for the Survey Area as well as a disturbed vegetation unit. These are:

- McHm, mid open shrublands;
- AhEp, mid sparse heathlands;
- EtBa, low open woodland; and
- Cc, disturbed *Corymbia calophylla* over low open shrubland.

Quadrats MF01, MF04, MF05, MF06, MF08 MF10 and MF11 which represent Vegetation association AhEp, have been determined to have affiliation with FCT SCP20d - *Dandaragan plateau shrublands and woodlands*. AhEp consisted of heaths and shrublands with no tree canopy present, including *Banksia* species. Even though SCP20d is identified as potentially being a sub-community of the TEC *Banksia Woodlands of the Swan Coastal Plain*, one of the defining attributes is the presence of at least one of the four key *Banksia* tree species. Based on this information, and the survey results showing the lack of *Banksia* tree species present in the vegetation association, AhEp is not representative of *Banksia Woodlands of the Swan Coastal Plain Ecological Community* and therefore, is not likely to be considered suitable for national protection.

Quadrats MF02, MF03, MF07, MF09 and MF012 which represent vegetation association EtBa, have been determined to have affiliation with both FCT SCP23b - *Northern Banksia attenuata – Banksia menziesii woodlands* and FCT SCP 23c – *North – eastern Banksia attenuata – Banksia menziesii woodlands*. The potential for the vegetation to be either SCP23b or SCP23c is due to the data showing the highest similarity with 23b, the location of the Survey Area being on the eastern side of the SCP as well as having the same typical species as 23c. Regardless, both of these FCTs are listed as sub-communities of *Banksia woodlands of the Swan Coastal Plain* and the presence of

Banksia tree species in vegetation association implies that it is considered a TEC under the Endangered category under the EPBC Act.

For vegetation remnants to be under full national protection the community has to meet key diagnostic characteristics. In regards to the presence of the TEC, the Approved Conservation Advice for the thresholds state that for vegetation in Excellent Condition the minimum patch size should be 0.5 ha, while vegetation in Very Good condition should be a minimum of one hectare and vegetation in Good condition should be a minimum of two hectares. If a vegetation patch is considered Degraded or worse it is not considered favourable for national protection. The *Banksia* woodlands generally have a dominant *Banksia* component, which includes at least one of four key species, *Banksia attenuata*, *B. menziesii*, *B. prionotes* and/or *B. ilicifolia*.

Based on this information, and the survey results, the vegetation association EtBA is representative of *Banksia Woodlands of the Swan Coastal Plain* and therefore is likely to be considered suitable for national protection. This is based on the presence of *Banksia* tree species, as well as the patch size and condition of the vegetation.

Possible impacts to TECs are taken into account by State assessment bodies when applications to develop or clear land are evaluated. Under the EP Act, any clearing of native vegetation requires a permit unless done for an exempt purpose. These exemptions do not apply in ESAs. TECs have been defined under the regulations as ESAs so the exemptions from requiring a clearing permit do not apply. Any such clearing proposal, therefore, must be undertaken under a specific permit and be assessed for any environmental impact.

Under the State legislation, FCT SCP23b, 23c and 20d are considered to have potential to form part of the Priority 3 Ecological Community *Banksia dominated woodlands of the Swan Coastal Plain IBRA region*. Vegetation that has an over storey dominated by *Banksia* are all listed as a Priority 3 Ecological Community. There is no written policy on how to respond to the presence of PECs within proposed development sites and the presence of these communities is dealt with by DBCA on a case-by-case basis. SCP23b is also listed as Priority 3 *Swan Coastal Plain Banksia attenuata - Banksia menziesii woodlands* by the State.

Vegetation associations McHm and Cc, although, were not included in the statistical analysis due to their size and/or condition, are not thought to represent any PEC or TEC.

5.1.3 Regional Representation

The DBCA has mapped native vegetation extent by vegetation complex on the Swan Coastal Plain. It is estimated that Mogumber 4 has 18.89%, Gingin 949 has 57.22% and Gingin 1015 has 33.95%) native vegetation remaining on the Swan Coastal Plain based on the pre-European extent.

The EPA recognises vegetation complexes that are not well represented as being significant. Vegetation complexes which have 10%-30% remaining may be considered regionally significant. Proposals that would affect a vegetation complex with 10% or less remaining are likely to be formally assessed by the EPA (EPA 2006).

The remaining extent of two vegetation community types are greater than the 30% threshold set by the EPA for protecting Australia's biological diversity in constrained areas. However, Mogumber 4 has 18.89% remaining. The proposal intends to clear 0.074 hectares of the vegetation complex Mogumber 4, this is unlikely to have an adverse effect on the overall occurrence of the complex.

5.2 Vertebrate Fauna and Black Cockatoos

5.2.1 Conservation Significant Species

Based on the Likelihood of Occurrence classification for each species the Quenda and Carnaby's Black Cockatoo are considered to have the greatest potential to be impacted by any development within the Survey Area. The Carnaby's Black Cockatoo will be discussed below in section 5.2.3.3.

The Quenda is likely to only utilise the heath habitat and therefore any disturbance occurring within the paddock habitat is unlikely to impact the species. It is anticipated that disturbance within the heath habitat will be limited, and any Quenda that may be utilising the habitat during the disturbance period can move out of the disturbance area and into the surrounding heath habitat which will not be impacted. Therefore, disturbance within the Survey Area is unlikely to impact this species at a local or regional level.

5.2.2 Fauna Habitat

The fauna habitat and flora species present in the Survey Area are typical for the region. The habitat present in both the Heath habitat type and Paddock habitat type provides foraging opportunities for Carnaby's Black Cockatoo, other birds, reptiles and mammals. The Heath habitat type is considered to be of high value to fauna species as it also provides refuge areas and resources in the leaf litter and dense shrub understory, which may be utilised by small reptiles, birds and mammals including the Quenda. The Paddock habitat type is considered to be of low value for most fauna species, but moderate value to bird species, including the Carnaby's Black Cockatoo, which will utilise the large Marri and *Eucalyptus todtiana* trees.

5.2.3 Black Cockatoo Assessment

5.2.3.1 Forest Red-tailed Black Cockatoo

The Forest Red-tailed Black Cockatoo is considered to have a 'Low' Likelihood of Occurrence within the Survey Area, and disturbance within the Survey Area is unlikely to impact this species at a local or regional level.

5.2.3.2 Baudin's Black Cockatoo

The Baudin's Black Cockatoo and the likelihood of the species occurring within the Survey Area is considered 'Low'. Disturbance within the Survey Area is unlikely this species at a local or regional level.

5.2.3.3 Carnaby's Black Cockatoo

The Carnaby's Black Cockatoo is considered to have a 'High' Likelihood of Occurrence within the Survey Area. Disturbance within the Survey Area may potentially impact this species. The value of both foraging and breeding habitat that occurs within the Survey Area will be discussed below.

Foraging Habitat

Banksia attenuata and *B. menziesii* within the Survey Area are in Excellent condition and is considered high value foraging habitat for Carnaby's Black Cockatoo. Clearing of *Banksia* spp. may impact the species in reduction of foraging habitat. The anticipated clearing footprint within the Survey Area of Banksia spp. covers a small area of 0.16 ha and is not considered to contribute to a negative impact to Carnaby's Black Cockatoo.

The isolated Marri (*Corymbia calophylla*) and *Eucalyptus todtiana* trees, of which there was 2.65 ha within the Paddock habitat, also provide foraging opportunities for the Carnaby's Black Cockatoo. As the species is less efficient at extracting Marri seeds than the other two Black Cockatoo species (Cooper *et al.*, 2002), this habitat is considered to be of moderate value as foraging habitat for the species. It is worth noting that *E. todtiana* is not specifically listed as a foraging species in the EPBC referral guidelines (Department of Sustainability Environment Water Population and Communities, 2012), however it has been documented as a foraging species for Carnaby's Black Cockatoo by Glossop *et al.* (2011) and Valentine and Stock (2008).

Potential evidence of Carnaby's Black Cockatoo foraging was only found in the *B. attenuata* and *B. menziesii* foraging habitat, indicating that this habitat may be in current or recent use for foraging by the species. Given the lack of foraging evidence found in the Paddock, it is unlikely that the isolated Marri and *E. todtiana* trees are in current or frequent use as a foraging resource for Black Cockatoo species.

Breeding Habitat

Currently the value the potential breeding habitat provides to Carnaby's Black Cockatoo is low. Three hollows of sufficient size for the species were observed within the Survey Area, however two were occupied by bees and one was potentially too decomposed to be of use to the species. However, these hollows may provide breeding habitat for the species in future.

6 Conclusions and Recommendations

Flora and Vegetation

The flora and vegetation survey was undertaken outside of the recommended seasonal and flowering period for the Swan Coastal Plain botanical province. The Survey Area was sufficiently traversed and as such the following conclusions can be drawn:

- A total of 119 flora taxa from 64 genera and 23 families were identified within the Survey Area;
- One Threatened species, *Banksia mimica* (DRF/T) pursuant to the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and/or gazetted as Threatened/ Declared Rare Flora pursuant to the *Wildlife Conservation Act 1950* were recorded during the survey was recorded in Survey Area. A total of 84 individuals were found in the Survey Area with 25 of these within the proposed Area of disturbance, Option A;
- Six Priority species were recorded in the Survey Area, *Synaphea* ? *sparsiflora* (P2), *Banksia dallanneyi* subsp. *pollosta* (P3), *Banksia pteridifolia* subsp. *vernalis* (P3), *Stylidium nonscandens* (P3), *Banksia chamaephyton* (P4) and *Isopogon drummondii* (P3);
- One species collected during the Survey, *Xanthorrhoea drummondii sans lat* is a species of interest as its features do not fit into current known collections of *Xanthorrhoea drummondii*. Additional collections of this species could be useful to voucher at the WA Herbarium and determine if it is *X. drummondii* or a new species;
- A total of three introduced taxa were recorded during the survey. None of these are listed as Declared Pest or a Weed of National Significance under the *Biosecurity and Agriculture Management Act 2007*;
- Three vegetation associations and one mapping unit were mapped for the Survey Area;
- The statistical analysis resulted in the EtBa vegetation association being most affiliated with both FCT SCP23b – *Northern Banksia attenuata – Banksia menziesii* woodlands and FCT SCP 23c – *North* – eastern *Banksia attenuata – Banksia menziesii woodlands*;
- These FCTs have been listed as sub-communities under the EPBC Act listed *Banksia woodlands of the Swan Coastal Plain* TEC;
- EtBa is likely to be considered for National protection under the Federally listed *Banksia woodlands of the Swan Coastal Plain*;

- AhEp vegetation association being most affiliated with FCT SCP20d - *Dandaragan plateau shrublands and woodlands*. AhEp consisted of heaths and shrublands with no tree canopy present, including *Banksia* species. Based on this information, and the survey results, the vegetation association AhEp is not representative of *Banksia Woodlands of the Swan Coastal Plain* and therefore is not likely to be considered suitable for national protection; and
- McHm and Cc are not considered to represent a PEC or TEC.

Fauna and Black Cockatoos

A total of 19 conservation significant species retrieved from the database searches are considered as having either a 'Recorded', 'High', 'Medium', or 'Low' likelihood of occurrence within the Survey Area. Of these 19 conservation significant species:

- Two species are considered as having a 'High' Likelihood of Occurrence within the Survey Area (Carnaby's Black Cockatoo and Quenda);
- Six are considered as having a 'Medium' Likelihood of Occurrence within the Survey Area; and
- Eleven (11) are considered as having a 'Low' Likelihood of Occurrence within the Survey Area.

During the field survey 26 terrestrial vertebrate fauna species were recorded with zero (0) amphibians, 18 birds, three (3) reptiles and five (5) mammals;

A total of two broad fauna habitats were identified and mapped during the survey. The fauna habitats identified within the fauna survey section of the Survey Area are comprised of:

- Heath (15.21 ha); and
- Paddock (22.23 ha).

The targeted Black Cockatoo survey determined that:

- Potential evidence of Carnaby's Black Cockatoo foraging was identified within the fauna survey section of the Survey Area;
- No evidence of breeding or roosting was identified within the Survey Area;
- A total of 5.84 ha of Black Cockatoo foraging habitat was recorded in the fauna survey section of the Survey Area; and
- A total of 29 trees were identified as Black Cockatoo potential breeding trees, three of which had hollows of a sufficient size for Black Cockatoos but were not currently appropriate.

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APPENDIX A:

Protection of Flora, Vegetation And Ecological Communities

Categories of Threatened Flora Species Under the EPBC Act (Commonwealth of Australia, 1999)

CONSERVATION CODE	DESCRIPTION
Ex	**Extinct** A native species is eligible to be included in the extinct category at a particular time if, at that time, there is no reasonable doubt that the last member of the species has died.
ExW	**Extinct in the Wild** A native species is eligible to be included in the extinct in the wild category at a particular time if, at that time, it is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or it 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.
CE	**Critically Endangered** A native species is eligible to be included in the critically endangered category at a particular time if, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.
E	**Endangered** A native species is eligible to be included in the endangered category at a particular time if, at that time, it is not critically endangered and it is facing a very high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.
V	**Vulnerable** A native species is eligible to be included in the vulnerable category at a particular time if, at that time, it is not critically endangered or endangered and it is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.
CD	**Conservation Dependent** A native species is eligible to be included in the conservation dependent category at a particular time if, at that time, the species is the focus of a specific conservation program, the cessation of which would result in the species becoming vulnerable, endangered or critically endangered within a period of 5 years.

Categories of Declared Rare Flora (WC Act) and DBCA Priority Flora Rankings (Department of Parks and Wildlife, 2017)

Conservation Code	Description
X	Presumed Extinct Flora (Declared Rare Flora – Extinct) "Taxa which have been adequately searched for and there is no reasonable doubt that the last individual has died, and have been gazetted as such (Schedule 2 under the *Wildlife Conservation Act 1950*)."
T	Threatened Flora (Declared Rare Flora – Extant) "Taxa which have been adequately searched for and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection, and have been gazetted as such (Schedule 1 under the *Wildlife Conservation Act 1950*)." "Threatened Flora (Schedule 1) are further ranked by the Department according to their level of threat using IUCN Red List criteria: CR: Critically Endangered – considered to be facing an extremely high risk of extinction in the wild; EN: Endangered – considered to be facing a very high risk of extinction in the wild; VU: Vulnerable – considered to be facing a high risk of extinction in the wild."
P1	Priority One: Poorly-known taxa "Taxa which are known from one or a few collections or sight records (generally less than five), all on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, Shire, Westrail and Main Roads WA road, gravel and soil reserves, and active mineral leases and under threat of habitat destruction or degradation. Taxa may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes."
P2	Priority Two: Poorly-known taxa "Taxa which are known from one or a few collections or sight records, some of which are on lands not under imminent threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, vacant Crown Land, water reserves, etc. Taxa may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes."

CONSERVATION CODE	DESCRIPTION
P3	**Priority Three: Poorly-known taxa** "Taxa which are known from collections or sight records from several localities not under imminent threat, or few but widespread localities with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Taxa may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and known threatening processes exist that could affect them."
P4	**Priority Four: Rare, Near Threatened and other taxa in need of monitoring** a. Rare. "Taxa which 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 taxa are usually represented on conservation lands." b. Near Threatened. "Taxa that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable." c. "Taxa that have been removed from the list of threatened species during the past five years for reasons other than taxonomy."
P5	**Priority Five: Conservation Dependent taxa** "Taxa that are not threatened but are subject to a specific conservation program, the cessation of which would result in the taxon becoming threatened within five years."

Definitions of Threatened Ecological Communities as Endorsed by the Western Australian Minister for the Environment (Department of Environment and Conservation, 2013)

PRESUMED TOTALLY DESTROYED (PD)
An ecological community will be listed as presumed totally destroyed if there are no recent records of the community being extant and either of the following applies (A or B); A) Records within the last 50 years have not been confirmed despite thorough searches or known or likely habitats or B) All occurrences recorded within the last 50 years have since been destroyed.
CRITICALLY ENDANGERED (CR)
An ecological community will be listed as Critically Endangered when it has been adequately surveyed and is found to be facing an extremely high risk of total destruction in the immediate future. This will be determined on the basis of the best available information, by it meeting any one or more of the following criteria (A, B or C): A) The estimated geographic range, and/or total area occupied, and/or number of discrete occurrences since European settlement have been reduced by at least 90% and either or both of the following apply (i or ii) i) geographic range, and/or total area occupied and/or number of discrete occurrences are continuing to decline such that total destruction of the community is imminent (within approximately 5 years) ii) modification throughout its range is continuing such that in the immediate future (within approximately 5 years) the community is unlikely to be capable of being substantially rehabilitated. B) Current distribution is limited, and one or more of the following apply (i, ii or iii): i) geographic range and/or number of discrete occurrences, and/or area occupied is highly restricted and the community is currently subject to known threatening processes which are likely to result in total destruction throughout its range in the immediate future (within approximately 5 years) ii) there are very few occurrences, each of which is small and/or isolated and extremely vulnerable to known threatening processes iii) there may be many occurrences but total area is very small and each occurrence is small and/or isolated and extremely vulnerable to known threatening processes C) The ecological community exists only as highly modified occurrences which may be capable of being rehabilitated if such work begins in the immediate future (within approximately 5 years)

ENDANGERED (EN)
An ecological community will be listed as Endangered when it has been adequately surveyed and is not Critically Endangered but is facing a very high risk of total destruction in the near future. This will be determined on the basis of the best available information, by it meeting any one or more of the following criteria (A, B or C): A) The estimated geographic range, and/or total area occupied, and/or number of discrete occurrences since European settlement have been reduced by at least 70% and either or both of the following apply (i or ii) i) geographic range, and/or total area occupied and/or number of discrete occurrences are continuing to decline such that total destruction of the community is likely in the short term (within approximately 10 years) ii) modification throughout its range is continuing such that in the short term future (within approximately 10 years) the community is unlikely to be capable of being substantially restored or rehabilitated. B) Current distribution is limited, and one or more of the following apply (i, ii or iii): i) geographic range and/or number of discrete occurrences, and/or area occupied is highly restricted and the community is currently subject to known threatening processes which are likely to result in total destruction throughout its range in the short term future (within approximately 10 years) ii) there are very few occurrences, each of which is small and/or isolated and extremely vulnerable to known threatening processes iii) there may be many occurrences but total area is very small and each occurrence is small and/or isolated and extremely vulnerable to known threatening processes C) The ecological community exists only as highly modified occurrences which may be capable of being rehabilitated if such work begins in the short term future (within approximately 10 years).
VULNERABLE (VU)
An ecological community will be listed as Vulnerable when it has been adequately surveyed and is not Critically Endangered or Endangered but is facing a high risk of total destruction in the medium to long term future. This will be determined on the basis of the best available information, by it meeting any one or more of the following criteria (A, B or C): A) The ecological community exists largely as modified occurrences which are likely to be capable of being substantially restored or rehabilitated. B) The ecological community can be modified or destroyed and would be vulnerable to threatening processes, is restricted in area and/or range and/or is only found at a few locations. C) The ecological community may still be widespread but is believed likely to move into a category of higher threat in the medium to long term future because of existing or impending threatening processes.

Definitions of Priority Ecological Communities as listed by DBCA (Department of Environment and Conservation, 2013)

Possible threatened ecological communities that do not meet survey criteria or that are not adequately defined are added to the Priority Ecological Community Lists under Priorities 1, 2 and 3. These three categories are ranked in order of priority for survey and/or definition of the community, and evaluation of conservation status, so that consideration can be given to their declaration as threatened ecological communities. Ecological Communities that are adequately known, and are rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list, are placed in Priority 4. These ecological communities require regular monitoring. Conservation Dependent ecological communities are placed in Priority 5.

PRIORITY ONE: POORLY KNOWN ECOLOGICAL COMMUNITIES
Ecological communities with apparently few, small occurrences, all or most not actively managed for conservation (e.g. within agricultural or pastoral lands, urban areas, active mineral leases) and for which current threats exist. Communities may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under immediate threat from known threatening processes across their range.
PRIORITY TWO: POORLY KNOWN ECOLOGICAL COMMUNITIES
Communities that are known from few small occurrences, all or most of which are actively managed for conservation (e.g. within national parks, conservation parks, nature reserves, State forest, unallocated Crown land, water reserves, etc.) and not under imminent threat of destruction or degradation. Communities may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under threat from known threatening processes.
PRIORITY THREE: POORLY KNOWN ECOLOGICAL COMMUNITIES
(i) Communities that are known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation or: (ii) Communities known from a few widespread occurrences, which are either large or within significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat, or; (iii) Communities made up of large, and/or widespread occurrences, that may or not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing by domestic and/or feral stock, and inappropriate fire regimes. Communities may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and/or are not well defined, and known threatening processes exist that could affect them.

PRIORITY FOUR: ECOLOGICAL COMMUNITIES THAT ARE ADEQUATELY KNOWN, RARE BUT NOT THREATENED OR MEET CRITERIA FOR NEAR THREATENED OR THAT HAVE BEEN RECENTLY REMOVED FROM THE THREATENED LIST.
These communities require regular monitoring. (a) Rare. Ecological communities known from few occurrences 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 communities are usually represented on conservation lands. (b) Near Threatened. Ecological communities that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable. (c) Ecological communities that have been removed from the list of threatened communities during the past five years.
PRIORITY FIVE: CONSERVATION DEPENDENT ECOLOGICAL COMMUNITIES.
Ecological communities that are not threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming threatened within five years

APPENDIX B:

WONS, Declared Plant and Environmental Weed Categories

To help focus national efforts to address weed problems in Australia, a list of Weeds of National Significance (WoNS) was compiled. Plant species were selected on the basis of their invasiveness and impact characteristics, their potential and current area of spread and their primary industry, environmental and socioeconomic impacts. Thirty-two WoNS have been identified by Australian governments. In Western Australia many of these WoNS are also declared pests under the *Biosecurity and Agriculture Management Act 2007*.

To protect Western Australia's agriculture, the Department of Primary Industries and Regional Development:

- Regulates weeds under the Biosecurity and Agriculture Management Act 2007 (BAM Act);
- Provides a weed identification service; and
- Provides information on weed control, crop weeds, regulated/declared plants and herbicides.

Under the BAM Act, all declared pests are placed in one of three categories, namely C1 (exclusion), C2 (eradication) or C3 (management).

Declared Pest Categories under the BAM Act (Department of Primary Industries and Regional Development, 2018)

C1 CATEGORY (EXCLUSION)
Pests will be assigned to this category if they are not established in WA and control measures are to be taken, including border checks, in order to prevent them entering and establishing in the State.
C2 CATEGORY (ERADICATION)
Pests will be assigned to this category if they are present in WA in low enough numbers or in sufficiently limited areas that their eradication is still a possibility
C3 CATEGORY (MANAGEMENT)
Pests will be assigned to this category if they are established in WA but it is feasible, or desirable, to manage them in order to limit their damage. Control measures can prevent a C3 pest from increasing in population size or density or moving from an area in which it is established into an area which currently is free of that pest.

The Weed Prioritisation Process for DBCA contains criteria for the assessment and ranking of weeds in terms of their environmental impact on biodiversity (Department of Parks and Wildlife, 2013a). These criteria are as follows:

- Potential Distribution – Area of potential habitat in the Region that could be occupied or the area at risk of invasion by the weed;
- Current Distribution - Area of habitat in the Region currently occupied by the weed, in relation to the habitat that it could invade;
- Ecological Impact - Impact of species within the Region, from low impact (causes minimal disruption to ecological processes or loss of biodiversity) to high (causes acute disruption of ecological processes, dominates and/or significantly alters vegetation structure, composition and function of ecosystems);
- Invasiveness – rate of spread of a weed in native vegetative, encompassing factors of establishment, reproduction and long distance dispersal (>100m); and
- Feasibility of Control - The longer a coordinated control program takes to achieve its desired goal, the more expensive and less feasible it becomes. Is it feasible to eradicate or at least contain the infestation?

Weed Prioritisation Process prioritises weeds in each DBCA region in terms of Ecological impact under each of the categories of very high (VH), high (H), medium (M), low (L) and negligible (N). Weeds are also prioritised by regions in relation to invasiveness according to the categories of slow (S), Moderate (M), Rapid (R) and Unknown (U) (Department of Parks and Wildlife, 2013a).

APPENDIX C:

Vegetation Condition Scale

Vegetation Condition Scale (Environmental Protection Authority, 2016a)

Vegetation Condition	South West and Interzone Botanical Provinces	Eremaean and Northern Botanical Provinces
Pristine	Pristine or nearly so, no obvious signs of disturbance or damage caused by human activities since European settlement.	
Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species. Damage to trees caused by fire, the presence of non-aggressive weeds and occasional vehicle tracks.	Pristine or nearly so, no obvious signs of damage caused by human activities since European settlement.
Very Good	Vegetation structure altered, obvious signs of disturbance. Disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.	Some relatively slight signs of damage caused by human activities since European settlement. For example, some signs of damage to tree trunks caused by repeated fire, the presence of some relatively non-aggressive weeds, or occasional vehicle tracks.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. Disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.	More obvious signs of damage caused by human activity since European settlement, including some obvious impact on the vegetation structure such as that caused by low levels of grazing or slightly aggressive weeds.
Poor		Still retains basic vegetation structure or ability to regenerate it after very obvious impacts of human activities since European settlement, such as grazing, partial clearing, frequent fires or aggressive weeds.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for	Severely impacted by grazing, very frequent fires, clearing or a

Vegetation Condition	South West and Interzone Botanical Provinces	Eremaean and Northern Botanical Provinces
	regeneration but not to a state approaching good condition without intensive management. Disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds at high density, partial clearing, dieback and grazing.	combination of these activities. Scope for some regeneration but not to a state approaching good condition without intensive management. Usually with a number of weed species present including very aggressive species.
Completely Degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees and shrubs.	Areas that are completely or almost completely without native species in the structure of their vegetation; i.e. areas that are cleared or 'parkland cleared' with their flora comprising weed or crop species with isolated native trees or shrubs.

APPENDIX D:

Flora Likelihood Table

Appendix D: Assessment of the Likely Occurrence of DRF and Priority Flora (DBCA and EPBC Database Searches) in the Survey Area

[1]Closest record to Survey Area based on DBCA 2018.Likely = Suitable habitat present and records less than 5 km from the Survey Area, Possible = Suitable habitat present and records between 5 km and 15 km from the Survey Area, and Unlikely = No suitable habitat present and/or records greater than 15 km from the Survey Area. En = Listed as Endangered under the EBPC Act, Vu = Listed as Vulnerable under the EBPC, Ce= Critically Endangered under the EBPC Act, P = Listed as Priority by the DPaW DRF = Declared Rare Flora as listed by the State

Species	Conservation Status		Habitat information	Distance to nearest Record (km)	Suitable Habitat present	Likelihood of occurrence in the Survey area
	EPBC	DBCA/WC Act				
Banksia fuscobractea	CR	T	Lateritic gravel, grey sand over laterite, hill tops ridges	13.2	No	Unlikely
Acacia cochlocarpa subsp. *cochlocarpa*	En	T	Clayey, sandy, often gravelly soils	86	No	Unlikely
Acacia splendens	En	T	White sand over clay, pale brown loam, cracked brown soil, gravel, laterite, ironstone. Slope of breakaways, especially southern slopes, hills.	16.6	No	Unlikely
Andersonia gracilis	En	T	White/grey sand, sandy clay, gravelly loam. Winter-wet areas, near swamps.	9.1	No	Unlikely
Banksia mimica	En	T	White or grey sand over laterite, sandy loam.	0.21	Yes	Recorded
Chamelaucium sp. Gingin (N.G.Marchant 6)	En	T	White/grey/brown/yellow gravelly sand.	-	Yes	Unknown
Conospermum densiflorum subsp. *unicephalatum*	En	T	Clay soils. Low-lying areas.	7.4	No	Unlikely
Conostylis wonganensis	En	T	Yellow sand, sandy clay.	69	No	Unlikely
Darwinia acerosa	En	T	Sand, loam, often moist soils, Granite outcrops, road verges.	4.24	No	Unlikely
Darwinia carnea	En	T	Lateritic loam and gravel	7.8	No	Unlikely
Diplolaena andrewsii	En	T	Loam, clay. Granite outcrops and hillsides.	73	No	Unlikely
Eremophila glabra subsp. *chlorella*	En	T	Sandy clay. Winter-wet depressions.	4.22	Yes	Likely
Eremophila scaberula	En	T	Clay, sandy clay or loam. Winter-wet plains, inundated areas.	22.9	No	Unlikely
Eucalyptus absita	En	T	White lateritic sand. Paddocks.	47.2	Yes	Unlikely
Eucalyptus leprophloia	En	T	White or grey sand over laterite. Valley Slopes.	93.4	Yes	Unlikely
Eucalyptus pruiniramis	En	T	Skeletal soils over sandstone or laterite. Rocky hillsides.	10.16	No	Unlikely
Eucalyptus recta	En	T	Sandy laterite.	38.4	Yes	Unlikely

Species	Conservation Status		Habitat information	Distance to nearest Record (km)	Suitable Habitat present	Likelihood of occurrence in the Survey area
	EPBC	DBCA/WC Act				
Eucalyptus x balanites	En	T	Sandy soils with lateritic gravel.	89.6	Yes	Unlikely
Gastrolobium hamulosum	En	T	Sandy, often gravelly soils or clay. Flats, slopes, ridges.	39.6	Yes	Unlikely
Goodenia arthrotricha	En	T	Gravel. Granite rocks, slopes.	2.39	No	Unlikely
Grevillea curviloba subsp. *incurva*	En	T	Sand, sandy loam. Winter-wet heath.	46.6	Yes	Unlikely
Grevillea pythara	En	T	Sand or sandy loam with gravel.	95.5	Yes	Unlikely
Hemiandra gardneri	En	T	Grey or yellow sand, clayey sand. Sandplains.	45.3	Yes	Unlikely
Lepidosperma rostratum	En	T	Peaty sand, clay.	1.31	No	Unlikely
Melaleuca sciotostyla	En	T	Orange clayey sand with lateritic pebbles. Scree slopes.	25.49	No	Unlikely
Roycea pycnophylloides	En	T	Sandy soils, clay. Saline flats.	117.4	No	Unlikely
Spirogardnera rubescens	En	T	Laterite, sand over laterite, loam.	14.9	Yes	Possible
Thelymitra dedmaniarum	En	T	Granite	25.76	No	Unlikely
Thelymitra stellata	En	T	Sand, gravel, lateritic loam.	46.8	Yes	Unlikely
Thomasia sp. Green Hill (S.Paust 1322)	En	T	Rocky rise.	-	No	Unlikely
Banksia serratuloides subsp. *serratuloides*	Vu	T	Loam or clay loam over laterite, sandy gravel.	4.24	No	Unlikely
Eleocharis keigheryi	Vu	T	Clay, sandy loam. Emergent in freshwater; creeks, claypans	7.4	No	Unlikely
Grevillea bracteosa subsp. *bracteosa*		T	Gravelly hills and slopes, clay loam.	6.5	No	Unlikely
Stylidium semaphorum		T	Lateritic gravelly soils. Hill summits.	21.5	No	Unlikely
Drosera leucostigma		P1	Margins of wet depressions.	61.3	No	Unlikely
Synaphea panhesya		P1	Gravelly loam & sandy gravel	5.9	No	Unlikely
Acacia browniana var. *glaucescens*		P2	Lateritic gravelly soils.	4.24	No	Unlikely
Lepyrodia curvescens		P2	Sand, laterite. Seasonally inundated swamplan.	4.51	No	Unlikely
Synaphea rangiferops		P2	Sandy loam, gravel.	4.22	No	Unlikely
Acacia anarthros		P3	Lateritic gravelly soils. Slopes.	16.75	No	Unlikely

Species	Conservation Status		Habitat information	Distance to nearest Record (km)	Suitable Habitat present	Likelihood of occurrence in the Survey area
	EPBC	DBCA/WC Act				
Acacia cummingiana		P3	Grey or yellow sand, lateritic gravel. Sandplains, lateritic breakaways.	10.5	Yes	Possible
Acacia drummondii subsp. *affinis*		P3	Lateritic gravelly soils	9.09	No	Unlikely
Acacia oncinophylla subsp. *oncinophylla*		P3	Granitic soils.	4.24	No	Unlikely
Acacia pulchella var. *reflexa* acuminate bracteole variant (R.J. Cumming 882)		P3	Sandy loam or sandy clay over laterite. Woodland.	Data not available	No	Unlikely
Acacia ridleyana		P3	Grey or yellow/brown sand, gravelly clay, granitic loam.	4.22	Yes	Likely
Allocasuarina grevilleoides		P3	Sand over laterite, gravel.	4.24	Yes	Likely
Babingtonia urbana		P3	Swamp, wetland areas, brown loam	28	No	Unlikely
Banksia dallanneyi subsp. *pollosta*		P3	Grey/yellow sand. Flats, lateritic rises.	7.11	Yes	Recorded
Banksia kippistiana var. *paenepeccata*		P3	Lateritic gravelly soils.	9.62	No	Unlikely
Banksia pteridifolia subsp. *vernalis*		P3	White/grey sand over laterite.	10.73	Yes	Recorded
Beaufortia eriocephala		P3	Lateritic sandy soils. Slopes.	7.63	No	Unlikely
Calytrix ecalycata subsp. *brevis*		P3	Dry yellow sand. Sandplains, low rises.	35.6	No	Unlikely
Chamaescilla gibsonii		P3	Winter-wet flats, shallow water-filled claypans.	4.24	No	Unlikely
Conospermum scaposum		P3	White-grey sand, sandy clay. Low swampy areas, road verges.	0.69	No	Unlikely
Dielsiodoxa leucantha subsp. *leucantha*		P3	White sandy clay, hilltops, low ironstone, brown laterite.	4.22	No	Unlikely
Eucalyptus macrocarpa x pyriformis		P3	Sand, lateritic sandy soils. Hills, rocky ironstone ridges, sandplains.	4.24	No	Unlikely
Grevillea florida		P3	Sand, sandy clay, gravel, laterite. Sandplain, slopes, road verges.	4.30	Yes	Likely
Guichenotia impudica		P3	Laterite, brown clayey sand, undulating plains, base of hills.	4.22	No	Unlikely

Species	Conservation Status		Habitat information	Distance to nearest Record (km)	Suitable Habitat present	Likelihood of occurrence in the Survey area
	EPBC	DBCA/WC Act				
Guichenotia micrantha		P3	Yellow or red sand, gravelly lateritic soils. Sandplains, breakaways, rocky hills, granite rocks.	3.4	No	Unlikely
Guichenotia tuberculata		P3	Sand clay over laterite, sand.	4.22	No	Unlikely
Haemodorum loratum		P3	Grey or yellow sand, gravel.	12.93	Yes	Possible
Hibbertia glomerata subsp. *ginginensis*		P3	Sand, brown clay, laterite. Near roadsides.	18.93	No	*Unlikely*
Isopogon drummondii		P3	Yellow, grey sand, laterite gravel, hills, hills slopes, flats.	1.40	Yes	Recorded
Lasiopetalum caroliae		P3	Slopes, brown clayey sand, laterite, gravel	15.48	No	Unlikely
Lasiopetalum venustum		P3	Slopes, undulating flats, rock, gravel, brown sandy loam over laterite.	16	No	Unlikely
Lepidobolus quadratus		P3	Lateritic gravel, grey white sand. Dry kwongan.	45.36	Yes	Unlikely
Leucopogon allittii		P3	Yellow, grey sand over laterite gravel.	4.22	Yes	Likely
Persoonia rudis		P3	White, grey or yellow sand, often over laterite.	4.22	Yes	Likely
Petrophile biternata		P3	Yellow/grey sand and gravel, laterite, quartzite soils. Lateritic ridges, plains.	6.88	Yes	Possible
Petrophile plumosa		P3	Red/brown laterite, loam. Sandplains, hills.	4.22	No	Unlikely
Platysace ramosissima		P3	Grey, white, yellow sandy soils.	20.4	Yes	Unlikely
Schoenus benthamii		P3	White, grey sand, sandy clay. Winter-wet flats, swamps.	4.24	Yes	Likely
Stylidium nonscandens		P3	Sand over laterite. Hillslopes and crests. Banksia woodland, heath, mallee shrubland.	3.74	Yes	Recorded
Styphelia filifolia		P3	Brown, yellow, grey sand, slopes, flat sandplains.	11.87	Yes	Possible
Acacia alata var. platyptera		P4	Clay, gravelly sandy clay. Lateritic ridges, clay flats.	8.29	No	Unlikely
Anigozanthos humilis subsp. *chrysanthus*		P4	White, grey or yellow sand. Slopes, flats.	4.22	Yes	Likely

Species	Conservation Status		Habitat information	Distance to nearest Record (km)	Suitable Habitat present	Likelihood of occurrence in the Survey area
	EPBC	DBCA/WC Act				
Banksia chamaephyton (Fishbone Banksia)		P4	Grey or white sand over laterite.	0.76	Yes	Recorded
Calothamnus pachystachyus		P4	Lateritic soils, often gravelly. Ridges, road verges.	1.44	No	Unlikely
Hibbertia miniata		P4	Lateritic gravelly soils.	10.43	No	Unlikely
Persoonia sulcata		P4	Lateritic or granitic soils	4.22	No	Unlikely
Synaphea grandis		P4	Brown sandy loam over laterite, low rises, hills.	16.69	No	Unlikely
Thelymitra apiculata		P4	Grey sand, lateritic gravel.	4.22	yes	Likely
Thysanotus glaucus		P4	White, grey or yellow sand, sandy gravel.	10.45	Yes	Possible
Verticordia lindleyi subsp. *lindleyi*		P4	Sand, sandy clay. Winter-wet depressions.	1.23	Yes	Likely
Verticordia paludosa		P4	White/grey sand. Winter-wet flats.	0.14	Yes	Likely

APPENDIX E:

Flora Inventory

Family	Name
Anarthriaceae	*Lyginia imberbis*
Asparagaceae	*Lomandra* ? *caespitosa*
	Lomandra hermaphrodita
Asteraceae	**Ursinia anthemoides*
Casuarinaceae	*Allocasuarina humilis*
	Allocasuarina microstachya
	Allocasuarina thuyoides
Cyperaceae	*Caustis dioica*
	Lepidosperma leptostachyum
	Mesomelaena pseudostygia
	Mesomelaena tetragona
	Schoenus brevisetis
	Schoenus clandestinus
	Schoenus curvifolius
	Schoenus insolitus
	Schoenus pedicellatus
	Schoenus pleiostemoneus
	Schoenus subfascicularis
	Tetraria octandra
	Tricostularia exsul
Dasypogonaceae	*Calectasia narragara*
Dilleniaceae	*Hibbertia* ? *crassifolia*
	Hibbertia huegelii
	Hibbertia hypericoides
	Hibbertia racemosa
Droseraceae	*Drosera* ? *nitidula*
Ericaceae	*Andersonia heterophylla*
	Andersonia lehmanniana subsp. *lehmanniana*
	Astroloma stomarrhena
	Conostephium pendulum
	Leucopogon oliganthus
	Leucopogon sp. Carnamah (M. Hislop 2898)

Family	Name
	Lysinema elegans
Fabaceae	*Acacia huegelii*
	Acacia pulchella var. *glaberrima*
	Acacia stenoptera
	Bossiaea eriocarpa
	Daviesia angulata
	Daviesia polyphylla
	Daviesia decurrens subsp. *decurrens*
	Daviesia incrassata subsp. *incrassata*
	Daviesia nudiflora subsp. *nudiflora*
	Gastrolobium ? *axillare*
	Gastrolobium linearifolium
	Gompholobium tomentosum
	Jacksonia floribunda
	Jacksonia nutans
Goodeniaceae	*Dampiera carinata*
	Dampiera teres
	Lechenaultia ? *stenosepala*
Haemodoraceae	*Conostylis aurea*
	Conostylis teretifolia subsp. *teretifolia*
	Conostylis teretiuscula
Hemerocallidaceae	*Arnocrinum preissii*
	Hensmania turbinata
	Tricoryne elatior
Iridaceae	**Gladiolus caryophyllaceus*
	Patersonia occidentalis var. *latifolia*
Lauraceae	*Cassytha flava*
Loranthaceae	*Nuytsia floribunda*
Myrtaceae	*Beaufortia elegans*
	Calothamnus sanguineus
	Calytrix angulata
	Calytrix fraseri

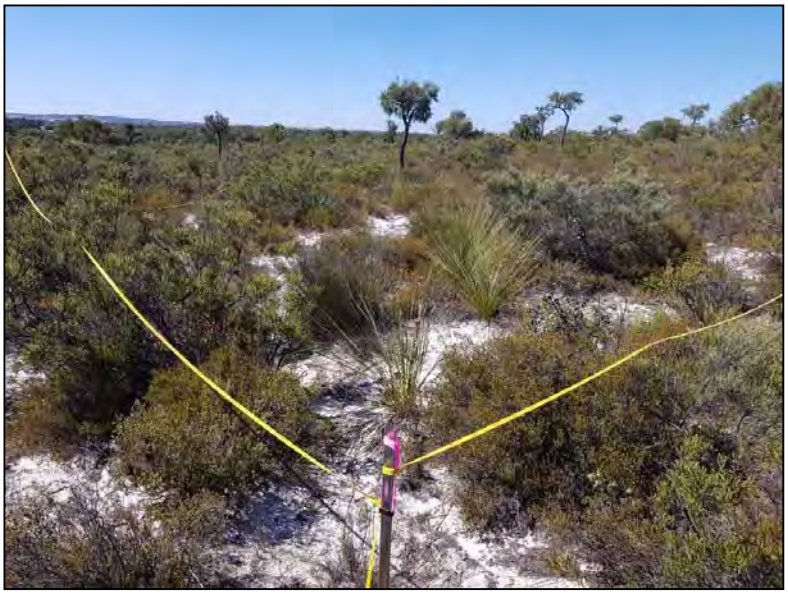
Family	Name
	Eremaea asterocarpa subsp. *histoclada*
	Eremaea pauciflora
	Eucalyptus todtiana
	Hypocalymma xanthopetalum
	Leptospermum erubescens
	Leptospermum spinescens
	Melaleuca carrii
	Melaleuca ciliosa
	Melaleuca clavifolia
	Melaleuca seriata
	Melaleuca trichophylla
	Scholtzia involucrata
	Verticordia densiflora var. *cespitosa*
	Verticordia drummondii
Poaceae	*Amphipogon debilis*
	Amphipogon turbinatus
	Austrostipa sp.
	**Briza maxima*
	Neurachne alopecuroidea
Proteaceae	*Adenanthos cygnorum* subsp. *cygnorum*
	Banksia attenuata
	Banksia bipinnatifida subsp. *multifida*
	Banksia chamaephyton (P4)
	Banksia dallanneyi subsp. *? dallanneyi*
	Banksia dallanneyi subsp. *pollosta* (P3)
	Banksia leptophylla var. *leptophylla*
	Banksia menziesii
	Banksia mimica (T)
	Banksia nivea subsp. *nivea*
	Banksia platycarpa
	Banksia pteridifolia subsp. *vernalis* (P3)
	Conospermum incurvum

Family	Name
	Hakea brownii
	Hakea marginata
	Hakea smilacifolia
	Hakea trifurcata
	Hakea varia
	Isopogon drummondii (P3)
	Lambertia multiflora var. *multiflora*
	Petrophile brevifolia
	Petrophile linearis
	Petrophile macrostachya
	Petrophile seminuda
	Stirlingia latifolia
	Synaphea ? *sparsiflora* (P2)
	Synaphea spinulosa subsp. *spinulosa*
Restionaceae	*Alexgeorgea nitens*
	Chordifex sinuosus
	Desmocladus virgatus
	Leptocarpus canus
Rutaceae	*Boronia ramosa* subsp. *anethifolia*
Stylidiaceae	*Stylidium nonscandens* (P3)
	Stylidium piliferum
	Stylidium repens
Xanthorrhoeaceae	*Xanthorrhoea drummondii sans lat*

APPENDIX F:

Flora Site Sheets

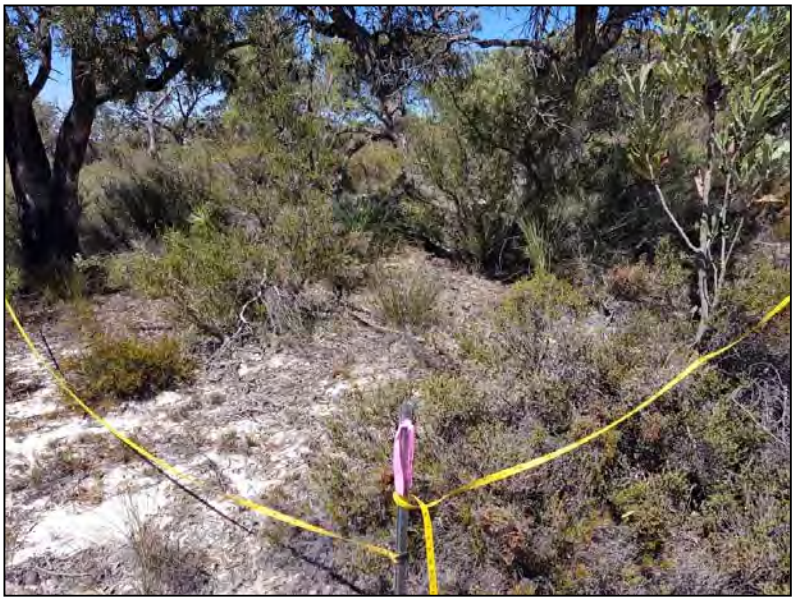
2668 Mogumber Farm
Site MF01
Described by SF&NW
Date 29/03/2018
Type Q 10 x 10 m
Season
Uniformity
Location Mogumber Farm, mid slope
MGA Zone 50K 402314 **mE** 6566202 **mN**
Habitat Low Shrubland
Soil white, grey sand
Rock Type
Veg Condition Excellent
Fire Age >10 years
Notes Total PFC - 60%
Bareground - 35%
Leaf Litter - 2%
Logs - 0%



SPECIES LIST:

Name	Cover	Height
Allocasuarina humilis	5	1.2
Amphipogon turbinatus	1	0.15
Andersonia heterophylla	0.1	0.2
Andersonia lehmanniana subsp. *lehmanniana*	0.1	0.1
Banksia dallanneyi subsp. *pollosta P3*	1	0.2
Calothamnus sanguineus	1	1
Cassytha flava	0.5	c
Chordifex sinuosus	1	0.1
Conostylis teretifolia subsp. *teretifolia*	0.1	0.1
Conostylis teretiuscula	0.1	0.1
Dampiera carinata	0.1	0.1
Daviesia decurrens subsp. *decurrens*	0.1	0.4
Eremaea pauciflora	2	0.45
Hakea smilacifolia	1	0.5
Hensmania turbinata	0.1	0.1
Hibbertia hypericoides	15	0.5
Jacksonia floribunda	0.1	0.3
Jacksonia nutans	1	1.2
Lambertia multiflora var. *multiflora*	5	1.7
Lepidosperma leptostachyum	0.5	0.4
Leucopogon oliganthus	0.1	0.2
Leucopogon sp. Carnamah (M. Hislop 2898)	0.1	0.1
Lysinema elegans	0.1	0.7
Melaleuca ciliosa	1	0.1
Melaleuca trichophylla	1	0.4
Mesomelaena pseudostygia	9	0.4
Mesomelaena tetragona	0.1	0.5
Patersonia occidentalis var. *latifolia*	0.1	0.4
Petrophile brevifolia	0.1	0.2
Schoenus curvifolius	0.1	0.1
Schoenus clandestinus	0.5	0.1
Schoenus pleiostemoneus	0.1	0.1
Stylidium repens	0.1	0.1
Synaphea spinulosa subsp. *spinulosa*	0.5	0.2
Tetraria octandra	0.1	0.4
Xanthorrhoea drummondii sans lat	5	1

2668 Mogumber Farm
Site MF02
Described by SF&NW
Date 29/03/2018
Type Q 10 x 10 m
Season
Uniformity
Location Mogumber farm, mid slope
MGA Zone 50K 402587 **mE** 6566131 **mN**
Habitat
Soil white, grey sand
Rock Type
Veg Condition Excellent
Fire Age > 15 years
Notes Total PFC - 65%
Bareground - 10%
Leaf Litter - 25%
Logs - 1%



SPECIES LIST:

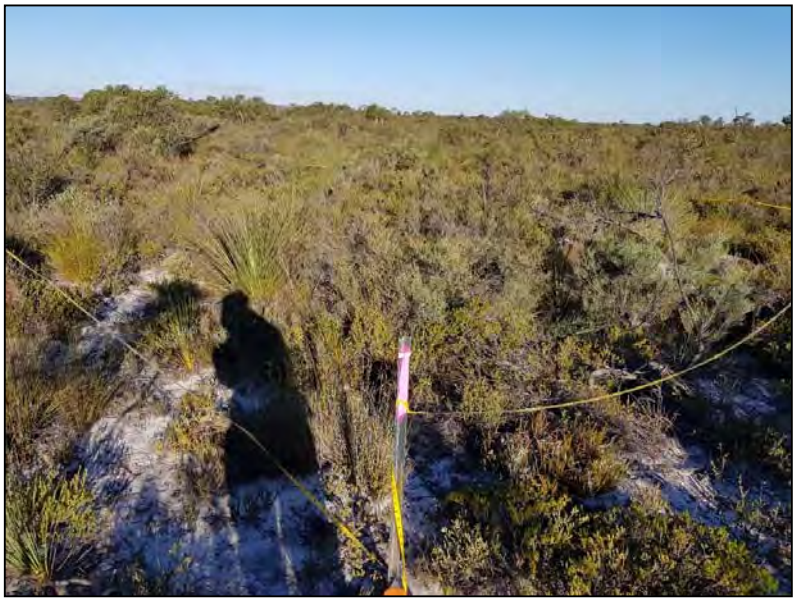
Name	Cover	Height
Allocasuarina humilis	0.1	1.3
Amphipogon turbinatus	2	0.25
Arnocrinum preissii	0.1	0.5
Banksia attenuata	15	0.6
Banksia dallanneyi subsp. *pollosta P3*	0.5	0.15
Banksia menziesii	1	2
Beaufortia elegans	0.5	0.4
Caustis dioica	1.5	0.25
Chordifex sinuosus	1	0.1
Eremaea pauciflora	4	1
**Gladiolus caryophyllaceus*	0.1	0.5
Gompholobium tomentosum	0.3	0.45
Hibbertia huegelii	0.5	0.3
Hibbertia hypericoides	1	0.35
Hibbertia racemosa	0.1	0.3
Jacksonia floribunda	0.1	0.3
Jacksonia nutans	1	0.8
Leptospermum erubescens	6	2
Leptospermum spinescens	1	0.5
Leucopogon sp. Carnamah (M. Hislop 2898)	0.5	0.2
Lyginia imberbis	1	0.5
Melaleuca seriata	1	1.3
Mesomelaena pseudostygia	7	0.45
Neurachne alopecuroidea	0.1	0.03
Nuytsia floribunda	10	5.5
Petrophile linearis	0.5	0.45
Petrophile macrostachya	3	1.1
Schoenus clandestinus	0.5	0.01
Schoenus curvifolius	0.1	0.2
Scholtzia involucrata	0.1	0.5
Stirlingia latifolia	3	0.35
Synaphea spinulosa subsp. *spinulosa*	0.1	0.25
Xanthorrhoea drummondii sans lat	1.5	1

2668 Mogumber Farm
Site MF03
Described by SF&NW
Date 29/03/2018
Type Q 10 x 10 m
Season
Uniformity
Location Mogumber farm
MGA Zone 50K 402905 **mE** 6566095 **mN**
Habitat
Soil white, grey sand
Rock Type
Veg Condition Excellent
Fire Age > 15 years
Notes Total PFC - 70%
Bareground - 10%
Leaf Litter - 25%
Logs - 0%

SPECIES LIST:

Name	Cover	C Class	Height	Specimen Notes
Acacia pulchella var. *glaberrima*	0.5		1	
Allocasuarina humilis	4		1.3	
Amphipogon turbinatus	1		0.3	
Banksia attenuata	0.1		6	
Banksia dallanneyi subsp. *pollosta P3*	0.5		0.1	
Boronia ramosa subsp. *anethifolia*	0.1		0.25	
Calytrix angulata	0.1		0.2	
Cassytha flava	1		c	
Caustis dioica	0.5		0.3	
Chordifex sinuosus	1		0.1	
Daviesia incrassata subsp. *incrassata*	1		1	
Desmocladus virgatus	0.1		0.15	
Eremaea pauciflora	7		1.3	
Eucalyptus todtiana	25		6	
Hibbertia ? crassifolia	0.1		0.2	
Hibbertia huegelii	0.5		0.3	
Hibbertia racemosa	0.1		0.3	
Jacksonia floribunda	1		3	
Leptospermum erubescens	5		1.8	
Leucopogon sp. Carnamah (M. Hislop 2898)	0.1		0.1	
Lomandra hermaphrodita	0.1		0.25	
Lyginia imberbis	4		0.45	
Melaleuca ciliosa	1.5		1.1	
Melaleuca seriata	2		1.4	
Patersonia occidentalis var. *latifolia*	0.5		0.4	
Petrophile linearis	0.1		0.35	
Petrophile seminuda	1		1.1	
Schoenus curvifolius	0.5		0.25	
Schoenus pedicellatus	1		0.5	
Scholtzia involucrata	0.1		0.6	
Stylidium piliferum	0.1		0.01	
Xanthorrhoea drummondii sans lat	1		1.1	

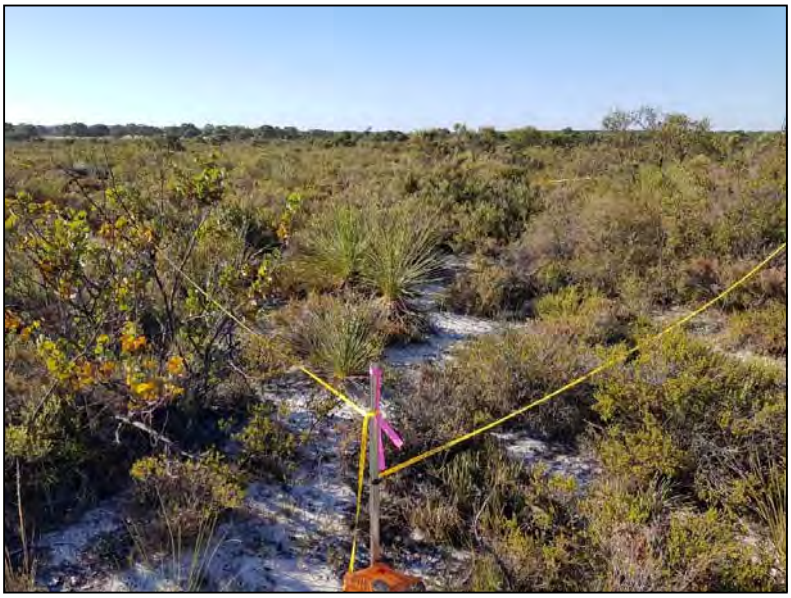
2668 Mogumber Farm
Site MF04
Described by SF&NW
Date 29/03/2018
Type Q 10 x 10 m
Season
Uniformity
Location Mogumber farm
MGA Zone 50K 402118 **mE** 6569810 **mN**
Habitat
Soil white, grey sand
Rock Type
Veg Condition Excellent
Fire Age > 15 years
Notes Total PFC - 75%
Bareground - 10%
Leaf Litter - 15%
Logs - 0%



SPECIES LIST:

Name	Cover	C Class	Height	Specimen Notes
Allocasuarina humilis	6		1.3	
Amphipogon turbinatus	0.5		0.05	
Banksia dallanneyi subsp. *pollosta P3*	4		0.15	
Beaufortia elegans	0.5		0.35	
Calectasia narragara	0.5		0.4	
Cassytha flava	0.1		c	
Caustis dioica	1		0.3	
Chordifex sinuosus	0.5		0.1	
Conostephium pendulum	0.5		0.5	
Conostylis teretifolia subsp. *teretifolia*	0.1		0.1	
Conostylis teretiuscula	0.1		10	
Daviesia decurrens subsp. *decurrens*	0.5		0.4	
Daviesia nudiflora subsp. *nudiflora*	2		0.6	
Drosera ? nitidula	0.1		0.01	
Eremaea pauciflora	2		0.45	
Eucalyptus todtiana	1		1.5	
Gastrolobium linearifolium	0.5		0.5	
Hakea brownii	0.5		1.5	
Hibbertia ? crassifolia	0.5		0.2	
Hypocalymma xanthopetalum	0.1		0.2	
Jacksonia floribunda	0.5		0.45	
Lambertia multiflora var. *multiflora*	2		2	
Lepidosperma leptostachyum	0.1		0.4	
Lysinema elegans	0.1		0.35	
Melaleuca clavifolia	8		0.5	
Melaleuca trichophylla	1		0.25	
Mesomelaena tetragona	0.5		0.5	
Patersonia occidentalis var. *latifolia*	0.1		0.35	
Petrophile brevifolia	1		0.4	
Schoenus clandestinus	0.1		0.02	
Schoenus curvifolius	0.1		0.25	
Synaphea spinulosa subsp. *spinulosa*	0.5		0.3	
Tricostularia exsul	3		0.5	
**Ursinia anthemoides*	0.1		0.1	
Verticordia densiflora var. *cespitosa*	0.5		0.5	
Xanthorrhoea drummondii sans lat	7		1	

2668 Mogumber Farm
Site MF05
Described by SF
Date 29/03/2018
Type Q 10 x 10 m
Season
Uniformity
Location Mogumber farm
MGA Zone 50K 402539 **mE** 6566652 **mN**
Habitat
Soil white, grey sand
Rock Type
Veg Condition Excellent
Fire Age > 15 years
Notes Total PFC - 75%
Bareground - 10%
Leaf Litter - 15%
Logs - 0%



SPECIES LIST:

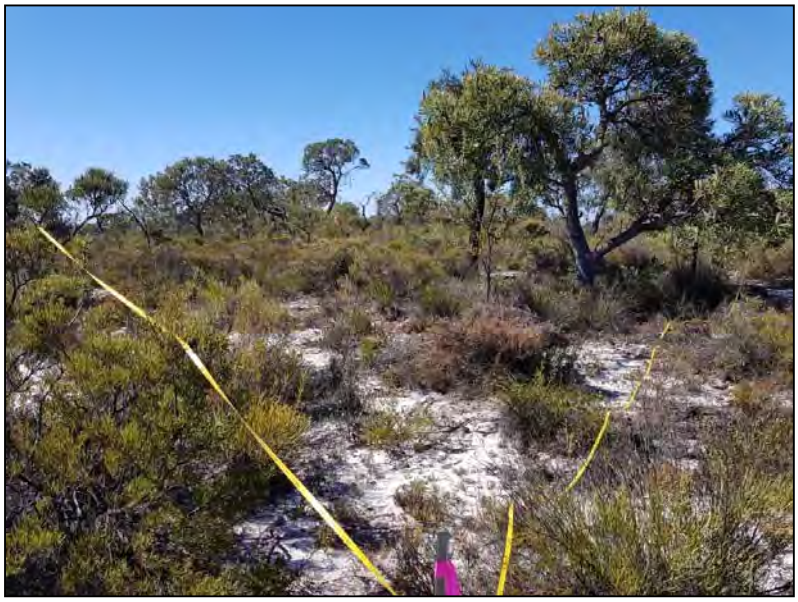
Name	Cover	Height
Acacia pulchella var. *glaberrima*	1.5	1
Acacia stenoptera	0.5	0.2
Alexgeorgea nitens	2	0.05
Allocasuarina humilis	10	2
Allocasuarina thuyoides	4	1.1
Amphipogon debilis	0.1	0.1
Banksia dallanneyi subsp. *pollosta P3*	3	0.1
Calothamnus sanguineus	2	1
Cassytha flava	0.5	c
Caustis dioica	2	0.5
Conostylis aurea	0.1	0.1
Eremaea pauciflora	3	1.1
Hakea brownii	2	1.5
Hakea smilacifolia	1	1
Hypocalymma xanthopetalum	0.5	0.1
Isopogon drummondii P3	0.5	0.5
Jacksonia floribunda	1	0.2
Lambertia multiflora var. *multiflora*	6	2
Lepidosperma leptostachyum	1	0.7
Lomandra ? caespitosa	0.1	0.1
Melaleuca ciliosa	4	1
Melaleuca clavifolia	3	1
Mesomelaena pseudostygia	1	0.5
Mesomelaena tetragona	1	0.5
Patersonia occidentalis var. *latifolia*	1	0.7
Petrophile linearis	0.1	0.1
Schoenus curvifolius	0.1	0.1
Synaphea spinulosa subsp. *spinulosa*	3	1
Tetraria octandra	0.5	0.2
Xanthorrhoea drummondii sans lat	8	1

2668 Mogumber Farm
Site MF06
Described by NW
Date 29/03/2018
Type Q 10 x 10 m
Season
Uniformity
Location Mogumber farm
MGA Zone 50K 402842 **mE** 6566557 **mN**
Habitat
Soil white, grey sand
Rock Type
Veg Condition Excellent
Fire Age >10 years
Notes Total PFC - 60%
Bareground - 35%
Leaf Litter - 5%
Logs - 0%

SPECIES LIST:

Name	Cover	Height
Acacia huegelii	0.1	0.15
Acacia stenoptera	0.1	0.25
Amphipogon turbinatus	1	0.15
Banksia dallanneyi subsp. *pollosta P3*	1.5	0.2
Cassytha flava	4	c
Caustis dioica	7	0.45
Chordifex sinuosus	5	0.3
Conostylis aurea	1	0.2
Eremaea pauciflora	4	0.6
Daviesia nudiflora subsp. *nudiflora*	5	1.3
Hakea trifurcata	1.5	2
Hakea varia	1.5	1.2
Lambertia multiflora var. *multiflora*	0.1	0.45
Lechenaultia ? stenosepala	0.1	0.2
Lyginia imberbis	0.5	0.3
Melaleuca seriata	20	0.85
Mesomelaena tetragona	0.5	0.4
Petrophile brevifolia	4	0.35
**Ursinia anthemoides*	0.5	0.1
Xanthorrhoea drummondii sans lat	2	1.1

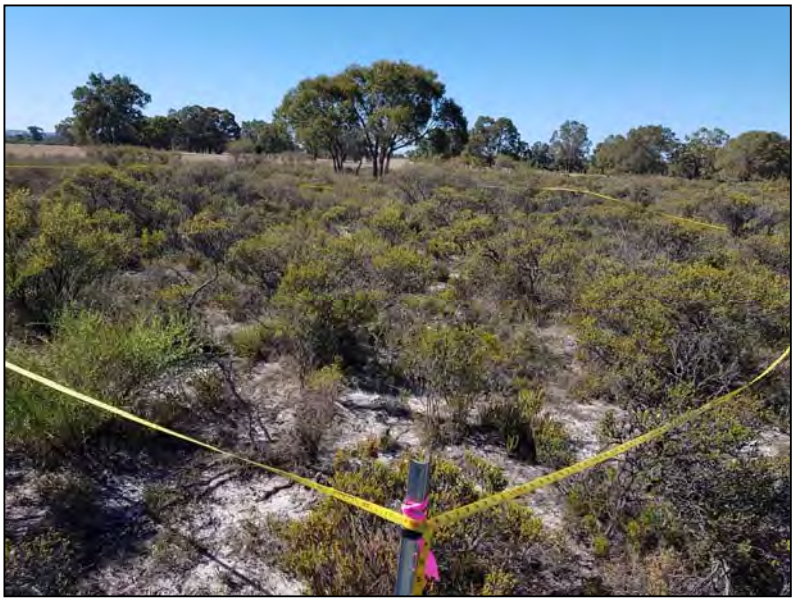
2668 Mogumber Farm
Site MF07
Described by SF
Date 29/03/2018
Type Q 10 x 10 m
Season
Uniformity
Location Mogumber farm, undulating plain
MGA Zone 50K 402160 **mE** 6566595 **mN**
Habitat
Soil white, grey sand
Rock Type
Veg Condition Excellent
Fire Age >10 years
Notes Total PFC - 65%
Bareground - 15%
Leaf Litter - 15%
Logs - 5%



SPECIES LIST:

Name	Cover	Height
Adenanthos cygnorum subsp. *cygnorum*	1	1.1
Alexgeorgea nitens	2	0.1
Allocasuarina humilis	3	1
Andersonia heterophylla	0.1	0.3
Astroloma stomarrhena	0.2	0.2
Banksia attenuata	10	4
Banksia dallanneyi subsp. *pollosta P3*	2	0.1
Beaufortia elegans	2	1.1
Calytrix fraseri	0.5	1
Cassytha flava	0.5	c
Conostylis teretifolia subsp. *teretifolia*	0.1	0.1
Daviesia nudiflora subsp. *nudiflora*	0.5	0.3
Eremaea pauciflora	2	1
Hibbertia ? crassifolia	1	0.6
Isopogon drummondii P3	1	1.1
Jacksonia floribunda	1	2
Jacksonia nutans	0.5	1
Lambertia multiflora var. *multiflora*	1	2
Lepidosperma leptostachyum	0.1	0.2
Leptospermum spinescens	1	1
Lyginia imberbis	0.1	0.5
Melaleuca ciliosa	11	1.2
Mesomelaena pseudostygia	4	0.7
Nuytsia floribunda	8	5
Petrophile linearis	0.5	0.5
Schoenus insolitus	0.5	0.3
Stirlingia latifolia	8	1
Synaphea spinulosa subsp. *spinulosa*	2	0.6
Tetraria octandra	0.5	0.6

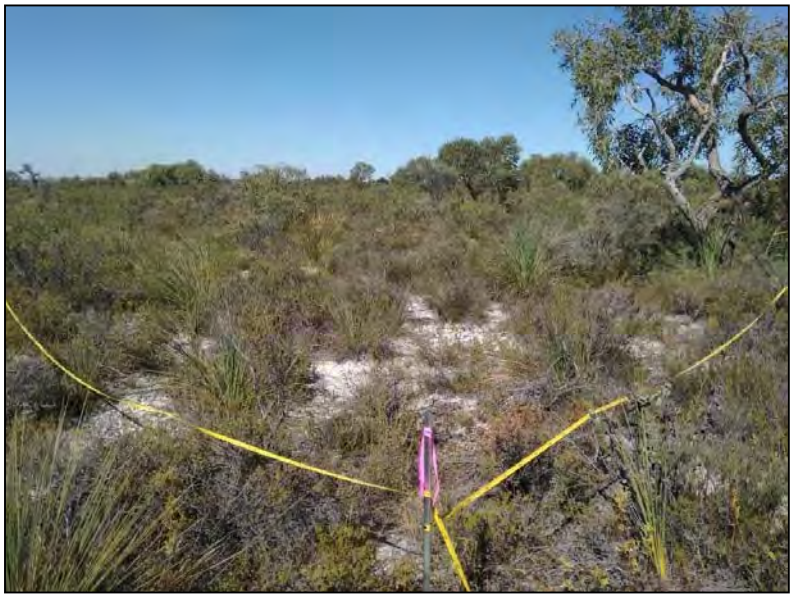
2668 Mogumber Farm
Site MF08
Described by NW
Date 29/03/2018
Type Q 10 x 10 m
Season
Uniformity
Location Mogumber farm, plain
MGA Zone 50K 403002 **mE** 6566372 **mN**
Habitat
Soil white, grey sand
Rock Type
Veg Condition Excellent
Fire Age >10 years
Notes Total PFC - 60%
Bareground - 35%
Leaf Litter - 10%
Logs - 0%



SPECIES LIST:

Name	Cover	Height
Acacia huegelii	0.5	0.35
Allocasuarina microstachya	0.5	0.25
Amphipogon turbinatus	1.5	0.15
Austrostipa sp.	0.1	0.7
Banksia dallanneyi subsp. *pollosta P3*	1	0.2
**Briza maxima*	0.1	0.25
Cassytha flava	1	c
Caustis dioica	2	0.4
Chordifex sinuosus	3	0.2
Conostylis teretifolia subsp. *teretifolia*	0.1	0.1
Dampiera carinata	1	0.15
Dampiera teres	1.5	0.3
Daviesia angulata	3	1.1
Gastrolobium ? axillare	0.1	0.25
Hakea varia	2	0.5
Jacksonia nutans	1	0.55
Melaleuca carrii	2.5	1.25
Melaleuca seriata	20	1
Mesomelaena tetragona	3	0.45
Neurachne alopecuroidea	0.1	0.02
Patersonia occidentalis var. *latifolia*	0.1	0.12
Petrophile brevifolia	1	0.45
Schoenus clandestinus	0.1	1
Schoenus subfascicularis	6	0.85
Synaphea spinulosa subsp. *spinulosa*	0.5	0.35
Tricoryne elatior	0.5	0.75
**Ursinia anthemoides*	0.1	0.1
Synaphea ? sparsiflora P2	2	0.35

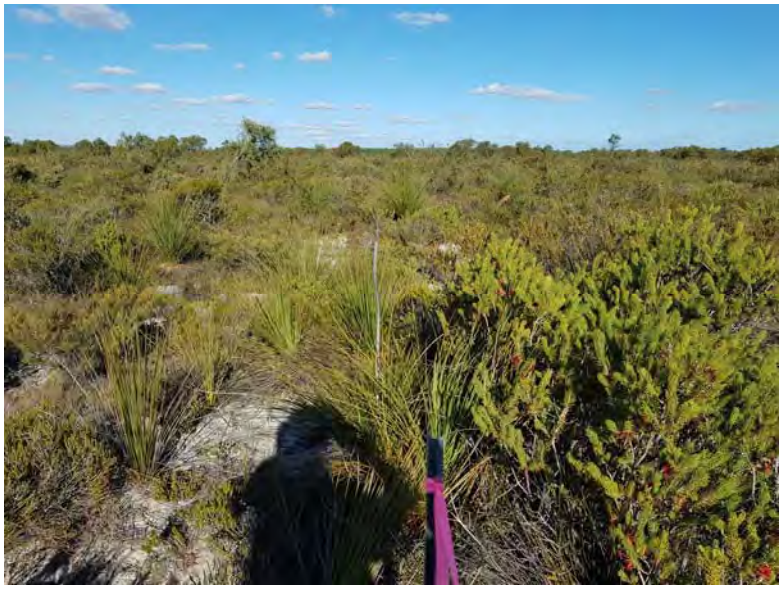
2668 Mogumber Farm
Site MF09
Described by SF
Date 29/03/2018
Type Q 10 x 10 m
Season
Uniformity
Location Mogumber farm, undulating plain
MGA Zone 50K 402417 **mE** 6565139 **mN**
Habitat
Soil white, grey sand
Rock Type
Veg Condition Excellent
Fire Age >10 years
Notes Total PFC - 70%
Bareground - 15%
Leaf Litter - 15%
Logs - 0%



SPECIES LIST:

Name	Cover	Height
Alexgeorgea nitens	2	0.1
Allocasuarina humilis	3	2
Banksia dallanneyi subsp. ? *dallanneyi*	4	0.1
Beaufortia elegans	1	0.7
Bossiaea eriocarpa	5	1
Calectasia narragara	0.1	0.5
Calothamnus sanguineus	4	1.4
Cassytha flava	0.5	c
Caustis dioica	1	0.5
Conostylis aurea	0.1	0.1
Daviesia decurrens subsp. *decurrens*	0.5	0.5
Eremaea pauciflora	4	0.7
Eucalyptus todtiana	15	5
Hakea smilacifolia	0.1	1
Isopogon drummondii P3	1	0.6
Jacksonia floribunda	0.5	0.1
Lambertia multiflora var. *multiflora*	3	1.4
Lepidosperma leptostachyum	0.1	0.2
Lyginia imberbis	0.5	0.5
Melaleuca ciliosa	1.5	1
Melaleuca clavifolia	1.5	0.5
Mesomelaena pseudostygia	5	0.5
Mesomelaena tetragona	1	0.5
Patersonia occidentalis var. *latifolia*	0.5	0.5
Petrophile linearis	0.1	1
Schoenus clandestinus	5	0.01
Synaphea spinulosa subsp. *spinulosa*	2	0.7
Tetraria octandra	0.5	0.2
Xanthorrhoea drummondii sans lat	8	1

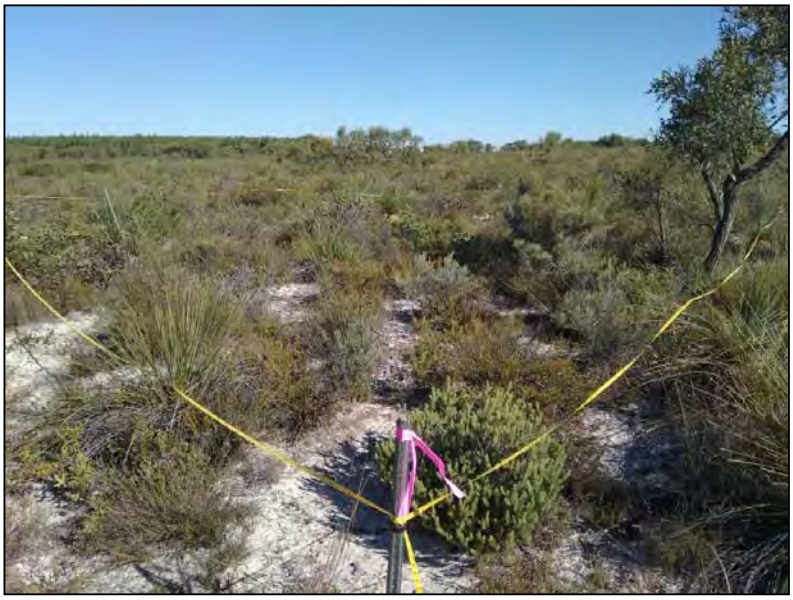
2668 Mogumber Farm
Site MF10
Described by NW
Date 29/03/2018
Type Q 10 x 10 m
Season
Uniformity
Location Mogumber farm, plain
MGA Zone 50K 402503 **mE** 6565101 **mN**
Habitat
Soil White, grey sand
Rock Type
Veg Condition Excellent
Fire Age >10 years
Notes Total PFC - 60%
Bareground - 35%
Leaf Litter - 10%
Logs - 0%



SPECIES LIST:

Name	Cover	Height
Acacia stenoptera	0.1	0.3
Allocasuarina humilis	6	1.2
Amphipogon turbinatus	1	0.1
Banksia dallanneyi subsp. *pollosta P3*	0.5	0.2
Calectasia narragara	0.1	0.25
Calothamnus sanguineus	4	1.1
Cassytha flava	0.5	c
Chordifex sinuosus	0.6	0.15
Daviesia polyphylla	1	0.6
Dampiera carinata	0.1	0.15
Desmocladus virgatus	1	0.25
Eremaea pauciflora	3	1.2
Gastrolobium ? axillare	0.1	0.25
Hakea smilacifolia	1	0.6
Hibbertia ? crassifolia	0.1	0.3
Hibbertia huegelii	0.1	0.15
Jacksonia floribunda	0.5	0.4
Lambertia multiflora var. *multiflora*	3	1.3
Lepidosperma leptostachyum	0.1	0.4
Leptospermum erubescens	1	1.2
Leucopogon oliganthus	0.1	0.3
Melaleuca clavifolia	5	0.35
Melaleuca trichophylla	2	0.35
Mesomelaena pseudostygia	12	0.4
Mesomelaena tetragona	2	0.45
Neurachne alopecuroidea	0.1	0.05
Patersonia occidentalis var. *latifolia*	0.1	0.2
Petrophile brevifolia	1	0.3
Schoenus brevisetis	0.2	0.15
Schoenus clandestinus	0.1	0.2
Schoenus curvifolius	0.1	0.2
Schoenus pleiostemoneus	0.1	0.1
Synaphea ? sparsiflora P2	0.1	0.35
Tetraria octandra	0.5	0.4
Verticordia densiflora var. *cespitosa*	0.5	0.4
Xanthorrhoea drummondii sans lat	9	1.1

2668 Mogumber Farm
Site MF11
Described by SF
Date 29/03/2018
Type Q 10 x 10 m
Season
Uniformity
Location Mogumber farm
MGA Zone 50K 402788 **mE** 6565081 **mN**
Habitat
Soil white, grey sand
Rock Type Laterite
Veg Condition Excellent
Fire Age >10 years
Notes Total PFC - 65%
Bareground - 20%
Leaf Litter - 15%
Logs - 0%



SPECIES LIST:

Name	Cover	Height
Alexgeorgea nitens	2	0.1
Allocasuarina humilis	2.5	1.1
Banksia dallanneyi	2	1.1
Calothamnus sanguineus	4	1
Daviesia decurrens subsp. *decurrens*	0.5	0.3
Eucalyptus todtiana	5	2.5
Hakea brownii	1	1
Hibbertia ? crassifolia	6	0.5
Lambertia multiflora var. *multiflora*	2	1.1
Melaleuca ciliosa	0.5	0.6
Mesomelaena pseudostygia	6	0.5
Mesomelaena tetragona	0.5	0.6
Schoenus clandestinus	4	0.01
Synaphea spinulosa subsp. *spinulosa*	2	0.6
Tetraria octandra	0.5	0.2
Xanthorrhoea drummondii sans lat	8	1.1

2668 Mogumber Farm
Site MF12
Described by NW
Date 29/03/2018
Type Q 10 x 10 m
Season
Uniformity
Location Mogumber farm, plain
MGA Zone 50K 403218 **mE** 6565434 **mN**
Habitat
Soil white, grey sand
Rock Type
Veg Condition Excellent
Fire Age >10 years
Notes Total PFC - 55%
Bareground - 40%
Leaf Litter - 20%
Logs - 0%

SPECIES LIST:

Name	Cover	Height
Acacia pulchella var. *glaberrima*	0.5	0.5
Allocasuarina humilis	4	0.8
Amphipogon turbinatus	0.5	0.15
Arnocrinum preissii	0.1	0.35
Banksia attenuata	5	5.5
Beaufortia elegans	2	0.45
Bossiaea eriocarpa	0.5	0.35
Calothamnus sanguineus	2	1.1
Cassytha flava	0.5	c
Chordifex sinuosus	1	0.2
Conostylis teretifolia subsp. *teretifolia*	0.1	0.1
Desmocladus virgatus	1	0.3
Eremaea pauciflora	8	1.2
Eucalyptus todtiana	4	6.5
Gompholobium tomentosum	1	0.45
Hibbertia ? *crassifolia*	4	0.4
Leptospermum spinescens	1	0.6
Melaleuca seriata	5	1.2
Mesomelaena pseudostygia	4	0.4
Petrophile linearis	0.1	0.45
Petrophile macrostachya	2	1.1
Stirlingia latifolia	3	0.7
Stylidium nonscandens P3	0.	0.15
Synaphea ? sparsiflora P2	0.5	0.4
Xanthorrhoea drummondii sans lat	7	1.1

2668 Mogumber Farm
Site MFR1
Described by NW
Date 29/03/2018
Type R 10 x 10 m
Season
Uniformity
Location Mogumber farm
MGA Zone 50K 402850 **mE** 6566398 **mN**
Habitat Wetland
Soil sand
Rock Type
Veg Condition Excellent
Fire Age >10 years
Notes Total PFC - 65%
Bareground - 35%
Leaf Litter - 20%
Logs - 0%

SPECIES LIST:

Name	Cover	Height
Acacia huegelii	1	0.3
Chordifex sinuosus	3	0.15
Hakea marginata	5	1.6
Leptocarpus canus	8	0.45
Melaleuca carrii	30	1.6
Patersonia occidentalis var. *latifolia*	10	0.4
Petrophile seminuda	0.5	0.6
Verticordia densiflora var. *cespitosa*	0.5	0.4

2668 Mogumber Farm
Opportunistic Collections
Date
Notes

SPECIES LIST:

Name
Banksia bipinnatifida subsp. *multifida*
Banksia chamaephyton P4
Banksia dallanneyi subsp. *pollosta* P3
Banksia leptophylla var. *leptophylla*
Banksia mimica DRF/T
Banksia nivea subsp. *nivea*
Banksia platycarpa
Banksia pteridifolia subsp. *vernalis* P3
Calytrix fraseri
Conospermum incurvum
Drosera ? *nitidula*
Eremaea asterocarpa subsp. *histoclada*
Hakea smilacifolia
Isopogon drummondii P3
Jacksonia floribunda
Petrophile brevifolia
Schoenus pleiostemoneus
Synaphea spinulosa
Verticordia drummondii

APPENDIX G:

Significant Flora Locations

Locations of *Banksia mimica* (DRF/T) within the Survey Area

Taxa	No. of Individuals	Coordinates 2018	
Banksia mimica (DRF/T)	1	E 402180	N 6566598
Banksia mimica (DRF/T)	1	E 402119	N 6566625
Banksia mimica (DRF/T)	1	E 401953	N 6566543
Banksia mimica (DRF/T)	1	E 401979	N 6566671
Banksia mimica (DRF/T)	1	E 402256	N 6565365
Banksia mimica (DRF/T)	3	E 402569	N 6565182
Banksia mimica (DRF/T)	4	E 402580	N 6565182
Banksia mimica (DRF/T)	5	E 402593	N 6565187
Banksia mimica (DRF/T)	1	E 402683	N 6565139
Banksia mimica (DRF/T)	2	E 402090	N 6566854
Banksia mimica (DRF/T)	3	E 402100	N 6566845
Banksia mimica (DRF/T)	3	E 403215	N 6565448
Banksia mimica (DRF/T)	6	E 403216	N 6565473
Banksia mimica (DRF/T)	1	E 402856	N 6566078
Banksia mimica (DRF/T)	1	E 402845	N 6566087
Banksia mimica (DRF/T)	5	E 402806	N 6566086
Banksia mimica (DRF/T)	1	E 402774	N 6566093
Banksia mimica (DRF/T)	1	E 402465	N 6566178
Banksia mimica (DRF/T)	1	E 402468	N 6566172
Banksia mimica (DRF/T)	1	E 402465	N 6566169
Banksia mimica (DRF/T)	1	E 402463	N 6566170
Banksia mimica (DRF/T)	1	E 402473	N 6566176
Banksia mimica (DRF/T)	1	E 402470	N 6566169
Banksia mimica (DRF/T)	3	E 402487	N 6566165
Banksia mimica (DRF/T)	1	E 402490	N 6566169
Banksia mimica (DRF/T)	1	E 402494	N 6566162
Banksia mimica (DRF/T)	1	E 402499	N 6566160
Banksia mimica (DRF/T)	2	E 402516	N 6566153
Banksia mimica (DRF/T)	1	E 402512	N 6566161
Banksia mimica (DRF/T)	1	E 402549	N 6566149
Banksia mimica (DRF/T)	1	E 402499	N 6566161
Banksia mimica (DRF/T)	2	E 402868	N 6565457
Banksia mimica (DRF/T)	8	E 402875	N 6565462
Banksia mimica (DRF/T)	3	E 402884	N 6565453
Banksia mimica (DRF/T)	4	E 402919	N 6565443
Banksia mimica (DRF/T)	1	E 402973	N 6565444
Banksia mimica (DRF/T)	1	E 402996	N 6565453
Banksia mimica (DRF/T)	3	E 403081	N 6565444
Banksia mimica (DRF/T)	5	E 403160	N 6565435

Locations of *Synaphea ? sparsiflora (P2)* within the Survey Area

TAXA	NO. OF INDIVIDUALS	COORDINATES 2018	
Synaphea ? sparsiflora P2	1	E 403002	N 6566372
Synaphea ? sparsiflora P2	1	E 402503	N 6565101
Synaphea ? sparsiflora P2	1	E 403218	N 6565434

Locations of *Banksia dallanneyi* subsp. *pollosta* P3 within the Survey Area

TAXA	NO. OF INDIVIDUALS	COORDINATES 2018	
Banksia dallanneyi subsp. *pollosta* P3	1	E 402422	N 6566178
Banksia dallanneyi subsp. *pollosta* P3	1	E 402490	N 6566168
Banksia dallanneyi subsp. *pollosta* P3	1	E 402515	N 6566152
Banksia dallanneyi subsp. *pollosta* P3	1	E 402519	N 6566161
Banksia dallanneyi subsp. *pollosta* P3	1	E 402680	N 6566115
Banksia dallanneyi subsp. *pollosta* P3	1	E 402761	N 6566102
Banksia dallanneyi subsp. *pollosta* P3	1	E 402763	N 6566097
Banksia dallanneyi subsp. *pollosta* P3	1	E 402763	N 6566095
Banksia dallanneyi subsp. *pollosta* P3	1	E 402770	N 6566098
Banksia dallanneyi subsp. *pollosta* P3	1	E 402802	N 6566095
Banksia dallanneyi subsp. *pollosta* P3	1	E 402805	N 6566086
Banksia dallanneyi subsp. *pollosta* P3	1	E 402845	N 6566085
Banksia dallanneyi subsp. *pollosta* P3	1	E 402849	N 6566090
Banksia dallanneyi subsp. *pollosta* P3	1	E 402852	N 6566086
Banksia dallanneyi subsp. *pollosta* P3	1	E 402853	N 6566081
Banksia dallanneyi subsp. *pollosta* P3	1	E 402895	N 6566074
Banksia dallanneyi subsp. *pollosta* P3	1	E 402918	N 6566077
Banksia dallanneyi subsp. *pollosta* P3	1	E 402932	N 6566073
Banksia dallanneyi subsp. *pollosta* P3	1	E 402938	N 6566070
Banksia dallanneyi subsp. *pollosta* P3	1	E 402217	N 6566221
Banksia dallanneyi subsp. *pollosta* P3	1	E 402260	N 6566218
Banksia dallanneyi subsp. *pollosta* P3	1	E 402270	N 6566224
Banksia dallanneyi subsp. *pollosta* P3	1	E 402264	N 6566227
Banksia dallanneyi subsp. *pollosta* P3	1	E 402272	N 6566214
Banksia dallanneyi subsp. *pollosta* P3	1	E 402285	N 6566213
Banksia dallanneyi subsp. *pollosta* P3	1	E 402285	N 6566211
Banksia dallanneyi subsp. *pollosta* P3	1	E 402290	N 6566217
Banksia dallanneyi subsp. *pollosta* P3	1	E 402298	N 6566213
Banksia dallanneyi subsp. *pollosta* P3	1	E 402302	N 6566214
Banksia dallanneyi subsp. *pollosta* P3	1	E 402232	N 6566207
Banksia dallanneyi subsp. *pollosta* P3	1	E 402363	N 6566198
Banksia dallanneyi subsp. *pollosta* P3	1	E 402409	N 6566186

Taxa	No. of Individuals	Coordinates 2018	
Banksia dallanneyi subsp. *pollosta* P3	1	E 402414	N 6566193
Banksia dallanneyi subsp. *pollosta* P3	1	E 402314	N 6566202
Banksia dallanneyi subsp. *pollosta* P3	1	E 402842	N 6566557
Banksia dallanneyi subsp. *pollosta* P3	1	E 402160	N 6566595
Banksia dallanneyi subsp. *pollosta* P3	1	E 403002	N 6566372
Banksia dallanneyi subsp. *pollosta* P3	1	E 402503	N 6565101
Banksia dallanneyi subsp. *pollosta* P3	1	E 402587	N 6566131
Banksia dallanneyi subsp. *pollosta* P3	1	E 402905	N 6566095
Banksia dallanneyi subsp. *pollosta* P3	1	E 402118	N 6569810
Banksia dallanneyi subsp. *pollosta* P3	1	E 402539	N 6566652

Location of *Banksia pteridi*folia subsp. *vernalis* (P3) recorded within the Survey Area

Taxa	No. of Individuals	Coordinates 2018	
Banksia pteridifolia subsp. *vernalis* P3	7	E 402553	N 6565716

Locations of *Stylidium nonscandens* (P3) within the Survey Area

Taxa	No. of Individuals	Coordinates 2018	
Stylidium nonscandens P3	1	E 403218	N 6565434

Locations of *Isopogon drummondii* (P3) within the Survey Area

Taxa	No. of Individuals	Coordinates 2018	
Isopogon drummondii P3	1	E 402083	N 6566847
Isopogon drummondii P3	1	E 402544	N 6566656
Isopogon drummondii P3	1	E 402250	N 6565293
Isopogon drummondii P3	5	E 402264	N 6565269
Isopogon drummondii P3	1	E 402781	N 6566575
Isopogon drummondii P3	1	E 402539	N 6566652
Isopogon drummondii P3	1	E 402160	N 6566595
Isopogon drummondii P3	1	E 402417	N 6565139

Locations of *Banksia chamaephyton* (P4) within the Survey Area

TAXA	NO. OF INDIVIDUALS	COORDINATES 2018	
Banksia chamaephyton P4	22	E 402387	N 6565721
Banksia chamaephyton P4	9	E 402419	N 6565711
Banksia chamaephyton P4	1	E 402434	N 6565722
Banksia chamaephyton P4	1	E 402557	N 6565725
Banksia chamaephyton P4	6	E 402594	N 6565395

APPENDIX H:

Black Cockatoo Distribution Maps

Carnaby's Black Cockatoo Distribution Maps

Photo: Female Carnaby's cockatoo *Calyptorhynchus latirostrise* (Rick Dawson, Department of Parks and Wildlife), sourced from the Carnaby's Cockatoo (*Calyptorhynchus latirostris*) Recovery Plan 2013.

Map 2: Modelled distribution of Carnaby's black cockatoo (*Calyptorhynchus latirostris*)

INDICATIVE MAP ONLY: For the latest departmental information, please refer to the Protected Matters Search Tool at www.environment.gov.au/epbc/index.html

0 50 100 150 200 250 km

Australian Government

Department of Sustainability, Environment, Water, Population and Communities

Produced by: Environmental Resources Information Network (ERIN)

Contextual data sources:
DEWHA (2006), Collaborative Australian Protected Areas Database
Geoscience Australia (2006), Geodata Topo 250K Topographic Data

Legend

- Breeding Range
- Non-breeding Range
- Cities & Towns
- Roads
- Major Rivers
- Lakes

Please Note: The breeding range represents the areas known to be used by birds for breeding as at December 2009. As habitat has been lost in traditional breeding areas, birds have begun breeding at new locations. Distribution created and verified using point locations in SPRAT database (DSEWPaC, 2011) and from expert feedback (R. Johnstone, 2011).

Calyptorhynchus latirostris Carnaby's Black-Cockatoo, Short-billed Black-Cockatoo

0 70 140 210 280 km

s59523.asc 1/04/2014

Species of National Environmental Significance, Map Summary Version 1 2014

Distribution

Species or species habitat likely to occur

Species or species habitat may occur

Commonwealth Marine Area

Produced by: Environmental Resources Information Network
Contextual data source: Geoscience Australia (2006), Geodata Topo 250K Topographic Data
Indicative Map Only: This map has been compiled from datasets with a range of geographic scales and quality. Species distributions are indicative only and not to be used for local assessment. Local knowledge and information should be sought to confirm the presence of the species, or its habitat, at the location of interest.

Australian Government

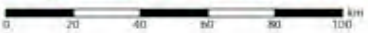
Department of the Environment

Forest Red-tailed Black Cockatoo Distribution Maps

Photo: Female Forest Red-tailed Black cockatoo *Calyptorhynchus baudinii* (Tony Kirkby (Western Australian Museum), sourced from the Forest Black Cockatoo (Baudin's Cockatoo) *Calyptorhynchus baudinii* and Forest Red-tailed Black Cockatoo *Calyptorhynchus banksii naso* Recovery Plan 2008.

Map 3: Modelled distribution of forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*)

INDICATIVE MAP ONLY: For the latest departmental information, please refer to the Protected Matters Search Tool at www.environment.gov.au/epbc/index.html



Australian Government

Department of Sustainability, Environment, Water, Population and Communities

Produced by: Environmental Resources Information Network (ERIN)

Contextual data sources:
DEWHA (2006), Collaborative Australian Protected Areas Database
Geoscience Australia (2006), Geodata Topo 250K Topographic Data

Legend

- Species May Occur
- Cities & Towns
- Roads
- Major Rivers
- Lakes

Please Note: Distribution created and verified using point locations in SPRAT database (DSEWPaC, 2011) and from expert feedback (R. Johnstone, 2011).

Calyptorhynchus banksii naso Forest Red-tailed Black-Cockatoo

0 40 80 120 160 km

s67034.asc 2/04/2014

Species of National Environmental Significance, Map Summary Version 1 2014

Distribution

Species or species habitat likely to occur

Species or species habitat may occur

Commonwealth Marine Area

Produced by: Environmental Resources Information Network
Contextual data source: Geoscience Australia (2006), Geodata Topo 250K Topographic Data
Indicative Map Only: This map has been compiled from datasets with a range of geographic scales and quality. Species distributions are indicative only and not to be used for local assessment. Local knowledge and information should be sought to confirm the presence of the species, or its habitat, at the location of interest.

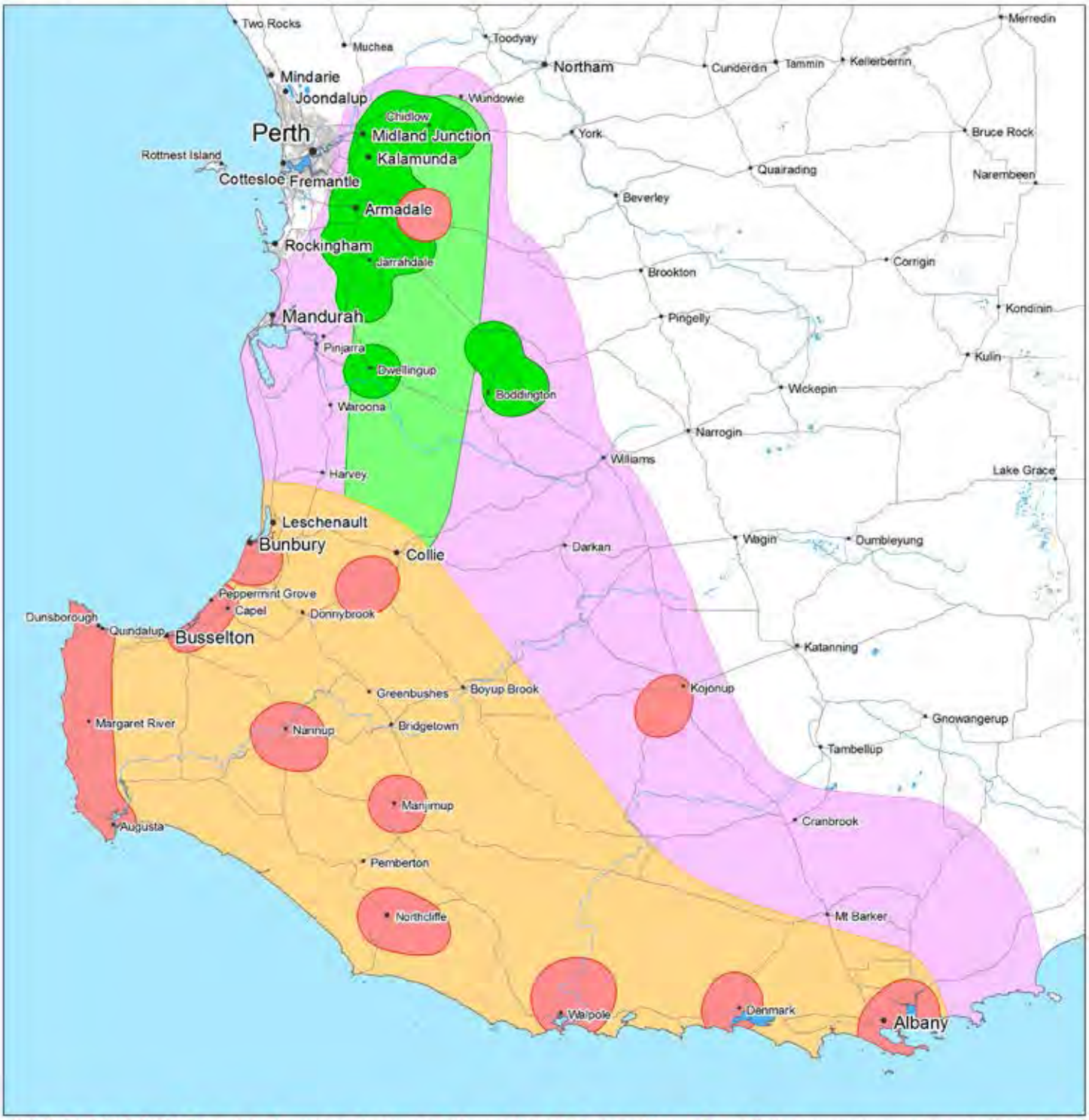
Australian Government

Department of the Environment

Baudin's Black Cockatoo Distribution Maps

Photo: Female Baudin's cockatoo *Calyptorhynchus baudinii* (Tony Kirkby (Western Australian Museum), sourced from the Forest Black Cockatoo (Baudin's Cockatoo) *Calyptorhynchus baudinii* and Forest Redtailed Black Cockatoo *Calyptorhynchus banksii naso* Recovery Plan 2008.

Map 1: Modelled distribution of Baudin's black cockatoo (*Calyptorhynchus baudinii*)



INDICATIVE MAP ONLY: For the latest departmental information, please refer to the Protected Matters Search Tool at www.environment.gov.au/epbc/index.html

0 20 40 60 80 100 km

Australian Government

Department of Sustainability, Environment, Water, Population and Communities

Produced by: Environmental Resources Information Network (ERIN)

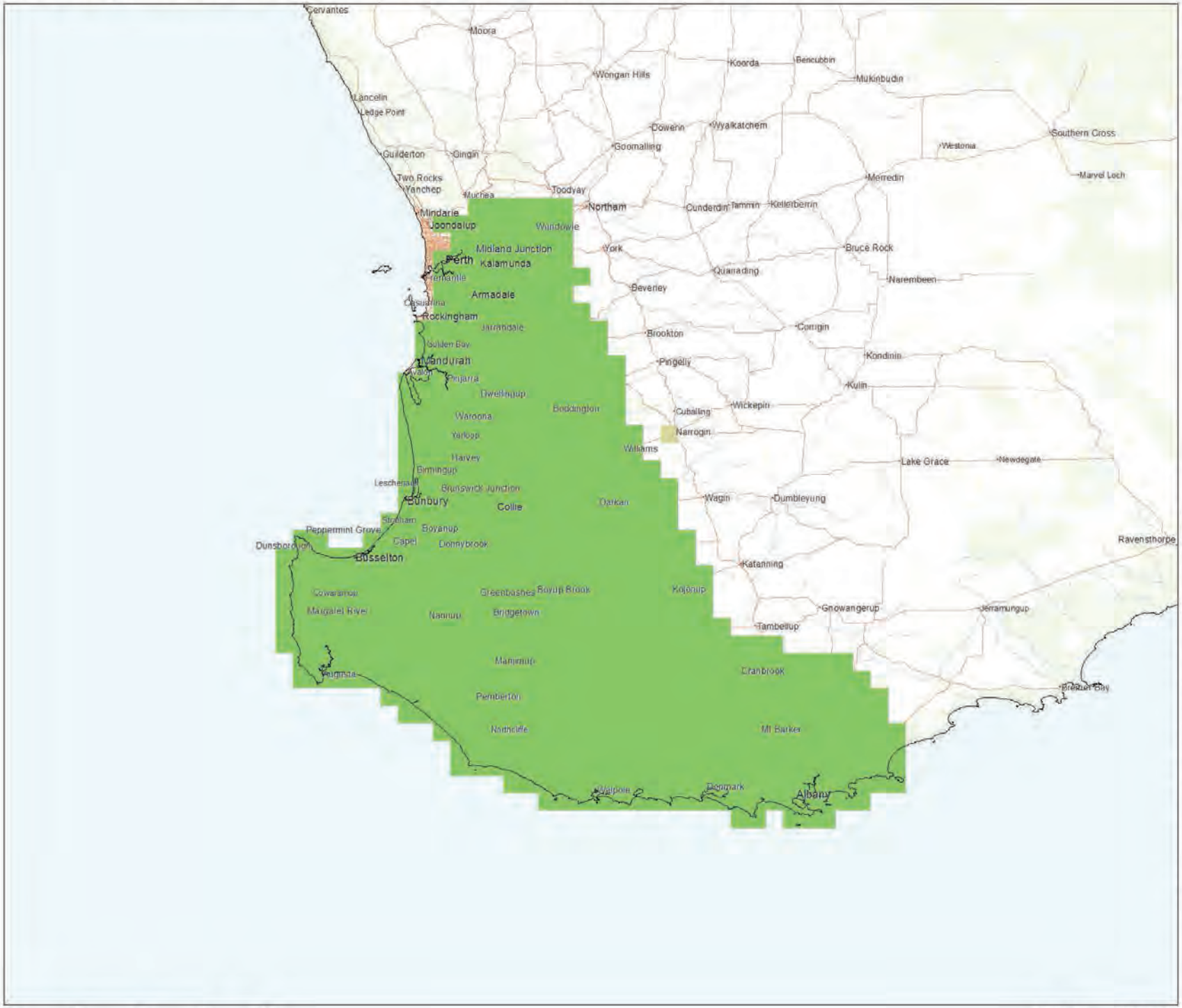
Contextual data sources:
DEWHA (2006), Collaborative Australian Protected Areas Database
Geoscience Australia (2006), Geodata Topo 250K Topographic Data

Legend

- Known Breeding Areas
- Predicted Breeding Range
- Known Foraging Areas
- Main Wintering Area
- Species Likely to Occur
- Cities & Towns
- Roads
- Major Rivers
- Lakes

Please Note: Known breeding areas represent locations known to be used by birds for breeding as at December 2009. As habitat has been lost in traditional breeding areas, birds have begun breeding at new locations. Distribution created and verified using point locations in SPRAT database (DSEWPaC, 2011) and from expert feedback (R. Johnstone, 2011).

Calyptorhynchus baudinii Baudin's Black-Cockatoo, Long-billed Black-Cockatoo



0 40 80 120 160 km

s00769.asc 28/03/2014

Species of National Environmental Significance, Map Summary Version 1 2014

Distribution

Species or species habitat likely to occur

Species or species habitat may occur

Commonwealth Marine Area

Produced by: Environmental Resources Information Network
Contextual data source: Geoscience Australia (2006), Geodata Topo 250K Topographic Data
Indicative Map Only: This map has been compiled from datasets with a range of geographic scales and quality. Species distributions are indicative only and not to be used for local assessment. Local knowledge and information should be sought to confirm the presence of the species, or its habitat, at the location of interest.

Australian Government

Department of the Environment

APPENDIX I:

Fauna Habitat Assessments

DATE	TAXA	EASTING	NORTHING	DBH (mm)	HEIGHT (m)	HOLLOWS	# HOLLOWS	COMMENTS	PHOTO REF
23/03/2018	*Marri (Corymbia calophylla)*	403083	6566119	1066	8	yes	1	One medium hollow occupied by bees, one small hollow lower in limb	1
23/03/2018	*Marri (Corymbia calophylla)*	403040	6566145	875	6	yes	1	Large spout, no evidence of use by BC, potentially too decomposed	2
23/03/2018	*Marri (Corymbia calophylla)*	403190	6566079	872	10	no			3
23/03/2018	*Eucalyptus todtiana*	402856	6566083	866	6	no			4
23/03/2018	*Marri (Corymbia calophylla)*	403066	6566126	793	10	no			5
23/03/2018	*Marri (Corymbia calophylla)*	403476	6566332	780	8	no			6
23/03/2018	*Marri (Corymbia calophylla)*	403098	6566407	758	8	no			7
23/03/2018	*Marri (Corymbia calophylla)*	403181	6566059	745	8	yes	1	Medium hollow with bees	8
23/03/2018	*Marri (Corymbia calophylla)*	403203	6566362	735	10	no			9
23/03/2018	*Marri (Corymbia calophylla)*	403060	6566100	735	12	no			10
23/03/2018	*Marri (Corymbia calophylla)*	403474	6566019	681	8	no			11
23/03/2018	*Marri (Corymbia calophylla)*	403219	6566419	681	12	no			12
23/03/2018	*Eucalyptus todtiana*	403146	6566410	678	6	no			13
23/03/2018	*Marri (Corymbia calophylla)*	403092	6566406	662	8	no			14
23/03/2018	*Marri (Corymbia calophylla)*	403474	6566085	656	8	no			15
23/03/2018	*Marri (Corymbia calophylla)*	403417	6566341	637	8	no			16
23/03/2018	*Marri (Corymbia calophylla)*	403171	6566450	624	8	no			17
23/03/2018	*Marri (Corymbia calophylla)*	403409	6566347	621	8	no			
23/03/2018	*Marri (Corymbia calophylla)*	403175	6566453	605	8	no			18
23/03/2018	*Marri (Corymbia calophylla)*	403117	6566198	602	10	no			19
23/03/2018	*Marri (Corymbia calophylla)*	403233	6566240	579	10	no			20
23/03/2018	*Marri (Corymbia calophylla)*	403454	6566155	573	8	no			
23/03/2018	*Marri (Corymbia calophylla)*	403053	6566144	573	8	no			
23/03/2018	*Marri (Corymbia calophylla)*	403457	6566101	560	10	no			21
23/03/2018	*Marri (Corymbia calophylla)*	403463	6566152	557	8	no			
23/03/2018	*Marri (Corymbia calophylla)*	403360	6566186	547	10	no			22
23/03/2018	*Marri (Corymbia calophylla)*	403445	6566112	544	8	no		Forked into 5 trunks	23
23/03/2018	*Marri (Corymbia calophylla)*	403169	6566159	538	10	no			24
23/03/2018	*Marri (Corymbia calophylla)*	403348	6566246	528	8	no			

		
Photo Reference: 1	Photo Reference: 2	Photo Reference: 3
		
Photo Reference: 4	Photo Reference: 5	Photo Reference: 6

		
Photo Reference: 7	Photo Reference: 8	Photo Reference: 9
		
Photo Reference: 10	Photo Reference: 11	Photo Reference: 12

		
Photo Reference: 13	Photo Reference: 14	Photo Reference: 15
		
Photo Reference: 16	Photo Reference: 17	Photo Reference: 18

		
Photo Reference: 19	Photo Reference: 20	Photo Reference: 21
		
Photo Reference: 22	Photo Reference: 23	Photo Reference: 24

APPENDIX J:

Black Cockatoo Potential Breeding Trees

FAUNA HABITAT ASSESSMENT - HEATH 1

Location: Mogumber | Project: 2668 Mogumber Farm II | Habitat Assessment: Heath 1 | Quadrat Size: 50x50
Date: 2018-04-10 14:23:54 AWST | Zone: 50 | Easting: 402219 | Northing: 6566225

VEGETATION

Vegetation Description: Heath

Stratum	Vegetation Species	Average Height (m)	Cover: Scattered Plants	Sparse	Moderate	Thick
Overstorey	*Nuytsia floribunda and Eucalyptus todtiana*	3	<5%	<20%	20-60%	60-100%
Midstorey	*NA*	0	<5%	<20%	20-60%	60-100%
Ground Cover	*Low lying shrub species*	0.3	<5%	<20%	20-60%	60-100%

CONDITION

Scale: Excellent

GROUND COVER

Bare Ground	<20%	Hummock Grass	<5%	
Rock	<5%	Other Grass	<5%	
Leaf Litter	<5%	Herbs	<5%	
Logs >10cm	<5%	Other:	<5%	

MICROHABITATS

Soil Texture	Sand	Woody Debris	Rare	Aspect	N/A
Pebbles Stones	None	Peeling Bark	None	Last Fire	4-5 years
Rock Crevices	None	Large Tree	None	Burrowing Suitab	Sand
Boulders	None	Small Tree	Rare	Cattle Disturbance	Mild
Exfoliating Slabs	None	Hollows	None	Water Prescence	None
Termite Mounds	None	Caves	No	Distance to Water	>5 km

FAUNA

Conservation Significant SPP Liklihood			DETAILS
Black Cockatoo	YES	NO	Habitat is not suitable
Quenda	YES	NO	Habitat is suitable

FAUNA SURVEY SPECIES LIST FOR HABITAT TYPE

Birds	Reptiles
Australian Magpie	Gould's Goanna
Australian Pipit	Lerista sp.
Australian Raven	Spotted Military Dragon
Australian Ringneck	
Black-faced Cuckoo-shrike	
Brown Honeyeater	
Emu	
Grey Fantail	
White-cheeked Honeyeater	
White-winged Fairy-wren	

Mammals
House Mouse
Rabbit
Red Fox
Western Grey Kangaroo

FAUNA HABITAT ASSESSMENT - HEATH 2

Location: Mogumber | Project: 2668 Mogumber Farm II | Habitat Assessment: Heath 2 | Quadrat Size: 50x50
Date: 2018-04-10 14:37:53 AWST | Zone: 50 | Easting: 402606 | Northing: 6566134

VEGETATION

Vegetation Description: Heath

Stratum	Vegetation Species	Average Height (m)	Scattered Plants	Cover: Sparse	Cover: Moderate	Cover: Thick
Overstorey	*Nuytsia floribunda and Eucalyptus todtiana*	3	<5%	**<20%**	20-60%	60-100%
Midstorey	*Banksia attenuata, Banksia menziesii*	2	<5%	<20%	**20-60%**	60-100%
Ground Cover	*Low heath shrub species*	0.3	<5%	<20%	20-60%	**60-100%**

CONDITION

Scale: Excellent

GROUND COVER

Bare Ground	<20%	Hummock Grass	<5%
Rock	<5%	Other Grass	<5%
Leaf Litter	<5%	Herbs	<5%
Logs >10cm	<5%	Other:	<5%

MICROHABITATS

Soil Texture	Sand	Woody Debris	Rare	Aspect	N/A
Pebbles Stones	None	Peeling Bark	None	Last Fire	>5 years
Rock Crevices	None	Large Tree	None	Burrowing Suitab	Sand
Boulders	None	Small Tree	Moderate	Cattle Disturbance	Mild
Exfoliating Slabs	None	Hollows	None	Water Prescence	None
Termite Mounds	None	Caves	No	Distance to Water	>5 km

FAUNA

Conservation Significant SPP Liklihood			DETAILS
Black Cockatoo	YES	NO	Habitat is suitable
Quenda	YES	NO	Habitat is suitable

FAUNA SURVEY SPECIES LIST FOR HABITAT TYPE

Birds	Reptiles
Australian Magpie	Gould's Goanna
Australian Pipit	Lerista sp.
Australian Raven	Spotted Military Dragon
Australian Ringneck	
Black-faced Cuckoo-shrike	
Brown Honeyeater	
Emu	
Grey Fantail	
White-cheeked Honeyeater	
White-winged Fairy-wren	

Mammals
House Mouse
Rabbit
Red Fox
Western Grey Kangaroo

FAUNA HABITAT ASSESSMENT - HEATH 3

Location: Mogumber | Project: 2668 Mogumber Farm II | Habitat Assessment: Heath 3 | Quadrat Size: 50x50
Date: 2018-04-10 14:38:14 AWST | Zone: 50 | Easting: 402283 | Northing: 6566742

VEGETATION

Vegetation Description: Heath

Stratum	Vegetation Species	Average Height (m)	Cover: Scattered Plants	Sparse	Moderate	Thick
Overstorey	*Eucalyptus todtiana*	3	**<5%**	<20%	20-60%	60-100%
Midstorey	*Banksia attenuata, Banksia menziesii*	2	<5%	**<20%**	20-60%	60-100%
Ground Cover	*Low heath species*	0.3	<5%	<20%	20-60%	**60-100%**

CONDITION

Scale: Excellent

GROUND COVER

Bare Ground	<20%	Hummock Grass	<5%	
Rock	<5%	Other Grass	<5%	
Leaf Litter	<5%	Herbs	<5%	
Logs >10cm	<5%	Other:	<5%	

MICROHABITATS

Soil Texture	Sand	Woody Debris	None	Aspect	N/A
Pebbles Stones	None	Peeling Bark	None	Last Fire	>5 years
Rock Crevices	None	Large Tree	None	Burrowing Suitab	Sand
Boulders	None	Small Tree	Rare	Cattle Disturbance	Mild
Exfoliating Slabs	None	Hollows	None	Water Prescence	None
Termite Mounds	None	Caves	No	Distance to Water	>5 km

FAUNA

Conservation Significant SPP Liklihood			DETAILS
Black Cockatoo	YES	NO	Habitat is suitable
Quenda	YES	NO	Habitat is suitable

FAUNA SURVEY SPECIES LIST FOR HABITAT TYPE

Birds

Australian Magpie
Australian Pipit
Australian Raven
Australian Ringneck
Black-faced Cuckoo-shrike
Brown Honeyeater
Emu
Grey Fantail
White-cheeked Honeyeater
White-winged Fairy-wren

Reptiles

Gould's Goanna
Lerista sp.
Spotted Military Dragon

Mammals

House Mouse
Rabbit
Red Fox
Western Grey Kangaroo

FAUNA HABITAT ASSESSMENT - PADDOCK 1

Location: Mogumber | Project: 2668 Mogumber Farm II | Habitat Assessment: Paddock 1 | Quadrat Size: 50x50
Date: 2018-04-10 14:42:02 AWST | Zone: 50 | Easting: 403458 | Northing: 6566185

VEGETATION

Vegetation Description: Completely Degraded paddock with isolated trees

Stratum	Vegetation Species	Average Height (m)	Scattered Plants	Cover: Sparse	Cover: Moderate	Cover: Thick
Overstorey	*Corymbia calophylla, Eucalyptus todtiana*	14	<5%	**<20%**	20-60%	60-100%
Midstorey	*NA*	0	**<5%**	<20%	20-60%	60-100%
Ground Cover	*NA*	0	**<5%**	<20%	20-60%	60-100%

CONDITION

Scale:	Degraded

GROUND COVER

Bare Ground	60-100%	Hummock Grass	<5%	
Rock	<5%	Other Grass	<5%	
Leaf Litter	<5%	Herbs	<5%	
Logs >10cm	<5%	Other:	<5%	

MICROHABITATS

Soil Texture	Sand	Woody Debris	Rare	Aspect	N/A
Pebbles Stones	None	Peeling Bark	Rare	Last Fire	>5 years
Rock Crevices	None	Large Tree	Moderate	Burrowing Suitab	Sand
Boulders	None	Small Tree	Rare	Cattle Disturbance	Medium
Exfoliating Slabs	None	Hollows	Rare	Water Prescence	None
Termite Mounds	None	Caves	No	Distance to Water	>5 km

FAUNA

Conservation Significant SPP Liklihood			DETAILS
Black Cockatoo	**YES**	NO	Habitat is suitable
Quenda	YES	**NO**	Habitat is not suitable

FAUNA SURVEY SPECIES LIST FOR HABITAT TYPE

Birds

Australian Magpie
Australian Ringneck
Brown Honeyeater
Galah
Grey Fantail
Laughing Kookaburra
Magpie-lark
Red-capped Parrot
Singing Honeyeater
Western Gerygone
White-cheeked Honeyeater
White-winged Fairy-wren
Willie Wagtail
Yellow-rumped Thornbill

Reptiles

Mammals

European Cattle
Rabbit
Red Fox

FAUNA HABITAT ASSESSMENT - PADDOCK 2

Location: Mogumber | Project: 2668 Mogumber Farm II | Habitat Assessment: Paddock 2 | Quadrat Size: 50x50
Date: 2018-04-10 14:42:44 AWST | Zone: 50 | Easting: 403214 | Northing: 6566376

VEGETATION

Vegetation Description: Completely Degraded paddock with isolated trees

Stratum	Vegetation Species	Average Height (m)	Scattered Plants	Cover		
				Sparse	Moderate	Thick
Overstorey	*Corymbia calophylla, Eucalyptus todtiana*	14	<5%	**<20%**	20-60%	60-100%
Midstorey	*NA*	0	**<5%**	<20%	20-60%	60-100%
Ground Cover	*NA*	0	**<5%**	<20%	20-60%	60-100%

CONDITION

Scale: Poor

GROUND COVER

Bare Ground	60-100%	Hummock Grass	<5%
Rock	<5%	Other Grass	<5%
Leaf Litter	20-60%	Herbs	<5%
Logs >10cm	<5%	Other:	<5%

MICROHABITATS

Soil Texture	Sand	Woody Debris	Rare	Aspect	N/A
Pebbles Stones	None	Peeling Bark	Rare	Last Fire	>5 years
Rock Crevices	None	Large Tree	Moderate	Burrowing Suitab	Sand
Boulders	None	Small Tree	Moderate	Cattle Disturbance	Medium
Exfoliating Slabs	None	Hollows	Rare	Water Prescence	Rare
Termite Mounds	None	Caves	No	Distance to Water	>5 km

FAUNA

Conservation Significant SPP Liklihood			DETAILS
Black Cockatoo	**YES**	NO	Habitat is suitable
Quenda	YES	**NO**	Habitat is not suitable

FAUNA SURVEY SPECIES LIST FOR HABITAT TYPE

Birds	Reptiles
Australian Magpie	
Australian Ringneck	
Brown Honeyeater	
Galah	
Grey Fantail	
Laughing Kookaburra	
Magpie-lark	
Red-capped Parrot	
Singing Honeyeater	
Western Gerygone	
White-cheeked Honeyeater	
White-winged Fairy-wren	
Willie Wagtail	
Yellow-rumped Thornbill	

Mammals
European Cattle
Rabbit
Red Fox

FAUNA HABITAT ASSESSMENT - PADDOCK 3

Location: Mogumber | Project: 2668 Mogumber Farm II | Habitat Assessment: Paddock 3 | Quadrat Size: 50x50
Date: 2018-04-10 14:43:02 AWST | Zone: 50 | Easting: 403047 | Northing: 6566215

VEGETATION

Vegetation Description: Completely Degraded paddock

Stratum	Vegetation Species	Average Height (m)	Cover: Scattered Plants	Sparse	Moderate	Thick
Overstorey	*Corymbia calophylla, Eucalyptus todtiana*	14	<5%	<20%	**20-60%**	60-100%
Midstorey	*NA*	0	**<5%**	<20%	20-60%	60-100%
Ground Cover	*NA*	0	**<5%**	<20%	20-60%	60-100%

CONDITION

Scale: Degraded

GROUND COVER

Bare Ground	60-100%	Hummock Grass	<5%	
Rock	<5%	Other Grass	<5%	
Leaf Litter	<5%	Herbs	<5%	
Logs >10cm	<5%	Other:	<5%	

MICROHABITATS

Soil Texture	Sand	Woody Debris	Rare	Aspect	N/A
Pebbles Stones	None	Peeling Bark	Rare	Last Fire	>5 years
Rock Crevices	None	Large Tree	Moderate	Burrowing Suitab	Sand
Boulders	None	Small Tree	Rare	Cattle Disturbance	Medium
Exfoliating Slabs	None	Hollows	Rare	Water Prescence	None
Termite Mounds	None	Caves	No	Distance to Water	>5 km

FAUNA

Conservation Significant SPP Liklihood			DETAILS
Black Cockatoo	**YES**	NO	Habitat is suitable
Quenda	YES	**NO**	Habitat is not suitable

FAUNA SURVEY SPECIES LIST FOR HABITAT TYPE

Birds

Australian Magpie
Australian Ringneck
Brown Honeyeater
Galah
Grey Fantail
Laughing Kookaburra
Magpie-lark
Red-capped Parrot
Singing Honeyeater
Western Gerygone
White-cheeked Honeyeater
White-winged Fairy-wren
Willie Wagtail
Yellow-rumped Thornbill

Reptiles

Mammals

European Cattle
Rabbit
Red Fox

APPENDIX K:

Conservation Significant Fauna Species Profiles

Conservation Significant Species

Quenda - *Isoodon obesulus fusciventer*

The Quenda is listed as Priority 4 under the DBCA Priority List. It once occurred throughout south-west WA; it now occurs from Guilderton southwards on the Swan Coastal Plain, including the Perth Metropolitan area, in Jarrah and Karri (*Eucalyptus diversicolor*) forests and adjacent coastal vegetation complexes. The species inhabits scrubby, often swampy, vegetation with dense cover up to about 1 m in height. It feeds in adjacent forest and woodland that is burnt on a regular basis and in areas of pasture and cropland lying close to dense cover (Woinarski, Burbidge and Harrison, 2014). The Quenda is patchily distributed in suitable habitat, with populations inhabiting Jarrah and Wandoo forests usually associated with watercourses. On the Swan Coastal Plain it is often associated with wetlands with dense vegetation where it feeds on fruit, seeds, insects and fungi (Woinarski, Burbidge and Harrison, 2014).

Black-striped Snake - *Neelaps calonotos*

The Black-striped Snake is listed as Priority 3 under the DBCA Priority List. The species is restricted to the sandy coastal strip near Perth from Mandurah to Cataby. It inhabits dunes and sand-plains vegetated with heaths and eucalypt/banksia woodland (Wilson and Swan, 2017).

Fork-tailed Swift - *Apus pacificus*

The Fork-tailed Swift is listed as Migratory and Marine under the EPBC Act. The species usually forages in flocks hundreds of metres from the ground, but will fly lower if prey is close to the ground. It can occur over any terrestrial habitat (Menkhorst *et al.*, 2017).

Peregrine Falcon - *Falco peregrinus*

The Peregrine Falcon is listed as Other Specially Protected fauna under the WC Act and is an uncommon but wide-ranging bird across Australia (Barrett *et al.*, 2003). The Peregrine Falcon mostly hunts birds and can be found anywhere with suitable nesting sites nearby. It favours nesting on cliff faces, however in Australia it often uses twig nests made by other birds (Menkhorst *et al.*, 2017).

Rainbow Bee-eater - *Merops ornatus*

The Rainbow Bee-eater is listed as a Marine species under the EPBC Act. This species is one of the most common and widespread birds in Australia with a distribution that covers the majority of Australia (Barrett *et al.*, 2003). It occurs in lightly wooded, often sandy country, preferring areas near water. It feeds on airborne insects, and nests throughout its range in WA in burrows excavated in sandy ground or banks, often at the margins of roads and tracks. In WA this species can occur as a 'resident, breeding visitor, postnuptial nomad, passage migrant and winter visitor' (Johnstone and Storr, 1998; Menkhorst *et al.*, 2017).

Western Quoll, Chuditch - *Dasyurus geoffroii*

The Western Quoll is listed as Vulnerable under the EPBC Act and WC Act. Knowledge of the ecology of the Western Quoll is largely restricted to its distribution in mesic jarrah forests, where population densities are three times greater than in semi-arid zones (Rayner *et al.*, 2012). It was formerly distributed over nearly 70% of the continent, occurring in every Mainland State and Territory (Woinarski, Burbidge and Harrison, 2014). Since European settlement, its range has contracted dramatically. This species is now only found in sclerophyll forest, woodland and mallee shrubland (Van Dyck and Strahan, 2008). It is highly mobile, and appears able to utilise bush remnants and corridors.

Western Brush Wallaby - *Notamacropus irma*

The Western Brush Wallaby is listed as Priority 4 under the DBCA Priority List. The species is locally common in sclerophyll forest and woodland in southwest Western Australia, also found in mallee and thickets of shrubs (Menkhorst and Knight, 2004).

Western Spiny-tailed Skink - *Egernia stokesii badia*

The Western Spiny-tailed Skink is listed as Endangered under the EPBC Act and Vulnerable under the WC Act. It shelters in rock crevices or under boulders and is generally found in rocky outcrops and mountain ranges (Cogger, 2014).

White-bellied Sea-Eagle - *Haliaeetus leucogaster*

The White-bellied Sea-Eagle is listed as Marine under the EPBC Act. It patrols beaches and inland waterbodies in search of prey (Menkhorst *et al.*, 2017).

Malleefowl - *Leipoa ocellata*

The Malleefowl is listed Vulnerable under the EPBC Act and WC Act. The species inhabits dry, open forest dominated by mallee and wattle species on sandy or gravelly soils with dense, scrubby, litter-forming understorey, where it builds nest mounds up to 5 m in diameter and 1 m tall, composed primarily of sand and leaf litter (Menkhorst *et al.*, 2017; Department of the Environment and Energy, 2018c).

Grey Wagtail - *Motacilla cinerea*

The Grey Wagtail is listed Migratory and Marine under the EPBC Act. The species is a scarce but regular visitor to northern Australia in late October to April, Including Christmas and Cocos Island and Ashmore Reef. The species is usually close to water, including beaches and rock pools on migration, and in Indonesia and New Guinea displaying a preference for waterfalls and fast flowing rocky waterways and occasionally shows a preference for these habitats in the Kimberley (Menkhorst *et al.*, 2017).

Osprey - *Pandion haliaetus*

The Osprey is listed as Migratory and Marine under the EPBC Act. It is a specialist fish hunter and is generally found patrolling coastal and inshore waters and streams (Menkhorst *et al.*, 2017).

Glossy Ibis - *Plegadis falcinellus*

The Glossy Ibis is listed as Migratory and Marine under the EPBC Act. The species normally feeds in shallow freshwater wetlands, although can also be found in grasslands and estuarine waters (Menkhorst *et al.*, 2017).

Red-tailed Phascogale - *Phascogale calura*

The Red-tailed Phascogale is listed as Vulnerable under the EPBC Act and Conservation Dependent under the WC Act. The species prefers tall, dense forest with hollows in Wandoo (*Eucalyptus wandoo*) to provide nesting sites (Van Dyck and Strahan, 2008).

South-western Brush-tailed Phascogale - *Phascogale tapoatafa wambenger*

The Southern Brush-tailed Phascogale is listed Vulnerable under the WC Act. The species is sparsely distributed outside the semi-arid zone in dry sclerophyll forest and monsoonal forest and woodland. It is generally rare and threatened by habitat fragmentation, most common within south-west WA (Menkhorst and Knight, 2004). This arboreal species is quite cryptic as it is shy, nocturnal and avoids spotlight beams by hiding behind branches (Menkhorst and Knight, 2004).

Water-rat, Rakali - *Hydromys chrysogaster*

The Water-rat is listed as Priority 4 under the DBCA Priority List. The species is common to coastal southwest Western Australia, where it inhabits a variety of waterbodies including rivers, streams, dams, lakes, and sheltered marine waters. It also often occurs in large cities (Menkhorst and Knight, 2004).

Desktop Study Omissions

Marine and Wetland Birds

A number of bird species that depend on marine or wetland habitat were returned from the database searches. The Survey Area does not contain marine or wetland habitat and, as such, these species have been omitted from any further discussion. These species include the Hooded Plover (*Thinornis cucullatus*), Caspian Tern (*Sterna caspia*), Australian Painted Snipe (*Rostratula benghalensis*), Sharp-tailed Sandpiper (*Calidris acuminate*), Curlew Sandpiper (*Calidris ferruginea*), Pectoral Sandpiper (*Calidris melanotos*), Red-necked Stint (*Calidris ruficollis*), Black-tailed Godwit (*Limosa limosa*), Eastern Curlew (*Numenius madagascariensis*), Little Curlew (*Numenius minutus*), Wood Sandpiper (*Tringa glareola*), Common Sandpiper (*Tringa hypoleucos*), Common Greenshank (*Tringa nebularia*), Blue-billed Duck (*Oxyura australis*), Cattle Egret (*Ardea ibis*) and Eastern Great Egret (*Ardea modesta*).

Aquatic Reptiles

One aquatic reptile, the Western Swamp Turtle (*Pseudemydura umbrina*), was returned from the database search. The Survey Area does not contain wetland habitat and, as such, this species has been omitted from any further discussion.

Now Regionally Extinct

A number of species returned were also known to be historical records of species now locally extinct and have therefore been omitted from any further discussion. These species include the Dibbler (*Parantechinus apicalis*), Greater Stick-nest Rat (*Leporillus conditor*), Long-tailed Hopping-mouse (*Notomys longicaudatus*), Big-eared Hopping-mouse (*Notomys macrotis*), Heath Mouse (*Pseudomys shortridgei*), Bilby (*Macrotis lagotis*), Boodie (inland) (*Bettongia lesueur graii*) and Western Ringtail Possum (Pseudocheirus occidentalis).

APPENDIX L:

Desktop Database Searches

Australian Government
Department of the Environment and Energy

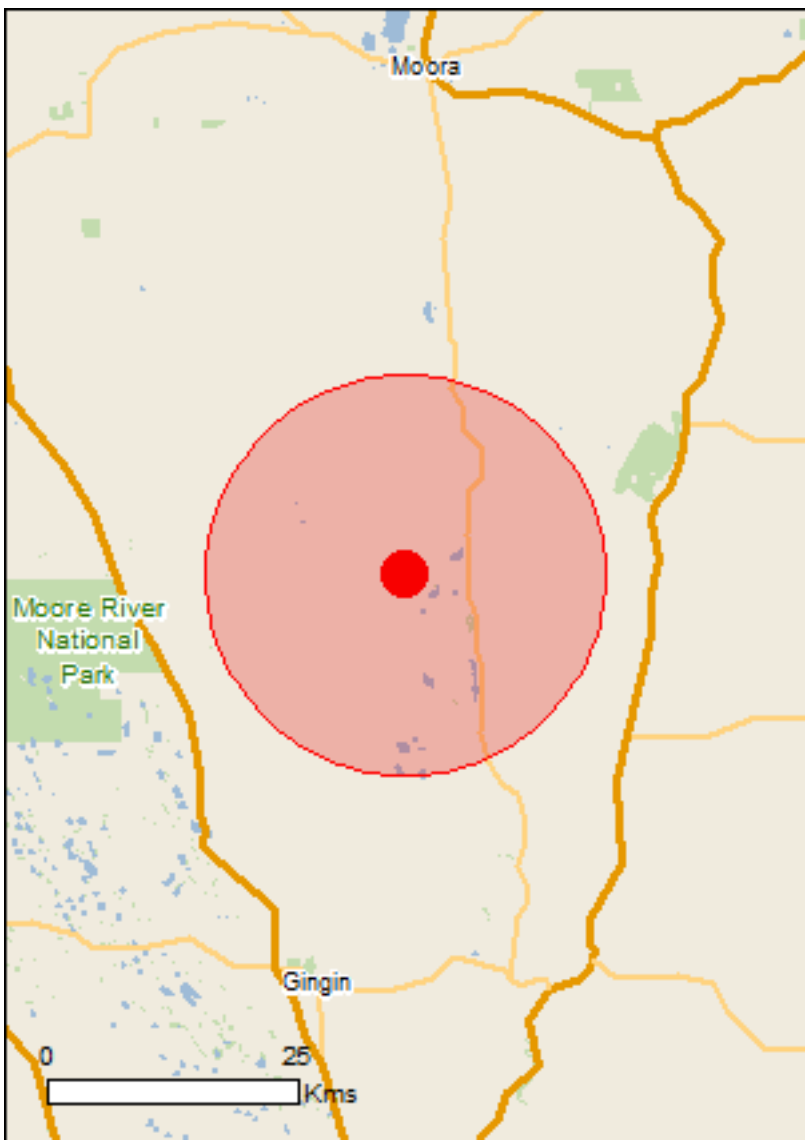
EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

Report created: 21/03/18 11:53:13



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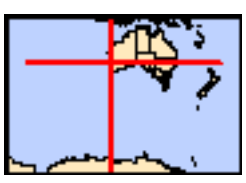

Summary

Matters of National Environmental Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	2
Listed Threatened Species:	40
Listed Migratory Species:	8

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Land:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	14
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Commonwealth Reserves Marine:	None

Extra Information

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

State and Territory Reserves:	12
Regional Forest Agreements:	1
Invasive Species:	21
Nationally Important Wetlands:	1
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities		[Resource Information]
For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.		
Name	Status	Type of Presence
Banksia Woodlands of the Swan Coastal Plain ecological community	Endangered	Community likely to occur within area
Clay Pans of the Swan Coastal Plain	Critically Endangered	Community likely to occur within area

Listed Threatened Species		[Resource Information]
Name	Status	Type of Presence
Birds		
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calyptorhynchus latirostris Carnaby's Cockatoo, Short-billed Black-Cockatoo [59523]	Endangered	Species or species habitat known to occur within area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area
Fish		
Nannatherina balstoni Balston's Pygmy Perch [66698]	Vulnerable	Species or species habitat likely to occur within area
Mammals		
Dasyurus geoffroii Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat likely to occur within area
Phascogale calura Red-tailed Phascogale, Red-tailed Wambenger, Kenngoor [316]	Vulnerable	Species or species habitat likely to occur within area
Other		
Idiosoma nigrum Shield-backed Trapdoor Spider, Black Rugose Trapdoor Spider [66798]	Vulnerable	Species or species habitat likely to occur within area
Plants		

Name	Status	Type of Presence
Acacia cochlocarpa subsp. cochlocarpa Spiral-fruited Wattle [23877]	Endangered	Species or species habitat may occur within area
Acacia splendens Splendid Wattle, Dandaragan Wattle [81510]	Endangered	Species or species habitat known to occur within area
Andersonia gracilis Slender Andersonia [14470]	Endangered	Species or species habitat likely to occur within area
Banksia fuscobractea Dark-bract Banksia [83059]	Critically Endangered	Species or species habitat known to occur within area
Banksia mimica Summer Honeypot [82765]	Endangered	Species or species habitat likely to occur within area
Banksia serratuloides subsp. serratuloides Southern Serrate Dryandra [82768]	Vulnerable	Species or species habitat known to occur within area
Chamelaucium sp. Gingin (N.G.Marchant 6) Gingin Wax [88881]	Endangered	Species or species habitat likely to occur within area
Conospermum densiflorum subsp. unicephalatum One-headed Smokebush [64871]	Endangered	Species or species habitat known to occur within area
Conostylis wonganensis Wongan Conostylis [10906]	Endangered	Species or species habitat may occur within area
Darwinia acerosa Fine-leaved Darwinia [9004]	Endangered	Species or species habitat likely to occur within area
Darwinia carnea Mogumber Bell, Narrogin Bell [9736]	Endangered	Species or species habitat likely to occur within area
Diplolaena andrewsii [6601]	Endangered	Species or species habitat may occur within area
Eleocharis keigheryi Keighery's Eleocharis [64893]	Vulnerable	Species or species habitat known to occur within area
Eremophila glabra subsp. chlorella [84927]	Endangered	Species or species habitat known to occur within area
Eremophila scaberula Rough Emu Bush [16729]	Endangered	Species or species habitat may occur within area
Eucalyptus absita Badgingarra Box [24260]	Endangered	Species or species habitat likely to occur within area
Eucalyptus leprophloia Scaly Butt Mallee, Scaly-butt Mallee [56712]	Endangered	Species or species habitat may occur within area
Eucalyptus pruiniramis Midlands Gum, Jingymia Gum [56403]	Endangered	Species or species habitat known to occur within area

Name	Status	Type of Presence
Eucalyptus recta Silver Mallet [56430]	Endangered	Species or species habitat likely to occur within area
Eucalyptus x balanites Cadda Road Mallee, Cadda Mallee [87816]	Endangered	Species or species habitat may occur within area
Gastrolobium hamulosum Hook-point Poison [9212]	Endangered	Species or species habitat likely to occur within area
Goodenia arthrotricha [12448]	Endangered	Species or species habitat known to occur within area
Grevillea curviloba subsp. incurva Narrow curved-leaf Grevillea [64909]	Endangered	Species or species habitat likely to occur within area
Grevillea pythara Pythara Grevillea [64525]	Endangered	Species or species habitat may occur within area
Hemiandra gardneri Red Snakebush [7945]	Endangered	Species or species habitat may occur within area
Melaleuca sciotostyla Wongan Melaleuca [24324]	Endangered	Species or species habitat may occur within area
Roycea pycnophylloides Saltmat [21161]	Endangered	Species or species habitat likely to occur within area
Spirogardnera rubescens Spiral Bush [15667]	Endangered	Species or species habitat likely to occur within area
Thelymitra dedmaniarum Cinnamon Sun Orchid [65105]	Endangered	Species or species habitat likely to occur within area
Thelymitra stellata Star Sun-orchid [7060]	Endangered	Species or species habitat may occur within area
Thomasia sp. Green Hill (S.Paust 1322) Green Hill Thomasia [64542]	Endangered	Species or species habitat likely to occur within area

Listed Migratory Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat likely to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land [Resource Information]

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

Name
Commonwealth Land -

Listed Marine Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat known to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species

Name	Threatened	Type of Presence
		habitat may occur within area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat likely to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat may occur within area
Thinornis rubricollis Hooded Plover [59510]		Species or species habitat may occur within area

Extra Information

State and Territory Reserves	[Resource Information]
Name	State
Betts	WA
Boonanarring	WA
Bundarra	WA
Gillingarra	WA
Koodjee	WA
Lake Wannamal	WA
Mogumber	WA
Mogumber West	WA
Moochamulla	WA
NTWA Bushland covenant (0048)	WA
Unnamed WA46899	WA
Unnamed WA47808	WA

Regional Forest Agreements	[Resource Information]

Note that all areas with completed RFAs have been included.

Name	State
South West WA RFA	Western Australia

Invasive Species	[Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Streptopelia senegalensis Laughing Turtle-dove, Laughing Dove [781]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Mammals		
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Brachiaria mutica Para Grass [5879]		Species or species habitat may occur within area
Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]		Species or species habitat may occur within area
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Genista sp. X Genista monspessulana Broom [67538]		Species or species habitat may occur within area
Olea europaea Olive, Common Olive [9160]		Species or species habitat may occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur

Name	Status	Type of Presence
		within area
Tamarix aphylla Athel Pine, Athel Tree, Tamarisk, Athel Tamarisk, Athel Tamarix, Desert Tamarisk, Flowering Cypress, Salt Cedar [16018]		Species or species habitat likely to occur within area

Nationally Important Wetlands

[Resource Information]

Name	State
Wannamal Lake System	WA

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

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

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

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

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

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

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

Coordinates

-31.03209 115.98571

Acknowledgements

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

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

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

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

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NatureMap
Mapping Western Australia's biodiversity

NatureMap Species Report

Created By 360 Enviro on 27/03/2018

Current Names Only	Yes
Core Datasets Only	Yes
Method	'By Circle'
Centre	116° 38' 57" E,31° 32' 09" S
Buffer	5km
Group By	Family

Family	Species	Records
Acanthizidae	3	5
Accipitridae	2	2
Anatidae	8	13
Ardeidae	1	3
Artamidae	1	5
Asparagaceae	1	1
Asteraceae	1	1
Brassicaceae	1	3
Cacatuidae	1	6
Campephagidae	1	4
Charadriidae	1	2
Chenopodiaceae	2	2
Colchicaceae	1	1
Columbidae	2	10
Corvidae	2	12
Cracticidae	2	8
Cuculidae	1	3
Cyperaceae	5	5
Dicruridae	3	16
Dilleniaceae	2	3
Droseraceae	1	1
Elaeocarpaceae	1	2
Ericaceae	1	1
Fabaceae	1	1
Falconidae	1	3
Haemodoraceae	2	2
Halcyonidae	1	2
Hirundinidae	2	10
Iridaceae	2	2
Maluridae	1	1
Malvaceae	1	1
Meliphagidae	5	14
Myrmecobiidae	1	1
Myrtaceae	4	4
Orchidaceae	2	2
Pachycephalidae	2	5
Papaveraceae	2	2
Pardalotidae	1	3
Petroicidae	1	4
Phasianidae	1	1
Pittosporaceae	1	1
Plumbaginaceae	1	1
Poaceae	2	2
Podicipedidae	1	1
Pomatostomidae	1	1
Proteaceae	1	1
Psittacidae	3	17
Rallidae	1	1
Rhamnaceae	2	2
Rutaceae	3	8
Xanthorrhoeaceae	1	1
Zosteropidae	1	1
TOTAL	**92**	**204**

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Acanthizidae					
1.	24261	*Acanthiza chrysorrhoa (Yellow-rumped Thornbill)*			
2.	25530	*Gerygone fusca (Western Gerygone)*			
3.	30948	*Smicrornis brevirostris (Weebill)*			
Accipitridae					
4.	25536	*Accipiter fasciatus (Brown Goshawk)*			
5.		*Elanus axillaris*			
Anatidae					
6.	24312	*Anas gracilis (Grey Teal)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
7.	24315	*Anas rhynchotis (Australasian Shoveler)*			
8.	24316	*Anas superciliosa (Pacific Black Duck)*			
9.	24319	*Biziura lobata (Musk Duck)*			
10.	24321	*Chenonetta jubata (Australian Wood Duck, Wood Duck)*			
11.	24322	*Cygnus atratus (Black Swan)*			
12.	24326	*Malacorhynchus membranaceus (Pink-eared Duck)*			
13.	24331	*Tadorna tadornoides (Australian Shelduck, Mountain Duck)*			
Ardeidae					
14.		*Egretta novaehollandiae*			
Artamidae					
15.	25566	*Artamus cinereus (Black-faced Woodswallow)*			
Asparagaceae					
16.	11464	*Laxmannia sessiliflora subsp. australis*			
Asteraceae					
17.	13252	*Rhodanthe pygmaea*			
Brassicaceae					
18.	2996	*Brassica nigra (Black Mustard)*	Y		
Cacatuidae					
19.		*Eolophus roseicapillus*			
Campephagidae					
20.	25568	*Coracina novaehollandiae (Black-faced Cuckoo-shrike)*			
Charadriidae					
21.	47937	*Elseyornis melanops (Black-fronted Dotterel)*			
Chenopodiaceae					
22.	2475	*Atriplex semibaccata (Berry Saltbush)*			
23.	33297	*Tecticornia pergranulata subsp. pergranulata (Blackseed Samphire)*			
Colchicaceae					
24.	1395	*Wurmbea drummondii (York Gum Nancy)*			
Columbidae					
25.	24407	*Ocyphaps lophotes (Crested Pigeon)*			
26.	25590	*Streptopelia senegalensis (Laughing Turtle-Dove)*	Y		
Corvidae					
27.	25592	*Corvus coronoides (Australian Raven)*			
28.	24417	*Corvus coronoides subsp. perplexus (Australian Raven)*			
Cracticidae					
29.	24420	*Cracticus nigrogularis (Pied Butcherbird)*			
30.	25595	*Cracticus tibicen (Australian Magpie)*			
Cuculidae					
31.	42307	*Cacomantis pallidus (Pallid Cuckoo)*			
Cyperaceae					
32.	936	*Lepidosperma leptostachyum*			
33.	954	*Mesomelaena preissii*			
34.	972	*Schoenus armeria*			
35.	982	*Schoenus clandestinus*			
36.	18164	*Schoenus sp. smooth culms (K.R. Newbey 7823)*			
Dicruridae					
37.	24443	*Grallina cyanoleuca (Magpie-lark)*			
38.	48096	*Rhipidura albiscapa (Grey Fantail)*			
39.	25614	*Rhipidura leucophrys (Willie Wagtail)*			
Dilleniaceae					
40.	5112	*Hibbertia aurea*			
41.	20046	*Hibbertia hibbertioides var. hibbertioides*			
Droseraceae					
42.	14298	*Drosera macrantha subsp. macrantha*			
Elaeocarpaceae					
43.	4545	*Tetratheca similis*		P3	
Ericaceae					
44.	6336	*Astroloma serratifolium (Kondrung)*			
Fabaceae					
45.	44513	*Acacia thieleana*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Falconidae					
46.	25622	*Falco cenchroides (Australian Kestrel, Nankeen Kestrel)*			
Haemodoraceae					
47.	1436	*Conostylis juncea*			
48.	11597	*Conostylis setigera subsp. setigera*			
Halcyonidae					
49.	25549	*Todiramphus sanctus (Sacred Kingfisher)*			
Hirundinidae					
50.	24491	*Hirundo neoxena (Welcome Swallow)*			
51.	48061	*Petrochelidon nigricans (Tree Martin)*			
Iridaceae					
52.	19180	*Moraea miniata (Two-leaf Cape Tulip)*	Y		
53.	11442	*Orthrosanthus laxus var. gramineus (Grass-leaved Orthrosanthus)*			
Maluridae					
54.	25654	*Malurus splendens (Splendid Fairy-wren)*			
Malvaceae					
55.	5080	*Thomasia foliosa*			
Meliphagidae					
56.	24560	*Acanthorhynchus superciliosus (Western Spinebill)*			
57.	24561	*Anthochaera carunculata (Red Wattlebird)*			
58.	25661	*Lichmera indistincta (Brown Honeyeater)*			
59.	24583	*Manorina flavigula (Yellow-throated Miner)*			
60.	25663	*Melithreptus brevirostris (Brown-headed Honeyeater)*			
Myrmecobiidae					
61.	24146	*Myrmecobius fasciatus (Numbat, Walpurti)*		T	
Myrtaceae					
62.	5429	*Calothamnus sanguineus (Silky-leaved Blood flower, Pindak)*			
63.	12372	*Calytrix oncophylla*		P2	
64.	5766	*Eucalyptus salmonophloia (Salmon Gum, Wurak)*			
65.	5817	*Hypocalymma angustifolium (White Myrtle, Kudjid)*			
Orchidaceae					
66.	1603	*Caladenia longiclavata (Clubbed Spider Orchid)*			
67.	11049	*Diuris corymbosa*			
Pachycephalidae					
68.	25675	*Colluricincla harmonica (Grey Shrike-thrush)*			
69.	25680	*Pachycephala rufiventris (Rufous Whistler)*			
Papaveraceae					
70.	8365	*Fumaria bastardii*	Y		
71.	2969	*Fumaria capreolata (Whiteflower Fumitory)*	Y		
Pardalotidae					
72.	25682	*Pardalotus striatus (Striated Pardalote)*			
Petroicidae					
73.	24659	*Petroica goodenovii (Red-capped Robin)*			
Phasianidae					
74.	24671	*Coturnix pectoralis (Stubble Quail)*			
Pittosporaceae					
75.	19744	*Pittosporum angustifolium*			
Plumbaginaceae					
76.	6489	*Limonium sinuatum (Perennial Sea Lavender)*	Y		
Poaceae					
77.	12063	*Aristida holathera var. holathera*			
78.	233	*Avena barbata (Bearded Oat)*	Y		
Podicipedidae					
79.	24681	*Poliocephalus poliocephalus (Hoary-headed Grebe)*			
Pomatostomidae					
80.	24683	*Pomatostomus superciliosus (White-browed Babbler)*			
Proteaceae					
81.	2158	*Hakea erinacea (Hedge-hog Hakea)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Psittacidae					
82.		*Barnardius zonarius*			
83.	25714	*Cacatua pastinator (Western Long-billed Corella)*			
84.	24736	*Melopsittacus undulatus (Budgerigar)*			
Rallidae					
85.	25727	*Fulica atra (Eurasian Coot)*			
Rhamnaceae					
86.	4840	*Trymalium daphnifolium*			
87.	15144	*Trymalium ledifolium var. lineare*			
Rutaceae					
88.	4398	*Asterolasia grandiflora*		P4	
89.	4435	*Boronia penicillata*			
90.	4443	*Boronia subsessilis*			
Xanthorrhoeaceae					
91.		*Xanthorrhoea sp.*			
Zosteropidae					
92.	25765	*Zosterops lateralis (Grey-breasted White-eye, Silvereye)*			

Conservation Codes
T - Rare or likely to become extinct
X - Presumed extinct
IA - Protected under international agreement
S - Other specially protected fauna
1 - Priority 1
2 - Priority 2
3 - Priority 3
4 - Priority 4
5 - Priority 5

[1] For NatureMap's purposes, species flagged as endemic are those whose records are wholely contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, 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 query area.

NatureMap
Mapping Western Australia's biodiversity

NatureMap Species Report

Created By 360 Enviro on 21/03/2018

Current Names Only	Yes
Core Datasets Only	Yes
Method	'By Circle'
Centre	115° 59' 09" E,31° 01' 56" S
Buffer	20km
Group By	Family

Family	Species	Records
Acanthizidae	8	214
Acariformes	2	2
Acarosporaceae	1	1
Accipitridae	9	60
Aeshnidae	1	1
Amaranthaceae	8	12
Amphisopodidae	1	1
Anarthriaceae	1	3
Anatidae	12	228
Anhingidae	1	3
Apiaceae	12	27
Araceae	1	2
Araliaceae	7	14
Ardeidae	5	42
Artamidae	2	14
Asparagaceae	25	56
Asteraceae	56	96
Boraginaceae	5	6
Boryaceae	3	6
Bothriuridae	1	1
Brachionidae	1	1
Brassicaceae	2	4
Burramyidae	1	1
Byblidaceae	1	3
Cacatuidae	1	49
Caliciaceae	1	1
Campanulaceae	5	8
Campephagidae	2	41
Carabidae	1	1
Caryophyllaceae	2	2
Casuariidae	1	3
Casuarinaceae	7	31
Ceinidae	1	1
Celastraceae	3	6
Centrolepidaceae	6	7
Centropagidae	1	1
Ceratopogonidae	3	3
Charadriidae	3	10
Cheluidae	1	5
Chenopodiaceae	6	8
Chiltoniidae	1	1
Chironomidae	12	12
Chydoridae	2	2
Cladoniaceae	2	5
Coenagrionidae	1	1
Colchicaceae	6	15
Columbidae	4	38
Corduliidae	1	1
Corixidae	2	2
Corvidae	2	81
Cracticidae	4	81
Crassulaceae	4	4
Cuculidae	2	14
Culicidae	2	2
Cupressaceae	2	6
Cyperaceae	42	82
Cyprididae	7	11
Daphniidae	1	1
Dasypogonaceae	3	3
Dasyuridae	1	2
Dicaeidae	1	10
Dicruridae	4	144
Dilleniaceae	17	58
Dioscoreaceae	1	3
Droseraceae	24	49
Dytiscidae	4	4
Ecdeiocoleaceae	1	1
Elaeocarpaceae	3	11
Elapidae	4	5
Enchytraeidae	1	1
Ericaceae	29	104
Euphorbiaceae	3	7
Fabaceae	139	395
Falconidae	3	18
Frankeniaceae	1	1
Gekkonidae	2	2
Gentianaceae	1	1

Geraniaceae	1	2
Goodeniaceae	36	113
Gyrostemonaceae	2	2
Haemodoraceae	38	212
Halcyonidae	2	40
Haliplidae	1	1
Haloragaceae	2	6
Hemerocallidaceae	11	24
Hirundinidae	4	64
Hydatellaceae	1	1
Hydrophilidae	2	3
Hypericaceae	1	1
Hypoxidaceae	3	4
Hyriidae	1	1
Icmadophilaceae	1	2
Iridaceae	12	19
Juncaceae	5	7
Juncaginaceae	4	6
Lamiaceae	12	33
Laridae	4	10
Lauraceae	4	8
Lecanidae	1	1
Lecideaceae	1	2
Lentibulariaceae	1	1
Leptoceridae	2	2
Lestidae	2	2
Libellulidae	1	1
Limnocharidae	1	1
Limnocytheridae	1	1
Limnodynastidae	2	58
Loganiaceae	1	3
Lycosidae	2	2
Macarthuriaceae	2	7
Macropodidae	2	3
Maluridae	4	68
Malvaceae	14	69
Marsileaceae	1	1
Megapodiidae	1	1
Meliphagidae	15	234
Menyanthaceae	1	2
Meropidae	1	23
Micropholcommatidae	1	1
Montiaceae	4	4
Myrtaceae	129	456
Nematoda	1	1
Neosittidae	1	3
Notodromadidae	1	1
Notonectidae	1	1
Nyctaginaceae	1	1
Ochrolechiaceae	1	1
Olacaceae	1	1
Orchidaceae	55	102
Orobanchaceae	1	1
Oxalidaceae	1	2
Pachycephalidae	3	91
Palaemonidae	1	1
Papaveraceae	1	1
Parastacidae	1	1
Pardalotidae	2	50
Parmeliaceae	2	3
Pelecanidae	1	5
Peramelidae	1	1
Peronosporaceae	1	3
Pertusariaceae	1	2
Petroicidae	5	40
Phalacrocoracidae	5	33
Phrymaceae	1	1
Phyllanthaceae	1	7
Physciaceae	1	1
Pionidae	1	1
Pittosporaceae	5	6
Plantaginaceae	4	4
Poaceae	25	39
Podicipedidae	4	25
Polygalaceae	4	9
Polygonaceae	3	4
Pomatiopsidae	1	1
Portulacaceae	1	1
Potamogetonaceae	2	3
Primulaceae	2	2
Proteaceae	129	609
Psittacidae	15	208
Pteridaceae	1	3
Pygopodidae	2	2
Rallidae	10	48
Ramalinaceae	1	1
Recurvirostridae	3	19
Restionaceae	21	56
Rhamnaceae	14	31
Rubiaceae	2	4
Ruppiaceae	1	2
Rutaceae	8	19
Santalaceae	4	6
Sapindaceae	4	7
Scirtidae	1	1
Scolopacidae	7	8
Scolopendridae	2	2
Scrophulariaceae	5	16
Scutigeridae	1	1
Solanaceae	3	4
Stylidiaceae	36	90
Surianaceae	1	2
Sylviidae	2	10
Tamaricaceae	1	1
Teloschistaceae	3	4

Terapontidae	1	1
Testudinellidae	1	1
Tettigoniidae	1	2
Thelypteridaceae	1	1
Theridiidae	1	1
Threskiornithidae	3	35
Thymelaeaceae	5	7
Unionicolidae	1	1
Urodacidae	1	7
Usneaceae	1	1
Vespertilionidae	1	1
Xanthorrhoeaceae	5	5
Zodariidae	1	1
Zosteropidae	1	57
TOTAL	**1330**	**5379**

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Acanthizidae					
1.	24260	*Acanthiza apicalis (Broad-tailed Thornbill, Inland Thornbill)*			
2.	24261	*Acanthiza chrysorrhoa (Yellow-rumped Thornbill)*			
3.	24262	*Acanthiza inornata (Western Thornbill)*			
4.	24265	*Acanthiza uropygialis (Chestnut-rumped Thornbill)*			
5.	25530	*Gerygone fusca (Western Gerygone)*			
6.	34001	*Hylacola cauta subsp. whitlocki (Shy Groundwren)*			
7.	25534	*Sericornis frontalis (White-browed Scrubwren)*			
8.	30948	*Smicrornis brevirostris (Weebill)*			
Acariformes					
9.		*Oribatida sp.*			
10.		*Trombidioidea sp.*			
Acarosporaceae					
11.		*Acarospora sp.*			
Accipitridae					
12.	25535	*Accipiter cirrocephalus (Collared Sparrowhawk)*			
13.	25536	*Accipiter fasciatus (Brown Goshawk)*			
14.	24282	*Accipiter fasciatus subsp. fasciatus (Brown Goshawk)*			
15.	24285	*Aquila audax (Wedge-tailed Eagle)*			
16.	24288	*Circus approximans (Swamp Harrier)*			
17.		*Elanus axillaris*			
18.	24295	*Haliastur sphenurus (Whistling Kite)*			
19.	24296	*Hamirostra isura (Square-tailed Kite)*			
20.	47965	*Hieraaetus morphnoides (Little Eagle)*			
Aeshnidae					
21.		*Adversaeschna brevistyla*			
Amaranthaceae					
22.	2652	*Alternanthera nodiflora (Common Joyweed)*			
23.	2716	*Ptilotus declinatus (Curved Mulla Mulla)*			
24.	2718	*Ptilotus drummondii (Narrowleaf Mulla Mulla)*			
25.	2733	*Ptilotus humilis*			
26.	2742	*Ptilotus manglesii (Pom Poms, Mulamula)*			
27.	2751	*Ptilotus polystachyus (Prince of Wales Feather)*			
28.	2763	*Ptilotus stirlingii (Stirling's Mulla Mulla)*			
29.	40841	*Ptilotus stirlingii subsp. stirlingii*			
Amphisopodidae					
30.		*Paramphisopus palustris*			
Anarthriaceae					
31.	18049	*Lyginia imberbis*			
Anatidae					
32.	24312	*Anas gracilis (Grey Teal)*			
33.	24313	*Anas platyrhynchos (Mallard)*			
34.	24315	*Anas rhynchotis (Australasian Shoveler)*			
35.	24316	*Anas superciliosa (Pacific Black Duck)*			
36.	24318	*Aythya australis (Hardhead)*			
37.	24319	*Biziura lobata (Musk Duck)*			
38.	24321	*Chenonetta jubata (Australian Wood Duck, Wood Duck)*			
39.	24322	*Cygnus atratus (Black Swan)*			
40.	24326	*Malacorhynchus membranaceus (Pink-eared Duck)*			
41.	24328	*Oxyura australis (Blue-billed Duck)*		P4	
42.	24329	*Stictonetta naevosa (Freckled Duck)*			
43.	24331	*Tadorna tadornoides (Australian Shelduck, Mountain Duck)*			
Anhingidae					
44.	47414	*Anhinga novaehollandiae (Australasian Darter)*			
Apiaceae					
45.	6205	*Actinotus leucocephalus (Flannel Flower)*			
46.	6218	*Daucus glochidiatus (Australian Carrot)*			
47.	6219	*Eryngium pinnatifidum (Blue Devils)*			
48.	6221	*Foeniculum vulgare (Fennel)*	Y		
49.	6222	*Homalosciadium homalocarpum*			
50.	6247	*Platysace cirrosa (Karna)*			
51.	6248	*Platysace commutata*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
52.	6262	*Platysace xerophila*			
53.	6283	*Xanthosia atkinsoniana*			
54.	6284	*Xanthosia candida*			
55.	6285	*Xanthosia ciliata*			
56.	6287	*Xanthosia fruticulosa*			
Araceae					
57.	1049	*Zantedeschia aethiopica (Arum Lily)*	Y		
Araliaceae					
58.	6223	*Hydrocotyle alata*			
59.	6233	*Hydrocotyle lemnoides (Aquatic Pennywort)*		P4	
60.	11546	*Hydrocotyle pilifera var. glabrata*			
61.	6239	*Hydrocotyle rugulosa*			
62.	6268	*Trachymene cyanopetala*			
63.	6279	*Trachymene ornata (Spongefruit)*			
64.	6280	*Trachymene pilosa (Native Parsnip)*			
Ardeidae					
65.	41324	*Ardea modesta (great egret, white egret)*		IA	
66.	24340	*Ardea novaehollandiae (White-faced Heron)*			
67.	24341	*Ardea pacifica (White-necked Heron)*			
68.		*Egretta novaehollandiae*			
69.	25564	*Nycticorax caledonicus (Rufous Night Heron)*			
Artamidae					
70.	25566	*Artamus cinereus (Black-faced Woodswallow)*			
71.	24353	*Artamus cyanopterus (Dusky Woodswallow)*			
Asparagaceae					
72.	1205	*Acanthocarpus canaliculatus*			
73.	1505	*Agave americana (Century Plant)*	Y		
74.	1266	*Arthropodium dyeri*			
75.	1287	*Dichopogon capillipes*			
76.	11815	*Laxmannia grandiflora subsp. grandiflora*			
77.	1305	*Laxmannia omnifertilis*			
78.	11464	*Laxmannia sessiliflora subsp. australis*			
79.	11679	*Laxmannia sessiliflora subsp. drummondii*			
80.	11732	*Laxmannia sessiliflora subsp. sessiliflora*			
81.	1309	*Laxmannia squarrosa*			
82.	1239	*Lomandra preissii*			
83.	1312	*Sowerbaea laxiflora (Purple Tassels)*			
84.	1318	*Thysanotus arbuscula*			
85.	1320	*Thysanotus asper (Hairy Fringe Lily)*			
86.	1328	*Thysanotus dichotomus (Branching Fringe Lily)*			
87.	1334	*Thysanotus glaucus*		P4	
88.	1338	*Thysanotus manglesianus (Fringed Lily)*			
89.	1343	*Thysanotus patersonii*			
90.	1348	*Thysanotus rectantherus*			
91.		*Thysanotus sp.*			
92.	1351	*Thysanotus sparteus*			
93.	1353	*Thysanotus spiniger*			
94.	1354	*Thysanotus tenellus*			
95.	1357	*Thysanotus thyrsoideus*			
96.	1358	*Thysanotus triandrus*			
Asteraceae					
97.	7817	*Actinobole uliginosum (Flannel Cudweed)*			
98.	7836	*Angianthus tomentosus (Camel-grass)*			
99.	7838	*Arctotheca calendula (Cape Weed, African Marigold)*	Y		
100.	7856	*Blennospora drummondii*			
101.	7875	*Brachyscome glandulosa*			
102.	7882	*Brachyscome perpusilla*			
103.	7902	*Calotis erinacea (Tangled Burr-daisy)*			
104.	7903	*Calotis hispidula (Bindy Eye)*			
105.	7924	*Ceratogyne obionoides (Wingwort)*			
106.	7944	*Cotula bipinnata (Ferny Cotula)*	Y		
107.	7945	*Cotula coronopifolia (Waterbuttons)*	Y		
108.	7961	*Dittrichia graveolens (Stinkwort)*	Y		
109.	12740	*Erymophyllum tenellum*			
110.	19908	*Gazania rigens*	Y		
111.	12624	*Gnephosis angianthoides*			
112.	8002	*Gnephosis tenuissima*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
113.	8006	*Gorteria personata (Gorteria)*	Y		
114.	8024	*Helichrysum leucopsideum*			
115.	12741	*Hyalosperma cotula*			
116.	12742	*Hyalosperma demissum*			
117.	12743	*Hyalosperma glutinosum*			
118.	15447	*Hyalosperma glutinosum subsp. glutinosum*			
119.	8086	*Hypochaeris glabra (Smooth Catsear)*	Y		
120.	29046	*Lactuca serriola forma serriola*	Y		
121.	18585	*Lagenophora huegelii*			
122.	13284	*Lawrencella rosea*			
123.	19727	*Leiocarpa semicalva subsp. semicalva*			
124.	8106	*Millotia tenuifolia (Soft Millotia)*			
125.	29418	*Monoculus monstrosus*	Y		
126.	8114	*Myriocephalus appendiculatus (White-tip Myriocephalus)*			
127.	14187	*Myriocephalus occidentalis*			
128.	32716	*Olearia lehmanniana*			
129.	8143	*Olearia paucidentata (Autumn Scrub Daisy)*			
130.	18353	*Pithocarpa pulchella var. pulchella*			
131.	45237	*Podolepis aristata subsp. aristata*			
132.	8173	*Podolepis capillaris (Wiry Podolepis)*			
133.	8175	*Podolepis gracilis (Slender Podolepis)*			
134.	8177	*Podolepis lessonii*			
135.	8182	*Podotheca angustifolia (Sticky Longheads)*			
136.	8184	*Podotheca gnaphalioides (Golden Long-heads)*			
137.	8188	*Pogonolepis stricta*			
138.	13255	*Pterochaeta paniculata*			
139.	13241	*Rhodanthe chlorocephala subsp. rosea*			
140.	13294	*Rhodanthe laevis*			
141.	13234	*Rhodanthe manglesii*			
142.	13251	*Rhodanthe propinqua*			
143.	8200	*Schoenia cassiniana (Schoenia)*			
144.	20663	*Senecio multicaulis subsp. multicaulis*			
145.	14583	*Siloxerus multiflorus*			
146.	8231	*Sonchus oleraceus (Common Sowthistle)*	Y		
147.	25902	*Symphyotrichum squamatum (Bushy Starwort)*	Y		
148.	38388	*Ursinia anthemoides subsp. anthemoides*	Y		
149.	13330	*Waitzia acuminata var. albicans*			
150.	13328	*Waitzia nitida*			
151.	8282	*Waitzia suaveolens (Fragrant Waitzia)*			
152.	44861	*Xerochrysum macranthum*			
Boraginaceae					
153.	48448	*Hackelia suaveolens*	Y		
154.	17485	*Halgania anagalloides*			
155.	6692	*Halgania lavandulacea (Blue Bush)*			
156.	29716	*Halgania sp. Wongan Hills (K.F. Kenneally 2393)*			
157.	6707	*Heliotropium curassavicum (Smooth Heliotrope)*			
Boryaceae					
158.	1267	*Borya constricta*			
159.	1272	*Borya scirpoidea*			
160.	1273	*Borya sphaerocephala (Pincushions)*			
Bothriuridae					
161.		*Cercophonius sulcatus*			
Brachionidae					
162.		*Brachionus plicatilis s.l.*			
Brassicaceae					
163.	11187	*Brassica barrelieri subsp. oxyrrhina (Smooth-stem Turnip)*	Y		
164.	3044	*Lepidium rotundum (Veined Peppercress)*			
Burramyidae					
165.	24086	*Cercartetus concinnus (Western Pygmy-possum, Mundarda)*			
Byblidaceae					
166.	20230	*Byblis lamellata*			
Cacatuidae					
167.		*Eolophus roseicapillus*			
Caliciaceae					
168.	27616	*Calicium abietinum*			

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Campanulaceae					
169.	7406	*Lobelia rhombifolia (Tufted Lobelia)*			
170.	7407	*Lobelia rhytidosperma (Wrinkled-seeded Lobelia)*			
171.	7410	*Monopsis debilis*	Y		
172.	7384	*Wahlenbergia capensis (Cape Bluebell)*	Y		
173.	7388	*Wahlenbergia multicaulis*			
Campephagidae					
174.	25568	*Coracina novaehollandiae (Black-faced Cuckoo-shrike)*			
175.	24367	*Lalage tricolor (White-winged Triller)*			
Carabidae					
176.		*Carabidae sp.*			
Caryophyllaceae					
177.	2912	*Spergula arvensis (Corn Spurry)*	Y		
178.	2915	*Spergularia rubra (Sand Spurry)*	Y		
Casuariidae					
179.	24470	*Dromaius novaehollandiae (Emu)*			
Casuarinaceae					
180.	1721	*Allocasuarina campestris*			
181.	1729	*Allocasuarina grevilleoides*		P3	
182.	1731	*Allocasuarina huegeliana (Rock Sheoak, Kwowl)*			
183.	1732	*Allocasuarina humilis (Dwarf Sheoak)*			
184.	1734	*Allocasuarina microstachya*			
185.	1739	*Allocasuarina thuyoides (Horned Sheoak)*			
186.	1742	*Casuarina obesa (Swamp Sheoak, Kuli)*			
Ceinidae					
187.		*Ceinidae sp.*			
Celastraceae					
188.	4725	*Psammomoya choretroides*			
189.	9070	*Stackhousia pubescens (Downy Stackhousia)*			
190.	4737	*Tripterococcus brunonis (Winged Stackhousia)*			
Centrolepidaceae					
191.	1116	*Aphelia brizula*			
192.	43548	*Aphelia sp. Albany (B.G. Briggs 596)*			
193.	1121	*Centrolepis aristata (Pointed Centrolepis)*			
194.	1123	*Centrolepis caespitosa*		P4	
195.	1133	*Centrolepis pilosa*			
196.	1134	*Centrolepis polygyna (Wiry Centrolepis)*			
Centropagidae					
197.		*Boeckella triarticulata*			
Ceratopogonidae					
198.		*Bezzia sp. (not 1 or 2)*			
199.		*Ceratopogonidae sp.*			
200.		*Culicoides sp.*			
Charadriidae					
201.	24377	*Charadrius ruficapillus (Red-capped Plover)*			
202.	47937	*Elseyornis melanops (Black-fronted Dotterel)*			
203.	48135	*Thinornis rubricollis (Hooded Plover, Hooded Dotterel)*		P4	
Cheluidae					
204.	25345	*Pseudemydura umbrina (Western Swamp Tortoise, Western Swamp Turtle)*		T	
Chenopodiaceae					
205.	2475	*Atriplex semibaccata (Berry Saltbush)*			
206.	33480	*Dysphania pumilio (Clammy Goosefoot)*			
207.	2537	*Maireana brevifolia (Small Leaf Bluebush)*			
208.	2541	*Maireana enchylaenoides*			
209.	33319	*Tecticornia indica subsp. bidens*			
210.	33297	*Tecticornia pergranulata subsp. pergranulata (Blackseed Samphire)*			
Chiltoniidae					
211.		*Austrochiltonia subtenuis*			
Chironomidae					
212.		*Chironominae sp.*			
213.		*Chironomus aff. alternans (V24) (CB)*			
214.		*Chironomus tepperi*			
215.		*Corynoneura sp. (V49) (SAP)*			

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216.		*Dicrotendipes conjunctus*			
217.		*Parachironomus sp. 1 (VSCL35) (SAP)*			
218.		*Paramerina levidensis*			
219.		*Polypedilum nubifer*			
220.		*Procladius paludicola*			
221.		*Procladius villosimanus*			
222.		*Tanypodinae sp.*			
223.		*Tanytarsus fuscithorax/semibarbitarsus*			
Chydoridae					
224.		*Dunhevedia crassa*			
225.		*Pleuroxus inermis*			
Cladoniaceae					
226.	27663	*Cladia aggregata*			
227.	48177	*Cladia muelleri*			
Coenagrionidae					
228.		*Coenagrionidae sp.*			
Colchicaceae					
229.	1383	*Burchardia bairdiae*			
230.	12770	*Burchardia congesta*			
231.	1385	*Burchardia multiflora (Dwarf Burchardia)*			
232.	12072	*Wurmbea dioica subsp. alba*			
233.	1395	*Wurmbea drummondii (York Gum Nancy)*			
234.	1401	*Wurmbea pygmaea*			
Columbidae					
235.	24407	*Ocyphaps lophotes (Crested Pigeon)*			
236.	24409	*Phaps chalcoptera (Common Bronzewing)*			
237.	25589	*Streptopelia chinensis (Spotted Turtle-Dove)*	Y		
238.	25590	*Streptopelia senegalensis (Laughing Turtle-Dove)*	Y		
Corduliidae					
239.		*Corduliidae sp.*			
Corixidae					
240.		*Agraptocorixa eurynome*			
241.		*Micronecta robusta*			
Corvidae					
242.	24416	*Corvus bennetti (Little Crow)*			
243.	25592	*Corvus coronoides (Australian Raven)*			
Cracticidae					
244.	24420	*Cracticus nigrogularis (Pied Butcherbird)*			
245.	25595	*Cracticus tibicen (Australian Magpie)*			
246.	25596	*Cracticus torquatus (Grey Butcherbird)*			
247.	25597	*Strepera versicolor (Grey Currawong)*			
Crassulaceae					
248.	11563	*Crassula colorata var. colorata*			
249.	11349	*Crassula decumbens var. decumbens*			
250.	3139	*Crassula exserta*			
251.	3144	*Crassula peduncularis (Purple Stonecrop)*			
Cuculidae					
252.	25598	*Cacomantis flabelliformis (Fan-tailed Cuckoo)*			
253.	42307	*Cacomantis pallidus (Pallid Cuckoo)*			
Culicidae					
254.		*Anopheles annulipes s.l.*			
255.		*Culicidae sp.*			
Cupressaceae					
256.	92	*Callitris canescens*			
257.	36600	*Callitris pyramidalis (Swamp Cypress)*			
Cyperaceae					
258.	741	*Baumea articulata (Jointed Rush)*			
259.	743	*Baumea juncea (Bare Twigrush)*			
260.	760	*Caustis dioica*			
261.	771	*Cyperus alterniflorus*			
262.	794	*Cyperus gymnocaulos (Spiny Flat-sedge)*			
263.	815	*Cyperus tenellus (Tiny Flatsedge)*	Y		
264.	17605	*Eleocharis keigheryi*		T	

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
265.	910	*Isolepis cernua (Nodding Club-rush)*			
266.	14540	*Isolepis hystrix*	Y		
267.	917	*Isolepis marginata (Coarse Club-rush)*			
268.	930	*Lepidosperma costale*			
269.	937	*Lepidosperma longitudinale (Pithy Sword-sedge)*			
270.	940	*Lepidosperma pubisquameum*			
271.	942	*Lepidosperma rostratum*		T	
272.	944	*Lepidosperma scabrum*			
273.		*Lepidosperma sp.*			
274.	30440	*Lepidosperma sp. Gingin (M.A. Langley & P.M. Smith MAL 2193)*			
275.	945	*Lepidosperma squamatum*			
276.	947	*Lepidosperma tenue*			
277.	955	*Mesomelaena pseudostygia*			
278.	956	*Mesomelaena stygia*			
279.	957	*Mesomelaena tetragona (Semaphore Sedge)*			
280.	971	*Schoenus andrewsii*			
281.	973	*Schoenus asperocarpus (Poison Sedge)*			
282.	974	*Schoenus benthamii*		P3	
283.	978	*Schoenus brevisetis*			
284.	980	*Schoenus capillifolius*		P3	
285.	982	*Schoenus clandestinus*			
286.	984	*Schoenus curvifolius*			
287.	986	*Schoenus efoliatus*			
288.	17606	*Schoenus griffinianus*		P4	
289.	1002	*Schoenus nanus (Tiny Bog Rush)*			
290.	1003	*Schoenus natans (Floating Bog-rush)*		P4	
291.	1006	*Schoenus odontocarpus*			
292.	1007	*Schoenus pedicellatus*			
293.	1009	*Schoenus pleiostemoneus*			
294.	1011	*Schoenus rigens*			
295.	1013	*Schoenus sculptus (Gimlet Bog-rush)*			
296.	1018	*Schoenus subfascicularis*			
297.	16252	*Schoenus subflavus subsp. subflavus*			
298.	1023	*Schoenus tenellus*			
299.	1026	*Schoenus unispiculatus*			
Cyprididae					
300.		*Alboa worooa*			
301.		*Candonocypris novaezelandiae*			
302.		*Cyprinotus cingalensis (ex edwardi)*			
303.		*Diacypris spinosa*			
304.		*Eucypris virens*			
305.		*Mytilocypris ambiguosa*			
306.		*Mytilocypris mytiloides*			
Daphniidae					
307.		*Simocephalus gibbosus*			
Dasypogonaceae					
308.	45757	*Calectasia elegans (Elegant Tinsel Lily)*		P2	
309.	19309	*Calectasia narragara*			
310.	1220	*Dasypogon obliquifolius*			
Dasyuridae					
311.	24088	*Antechinus flavipes subsp. leucogaster (Yellow-footed Antechinus, Mardo)*			
Dicaeidae					
312.	25607	*Dicaeum hirundinaceum (Mistletoebird)*			
Dicruridae					
313.	24443	*Grallina cyanoleuca (Magpie-lark)*			
314.	25610	*Myiagra inquieta (Restless Flycatcher)*			
315.	48096	*Rhipidura albiscapa (Grey Fantail)*			
316.	25614	*Rhipidura leucophrys (Willie Wagtail)*			
Dilleniaceae					
317.	5108	*Hibbertia acerosa (Needle Leaved Guinea Flower)*			
318.	5112	*Hibbertia aurea*			
319.	5114	*Hibbertia commutata*			
320.	5116	*Hibbertia crassifolia*			
321.	5120	*Hibbertia desmophylla*			
322.	19775	*Hibbertia glomerata subsp. ginginensis*		P2	
323.	20046	*Hibbertia hibbertioides var. hibbertioides*			
324.	5134	*Hibbertia huegelii*			

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325.	45534	*Hibbertia hypericoides subsp. hypericoides*			
326.	5139	*Hibbertia lasiopus (Large Hibbertia)*			
327.	5145	*Hibbertia miniata (Orange Hibbertia)*		P4	
328.	5157	*Hibbertia polystachya*			
329.	5162	*Hibbertia racemosa (Stalked Guinea Flower)*			
330.		*Hibbertia sp.*			
331.	11481	*Hibbertia spicata subsp. spicata*			
332.	48381	*Hibbertia striata*			
333.	5173	*Hibbertia subvaginata*			
Dioscoreaceae					
334.	1509	*Dioscorea hastifolia (Warrine, Wararn)*			
Droseraceae					
335.	3090	*Drosera barbigera*			
336.	13203	*Drosera closterostigma*			
337.	13201	*Drosera eneabba*			
338.	13217	*Drosera erythrorhiza subsp. erythrorhiza*			
339.	15453	*Drosera gigantea subsp. gigantea*			
340.	3098	*Drosera glanduligera (Pimpernel Sundew)*			
341.	3101	*Drosera heterophylla (Swamp Rainbow)*			
342.	8910	*Drosera humilis*			
343.	13197	*Drosera hyperostigma*			
344.	3105	*Drosera leucoblasta (Wheel Sundew)*			
345.	3106	*Drosera macrantha (Bridal Rainbow)*			
346.	14298	*Drosera macrantha subsp. macrantha*			
347.	3107	*Drosera macrophylla (Showy Sundew)*			
348.	11853	*Drosera menziesii subsp. menziesii*			
349.	13216	*Drosera menziesii subsp. penicillaris*			
350.	11196	*Drosera menziesii subsp. thysanosepala*			
351.	11768	*Drosera neesii subsp. neesii*			
352.	13207	*Drosera orbiculata*		P1	Y
353.	3118	*Drosera pallida (Pale Rainbow)*			
354.	29178	*Drosera porrecta*			
355.	3128	*Drosera ramellosa (Branched Sundew)*			
356.	13185	*Drosera spilos*			
357.	3133	*Drosera subhirtella (Sunny Rainbow)*			
358.	3135	*Drosera zonaria (Painted Sundew)*			
Dytiscidae					
359.		*Dytiscidae sp.*			
360.		*Lancetes lanceolatus*			
361.		*Megaporus solidus*			
362.		*Necterosoma penicillatus*			
Ecdeiocoleaceae					
363.	1066	*Ecdeiocolea monostachya*			
Elaeocarpaceae					
364.	4528	*Tetratheca confertifolia*			
365.	48340	*Tetratheca hirsuta subsp. boonanarring*		P2	
366.	34767	*Tetratheca plumosa*		P1	Y
Elapidae					
367.	42381	*Brachyurophis semifasciatus (Southern Shovel-nosed Snake)*			
368.	25296	*Demansia psammophis subsp. reticulata (Yellow-faced Whipsnake)*			
369.	25261	*Pseudechis australis (Mulga Snake)*			
370.	42416	*Pseudonaja mengdeni (Western Brown Snake)*			
Enchytraeidae					
371.		*Enchytraeidae sp.*			
Ericaceae					
372.	6305	*Andersonia brevifolia*			
373.	6309	*Andersonia gracilis*		T	
374.	6311	*Andersonia heterophylla*			
375.	6314	*Andersonia lehmanniana*			
376.	11471	*Andersonia lehmanniana subsp. lehmanniana*			
377.	6328	*Astroloma glaucescens*			
378.	6332	*Astroloma microdonta (Sandplain Cranberry)*			
379.	6334	*Astroloma pallidum (Kick Bush)*			
380.	6336	*Astroloma serratifolium (Kondrung)*			
381.	6337	*Astroloma stomarrhena (Red Swamp Cranberry)*			
382.	6339	*Astroloma xerophyllum*			

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383.	6348	*Conostephium pendulum (Pearl Flower)*			
384.	6349	*Conostephium preissii*			
385.	38221	*Dielsiodoxa leucantha*			Y
386.	40867	*Dielsiodoxa leucantha subsp. leucantha*		P3	
387.	6354	*Leucopogon allittii*		P3	
388.	6360	*Leucopogon australis (Spiked Beard-heath)*			
389.	6369	*Leucopogon cinereus*			
390.	6374	*Leucopogon conostephioides*			
391.	6421	*Leucopogon oliganthus*			
392.	6439	*Leucopogon pulchellus (Beard-heath)*			
393.	34163	*Leucopogon sp. Newdegate (M. Hislop 3585)*			
394.	20086	*Leucopogon sp. Northern Scarp (M. Hislop 2233)*			
395.	6444	*Leucopogon sprengelioides*			
396.	6458	*Lysinema elegans*			
397.	34736	*Lysinema pentapetalum*			
398.	48293	*Styphelia ciliosa*			
399.	48297	*Styphelia filifolia*		P3	
400.	6476	*Styphelia tenuiflora (Common Pinheath)*			
Euphorbiaceae					
401.	19942	*Ricinocarpos undulatus*			
402.	4713	*Stachystemon axillaris (Leafy Stachystemon)*			
403.	20537	*Stachystemon virgatus*			
Fabaceae					
404.	15460	*Acacia aculeiformis*			
405.	3200	*Acacia acuminata (Jam, Mangard)*			
406.	16110	*Acacia alata var. platyptera*		P4	
407.	3210	*Acacia anarthros*		P3	
408.	15466	*Acacia applanata*			
409.	3231	*Acacia auronitens*			
410.	15470	*Acacia barbinervis subsp. borealis*			
411.	3235	*Acacia baxteri (Baxter's Wattle)*			
412.	3238	*Acacia bidentata*			
413.	3242	*Acacia blakelyi*			
414.	11655	*Acacia browniana var. glaucescens*		P2	
415.	3254	*Acacia celastrifolia (Glowing Wattle)*			
416.	14061	*Acacia clydonophora*			
417.	3267	*Acacia congesta*			
418.	15473	*Acacia congesta subsp. congesta*			
419.	3274	*Acacia crassistipula*			
420.	14066	*Acacia cummingiana*		P3	
421.	3303	*Acacia dilatata*			
422.	11229	*Acacia drummondii subsp. affinis*		P3	
423.	11303	*Acacia drummondii subsp. candolleana*			
424.	11661	*Acacia drummondii subsp. drummondii*			
425.	3323	*Acacia ericifolia*			
426.	18194	*Acacia ericksoniae*			
427.	3324	*Acacia erinacea*			
428.	3325	*Acacia erioclada*			
429.	3331	*Acacia extensa (Wiry Wattle)*			
430.	3347	*Acacia gilbertii*			
431.	15475	*Acacia heteroclita subsp. heteroclita*			
432.	3374	*Acacia huegelii*			
433.	3382	*Acacia incrassata*			
434.	3391	*Acacia jacksonioides*			
435.	3408	*Acacia lasiocalyx (Silver Wattle, Wilyurwur)*			
436.	3409	*Acacia lasiocarpa (Panjang)*			
437.	15721	*Acacia lasiocarpa var. sedifolia*			
438.	3412	*Acacia latipes*			
439.	15476	*Acacia latipes subsp. latipes*			
440.	14612	*Acacia latipes subsp. licina*		P3	
441.	3418	*Acacia leptospermoides*			
442.	11448	*Acacia leptospermoides subsp. leptospermoides*			
443.	3442	*Acacia microbotrya (Manna Wattle, Kalyang)*			
444.	3451	*Acacia multispicata*			
445.	3454	*Acacia nervosa (Rib Wattle)*			
446.	3458	*Acacia nigripilosa*			
447.	15479	*Acacia nigripilosa subsp. nigripilosa*			
448.	14129	*Acacia oncinophylla subsp. oncinophylla*		P3	
449.	15481	*Acacia pulchella var. glaberrima*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
450.	15482	*Acacia pulchella var. goadbyi*			
451.	15483	*Acacia pulchella var. pulchella*			
452.	15480	*Acacia pulchella var. reflexa*			
453.	14927	*Acacia pulchella var. reflexa acuminate bracteole variant (R.J. Cumming 882)*		P3	
454.	3515	*Acacia restiacea*			
455.	3521	*Acacia ridleyana*		P3	
456.	3527	*Acacia saligna (Orange Wattle, Kudjong)*			
457.	30033	*Acacia saligna subsp. lindleyi*			
458.	3543	*Acacia shuttleworthii*			
459.	14042	*Acacia sp. New Norcia (E.A. Griffin 5917)*			
460.	3550	*Acacia sphacelata*			
461.	15484	*Acacia sphacelata subsp. sphacelata*			
462.	15486	*Acacia sphacelata subsp. verticillata*			
463.	20439	*Acacia splendens*		T	
464.	3557	*Acacia stenoptera (Narrow Winged Wattle)*			
465.	3602	*Acacia willdenowiana (Grass Wattle)*			
466.	3692	*Aotus procumbens*			
467.	3710	*Bossiaea eriocarpa (Common Brown Pea)*			
468.	3719	*Bossiaea spinescens*			
469.	13112	*Chorizema aciculare subsp. aciculare*			
470.	13111	*Chorizema aciculare subsp. laxum*			
471.	3753	*Chorizema dicksonii (Yellow-eyed Flame Pea)*			
472.	3793	*Daviesia angulata*			
473.	3796	*Daviesia benthamii*			
474.	3800	*Daviesia costata*			
475.	3803	*Daviesia daphnoides*			
476.	19747	*Daviesia decurrens subsp. decurrens*			
477.	18560	*Daviesia divaricata subsp. divaricata*			
478.	12326	*Daviesia hakeoides subsp. subnuda*			
479.	15506	*Daviesia incrassata subsp. teres*			
480.	3819	*Daviesia longifolia*			
481.	12329	*Daviesia nudiflora subsp. hirtella*			
482.	16585	*Daviesia nudiflora subsp. nudiflora*			
483.	3834	*Daviesia polyphylla*			
484.	3835	*Daviesia preissii*			
485.	3863	*Dillwynia dillwynioides*		P3	
486.	3887	*Gastrolobium acutum*			
487.	20515	*Gastrolobium axillare*			
488.	3894	*Gastrolobium callistachys (Rock Poison)*			
489.	3895	*Gastrolobium calycinum (York Road Poison)*			
490.	20475	*Gastrolobium capitatum*			
491.	20505	*Gastrolobium celsianum*			
492.	3900	*Gastrolobium floribundum (Wodjil Poison)*			
493.	3906	*Gastrolobium ilicifolium*			
494.	3907	*Gastrolobium laytonii (Breelya, Prilya)*			
495.	20483	*Gastrolobium linearifolium*			
496.	3909	*Gastrolobium microcarpum (Sandplain Poison)*			
497.	3912	*Gastrolobium oxylobioides (Champion Bay Poison)*			
498.	3915	*Gastrolobium plicatum*			
499.	3916	*Gastrolobium polystachyum (Horned Poison)*			
500.	3923	*Gastrolobium spathulatum (Poison Bush)*			
501.	3924	*Gastrolobium spinosum (Prickly Poison)*			
502.	3930	*Gastrolobium trilobum (Bullock Poison)*			
503.	3933	*Gastrolobium villosum (Crinkle-leaved Poison)*			
504.	3945	*Gompholobium aristatum*			
505.	3948	*Gompholobium capitatum*			
506.	10909	*Gompholobium confertum*			
507.	3950	*Gompholobium knightianum*			
508.	19214	*Gompholobium laxum*			
509.	29267	*Gompholobium muticum*			
510.	3955	*Gompholobium preissii*			
511.	11083	*Gompholobium scabrum*			
512.	3956	*Gompholobium shuttleworthii*			
513.	3957	*Gompholobium tomentosum (Hairy Yellow Pea)*			
514.	3966	*Hovea pungens (Devil's Pins, Puyenak)*			
515.	3967	*Hovea stricta*			
516.	3968	*Hovea trisperma (Common Hovea)*			
517.	19700	*Isotropis cuneifolia subsp. cuneifolia*			
518.	3993	*Isotropis drummondii (Lamb Poison)*			
519.	3995	*Isotropis juncea (Slender Lamb Poison)*			

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520.	4010	*Jacksonia floribunda (Holly Pea)*			
521.	4012	*Jacksonia furcellata (Grey Stinkwood)*			
522.	4015	*Jacksonia hakeoides*			
523.	14778	*Jacksonia nutans*			
524.	4025	*Jacksonia restioides*			
525.	4029	*Jacksonia sternbergiana (Stinkwood, Kapur)*			
526.	4044	*Kennedia prostrata (Scarlet Runner)*			
527.	11289	*Labichea lanceolata subsp. lanceolata*			
528.	8564	*Lotus subbiflorus*	Y		
529.	4090	*Mirbelia dilatata (Holly-leaved Mirbelia)*			
530.	4091	*Mirbelia floribunda (Purple Mirbelia)*			
531.	4097	*Mirbelia ramulosa*			
532.	4100	*Mirbelia spinosa*			
533.	4104	*Mirbelia trichocalyx*			
534.	17551	*Sphaerolobium drummondii*			
535.	4205	*Sphaerolobium linophyllum*			
536.	4207	*Sphaerolobium medium*			
537.	4248	*Templetonia aculeata*			
538.	4251	*Templetonia drummondii*			
539.	4291	*Trifolium arvense (Hare's Foot Clover)*	Y		
540.	4298	*Trifolium hirtum (Rose Clover)*	Y		
541.	4307	*Trifolium repens (White Clover)*	Y		
542.	30716	*Vachellia farnesiana (Mimosa Bush)*	Y		
Falconidae					
543.	25621	*Falco berigora (Brown Falcon)*			
544.	25622	*Falco cenchroides (Australian Kestrel, Nankeen Kestrel)*			
545.	25623	*Falco longipennis (Australian Hobby)*			
Frankeniaceae					
546.	12831	*Frankenia pulverulenta*	Y		
Gekkonidae					
547.	24959	*Gehyra variegata*			
548.	24983	*Underwoodisaurus milii (Barking Gecko)*			
Gentianaceae					
549.	6543	*Cicendia filiformis (Slender Cicendia)*	Y		
Geraniaceae					
550.	4335	*Erodium cygnorum (Blue Heronsbill)*			
Goodeniaceae					
551.	7420	*Dampiera alata (Winged-stem Dampiera)*			
552.	7421	*Dampiera altissima (Tall Dampiera)*			
553.	7425	*Dampiera carinata (Summer Dampiera)*			
554.	7428	*Dampiera coronata (Wedge-leaved Dampiera)*			
555.	7451	*Dampiera lavandulacea*			
556.	7453	*Dampiera lindleyi*			
557.	7454	*Dampiera linearis (Common Dampiera)*			
558.	7475	*Dampiera spicigera (Spiked Dampiera)*			
559.	7481	*Dampiera tephrea*		P2	
560.	7482	*Dampiera teres (Terete-leaved Dampiera)*			
561.	7484	*Dampiera trigona (Angled-stem Dampiera)*			
562.	7488	*Goodenia affinis (Silver Goodenia)*			
563.	7491	*Goodenia arthrotricha*		T	
564.	7495	*Goodenia berardiana*			
565.	29362	*Goodenia coerulea*			
566.	12516	*Goodenia convexa*			
567.	12520	*Goodenia fasciculata*			
568.	12522	*Goodenia glareicola*			
569.	7513	*Goodenia hassallii*			
570.	12551	*Goodenia micrantha*			
571.	7538	*Goodenia pulchella*			
572.	19051	*Goodenia scapigera subsp. scapigera*			
573.	7568	*Lechenaultia biloba (Blue Leschenaultia)*			
574.	7574	*Lechenaultia floribunda (Free-flowering Leschenaultia)*			
575.	7580	*Lechenaultia linarioides (Yellow Leschenaultia)*			
576.	7586	*Lechenaultia stenosepala (Narrow-sepaled Leschenaultia)*			
577.	7602	*Scaevola calliptera*			
578.	7603	*Scaevola canescens (Grey Scaevola)*			
579.	7613	*Scaevola glandulifera (Viscid Hand-flower)*			
580.	7619	*Scaevola lanceolata (Long-leaved Scaevola)*			

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581.	7634	*Scaevola phlebopetala (Velvet Fanflower)*			
582.	7636	*Scaevola platyphylla (Broad-leaved Fanflower)*			
583.	12585	*Scaevola repens*			
584.	13182	*Scaevola repens var. repens*			
585.	7665	*Velleia trinervis*			
586.	7666	*Verreauxia reinwardtii (Common Verreauxia)*			
Gyrostemonaceae					
587.	2783	*Gyrostemon racemiger*			
588.	2788	*Gyrostemon subnudus*			
Haemodoraceae					
589.	11470	*Anigozanthos bicolor subsp. bicolor*			
590.	1409	*Anigozanthos humilis (Catspaw)*			
591.	11957	*Anigozanthos humilis subsp. chrysanthus (Golden Catspaw)*		P4	
592.	11434	*Anigozanthos humilis subsp. humilis*			
593.	1414	*Anigozanthos pulcherrimus (Yellow Kangaroo Paw)*			
594.	1417	*Blancoa canescens (Winter Bell)*			
595.	1418	*Conostylis aculeata (Prickly Conostylis)*			
596.	11826	*Conostylis aculeata subsp. aculeata*			
597.	11552	*Conostylis aculeata subsp. bromelioides*			
598.	12109	*Conostylis aculeata subsp. preissii*			
599.	11977	*Conostylis aculeata subsp. spinuligera (Spiny Conostylis)*			
600.	1420	*Conostylis androstemma (Trumpets)*			
601.	1423	*Conostylis aurea (Golden Conostylis)*			
602.	1427	*Conostylis candicans (Grey Cottonhead)*			
603.	11438	*Conostylis candicans subsp. candicans*			
604.	48452	*Conostylis crassinerva subsp. absens*			
605.	1436	*Conostylis juncea*			
606.	1437	*Conostylis latens*			
607.	1446	*Conostylis prolifera (Mat Cottonheads)*			
608.	1454	*Conostylis setigera (Bristly Cottonhead)*			
609.	11597	*Conostylis setigera subsp. setigera*			
610.	11543	*Conostylis teretifolia subsp. planescens*			
611.	11870	*Conostylis teretifolia subsp. teretifolia*			
612.	1458	*Conostylis teretiuscula*			
613.	1462	*Conostylis wonganensis (Wongan Conostylis)*		T	
614.	1465	*Haemodorum discolor*			
615.	1469	*Haemodorum loratum*		P3	
616.	1470	*Haemodorum paniculatum (Mardja)*			
617.	1472	*Haemodorum simplex*			
618.	1473	*Haemodorum simulans*			
619.	1475	*Haemodorum spicatum (Mardja)*			
620.	1476	*Haemodorum venosum*			
621.	1477	*Macropidia fuliginosa (Black Kangaroo Paw)*			
622.	1478	*Phlebocarya ciliata*			
623.	1479	*Phlebocarya filifolia*			
624.	1481	*Tribonanthes australis*			
625.	1483	*Tribonanthes longipetala*			
626.	1485	*Tribonanthes violacea*			
Halcyonidae					
627.	30901	*Dacelo novaeguineae (Laughing Kookaburra)*	Y		
628.	25549	*Todiramphus sanctus (Sacred Kingfisher)*			
Haliplidae					
629.		*Haliplus fuscatus*			
Haloragaceae					
630.	6143	*Glischrocaryon aureum (Common Popflower)*			
631.	6159	*Gonocarpus nodulosus*			
Hemerocallidaceae					
632.	1261	*Agrostocrinum scabrum (Blue Grass Lily)*			
633.	1264	*Arnocrinum preissii*			
634.	1276	*Caesia micrantha (Pale Grass Lily)*			
635.	1285	*Corynotheca micrantha (Sand Lily)*			
636.	11283	*Corynotheca micrantha var. micrantha*			
637.	1259	*Dianella revoluta (Blueberry Lily)*			
638.	1293	*Hensmania turbinata*			
639.	19632	*Johnsonia pubescens subsp. pubescens*			
640.	1260	*Stypandra glauca (Blind Grass)*			
641.	1361	*Tricoryne elatior (Yellow Autumn Lily)*			

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642.	1363	*Tricoryne tenella*			
Hirundinidae					
643.	47909	*Cheramoeca leucosterna (White-backed Swallow)*			
644.	24491	*Hirundo neoxena (Welcome Swallow)*			
645.	48060	*Petrochelidon ariel (Fairy Martin)*			
646.	48061	*Petrochelidon nigricans (Tree Martin)*			
Hydatellaceae					
647.	1141	*Trithuria submersa*			
Hydrophilidae					
648.		*Berosus sp.*			
649.		*Hydrophilidae sp.*			
Hypericaceae					
650.	5181	*Hypericum japonicum (Matted St John's Wort)*			
Hypoxidaceae					
651.	43765	*Pauridia glabella var. glabella*			
652.	43760	*Pauridia occidentalis*			
653.	43761	*Pauridia occidentalis var. occidentalis*			
Hyriidae					
654.	34113	*Westralunio carteri (Carter's Freshwater Mussel)*		T	
Icmadophilaceae					
655.	28060	*Siphula coriacea*			
Iridaceae					
656.	18279	*Babiana angustifolia*	Y		
657.	1513	*Chasmanthe floribunda (African Cornflag)*	Y		
658.	18392	*Freesia alba x leichtlinii*	Y		
659.	1520	*Gladiolus caryophyllaceus (Wild Gladiolus)*	Y		
660.	19178	*Moraea lewisiae*	Y		
661.	1537	*Orthrosanthus laxus (Morning Iris)*			
662.	1546	*Patersonia juncea (Rush Leaved Patersonia)*			
663.	1550	*Patersonia occidentalis (Purple Flag, Koma)*			
664.	30476	*Patersonia occidentalis var. latifolia*			
665.	30472	*Patersonia occidentalis var. occidentalis*			
666.	1556	*Romulea rosea (Guildford Grass)*	Y		
667.	11544	*Romulea rosea var. australis (Guildford Grass)*	Y		
Juncaceae					
668.	1178	*Juncus bufonius (Toad Rush)*	Y		
669.	1180	*Juncus capitatus (Capitate Rush)*	Y		
670.	1188	*Juncus pallidus (Pale Rush)*			
671.	1189	*Juncus pauciflorus (Loose Flower Rush)*			
672.	1195	*Juncus subsecundus (Finger Rush)*			
Juncaginaceae					
673.	33276	*Triglochin isingiana*			
674.	146	*Triglochin minutissima*			
675.	18587	*Triglochin nana*			
676.	150	*Triglochin stowardii*			
Lamiaceae					
677.	16933	*Hemiandra glabra*			
678.	6836	*Hemiandra incana*			
679.	6838	*Hemiandra linearis (Speckled Snakebush)*			
680.	6839	*Hemiandra pungens (Snakebush)*			
681.	6842	*Hemigenia barbata*			
682.	6855	*Hemigenia humilis*			
683.	6856	*Hemigenia incana (Silky Hemigenia)*			
684.	33796	*Hemigenia wandooana*			
685.	41020	*Hemiphora bartlingii (Woolly Dragon)*			
686.	6887	*Microcorys barbata*			
687.	6913	*Prostanthera canaliculata*			
688.	41060	*Quoya dilatata*			
Laridae					
689.		*Chroicocephalus novaehollandiae*			
690.	24511	*Larus novaehollandiae subsp. novaehollandiae (Silver Gull)*			
691.	24523	*Sterna caspia (Caspian Tern)*		IA	
692.	25643	*Sterna hybrida (Whiskered Tern)*			

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Lauraceae					
693.	2952	*Cassytha glabella (Tangled Dodder Laurel)*			
694.	11501	*Cassytha glabella forma casuarinae*			
695.	2957	*Cassytha racemosa (Dodder Laurel)*			
696.	11799	*Cassytha racemosa forma racemosa*			
Lecanidae					
697.		*Lecane ludwigii*			
Lecideaceae					
698.		*Lecidea sp.*			
Lentibulariaceae					
699.	7148	*Utricularia multifida*			
Leptoceridae					
700.		*Leptoceridae sp.*			
701.		*Notalina spira*			
Lestidae					
702.		*Austrolestes analis*			
703.		*Austrolestes annulosus*			
Libellulidae					
704.		*Libellulidae sp.*			
Limnocharidae					
705.		*Limnochares australica*			
Limnocytheridae					
706.		*Limnocythere mowbrayensis*			
Limnodynastidae					
707.	25408	*Heleioporus albopunctatus (Western Spotted Frog)*			
708.	25426	*Neobatrachus pelobatoides (Humming Frog)*			
Loganiaceae					
709.	46254	*Orianthera spermacocea*			
Lycosidae					
710.		*Tasmanicosa leuckartii*			
711.		*Venator immansueta*			
Macarthuriaceae					
712.	2838	*Macarthuria apetala*			
713.	2839	*Macarthuria australis*			
Macropodidae					
714.	24132	*Macropus fuliginosus (Western Grey Kangaroo)*			
715.	24133	*Macropus irma (Western Brush Wallaby)*		P4	
Maluridae					
716.	25650	*Malurus elegans (Red-winged Fairy-wren)*			
717.	25651	*Malurus lamberti (Variegated Fairy-wren)*			
718.	25652	*Malurus leucopterus (White-winged Fairy-wren)*			
719.	25654	*Malurus splendens (Splendid Fairy-wren)*			
Malvaceae					
720.	4905	*Alyogyne hakeifolia*			
721.	17416	*Guichenotia angustifolia*			
722.	17776	*Guichenotia impudica*		P3	
723.	5012	*Guichenotia macrantha (Large-flowered Guichenotia)*			
724.	5013	*Guichenotia micrantha (Small Flowered Guichenotia)*			
725.	16952	*Guichenotia tuberculata*		P3	
726.	48346	*Lasiopetalum caroliae*		P3	
727.	45082	*Lasiopetalum glutinosum subsp. latifolium*			
728.	45083	*Lasiopetalum venustum*		P3	
729.	46818	*Seringia hermanniifolia (Crinkle-leaved firebush)*			
730.	46819	*Seringia integrifolia (Common firebush)*			
731.	5080	*Thomasia foliosa*			
732.	5084	*Thomasia grandiflora (Large Flowered Thomasia)*			
733.	14248	*Thomasia sp. Green Hill (S. Paust 1322)*		T	
Marsileaceae					
734.	74	*Marsilea drummondii (Common Nardoo)*			
Megapodiidae					
735.	24557	*Leipoa ocellata (Malleefowl)*		T	

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Meliphagidae					
736.	24559	*Acanthagenys rufogularis (Spiny-cheeked Honeyeater)*			
737.	24560	*Acanthorhynchus superciliosus (Western Spinebill)*			
738.	24561	*Anthochaera carunculata (Red Wattlebird)*			
739.	24562	*Anthochaera lunulata (Western Little Wattlebird)*			
740.	24567	*Epthianura albifrons (White-fronted Chat)*			
741.	24570	*Epthianura tricolor (Crimson Chat)*			
742.	47962	*Glyciphila melanops (Tawny-crowned Honeyeater)*			
743.	25659	*Lichenostomus leucotis (White-eared Honeyeater)*			
744.	25661	*Lichmera indistincta (Brown Honeyeater)*			
745.	24582	*Lichmera indistincta subsp. indistincta (Brown Honeyeater)*			
746.	24583	*Manorina flavigula (Yellow-throated Miner)*			
747.	25663	*Melithreptus brevirostris (Brown-headed Honeyeater)*			
748.	48071	*Phylidonyris niger (White-cheeked Honeyeater)*			
749.	24596	*Phylidonyris novaehollandiae (New Holland Honeyeater)*			
750.	42344	*Purnella albifrons (White-fronted Honeyeater)*			
Menyanthaceae					
751.	36160	*Liparophyllum capitatum*			
Meropidae					
752.	24598	*Merops ornatus (Rainbow Bee-eater)*		IA	
Micropholcommatidae					
753.		*Raveniella cirrata*			
Montiaceae					
754.	2846	*Calandrinia calyptrata (Pink Purslane)*			
755.	2848	*Calandrinia corrigioloides (Strap Purslane)*			
756.	2853	*Calandrinia eremaea (Twining Purslane)*			
757.	2855	*Calandrinia lehmannii*			
Myrtaceae					
758.	20283	*Astartea scoparia (Common Astartea)*			
759.	36441	*Babingtonia camphorosmae (Camphor Myrtle)*			
760.	45416	*Babingtonia grandiflora (Large-flowered Babingtonia)*			
761.	45403	*Babingtonia pelloeae (Pelloe's Babingtonia)*			
762.	16815	*Baeckea sp. Mingenew (M.E. Trudgen 12029)*			
763.	28317	*Baeckea sp. Youndegin Hill (A.S. George 15772)*		P1	
764.	17761	*Beaufortia aestiva (Kalbarri Beaufortia)*			
765.	5382	*Beaufortia elegans (Elegant Beaufortia)*			
766.	5384	*Beaufortia eriocephala (Woolly Bottlebrush, Woolly Beaufortia)*		P3	
767.	5387	*Beaufortia macrostemon (Darling Range Beaufortia)*			
768.	46826	*Beaufortia puberula (Hairy-leaved Beaufortia)*			
769.	5393	*Beaufortia squarrosa (Sand Beaufortia, Sand Bottlebrush, Puno)*			
770.	5411	*Calothamnus hirsutus*			
771.	5421	*Calothamnus pachystachyus*		P4	
772.	35816	*Calothamnus quadrifidus subsp. quadrifidus*			
773.	5429	*Calothamnus sanguineus (Silky-leaved Blood flower, Pindak)*			
774.	5439	*Calytrix angulata (Yellow Starflower)*			
775.	5450	*Calytrix depressa*			
776.	5460	*Calytrix fraseri (Pink Summer Calytrix)*			
777.	5461	*Calytrix glutinosa*			
778.	5462	*Calytrix gracilis*			
779.	5463	*Calytrix habrantha*			
780.	5465	*Calytrix leschenaultii*			
781.	5476	*Calytrix sapphirina*			
782.	5479	*Calytrix strigosa*			
783.	5485	*Calytrix variabilis*			
784.	5491	*Chamelaucium ciliatum*			
785.	14808	*Chamelaucium drummondii subsp. drummondii*			
786.	35641	*Chamelaucium sp. Wongan Hills (B.H. Smith 1140)*		P3	
787.	5498	*Chamelaucium uncinatum (Geraldton Wax)*			
788.	17104	*Corymbia calophylla (Marri)*			
789.	5504	*Darwinia acerosa (Fine-leaved Darwinia)*		T	
790.	5507	*Darwinia carnea (Mogumber Bell)*		T	
791.	5518	*Darwinia neildiana (Fringed Bell)*			
792.	5524	*Darwinia pinifolia*			
793.	13949	*Eremaea asterocarpa*			
794.	13950	*Eremaea asterocarpa subsp. asterocarpa*			
795.	5537	*Eremaea beaufortioides*			
796.	5540	*Eremaea fimbriata*			
797.	5541	*Eremaea pauciflora*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
798.	14104	*Eremaea pauciflora var. pauciflora*			
799.	5542	*Eremaea purpurea*			
800.	45244	*Ericomyrtus serpyllifolia*			
801.	45215	*Ericomyrtus tenuior*			
802.	5545	*Eucalyptus accedens (Powderbark Wandoo)*			
803.	12895	*Eucalyptus arachnaea subsp. arachnaea*			
804.	35345	*Eucalyptus camaldulensis subsp. obtusa (Blunt-budded River Red Gum)*			
805.	5616	*Eucalyptus decurva (Slender Mallee)*			
806.	5628	*Eucalyptus drummondii (Drummond's Gum)*			
807.	5640	*Eucalyptus eudesmioides (Malallie, Marlarli)*			
808.	5648	*Eucalyptus flocktoniae (Merrit, Merid)*			
809.	18521	*Eucalyptus flocktoniae subsp. flocktoniae*			
810.	5658	*Eucalyptus gittinsii (Northern Sandplain Mallee)*			
811.	5673	*Eucalyptus horistes*			
812.	15682	*Eucalyptus leptophylla (Narrow-leaved Red Mallee)*			
813.	11295	*Eucalyptus loxophleba subsp. loxophleba (York Gum)*			
814.	13531	*Eucalyptus macrocarpa subsp. elachantha (Small-leaved Mottlecah)*		P4	
815.	16887	*Eucalyptus macrocarpa x pyriformis*		P3	
816.	13548	*Eucalyptus marginata subsp. thalassica (Blue-leaved Jarrah)*			
817.	5722	*Eucalyptus obtusiflora (Dongara Mallee)*			
818.	20047	*Eucalyptus orthostemon*			
819.	12866	*Eucalyptus pluricaulis subsp. pluricaulis*			
820.	13040	*Eucalyptus pruiniramis*		T	
821.	5763	*Eucalyptus rudis (Flooded Gum, Kulurda)*			
822.	5766	*Eucalyptus salmonophloia (Salmon Gum, Wurak)*			
823.	12883	*Eucalyptus subangusta subsp. subangusta*			
824.	5790	*Eucalyptus todtiana (Coastal Blackbutt)*			
825.	5797	*Eucalyptus wandoo (Wandoo, Wondu)*			
826.	12905	*Eucalyptus wandoo subsp. pulverea*			
827.	12906	*Eucalyptus wandoo subsp. wandoo*			
828.	5817	*Hypocalymma angustifolium (White Myrtle, Kudjid)*			
829.	35074	*Hypocalymma angustifolium subsp. Dandaragan plateau (S. Patrick 702A)*			
830.	35070	*Hypocalymma angustifolium subsp. Swan Coastal Plain (G.J. Keighery 16777)*			
831.	5829	*Hypocalymma xanthopetalum*			
832.	15498	*Kunzea glabrescens (Spearwood)*			
833.	5847	*Leptospermum erubescens (Roadside Teatree)*			
834.	5850	*Leptospermum laevigatum (Coast Teatree)*	Y		
835.	37580	*Melaleuca acutifolia*			
836.	5876	*Melaleuca aspalathoides*			
837.	19381	*Melaleuca caeca*			
838.	17982	*Melaleuca carrii*			
839.	5888	*Melaleuca ciliosa*			
840.	5895	*Melaleuca conothamnoides*			
841.	19486	*Melaleuca hamata*			
842.	5926	*Melaleuca lateritia (Robin Redbreast Bush)*			
843.	5931	*Melaleuca leptospermoides*			
844.	41120	*Melaleuca marginata*			
845.	5936	*Melaleuca megacephala*			
846.	17981	*Melaleuca orbicularis*			
847.	20297	*Melaleuca osullivanii*			
848.	18394	*Melaleuca parviceps*			
849.	5952	*Melaleuca preissiana (Moonah)*			
850.	5958	*Melaleuca radula (Graceful Honeymyrtle)*			
851.	5959	*Melaleuca rhaphiophylla (Swamp Paperbark)*			
852.	19365	*Melaleuca ryeae*			
853.	5964	*Melaleuca seriata*			
854.	5975	*Melaleuca subtrigona*			
855.	5978	*Melaleuca teretifolia (Banbar)*			
856.	5983	*Melaleuca trichophylla*			
857.	5986	*Melaleuca urceolaris*			
858.	18395	*Melaleuca villosisepala*			
859.	5987	*Melaleuca viminea (Mohan)*			
860.	13280	*Melaleuca viminea subsp. viminea*			
861.	16477	*Pericalymma ellipticum var. ellipticum*			
862.	6009	*Pileanthus filifolius (Summer Coppercups)*			
863.	20219	*Pileanthus peduncularis subsp. peduncularis*			
864.	6012	*Regelia ciliata*			
865.	6015	*Regelia megacephala*		P4	
866.	6033	*Scholtzia involucrata (Spiked Scholtzia)*			
867.	6037	*Scholtzia parviflora*			

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868.	46437	*Tetrapora preissiana*			
869.	6060	*Thryptomene mucronulata*			
870.	12388	*Verticordia acerosa var. preissii*			
871.	12395	*Verticordia bifimbriata*			
872.	12411	*Verticordia densiflora var. cespitosa*			
873.	15432	*Verticordia densiflora var. densiflora*			
874.	15620	*Verticordia endlicheriana var. manicula*			
875.	12422	*Verticordia eriocephala (Common Cauliflower)*			
876.	12430	*Verticordia huegelii var. stylosa*			
877.	12431	*Verticordia huegelii var. tridens*		P3	
878.	14714	*Verticordia lindleyi subsp. lindleyi*		P4	
879.	14716	*Verticordia muelleriana subsp. muelleriana*		P3	
880.	10822	*Verticordia nobilis*			
881.	6103	*Verticordia ovalifolia*			
882.	12446	*Verticordia paludosa*		P4	
883.	6105	*Verticordia patens*			
884.	6107	*Verticordia pennigera*			
885.	6109	*Verticordia picta (Painted Featherflower)*			
886.	12458	*Verticordia serrata var. ciliata*			
Nematoda					
887.		*Nematoda sp.*			
Neosittidae					
888.	25673	*Daphoenositta chrysoptera (Varied Sittella)*			
Notodromadidae					
889.		*Kennethia cristata*			
Notonectidae					
890.		*Anisops thienemanni*			
Nyctaginaceae					
891.	2770	*Boerhavia coccinea (Tar Vine, Wituka)*			
Ochrolechiaceae					
892.	27884	*Ochrolechia subpallescens*			
Olacaceae					
893.	2367	*Olax scalariformis*			
Orchidaceae					
894.	11136	*Caladenia denticulata*			
895.	44900	*Caladenia denticulata subsp. rubella*			
896.	15344	*Caladenia dimidia*			
897.	18032	*Caladenia exilis subsp. vanleeuwenii*			
898.	15348	*Caladenia flava subsp. flava*			
899.	15502	*Caladenia footeana*			
900.	1595	*Caladenia hirta (Sugar Candy Orchid)*			
901.	1599	*Caladenia latifolia (Pink Fairy Orchid)*			
902.	1602	*Caladenia longicauda (Common White Spider Orchid)*			
903.	15360	*Caladenia longicauda subsp. borealis*			
904.	15363	*Caladenia longicauda subsp. eminens*			
905.	15369	*Caladenia lorea*			
906.		*Caladenia sp.*			
907.	13862	*Caladenia speciosa*		P4	
908.	15380	*Caladenia splendens*			
909.	18019	*Caladenia vulgata*			
910.	15398	*Caladenia xantha*			
911.	15114	*Cyanicula gemmata*			
912.	12943	*Diuris brumalis*			
913.	11049	*Diuris corymbosa*			
914.	1634	*Diuris laxiflora (Bee Orchid)*			
915.	42182	*Diuris perialla*			
916.	43300	*Diuris refracta*			
917.	42228	*Diuris septentrionalis*			
918.	1638	*Diuris setacea (Bristly Donkey Orchid)*			
919.	44162	*Diuris tinkeri*			
920.	1640	*Drakaea glyptodon (King-in-his-carriage)*			
921.	15406	*Drakaea gracilis*			
922.	1643	*Elythranthera brunonis (Purple Enamel Orchid)*			
923.	20718	*Ericksonella saccharata*			
924.	15413	*Eriochilus dilatatus subsp. undulatus*			
925.	15418	*Leptoceras menziesii*			

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926.	1667	*Paracaleana nigrita (Flying Duck Orchid)*			
927.	20460	*Pheladenia deformis*			
928.	1669	*Prasophyllum cyphochilum (Pouched Leek Orchid)*			
929.	1671	*Prasophyllum elatum (Tall Leek Orchid)*			
930.	16688	*Prasophyllum gracile*			
931.	1676	*Prasophyllum hians (Yawning Leek Orchid)*			
932.	1677	*Prasophyllum macrostachyum (Laughing Leek Orchid)*			
933.	11125	*Prasophyllum macrotys*			
934.	1687	*Pterostylis dilatata*			
935.	44723	*Pterostylis glebosa*			
936.	45343	*Pterostylis platypetala*			
937.	1693	*Pterostylis recurva (Jug Orchid)*			
938.	12217	*Pterostylis sanguinea*			
939.	1697	*Pterostylis scabra (Bronze Shell Orchid)*			
940.	45344	*Pterostylis scitula*			
941.	18658	*Pterostylis sp. short sepals (W. Jackson BJ259)*			
942.	1698	*Pterostylis vittata (Banded Greenhood)*			
943.	16367	*Pyrorchis nigricans (Red beaks, Elephants ears)*			
944.	1701	*Thelymitra antennifera (Vanilla Orchid)*			
945.	11032	*Thelymitra apiculata*		P4	
946.	1702	*Thelymitra campanulata (Shirt Orchid)*			
947.	1718	*Thelymitra villosa (Custard Orchid)*			
948.	20731	*Thelymitra vulgaris*			
Orobanchaceae					
949.	7089	*Parentucellia latifolia (Common Bartsia)*	Y		
Oxalidaceae					
950.	30375	*Oxalis exilis*			
Pachycephalidae					
951.	25675	*Colluricincla harmonica (Grey Shrike-thrush)*			
952.	24618	*Oreoica gutturalis (Crested Bellbird)*			
953.	25680	*Pachycephala rufiventris (Rufous Whistler)*			
Palaemonidae					
954.		*Palaemonidae sp.*			
Papaveraceae					
955.	2969	*Fumaria capreolata (Whiteflower Fumitory)*	Y		
Parastacidae					
956.		*Parastacidae sp.*			
Pardalotidae					
957.	25681	*Pardalotus punctatus (Spotted Pardalote)*			
958.	25682	*Pardalotus striatus (Striated Pardalote)*			
Parmeliaceae					
959.	27748	*Flavoparmelia rutidota*			
960.		*Xanthoparmelia sp.*			
Pelecanidae					
961.	24648	*Pelecanus conspicillatus (Australian Pelican)*			
Peramelidae					
962.	24153	*Isoodon obesulus subsp. fusciventer (Quenda, Southern Brown Bandicoot)*		P4	
Peronosporaceae					
963.		*Phytophthora cinnamomi*			
Pertusariaceae					
964.	27949	*Pertusaria leucostomoides*			
Petroicidae					
965.	24652	*Eopsaltria georgiana (White-breasted Robin)*			
966.	47997	*Melanodryas cucullata (Hooded Robin)*			
967.	24654	*Microeca fascinans subsp. assimilis (Jacky Winter)*			
968.	48066	*Petroica boodang (Scarlet Robin)*			
969.	24659	*Petroica goodenovii (Red-capped Robin)*			
Phalacrocoracidae					
970.		*Microcarbo melanoleucos*			
971.	25697	*Phalacrocorax carbo (Great Cormorant)*			
972.	25698	*Phalacrocorax melanoleucos (Little Pied Cormorant)*			
973.	24666	*Phalacrocorax melanoleucos subsp. melanoleucos (Little Pied Cormorant)*			
974.	24667	*Phalacrocorax sulcirostris (Little Black Cormorant)*			

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Phrymaceae					
975.	48213	*Thyridia repens*			
Phyllanthaceae					
976.	4675	*Phyllanthus calycinus (False Boronia)*			
Physciaceae					
977.	27581	*Amandinea punctata*			
Pionidae					
978.		*Acercella sp.*			Y
Pittosporaceae					
979.	25788	*Billardiera fraseri (Elegant Pronaya)*			
980.	25798	*Billardiera fusiformis (Australian Bluebell)*			
981.	25796	*Billardiera heterophylla (Australian Bluebell)*			
982.	25779	*Billardiera venusta*			
983.	19421	*Marianthus bicolor (Painted Marianthus)*			
Plantaginaceae					
984.	14282	*Gratiola pubescens*			
985.	12008	*Kickxia elatine subsp. crinita*	Y		
986.	7299	*Plantago debilis*			
987.	7301	*Plantago exilis*			
Poaceae					
988.	13380	*Amphibromus nervosus*			
989.	196	*Amphipogon caricinus (Long Greybeard Grass)*			
990.	197	*Amphipogon debilis*			
991.	200	*Amphipogon turbinatus*			
992.	207	*Aristida contorta (Bunched Kerosene Grass)*			
993.	17237	*Austrostipa elegantissima*			
994.	17244	*Austrostipa macalpinei*			
995.	17254	*Austrostipa tenuifolia*			
996.	233	*Avena barbata (Bearded Oat)*	Y		
997.	244	*Briza maxima (Blowfly Grass)*	Y		
998.	245	*Briza minor (Shivery Grass)*	Y		
999.	281	*Cymbopogon obtectus (Silkyheads)*			
1000.	320	*Digitaria sanguinalis (Crab Grass)*	Y		
1001.	347	*Ehrharta calycina (Perennial Veldt Grass)*	Y		
1002.	349	*Ehrharta longiflora (Annual Veldt Grass)*	Y		
1003.	436	*Glyceria drummondii (Nangetty Grass)*		T	
1004.	20019	*Lachnagrostis filiformis*			
1005.	19955	*Lachnagrostis plebeia*			
1006.	492	*Neurachne alopecuroidea (Foxtail Mulga Grass)*			
1007.	519	*Paspalidium constrictum (Knottybutt Grass)*			
1008.	577	*Poa poiformis (Coastal Poa)*			
1009.	40425	*Rytidosperma caespitosum*			
1010.	19453	*Setaria parviflora*	Y		
1011.	17882	*Triodia danthonioides*			
1012.	724	*Vulpia myuros (Rat's Tail Fescue)*	Y		
Podicipedidae					
1013.	25704	*Podiceps cristatus (Great Crested Grebe)*			
1014.	24681	*Poliocephalus poliocephalus (Hoary-headed Grebe)*			
1015.	25705	*Tachybaptus novaehollandiae (Australasian Grebe, Black-throated Grebe)*			
1016.	24682	*Tachybaptus novaehollandiae subsp. novaehollandiae (Australasian Grebe, Black-throated Grebe)*			
Polygalaceae					
1017.	4549	*Comesperma acerosum*			
1018.	4552	*Comesperma confertum*			
1019.	4561	*Comesperma scoparium (Broom Milkwort)*			
1020.	4566	*Comesperma volubile (Love Creeper)*			
Polygonaceae					
1021.	2412	*Muehlenbeckia adpressa (Climbing Lignum)*			
1022.	2419	*Polygonum aviculare (Wireweed)*	Y		
1023.	20171	*Rumex pulcher subsp. woodsii*	Y		
Pomatiopsidae					
1024.		*Coxiella exsposita*			
Portulacaceae					
1025.	2884	*Portulaca oleracea (Purslane, Wakati)*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Potamogetonaceae					
1026.	118	*Lepilaena australis (Austral Water Mat)*			
1027.	120	*Lepilaena cylindrocarpa*			
Primulaceae					
1028.	36375	*Lysimachia arvensis (Pimpernel)*	Y		
1029.	6483	*Samolus junceus*			
Proteaceae					
1030.	11837	*Adenanthos cygnorum subsp. cygnorum (Common Woollybush)*			
1031.	1779	*Adenanthos drummondii*			
1032.	32682	*Banksia armata var. armata*			
1033.	1800	*Banksia attenuata (Slender Banksia, Piara)*			
1034.	32679	*Banksia bipinnatifida subsp. multifida*			
1035.	1807	*Banksia burdettii (Burdett's Banksia)*			
1036.	1809	*Banksia candolleana (Propeller Banksia)*			
1037.	32623	*Banksia carlinoides (Pink Dryandra)*			
1038.	1810	*Banksia chamaephyton (Fishbone Banksia)*		P4	
1039.	32696	*Banksia dallanneyi subsp. pollosta*		P3	
1040.	32580	*Banksia dallanneyi var. dallanneyi*			
1041.	32577	*Banksia dallanneyi var. mellicula*			
1042.	32556	*Banksia echinata*			
1043.	32523	*Banksia fraseri var. fraseri*			
1044.	32520	*Banksia fuscobractea*		T	Y
1045.	32518	*Banksia hewardiana*			
1046.	1822	*Banksia ilicifolia (Holly-leaved Banksia)*			
1047.	1823	*Banksia incana*			
1048.	32214	*Banksia kippistiana*			
1049.	32215	*Banksia kippistiana var. kippistiana*			
1050.	32216	*Banksia kippistiana var. paenepeccata*		P3	
1051.	1826	*Banksia laricina (Rose Banksia)*			
1052.	1828	*Banksia leptophylla*			
1053.	11714	*Banksia leptophylla var. leptophylla*			
1054.	1830	*Banksia littoralis (Swamp Banksia, Pungura)*			
1055.	1834	*Banksia menziesii (Firewood Banksia)*			
1056.	32211	*Banksia mimica (Summer Honeypot)*		T	
1057.	32202	*Banksia nivea (Honeypot Dryandra, Pudjarn)*			
1058.	32203	*Banksia nivea subsp. nivea*			
1059.	32200	*Banksia nobilis subsp. nobilis*			
1060.	32163	*Banksia platycarpa*			
1061.	32159	*Banksia polycephala (Many-headed Dryandra)*			
1062.	32138	*Banksia pteridifolia subsp. vernalis*		P3	
1063.	32082	*Banksia serratuloides subsp. serratuloides*		T	
1064.	32080	*Banksia sessilis var. sessilis*			
1065.	32074	*Banksia shuttleworthiana (Bearded Dryandra)*			
1066.	33401	*Banksia sphaerocarpa var. pumilio*			
1067.	12111	*Banksia sphaerocarpa var. sphaerocarpa (Fox Banksia)*			
1068.	32045	*Banksia squarrosa subsp. squarrosa*			
1069.	32031	*Banksia vestita (Summer Dryandra)*			
1070.	15607	*Conospermum acerosum subsp. acerosum*			
1071.	1859	*Conospermum brachyphyllum*			
1072.	15041	*Conospermum canaliculatum*			
1073.	14876	*Conospermum densiflorum subsp. densiflorum*			
1074.	14000	*Conospermum densiflorum subsp. unicephalatum*		T	
1075.	15518	*Conospermum filifolium subsp. filifolium*			
1076.	1874	*Conospermum glumaceum (Hooded Smokebush)*			
1077.	1875	*Conospermum huegelii (Slender Smokebush)*			
1078.	1876	*Conospermum incurvum (Plume Smokebush)*			
1079.	1880	*Conospermum polycephalum*			
1080.	1881	*Conospermum scaposum*		P3	
1081.	1882	*Conospermum stoechadis (Common Smokebush)*			
1082.	15520	*Conospermum stoechadis subsp. sclerophyllum*			
1083.	1885	*Conospermum triplinervium (Tree Smokebush)*			
1084.	15523	*Conospermum wycherleyi*			
1085.	19628	*Grevillea bipinnatifida subsp. bipinnatifida*			
1086.	1965	*Grevillea biternata*			
1087.	33580	*Grevillea bracteosa subsp. bracteosa*		T	
1088.	1994	*Grevillea drummondii (Drummond's Grevillea)*		P4	
1089.	1997	*Grevillea endlicheriana (Spindly Grevillea)*			
1090.	2001	*Grevillea eriostachya (Flame Grevillea, Kaliny-kalinypa)*			
1091.	19567	*Grevillea florida*			

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				P3	
1092.	2066	*Grevillea pilulifera (Woolly-flowered Grevillea)*			
1093.		*Grevillea sp.*			
1094.	31354	*Grevillea sp. Gillingarra (R.J. Cranfield 4087)*		T	Y
1095.	2101	*Grevillea synapheae (Catkin Grevillea)*			
1096.	14420	*Grevillea synapheae subsp. pachyphylla*			
1097.	14421	*Grevillea synapheae subsp. synapheae*			
1098.	2115	*Grevillea umbellulata*			
1099.	12824	*Grevillea vestita subsp. vestita*			
1100.	2131	*Hakea auriculata*			
1101.	12225	*Hakea brownii*			
1102.	2140	*Hakea circumalata*			
1103.	2143	*Hakea conchifolia (Shell-leaved Hakea)*			
1104.	2146	*Hakea costata (Ribbed Hakea)*			
1105.	2157	*Hakea erecta*			
1106.	2158	*Hakea erinacea (Hedge-hog Hakea)*			
1107.	2164	*Hakea gilbertii*			
1108.	2166	*Hakea incrassata (Marble Hakea)*			
1109.	2167	*Hakea invaginata*			
1110.	2175	*Hakea lissocarpha (Honey Bush)*			
1111.	2179	*Hakea marginata*			
1112.	2185	*Hakea myrtoides (Myrtle Hakea)*			
1113.	45333	*Hakea neospathulata*			
1114.	2196	*Hakea preissii (Needle Tree, Dandjin)*			
1115.	2197	*Hakea prostrata (Harsh Hakea)*			
1116.	12233	*Hakea psilorrhyncha*			
1117.	2212	*Hakea sulcata (Furrowed Hakea)*			
1118.	2214	*Hakea trifurcata (Two-leaf Hakea)*			
1119.	2219	*Isopogon adenanthoides (Spider Coneflower)*			
1120.	2227	*Isopogon divergens (Spreading Coneflower)*			
1121.	29775	*Isopogon drummondii*		P3	
1122.	2229	*Isopogon dubius (Pincushion Coneflower)*			
1123.	2232	*Isopogon linearis*			
1124.	37880	*Isopogon panduratus*			
1125.	2238	*Isopogon teretifolius (Nodding Coneflower)*			
1126.	15528	*Lambertia multiflora var. multiflora*			
1127.	2254	*Persoonia acicularis*			
1128.	2258	*Persoonia comata*			
1129.	2271	*Persoonia rudis*		P3	
1130.	2272	*Persoonia rufiflora*			
1131.	2278	*Persoonia sulcata*		P4	
1132.	2281	*Persoonia trinervis*			
1133.	2284	*Petrophile biloba (Granite Petrophile)*			
1134.	2285	*Petrophile biternata*		P3	
1135.	2286	*Petrophile brevifolia*			
1136.	2288	*Petrophile chrysantha*			
1137.	2297	*Petrophile heterophylla (Variable-leaved Cone Bush)*			
1138.	2299	*Petrophile linearis (Pixie Mops)*			
1139.	2301	*Petrophile macrostachya*			
1140.	2305	*Petrophile plumosa*		P3	
1141.	16874	*Petrophile recurva*			
1142.	2308	*Petrophile seminuda*			
1143.	2309	*Petrophile serruriae*			
1144.	2312	*Petrophile striata*			
1145.	12856	*Stirlingia abrotanoides*			
1146.	2316	*Stirlingia latifolia (Blueboy)*			
1147.	2317	*Stirlingia simplex*			
1148.	2321	*Synaphea acutiloba (Granite Synaphea)*			
1149.	16882	*Synaphea aephynsa*			
1150.	2323	*Synaphea gracillima*			
1151.	16867	*Synaphea grandis*		P4	
1152.	16761	*Synaphea interioris*			
1153.	16768	*Synaphea panhesya*		P1	
1154.	16773	*Synaphea rangiferops*		P2	
1155.	29186	*Synaphea sp. Udumung (A.S. George 17058)*			
1156.	16764	*Synaphea sparsiflora*		P2	
1157.	2329	*Synaphea spinulosa*			
1158.	15532	*Synaphea spinulosa subsp. spinulosa*			

Psittacidae

1159.		*Barnardius zonarius*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
1160.	24722	*Cacatua leadbeateri (Major Mitchell's Cockatoo)*			
1161.	25714	*Cacatua pastinator (Western Long-billed Corella)*			
1162.	24723	*Cacatua pastinator subsp. butleri (Butler's Corella)*			
1163.	25716	*Cacatua sanguinea (Little Corella)*			
1164.	24729	*Cacatua tenuirostris (Eastern Long-billed Corella)*	Y		
1165.	25717	*Calyptorhynchus banksii (Red-tailed Black-Cockatoo)*			
1166.	24734	*Calyptorhynchus latirostris (Carnaby's Cockatoo (short-billed black-cockatoo), Carnaby's Cockatoo)*		T	
1167.	48400	*Calyptorhynchus sp. (white-tailed black cockatoo)*		T	
1168.	24738	*Neophema elegans (Elegant Parrot)*			
1169.	25720	*Platycercus icterotis (Western Rosella)*			
1170.	24751	*Platycercus zonarius subsp. zonarius (Port Lincoln Parrot)*			
1171.	25722	*Polytelis anthopeplus (Regent Parrot)*			
1172.		*Purpureicephalus spurius*			
1173.	25723	*Trichoglossus haematodus (Rainbow Lorikeet)*			
Pteridaceae					
1174.	31	*Cheilanthes austrotenuifolia*			
Pygopodidae					
1175.	25766	*Delma fraseri (Fraser's Legless Lizard)*			
1176.	25008	*Pygopus lepidopodus (Common Scaly Foot)*			
Rallidae					
1177.	25727	*Fulica atra (Eurasian Coot)*			
1178.	24761	*Fulica atra subsp. australis (Eurasian Coot)*			
1179.	25729	*Gallinula tenebrosa (Dusky Moorhen)*			
1180.	24763	*Gallinula tenebrosa subsp. tenebrosa (Dusky Moorhen)*			
1181.	25731	*Porphyrio porphyrio (Purple Swamphen)*			
1182.	24767	*Porphyrio porphyrio subsp. bellus (Purple Swamphen)*			
1183.	24769	*Porzana fluminea (Australian Spotted Crake)*			
1184.	24770	*Porzana pusilla subsp. palustris (Baillon's Crake)*			
1185.	24771	*Porzana tabuensis (Spotless Crake)*			
1186.	48141	*Tribonyx ventralis (Black-tailed Native-hen)*			
Ramalinaceae					
1187.	28224	*Ramalina inflata subsp. australis*			
Recurvirostridae					
1188.	24774	*Cladorhynchus leucocephalus (Banded Stilt)*			
1189.	25734	*Himantopus himantopus (Black-winged Stilt)*			
1190.	24776	*Recurvirostra novaehollandiae (Red-necked Avocet)*			
Restionaceae					
1191.	17685	*Chaetanthus aristatus*			
1192.	17833	*Chordifex microcodon*			
1193.	17706	*Chordifex sinuosus*			
1194.	17834	*Chordifex sphacelatus*			
1195.	17663	*Desmocladus asper*			
1196.	16593	*Desmocladus biformis*		P3	
1197.	46362	*Desmocladus lateriflorus*			
1198.	17662	*Desmocladus lateriticus*			
1199.	46364	*Desmocladus microcarpus*		P2	
1200.	16471	*Desmocladus myriocladus*			
1201.	17846	*Desmocladus parthenicus*			
1202.	17838	*Dielsia stenostachya*			
1203.	1070	*Hypolaena exsulca*			
1204.	17622	*Hypolaena robusta*		P4	
1205.	1073	*Lepidobolus chaetocephalus (Bristle-headed Chaff Rush)*			
1206.	13774	*Lepidobolus densus*		P4	
1207.	18074	*Lepidobolus preissianus subsp. preissianus*			
1208.	1077	*Leptocarpus canus (Hoary Twine-rush)*			
1209.	1078	*Leptocarpus coangustatus*			
1210.	19241	*Lepyrodia curvescens*		P2	
1211.	15835	*Loxocarya striata*			
Rhamnaceae					
1212.	13470	*Cryptandra arbutiflora var. arbutiflora*			
1213.	31571	*Cryptandra intermedia*			
1214.	9076	*Cryptandra myriantha*			
1215.	4804	*Cryptandra nutans*			
1216.	4809	*Cryptandra pungens*			
1217.	4810	*Cryptandra scoparia*			
1218.	13475	*Stenanthemum humile*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
1219.	16198	*Stenanthemum intricatum*			
1220.	4840	*Trymalium daphnifolium*			
1221.	4842	*Trymalium ledifolium*			
1222.	15144	*Trymalium ledifolium var. lineare*			
1223.	13479	*Trymalium ledifolium var. rosmarinifolium*			
1224.	33418	*Trymalium odoratissimum subsp. odoratissimum*			
1225.	4844	*Trymalium urceolare*			
Rubiaceae					
1226.	7323	*Galium murale (Small Goosegrass)*	Y		
1227.	18255	*Opercularia vaginata (Dog Weed)*			
Ruppiaceae					
1228.	116	*Ruppia polycarpa*			
Rutaceae					
1229.	4432	*Boronia ovata*			
1230.	11381	*Boronia ramosa subsp. anethifolia*			
1231.	11564	*Boronia ramosa subsp. ramosa*			
1232.	16639	*Boronia scabra subsp. scabra*			
1233.	4444	*Boronia tenuis (Blue Boronia)*		P4	
1234.	4483	*Geleznowia verrucosa*			
1235.	18537	*Philotheca brucei subsp. brucei*			
1236.	19417	*Philotheca spicata subsp. Moore River National Park (G. & D. Woodman Op 47)*			
Santalaceae					
1237.	10765	*Exocarpos sparteus (Broom Ballart, Djuk)*			
1238.	2344	*Leptomeria empetriformis*			
1239.	2350	*Leptomeria pauciflora (Sparse-flowered Currant Bush)*			
1240.	2360	*Spirogardnera rubescens (Spiral Bush)*		T	
Sapindaceae					
1241.	18589	*Diplopeltis huegelii subsp. lehmannii*			
1242.	4756	*Dodonaea caespitosa*			
1243.	4761	*Dodonaea ericoides*			
1244.	4775	*Dodonaea pinifolia*			
Scirtidae					
1245.		*Scirtidae sp.*			
Scolopacidae					
1246.	41323	*Actitis hypoleucos (Common Sandpiper)*		IA	
1247.	24779	*Calidris acuminata (Sharp-tailed Sandpiper)*		IA	
1248.	24784	*Calidris ferruginea (Curlew Sandpiper)*		T	
1249.	24788	*Calidris ruficollis (Red-necked Stint)*		IA	
1250.	25741	*Limosa limosa (Black-tailed Godwit)*		IA	
1251.	24806	*Tringa glareola (Wood Sandpiper)*		IA	
1252.	24808	*Tringa nebularia (Common Greenshank, greenshank)*		IA	
Scolopendridae					
1253.		*Cormocephalus turneri*			
1254.		*Scolopendra morsitans*			
Scrophulariaceae					
1255.	7055	*Dischisma capitatum (Woolly-headed Dischisma)*	Y		
1256.	17150	*Eremophila glabra subsp. chlorella*		T	
1257.	29062	*Eremophila glabra subsp. green flowers (E.A. Griffin 5347)*			
1258.	7231	*Eremophila lehmanniana*			
1259.	7113	*Zaluzianskya divaricata (Spreading Night Phlox)*	Y		
Scutigeridae					
1260.		*Allothereua maculata*			
Solanaceae					
1261.	7018	*Solanum lasiophyllum (Flannel Bush, Mindjulu)*			
1262.	7025	*Solanum oldfieldii*			
1263.	7035	*Solanum sisymbriifolium (Viscid Nightshade)*	Y		
Stylidiaceae					
1264.	7673	*Levenhookia pauciflora (Deceptive Stylewort)*			
1265.	7676	*Levenhookia pusilla (Midget Stylewort)*			
1266.	7677	*Levenhookia stipitata (Common Stylewort)*			
1267.	7679	*Stylidium adpressum (Trigger-on-stilts)*			
1268.	7681	*Stylidium affine (Queen Triggerplant)*			
1269.	12846	*Stylidium albolilacinum*			
1270.	30278	*Stylidium androsaceum*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
1271.	30276	*Stylidium bicolor*			
1272.	48457	*Stylidium bindoon*			
1273.	7694	*Stylidium bulbiferum (Circus Triggerplant)*			
1274.	7698	*Stylidium caricifolium (Milkmaids)*			
1275.	12845	*Stylidium carlquistii*			
1276.	7712	*Stylidium despectum (Dwarf Triggerplant)*			
1277.	7713	*Stylidium dichotomum (Pins-and-needles)*			
1278.	7717	*Stylidium divaricatum (Daddy-long-legs)*			
1279.	7719	*Stylidium ecorne (Foot Triggerplant)*			
1280.	7721	*Stylidium emarginatum (Biddy-four-legs)*			
1281.	19251	*Stylidium eriopodum*			
1282.	7736	*Stylidium hispidum (White Butterfly Triggerplant)*			
1283.	7749	*Stylidium leptophyllum (Needle-leaved Triggerplant)*			
1284.	7756	*Stylidium longitubum (Jumping Jacks)*		P4	
1285.	7762	*Stylidium miniatum (Pink Butterfly Triggerplant)*			
1286.	25829	*Stylidium neurophyllum (Coastal Plain Triggerplant)*			
1287.	7766	*Stylidium nonscandens*		P3	
1288.	7768	*Stylidium obtusatum (Pinafore Triggerplant)*			
1289.	7774	*Stylidium piliferum (Common Butterfly Triggerplant)*			
1290.	25837	*Stylidium purpureum (Purple Fountain Triggerplant)*			
1291.	7787	*Stylidium rhynchocarpum (Black-beaked Triggerplant)*			
1292.	7790	*Stylidium roseoalatum (Pink-wing Triggerplant)*			
1293.	19260	*Stylidium sacculatum*		P3	
1294.	25806	*Stylidium scariosum*			
1295.	7798	*Stylidium schoenoides (Cow Kicks)*			
1296.		*Stylidium sp.*			
1297.	33081	*Stylidium sp. Moora (J.A. Wege 713)*		P2	
1298.	25836	*Stylidium spiciforme (Spiciform Triggerplant)*			
1299.	20608	*Stylidium stenosepalum*			
Surianaceae					
1300.	3181	*Stylobasium australe*			
Sylviidae					
1301.	25755	*Acrocephalus australis (Australian Reed Warbler)*			
1302.	25758	*Megalurus gramineus (Little Grassbird)*			
Tamaricaceae					
1303.	33020	*Tamarix parviflora*	Y		
Teloschistaceae					
1304.	27630	*Caloplaca flavorubescens*			Y
1305.		*Caloplaca sp.*			
1306.	28065	*Teloschistes chrysophthalmus*			
Terapontidae					
1307.		*Pelates octolineatus*			
Testudinellidae					
1308.		*Testudinella patina*			
Tettigoniidae					
1309.	33993	*Throscodectes xederoides (Mogumber Bush Cricket)*		P3	
Thelypteridaceae					
1310.	54	*Cyclosorus interruptus*			
Theridiidae					
1311.		*Latrodectus hasseltii*			
Threskiornithidae					
1312.	24841	*Platalea flavipes (Yellow-billed Spoonbill)*			
1313.	24842	*Platalea regia (Royal Spoonbill)*			
1314.	24845	*Threskiornis spinicollis (Straw-necked Ibis)*			
Thymelaeaceae					
1315.	11667	*Pimelea brevistyla subsp. brevistyla*			
1316.	11928	*Pimelea ciliata subsp. ciliata*			
1317.	5244	*Pimelea floribunda*			
1318.	12041	*Pimelea suaveolens subsp. suaveolens*			
1319.	5268	*Pimelea sulphurea (Yellow Banjine)*			
Unionicolidae					
1320.		*Koenikea nr australica (=verrucosa)*			
Urodacidae					
1321.		*Urodacus novaehollandiae*			

	Name ID	Species Name	Naturalised	Conservation Code	[1]Endemic To Query Area
Usneaceae					
1322.	28227	*Usnea scabrida subsp. scabrida*			
Vespertilionidae					
1323.	24186	*Chalinolobus gouldii (Gould's Wattled Bat)*			
Xanthorrhoeaceae					
1324.	1280	*Chamaescilla corymbosa (Blue Squill)*			
1325.	19338	*Chamaescilla gibsonii*		P3	
1326.	1281	*Chamaescilla spiralis*			
1327.	8788	*Chamaescilla versicolor*			
1328.	1256	*Xanthorrhoea preissii (Grass tree, Palga)*			
Zodariidae					
1329.		*Habronestes bradleyi*			
Zosteropidae					
1330.	25765	*Zosterops lateralis (Grey-breasted White-eye, Silvereye)*			

Conservation Codes
T - Rare or likely to become extinct
X - Presumed extinct
IA - Protected under international agreement
S - Other specially protected fauna
1 - Priority 1
2 - Priority 2
3 - Priority 3
4 - Priority 4
5 - Priority 5

[1] For NatureMap's purposes, species flagged as endemic are those whose records are wholely contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, 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 query area.

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APPENDIX B

Flora and Fauna Likelihood Assessments

Appendix D: Assessment of the Likely Occurrence of DRF and Priority Flora (DBCA and EPBC Database Searches) in the Survey Area

[1]Closest record to Survey Area based on DBCA 2018.Likely = Suitable habitat present and records less than 5 km from the Survey Area, Possible = Suitable habitat present and records between 5 km and 15 km from the Survey Area, and Unlikely = No suitable habitat present and/or records greater than 15 km from the Survey Area. En = Listed as Endangered under the EBPC Act, Vu = Listed as Vulnerable under the EBPC, Ce= Critically Endangered under the EBPC Act, P = Listed as Priority by the DPaW DRF = Declared Rare Flora as listed by the State

Species	Conservation Status		Habitat information	Distance to nearest Record (km)	Suitable Habitat present	Likelihood of occurrence in the Survey area
	EPBC	DBCA/WC Act				
Banksia fuscobractea	CR	T	Lateritic gravel, grey sand over laterite, hill tops ridges	13.2	No	Unlikely
Acacia cochlocarpa subsp. *cochlocarpa*	En	T	Clayey, sandy, often gravelly soils	86	No	Unlikely
Acacia splendens	En	T	White sand over clay, pale brown loam, cracked brown soil, gravel, laterite, ironstone. Slope of breakaways, especially southern slopes, hills.	16.6	No	Unlikely
Andersonia gracilis	En	T	White/grey sand, sandy clay, gravelly loam. Winter-wet areas, near swamps.	9.1	No	Unlikely
Banksia mimica	En	T	White or grey sand over laterite, sandy loam.	0.21	Yes	Recorded
Chamelaucium sp. Gingin (N.G.Marchant 6)	En	T	White/grey/brown/yellow gravelly sand.	-	Yes	Unknown
Conospermum densiflorum subsp. *unicephalatum*	En	T	Clay soils. Low-lying areas.	7.4	No	Unlikely
Conostylis wonganensis	En	T	Yellow sand, sandy clay.	69	No	Unlikely
Darwinia acerosa	En	T	Sand, loam, often moist soils, Granite outcrops, road verges.	4.24	No	Unlikely
Darwinia carnea	En	T	Lateritic loam and gravel	7.8	No	Unlikely
Diplolaena andrewsii	En	T	Loam, clay. Granite outcrops and hillsides.	73	No	Unlikely
Eremophila glabra subsp. *chlorella*	En	T	Sandy clay. Winter-wet depressions.	4.22	Yes	Likely
Eremophila scaberula	En	T	Clay, sandy clay or loam. Winter-wet plains, inundated areas.	22.9	No	Unlikely
Eucalyptus absita	En	T	White lateritic sand. Paddocks.	47.2	Yes	Unlikely
Eucalyptus leprophloia	En	T	White or grey sand over laterite. Valley Slopes.	93.4	Yes	Unlikely
Eucalyptus pruiniramis	En	T	Skeletal soils over sandstone or laterite. Rocky hillsides.	10.16	No	Unlikely
Eucalyptus recta	En	T	Sandy laterite.	38.4	Yes	Unlikely

Species	Conservation Status		Habitat information	Distance to nearest Record (km)	Suitable Habitat present	Likelihood of occurrence in the Survey area
	EPBC	DBCA/WC Act				
Eucalyptus x balanites	En	T	Sandy soils with lateritic gravel.	89.6	Yes	Unlikely
Gastrolobium hamulosum	En	T	Sandy, often gravelly soils or clay. Flats, slopes, ridges.	39.6	Yes	Unlikely
Goodenia arthrotricha	En	T	Gravel. Granite rocks, slopes.	2.39	No	Unlikely
Grevillea curviloba subsp. *incurva*	En	T	Sand, sandy loam. Winter-wet heath.	46.6	Yes	Unlikely
Grevillea pythara	En	T	Sand or sandy loam with gravel.	95.5	Yes	Unlikely
Hemiandra gardneri	En	T	Grey or yellow sand, clayey sand. Sandplains.	45.3	Yes	Unlikely
Lepidosperma rostratum	En	T	Peaty sand, clay.	1.31	No	Unlikely
Melaleuca sciotostyla	En	T	Orange clayey sand with lateritic pebbles. Scree slopes.	25.49	No	Unlikely
Roycea pycnophylloides	En	T	Sandy soils, clay. Saline flats.	117.4	No	Unlikely
Spirogardnera rubescens	En	T	Laterite, sand over laterite, loam.	14.9	Yes	Possible
Thelymitra dedmaniarum	En	T	Granite	25.76	No	Unlikely
Thelymitra stellata	En	T	Sand, gravel, lateritic loam.	46.8	Yes	Unlikely
Thomasia sp. Green Hill (S.Paust 1322)	En	T	Rocky rise.	-	No	Unlikely
Banksia serratuloides subsp. *serratuloides*	Vu	T	Loam or clay loam over laterite, sandy gravel.	4.24	No	Unlikely
Eleocharis keigheryi	Vu	T	Clay, sandy loam. Emergent in freshwater; creeks, claypans	7.4	No	Unlikely
Grevillea bracteosa subsp. *bracteosa*		T	Gravelly hills and slopes, clay loam.	6.5	No	Unlikely
Stylidium semaphorum		T	Lateritic gravelly soils. Hill summits.	21.5	No	Unlikely
Drosera leucostigma		P1	Margins of wet depressions.	61.3	No	Unlikely
Synaphea panhesya		P1	Gravelly loam & sandy gravel	5.9	No	Unlikely
Acacia browniana var. *glaucescens*		P2	Lateritic gravelly soils.	4.24	No	Unlikely
Lepyrodia curvescens		P2	Sand, laterite. Seasonally inundated swamplan.	4.51	No	Unlikely
Synaphea rangiferops		P2	Sandy loam, gravel.	4.22	No	Unlikely
Acacia anarthros		P3	Lateritic gravelly soils. Slopes.	16.75	No	Unlikely

Species	Conservation Status		Habitat information	Distance to nearest Record (km)	Suitable Habitat present	Likelihood of occurrence in the Survey area
	EPBC	DBCA/WC Act				
Acacia cummingiana		P3	Grey or yellow sand, lateritic gravel. Sandplains, lateritic breakaways.	10.5	Yes	Possible
Acacia drummondii subsp. *affinis*		P3	Lateritic gravelly soils	9.09	No	Unlikely
Acacia oncinophylla subsp. *oncinophylla*		P3	Granitic soils.	4.24	No	Unlikely
Acacia pulchella var. *reflexa* acuminate bracteole variant (R.J. Cumming 882)		P3	Sandy loam or sandy clay over laterite. Woodland.	Data not available	No	Unlikely
Acacia ridleyana		P3	Grey or yellow/brown sand, gravelly clay, granitic loam.	4.22	Yes	Likely
Allocasuarina grevilleoides		P3	Sand over laterite, gravel.	4.24	Yes	Likely
Babingtonia urbana		P3	Swamp, wetland areas, brown loam	28	No	Unlikely
Banksia dallanneyi subsp. *pollosta*		P3	Grey/yellow sand. Flats, lateritic rises.	7.11	Yes	Recorded
Banksia kippistiana var. *paenepeccata*		P3	Lateritic gravelly soils.	9.62	No	Unlikely
Banksia pteridifolia subsp. *vernalis*		P3	White/grey sand over laterite.	10.73	Yes	Recorded
Beaufortia eriocephala		P3	Lateritic sandy soils. Slopes.	7.63	No	Unlikely
Calytrix ecalycata subsp. *brevis*		P3	Dry yellow sand. Sandplains, low rises.	35.6	No	Unlikely
Chamaescilla gibsonii		P3	Winter-wet flats, shallow water-filled claypans.	4.24	No	Unlikely
Conospermum scaposum		P3	White-grey sand, sandy clay. Low swampy areas, road verges.	0.69	No	Unlikely
Dielsiodoxa leucantha subsp. *leucantha*		P3	White sandy clay, hilltops, low ironstone, brown laterite.	4.22	No	Unlikely
Eucalyptus macrocarpa x pyriformis		P3	Sand, lateritic sandy soils. Hills, rocky ironstone ridges, sandplains.	4.24	No	Unlikely
Grevillea florida		P3	Sand, sandy clay, gravel, laterite. Sandplain, slopes, road verges.	4.30	Yes	Likely
Guichenotia impudica		P3	Laterite, brown clayey sand, undulating plains, base of hills.	4.22	No	Unlikely

Species	Conservation Status		Habitat information	Distance to nearest Record (km)	Suitable Habitat present	Likelihood of occurrence in the Survey area
	EPBC	DBCA/WC Act				
Guichenotia micrantha		P3	Yellow or red sand, gravelly lateritic soils. Sandplains, breakaways, rocky hills, granite rocks.	3.4	No	Unlikely
Guichenotia tuberculata		P3	Sand clay over laterite, sand.	4.22	No	Unlikely
Haemodorum loratum		P3	Grey or yellow sand, gravel.	12.93	Yes	Possible
Hibbertia glomerata subsp. *ginginensis*		P3	Sand, brown clay, laterite. Near roadsides.	18.93	No	*Unlikely*
Isopogon drummondii		P3	Yellow, grey sand, laterite gravel, hills, hills slopes, flats.	1.40	Yes	Recorded
Lasiopetalum caroliae		P3	Slopes, brown clayey sand, laterite, gravel	15.48	No	Unlikely
Lasiopetalum venustum		P3	Slopes, undulating flats, rock, gravel, brown sandy loam over laterite.	16	No	Unlikely
Lepidobolus quadratus		P3	Lateritic gravel, grey white sand. Dry kwongan.	45.36	Yes	Unlikely
Leucopogon allittii		P3	Yellow, grey sand over laterite gravel.	4.22	Yes	Likely
Persoonia rudis		P3	White, grey or yellow sand, often over laterite.	4.22	Yes	Likely
Petrophile biternata		P3	Yellow/grey sand and gravel, laterite, quartzite soils. Lateritic ridges, plains.	6.88	Yes	Possible
Petrophile plumosa		P3	Red/brown laterite, loam. Sandplains, hills.	4.22	No	Unlikely
Platysace ramosissima		P3	Grey, white, yellow sandy soils.	20.4	Yes	Unlikely
Schoenus benthamii		P3	White, grey sand, sandy clay. Winter-wet flats, swamps.	4.24	Yes	Likely
Stylidium nonscandens		P3	Sand over laterite. Hillslopes and crests. Banksia woodland, heath, mallee shrubland.	3.74	Yes	Recorded
Styphelia filifolia		P3	Brown, yellow, grey sand, slopes, flat sandplains.	11.87	Yes	Possible
Acacia alata var. platyptera		P4	Clay, gravelly sandy clay. Lateritic ridges, clay flats.	8.29	No	Unlikely
Anigozanthos humilis subsp. *chrysanthus*		P4	White, grey or yellow sand. Slopes, flats.	4.22	Yes	Likely

Species	Conservation Status		Habitat information	Distance to nearest Record (km)	Suitable Habitat present	Likelihood of occurrence in the Survey area
	EPBC	DBCA/WC Act				
Banksia chamaephyton (Fishbone Banksia)		P4	Grey or white sand over laterite.	0.76	Yes	Recorded
Calothamnus pachystachyus		P4	Lateritic soils, often gravelly. Ridges, road verges.	1.44	No	Unlikely
Hibbertia miniata		P4	Lateritic gravelly soils.	10.43	No	Unlikely
Persoonia sulcata		P4	Lateritic or granitic soils	4.22	No	Unlikely
Synaphea grandis		P4	Brown sandy loam over laterite, low rises, hills.	16.69	No	Unlikely
Thelymitra apiculata		P4	Grey sand, lateritic gravel.	4.22	yes	Likely
Thysanotus glaucus		P4	White, grey or yellow sand, sandy gravel.	10.45	Yes	Possible
Verticordia lindleyi subsp. *lindleyi*		P4	Sand, sandy clay. Winter-wet depressions.	1.23	Yes	Likely
Verticordia paludosa		P4	White/grey sand. Winter-wet flats.	0.14	Yes	Likely

Table 12: Conservation Significant Fauna Potentially Occurring in the Survey Areas

Key: EPBC = Environmental Protection and Biodiversity Conservation Act 1999, WC = Wildlife Conservation Act 1950, DBCA = Department of Biodiversity, Conservation and Attractions Priority Code, A = Listed in Naturemap Search, B = EPBC Protected Matters Search, C = DBCA Threatened and Priority Fauna Search, D = Current Survey;

CR = Critically Endangered, EN = Listed as Endangered, VU = Listed as Vulnerable, IA = International Agreement, Mi = Listed as Migratory, CD = Consrvation dependent fauna, S = Specially protected fauna, OS = Other specially protected fauna under the EBPC Act, Ma = Listed as Marine under the EBPC Act, P = Listed as Priority by the DBCA.

		Conservation Codes							Likelihood of
Scientific Name	Common Name	EPBC	WC	DBCA	A	B	C	D	Occurrence
REPTILIAN									
ELAPIDAE									
Neelaps calonotos	Black-striped Snake			P3			X		Medium
SCINCIDAE									
Egernia stokesii supsp. Badia	Western Spiny-tailed Skink	EN	VU				X		Low
AVIAN									
ACCIPITRIDAE									
Haliaeetus leucogaster	White-bellied Sea-Eagle	Ma	IA			X			Low
APODIDAE									
Apus pacificus	Fork-tailed Swift	MiMa	IA			X			Medium
CACATUIDAE									
Calyptorhynchus banksii naso	Forest Red-tailed Black Cockatoo	VU	VU				X		Low
Calyptorhynchus baudinii	Baudin's Cockatoo	EN	EN				X		Low
Calyptorhynchus latirostris	Carnaby's Cockatoo (short-billed black-cockatoo), Carnaby's Cockatoo	EN	EN			X	X		High
FALCONIDAE									
Falco peregrinus	Peregrine Falcon		S	OS			X		Medium
MEGAPODIIDAE									
Leipoa ocellata	Malleefowl	VU	VU		X	X	X		Low
MEROPIDAE									
Merops ornatus	Rainbow Bee-eater	Ma	IA		X	X			Medium
MOTACILLIDAE									
Motacilla cinerea	Grey Wagtail	MiMa	IA			X			Low
PANDIONIDAE									
Pandion haliaetus	Osprey	MiMa	IA			X			Low
THRESKIORNITHIDAE									
Plegadis falcinellus	Glossy Ibis	MiMa	IA				X		Low
MAMMALIAN									
DASYURIDAE									
Dasyurus geoffroii	Western Quoll, Chuditch	VU	VU			X	X		Medium
Phascogale calura	Red-tailed Phascogale, Red-tailed Wambenger	VU	CD			X			Low
Phascogale tapoatafa subsp. wambenger	South-western Brush-tailed Phascogale		VU				X		Low
MACROPODIDAE									
Notamacropus irma	Western Brush Wallaby			P4	X		X		Medium
MURIDAE									
Hydromys chrysogaster	Water-rat, Rakali			P4			X		Low
PERAMELIDAE									
Isoodon obesulus subsp. fusciventer	Southern Brown Bandicoot, Quenda			P4	X		X		High

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