

PT LOT 13 HORTON ROAD, THE LAKES

FLORA, VEGETATION AND BLACK COCKATOO HABITAT SURVEY

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1 INTRODUCTION

1.1 Background

Lot 13 Horton Road, The Lakes, is located in the Shire of Northam approximately 50km east-north-east of the Perth Central Business District (Figure 1). The central portion of the lot is used by Purearth for a composting facility. Purearth intends to expand the operation to the north of the current facility. The proposed expansion area (the site) is approximately 7ha in size and would include hardstand as well as two storage dams (Figure 2).

The site contains some native trees and potentially some native understorey. PGV Environmental was commissioned by Purearth to undertake a Flora, Vegetation and Black Cockatoo Habitat Assessment of the site.

1.2 Scope of Works

1.2.1 Detailed Flora and Vegetation Survey

A Detailed Flora and Vegetation Survey was undertaken in accordance with EPA Technical Guidance *Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016). The survey included:

- Desktop search and review of the Department of Biodiversity, Conservation and Attractions (DBCA) Naturemap website (DBCA, 2021);
- A search of the Commonwealth Government's Protected Matters Search Tool (DAWE, 2021) to identify species potentially occurring within the area that are protected under the *Environment Protection and Biodiversity Conservation (EPBC) Act 1999*;
- Examination of historic and recent aerial photography and contour and soil maps to provisionally identify vegetation types and condition;
- A thorough site walkover of any areas of native vegetation;
- Recording of any significant plant species using a hand-held GPS; and
- Description and mapping of vegetation types and vegetation condition.

1.2.2 Black Cockatoo Habitat Assessment

A Black Cockatoo Habitat Assessment was undertaken to:

- Describe the Black Cockatoo habitat on the site;
- Map foraging habitat, potential breeding and potential roosting habitat;
- Assess the impact of proposed clearing on Black Cockatoos;
- Ascertain whether referral of the proposed development is required under the EPBC Act; and
- Make recommendations on mitigating any impact on Black Cockatoo species.

2 EXISTING ENVIRONMENT

2.1 Land Use

Examination of historical aerial photography shows the site was covered in native vegetation up until the early 1980s after which the site was mostly cleared presumably for grazing purposes. Stands of native trees and individual trees have been retained on the site (Plate 1) (Landgate, 2021).

Plate 1: Aerial Photograph 2021 (Landgate, 2021)



2.1.1 Current Land Use

The site is currently not used for grazing or any other purpose.

2.1.2 Surrounding Land Use

The site is bounded by similar pasture and partially treed land to the west, north and east and by the composting facility to the south.

2.2 Topography

The site is located on a broad ridge with a high point of around 294m AHD along the mid-southern boundary. The site slopes gently down to the west, north and east with the lowest point around 288m AHD along the western boundary (Figure 2).

2.3 Geology and Soils

2.3.1 Geology

Geologically the western side of the Shire of Northam consists of laterites of the Darling Scarp overlying granites of the Yilgarn Block. The Northam-York District consists of Archaean granites, gneisses and migmites with some meta-sediments and volcanic areas (McArthur, 1991).

2.3.2 Soils

The soil on the site has been mapped and described in the Yalanbee Subsystem (Ya) as 253WnYa which is described as residual plateau at the top of the landscape shallowly dissected by Pindalup valleys. The soil is pisolitic gravelly, yellowish brown soils that vary from loamy sands to clays, with pockets of pale sands and areas of outcropping laterite (DPIRD, 2021).

2.4 Hydrology

Groundwater is at depth and there are no surface expressions of groundwater on the site (DWER, 2021). There are no wetlands or water courses on the site. Some low-lying areas, including a creekline occur to the west, north and east of the proposed expansion area.

3 FLORA AND VEGETATION

3.1 Methodology

3.1.1 Desktop Searches

Searches of the following databases were undertaken prior to the site survey:

- DBCA Naturemap Database for a radius of 10km; and
- The Commonwealth Government's Protected Matters Search Tool to identify species potentially occurring within the area that are protected under the *Environment Protection and Biodiversity Conservation (EPBC) Act 1999*. A radius of 5km was used for this database.

3.1.2 Site Survey

A flora and vegetation survey of the site was conducted by Dr Paul van der Moezel on 9 December 2021 in accordance with *Technical Guidance: Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016). The survey included a thorough walk over the area and shown in the Track Log (Plate 2). The survey was not able to be undertaken earlier than December.

Plate 2: Survey Track Log



One quadrat was sampled in a small area that contained some native understorey vegetation.

3.1.3 Survey Conditions

The conditions that the survey was undertaken in are presented in Table 1 in order to assess the adequacy of the survey. In summary, there were no constraints to the survey.

Table 1: Statement of Botanical Survey Conditions

Issue	Constraints (Y/N)*	Comment
Competency/experience of the consultant conducting the survey	No	Dr Paul van der Moezel has extensive botanical survey experience in the South-West of Western Australia including the Darling Range
Proportion of the flora identified^	No	The timing of the survey in early December was not optimal but only a very small area of native understorey was recorded and the condition rated as Good (as opposed to Very Good or Excellent). Therefore, the proportion of flora identified is considered likely to be fairly high.
Sources of information (historic/recent or new data)	No	The flora of the Perth Hills area is well documented.
Proportion of the task achieved and further work that may need to be undertaken	No	No follow-up survey required as no Threatened Flora expected to occur in other seasons.
Timing/weather/season/cycle	No	The timing of the survey in early December was not optimal but only a very small area of native understorey was recorded and the condition rated as Good (as opposed to Very Good or Excellent). Therefore, very few native species are expected to have been missed due to the December timing.
Disturbances (Fire)	No	The fire age of the vegetation was less than 5 years however due to the absence of intact native understorey over most of the site the fire age was not a constraint to the survey.
Intensity of survey (e.g. In retrospect was the intensity adequate)	No	Approximately 4 hours spent on the site which was longer than needed for the flora survey but included the Black Cockatoo habitat survey as well.
Completeness (e.g. was relevant area fully surveyed)	No	
Resources (e.g. degree of expertise available for plant identification)	No	All plant identifications occurred in the field
Remoteness and/or access problems	No	Accessible site close to Perth.
Availability of contextual (e.g. bioregional) information for the study area.	No	Beard Vegetation Mapping

*Constraints have been rated as Significant, Moderate or No constraints

^Fungi and nonvascular flora (e.g. algae, mosses and liverworts) were not specifically surveyed for during the survey.

3.2 Desktop Studies

A search of the DBCA Naturemap database (Appendix 1) (DBCA, 2021) indicates that a number of species that are listed as Endangered, Threatened or Priority are identified as being recorded within 10km of the site. The EPBC Act Protected Matters Search Tool (DAWE, 2021) indicates species that potentially have habitat within 5km of the site (Appendix 2). The results from these database searches are shown in Table 2.

Table 2: Conservation Significant Flora Identified in Database Searches

Species	Common Name	Conservation Status in WA	Status Under EPBC Act 1999
<i>Thelymitra dedmaniarum</i>	Cinnamon Sun-orchid	Critically Endangered	Endangered
<i>Diplolaena andrewsii</i>	Native Wild Rose	Endangered	Endangered
<i>Diuris purdiei</i>	Purdie's Donkey-orchid	Endangered	Endangered
<i>Thelymitra stellata</i>	Star Sun-orchid	Endangered	Endangered
<i>Acacia aphylla</i>	Leafless Rock Wattle	Vulnerable	Vulnerable
<i>Andersonia gracilis</i>	Slender Andersonia	Vulnerable	Endangered
<i>Anthocercis gracilis</i>	Slender Tailflower	Vulnerable	Vulnerable
<i>Diuris micrantha</i>	Dwarf Bee-orchid	Vulnerable	Vulnerable
<i>Grevillea flexuosa</i>	Zig Zag Grevillea	Vulnerable	Vulnerable
<i>Senecio gilbertii</i>		Priority 1	
<i>Cyanicula ixioides</i> subsp. <i>candida</i>		Priority 2	
<i>Adenanthos cygnorum</i> subsp. <i>chamaephyton</i>		Priority 3	
<i>Meionectes tenuifolia</i>		Priority 3	
<i>Synaphea diabolica</i>		Priority 3	
<i>Tetradlea pilifera</i>		Priority 3	
<i>Thysanotus cymosus</i>		Priority 3	
<i>Cyanicula ixioides</i> subsp. <i>ixioides</i>		Priority 4	
<i>Daviesia oxylabium</i>		Priority 4	
<i>Grevillea pimeleoides</i>		Priority 4	
<i>Hibbertia montana</i>		Priority 4	
<i>Trithuria australis</i>		Priority 4	

Definitions of the Conservation Codes are in Appendix 3.

3.3 Survey Results

3.3.1 Vegetation

Vegetation Complexes

Vegetation Complexes are a broad level of vegetation description which is based on the underlying geomorphology and rainfall. The vegetation on the site is part of the Murray 2 Complex which is on the Darling Plateau (National Map, 2021). The complex is described as:

Open forest of Eucalyptus marginata subsp. thalassica-Corymbia calophylla-Eucalyptus patens and woodland of Eucalyptus wandoo with some Eucalyptus accedens on valley slopes to

woodland of Eucalyptus rudis-Melaleuca raphiophylla on the valley floors in semiarid and arid zones (Shepherd et al., 2001).

There is a small area in the southern part of the site that is mapped in the Yalanbee, Y5 complex which is:

Mixture of open forest of Eucalyptus marginata subsp. thalassica-Corymbia calophylla and woodland of Eucalyptus wandoo on lateritic uplands in semiarid to perarid zones (Shepherd et al., 2001).

The vegetation on the site is mapped as Medium Forest Jarrah Marri e2,3Mc (Hedde et al. 1980).

The remnant trees on the site are not considered representative of any intact vegetation complexes.

Vegetation Type

The remnant trees on the site are predominantly Marri (*Corymbia calophylla*) with a few scattered Jarrah (*Eucalyptus marginata*) and one Wandoo tree (*Eucalyptus wandoo*) (Plate 3). The vegetation type is described as a *Corymbia calophylla* (Marri) Low Open Woodland with occasional *Eucalyptus marginata* (Jarrah) over pasture (Figure 3).

Plate 3: Typical vegetation on the site



One small area of about 0.5ha in the north-east corner of the site contains some native understorey species (Plate 4). The most common understorey species was *Hakea lissocarpha* with other species only sparsely present. The vegetation in this area is described as *Corymbia calophylla* (Marri) Low Open Woodland over *Hakea lissocarpha* Low Open Shrubland.

Plate 4: Small area with native understorey



3.3.2 Vegetation Condition

The condition of the vegetation was assessed according to the system devised by Keighery and described in Bush Forever (Government of Western Australia, 2000) (Table 3).

Table 3: Vegetation Condition Rating Scale.

Condition	Description
Pristine	Pristine or nearly so, no obvious signs of disturbance.
Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species.
Very Good	Vegetation structure altered, obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbance. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and grazing.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.
Completely Degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs.

Source: Government of Western Australia, 2000.

The site mostly contains native trees over pasture and is rated as Completely Degraded. A small area with some native understorey in the north-east corner of the site was rated as Good (Figure 3).

The site was severely burnt in May 2015 and the damage to the vegetation is still evident (Plate 5).

Plate 5: Evidence of Impact by Fire



3.3.3 Flora

A total of 38 plant species were recorded on the site. The total included 27 native species and 11 introduced species. All the native species apart from the three tree species were recorded in the small area of native vegetation in the north-east corner of the site.

A survey in spring would likely record a few more ephemeral native species in the north-east corner, but unlikely to be many due to the small size and low quality of the vegetation in that area.

None of the species is a Threatened or Priority flora species.

3.4 Conservation Significance of Flora and Vegetation

3.4.1 Vegetation

The predominantly parkland cleared site and the small area of native vegetation in the north-east corner are not part of any Threatened or Priority Ecological Communities or poorly represented Vegetation Complexes.

3.4.2 Flora

No Conservation Significant species in the database searches were recorded on the site or are likely to occur due to the Completely Degraded condition of most of the site and the very small (0.5ha) size and low condition of the native vegetation in the north-east corner.

4 BLACK COCKATOO HABITAT ASSESSMENT

4.1 Black Cockatoo Species

4.1.1 Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*)

Carnaby's Black Cockatoo is found in the south-west of Australia from Kalbarri through to Ravensthorpe. It has a preference for feeding on the seeds of *Banksia*, *Hakea*, *Eucalyptus*, *Grevillea*, *Pinus* and *Allocasuarina* spp. It is nomadic, often moving toward the coast after breeding. It breeds in tree hollows that are 2.5 – 12m above the ground and have an entrance of 23-30cm with a depth of 1-2.5m. Nesting mostly occurs in smooth-barked trees (e.g. Salmon Gum, Wandoo, Red Morrell). Eggs are laid from July to October, with incubation lasting 29 days (DoE, 2014).

The site is inside the boundary of the modelled distribution for Carnaby's Black Cockatoos (SEWPaC, 2012). The site is shown as being within an unconfirmed breeding area but is not within a confirmed breeding area (National Map, 2021).

4.1.2 Baudin's Black Cockatoo (*Calyptorhynchus baudinii*)

Baudin's Black Cockatoo is most common in the far south-west of Western Australia. It is known to breed from the southern forests north to Collie and east to near Kojonup. Baudin's Black Cockatoo is typically found in vagrant flocks and utilises the taller, more open Jarrah (*Eucalyptus marginata*) and Marri (*Corymbia calophylla*) woodlands where it feeds mainly on Marri seeds and various Proteaceous species (Johnstone, Johnstone and Kirkby, 2011).

The site is inside the modelled 'Known Foraging Area' distribution for Baudin's Black Cockatoos (SEWPaC, 2021).

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

Forest Red-tailed Black Cockatoos are endemic to the humid to sub-humid south-west of Western Australia (SEWPaC, 2012). The range of Forest Red-tailed Black Cockatoos is bound by Gingin in the north to Mt Helena, Christmas Tree Well, West Dale, North Bannister, Mt Saddleback, Kojonup, Rocky Gully, upper King River and Green Range (east of Albany) (SEWPaC, 2012; DoE, 2014). It nests in tree hollows with a depth of 1-5m, that are predominately Marri, Jarrah and Karri (*E. diversicolor*) and it feeds primarily on the seeds of Marri and Jarrah (Johnstone, Johnstone and Kirkby, 2011).

The site is inside the modelled distribution for Forest Red-tailed Black Cockatoos (SEWPaC, 2012).

4.2 Habitat Survey

PGV Environmental undertook a Black Cockatoo habitat assessment on 9 December 2021 in accordance with the *EPBC Act referral guidelines for three threatened Black Cockatoo species: Carnaby's cockatoo (endangered) Calyptorhynchus latirostris Baudin's cockatoo (vulnerable) Calyptorhynchus baudinii Forest red-tailed Black Cockatoo (vulnerable) Calyptorhynchus banksii naso* (SEWPaC, 2012) (Black Cockatoo Referral Guidelines) and the methodology that is outlined in the SPRAT Database for each of the Black Cockatoo species for Black Cockatoo Habitat Assessments.

The site was traversed on foot and information on Black Cockatoo foraging, roosting and breeding habitat was assessed. Track Logs are shown on Plate 4. The extent, type and quality of the vegetation present, including the presence and extent of plants known to be used by Black Cockatoos was investigated.

Breeding habitat was examined and, where possible, parts of trees that resembled possible breeding habitat were photographed from the ground to determine if there was suitable habitat. Potential breeding spouts/hollows that were determined to be hollow or could not be verified either way were recorded.

4.3 Habitat definitions

‘Foraging habitat’ for Black Cockatoos is determined from the plant species that are present on the site and evidence of feeding such as direct observation of birds or by chewed nuts and cones. ‘Roosting habitat’ is usually evident due to the presence of Black Cockatoos on the site in the evening and early morning and of scat under the roosting area. ‘Breeding habitat’ is defined as trees of species known to support breeding within the range of the species which either have a suitable nest hollow OR have a DBH of 500mm or greater.

4.4 Foraging

The site contains three species that are recognised as foraging habitat for all three species of Black Cockatoos (Davies 1966; Saunders 1980; Johnstone and Storr 1998; Johnstone and Kirkby 1999; Valentine and Stock, 2008; Groom 2011; Johnstone *et al.*, 2011; SEWPaC, 2012; Johnstone, *et al.*, 2013; Johnstone *et al.*, 2016) as shown in Table 4.

Table 4: Foraging Species for Carnaby’s Black Cockatoos Recorded on the Site

Species	Common Name	Part eaten	Priority for Foraging ¹
<i>Corymbia calophylla</i>	Marri	Seed, flowers	High
<i>Eucalyptus marginata</i>	Jarrah	Seed, flowers	High
<i>Eucalyptus wandoo</i>	White Gum	Seed, flowers	Low

¹ – Groom, 2011

There was evidence of foraging on Marri nuts by Forest Red-tailed Black Cockatoos (Plate 3).

Plate 3: Forest Red-tailed Black Cockatoo Foraging on Marri



The total amount of foraging habitat, as estimated using tree crown cover at around 1.4ha.

4.5 Roosting

Carnaby's Black Cockatoos are known to roost overnight in tall trees including native and introduced eucalypts and pine trees generally in close proximity to a fresh water source. The site does not contain a known roosting site for Carnaby's Black Cockatoos (DoP, 2011; Peck *et al.*, 2019; National Map, 2021). The nearest roosting sites are reported to be around 2.6km to the south-west (National Map, 2021).

No evidence of the trees being utilised for roosting by Black Cockatoos was observed in the assessment.

4.6 Breeding

Black Cockatoos are known to breed in hollows of large eucalypts, including Jarrah, Tuart and Marri trees. The site is not known as a breeding site for Black Cockatoos (DoP, 2011; National Map, 2021).

The site mostly contains Jarrah and Marri trees and one Wandoo tree. The Black Cockatoo Referral Guidelines define trees of certain species with a DBH of 300 to 500mm or greater, dependent on the tree species, as breeding habitat regardless of the presence or not of hollows. The theory behind this definition is the concept that while the trees may not currently contain hollows, they are mature enough that in the next 50 years or so a hollow might form and be of use to Black Cockatoos for the purposes of breeding.

A total of 19 trees were recorded on the site that had a DBH large enough to be considered potential breeding habitat (Figure 5; Appendix 9). The total included 17 Marri, one Jarrah and one Wandoo. The Wandoo, Tree 17, had a potential large vertical hollow (Plate 6). No evidence of usage by Black Cockatoos was observed around the rim of the potential hollow.

Plate 6: Vertical Hollow in Wandoo Tree 17



Many of the trees had been significantly impacted by fire in May 2015 and some have not recovered such as Tree 3 (Plate 7). The crown of some trees has partially recovered such as Tree 9 (Plate 8). The crown of all trees apart from the large Wandoo tree (#17) are considered too impacted by the recent fire to be able to form a large hollow in the future.

Plate 7: Tree 3 in Poor Condition



Plate 8: Tree 9 Crown Impacted by Fire



4.7 Regional Context

To assist in determining the significance of any impact on Black Cockatoo habitat on the site an assessment of Black Cockatoo habitat within the vicinity of the site was undertaken.

There are a large number of areas of reserved bushland including State Forest, Regional Parks and National Parks that occur within 12km of the site (Figure 5). The habitat in reserves exceeds a total area of 10,000ha. All sites contain foraging habitat and large trees that are potential breeding habitat.

4.8 Impact of Proposed Works

The survey area contains 1.4ha of foraging habitat and 19 habitat trees. The proposed development footprint has been designed to avoid as much of the foraging habitat and as many of the habitat trees as possible (Figure 6). The footprint has also avoided clearing any of the intact native vegetation in the north-east corner of the site. The large Wandoo tree on the site has also been avoided.

The design is shown in Figure 6. The extent of impact of the footprint would clear:

- 0.99ha of foraging habitat
- 16 habitat trees

4.9 Black Cockatoo Referral Guidelines

The EPBC Act referral guidelines for three threatened Black Cockatoo species: Carnaby's cockatoo (endangered) *Calyptorhynchus latirostris* Baudin's cockatoo (vulnerable) *Calyptorhynchus baudinii* Forest red-tailed Black Cockatoo (vulnerable) *Calyptorhynchus banksii naso* (SEWPaC, 2012) (Black

Cockatoo Referral Guidelines) contain several steps to determine whether or not a referral is required. These steps are:

1. The definition of habitat (breeding, roosting and foraging – Table 1 in the Black Cockatoo Referral Guidelines);
2. A description of the type of action that may have a high or low risk of being a significant impact and therefore require referral (Table 3 in the Black Cockatoo Referral Guidelines);
3. Formulation of a mitigation strategy to reduce the scale of impact; and
4. A flowchart to assist in decision making on whether or not an action should be referred.

Step 1 Black Cockatoo Habitat

Figure 6 shows the extent of impact on Black Cockatoo habitat. In summary, the development would clear 0.99ha of foraging habitat for Black Cockatoos and 16 trees that are considered to be potential breeding trees under the definition provided by the Department of the Agriculture, Water and the Environment (DAWE). There is however no recorded breeding or roosting on the site or evidence of such. In addition, all but one of the trees is considered too affected by past fires to form a large hollow in the future. The one tree with potential has been retained and would not be cleared.

Step 2 Level of Impact

Foraging

According to Table 3 in the Black Cockatoo Referral Guidelines the clearing of more than 1ha of quality foraging habitat has a high risk of causing a significant impact. Degradation of more than 1ha of quality habitat by things such as altered hydrology or fire regimes has an uncertain risk. The significance of degradation depends on the type of degradation and the quality of the habitat.

The development would result in the clearing of 0.99ha of foraging habitat. The Marri and Jarrah trees are considered quality foraging habitat. Clearing of 0.99ha of quality foraging habitat therefore would not result in a high risk of a significant impact.

Roosting

The Black Cockatoo Referral Guidelines consider the clearing of a known roosting site as a high risk of being a significant impact. The site is not mapped as having a known roosting site. There were no roosting sites recorded in the Significant Tree Survey and the risk of a significant impact on a known roosting site is considered to be low.

Breeding

According to Table 3 in the Black Cockatoo Referral Guidelines the clearing of any known nesting tree has a high risk of being a significant impact. A known nesting tree is defined in the Black Cockatoo Referral Guidelines as any existing tree in which breeding has been recorded or suspected. There are no known nesting trees that occur on the site and therefore there is no risk of a significant impact on known breeding habitat of Black Cockatoos.

The Black Cockatoo Referral Guidelines also consider that the clearing or degradation of any part of a vegetation community known to contain breeding habitat is likely to have a high risk of a significant

impact. In Table 1 of the Black Cockatoo Referral Guidelines breeding habitat is defined as woodlands, forests or isolated trees that contain or consist of live or dead trees of certain species with either a DBH of or greater than 500mm or the presence of suitable nest hollows. The site contains 19 trees with a DBH of or greater than 500mm, one of which contained a hollow potentially suitable for Black Cockatoos. According to Table 1 of the Black Cockatoo Referral Guidelines Black Cockatoos have the potential to breed in the Marri, Jarrah and Wandoo trees on the site in the future.

According to the Black Cockatoo Referral Guidelines the risk of a significant impact on breeding habitat of Black Cockatoos is considered to be low high as none of the 16 potential habitat trees that would be cleared is likely to form a large hollow in the future.

Surrounding Habitat

According to the Black Cockatoo Referral Guidelines clearing of vegetation that results in a gap of greater than 4km between patches of Black Cockatoo habitat (foraging, roosting or breeding) has a high risk of having a significant impact. As listed in Table 6 there are greater than 10,000ha of reserves within 10km of the site that provide Black Cockatoo habitat. Therefore, the risk of creating a gap of greater than 4km between areas of Black Cockatoo habitat is considered to be very low.

Step 3 Mitigation

The consideration of a mitigation strategy during the determination of the level of impact and requirement to refer is allowed by the Black Cockatoo Referral Guidelines and setting in place the best practice mitigation strategy may reduce the level of impact and in turn the risk of a significant impact. Mitigation strategies include avoiding impact, managing impact so that there is no net decline in habitat and monitoring the effectiveness of mitigation.

The development footprint has been revised from earlier iterations to avoid as much of the Black Cockatoo habitat on site as possible. Mitigating the residual impact of clearing could include the planting of Marri and Jarrah trees in the surrounding pasture area.

Step 4 Referral Advice

The Decision Making flowchart in Figure 1 of the Black Cockatoo Referral Guidelines was applied to the site without consideration of mitigation strategies and is shown in sequence below:

- 1 Could the impacts of your action occur within the modelled distribution of the black cockatoos? – YES
- 2 Could the impacts of your action affect any black cockatoo habitat or individuals? - YES
- 3 Have you surveyed for black cockatoo habitat using the recommended methods? – YES
- 4 Could your action have a (significant) impact on black cockatoos or their habitat? – No
- 5 Is your impact mitigation best practice so that it may reduce the significance of your impacts on black cockatoos? Prioritise impact avoidance over impact minimisation - Yes

RESULT –Low risk of resulting in a significant impact.

5 SUMMARY AND CONCLUSIONS

5.1 Flora and Vegetation

The 2021 Detailed Flora and Vegetation Survey of the proposed hard stand and storage dam area resulted in the following findings:

- Most of the site is parkland cleared with Marri trees and some Jarrah. A small area (0.5ha) containing some native understorey species occurs in the north-east corner of the site;
- The condition of the vegetation is mostly Completely Degraded with the small area of native vegetation in the north-east corner rated as Good;
- The vegetation type is not a Threatened or Priority Ecological Community or part of a poorly reserve vegetation complex;
- A total of 38 plant species was recorded on the site, including 27 native and 11 introduced. 24 of the native species only occur in the small area of native vegetation in the north-east corner. The other three species are the trees throughout the site (Marri, Jarrah and one Wandoo);
- None of the species is a Threatened or Priority species. While the survey was undertaken in December, no Threatened or Priority species are expected to occur on the site in other seasons due to the very small area that contains some native understorey in the north-east corner and the low condition of this area;
- The development footprint has avoided the small area of intact native vegetation in the north-east corner of the site. Clearing the remaining Marri and Jarrah trees may need a Clearing Permit unless there is an exemption under the Clearing Permit Regulations for a structure less than 5ha in size.

5.2 Black Cockatoo Habitat

The Black Cockatoo Habitat Survey resulted in the following findings:

- The site contains 1.4ha of foraging habitat for three species of Black Cockatoo. Evidence of foraging on Marri nuts by Forest Red-tailed Black Cockatoos was recorded;
- The site does not contain any known roosting or breeding trees and no evidence of roosting or breeding was observed;
- The site contains 19 trees (17 Marri, one Jarrah and one Wandoo) that are defined as potential breeding habitat due to their diameter. Most of the trees were greatly impacted by fire and are highly unlikely to form a hollow in the future. The Wandoo tree had a potential vertical hollow large enough for Black Cockatoos to breed in. This tree has been avoided from clearing in the development design;
- There are more than 10,000ha of native vegetation in reserves in a 12km radius of the site; and
- The proposed development is likely to result in the clearing of 0.99ha of foraging habitat and 16 potential breeding habitat trees. None of the habitat trees is likely to form a large hollow in the future due to the impact of fires on the tree canopy. The outcome of the clearing is

likely to have a Low risk of a significant impact. Therefore, Referral under the Commonwealth EPBC Act is not a requirement.

5.3 Conclusions

The proposed expansion of the existing composting facility on Lot 13 Horton Road has been designed in consideration of the results of the flora, vegetation and Black Cockatoo habitat survey to avoid the clearing of an area of intact native vegetation, minimise the canopy of trees to be cleared and to avoid the clearing of a large Wandoo tree.

PGV Environmental considers the final design will have a minimal and acceptable impact on a small number fire-affected Marri and Jarrah trees on the site.

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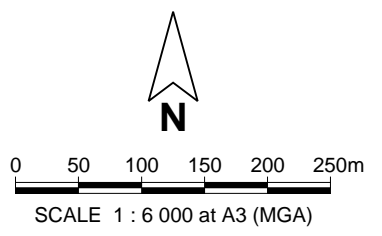
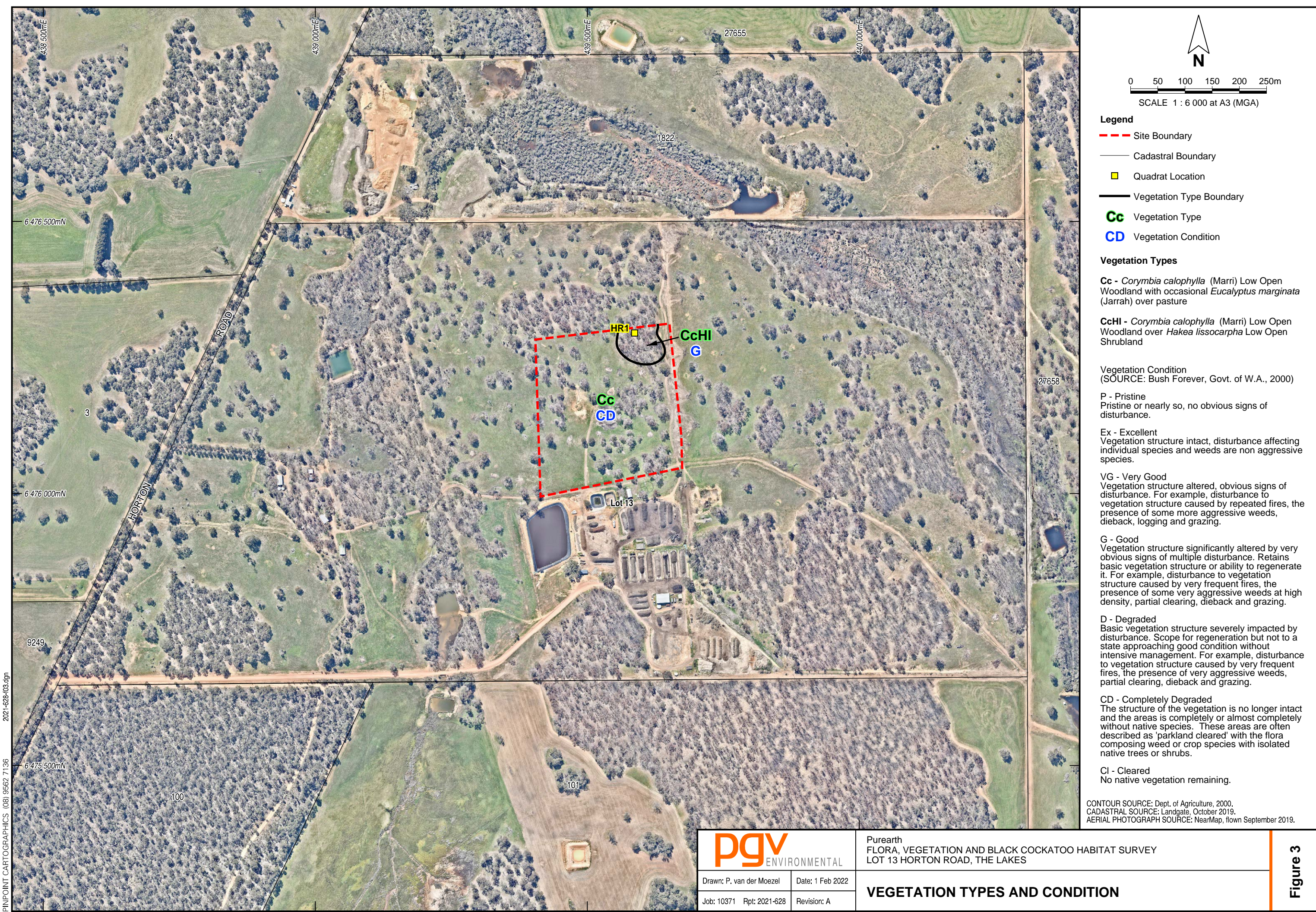
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FIGURES



Figure 1

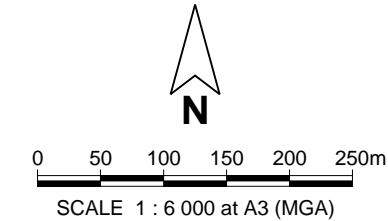
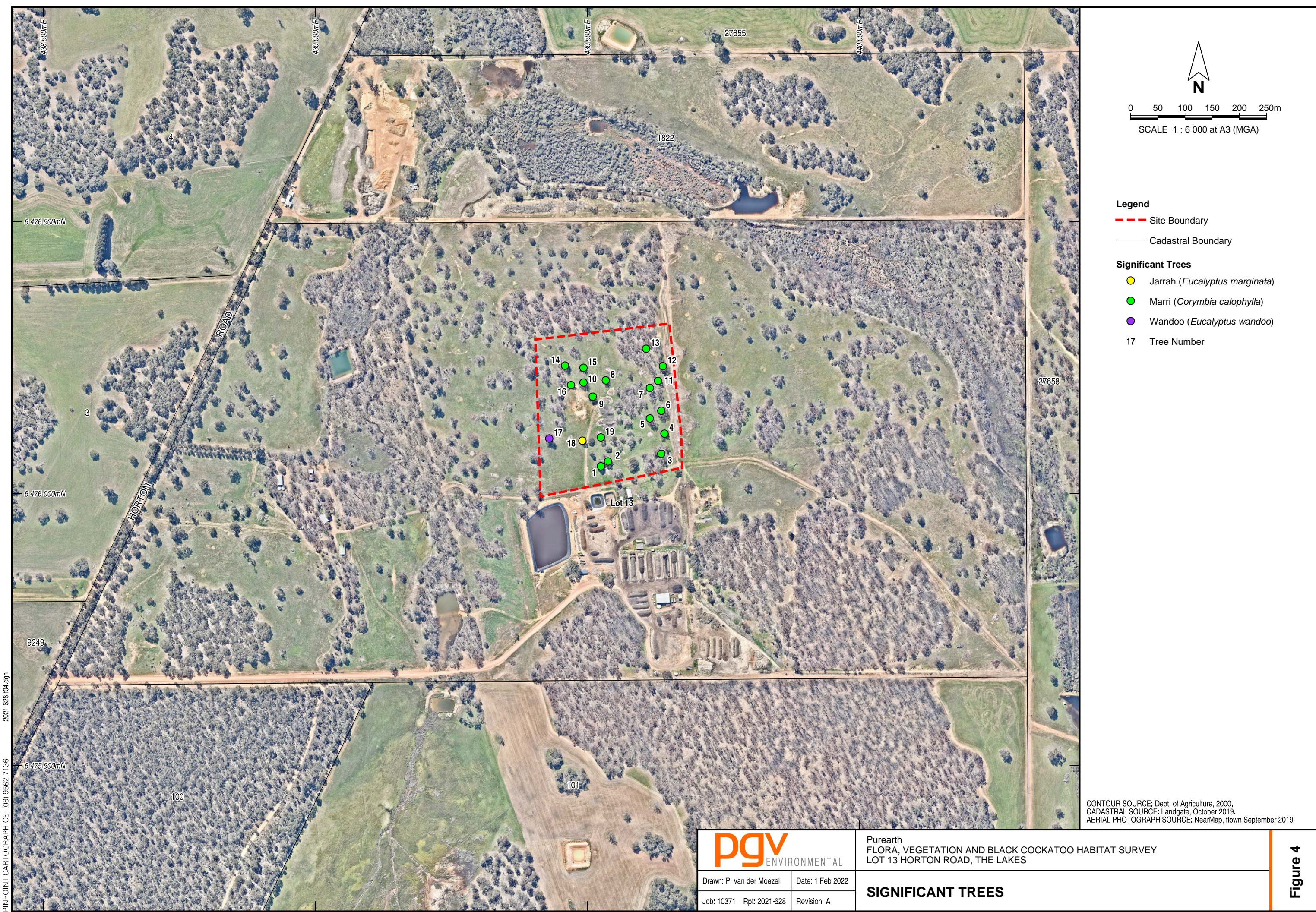


- Legend**
- Site Boundary
 - Cadastral Boundary
 - Quadrat Location
 - Vegetation Type Boundary
 - Cc** Vegetation Type
 - CD** Vegetation Condition
- Vegetation Types**
- Cc** - *Corymbia calophylla* (Marri) Low Open Woodland with occasional *Eucalyptus marginata* (Jarrah) over pasture
- CcHI** - *Corymbia calophylla* (Marri) Low Open Woodland over *Hakea lissocarpa* Low Open Shrubland
- Vegetation Condition**
(SOURCE: Bush Forever, Govt. of W.A., 2000)
- P** - Pristine
Pristine or nearly so, no obvious signs of disturbance.
- Ex** - Excellent
Vegetation structure intact, disturbance affecting individual species and weeds are non aggressive species.
- VG** - Very Good
Vegetation structure altered, obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.
- G** - Good
Vegetation structure significantly altered by very obvious signs of multiple disturbance. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and grazing.
- D** - Degraded
Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.
- CD** - Completely Degraded
The structure of the vegetation is no longer intact and the areas is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora composing weed or crop species with isolated native trees or shrubs.
- CI** - Cleared
No native vegetation remaining.

CONTOUR SOURCE: Dept. of Agriculture, 2000.
CADASTRAL SOURCE: Landgate, October 2019.
AERIAL PHOTOGRAPH SOURCE: NearMap, flown September 2019.

		Purearth FLORA, VEGETATION AND BLACK COCKATOO HABITAT SURVEY LOT 13 HORTON ROAD, THE LAKES	
Drawn: P. van der Moezel	Date: 1 Feb 2022	VEGETATION TYPES AND CONDITION	
Job: 10371 Rpt: 2021-628	Revision: A		

Figure 3



Legend

- Site Boundary
- Cadastral Boundary

Significant Trees

- Jarrah (*Eucalyptus marginata*)
- Marri (*Corymbia calophylla*)
- Wandoo (*Eucalyptus wandoo*)
- 17 Tree Number

CONTOUR SOURCE: Dept. of Agriculture, 2000.
CADASTRAL SOURCE: Landgate, October 2019.
AERIAL PHOTOGRAPH SOURCE: NearMap, flown September 2019.

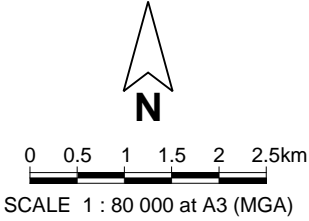
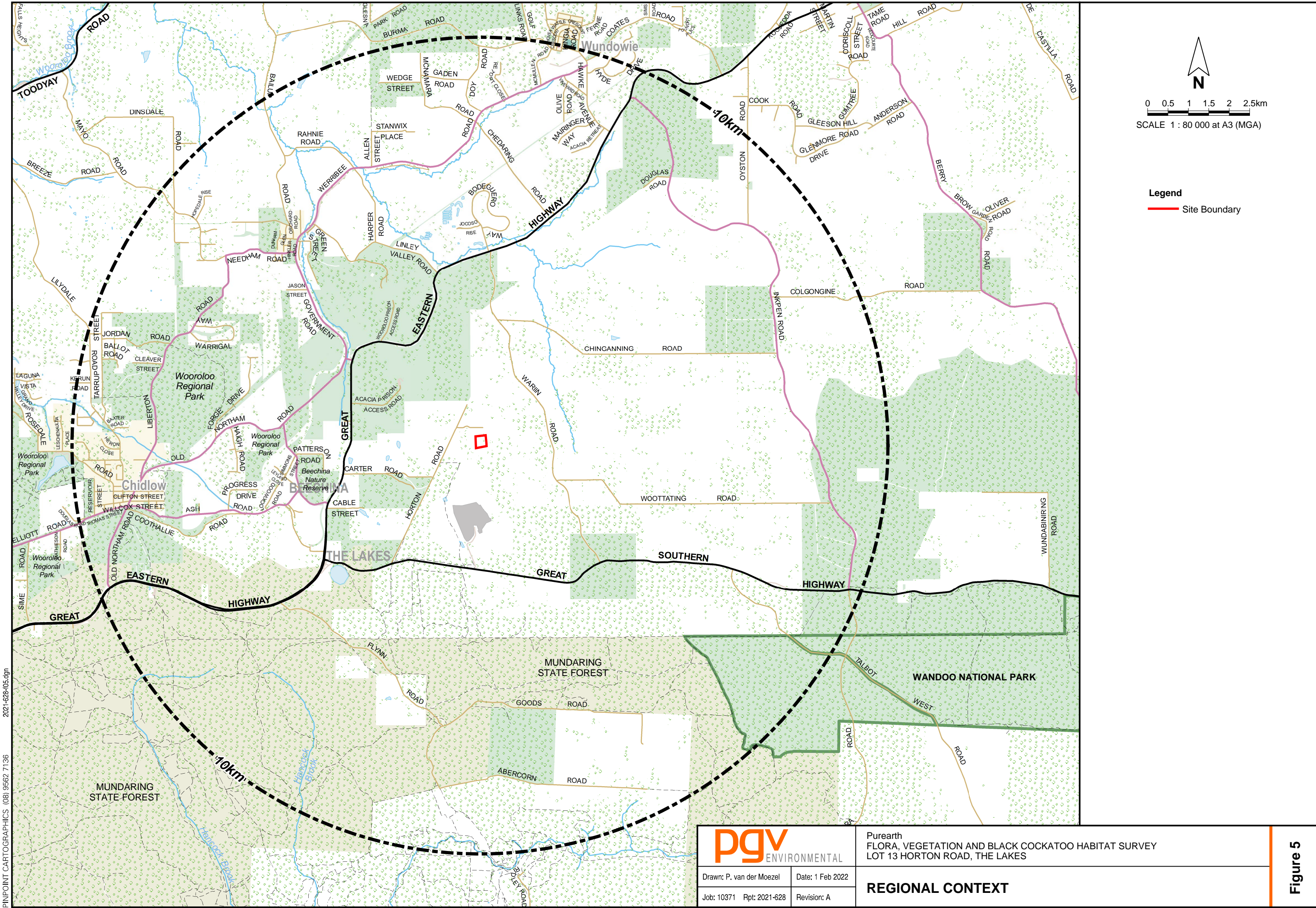


Purearth
FLORA, VEGETATION AND BLACK COCKATOO HABITAT SURVEY
LOT 13 HORTON ROAD, THE LAKES

Drawn: P. van der Moezel	Date: 1 Feb 2022
Job: 10371 Rpt: 2021-628	Revision: A

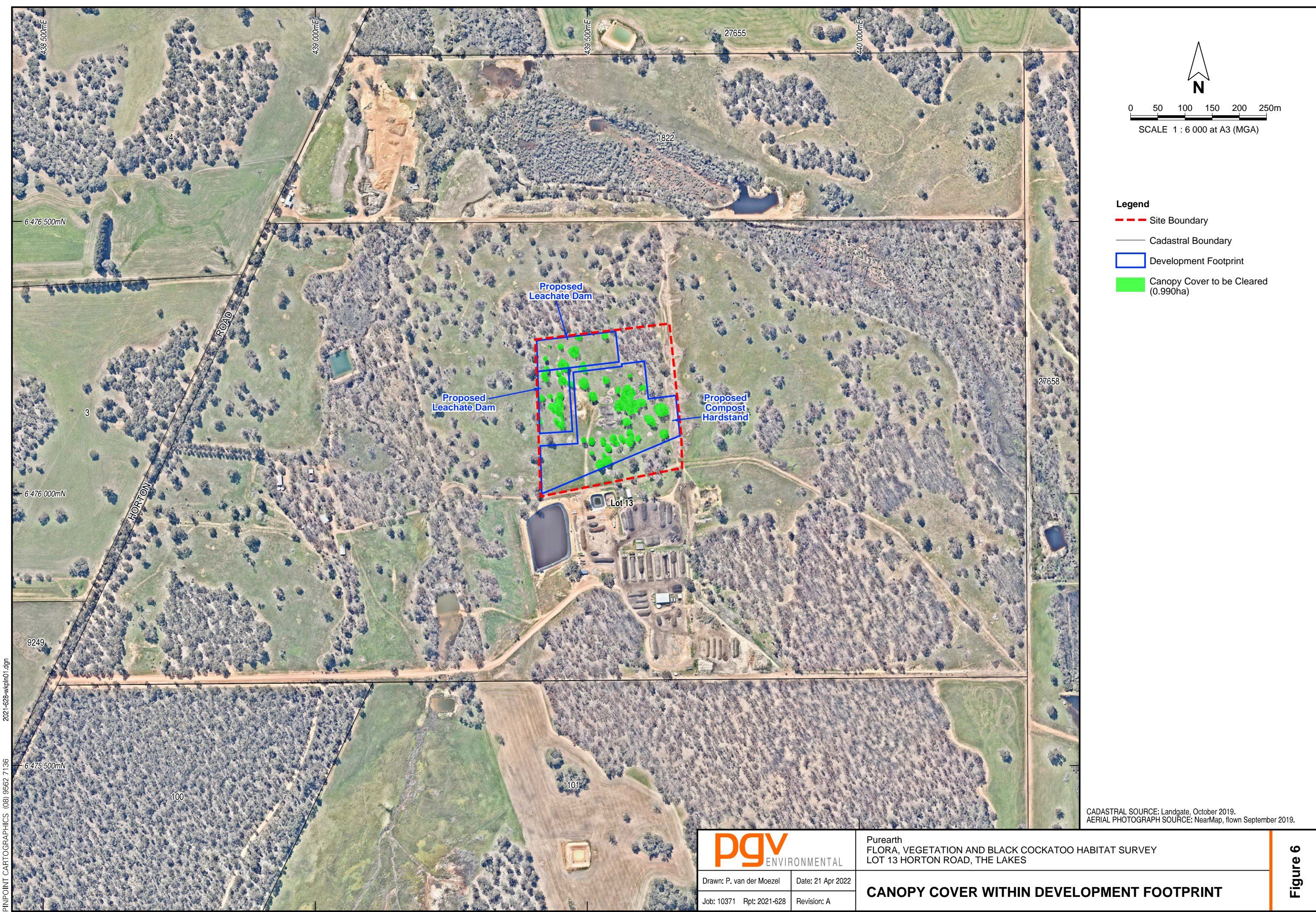
SIGNIFICANT TREES

Figure 4



Legend
Site Boundary

pgv ENVIRONMENTAL		Purearth FLORA, VEGETATION AND BLACK COCKATOO HABITAT SURVEY LOT 13 HORTON ROAD, THE LAKES
Drawn: P. van der Moezel	Date: 1 Feb 2022	
Job: 10371 Rpt: 2021-628	Revision: A	
REGIONAL CONTEXT		Figure 5



CADASTRAL SOURCE: Landgate, October 2019.
AERIAL PHOTOGRAPH SOURCE: NearMap, flown September 2019.

pgv ENVIRONMENTAL		Purearth FLORA, VEGETATION AND BLACK COCKATOO HABITAT SURVEY LOT 13 HORTON ROAD, THE LAKES	
Drawn: P. van der Moezel	Date: 21 Apr 2022	CANOPY COVER WITHIN DEVELOPMENT FOOTPRINT	
Job: 10371 Rpt: 2021-628	Revision: A		

Figure 6

APPENDIX 1

Naturemap Report

NatureMap Species Report

Created By Guest user on 15/12/2021

Current Names Only Yes
Core Datasets Only Yes
Method 'By Circle'
Centre 116° 21' 34" E, 31° 50' 58" S
Buffer 10km
Group By Conservation Status

Conservation Status	Species	Records
Non-conservation taxon	683	4011
Other specially protected fauna	2	5
Priority 1	1	2
Priority 2	1	1
Priority 3	5	24
Priority 4	9	33
Rare or likely to become extinct	10	99
TOTAL	711	4175

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
Rare or likely to become extinct				
1.	3220 <i>Acacia aphylla</i> (Leafless Rock Wattle)		T	
2.	24162 <i>Bettongia penicillata</i> subsp. <i>ogilbyi</i> (Woylie, Brush-tailed Bettong)		T	
3.	24731 <i>Calyptorhynchus banksii</i> subsp. <i>naso</i> (Forest Red-tailed Black Cockatoo)		T	
4.	24733 <i>Calyptorhynchus baudinii</i> (Baudin's Cockatoo, White-tailed Long-billed Black Cockatoo)		T	
5.	24734 <i>Calyptorhynchus latirostris</i> (Carnaby's Cockatoo, White-tailed Short-billed Black Cockatoo)		T	
6.	48400 <i>Calyptorhynchus</i> sp. (white-tailed black cockatoo)		T	
7.	24092 <i>Dasyurus geoffroii</i> (Chuditch, Western Quoll)		T	
8.	24557 <i>Leipoa ocellata</i> (Malleefowl)		T	
9.	24168 <i>Macrotis lagotis</i> (Bilby, Dalgyte, Ninu)		T	
10.	24146 <i>Myrmecobius fasciatus</i> (Numbat, Walpurti)		T	
Other specially protected fauna				
11.	25624 <i>Falco peregrinus</i> (Peregrine Falcon)		S	
12.	48070 <i>Phascogale tapoatafa</i> subsp. <i>wambenger</i> (South-western Brush-tailed Phascogale, Wambenger)		S	
Priority 1				
13.	8205 <i>Senecio gilbertii</i>		P1	
Priority 2				
14.	13827 <i>Cyanicula ixioides</i> subsp. <i>candida</i>		P2	
Priority 3				
15.	11336 <i>Adenanthos cygnorum</i> subsp. <i>chamaephyton</i>		P3	
16.	33638 <i>Meionectes tenuifolia</i>		P3	
17.	31765 <i>Synaphea diabolica</i>		P3	
18.	4540 <i>Tetratheca pilifera</i>		P3	
19.	1327 <i>Thysanotus cymosus</i>		P3	
Priority 4				
20.	13826 <i>Cyanicula ixioides</i> subsp. <i>ixioides</i>		P4	
21.	14755 <i>Daviesia oxylebium</i>		P4	
22.	24189 <i>Falsistrellus mackenziei</i> (Western False Pipistrelle, Western Falsistrelle)		P4	
23.	13086 <i>Grevillea pimeleoides</i>		P4	
24.	5146 <i>Hibbertia montana</i>		P4	
25.	24215 <i>Hydromys chrysogaster</i> (Water-rat, Rakali)		P4	
26.	48588 <i>Isodon fusciventer</i> (Quenda, southwestern brown bandicoot)		P4	
27.	48022 <i>Notamacropus irma</i> (Western Brush Wallaby)		P4	
28.	33019 <i>Trithuria australis</i>		P4	
Non-conservation taxon				
29.	15466 <i>Acacia applanata</i>			

	Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
30.	18285	<i>Acacia baileyana</i>	Y		
31.	15469	<i>Acacia barbinervis</i> subsp. <i>barbinervis</i>			
32.	3254	<i>Acacia celastrifolia</i> (Glowing Wattle)			
33.	11661	<i>Acacia drummondii</i> subsp. <i>drummondii</i>			
34.	11192	<i>Acacia drummondii</i> subsp. <i>elegans</i>			
35.	3320	<i>Acacia ephedroides</i>			
36.	3331	<i>Acacia extensa</i> (Wiry Wattle)			
37.	3374	<i>Acacia huegelii</i>			
38.	11519	<i>Acacia lasiocarpa</i> var. <i>bracteolata</i>			
39.	15721	<i>Acacia lasiocarpa</i> var. <i>sedifolia</i>			
40.	15476	<i>Acacia latipes</i> subsp. <i>latipes</i>			
41.	3442	<i>Acacia microbotrya</i> (Manna Wattle, Kalyang)			
42.	3454	<i>Acacia nervosa</i> (Rib Wattle)			
43.	3496	<i>Acacia preissiana</i>			
44.	15481	<i>Acacia pulchella</i> var. <i>glaberrima</i>			
45.	15483	<i>Acacia pulchella</i> var. <i>pulchella</i>			
46.	15480	<i>Acacia pulchella</i> var. <i>reflexa</i>			
47.	3515	<i>Acacia restiacea</i>			
48.	30033	<i>Acacia saligna</i> subsp. <i>lindleyi</i>			
49.		<i>Acacia</i> sp.			
50.	3557	<i>Acacia stenoptera</i> (Narrow Winged Wattle)			
51.	3574	<i>Acacia teretifolia</i>			
52.	3602	<i>Acacia willdenowiana</i> (Grass Wattle)			
53.	24260	<i>Acanthiza apicalis</i> (Broad-tailed Thornbill, Inland Thornbill)			
54.	24261	<i>Acanthiza chrysorrhoa</i> (Yellow-rumped Thornbill)			
55.	24262	<i>Acanthiza inornata</i> (Western Thornbill)			
56.	24560	<i>Acanthorhynchus superciliosus</i> (Western Spinebill)			
57.	25535	<i>Accipiter cirrocephalus</i> (Collared Sparrowhawk)			
58.	25536	<i>Accipiter fasciatus</i> (Brown Goshawk)			
59.	25755	<i>Acrocephalus australis</i> (Australian Reed Warbler)			
60.	7817	<i>Actinobole uliginosum</i> (Flannel Cudweed)			
61.	6205	<i>Actinotus leucocephalus</i> (Flannel Flower)			
62.	14970	<i>Adenanthos barbiger</i>			
63.	1775	<i>Adenanthos cygnorum</i> (Common Woollybush)			
64.	25544	<i>Aegotheles cristatus</i> (Australian Owlet-nightjar)			
65.	24301	<i>Aegotheles cristatus</i> subsp. <i>cristatus</i> (Australian Owlet-nightjar)			
66.	23474	<i>Agrostocrinum hirsutum</i>			
67.	185	<i>Aira cupaniana</i> (Silvery Hairgrass)	Y		
68.	1721	<i>Allocasuarina campestris</i>			
69.	1728	<i>Allocasuarina fraseriana</i> (Sheoak, Kondil)			
70.	20755	<i>Alstroemeria psittacina</i>	Y		
71.	2652	<i>Alternanthera nodiflora</i> (Common Joyweed)			
72.		<i>Ambicodamus kochi</i>			
73.		<i>Amblyomma triguttatum</i>			
74.	194	<i>Amphipogon amphipogonoides</i>			
75.	20197	<i>Amphipogon laguroides</i> subsp. <i>havelii</i>			
76.		<i>Aname mainae</i>			
77.	24312	<i>Anas gracilis</i> (Grey Teal)			
78.	24315	<i>Anas rhynchotis</i> (Australasian Shoveler)			
79.	24316	<i>Anas superciliosa</i> (Pacific Black Duck)			
80.	47414	<i>Anhinga novaehollandiae</i> (Australasian Darter)			
81.	11470	<i>Anigozanthos bicolor</i> subsp. <i>bicolor</i>			
82.	1409	<i>Anigozanthos humilis</i> (Catspaw)			
83.	11434	<i>Anigozanthos humilis</i> subsp. <i>humilis</i>			
84.	11261	<i>Anigozanthos manglesii</i> subsp. <i>manglesii</i>			
85.	24087	<i>Antechinomys laniger</i> (Kultarr)			
86.	24561	<i>Anthochaera carunculata</i> (Red Wattlebird)			
87.	24562	<i>Anthochaera lunulata</i> (Western Little Wattlebird)			
88.		<i>Antichtopauropus brevitarus</i>			Y
89.	24285	<i>Aquila audax</i> (Wedge-tailed Eagle)			
90.		<i>Arachnura higginsii</i>			
91.	24341	<i>Ardea pacifica</i> (White-necked Heron)			
92.	1264	<i>Arnocrinum preissii</i>			
93.	25566	<i>Artamus cinereus</i> (Black-faced Woodswallow)			
94.	24353	<i>Artamus cyanopterus</i> (Dusky Woodswallow)			
95.	24356	<i>Artamus personatus</i> (Masked Woodswallow)			
96.		<i>Asadipus kunderang</i>			
97.	6323	<i>Astroloma ciliatum</i> (Candle Cranberry)			
98.	6324	<i>Astroloma compactum</i>			
99.	6334	<i>Astroloma pallidum</i> (Kick Bush)			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
100.	<i>Austracantha minax</i>			
101.	17237 <i>Austrostipa elegantissima</i>			
102.	17240 <i>Austrostipa flavescens</i>			
103.	17254 <i>Austrostipa tenuifolia</i>			
104.	17257 <i>Austrostipa variabilis</i>			
105.	18279 <i>Babiana angustifolia</i>	Y		
106.	36441 <i>Babingtonia camphorosmae</i> (Camphor Myrtle)			
107.	<i>Badumna insignis</i>			
108.	<i>Baiami volucripes</i>			
109.	32682 <i>Banksia armata</i> var. <i>armata</i>			
110.	32677 <i>Banksia bipinnatifida</i>			
111.	32678 <i>Banksia bipinnatifida</i> subsp. <i>bipinnatifida</i>			
112.	32580 <i>Banksia dallanneyi</i> subsp. <i>dallanneyi</i> var. <i>dallanneyi</i>			
113.	32577 <i>Banksia dallanneyi</i> subsp. <i>dallanneyi</i> var. <i>mellicula</i>			
114.	32616 <i>Banksia dallanneyi</i> subsp. <i>sylvestris</i>			
115.	32560 <i>Banksia drummondii</i> subsp. <i>hiemalis</i>			
116.	32523 <i>Banksia fraseri</i> var. <i>fraseri</i>			
117.	1819 <i>Banksia grandis</i> (Bull Banksia, Pulgarla)			
118.	32080 <i>Banksia sessilis</i> var. <i>sessilis</i>			
119.	12111 <i>Banksia sphaerocarpa</i> var. <i>sphaerocarpa</i> (Fox Banksia)			
120.	32044 <i>Banksia squarrosa</i> (Pingle)			
121.	32045 <i>Banksia squarrosa</i> subsp. <i>squarrosa</i>			
122.	<i>Barnardius zonarius</i>			
123.	740 <i>Baumea arthropophylla</i>			
124.	747 <i>Baumea rubiginosa</i>			
125.	25788 <i>Billardiera fraseri</i> (Elegant Pronaya)			
126.	25798 <i>Billardiera fusiformis</i> (Australian Bluebell)			
127.	24319 <i>Biziura lobata</i> (Musk Duck)			
128.	7856 <i>Blennospora drummondii</i>			
129.	11381 <i>Boronia ramosa</i> subsp. <i>anethifolia</i>			
130.	4441 <i>Boronia spathulata</i> (Boronia)			
131.	3710 <i>Bossiaea eriocarpa</i> (Common Brown Pea)			
132.	3714 <i>Bossiaea ornata</i> (Broad Leaved Brown Pea)			
133.	3717 <i>Bossiaea pulchella</i>			
134.	7875 <i>Brachyscome glandulosa</i>			
135.	7878 <i>Brachyscome iberidifolia</i>			
136.	42381 <i>Brachyurophis semifasciatus</i> (Southern Shovel-nosed Snake)			
137.	2995 <i>Brassica x napus</i>	Y		
138.	244 <i>Briza maxima</i> (Blowfly Grass)	Y		
139.	250 <i>Bromus hordeaceus</i> (Soft Brome)	Y		
140.	24359 <i>Burhinus grallarius</i> (Bush Stone-curlew)			
141.	25714 <i>Cacatua pastinator</i> (Western Long-billed Corella)			
142.	25715 <i>Cacatua roseicapilla</i> (Galah)			
143.	25716 <i>Cacatua sanguinea</i> (Little Corella)			
144.	25598 <i>Cacomantis flabelliformis</i> (Fan-tailed Cuckoo)			
145.	24427 <i>Cacomantis flabelliformis</i> subsp. <i>flabelliformis</i> (Fan-tailed Cuckoo)			
146.	42307 <i>Cacomantis pallidus</i> (Pallid Cuckoo)			
147.	15348 <i>Caladenia flava</i> subsp. <i>flava</i>			
148.	1603 <i>Caladenia longiclavata</i> (Clubbed Spider Orchid)			
149.	15371 <i>Caladenia nana</i> subsp. <i>nana</i>			
150.	15377 <i>Caladenia reptans</i> subsp. <i>reptans</i>			
151.	19309 <i>Calectasia narragara</i>			
152.	35816 <i>Calothamnus quadrifidus</i> subsp. <i>quadrifidus</i>			
153.	25717 <i>Calyptorhynchus banksii</i> (Red-tailed Black-Cockatoo)			
154.	5450 <i>Calytrix depressa</i>			
155.	5461 <i>Calytrix glutinosa</i>			
156.	5485 <i>Calytrix variabilis</i>			
157.	32338 <i>Campylopus introflexus</i>	Y		
158.	27645 <i>Candelariella xanthostigmoides</i>			
159.	2957 <i>Cassytha racemosa</i> (Dodder Laurel)			
160.	760 <i>Caustis dioica</i>			
161.	7916 <i>Centaurea melitensis</i> (Maltese Cockspur, Malta Thistle)	Y		
162.	6542 <i>Centaurium tenuiflorum</i>	Y		
163.	2889 <i>Cerastium glomeratum</i> (Mouse Ear Chickweed)	Y		
164.	24086 <i>Cercartetus concinnus</i> (Western Pygmy-possum, Mundarda)			
165.	<i>Cercophonius squama</i>			
166.	24186 <i>Chalinolobus gouldii</i> (Gould's Wattle Bat)			
167.	1280 <i>Chamaescilla corymbosa</i> (Blue Squill)			
168.	3169 <i>Cheiranthra preissiana</i>			
169.	24321 <i>Chenonetta jubata</i> (Australian Wood Duck, Wood Duck)			

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170.	47909	<i>Cheramoeca leucosterna</i> (White-backed Swallow)			
171.	271	<i>Chloris truncata</i> (Windmill Grass)			
172.	763	<i>Chorizandra enodis</i> (Black Bristlerush)			
173.	13111	<i>Chorizema aciculare</i> subsp. <i>laxum</i>			
174.	48838	<i>Citrullus amarus</i>	Y		
175.	27673	<i>Cladonia capitellata</i>			
176.	27692	<i>Cladonia rigida</i>			
177.	2929	<i>Clematis pubescens</i> (Common Clematis)			
178.	25675	<i>Colluricincla harmonica</i> (Grey Shrike-thrush)			
179.	24613	<i>Colluricincla harmonica</i> subsp. <i>rufiventris</i> (Grey Shrike-thrush)			
180.	4550	<i>Comesperma calymega</i> (Blue-spike Milkwort)			
181.	4551	<i>Comesperma ciliatum</i>			
182.	14876	<i>Conospermum densiflorum</i> subsp. <i>densiflorum</i>			
183.	15611	<i>Conospermum stoechadis</i> subsp. <i>stoechadis</i> (Common Smokebush)			
184.	1418	<i>Conostylis aculeata</i> (Prickly Conostylis)			
185.	11552	<i>Conostylis aculeata</i> subsp. <i>bromelioides</i>			
186.	12035	<i>Conostylis caricina</i> subsp. <i>caricina</i>			
187.	1453	<i>Conostylis serrulata</i>			
188.	1454	<i>Conostylis setigera</i> (Bristly Cottonhead)			
189.	11597	<i>Conostylis setigera</i> subsp. <i>setigera</i>			
190.	1455	<i>Conostylis setosa</i> (White Cottonhead)			
191.	25568	<i>Coracina novaehollandiae</i> (Black-faced Cuckoo-shrike)			
192.		<i>Cormocephalus aurantiipes</i>			
193.	25592	<i>Corvus coronoides</i> (Australian Raven)			
194.	17104	<i>Corymbia calophylla</i> (Marri)			
195.	24671	<i>Coturnix pectoralis</i> (Stubble Quail)			
196.	24420	<i>Cracticus nigrogularis</i> (Pied Butcherbird)			
197.	25595	<i>Cracticus tibicen</i> (Australian Magpie)			
198.	25596	<i>Cracticus torquatus</i> (Grey Butcherbird)			
199.	13354	<i>Craspedia variabilis</i>			
200.	3136	<i>Crassula alata</i>	Y		
201.	17701	<i>Crassula closiana</i>			
202.	24918	<i>Crenadactylus ocellatus</i> subsp. <i>ocellatus</i> (Clawless Gecko)			
203.	29054	<i>Crepis foetida</i> subsp. <i>foetida</i> (Stinking Hawksbeard)	Y		
204.	25398	<i>Crinia georgiana</i> (Quacking Frog)			
205.	25399	<i>Crinia glauerti</i> (Clicking Frog)			
206.	25401	<i>Crinia pseudinsignifera</i> (Bleating Froglet)			
207.	13470	<i>Cryptandra arbutiflora</i> var. <i>arbutiflora</i>			
208.	4804	<i>Cryptandra nutans</i>			
209.	30893	<i>Cryptoblepharus buechananii</i>			
210.	24883	<i>Ctenophorus ornatus</i> (Ornate Crevice-Dragon)			
211.	48865	<i>Cucumis myriocarpus</i> subsp. <i>myriocarpus</i>	Y		
212.	1487	<i>Cyanella hyacinthoides</i>	Y		
213.	15114	<i>Cyanicula gemmata</i>			
214.	768	<i>Cyathochaeta avenacea</i>			
215.	815	<i>Cyperus tenellus</i> (Tiny Flatsedge)	Y		
216.	30901	<i>Dacelo novaeguineae</i> (Laughing Kookaburra)	Y		
217.	30902	<i>Dacelo novaeguineae</i> subsp. <i>novaeguineae</i> (Laughing Kookaburra)	Y		
218.	7420	<i>Dampiera alata</i> (Winged-stem Dampiera)			
219.	7451	<i>Dampiera lavandulacea</i>			
220.	7454	<i>Dampiera linearis</i> (Common Dampiera)			
221.	25673	<i>Daphoenositta chrysoptera</i> (Varied Sittella)			
222.	24606	<i>Daphoenositta chrysoptera</i> subsp. <i>pileata</i> (Varied Sittella, Black-capped Sittella)			
223.	6960	<i>Datura ferox</i> (Fierce Thornapple)	Y		
224.	3799	<i>Daviesia cordata</i> (Bookleaf)			
225.	19747	<i>Daviesia decurrens</i> subsp. <i>decurrens</i>			
226.	11879	<i>Daviesia hakeoides</i> subsp. <i>hakeoides</i>			
227.	12326	<i>Daviesia hakeoides</i> subsp. <i>subnuda</i>			
228.	3815	<i>Daviesia horrida</i> (Prickly Bitter-pea)			
229.	3819	<i>Daviesia longifolia</i>			
230.	3832	<i>Daviesia physodes</i>			
231.	3835	<i>Daviesia preissii</i>			
232.	3839	<i>Daviesia rhombifolia</i>			
233.	25766	<i>Delma fraseri</i> (Fraser's Legless Lizard)			
234.	17691	<i>Desmocladius fasciculatus</i>			
235.	1259	<i>Dianella revoluta</i> (Blueberry Lily)			
236.	11636	<i>Dianella revoluta</i> var. <i>divaricata</i>			
237.	25607	<i>Dicaeum hirundinaceum</i> (Mistletoebird)			
238.	306	<i>Dichelachne crinita</i> (Longhair Plumegrass)			
239.	1287	<i>Dichopogon capillipes</i>			

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240.	20367	<i>Dillwynia laxiflora</i>			
241.	24929	<i>Diplodactylus granariensis</i> subsp. <i>granariensis</i>			
242.	4746	<i>Diplopeltis huegeli</i>			
243.	18589	<i>Diplopeltis huegeli</i> subsp. <i>lehmannii</i>			
244.	3011	<i>Diplotaxis muralis</i> (Wall Rocket)	Y		
245.	10791	<i>Diuris carinata</i> (Bee Orchid)			
246.	11049	<i>Diuris corymbosa</i>			
247.	1635	<i>Diuris longifolia</i> (Common Donkey Orchid)			
248.	15436	<i>Diuris porrifolia</i>			
249.	11247	<i>Dodonaea viscosa</i> subsp. <i>angustissima</i>			
250.	15406	<i>Drakea gracilis</i>			
251.	24470	<i>Dromaius novaehollandiae</i> (Emu)			
252.	3092	<i>Drosera bulbosa</i> (Red-leaved Sundew)			
253.	13204	<i>Drosera callistos</i>			
254.	48724	<i>Drosera collina</i>			
255.	3095	<i>Drosera erythrorhiza</i> (Red Ink Sundew)			
256.	3097	<i>Drosera gigantea</i> (Giant Sundew)			
257.	3098	<i>Drosera glanduligera</i> (Pimpernel Sundew)			
258.	3106	<i>Drosera macrantha</i> (Bridal Rainbow)			
259.	3109	<i>Drosera menziesii</i> (Pink Rainbow)			
260.	3131	<i>Drosera stolonifera</i> (Leafy Sundew)			
261.		<i>Egretta novaehollandiae</i>			
262.	349	<i>Ehrharta longiflora</i> (Annual Veldt Grass)	Y		
263.		<i>Elanus axillaris</i>			
264.	47937	<i>Elseymoris melanops</i> (Black-fronted Dotterel)			
265.	1644	<i>Elythranthera emarginata</i> (Pink Enamel Orchid)			
266.		<i>Eolophus roseicapillus</i>			
267.	24652	<i>Eopsaltria georgiana</i> (White-breasted Robin)			
268.	24567	<i>Epthianura albifrons</i> (White-fronted Chat)			
269.	24258	<i>Equus caballus</i> (Horse)	Y		
270.	376	<i>Eragrostis curvula</i> (African Lovegrass)	Y		
271.	379	<i>Eragrostis elongata</i> (Clustered Lovegrass)			
272.	25109	<i>Eremiascincus richardsonii</i> (Broad-banded Sand Swimmer)			
273.	45244	<i>Ericomyrtus serpyllifolia</i>			
274.	4332	<i>Erodium botrys</i> (Long Storksbill)	Y		
275.		<i>Ethmostigmus rubripes</i>			
276.	5545	<i>Eucalyptus accedens</i> (Powderbark Wandoo)			
277.	13547	<i>Eucalyptus marginata</i> subsp. <i>marginata</i> (Jarrah)			
278.	13548	<i>Eucalyptus marginata</i> subsp. <i>thalassica</i> (Blue-leaved Jarrah)			
279.	5739	<i>Eucalyptus patens</i> (Swan River Blackbutt, Dwuda)			
280.	5763	<i>Eucalyptus rudis</i> (Flooded Gum, Kulurda)			
281.	12906	<i>Eucalyptus wandoo</i> subsp. <i>wandoo</i>			
282.		<i>Eucyrtops lator</i>			
283.	25621	<i>Falco berigora</i> (Brown Falcon)			
284.	25622	<i>Falco cenchroides</i> (Australian Kestrel, Nankeen Kestrel)			
285.	25623	<i>Falco longipennis</i> (Australian Hobby)			
286.	25677	<i>Falcunculus frontatus</i> (Crested Shrike-tit)			
287.	24616	<i>Falcunculus frontatus</i> subsp. <i>leucogaster</i> (Western Shrike-tit, Crested Shrike-tit)			
288.	24041	<i>Felis catus</i> (Cat)	Y		
289.	25727	<i>Fulica atra</i> (Eurasian Coot)			
290.	8365	<i>Fumaria bastardii</i>	Y		
291.	2969	<i>Fumaria capreolata</i> (Whiteflower Fumitory)	Y		
292.	7321	<i>Galium divaricatum</i>	Y		
293.	25729	<i>Gallinula tenebrosa</i> (Dusky Moorhen)			
294.	25730	<i>Gallirallus philippensis</i> (Buff-banded Rail)			
295.		<i>Gallus gallus</i>			
296.	20475	<i>Gastrolobium capitatum</i>			
297.	20513	<i>Gastrolobium dilatatum</i>			
298.	3905	<i>Gastrolobium hookeri</i>			
299.	19733	<i>Gastrolobium retusum</i>			
300.	3924	<i>Gastrolobium spinosum</i> (Prickly Poison)			
301.	3933	<i>Gastrolobium villosum</i> (Crinkle-leaved Poison)			
302.	42314	<i>Gavicalis virescens</i> (Singing Honeyeater)			
303.		<i>Geocrinia</i> sp.			
304.	25530	<i>Gerygone fusca</i> (Western Gerygone)			
305.	1520	<i>Gladiolus caryophyllaceus</i> (Wild Gladiolus)	Y		
306.	33620	<i>Glischrocaryon angustifolium</i>			
307.	47962	<i>Glyciphila melanops</i> (Tawny-crowned Honeyeater)			
308.	8002	<i>Gnephosis tenuissima</i>			
309.	19216	<i>Gompholobium cyaninum</i>			

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310.	3950	<i>Gompholobium knightianum</i>			
311.	3951	<i>Gompholobium marginatum</i>			
312.	3954	<i>Gompholobium polymorphum</i>			
313.	3955	<i>Gompholobium preissii</i>			
314.	3956	<i>Gompholobium shuttleworthii</i>			
315.	3957	<i>Gompholobium tomentosum</i> (Hairy Yellow Pea)			
316.	6149	<i>Gonocarpus cordiger</i>			
317.	6161	<i>Gonocarpus pithyoides</i>			
318.	29362	<i>Goodenia coerulea</i>			
319.	12520	<i>Goodenia fasciculata</i>			
320.	12551	<i>Goodenia micrantha</i>			
321.	7538	<i>Goodenia pulchella</i>			
322.	24443	<i>Grallina cyanoleuca</i> (Magpie-lark)			
323.	14282	<i>Gratiola pubescens</i>			
324.	19628	<i>Grevillea bipinnatifida</i> subsp. <i>bipinnatifida</i>			
325.	1997	<i>Grevillea endlicheriana</i> (Spindly Grevillea)			
326.	13450	<i>Grevillea manglesii</i> subsp. <i>manglesii</i>			
327.	2066	<i>Grevillea pilulifera</i> (Woolly-flowered Grevillea)			
328.	2080	<i>Grevillea quercifolia</i> (Oak-leaf Grevillea)			
329.	14421	<i>Grevillea synapheae</i> subsp. <i>synapheae</i>			
330.	2122	<i>Grevillea wilsonii</i> (Native Fuchsia)			
331.	1465	<i>Haemodorum discolor</i>			
332.	1468	<i>Haemodorum laxum</i>			
333.	1470	<i>Haemodorum paniculatum</i> (Mardja)			
334.	1472	<i>Haemodorum simplex</i>			
335.	2149	<i>Hakea cristata</i> (Snail Hakea)			
336.	2166	<i>Hakea incrassata</i> (Marble Hakea)			
337.	2175	<i>Hakea lissocarpha</i> (Honey Bush)			
338.	45333	<i>Hakea neospathulata</i>			
339.	2197	<i>Hakea prostrata</i> (Harsh Hakea)			
340.	2203	<i>Hakea ruscifolia</i> (Candle Hakea)			
341.	2206	<i>Hakea stenocarpa</i> (Narrow-fruited Hakea)			
342.	2215	<i>Hakea undulata</i> (Wavy-leaved Hakea)			
343.	2216	<i>Hakea varia</i> (Variable-leaved Hakea)			
344.	17485	<i>Halgania anagalloides</i>			
345.	25408	<i>Heleioporus albopunctatus</i> (Western Spotted Frog)			
346.	25409	<i>Heleioporus barycragus</i> (Hooting Frog)			
347.	25410	<i>Heleioporus eyrei</i> (Moaning Frog)			
348.	25411	<i>Heleioporus inornatus</i> (Whooping Frog)			
349.	25412	<i>Heleioporus psammophilus</i> (Sand Frog)			
350.	6710	<i>Heliotropium europaeum</i> (Common Heliotrope)	Y		
351.	6839	<i>Hemandra pungens</i> (Snakebush)			
352.	6842	<i>Hemigenia barbata</i>			
353.	6856	<i>Hemigenia incana</i> (Silky Hemigenia)			
354.	29632	<i>Hemigenia parviflora</i>			
355.	1526	<i>Hesperantha falcata</i>	Y		
356.	5109	<i>Hibbertia amplexicaulis</i>			
357.	5114	<i>Hibbertia commutata</i>			
358.	5134	<i>Hibbertia huegelii</i>			
359.	45534	<i>Hibbertia hypericoides</i> subsp. <i>hypericoides</i>			
360.	5139	<i>Hibbertia lasiopus</i> (Large Hibbertia)			
361.	5172	<i>Hibbertia stellaris</i> (Orange Stars)			
362.	47965	<i>Hieraaetus morphnoides</i> (Little Eagle)			
363.	25734	<i>Himantopus himantopus</i> (Black-winged Stilt)			
364.	24491	<i>Hirundo neoxena</i> (Welcome Swallow)			
365.		<i>Holconia westralia</i>			
366.	445	<i>Holcus setiger</i> (Annual Fog)	Y		
367.	6222	<i>Homalosciadium homalocarpum</i>			
368.	3964	<i>Hovea chorizemifolia</i> (Holly-leaved Hovea)			
369.	3968	<i>Hovea trisperma</i> (Common Hovea)			
370.	12741	<i>Hyalosperma cotula</i>			
371.	16759	<i>Hyalosperma simplex</i> subsp. <i>simplex</i>			
372.	12007	<i>Hybanthus floribundus</i> subsp. <i>floribundus</i>			
373.	6226	<i>Hydrocotyle callicarpa</i> (Small Pennywort)			
374.	8086	<i>Hypochoeris glabra</i> (Smooth Catsear)	Y		
375.		<i>Idiomma blackwalli</i>			
376.	912	<i>Isolepis cyperoides</i>			
377.	917	<i>Isolepis marginata</i> (Coarse Club-rush)			
378.		<i>Isopeda leishmanni</i>			
379.		<i>Isopedella cana</i>			

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380.	2229	<i>Isopogon dubius</i> (Pincushion Coneflower)			
381.	19996	<i>Isopogon</i> sp. Darling Range (F. Hort 1662)			
382.	7396	<i>Isotoma hypocrateriformis</i> (Woodbridge Poison)			
383.	7399	<i>Isotoma scapigera</i> (Long-scaped Isotome)			
384.	19700	<i>Isotropis cuneifolia</i> subsp. <i>cuneifolia</i>			
385.	1532	<i>Ixia maculata</i> (Yellow Ixia)	Y		
386.	14739	<i>Jacksonia epiphyllum</i>			
387.	4012	<i>Jacksonia furcellata</i> (Grey Stinkwood)			
388.	4025	<i>Jacksonia restioides</i>			
389.	1178	<i>Juncus bufonius</i> (Toad Rush)	Y		
390.	1195	<i>Juncus subsecundus</i> (Finger Rush)			
391.	4037	<i>Kennedia coccinea</i> (Coral Vine)			
392.	4044	<i>Kennedia prostrata</i> (Scarlet Runner)			
393.	4045	<i>Kennedia stirlingii</i> (Bushy Kennedia)			
394.	12008	<i>Kickxia elatine</i> subsp. <i>crinita</i>	Y		
395.	1221	<i>Kingia australis</i> (Kingia, Pulongok)			
396.	11289	<i>Labichea lanceolata</i> subsp. <i>lanceolata</i>			
397.	3669	<i>Labichea punctata</i> (Lance-leaved Cassia)			
398.	18585	<i>Lagenophora huegelii</i>			
399.	24367	<i>Lalage tricolor</i> (White-winged Triller)			
400.	14083	<i>Lambertia multiflora</i> var. <i>darlingensis</i>			
401.		<i>Lampona cylindrata</i>			
402.	45082	<i>Lasiopetalum glutinosum</i> subsp. <i>latifolium</i>			
403.		<i>Latrodectus hasseltii</i>			
404.	11815	<i>Laxmannia grandiflora</i> subsp. <i>grandiflora</i>			
405.	11911	<i>Laxmannia ramosa</i> subsp. <i>ramosa</i>			
406.	11464	<i>Laxmannia sessiliflora</i> subsp. <i>australis</i>			
407.	1309	<i>Laxmannia squarrosa</i>			
408.	7568	<i>Lechenaultia biloba</i> (Blue Leschenaultia)			
409.	7572	<i>Lechenaultia expansa</i>			
410.	936	<i>Lepidosperma leptostachyum</i>			
411.	937	<i>Lepidosperma longitudinale</i> (Pithy Sword-sedge)			
412.	14642	<i>Lepidosperma obtusum</i>			
413.	944	<i>Lepidosperma scabrum</i>			
414.		<i>Lepidosperma</i> sp.			
415.	945	<i>Lepidosperma squamatum</i>			
416.	1078	<i>Leptocarpus coangustatus</i>			
417.	46375	<i>Leptocarpus decipiens</i>			
418.	19833	<i>Leptocarpus laxus</i>			
419.	15418	<i>Leptoceras menziesii</i>			
420.	2342	<i>Leptomeria cunninghamii</i>			
421.	5847	<i>Leptospermum erubescens</i> (Roadside Teatree)			
422.	6367	<i>Leucopogon capitellatus</i>			
423.	6416	<i>Leucopogon nutans</i> (Drooping Leucopogon)			
424.	6436	<i>Leucopogon propinquus</i>			
425.	6439	<i>Leucopogon pulchellus</i> (Beard-heath)			
426.	6444	<i>Leucopogon sprengelioides</i>			
427.	7676	<i>Levenhookia pusilla</i> (Midget Stylewort)			
428.	7677	<i>Levenhookia stipitata</i> (Common Stylewort)			
429.	25661	<i>Lichmera indistincta</i> (Brown Honeyeater)			
430.	24582	<i>Lichmera indistincta</i> subsp. <i>indistincta</i> (Brown Honeyeater)			
431.	25415	<i>Limnodynastes dorsalis</i> (Western Banjo Frog)			
432.		<i>Ljunghia pullei</i> subsp. <i>aname</i>			
433.	9289	<i>Lobelia anceps</i> (Angled Lobelia)			
434.	1223	<i>Lomandra caespitosa</i> (Tufted Mat Rush)			
435.	1228	<i>Lomandra hermaphrodita</i>			
436.	14542	<i>Lomandra micrantha</i> subsp. <i>micrantha</i>			
437.	1236	<i>Lomandra odora</i> (Tiered Matrush)			
438.		<i>Lomandra</i> sp.			
439.	1245	<i>Lomandra spartea</i>			
440.		<i>Lophocitnia isura</i>			
441.	1198	<i>Luzula meridionalis</i> (Field Woodrush)			
442.	24132	<i>Macropus fuliginosus</i> (Western Grey Kangaroo)			
443.	18119	<i>Macrozamia fraseri</i>			
444.	85	<i>Macrozamia riedlei</i> (Zamia, Djiridji)			
445.	25654	<i>Malurus splendens</i> (Splendid Fairy-wren)			
446.	24583	<i>Manorina flavivula</i> (Yellow-throated Miner)			
447.	19421	<i>Marianthus bicolor</i> (Painted Marianthus)			
448.	17637	<i>Marianthus candidus</i> (White Marianthus)			
449.	17636	<i>Marianthus coeruleopunctatus</i> (Blue-spotted Marianthus)			

Name ID	Species Name	Naturalised	Conservation Code	¹ Endemic To Query Area
450.	<i>Masasteron maini</i>			
451.	5876 <i>Melaleuca aspalathoides</i>			
452.	5926 <i>Melaleuca lateritia</i> (Robin Redbreast Bush)			
453.	5959 <i>Melaleuca raphiophylla</i> (Swamp Paperbark)			
454.	5980 <i>Melaleuca thymoides</i>			
455.	13280 <i>Melaleuca viminea</i> subsp. <i>viminea</i>			
456.	47997 <i>Melanodryas cucullata</i> (Hooded Robin)			
457.	4085 <i>Melilotus indicus</i>	Y		
458.	25663 <i>Melithreptus brevirostris</i> (Brown-headed Honeyeater)			
459.	24587 <i>Melithreptus chloropsis</i> (Western White-naped Honeyeater)			
460.	24736 <i>Melopsittacus undulatus</i> (Budgerigar)			
461.	24598 <i>Merops ornatus</i> (Rainbow Bee-eater)			
462.	957 <i>Mesomelaena tetragona</i> (Semaphore Sedge)			
463.	<i>Microcarbo melanoleucos</i>			
464.	25693 <i>Microeca fascians</i> (Jacky Winter)			
465.	8106 <i>Millotia tenuifolia</i> (Soft Millotia)			
466.	14344 <i>Millotia tenuifolia</i> var. <i>tenuifolia</i> (Soft Millotia)			
467.	25542 <i>Milvus migrans</i> (Black Kite)			
468.	<i>Missulena granulosa</i>			
469.	<i>Missulena hoggi</i>			
470.	<i>Missulena occatoria</i>			
471.	37440 <i>Monopsis debilis</i> var. <i>depressa</i>	Y		
472.	25240 <i>Morelia spilota</i> subsp. <i>imbricata</i> (Carpet Python)			
473.	25192 <i>Morethia obscura</i>			
474.	25610 <i>Myiagra inquieta</i> (Restless Flycatcher)			
475.	6199 <i>Myriophyllum tillaeoides</i>			
476.	11019 <i>Narcissus papyraceus</i>	Y		
477.	44496 <i>Narcissus tazetta</i> subsp. <i>italicus</i>	Y		
478.	25248 <i>Neelaps bimaculatus</i> (Black-naped Snake)			
479.	25426 <i>Neobatrachus pelobatoides</i> (Humming Frog)			
480.	24738 <i>Neophema elegans</i> (Elegant Parrot)			
481.	492 <i>Neurachne alopecuroides</i> (Foxtail Mulga Grass)			
482.	24407 <i>Ocyphaps lophotes</i> (Crested Pigeon)			
483.	2365 <i>Olex benthamiana</i>			
484.	8127 <i>Olearia axillaris</i> (Coastal Daisybush)			
485.	8143 <i>Olearia paucidentata</i> (Autumn Scrub Daisy)			
486.	<i>Ommatolulus moreletii</i>			
487.	7346 <i>Opercularia echinocephala</i> (Bristly Headed Stink Weed)			
488.	18255 <i>Opercularia vaginata</i> (Dog Weed)			
489.	36177 <i>Ornduffia albiflora</i>			
490.	11442 <i>Orthrosanthus laxus</i> var. <i>gramineus</i> (Grass-leaved Orthrosanthus)			
491.	24085 <i>Oryctolagus cuniculus</i> (Rabbit)	Y		
492.	4358 <i>Oxalis purpurea</i> (Largeflower Wood Sorrel)	Y		
493.	25680 <i>Pachycephala rufiventris</i> (Rufous Whistler)			
494.	2965 <i>Papaver rhoeas</i> (Field Poppy)	Y		
495.	25253 <i>Parasuta gouldii</i>			
496.	25255 <i>Parasuta nigriceps</i>			
497.	25681 <i>Pardalotus punctatus</i> (Spotted Pardalote)			
498.	25682 <i>Pardalotus striatus</i> (Striated Pardalote)			
499.	1542 <i>Patersonia babianoides</i>			
500.	1546 <i>Patersonia juncea</i> (Rush Leaved Patersonia)			
501.	1552 <i>Patersonia rudis</i> (Hairy Flag)			
502.	14433 <i>Patersonia rudis</i> subsp. <i>rudis</i>			
503.	6245 <i>Pentapeltis peltigera</i>			
504.	11052 <i>Persicaria prostrata</i>			
505.	2255 <i>Persoonia angustiflora</i>			
506.	2262 <i>Persoonia elliptica</i> (Spreading Snottygobble)			
507.	48060 <i>Petrochelidon ariel</i> (Fairy Martin)			
508.	48061 <i>Petrochelidon nigricans</i> (Tree Martin)			
509.	48066 <i>Petroica boodang</i> (Scarlet Robin)			
510.	24659 <i>Petroica goodenovii</i> (Red-capped Robin)			
511.	2309 <i>Petrophile serruriae</i>			
512.	2312 <i>Petrophile striata</i>			
513.	24667 <i>Phalacrocorax sulcirostris</i> (Little Black Cormorant)			
514.	24409 <i>Phaps chalcoptera</i> (Common Bronzewing)			
515.	20460 <i>Pheladenia deformis</i>			
516.	18529 <i>Philotheca spicata</i> (Pepper and Salt)			
517.	1172 <i>Philydrella drummondii</i>			
518.	1173 <i>Philydrella pygmaea</i> (Butterfly Flowers)			
519.	48071 <i>Phylidonyris niger</i> (White-cheeked Honeyeater)			

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520.	24596	<i>Phylidonyris novaehollandiae</i> (New Holland Honeyeater)			
521.	16825	<i>Phyllangium divergens</i>			
522.	16177	<i>Phyllangium paradoxum</i>			
523.	4675	<i>Phyllanthus calycinus</i> (False Boronia)			
524.		<i>Phytophthora cinnamomi</i>			
525.	2408	<i>Ptilostyles hamiltonii</i>			
526.	5231	<i>Pimelea angustifolia</i> (Narrow-leaved Pimelea)			
527.	5232	<i>Pimelea argentea</i> (Silvery Leaved Pimelea)			
528.	11928	<i>Pimelea ciliata</i> subsp. <i>ciliata</i>			
529.	11402	<i>Pimelea imbricata</i> var. <i>piligera</i>			
530.	5259	<i>Pimelea preissii</i>			
531.	12041	<i>Pimelea suaveolens</i> subsp. <i>suaveolens</i>			
532.	18353	<i>Pithocarpa pulchella</i> var. <i>pulchella</i>			
533.	25720	<i>Platycercus icterotis</i> (Western Rosella)			
534.	24747	<i>Platycercus spurius</i> (Red-capped Parrot)			
535.	25721	<i>Platycercus zonarius</i> (Australian Ringneck, Ring-necked Parrot)			
536.	24751	<i>Platycercus zonarius</i> subsp. <i>zonarius</i> (Port Lincoln Parrot)			
537.	6260	<i>Platysace teres</i>			
538.	573	<i>Poa drummondiana</i> (Knotted Poa)			
539.	25703	<i>Podargus strigoides</i> (Tawny Frogmouth)			
540.	45237	<i>Podolepis aristata</i> subsp. <i>aristata</i>			
541.	8175	<i>Podolepis gracilis</i> (Slender Podolepis)			
542.	8179	<i>Podolepis nutans</i> (Nodding Podolepis)			
543.		<i>Podykipus leptoiuloides</i>			
544.	8188	<i>Pogonolepis stricta</i>			
545.	24681	<i>Polioccephalus poliocephalus</i> (Hoary-headed Grebe)			
546.		<i>Polys lacinosus</i>			
547.	2905	<i>Polycarpon tetraphyllum</i> (Fourleaf Allseed)	Y		
548.	24683	<i>Pomatostomus superciliosus</i> (White-browed Babbler)			
549.	4691	<i>Poranthera microphylla</i> (Small Poranthera)			
550.	25731	<i>Porphyrio porphyrio</i> (Purple Swamphen)			
551.	111	<i>Potamogeton ochreateus</i> (Blunt Pondweed)			
552.	1671	<i>Prasophyllum elatum</i> (Tall Leek Orchid)			
553.	16688	<i>Prasophyllum gracile</i>			
554.	1676	<i>Prasophyllum hians</i> (Yawning Leek Orchid)			
555.		<i>Proshermacha subarmata</i>			Y
556.	25511	<i>Pseudonaja affinis</i> (Dugite)			
557.	25259	<i>Pseudonaja affinis</i> subsp. <i>affinis</i> (Dugite)			
558.	42416	<i>Pseudonaja mengdeni</i> (Western Brown Snake)			
559.	25433	<i>Pseudophryne guentheri</i> (Crawling Toadlet)			
560.	13255	<i>Pterochaeta paniculata</i>			
561.	1693	<i>Pterostylis recurva</i> (Jug Orchid)			
562.	12217	<i>Pterostylis sanguinea</i>			
563.	2716	<i>Ptilotus declinatus</i> (Curved Mulla Mulla)			
564.	2718	<i>Ptilotus drummondii</i> (Narrowleaf Mulla Mulla)			
565.	11260	<i>Ptilotus drummondii</i> var. <i>drummondii</i> (Pussytail)			
566.	2742	<i>Ptilotus manglesii</i> (Pom Poms, Mulamula)			
567.	32417	<i>Ptychostomum angustifolium</i>			
568.		<i>Puccinia dampiera</i>			
569.		<i>Purpureicephalus spurius</i>			
570.	16367	<i>Pyrorchis nigricans</i> (Red beaks, Elephants ears)			
571.	24245	<i>Rattus rattus</i> (Black Rat)	Y		
572.	48096	<i>Rhipidura albiscapa</i> (Grey Fantail)			
573.	25614	<i>Rhipidura leucophrys</i> (Willie Wagtail)			
574.	13300	<i>Rhodanthe citrina</i>			
575.	15035	<i>Rhodanthe corymbosa</i>			
576.	19942	<i>Ricinocarpos undulatus</i>			
577.	1556	<i>Romulea rosea</i> (Guildford Grass)	Y		
578.	40425	<i>Rytidosperma caespitosum</i>			
579.	40426	<i>Rytidosperma occidentale</i>			
580.	6929	<i>Salvia verbenaca</i> (Wild Sage)	Y		
581.	7368	<i>Scabiosa atropurpurea</i> (Purple Pincushion)	Y		
582.	7602	<i>Scaevola calliptera</i>			
583.	7613	<i>Scaevola glandulifera</i> (Viscid Hand-flower)			
584.	7619	<i>Scaevola lanceolata</i> (Long-leaved Scaevola)			
585.	7635	<i>Scaevola pilosa</i> (Hairy Fan-flower)			
586.	7636	<i>Scaevola platyphylla</i> (Broad-leaved Fanflower)			
587.	13182	<i>Scaevola repens</i> var. <i>repens</i>			
588.		<i>Schizophyllum commune</i>			
589.	975	<i>Schoenus bifidus</i>			

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590.	984	<i>Schoenus curvifolius</i>			
591.	1002	<i>Schoenus nanus</i> (Tiny Bog Rush)			
592.	1018	<i>Schoenus subfascicularis</i>			
593.	17409	<i>Schoenus variicellae</i>			
594.		<i>Scolopendra morsitans</i>			
595.	6	<i>Selaginella gracillima</i> (Tiny Clubmoss)			
596.	20663	<i>Senecio multicaulis</i> subsp. <i>multicaulis</i>			
597.	25534	<i>Sericornis frontalis</i> (White-browed Scrubwren)			
598.	8224	<i>Siloxerus filifolius</i>			
599.	8225	<i>Siloxerus humifusus</i> (Procumbent Siloxerus)			
600.	14583	<i>Siloxerus multiflorus</i>			
601.	25266	<i>Simoselaps bertholdi</i> (Jan's Banded Snake)			
602.	30948	<i>Smicronis brevirostris</i> (Weebill)			
603.	24109	<i>Sminthopsis dolichura</i> (Little long-tailed Dunnart)			
604.	24111	<i>Sminthopsis gilberti</i> (Gilbert's Dunnart)			
605.	7013	<i>Solanum hoplopetalum</i> (Thorny Solanum)			
606.	35236	<i>Sorghum x drummondii</i> (Sudan Grass)	Y		
607.	2912	<i>Spergula arvensis</i> (Corn Spurry)	Y		
608.	4207	<i>Sphaerolobium medium</i>			
609.	4211	<i>Sphaerolobium vimineum</i> (Leafless Globe Pea)			
610.		<i>Sphaerotrachopus ramosus</i>			
611.	6930	<i>Stachys arvensis</i> (Staggerweed)	Y		
612.	9070	<i>Stackhousia pubescens</i> (Downy Stackhousia)			
613.	13473	<i>Stenanthemum coronatum</i>			
614.	25597	<i>Strepera versicolor</i> (Grey Currawong)			
615.	7684	<i>Stylidium amoenum</i> (Lovely Triggerplant)			
616.	30278	<i>Stylidium androsaceum</i>			
617.	7702	<i>Stylidium ciliatum</i> (Golden Triggerplant)			
618.	7708	<i>Stylidium crassifolium</i> (Thick-leaved Triggerplant)			
619.	7713	<i>Stylidium dichotomum</i> (Pins-and-needles)			
620.	7716	<i>Stylidium diuroides</i> (Donkey Triggerplant)			
621.	19251	<i>Stylidium eriopodium</i>			
622.	7736	<i>Stylidium hispidum</i> (White Butterfly Triggerplant)			
623.	7742	<i>Stylidium inundatum</i> (Hundreds and Thousands)			
624.	7749	<i>Stylidium leptophyllum</i> (Needle-leaved Triggerplant)			
625.	7773	<i>Stylidium petiolare</i> (Horn Triggerplant)			
626.	7774	<i>Stylidium piliferum</i> (Common Butterfly Triggerplant)			
627.	7781	<i>Stylidium pubigerum</i> (Yellow Butterfly Triggerplant)			
628.	7783	<i>Stylidium pycnostachyum</i> (Downy Triggerplant)			
629.	7785	<i>Stylidium repens</i> (Matted Triggerplant)			
630.	7787	<i>Stylidium rhynchocarpum</i> (Black-beaked Triggerplant)			
631.	7790	<i>Stylidium roseoalatum</i> (Pink-wing Triggerplant)			
632.	25806	<i>Stylidium scarosum</i>			
633.	7798	<i>Stylidium schoenoides</i> (Cow Kicks)			
634.		<i>Stylidium</i> sp.			
635.	25845	<i>Stylidium tenue</i>			
636.	45594	<i>Stylidium tenue</i> subsp. <i>majusculum</i> (Showy Fountain Triggerplant)			
637.	45593	<i>Stylidium tenue</i> subsp. <i>tenue</i> (Little Fountain Triggerplant)			
638.	23511	<i>Stylidium thesioides</i> (Delicate Triggerplant)			
639.	7806	<i>Stylidium utricularioides</i> (Pink Fan Triggerplant)			
640.		<i>Stylopauropoides lapicidarius</i>			Y
641.	6476	<i>Styphelia tenuiflora</i> (Common Pinheath)			
642.		<i>Supunna picta</i>			
643.	12914	<i>Synaphea decorticans</i>			
644.	2323	<i>Synaphea gracillima</i>			
645.	25705	<i>Tachybaptus novaehollandiae</i> (Australasian Grebe, Black-throated Grebe)			
646.	24207	<i>Tachyglossus aculeatus</i> (Short-beaked Echidna)			
647.	24331	<i>Tadorna tadornoides</i> (Australian Shelduck, Mountain Duck)			
648.	4251	<i>Templetonia drummondii</i>			
649.	46437	<i>Tetrapora preissiana</i>			
650.	1036	<i>Tetralia octandra</i>			
651.	4528	<i>Tetralthea confertifolia</i>			
652.	4535	<i>Tetralthea hirsuta</i> (Black Eyed Susan)			
653.	48342	<i>Tetralthea hirsuta</i> subsp. <i>hirsuta</i>			
654.	48341	<i>Tetralthea hirsuta</i> subsp. <i>viminea</i>			
655.	4537	<i>Tetralthea nuda</i>			
656.	11143	<i>Thelymitra graminea</i>			
657.	673	<i>Themeda triandra</i>			
658.	5080	<i>Thomasia foliosa</i>			
659.	24845	<i>Threskiornis spinicollis</i> (Straw-necked Ibis)			

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660.	1339	<i>Thysanotus multiflorus</i> (Many-flowered Fringe Lily)			
661.	1343	<i>Thysanotus patersonii</i>			
662.	1351	<i>Thysanotus sparteus</i>			
663.	1357	<i>Thysanotus thyrsoides</i>			
664.	1358	<i>Thysanotus triandrus</i>			
665.	25519	<i>Tiliqua rugosa</i>			
666.	25207	<i>Tiliqua rugosa</i> subsp. <i>rugosa</i>			
667.	25549	<i>Todiramphus sanctus</i> (Sacred Kingfisher)			
668.	6268	<i>Trachymene cyanopetala</i>			
669.	6280	<i>Trachymene pilosa</i> (Native Parsnip)			
670.	1483	<i>Tribonanthes longipetala</i> (Branching Tiurmdin)			
671.	39094	<i>Trichia affinis</i>			
672.	8251	<i>Trichocline spathulata</i> (Native Gerbera)			
673.	25521	<i>Trichosurus vulpecula</i> (Common Brushtail Possum)			
674.	1361	<i>Tricoryne elatior</i> (Yellow Autumn Lily)			
675.	1362	<i>Tricoryne humilis</i>			
676.	4737	<i>Tripterococcus brunonis</i> (Winged Stackhousia)			
677.	1139	<i>Triithuria bibracteata</i>			
678.	4839	<i>Trymalium angustifolium</i>			
679.	13479	<i>Trymalium ledifolium</i> var. <i>rosmarinifolium</i>			
680.	33418	<i>Trymalium odoratissimum</i> subsp. <i>odoratissimum</i>			
681.	48147	<i>Turnix varius</i> (Painted Button-quail)			
682.	24851	<i>Turnix velox</i> (Little Button-quail)			
683.	99	<i>Typha orientalis</i> (Bulrush, Cumbungi)			
684.	24983	<i>Underwoodisaurus milii</i> (Barking Gecko)			
685.		<i>Urodacus novaehollandiae</i>			
686.	38388	<i>Ursinia anthemoides</i> subsp. <i>anthemoides</i>	Y		
687.	7148	<i>Utricularia multifida</i>			
688.	7158	<i>Utricularia volubilis</i> (Twining Bladderwort)			
689.	25218	<i>Varanus gouldii</i> (Bungarra or Sand Monitor)			
690.	7665	<i>Velleia trinervis</i>			
691.	8257	<i>Vellereophyton dealbatum</i> (White Cudweed)	Y		
692.	6082	<i>Verticordia grandiflora</i> (Claw Featherflower)			
693.	15433	<i>Verticordia huegelii</i> var. <i>huegelii</i>			
694.	15434	<i>Verticordia insignis</i> subsp. <i>insignis</i>			
695.	6107	<i>Verticordia pennigera</i>			
696.	6109	<i>Verticordia picta</i> (Painted Featherflower)			
697.	15618	<i>Verticordia plumosa</i> var. <i>plumosa</i>			
698.	24206	<i>Vespadelus regulus</i> (Southern Forest Bat)			
699.	4325	<i>Viminaria juncea</i> (Swishbush, Koweda)			
700.	24040	<i>Vulpes vulpes</i> (Red Fox)	Y		
701.	7386	<i>Wahlenbergia gracilentia</i> (Annual Bluebell)			
702.	8281	<i>Waitzia podolepis</i>			
703.	12072	<i>Wurmbea dioica</i> subsp. <i>alba</i>			
704.	1253	<i>Xanthorrhoea gracilis</i> (Graceful Grass Tree, Mimidi)			
705.	1256	<i>Xanthorrhoea preissii</i> (Grass tree, Palga)			
706.	6283	<i>Xanthosia atkinsoniana</i>			
707.	6284	<i>Xanthosia candida</i>			
708.	6285	<i>Xanthosia ciliata</i>			
709.	6289	<i>Xanthosia huegelii</i>			
710.	6293	<i>Xanthosia singuliflora</i>			
711.	25765	<i>Zosterops lateralis</i> (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 wholly 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.

APPENDIX 2

Protected Matters Search Tool Report



EPBC Act Protected Matters Report

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

Report created: 02-Feb-2022

[Summary](#)

[Details](#)

[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)

Summary

Matters of National Environment Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	14
Listed Migratory Species:	7

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	11
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

State and Territory Reserves:	None
Regional Forest Agreements:	1
Nationally Important Wetlands:	None
EPBC Act Referrals:	2
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Listed Threatened Species

[Resource Information]

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

Scientific Name	Threatened Category	Presence Text
BIRD		
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calyptorhynchus banksii naso Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat likely to occur within area
Leipoa ocellata Malleefowl [934]	Vulnerable	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
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
Zanda baudinii listed as Calyptorhynchus baudinii Baudin's Black-Cockatoo, Long-billed Black-cockatoo [87736]	Endangered	Roosting known to occur within area
Zanda latirostris listed as Calyptorhynchus latirostris Carnaby's Black Cockatoo, Short-billed Black-cockatoo [87737]	Endangered	Species or species habitat known to occur within area
MAMMAL		
Dasyurus geoffroii Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Setonix brachyurus Quokka [229]	Vulnerable	Species or species habitat may occur within area
PLANT		
Andersonia gracilis Slender Andersonia [14470]	Endangered	Species or species habitat may occur within area
Diplolaena andrewsii [6601]	Endangered	Species or species habitat may occur within area
Diuris micrantha Dwarf Bee-orchid [55082]	Vulnerable	Species or species habitat may occur within area
Diuris purdiei Purdie's Donkey-orchid [12950]	Endangered	Species or species habitat may occur within area
Grevillea flexuosa Zig Zag Grevillea [2957]	Vulnerable	Species or species habitat may occur within area
Listed Migratory Species [Resource Information]		
Scientific Name	Threatened Category	Presence Text
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
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 may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
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

Other Matters Protected by the EPBC Act

Listed Marine Species	[Resource Information]	
Scientific Name	Threatened Category	Presence Text
Bird		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area overfly marine area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area

Extra Information

Regional Forest Agreements	[Resource Information]
Note that all areas with completed RFAs have been included.	
RFA Name	State
South West WA RFA	Western Australia

EPBC Act Referrals	[Resource Information]		
Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Granite Quarry Expansion	2002/587	Not Controlled Action	Completed
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed

Caveat

1 PURPOSE

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

The report contains the mapped locations of:

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

2 DISCLAIMER

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

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

3 DATA SOURCES

Threatened ecological communities

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

Threatened, migratory and marine species

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

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

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

4 LIMITATIONS

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

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

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

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

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

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

Acknowledgements

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

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

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

Please feel free to provide feedback via the [Contact Us](#) page.

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APPENDIX 3

Conservation Codes

Conservation Codes for Western Australian Flora and Fauna

Specially protected fauna or flora are species* which have been adequately searched for and are deemed to be, in the wild, either rare, at risk of extinction, or otherwise in need of special protection, and have been gazetted as such. Conservation codes have been transitioned under regulations 170, 171 and 172 of the *Biodiversity Conservation Regulations 2018*.

T **Threatened species – Schedules 1-4**

Listed by order of the Minister as Threatened in the category of critically endangered, endangered or vulnerable under section 19(1), or is a rediscovered species to be regarded as threatened species under section 26(2) of the *Biodiversity Conservation Act 2016* (BC Act).

- **Threatened fauna** is that subset of ‘Specially Protected Fauna’ listed under schedules 1 to 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for Threatened Fauna.
- **Threatened flora** is that subset of ‘Rare Flora’ listed under schedules 1 to 3 of the *Wildlife Conservation (Rare Flora) Notice 2018* for Threatened Flora.

The assessment of the conservation status of these species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria as detailed below.

CR Critically endangered species

Threatened species considered to be “*facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines*”.

Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines. Published under schedule 1 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for critically endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for critically endangered flora.

EN Endangered species

Threatened species considered to be “*facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines*”.

Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines. Published under schedule 2 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for endangered flora.

VU Vulnerable species

Threatened species considered to be “*facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines*”.

Listed as vulnerable under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines. Published under schedule 3 of the *Wildlife*

Conservation (Specially Protected Fauna) Notice 2018 for vulnerable fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for vulnerable flora.

EX Presumed extinct species

Species where “*there is no reasonable doubt that the last member of the species has died*”, and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act).

Published as presumed extinct under schedule 4 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for extinct fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for extinct flora.

EW Extinct in the wild species

Species that “*is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form*”, and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act).

Currently there are no threatened fauna or threatened flora species listed as extinct in the wild. If listing of a species as extinct in the wild occurs, then a schedule will be added to the applicable notice.

Specially protected species

Listed by order of the Minister as specially protected under section 13(1) of the BC Act. Meeting one or more of the following categories: species of special conservation interest; migratory species; cetaceans; species subject to international agreement; or species otherwise in need of special protection.

Species that are listed as threatened species (critically endangered, endangered or vulnerable) or extinct species under the BC Act cannot also be listed as Specially Protected species.

MI Migratory species

Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; and listing is otherwise in accordance with the ministerial guidelines (section 15 of the BC Act).

Includes birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and fauna subject to the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals, that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species.

Published as migratory birds protected under an international agreement under schedule 5 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

CD Species of special conservation interest (conservation dependent fauna)

Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened, and listing is otherwise in accordance with the ministerial guidelines (section 14 of the BC Act).

Published as conservation dependent fauna under schedule 6 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

OS Other specially protected species

Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act).

Published as other specially protected fauna under schedule 7 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

P Priority species

Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened fauna or flora.

Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been recently removed from the threatened species or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring.

Assessment of Priority codes is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations.

Priority 1: Poorly-known species

Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.

Priority 2: Poorly-known species

Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.

Priority 3: Poorly-known species

Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.

Priority 4: Rare, Near Threatened and other species in need of monitoring

- (a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These species are usually represented on conservation lands.
- (b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for vulnerable but are not listed as Conservation Dependent.
- (c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

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

Western Australian Ecological Communities

Threatened Ecological Communities

The BC Act provides for the statutory listing of threatened ecological communities (TECs) by the Minister.

Presumed Totally Destroyed (PD)

An ecological community that has been adequately searched for but for which no representative occurrences have been located. The community has been found to be totally destroyed or so extensively modified throughout its range that no occurrence of it is likely to recover its species composition and/or structure in the foreseeable future.

Critically Endangered (CR)

An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or that was originally of limited distribution and is facing severe modification or destruction throughout its range in the immediate future, or is already severely degraded throughout its range but capable of being substantially restored or rehabilitated.

Endangered (EN)

An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or was originally of limited distribution and is in danger of significant modification throughout its range or severe modification or destruction over most of its range in the near future.

Vulnerable (VU)

An ecological community that has been adequately surveyed and is found to be declining and/or has declined in distribution and/or condition and whose ultimate security has not yet been assured and/or a community that is still widespread but is believed likely to move into a category of higher threat in the near future if threatening processes continue or begin operating throughout its range.

Priority Ecological Communities

Possible threatened ecological communities that do not meet survey criteria or that are not adequately defined are added to the Priority Ecological Community List under priorities 1, 2 and 3. These three categories are ranked in order of priority for survey and/or definition of the community. 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 that are known from very few occurrences with a very restricted distribution (generally ≤ 5 occurrences or a total area of $\leq 100\text{ha}$).

Occurrences are believed to be under threat either due to limited extent, or being on lands under immediate threat (e.g. within agricultural or pastoral lands, urban areas, active mineral leases) or for which current threats exist. May include communities with occurrences on protected lands. 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 occurrences with a restricted distribution (generally ≤ 10 occurrences or a total area of $\leq 200\text{ha}$). At least some occurrences are not believed to be under immediate threat (within approximately 10 years) 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 with significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat (within approximately 10 years), or;
- (iii) munities made up of large, and/or widespread occurrences, that may or may 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, inappropriate fire regimes, clearing, hydrological change etc.

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.

- (i) 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.
- (ii) 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 a higher threat category.
- (iii) 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.

Commonwealth of Australia Conservation Codes

Threatened Flora and Fauna

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

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.

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:

- a) it is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or
- b) 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.

Critically endangered

A taxon is Critically Endangered when the best available evidence indicates that it meets any of the five criteria for the category identified in Part 7.01 of the EPBC Regulations, and it is therefore considered to be facing an extremely high risk of extinction in the wild.

Endangered

A taxon is Endangered when the best available evidence indicates that it meets any of the five criteria for the category identified in Part 7.01 of the EPBC Regulations, and it is therefore considered to be facing a very high risk of extinction in the wild.

Vulnerable

A taxon is Vulnerable when the best available evidence indicates that it meets any of the five criteria for the category identified in Part 7.01 of the EPBC Regulations, and it is therefore considered to be facing a high risk of extinction in the wild.

Conservation dependent

A native species is eligible to be included in the conservation dependent category at a particular time if, at that time:

- a) 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; or
- b) the following subparagraphs are satisfied:
 - i. the species is a species of fish;

- ii. the species is the focus of a plan of management that provides for management actions necessary to stop the decline of, and support the recovery of, the species so that its chances of long term survival in nature are maximised;
- iii. the plan of management is in force under a law of the Commonwealth or of a State or Territory;
- iv. cessation of the plan of management would adversely affect the conservation status of the species.

The EPBC Act does not provide for listing in a data deficient category. Where sufficient data (evidence) is unavailable to allow assessment by the Threatened Species Scientific Committee against the criteria for listing, the species are found to be ineligible. A recommendation is made to the Minister to not include the species in any category under the EPBC Act. For reasons of transparency and to inform future research, the Threatened Species Scientific Committee publishes the names of those species found to be data deficient. As data deficient is not a listing category under the EPBC Act, this has no statutory implications and the species is not considered to be listed under the EPBC Act.

Threatened Ecological Communities

Threatened Ecological communities under the EPBC Act are listed in three categories.

Critically endangered

If, at that time, an ecological community is facing an extremely high risk of extinction in the wild in the immediate future (indicative timeframe being the next 10 years).

Endangered

If, at that time, an ecological community is not critically endangered but is facing a very high risk of extinction in the wild in the near future (indicative timeframe being the next 20 years).

Vulnerable

If, at that time, an ecological community is not critically endangered or endangered, but is facing a high risk of extinction in the wild in the medium-term future (indicative timeframe being the next 50 years).

APPENDIX 4

Flora Species List

SPECIES LIST – Lot 13 Horton Road – Hard Stand Site

MONOCOTYLEDONS

CYPERACEAE

Lepidosperma leptostachyum
Morelotia octandra
Schoenus sp

HAEMODORACEAE

Haemodorum spicatum

HEMEROCALLIDACEAE

Tricoryne elatior

POACEAE

**Aira caryophyllea*
**Anthoxanthum odoratum*
Austrostipa sp.
**Avena fatua*
**Briza maxima*
**Bromus sp*
**Ehrharta longiflora*
Neurachne alopecuroidea

XANTHORRHOEACEAE

Xanthorrhoea gracilis

DICOTYLEDONS

ASTERACEAE

**Hypochaeris glabra*
**Sonchus oleraceus*
**Taraxacum officinale*
**Ursinia anthemoides*

DILLENACEAE

Hibbertia huegelii
Hibbertia hypericoides

ERICACEAE

Styphelia pallida

FABACEAE

Acacia barbinervis
Acacia drummondii subsp. *drummondii*
Acacia extensa
Bossiaea ornata
Daviesia physodes
Daviesia podophylla
Gompholobium tomentosum
**Trifolium sp*

GOODENIACEAE

Scaevola calliptera

MYRTACEAE

Babingtonia camphorosmae
Corymbia calophylla
Eucalyptus marginata
Eucalyptus wandoo

POLYGALACEAE

Comesperma calymega

PROTEACEAE

Grevillea synapheae
Hakea lissocarpa

RUBIACEAE

Opercularia vaginata

APPENDIX 5

Quadrat Data

QUADRAT HR1

50 439587 E 6476295 N

Vegetation: *Corymbia calophylla* Open Woodland over *Hakea lissocarpha* Low Open Shrubland
Condition: Good
Soil Type: Orange-brown sandy loam with some surface laterite
Landform: Gently sloping down to the north
Date: 9.12.21
Recorder: Paul van der Moezel



QUADRAT (10 x 10m)

SPECIES	HEIGHT (m)	COVER (%)
<i>Corymbia calophylla</i>	20	10
<i>Hakea lissocarpha</i>	0.6	5
* <i>Avena fatua</i>	0.4	1
<i>Lepidosperma leptostachyum</i>	0.4	<1
<i>Xanthorrhoea gracilis</i>	0.4	<1
* <i>Bromus sp</i>	0.4	<1
<i>Acacia barbinervis</i>	0.3	1
* <i>Anthoxanthum odoratum</i>	0.3	1
* <i>Ursinia anthemoides</i>	0.3	<1
<i>Austrostipa sp</i>	0.3	<1
<i>Hibbertia hypericoides</i>	0.2	<1
<i>Morelotia octandra</i>	0.2	<1
* <i>Aira caryophylla</i>	0.1	1
<i>Scaevola calliptera</i>	0.1	<1
<i>Gompholobium tomentosum</i>	0.1	<1
<i>Bossiaea ornata</i>	0.1	<1
* <i>Trifolium sp</i> (dead)	<0.1	<1
* <i>Hypochaeris glabra</i>	Flat	<1

* introduced species

APPENDIX 6

Significant Tree Data

Pt Lot 13 Horton Road, The Lakes Potential Black Cockatoo Breeding Tree Data - Hardstand Area

Tree Number	Species	Easting MGA zn50	Northing MGA zn50	Height (m)	Diameter (mm)			Notes (hollows, bees etc.)
					DBH1	DBH2	DBH3	
1	Marri (<i>Corymbia calophylla</i>)	439525	6476050	22	560			no hollows
2	Marri (<i>Corymbia calophylla</i>)	439538	6476059	20	890			no hollows
3	Marri (<i>Corymbia calophylla</i>)	439636	6476073	22	930			no hollows, unhealthy
4	Marri (<i>Corymbia calophylla</i>)	439642	6476110	19	510	390		no hollows
5	Marri (<i>Corymbia calophylla</i>)	439615	6476138	22	510			no hollows
6	Marri (<i>Corymbia calophylla</i>)	439636	6476152	22	1080			no hollows
7	Marri (<i>Corymbia calophylla</i>)	439615	6476194	20	530			no hollows
8	Marri (<i>Corymbia calophylla</i>)	439534	6476208	19	800			no hollows
9	Marri (<i>Corymbia calophylla</i>)	439510	6476178	10	1220			no hollows, dead top
10	Marri (<i>Corymbia calophylla</i>)	439493	6476204	20	500	200		no hollows, dead branches
11	Marri (<i>Corymbia calophylla</i>)	439630	6476207	19	730			no hollows
12	Marri (<i>Corymbia calophylla</i>)	439639	6476234	22	530	470	410	no hollows
13	Marri (<i>Corymbia calophylla</i>)	439608	6476266	20	720			no hollows
14	Marri (<i>Corymbia calophylla</i>)	439459	6476235	23	900			no hollows, half of tree dead
15	Marri (<i>Corymbia calophylla</i>)	439493	6476231	11	610			no hollows, unhealthy
16	Marri (<i>Corymbia calophylla</i>)	439470	6476199	14	570	300		no hollows
17	White Gum (<i>Eucalyptus wandoo</i>)	439430	6476101	25	1030			Possible large vertical hollow on trunk
18	Jarrah (<i>Eucalyptus marginata</i>)	439491	6476097	22	620	310		no hollows
19	Marri (<i>Corymbia calophylla</i>)	439525	6476103	16	500			no hollows