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# Lot 37 Barfield Road, Hammond Park

## Native Vegetation Clearing Permit supporting documentation

## FINAL

Prepared for
Richard Noble and Co.
by Strategen

July 2018

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# Lot 37 Barfield Road, Hammond Park

## Native Vegetation Clearing Permit supporting documentation

## FINAL

Strategen is a trading name of
Strategen Environmental Consultants Pty Ltd
Level 1, 50 Subiaco Square Road Subiaco WA 6008
ACN: 056 190 419

July 2018

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**Client: Richard Noble and Co.**

| Report Version | Revision No. | Purpose | Strategen author/reviewer | Submitted to Client | |
|---|---|---|---|---|---|
| | | | | Form | Date |
| Preliminary Draft Report | A | Client review | R Chesney / D Walsh | Electronic | 1/05/2018 |
| Final Report | 0 | Regulator Submission | T Sleigh / D Walsh | Electronic | 29/05/2018 |
| Final Report | 1 | Regulator Submission | T Sleigh / D Walsh | Electronic | 25/07/2018 |

Filename: RNO17693_01 R001 Rev 1.docx - 25 July 2018

## Table of contents



## List of tables



## List of figures

## List of appendices

# 1. Introduction

Richard Noble and Company (RNC) are proposing to undertake sand extraction within Lot 37 Barfield Road, Hammond Park (the proposed clearing area). The proposed clearing area is located approximately 28 km from the Perth Central Business District, within the City of Cockburn (Figure 1).

The proposed sand extraction will necessitate the clearing of a small area of native vegetation (1.75 ha) within the proposed clearing area (Figure 1). Clearing of this vegetation will require RNC to obtain a Native Vegetation Clearing Permit (NVCP) to facilitate lawful clearing of native vegetation. The purpose permit application form (form C2) is provided in Appendix 1.

This supporting document has been prepared to support the granting of a NVCP under s 51 E of the *Environmental Protection Act 1986* (EP Act). The supporting document includes the following information:

- an overview of the existing environmental conditions of the site
- an evaluation of potential impacts of the vegetation clearing
- an evaluation of compliance of the proposed clearing against the ten clearing principles listed under Schedule 5 of the EP Act
- environmental approvals and management requirements.

The information provided within this supporting document is based on survey of the proposed clearing area as documented in *Lot 37 Barfield Road, Hammond Park Flora, Vegetation and Fauna assessment* (Strategen 2018, see Appendix 2).

## 1.1 Location, ownership and tenure

The proposed clearing area is located at Lot 37 Barfield Road, Hammond Park. Site identification details for the proposed clearing area are provided in Table 1.

The current zoning under the current Local Planning Scheme, Special Use (transmission corridor), reflects the degraded nature of the proposed clearing area with historic partial clearing evident. As such, a large proportion of the vegetation represents regrowth.

Table 1: Site identification details

| Subject | Detail |
|---|---|
| Lot address | Lot 37 on Plan 9781 |
| Street address | Lot 37 Barfield Rd, Hammond Park 6164 |
| Current site owner | Western Power |
| Local Government Authority | City of Cockburn |
| Current MRS zoning | Urban |
| Current Local Planning Scheme No. 3 Zoning | Special Use (transmission corridor) |

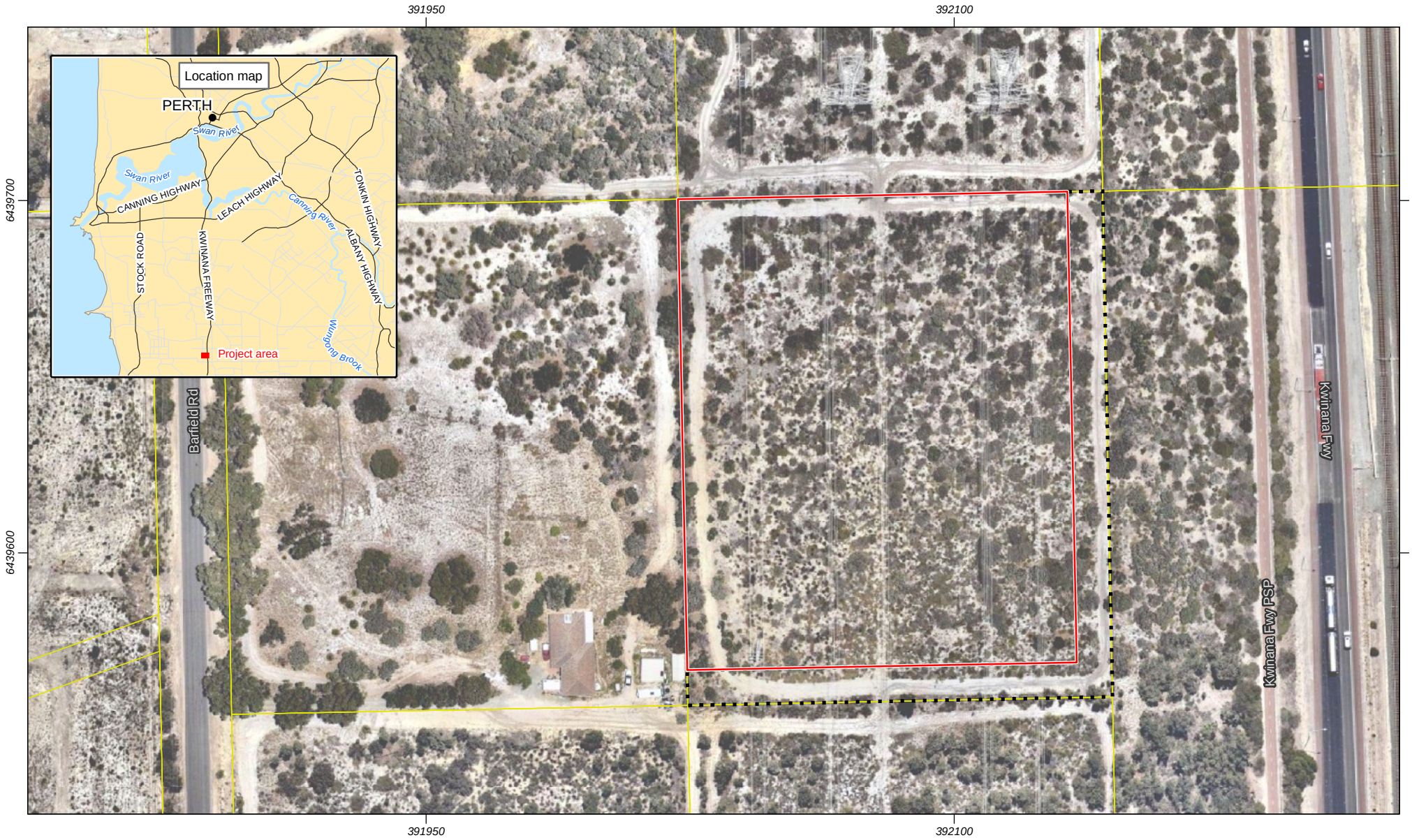


**Figure 1: Proposed clearing area**

Scale 1:1,500 at A4

0 15 30 45 m

N

Coordinate System: GDA 1994 MGA Zone 50
Note that positional errors may occur in some areas
Date: 1/05/2018
Author: vdinh
Source: Nearmap: Aerial imagery - 14/02/2018.

**Legend**

- Cadastre
- Proposed clearing area
- 10 m wide retained vegetation buffer

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# 2. Overview of existing environment

## 2.1 Topography

The proposed clearing area slopes from 28 m Australian Height Datum (AHD) to a rise of 36 m AHD, extending between approximately the northeast and southwest corners based on regional topographic contour data (WALGA 2018).

## 2.2 Landform and Geology

The proposed clearing area is located within the Swan Coastal Plain bioregion (SWA2 – Swan Coastal Plain subregion) of Western Australia (Mitchell et al. 2002). The Swan Coastal Plain comprises five major geomorphologic systems that lie parallel to the coast, namely (from west to east) the Quindalup Dunes, Spearwood Dunes, Bassendean Dunes, Pinjarra Plain and Ridge Hill Shelf (Churchward & McArthur 1980; Gibson *et al.* 1994). Each major system is composed of further subdivisions in the form of detailed geomorphologic units (Churchward & McArthur 1980; Semeniuk 1990; Gibson *et al.*1994). Beard (1990) describes the Swan Coastal Plain as a low-lying coastal plain, often swampy, with sandhills also containing dissected country rising to the duricrusted Dandaragan plateau on Mesozoic, mainly sandy, yellow soils. The proposed clearing area is situated within the Bassendean Dunes formation.

## 2.3 Soils

Regional geological mapping identified one geological unit within the proposed clearing area; namely, Bassendean Sand (Qdcb) which is characterised by 'basal conglomerate overlain by dune quartz sand with heavy mineral concentrations' (Geoscience Australia 2008).

## 2.4 Acid Sulfate Soils

Acid Sulfate Soils (ASS) are naturally occurring, iron-sulphide rich soils, sediments or organic substrates, formed under waterlogged conditions. If exposed to air, these sulphides can oxidise and release sulphuric acid and heavy metals. This process can occur due to drainage, dewatering or excavation.

A search of the Swan Coastal Plain ASS risk mapping (WALGA 2017) indicates that there is a 'moderate to low' potential of soil within the proposed clearing area containing ASS.

## 2.5 Hydrology

### 2.5.1 Surface water

No surface water features have been identified within the proposed clearing area.

The Geomorphic Wetlands, Swan Coastal Plain mapping (DBCA 2015) identifies one Conservation Category Wetland (CCW) within 1 km of the proposed clearing area; namely UFI14104, approximately 1 km to the northwest of the proposed clearing area.

### 2.5.2 Groundwater

Groundwater contours within the proposed clearing area indicate that depth to groundwater across the proposed clearing area is estimated at 6.5 – 14.5 m below ground level (WALGA 2018).

## 2.6 Vegetation and flora

On behalf of RNC, Strategen undertook a flora, vegetation and fauna assessment of the proposed clearing area in February 2018. The results of the assessment are detailed under the following sub-sections and a copy of the report is provided in Appendix 2.

### 2.6.1 Regional vegetation

Vegetation occurring within the region was initially mapped at a broad scale (1: 1 000 000) by Beard during the 1970s. This dataset has formed the basis of several regional mapping systems, including physiographic regions defined by Beard (1981); System 6 Vegetation Complex mapping undertaken by Heddle et al. (1980); the biogeographical region dataset (Interim Biogeographic Regionalisation for Australia) for Western Australia (DEE 2018a).

The proposed clearing area is situated within vegetation association Bassendean 1001 – Medium very sparse woodland; jarrah, with low woodland*; Banksia & Casuarina* (Beard 1990; Figure 2).

Based on regional vegetation complex mapping (Heddle et al. 1980) the proposed clearing area contains the Bassendean Central and South vegetation complex, described as ranging from woodland of *Eucalyptus marginata - Allocasuarina fraseriana - Banksia* species to low woodland of *Melaleuca* species, and sedgelands on the moister sites, and includes the transition of *Eucalyptus marginata* to *Eucalyptus todtiana* near Perth.

Vegetation statistics for the above vegetation system association and complex are displayed in Table 2. The proposed clearing area contains 1.4 ha of intact vegetation in Good – Very Good condition, and 0.15 ha of vegetation in Degraded condition that is potentially representative of Pre-European vegetation associations and complexes.

Table 2: Pre-European and current extent vegetation system association and complexes (Government of Western Australia 2018; 2018a)

| Vegetation system association/ complex | Pre-European extent (ha) | Current extent (ha) | % remaining | % Current Extent Protected for Conservation |
|---|---|---|---|---|
| 1001 | 57 410 | 12 704 | 22.13 | 2.8 |
| Bassendean Central and South | 87 476 | 23 533 | 26.9 | 1.86 |

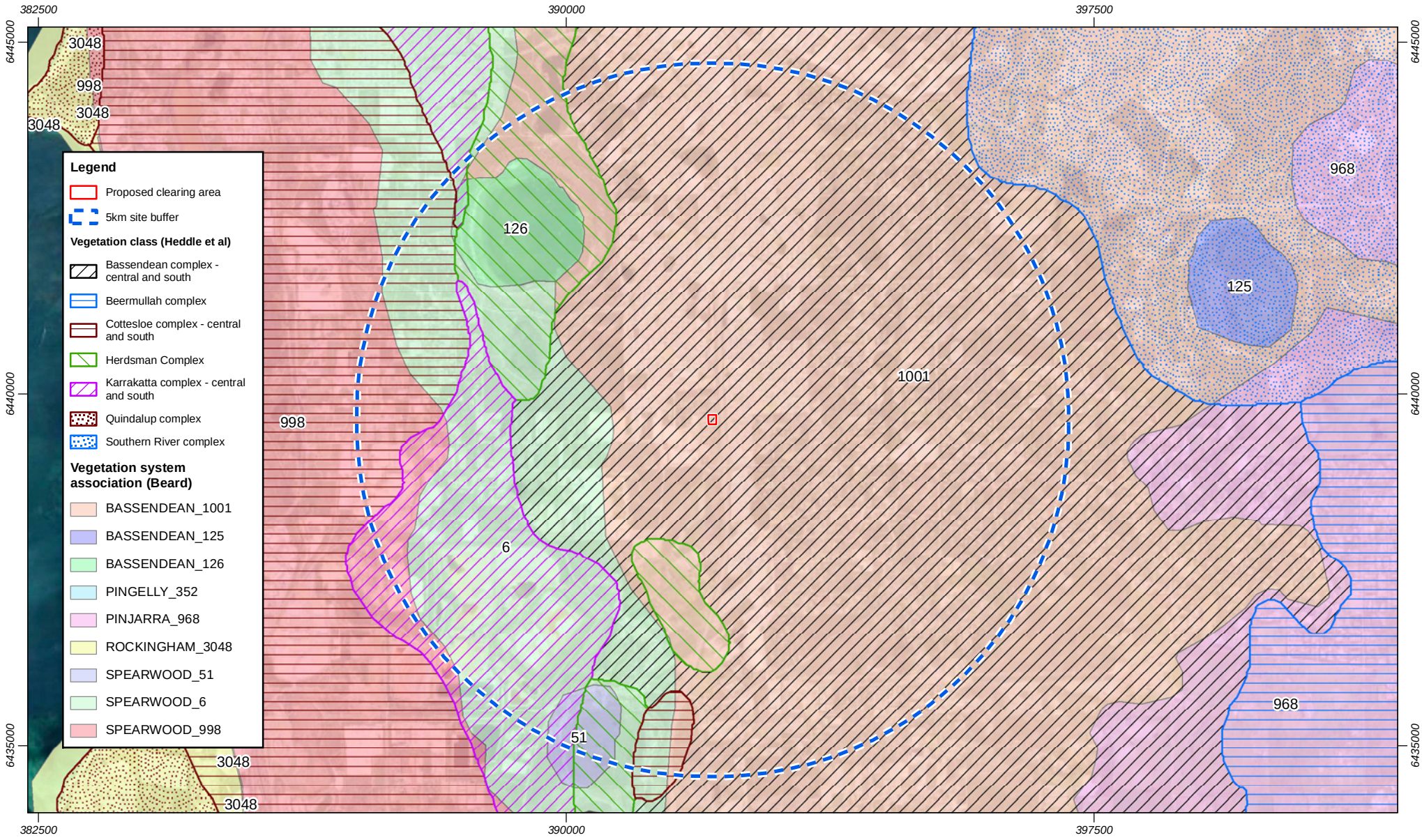


**Figure 2: Regional vegetation mapping**

Scale 1:75,000 at A4

0 750 1,500 2,250 m

N

Coordinate System: GDA 1994 MGA Zone 50
Note that positional errors may occur in some areas
Date: 1/05/2018
Author: jcrute
Source: Nearmap: Aerial imagery - 14/02/2018.

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### 2.6.2 Native flora

A total of 29 native vascular plant taxa from 17 plant families were recorded within the proposed clearing area. The majority of taxa were recorded within the Fabaceae and Proteaceae families (see Appendix 2).

### 2.6.3 Threatened and Priority flora

The desktop assessment (Appendix 2) identified seven Threatened flora and three Priority flora species that have been recorded in the regional area. Table 3 presents the Threatened and Priority flora potentially occurring within the proposed clearing area, based on the desktop assessment.

Based on site observations, it was determined that preferred or potential habitat for the following Threatened and Priority flora taxa is potentially present:

- *Caladenia huegelii* (T, Endangered)
- *Dodonaea hackettiana* (P4).

As the survey was undertaken in February, the timing of the survey was outside of the usual flowering period for these two species.

Although the desktop assessment identified potential habitat for these species, *Dodonaea* species would be identifiable throughout the year, even without reproductive characteristics (flowers or fruit) present, and none were recorded within the proposed clearing area during the survey. Preferred habitat for *C. huegelii* is mixed woodland of *Eucalyptus marginata*, *Banksia attenuata* and other *Banksia* species with scattered *Allocasuarina fraseriana* and *Corymbia calophylla* over a dense understorey, which was not present within the proposed clearing area. VT3, an area of heavily disturbed *Banksia* woodland, is likely to be too degraded for this species to be present given the species tends to favour vegetation with dense undergrowth (DEC 2009).

No other flora species listed as Threatened under the *Wildlife Conservation Act 1950* (WC Act) or Priority Flora species as listed by the DBCA were recorded during the field survey.

Table 3: Threatened and Priority flora potentially occurring within the proposed clearing area

| Species | Conservation status | | Description | Potential to occur |
|---|---|---|---|---|
| | WC Act | EPBC Act | | |
| *Andersonia gracilis* | T | Endangered | A slender, erect or open straggly shrub, 10 to 100 cm high. Flowers are white to pink to purple from September to November. Habitat for this species occurs in white/grey sand, sandy clay, gravelly loam within winter-wet areas and near swamps (Western Australian Herbarium 1998-). The species occurs in damp black, sandy clay flats near swamps in open low heath with *Calothamnus* hirsutus, Verticordia densiflora, Kunzea recurva and Banksia telmatiaea over sedges. Vegetation within the proposed action area is dominated by Open Woodland of Eucalyptus marginata, Corymbia calophylla, Pinus pinaster, Eucalyptus gomphocephala (over Kunzea glabrescens and mixed native/non-native shrubs and grasses on predominantly light grey sand. | **Unlikely** due to absence of preferred habitat. |
| *Caladenia huegelii* | T | Endangered | A slender orchid 30 to 50 cm tall. One or two striking flowers characterised by a greenish-cream lower petal with a maroon tip. Other petals are cream with red or pink suffusions. Habitat for this species occurs within well-drained, deep sandy soils in low mixed Banksia, Allocasuarina and Jarrah woodlands (Western Australian Herbarium 1998-, DEE 2018b). | **Unlikley** due to the degraded nature of the vegetation |
| *Diuris micrantha* | T | Vulnerable | A slender orchid to 60 cm tall. Flowers are yellow with reddish-brown markings and visible from September to October. Habitat for this species occurs within clay-loam substrates in winter-wet depressions or swamps (DEE 2018b). | **Unlikely** due to absence of preferred habitat. |
| *Diuris purdiei* | T | Endangered | A slender orchid to 0.35 m tall. Flowers are yellow and visible from September to October. Habitat for this species is grey-black sand substrates in winter-wet swamps which have high moisture (Western Australian Herbarium 1998-). Diuris purdiei occurs from Perth south to near the Whicher Range, within the Swan (Western Australia) Natural Resource Management Region. It grows on sand to sandy clay soils, in areas subject to winter inundation, and amongst native sedges and dense heath with scattered emergent *Melaleuca preissiana*, *Corymbia calophylla*, *E. marginata* and *Nuytsia floribunda* (DEE 2018b). | **Unlikely** due to absence of preferred habitat. |

| Species | Conservation status | | Description | Potential to occur |
|---|---|---|---|---|
| | WC Act | EPBC Act | | |
| *Dodonaea hackettiana* | P4 | | An erect shrub or tree, 100 to 500 cm tall. Flowers are yellow to green/red and occur mainly from July to October. Habitat for this species occurs in sand and outcropping limestone (Western Australian Herbarium 1998-). | **Possible** due to presence of potential habitat. |
| *Drakaea elastica* | T | Endangered | A slender orchid to 30 cm tall with a prostrate, round to heart shaped leaf. Singular, bright green, glossy flower. Habitat for this species is within bare patches of white sand over dark sandy loams on damp areas mostly in *Kunzea glabrescens* thickets (DotE 2015d). | **Unlikely** due to absence of preferred habitat. |
| *Eleocharis keigheryi* | T | Vulnerable | A rhizomatous, clumped perennial grass-like herb to 40 cm tall. Flowers are green and visible from August to November. Habitat for this species occurs in clay or sandy loam in freshwater creeks and claypans (Western Australian Herbarium 1998-). | **Unlikely** due to absence of preferred habitat. |
| *Lepidosperma rostratum* | T | Endangered | A rhizomatous, tufted perennial, grass-like or herb (sedge), 50 cm tall. Flowers are brown and flowering occurs from May to June. Habitat for this species occurs in peaty sand or clay and within seasonally wet swamps (Western Australian Herbarium 1998-, DotE 2015d). | **Unlikely** due to absence of preferred habitat. |
| *Pimelea calcicola* | P3 | | An erect to spreading shrub to 1 m tall. Flowers are pink and visible between September to November. Habitat for this species occurs in sand on coastal limestone ridges (Western Australian Herbarium 1998-). | **Unlikely** due to absence of preferred habitat. |
| *Stylidium paludicola* | P3 | | Reed-like perennial, herb, 35 to 100 cm tall. Leaves are tufted, linear or subulate or narrowly oblanceolate. Flowers are pink and occur in October to December. Habitat for this species occurs in peaty sand over clay and winter wet areas, often in Marri and Melaleuca woodland or Melaleuca shrubland (Western Australian Herbarium 1998-). | **Unlikely** due to absence of preferred habitat. |

### 2.6.4 Vegetation type and condition

Three vegetation types were recorded within the proposed clearing area (Table 4; Figure 3). Eaxmple photographs from each vegetation type are presented in Plates 1 to Plate 3

Table 4: Vegetation type within proposed clearing area

| Vegetation type | Description | Condition | Area |
|---|---|---|---|
| VT1 | Shrubland of *Adenanthos cygnorum* over open shrubland of *Allocasuarina humilis*, *Scholtzia involucrata* and *Hibbertia hypericoides* with occasional *Banksia menziesii*, *B. attenuata* and *Allocasuarina fraseriana*. | Good – Very Good | 0.77 |
| VT2 | Shrubland of *Allocasuarina humilis* over open heath of *Scholtzia involucrata*, *Mesomelaena pseudostygia* and mixed shrubs with occasional *Banksia menziesii*. | Good | 0.48 |
| VT3 | Open woodland of *Banksia menziesii*, *Eucalyptus todtiana* and *B. attenuata* over isolated shrubs of *Adenanthos cygnorum* over mixed introduced species. | Degraded | 0.13 |
| CL | Cleared areas including tracks / firebreaks | Completely Degraded | 0.09 |
| **Total** | | | **1.48** |


**Figure 3: Vegetation types**

Scale 1:1,500 at A4

0 15 30 45 m

N

Coordinate System: GDA 1994 MGA Zone 50
Note that positional errors may occur in some areas
Date: 1/05/2018
Author: vdinh
Source: Nearmap: Aerial imagery - 14/02/2018.

**Legend**

- 10 m wide retained vegetation buffer
- Proposed clearing area
- Cadastre
- VT1
- VT2
- VT3
- Cleared
- Banksia woodlands of the Swan Coastal Plain TEC

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### 2.6.5 Vegetation condition

Vegetation condition was rated using the scale of Keighery (1994) for the South West Botanical Province (Table 5). Despite a history of disturbance within the proposed clearing area, approximately half of the vegetation was rated in Good – Very Good condition due to retention of moderate species diversity within the understorey (Table 6). The remainder of the vegetation was rated as Completely Degraded to Good condition (Figure 4).

Table 5: Vegetation condition scale (Keighery 1994)

| Condition rating | Description |
|---|---|
| Pristine (1) | Pristine or nearly so, no obvious sign of disturbance. |
| Excellent (2) | Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species. |
| Very Good (3) | Vegetation structure altered obvious signs of disturbance.<br>For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing. |
| Good (4) | Vegetation structure significantly altered by obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it.<br>For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback, grazing. |
| Degraded (5) | Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management.<br>For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing. |
| Completely Degraded (6) | The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs. |

Table 6: Vegetation condition within proposed clearing area

| Condition | Area (ha) | Percentage of proposed clearing area |
|---|---|---|
| Good-Very Good | 0.75 | 50.68 |
| Good | 0.48 | 32.43 |
| Degraded | 0.15 | 10.14 |
| Completely Degraded | 0.09 | 6.08 |
| **Total** | **1.75** | **100** |


**Figure 4: Vegetation condition within the proposed clearing area**

Scale 1:1,500 at A4

0 15 30 45 m

N

Coordinate System: GDA 1994 MGA Zone 50
Note that positional errors may occur in some areas
Date: 1/05/2018
Author: vdinh
Source: Nearmap: Aerial imagery - 14/02/2018.

**Legend**

- 10 m wide retained vegetation buffer
- Proposed clearing area
- Cadastre

**Vegetation condition**

- Good
- Good-Very Good
- Degraded
- Completely Degraded

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### 2.6.6 Threatened and Priority Ecological Communities

Table 7 presents the Threatened and Priority Ecological Communities identified within 5 km of the proposed clearing area (Figure 5).

Table 7: Mapped TECs identified within 5 km of proposed clearing area

| Community identifier | Community name | Listing under WC Act | Listing under EPBC Act |
|---|---|---|---|
| Banksia woodlands of the Swan Coastal Plain | Banksia woodlands of the Swan Coastal Plain | Various listings; encompasses multiple state-listed TECs and PECs | Endangered |
| Limestone ridges (SCP 26a) | *Melaleuca huegelii - Melaleuca systena* shrublands on limestone ridges | Endangered | NA |
| SCP21c | Low lying *Banksia attenuata* woodlands or shrublands | Priority 3 | Endangered |
| SCP22 | *Banksia ilicifolia* woodlands | Priority 3 | Endangered |
| SCP24 | Northern Spearwood shrublands and woodlands | Priority 3 | Endangered |

While VT3 contained *Banksia menziesii* and *B. attenuata*, the area was heavily degraded with minimal native understorey. Insufficient data was available to conduct statistical analysis to affiliate this vegetation type with any of the Floristic Community Types (FCTs) as described by Gibson et al. (1994). While a definitive association cannot be made, given the soil and position in the landscape, as well as adjacent reference sites, the vegetation within the proposed clearing area is most likely to be aligned with FCT28 – Spearwood *Banksia attenuata* or *Banksia attenuata – Eucalyptus* woodlands. This FCT is not considered to be locally or regionally significant with reference to Banksia woodland communities.

#### *Banksia woodland TEC*

Vegetation within VT3 (0.15 ha) retained Banksia woodland structure, but was heavily degraded and with limited native understorey. TSSC (2016) states that to be considered a part of the Banksia Woodlands TEC, a patch should be in at least 'Good' condition, 2 ha in size or above. As such, on its own, this patch would not meet the requirements due to its small size and degraded condition. However, as this VT forms part of a broader area of Banksia woodland vegetation (within the road reserve to the east and the private lot to the south), this small area of vegetation should be considered to form part of the *Banksia woodlands of the Swan Coastal Plain* TEC, listed as Endangered under the EPBC Act.

An assessment of this VT against diagnostic criteria provided in the approved conservation advice for the *Banksia woodlands of the Swan Coastal Plain* TEC is shown in Table 8.

Table 8: Characteristics of the Banksia woodland within the Subject Site compared to the key diagnostic criteria as per TSSC (2016)

| Key diagnostic criteria (TSSC 2016) | Banksia woodlands within the proposed clearing area |
|---|---|
| Location:<br>Occurs in the Swan Coastal Plain or Jarrah Forest IBRA bioregions. | Yes. Banksia woodlands within the proposed clearing area occur on the Swan Coastal Plain. |
| Soils and landform:<br>Occurs on:<br>• well drained, low nutrient soils on sandplain landforms, particularly deep Bassendean and Spearwood sands and occasionally on Quindalup sands<br>• sandy colluviums and aeolian sands of the Ridge Hill Shelf, Whicher Scarp and Dandaragan Plateau<br>• transitional substrates and sandflats. | Yes. Banksia woodlands within the proposed clearing area occur on Bassendean sands. |

| Key diagnostic criteria (TSSC 2016) | Banksia woodlands within the proposed clearing area |
|---|---|
| Structure:<br>Low woodland to forest with:<br>• a distinctive upper sclerophyllous layer of low trees (occasionally large shrubs more than 2 m tall), typically dominated or co-dominated by one or more of the banksia species identified below<br>• emergent trees of medium or tall (>10 m) height. *Eucalyptus* or *Allocasuarina* species may sometimes be present above the banksia canopy<br>• an often highly species-rich understorey. | Yes. Banksia woodlands within the proposed clearing area represent a low woodland-woodland structure. |
| Composition:<br>Contains at least one of the following species:<br>• *Banksia attenuata*<br>• *Banksia menziesii*<br>• *Banksia prionotes*<br>• *Banksia ilicifolia.* | Yes. Banksia woodlands within the proposed clearing area contain *Banksia attenuata* and *B. menziesii*. |
| Condition (Keighery 1994):<br>'Pristine': no minimum patch size<br>'Excellent': 0.5 ha<br>'Very Good': 1 ha<br>'Good': 2 ha. | Banksia woodlands covering 0.2 ha within the proposed clearing area are predominantly in Degraded condition. However, the patch is continuous with a broader patch of Banksia woodland in Very Good condition directly to the south of the proposed clearing area, bringing the overall patch size to >2 ha. |

No other PECs or TECs were considered to be represented by the vegetation within the proposed clearing area.

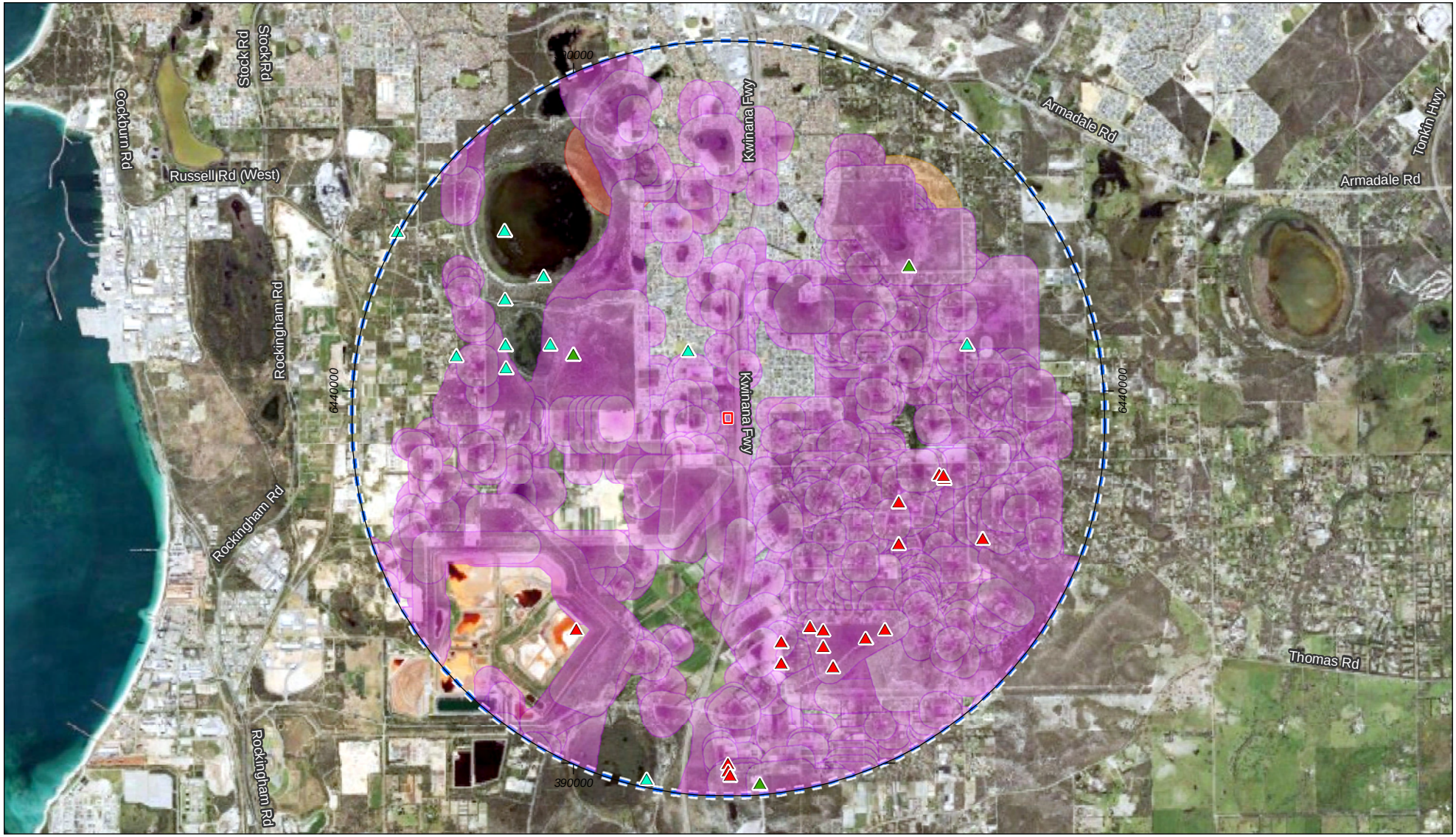


**Figure 5: Environmentally Sensitive Areas, location of Threatened and Priority Flora species and Ecological Communities within 5 km of the proposed clearing area**

Scale 1:75,000 at A4

0 750 1,500 2,250 m

Coordinate System: GDA 1994 MGA Zone 50
Note that positional errors may occur in some areas
Date: 1/05/2018
Author: vdinh
Source: Nearmap: Aerial imagery - 14/02/2018.

**Legend**

- Proposed clearing area

**Threatened & Priority Flora**

- (T) Threatened Rare Flora - Extant Taxa
- Priority 3 - Poorly Known Taxa
- Priority 4 - Rare Taxa
- 5km site buffer

**Threatened ecological communities**

- SCP21c
- SCP22
- SCP24
- Banksia Woodlands of the Swan Coastal Plain
- Limestone ridges (SCP 26a)

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## 2.7 Terrestrial fauna

Database searches of *NatureMap* and the DEE Protected Matters Database were undertaken as part of the flora vegetation and fauna habitat survey. These databases were used in conjunction with the vegetation and consequently the habitat present to determine the likelihood of any Threatened or Priority fauna species occurring in the proposed clearing area and in the nearby surrounds (where habitat is similar) (Appendix 3).

Fauna habitat present in the proposed clearing area is described as Banksia Woodland that has previously been disturbed because of the electrical transmission lines running through the middle of the proposed clearing area.

It is important to note that the databases returned fauna species that are unlikely to occur in the proposed clearing area or nearby because of the following:

- specific habitat is not present within the proposed clearing area such as the ocean for marine mammals, or coastal shore habitat for shorebirds and wading birds or wetlands for waterbirds
- some species have a limited or patchy distribution
- species that have become locally extinct, or
- species that have been erroneously identified in previous surveys.

The database searches were examined and species were excluded if they met the above criteria, because they are then not expected to occur in the proposed clearing area.

Below provides a summary of species excluded from the conservation significant fauna records.

### *Waterbirds*

Several shorebirds and wetland bird species were returned in the database searches. Wetland birds such as Egrets and wading birds including Plovers, Stints and Sandpipers inhabit estuaries, mudflats, saltmarshes, sandflats and beaches, where they feed on invertebrates such as worms, molluscs, insects and crustaceans (Garnett *et al.* 2011). There is no wetland in the proposed clearing area and therefore no habitat for these species. The wading birds returned from the database searches are excluded from any further discussion in this report.

Several coastal birds were returned from the database searches. Coastal birds such as White-bellied Sea-eagle and Osprey require coasts and near-coastal wetland habitat, where they feed mainly on fish, sea snakes and nesting seabirds (Johnstone & Storr 1998). There is no such habitat present in the proposed clearing area. As such, these species have also been excluded from any further discussion in this report.

### *Now Regionally Extinct*

Several species returned in the database searches are also known to be historical records of species now regionally/locally extinct, for example the Malleefowl, Numbat and Western Ringtail Possum. These species have been excluded from any further discussion in this report.

### *Database Errors and Anomalies*

Occasionally species appear in only the EPBC database searches, for example the Grey Wagtail and the Fork-tailed Swift. This database also considers broader information, for example bioclimatic distribution models, so can be less accurate at the local level. These species have also been omitted from any further discussion.

In addition, many fauna species are not distributed evenly across the landscape, are more abundant in some places than others are, and consequently more detectable (Currie 2007). Furthermore, some small, common ground-dwelling reptile and mammal species tend to be habitat specific, and many bird species can occur as regular migrants, occasional visitors or vagrants.

### *Conservation significant fauna*

The likelihood of conservation significant species occurring in the proposed clearing area is outlined below in Table 9 and is based on the following criteria:

- Recorded: Recorded during the field survey or site reconnaissance
- Likely: Suitable habitat is present in the proposed clearing area and the proposed clearing area is in the species' known distribution
- Possible: Limited or no suitable habitat is present in proposed clearing area, but is nearby. The species has good dispersal abilities and is known from the general area
- Unlikely: No suitable habitat is present in proposed clearing area but is nearby, the species has poor dispersal abilities but is known from the general area or suitable habitat is present, however, the proposed clearing area is outside of the species' known distribution.

A total of five conservation significant species (including Priority species) identified by the database searches have been considered here, with that being based on database records and suitable habitat in the proposed clearing area. These four species are comprised of one reptile species, three birds and one mammal species.

Table 9: Threatened and priority fauna potentially occurring within the proposed clearing area

| Species | Conservation status | | Relevant Ecology | Likelihood of Occurrence |
|---|---|---|---|---|
| | WC Act and Priority Species | EPBC Act | | |
| *Lerista lineata* (Lined Skink) | P3 | | This species is restricted to the south of the Swan River, where it inhabits sandy coastal heath and shrubland, this includes Banksia / Eucalypt woodlands (Wilson and Swan 2017). The proposed clearing area does have habitat that would be considered suitable for this species i.e. Banksia Woodland, however, the site has previously been cleared. The species is also likely to have poor dispersal ability. | **Possible** |
| *Calyptorhynchus banksii naso* (Forest Red-tailed Black-Cockatoo [FRTBC]) | T/S3 | Vulnerable | This species is relatively common in the Perth metropolitan area. The FRTBC feeds primarily on Marri and Jarrah fruit, but also Tuart and to a lesser extent on Blackbutt (*Eucalyptus patens*), Albany Blackbutt (*E. staeri*), Karri (*Eucalyptus diversicolor*), Sheoak (*Allocasuarina fraseriana*) and Snottygobble (*Persoonia longifolia*) (Johnstone et al. 2013). The FRTBC can obtain energy faster when feeding on Marri and Jarrah than other food sources (Cooper et al. 2002), and these two-plant species make up most of their diet (Johnstone et al. 2013). The proposed clearing area has none of the FRTBC foraging species present. | Unlikely |
| *Calyptorhynchus latirostris* (Carnaby's Cockatoo) | T/S2 | Endangered | This species as with the FTRBC is relatively common in the Perth metropolitan area. Carnaby's Cockatoos feed on seeds, nuts and flowers of a variety of native and exotic plants. Food plants include a variety of Banksia species, for example the Slender Banksia (*Banksia attenuata*) and Firewood Banksia (*Banksia menziesii*), Eucalyptus species, such as Marri, Jarrah, Blackbutt, Coastal Blackbutt, Salmon Gum (*Eucalyptus salmonophloia*), as well as Pine trees (*Pinus sp.*), Grevillea, Allocasuarina, and Hakea species (Shah 2006, Johnstone et al. 2011). The seeds from a variety of Banksia species and the cones of Pine trees provide the highest energetic yield (Cooper et al. 2002). The proposed clearing area has food items such as the Slender Banksia, Firewood Banksia and Coastal Blackbutt that Carnaby's Cockatoo is known to eat. | Likely |

| Species | Conservation status | | Relevant Ecology | Likelihood of Occurrence |
|---|---|---|---|---|
| | WC Act and Priority Species | EPBC Act | | |
| *Merops ornatus (Rainbow Bee-eater)* | T/S5 | Marine | The Rainbow Bee-eater is often seen in the Perth metropolitan area. This species is one of the most common and widespread birds in Australia with a distribution that covers the majority of Australia (Barrett et al. 2003). The Rainbow Bee-eater is also a common and widespread species in WA, except the drier interior of the State and the far south-west. It occurs in lightly wooded, often sandy country, preferring areas near water. It feeds on airborne insects and nests throughout its range in WA in burrows excavated in sandy ground or banks, often at the margins of roads and tracks (Johnstone & Storr 1998). In WA, this bird can occur as a 'resident, breeding visitor, postnuptial nomad, passage migrant and winter visitor' (Johnstone & Storr 1998). | **Possible** |
| *Isoodon obesulus (Southern Brown Bandicoot)* | P4 | | This species occurs from Guilderton southwards on the SCP, including the Perth Metropolitan area, in Jarrah and Karri forests and adjacent coastal vegetation complexes. The species inhabits scrubby, often swampy, vegetation with dense cover up to about 1 m high. It feeds in adjacent forest and woodland that is burnt on a regular basis and in areas of pasture and cropland lying close to dense cover. The Southern Brown Bandicoot is patchily distributed in suitable habitat, with populations inhabiting Jarrah and Wandoo forests usually associated with watercourses. On the Swan Coastal Plain it is often associated with wetlands with dense vegetation where they feed on fruit, seeds, insects and fungi (Woinarski et al. 2012). The proposed clearing area has some limited suitable habitat in the form of relatively dense vegetation cover in the understory. | **Possible** |

### 2.7.1 Black cockatoo habitat

#### *Foraging habitat*

There is limited suitable habitat for one of the two Black Cockatoo species (Carnaby's Cockatoo and FRTBC) that have known distributions that include the proposed clearing area (Appendix 4). There are species present in the proposed clearing area that are known to be dietary items for Carnaby's Cockatoo, such as the Slender Banksia, Firewood Banksia and Coastal Blackbutt (Shah 2006, Johnstone et al. 2011). However, these species are found relatively sparsely throughout the proposed clearing area.

The FRTBC feeds primarily on Marri and Jarrah fruit, but also Tuart and to a lesser extent on Blackbutt, Albany Blackbutt, Karri, Sheoak and Snottygobble (Johnstone et al. 2013). The proposed clearing area has none of these species present, therefore there is no foraging habitat for the FRTBC.

#### *Breeding habitat*

There are no tree species in the proposed clearing area that are known to be used by Carnaby's Cockatoo or FRTBC for nesting, and further to this, no tree species that have a diameter at breast height (DBH) that is ≥ 500 mm, this being the size at which suitable tree species can be considered potential breeding trees (DSEWPaC 2012).

Given the limited extent of Carnaby's Cockatoo foraging habitat and no breeding or potential breeding habitat in the proposed clearing area, the site is of low quality habitat for Carnaby's Cockatoo.


**Figure 6: Black cockatoo foraging habitat quality**

Scale 1:1,500 at A4

0 15 30 45 m

N

Coordinate System: GDA 1994 MGA Zone 50
Note that positional errors may occur in some areas
Date: 1/05/2018
Author: vdinh
Source: Nearmap: Aerial imagery - 14/02/2018.

**Legend**

- Cadastre
- 10 m wide retained vegetation buffer
- Proposed clearing area

**Black cockatoo habitat**

- Low quality

strategen ENVIRONMENTAL

info@strategen.com.au
www.strategen.com.au

Path: Q:\Consult\2017\RNO\RNO17693\01_GIS_documents\ArcMap_documents\RNO17693_G007_RevA.mxd

# 3. Assessment against the ten clearing principles

An assessment of the proposed clearing against the ten clearing principles is provided in Table 10. The ten clearing principles are outlined in Schedule 5 of the EP Act and assessment is in accordance with Department of Water and Environmental Regulation guidelines (DER 2014).

This assessment demonstrates that the proposed removal of 1.75 ha of native vegetation is not at variance with the any of the clearing principles.

Table 10: Assessment of native vegetation clearing in accordance with the ten clearing principles

| Clearing principle | Assessment | Outcome |
|---|---|---|
| (a) Native vegetation should not be cleared if it comprises a high level of biological diversity. | A total of 29 native vascular plant taxa from 17 plant families were recorded within the proposed clearing area (Strategen 2018). The relatively low number of taxa recorded was attributed to the small size and the degraded nature of the proposed clearing area.<br>No flora species listed as Threatened under the WC Act or Priority Flora species as listed by the DBCA were recorded during the field survey. However, the surveyed identified the potential for *Caladenia huegelii* (T) and *Dodonaea hackettiana* (P3) based on preferred habitat and survey timing.<br>Most of the vegetation within the proposed clearing area is not considered representative of any PECs or TECs. VT3 appeared to be a heavily degraded remnant of the Banksia woodlands of the Swan Coastal Plain TEC. Minimal native understorey was present within this vegetation type; as such, statistical analysis to affiliate it with any PECs was not possible.<br>The Pre-European vegetation system association and complexes within which the proposed clearing area is mapped, each have above 20% remaining which is above the 10% threshold for 'constrained areas'.<br>Given the information above, vegetation within the proposed clearing area is not considered to comprises a high level of biological diversity and as such clearing is not expected to be at variance to this principle. | Not at variance. |
| b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia. | The proposed clearing area is not considered to represent or be necessary for the maintenance of significant habitat critical for fauna species. No breeding trees for Carnaby's black cockatoo were recorded within the proposed clearing area and foraging habitat quality was rated as very poor.<br>Therefore, clearing of 1.48 ha of vegetation is unlikely to be at variance to this principle. | Not at variance. |
| c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora. | No Threatened or Priority flora species were recorded in the proposed clearing area during the flora and vegetation assessment (Strategen 2018).<br>The field survey was undertaken outside of the usual flowering period of *Caladenia huegelii* (T; flowers September - October) and *Dodonaea hackettiana* (P4; flowers July - October); however, no *Dodonaea* species were observed during the field survey, and vegetation within the proposed clearing area was considered to be too degraded to constitute suitable habitat for *C. huegelii*.<br>Given that the clearing area is small and unlikely to provide favourable habitat for Threatened or Priority flora, and that no Threatened or Priority flora were recorded during the field survey or have previously been recorded in the proposed clearing area, the proposed clearing is unlikely to be at variance with this principal. | Not at variance. |

| Clearing principle | Assessment | Outcome |
|---|---|---|
| d) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a threatened ecological community. | While vegetation in VT3 is aligned with the Banksia woodlands of the Swan Coastal Plain TEC listed under the EPBC Act, this vegetation type has been heavily disturbed by historical clearing.<br>A 10 m buffer of native vegetation will be retained along the proposed clearing area boundaries that abut instances of the Banksia Woodlands TEC in adjacent sites (i.e. the eastern and southern boundaries of the Project Area). This buffer will minimise the potential for dispersal of weed propagules into surrounding areas of the Banksia Woodlands TEC related to earthworks and vehicle movement within the Project Area. Additionally, as dust is likely to be generated by these activities, the buffer will provide protection against dust deposition on adjacent vegetation. Further, vegetation retained within the buffer will maintain habitat connectivity between areas of vegetation to the north and south.<br>For the above reasons, clearing of this area of vegetation would have limited impact on the maintenance of the overall TEC.<br>As a result, the proposed clearing will not be at variance with this principle. | Not at variance. |
| e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared. | A total 1.48 ha of intact vegetation will be cleared to facilitate sand extraction, which is not considered to be a significant remnant.<br>The Pre-European vegetation system association and complexes within which the proposed clearing area is mapped, each have above 20% remaining which is above the above the 10% threshold for 'constrained areas'.<br>The proposed clearing is not expected to result in a significant impact at the local or regional scale due to the small scale of clearing, with larger areas of vegetation protected in the broader region, including three nature reserves / Bush Forever sites within a 2 km radius (Thomsons Lake Reserve, Harry Waring Nature Reserve, and Banksia Eucalypt Woodland Park).<br>Furthermore, the proposed clearing area encompasses previously disturbed areas, further reducing impacts on native vegetation.<br>Given the above, the proposed clearing is not expected to be at variance to this principle. | Not at variance. |
| f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland. | The proposed clearing will not occur within or immediately adjacent to a watercourse or wetland. The closest wetland is located approximately 1 km to the northwest of the proposed clearing area.<br>Therefore, the proposed clearing is not considered at variance to this principle. | Not at variance. |
| g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation. | The proposed clearing will be limited to a small area of vegetation (1.55 ha) in a broader area of existing urban development.<br>In consideration of the above, the clearing is not likely to cause appreciable land degradation due to:<br>• the small area of total proposed clearing<br>• the large extent of vegetation that would remain within the local and regional areas<br>• general construction environmental management measures being implemented.<br>For the above reasons, the proposed clearing is unlikely to be at variance with this principle. | Not at variance. |

| Clearing principle | Assessment | Outcome |
|---|---|---|
| h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area. | The proposed clearing area occurs a very small component of vegetation in the local area, does not occur within a conservation area and is isolated from any conservation areas. The nearest conservation areas are Thomsons Lake Nature Reserve (Bush Forever site 391), Harry Waring Marsupial Reserve (Bush Forever site 392) to the west, both of which are separated from the proposed clearing area by urban residential areas, and Banksia Eucalypt Woodland Park (Bush Forever site 492) to the east, which is separated from the proposed clearing area by residential areas and the Kwinana Freeway.<br>Given the above information, the proposed clearing of vegetation within the proposed clearing area is unlikely to impact on the environmental values of any of these nearby conservation areas or be at variance to this principle. | Not at variance. |
| i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water. | No surface water features have been identified within the proposed clearing area, and stormwater readily filtrates through the porous, sandy soils of the Bassendean Sands.<br>Earthworks within the proposed clearing area will not intersect with the water table and, as such, no disruption to the hydrological regime are expected within the proposed clearing area or in adjacent vegetation.<br>Additionally, the vegetation proposed to be cleared is minimal (1.55 ha of vegetation). As such, the proposed clearing is not expected to affect surface water or groundwater quality given the remaining areas of intact native vegetation in the local area.<br>Given the above information, the proposed clearing is not expected to be at variance to this principle. | Not at variance. |
| j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence of flooding. | Depth to groundwater across the proposed clearing area is estimated at 6.5 – 14.5 m below ground level. Given the porous, sandy nature of the soils within the proposed clearing area, stormwater readily infiltrates.<br>In addition to the stormwater and groundwater characteristics above, the small scale of the proposed clearing, is highly unlikely to cause, or exacerbate, the incidence of flooding and therefore is not considered to be at variance to this principle. | Not at variance. |

# 4. Environmental approval and management

## 4.1 Environmental approvals

The key approvals identified as being required and/or potentially required to support the proposed clearing include the following:

- Native Vegetation Clearing Permit (NVCP) under s 51 E of the EP Act.

## 4.2 Environmental mitigation and management

To manage potential impacts associated with the proposed clearing, the following actions will be undertaken:

- a 10 m buffer will be retained along the eastern and southern boundaries, which will reduce the potential for weed propagules to spread into adjacent areas of Banksia woodland along these boundaries
- excavation will be limited to a depth of 26.5 mAHD (5 m above the groundwaer level) so as not to disrupt groundwater function
- general construction environmental management measures will be implemented, including but not limited to clear demarcation of the clearing boundary as to not impact upon adjacent vegetation, and site inductions for all contractors to inform of construction environmental management measures.

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## Appendix 1
## DWER Form C2 and Certificate of Title

GOVERNMENT OF WESTERN AUSTRALIA

**Department of Water and Environmental Regulation**
**Department of Mines, Industry Regulation and Safety**

# Application for a clearing permit (purpose permit)

*Environmental Protection Act 1986*, section 51E

# FORM C2

Clearing of native vegetation is prohibited in Western Australia except where a clearing permit has been granted or an exemption applies. A person who causes or allows unauthorised clearing commits an offence.

| CPS No. |
|---|
| Date stamp |

## Part 1: Assessment bilateral agreement

The native vegetation clearing processes under Part V of the *Environmental Protection Act 1986* (WA) (EP Act) have been accredited by the Commonwealth of Australia under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) and can be assessed under an assessment bilateral agreement.

To be assessed in this manner, the proposed clearing action must be referred to the Commonwealth under the EPBC Act and deemed a 'controlled action' prior to submitting this application form.

For further information see *Form Annex C7* and *A guide to native vegetation clearing processes under the assessment bilateral agreement* available at www.der.wa.gov.au/our-work/clearing-permits.

Do you want your proposed clearing action assessed in accordance with, or under, an EPBC Act Accredited Process such as the assessment bilateral agreement?

☐ Yes EPBC Number:

☒ No Proceed to Part 2

List the controlling provisions identified in the notification of the controlled action decision.

☐ *Form Annex C7* is complete and the required supporting information is attached.

## Part 2: Land details

The location of the land where clearing is proposed must be accurately described.

Land description: volume and folio number, lot or location number(s), Crown lease or reserve number, pastoral lease number or mining tenement number of all properties.

Lot 37 on Plan 009781

FILE REFERENCE

| | |
|---|---|
| Street address | Lot 37 Barfield Road, Hammond Park 6164 |
| Local government area | City of Cockburn |

## Part 3: Applicant details

### Applicant details

Note: if granted, the applicant will be considered the holder of the permit.

Include the Australian Company Number (ACN) if the proposed permit holder is a body corporate or other entity formed at law.

Are you applying as an individual, a company or an incorporated body? Enter details for one only.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| An individual | Title | ☐ | Mr | ☐ | Mrs | ☐ | Ms | ☐ | Other: |
| | Name(s) | | | | | | | | |

**OR**

| | |
|---|---|
| A body corporate or other entity formed at law (include ACN) | Richard Noble and Company<br>ACN: 008 841 307 |

"I am…" (mark applicable box or boxes)

| | |
|---|---|
| ☐ | the owner of the land. |
| ☐ | acting on behalf of the owner and have attached an agent's authority, expressly authorising me to act on behalf of the landowner.<br>*[Attach a copy of the authorisation]* |
| ☐ | likely to become the owner of the land.<br>*[Attach evidence of the pending transfer of ownership, contract of sale ('offer and acceptance') or letter from current landowner.]* |
| ☒ | the person doing the clearing. |
| ☐ | the person on whose behalf the clearing is being done. |

### Applicant contact details

If applying as a company or incorporated body, please also supply the registered business office address.

All written correspondence from the Department of Water and Environmental Regulation (DWER) or Department of Mines, Industry Regulation and Safety (DMIRS) regarding your application will be made via email. You must provide a valid email address through which you agree to accept all electronic correspondence.

The postal/business address supplied must be a physical address to which a statutory notice under the EP Act may be delivered.[1]

Provide contact details for the above individual or body corporate.

| | | | |
|---|---|---|---|
| Contact person (and position, if applicable) | Alex Gregg | | |
| Company name (if applicable) | Richard Noble and Company | | |
| Postal / business address | Level 1, 189 Hay Street<br>Subiaco WA 6008 | | |
| Phone (fixed line) | 08 9380 3800 | Phone (mobile) | |
| Email address | agregg@rnoble.com.au | | |

[1] The provision of a postal/business address is required as any statutory notices or directions under the relevant legislation are required to be served by post or personally [sections 75 and 76 *Interpretation Act 1984* (WA)].

## Part 3: Applicant details (continued)

### Authority to access land

To apply for a permit you must be the landowner, or have the authority of the landowner to access the land and undertake the clearing.

Evidence of authority can include, for example, a copy of the certificate of title or a letter of authority from the landowner.

Note: the letter of authority must explicitly state the applicant has authority to clear on the land.

State the nature of the applicant's authority to access the land to be cleared.
*[Attach evidence of authority]*

acting on behalf of the owner and have attached an agent's authority, expressly authorising me to act on behalf of the landowner

### Landowner's ownership of land

A landowner can be:

- a person who holds the certificate of title;
- a person who is the lessee of Crown land;

*or*

- a public authority that is responsible for care of the land.

The landowner's form of ownership is:

| | |
|---|---|
| ☒ | Certificate of title *[Attach a copy of the certificate and all associated encumbrances with the application – available from Landgate]*. |
| ☐ | Pastoral lease<br>*[Attach a copy of the lease and all associated encumbrances]*. |
| ☐ | Mining lease. |
| ☐ | Public authority that has care, control or management of the land. |
| ☐ | Other form of lease, land tenure or specific arrangement.<br>Please state: |

### Contact details for enquiries

If different from the applicant's contact details, enter the contact details of a person with whom DWER or DMIRS should liaise with concerning this clearing application.

Where contact details differ to those of the applicant, complete the below section:

| | | | |
|---|---|---|---|
| Contact person (and position, if applicable) | Tristan Sleigh – Associate | | |
| Company name (if applicable) | Strategen Environmental | | |
| Postal / business address | Level 1, 50 Subiaco Square Road, Subiaco | | |
| Phone (fixed line) | 08 9380 3100 | Phone (mobile) | 0423 385 847 |
| Email address | t.sleigh@strategen.com.au | | |

| **Part 4: Proposed clearing** | | | | | | |
|---|---|---|---|---|---|---|
| An aerial photograph and/or map with a north arrow must be attached, clearly marking the area proposed to be cleared<br>*or*<br>if you have the facilities, a digital map on a suitable portable digital storage device of the area to clear as an ESRI shapefile with the following properties:<br>Geometry type: Polygon shape<br>Coordinate system: GDA 1994 (Geographic latitude/longitude)<br>Datum: GDA 1994 (Geocentric Datum of Australia 1994).<br><br>An ESRI shapefile must be provided if the application requires an assessment under an EPBC Act accredited process. | Total **area** of clearing proposed (hectares) | 1.75 ha | | | | |
| | *and/or* | | | | | |
| | number of individual **trees** to be removed | | | | | |
| | Proposed method of clearing: | | | | | |
| | mechanical | | | | | |
| | Purpose of clearing: | | | | | |
| | Sand extraction | | | | | |
| | Period within which clearing is proposed to be undertaken, e.g. May 2018 – June 2018 | | | | | |
| | from | August 2018 | to | July 2021 | | |
| | Final land use: | | | | | |
| | | | | | | |
| You must provide evidence that avoidance and mitigation options have been pursued to eliminate, reduce or otherwise mitigate the need for, and scale of, the proposed clearing of native vegetation. | Have alternatives that would avoid or minimise the need for clearing been considered and applied? | ☒ | Yes | ☐ | No | |
| | If yes, provide details: | | | | | |
| | The proposed clearing represent s the minimum area required to enable the sand extraction. | | | | | |
| Refer to DWER's *Clearing of native vegetation offsets procedure* guideline available on the DWER website, and the Environmental Protection Authority's (EPA) *WA Environmental Offsets Policy and Guidelines* on the EPA website for further information. | Do you want to submit a clearing permit offset proposal with your application? | ☐ | Yes | ☒ | No | |
| | If yes, provide details, and complete and attach Appendix A of the *Clearing of native vegetation offsets procedure* guideline. | | | | | |
| | | | | | | |

## Part 5: Other DWER approvals

**Instructions:**

- **If your application is to be submitted to DMIRS, complete Section A and then skip to Part 6 of this form.**
- **If your application is to be submitted to DWER, complete Section A and B.**

### Section A: Environmental Impact Assessment

#### Environmental Impact Assessment (Part IV of the EP Act)

| | |
|---|---|
| **Has this clearing application or any related matter been referred to the Environmental Protection Authority?** | ☐ Yes – provide details [ ]<br>☒ No |
| **Do you intend to refer the proposal to the Environmental Protection Authority?**<br>Section 37B(1) of the EP Act defines a 'significant proposal' as *"a proposal likely, if implemented, to have a significant effect on the environment"*.<br>If a decision-making authority (e.g. DWER or DMIRS) considers that the proposal in this application is likely to constitute a 'significant proposal', they are required under section 38(5) of the EP Act to refer the proposal to the EPA for assessment under Part IV, if such a referral has not already been made.<br>If a relevant Ministerial Statement already exists, please provide the MS number in the space provided. | ☐ Yes – intend to refer (proposal is a 'significant proposal')<br>☐ Yes – intend to refer (proposal will require a section 45C amendment to the current Ministerial Statement) MS [ ]<br>☐ No – a current valid Ministerial Statement applies: MS [ ]<br>☐ No – not a 'significant proposal' |

### Section B: Other approvals

#### Pre-application scoping

| | |
|---|---|
| **Have you had any pre-application / pre-referral / scoping meetings with DWER regarding any planned applications?** | ☐ No<br>☒ Yes – provide details: [meeting with applicant and DWER officers was held on 20 July 2018 regarding the purpose of clearing ] |

#### Works Approval / Licence / Registration (Part V Division 3 of the EP Act)

| | |
|---|---|
| **Have you applied or do you intend to apply for a works approval, licence, registration, or an amendment to any of the above, under Part V Division 3 of the EP Act?**<br>It is an offence to perform any action that would cause a premises to become a prescribed premises of a type listed in Schedule 1 of the *Environmental Protection Regulations 1987*, unless that action is done in accordance with a works approval, licence, or registration.<br>For further guidance, please refer to the *Guidance Statement: Decision Making* (February 2017). | ☐ Yes – application reference (if known): [ ]<br>☐ No – a valid works approval applies: [ ]<br>☐ No – a valid licence applies: [ ]<br>☐ No – a valid registration applies: [ ]<br>☒ No – not required |

#### Water Licences and Permits (*Rights in Water and Irrigation Act 1914*)

| | |
|---|---|
| **Have you applied or do you intend to apply for:**<br>**1. a licence or amendment to a licence to take water (surface water or groundwater); or**<br>**2. a licence or amendment to a licence to construct wells (including bores and soaks); or**<br>**3. a permit or amendment to a permit to interfere with the bed and banks of a watercourse?** | ☐ Yes –application reference (if known): [ ]<br>☐ No – a current valid licence applies: [ ]<br>☒ N/A |

## Part 6: Index of Biodiversity Surveys for Assessments (IBSA)

| | | |
|---|---|---|
| Biodiversity surveys submitted to support this application must meet the requirements of the EPA's *Instructions for the preparation of data packages for the Index of Biodiversity Surveys for Assessments (IBSA)* (April 2018). If these requirements are not met, DWER / DMIRS may decline to deal with the application. | ☐ | All biodiversity surveys submitted with this application meet the requirements of the EPA's *Instructions for the preparation of data packages for the Index of Biodiversity Surveys for Assessments (IBSA).* |

## Part 7: Prescribed fee

Make cheques or money orders payable to:

**Department of Water and Environmental Regulation** for all clearing purposes other than mining and petroleum activities

*or*

**Department of Mines, Industry Regulation and Safety** for mineral and petroleum clearing activities under the *Mining Act 1978*, various Petroleum Acts, or State Agreement Acts.

For credit card payments to:

- DWER, pay via BPoint, accessible online at: https://dwer.wa.gov.au/make-a-payment
- DMIRS, complete *Form C3* and attach it to this form.

Do not send cash in the mail.

Please indicate the clearing permit application fee that you are paying:

☒ **$200** for a purpose permit

OFFICE USE ONLY

Payment method (tick applicable box):

☐ Cheque / Money Order

☐ *(DWER)* Secure EFT payment *(see https://dwer.wa.gov.au/make-a-payment for payment details)*

☒ *(DWER)* Secure credit card payment through BPoint

Receipt number: 8559 0427 536

Date of payment: 27/07/2018

☐ *(DMIRS)* Credit card – complete and attach *Form C3*

## Part 8: Application checklist

Additional information to assist in the assessment of your proposal may be attached to this application – e.g. reports on salinity, fauna or flora studies or other environmental reports conducted for the site could be included in electronic format and submitted on suitable portable digital storage device.

Please ensure you have included the following as part of your application:

| | | |
|---|---|---|
| **REQUIRED** | ☒ | Payment. |
| | ☒ | An aerial photograph or map with a north arrow clearly identifying the areas of vegetation proposed to be cleared or ESRI shapefile. |
| | ☒ | Copy of the certificate of title or pastoral lease. |
| | ☒ | An index of all documentation attached to this application. |
| **AS REQUIRED** | ☐ | Copy of written authority to act on behalf of the landowner. |
| | ☐ | Written authority from the landowner to access the land and conduct the clearing. |
| | ☐ | Evidence of the pending transfer of land ownership, such as the offer and acceptance letter, or written notice from the current landowner. |
| | ☐ | *Form C3 – Credit card payment for DMIRS clearing applications*, if the fee is to be paid to DMIRS by credit card. |
| | ☐ | *Form Annex C7 – Assessment bilateral agreement*, if the clearing is also to be assessed under an EPBC Act accredited process. |
| | ☐ | Appendix A of the *Clearing of native vegetation offsets procedure* guideline if the application includes a proposal for clearing permit offsets. |

| Part 8: Application checklist | | | |
|---|---|---|---|
| | **ADDITIONAL SUPPORTING INFORMATION** | ☒ | Photos of application area. |
| | | ☐ | Biodiversity surveys, submitted in accordance with the requirements of the EPA's *Instructions for the preparation of data packages for the Index of Biodiversity Surveys for Assessments (IBSA).* |

| Part 9: Submission of application | |
|---|---|
| **Confidential or commercially sensitive information**<br>Information submitted as part of this application will be made publicly available. If you wish to submit information that you believe to be commercially sensitive or otherwise confidential, then you should submit that information in an appendix to this application (Attachment 1), with a written statement of reasons why you request that each item of information be kept confidential.<br>DWER and DMIRS will take reasonable steps to protect confidential or commercially sensitive information. Please note in particular that all submitted information may be the subject of an application for release under the *Freedom of Information Act 1992* (WA).<br>If you have any enquiries regarding the provision of relevant information as part of this application contact either DWER or DMIRS, on the details below.<br>Files that are greater than 10MB in size cannot be received via email by DWER. Files larger than 45MB cannot be received via email by DMIRS. These large files can be sent via File Transfer. Alternatively, email DWER or DMIRS (as applicable) and you will be provided with a link to submit these files. | |
| All information which you would propose to be exempt from public disclosure has been separately placed in **Attachment 1** (located at the end of this form). Grounds for claiming exemption in accordance with Schedule 1 to the *Freedom of Information Act 1992* must be specified. | ☐ |
| A signed, electronic copy of the application form, including all attachments, has been submitted via the appropriate email address specified below. | ☒ |
| A signed, electronic copy of the application form has been submitted via the appropriate email address specified below, and attachments have been submitted via File Transfer, or via the link supplied by the relevant Department. | ☐ |
| A full, signed hard copy has been sent to the appropriate postal address specified below. | ☐ |

| | |
|---|---|
| Email or post applications for all clearing purposes (other than mining and petroleum activities) to:<br><br>Email: info@dwer.wa.gov.au<br><br>**Department of Water and Environmental Regulation**<br>Locked Bag 33<br>CLOISTERS SQUARE<br>PERTH WA 6850<br><br>Telephone: 6364 7000<br><br>For more information: www.dwer.wa.gov.au | Email or post applications related to mining and petroleum clearing activities (under delegation) to:<br><br>Email: nvab@dmirs.wa.gov.au<br><br>**Department of Mines, Industry Regulation and Safety**<br>Resource and Environmental Compliance Division<br>Mineral House<br>100 Plain St<br>EAST PERTH WA 6004<br><br>Telephone: 9222 3333<br><br>For more information: www.dmirs.wa.gov.au |
| Please retain a copy of this form for your records.<br>Incomplete applications will be declined in accordance with section 51E(3) of the *Environmental Protection Act 1986*. | |
| If there is insufficient space on any part of this form, please continue on a separate sheet of paper and attach to this form | |

## Part 10: Declaration and signature

### General

I/We confirm and acknowledge that:

- the information contained in this application is true and correct and I/we acknowledge that knowingly providing information which is false or misleading in a material particular constitutes an offence under section 112 of the *Environmental Protection Act 1986* (WA) and may incur a penalty of up to $50,000;
- I/We have legal authority to sign on behalf of the applicant (where authorisation provided);
- I/We have not altered the requirements and instructions set out in this application form;
- I/We have provided a valid email address in Part 3 for receipt of all written correspondence from DWER or DMIRS (as applicable) in relation to this application. I/We acknowledge that successful delivery to my/our server constitutes receipt of correspondence for the purposes of the *Environmental Protection Act 1986* (WA); and
- I/We have provided a valid postal and /or business address in Part 3 for the service of all statutory notices under the relevant legislation.

### Publication

I/We confirm and acknowledge:

- this application (including all attachments, apart from the sections identified in Attachment 1) is a public document and may be published;
- biodiversity surveys provided in accordance with Part 6 will be published and used, for the purposes of the IBSA project, in accordance with your declaration made in the *Metadata and Licensing Statement*;
- all necessary consents for the publication of information have been obtained from third parties;
- information considered exempt from public disclosure has been placed in Attachment 1 with reasons as to why the information should be exempt in accordance with the grounds specified in Schedule 1 to the *Freedom of Information Act 1992* (WA);
- subsequent information provided in relation to this application will be a public document and may be published unless written notice has been given to the Department by the applicant, at the time the information is provided, claiming that the information is considered exempt from public disclosure; and
- the decision to not publish information will be at the discretion of the CEO of the Department and will be made consistently with the provisions of the *Freedom of Information Act 1992* (WA).

**Please indicate if you are signing as an individual or a company:**

☐ **An individual.** If an individual landowner is applying, **all landowners** must sign this form.

☒ **A company.** **Company name:** **Richard Noble and Company** **ACN:** **008 841 307**

A person expressly authorised or authorised to execute on behalf of a body corporate must sign this form. A company must be a legal entity and provide an ACN. Please note an Australian Business Number is not sufficient.

☐ **Other entity formed at law.** Provide details:

Signature _____ Date 24/7/18

Alexander Stevenson Gregg

Name

MANAGING DIRECTOR

Position

Signature _____ Date _____

Name

Position

**ATTACHMENT 1 – Confidential or Commercially Sensitive Information**

**ATTACHMENT 1 – Confidential or Commercially Sensitive Information**

| **Request for exemption from publication** | |
|---|---|
| Information which you consider should not be published, on the grounds of a relevant exemption found in Schedule 1 to the *Freedom of Information Act 1992* (WA), must be specified in this Attachment. | |
| **NOT FOR PUBLICATION IF GROUNDS FOR EXEMPTION ARE DETERMINED** | |
| Specify section: | Ground for claiming exemption: |
| | |
| | |
| Specify section: | Ground for claiming exemption: |
| | |
| | |
| | |

ANNEXURE B

| REGISTER NUMBER | |
|---|---|
| 37/P9781 | |
| DUPLICATE EDITION | DATE DUPLICATE ISSUED |
| 1 | 29/7/2006 |

WESTERN AUSTRALIA

# RECORD OF CERTIFICATE OF TITLE

VOLUME 1351 FOLIO 672

UNDER THE TRANSFER OF LAND ACT 1893

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

REGISTRAR OF TITLES

**LAND DESCRIPTION:**

LOT 37 ON PLAN 9781

**REGISTERED PROPRIETOR:**
(FIRST SCHEDULE)

ELECTRICITY NETWORKS CORPORATION OF 363-365 WELLINGTON STREET, PERTH
(AN J789512 ) REGISTERED 16/6/2006

**LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:**
(SECOND SCHEDULE)

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.
* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title.
Lot as described in the land description may be a lot or location.

----------END OF CERTIFICATE OF TITLE----------

**STATEMENTS:**

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

| | |
|---|---|
| SKETCH OF LAND: | P9781 |
| PREVIOUS TITLE: | 1289-813 |
| PROPERTY STREET ADDRESS: | 37 BARFIELD RD, HAMMOND PARK. |
| LOCAL GOVERNMENT AUTHORITY: | CITY OF COCKBURN |
| RESPONSIBLE AGENCY: | ELECTRICITY NETWORKS CORPORATION |

# Appendix 2
# Flora, vegetation and fauna assessment

Level 1, 50 Subiaco Square Road Subiaco WA 6008 PO Box 243 Subiaco WA 6904
Phone (08) 9380 3100 Fax (08) 9380 4606
177 Spencer Street Bunbury WA 6230 PO Box 287 Bunbury WA 6231
Phone (08) 9792 4797 Fax (08) 9792 4708

To: Alex Gregg

Date: 25 July 2018

Company: Richard Noble

Project No: RNO17693.01

Fax/email: agregg@rnoble.com.au

Inquiries: Darren Walsh

# Lot 37 Barfield Road, Hammond Park
# Flora, vegetation and fauna assessment

## *Background*

Richard Noble and Associates propose to develop Lot 37 Barfield Road, Hammond Park (the Survey Area). A desktop survey of the environmental values of the Survey Area was undertaken and a site visit was conducted to confirm results.

## *Methods*

The desktop survey comprised the following tasks:

- review of *NatureMap* database (DBCA 2018) and Department of Biodiversity, Conservation and Attractions (DBCA 2017a, 2017b) listings to determine whether any of the following were potentially present within the Survey Area:
  - flora taxa listed as Threatened under the Wildlife Conservation Act 1950 (WA) (WC Act) or Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act)
  - flora taxa listed as Priority species by the Department of Biodiversity, Conservation and Attractions
  - Threatened or Priority Ecological Communities.
- review of *Protected Matters Search Tool* database (DEE 2018) to determine whether any flora taxa listed as Threatened under the EPBC Act were potentially present within the Survey Area
- assessment of likelihood of any of the flora taxa identified in the above searches occurring within the Survey Area
- review of Western Australian Local Government Association (WALGA) *Environmental Planning Tool* database (WALGA 2018) to determine the location of any wetlands, Bush Forever sites or other environmentally sensitive areas within or adjacent to the Survey Area.

The site visit involved assessing the following:

- structure, composition and extent of native vegetation
- presence of habitat for any of the Threatened or Priority flora taxa identified in the above database searches
- condition of native vegetation
- extent of the Commonwealth listed Banksia Woodlands of the Swan Coastal Plain TEC
- extent of black cockatoo foraging habitat.

## *Results*

### *Vegetation types*

Three vegetation types were identified within the Survey Area (Table 1; Figure 1). The majority of the Survey Area comprised shrubland vegetation with scattered *Banksia attenuata* and *B. menziesii* in the overstorey. A narrow strip of vegetation along the western boundary contained taller overstorey including *Banksia attenuata*, *B. menziesii* and *Eucalyptus todtiana* with minimal native understorey remaining. Example photographs from each vegetation type are presented in Plate 1 to Plate 3. A species by site matrix is provided in Appendix 1.

Table 1: Vegetation types within the Survey Area

| Vegetation type | Description | Condition | Area |
|---|---|---|---|
| VT1 | Shrubland of *Adenanthos cygnorum* over open shrubland of *Allocasuarina humilis*, *Scholtzia involucrata* and *Hibbertia hypericoides* with occasional *Banksia menziesii*, *B. attenuata* and *Allocasuarina fraseriana*. | Good – Very Good | 0.86 |
| VT2 | Shrubland of *Allocasuarina humilis* over open heath of *Scholtzia involucrata*, *Mesomelaena pseudostygia* and mixed shrubs with occasional *Banksia menziesii*. | Good | 0.54 |
| VT3 | Open woodland of *Banksia menziesii*, *Eucalyptus todtiana* and *B. attenuata* over isolated shrubs of *Adenanthos cygnorum* over mixed introduced species. | Degraded | 0.15 |
| CL | Cleared areas including tracks / firebreaks | Completely Degraded | 0.20 |
| **Total** | | | **1.75** |

Plate 1: VT1

Plate 2: VT2

Plate 3: VT3


**Figure 1: Vegetation types within the Survey Area**

Scale 1:1,500 at A4

0 15 30 45 m

N

Coordinate System: GDA 1994 MGA Zone 50
Note that positional errors may occur in some areas
Date: 6/03/2018
Author: vdinh
Source: Nearmap: Aerial imagery - 14/02/2018.

**Legend**

- Survey area
- Cadastre

**Vegetation type**

- VT1
- VT2
- VT3
- Cleared

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info@strategen.com.au
www.strategen.com.au

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***Vegetation condition***

Vegetation condition was rated using the scale of Keighery (1994) for the South West Botanical Province (Table 2). Despite a history of disturbance within the Survey Area, approximately half of the vegetation was rated in Good – Very Good condition due to retention of moderate species diversity within the understorey (Table 3; Figure 2). The remainder of the vegetation was rated as Completely Degraded to Good condition.

Table 2: Vegetation condition scale (Keighery 1994)

| Condition rating | Description |
|---|---|
| Pristine (1) | Pristine or nearly so, no obvious sign of disturbance. |
| Excellent (2) | Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species. |
| Very Good (3) | Vegetation structure altered obvious signs of disturbance.<br>For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing. |
| Good (4) | Vegetation structure significantly altered by obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it.<br>For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback, grazing. |
| Degraded (5) | Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management.<br>For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing. |
| Completely Degraded (6) | The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs. |

Table 3: Vegetation condition within Survey Area

| Condition | Area (ha) | Percentage of Survey Area |
|---|---|---|
| Good-Very Good | 0.83 | 47.71 |
| Good | 0.53 | 30.24 |
| Degraded | 0.19 | 10.88 |
| Completely Degraded | 0.20 | 11.17 |
| **Total** | **1.75** | **100** |


**Figure 2: Vegetation condition within the Survey Area**

Scale 1:1,500 at A4

0 15 30 45 m

N

Coordinate System: GDA 1994 MGA Zone 50
Note that positional errors may occur in some areas
Date: 6/03/2018
Author: vdinh
Source: Nearmap: Aerial imagery - 14/02/2018.

**Legend**

- Survey area
- Cadastre

**Vegetation condition**

- Good
- Good-Very Good
- Degraded
- Completely Degraded

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info@strategen.com.au
www.strategen.com.au

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***Banksia woodland TEC***

Vegetation within VT3 retained banksia woodland structure. As this VT forms part of a broader area of banksia woodland vegetation (within the road reserve to the east and the private lot to the south), this small area of vegetation should be considered to form part of the *Banksia woodlands of the Swan Coastal Plain* TEC, listed as Endangered under the EPBC Act.

An assessment of this VT against diagnostic criteria provided in the approved conservation advice for the *Banksia woodlands of the Swan Coastal Plain* TEC is shown in Table 4.

Table 4: Characteristics of the Banksia woodland within the Subject Site compared to the key diagnostic criteria as per TSSC (2016)

| Key diagnostic criteria (TSSC 2016) | Banksia woodlands within the survey area |
|---|---|
| Location:<br>Occurs in the Swan Coastal Plain or Jarrah Forest IBRA bioregions. | Yes. Banksia woodlands within the Survey Area occur on the Swan Coastal Plain. |
| Soils and landform:<br>Occurs on:<br>• well drained, low nutrient soils on sandplain landforms, particularly deep Bassendean and Spearwood sands and occasionally on Quindalup sands<br>• sandy colluviums and aeolian sands of the Ridge Hill Shelf, Whicher Scarp and Dandaragan Plateau<br>• transitional substrates and sandflats. | Yes. Banksia woodlands within the survey area occur on Bassendean sands. |
| Structure:<br>Low woodland to forest with:<br>• a distinctive upper sclerophyllous layer of low trees (occasionally large shrubs more than 2 m tall), typically dominated or co-dominated by one or more of the banksia species identified below<br>• emergent trees of medium or tall (>10 m) height. *Eucalyptus* or *Allocasuarina* species may sometimes be present above the banksia canopy<br>• an often highly species-rich understorey. | Yes. Banksia woodlands within the survey area represent a low woodland-woodland structure. |
| Composition:<br>Contains at least one of the following species:<br>• *Banksia attenuata*<br>• *Banksia menziesii*<br>• *Banksia prionotes*<br>• *Banksia ilicifolia.* | Yes. Banksia woodlands within the survey area contain *Banksia attenuata* and *B. menziesii*. |
| Condition (Keighery 1994):<br>'Pristine': no minimum patch size<br>'Excellent': 0.5 ha<br>'Very Good': 1 ha<br>'Good': 2 ha. | Banksia woodlands cover 0.2 ha within the Survey Area are predominantly in Degraded condition. However, the patch is connected with a broader patch of banksia woodland in Very Good condition directly to the south of the Survey Area, bringing the overall patch size to >2 ha. |

***Wetlands and Bush Forever***

There are no wetlands mapped within or adjacent to the Survey Area. The nearest Conservation Category Wetland is approximately 1 km to the northwest, on Gaebler Road.

There are no Bush Forever sites within the Survey Area. The nearest Bush Forever location is site no. 392 – Harry Waring Marsupial Reserve, Wattleup, located approximately 1.2 km to the east northeast of the Survey Area, separated by patches of remnant bushland, residential blocks and other cleared areas.

***Black cockatoo habitat***

'Breeding habitat' for black cockatoos is defined in DSEWPaC (2012) as trees of species known to support breeding within the range of the species which either have a suitable nest hollow or are of a suitable DBH to develop a nest hollow (> 300 mm for salmon gum and wandoo, and >500 mm for other species). These trees are known as significant trees. No significant trees were observed within the Survey Area.

Habitat foraging quality of each vegetation type is shown in Table 6 and was determined using the scale described in Table 5. The Survey Area does not fall within the known distribution of Baudin's Black Cockatoo; as such, this species has not been included in the assessment.

Table 5: Definition of black cockatoo foraging habitat within the survey area

| Foraging quality | Justification |
|---|---|
| Excellent | High density of species suitable for foraging by black cockatoos (i.e. foliage cover of suitable species >60%) and presence of food sources at several strata (i.e. canopy, midstorey and understorey). |
| Good | High density of species suitable for foraging by black cockatoos (i.e. foliage cover of suitable species >60%) but food sources only present at one or two strata (i.e. canopy and midstorey). |
| Moderate | Moderate foraging value density of species suitable for foraging by black cockatoos (i.e. foliage cover of suitable species 20-40%) and food sources only present at one or two strata (i.e. canopy and midstorey). |
| Poor | Low density of species suitable for foraging by black cockatoos (i.e. foliage cover of suitable species 10-20%) and presence of food sources at only one stratum (i.e. canopy). |
| Very poor | Very low density of species suitable for foraging by black cockatoos (i.e. foliage cover of suitable species <10%) and presence of food sources at only one stratum (i.e. canopy). |
| Nil | Cleared areas - no suitable vegetation present. |

Table 6: Vegetation types and black cockatoo foraging species within the survey area

| Vegetation type | Black cockatoo foraging species | Foraging quality | Area (ha) within proposed clearing area |
|---|---|---|---|
| VT1 | CBC – *Banksia menziesii, B. attenuata, Allocasuarina fraseriana*<br>FRTBC – *Allocasuarina fraseriana*. | • Very poor (CBC)<br>• Very poor (FRTBC) | 0.86 |
| VT2 | CBC – *Banksia menziesii, Jacksonia furcellata, Mesomelaena pseudostygia*<br>FRTBC – Nil | • Very poor (CBC)<br>• Nil (FRTBC) | 0.54 |
| VT3 | CBC – *Banksia menziesii, B. attenuata, Eucalyptus todtiana*<br>FRTBC – Nil | • Very poor (CBC)<br>• Nil (FRTBC) | 0.15 |
| Cleared | Nil | Nil | 0.20 |
| **TOTAL** | | | **1.75** |

CBC – Carnaby's Black Cockatoo; FRTBC – Forest Red-tailed Black Cockatoo

***Threatened and Priority Flora***

Seven Threatened and three Priority flora taxa were identified in the database searches as potentially occurring within the Survey Area (Table 7). Based on site observations, it was determined that the following Threatened and Priority flora taxa could potentially be present:

- *Caladenia huegelii* (T, Endangered)
- *Dodonaea hackettiana* (P4).

Table 7: Likelihood of presence of Threatened and Priority flora taxa identified in desktop survey

| Species | Conservation status | | Description | Potential to occur |
|---|---|---|---|---|
| | WC Act | EPBC Act | | |
| *Andersonia gracilis* | T | Endangered | A slender, erect or open straggly shrub, 10 to 100 cm high. Flowers are white to pink to purple from September to November. Habitat for this species occurs in white/grey sand, sandy clay, gravelly loam within winter-wet areas and near swamps (Western Australian Herbarium 1998-). The species occurs in damp black, sandy clay flats near swamps in open low heath with Calothamnus hirsutus (hairy clawflower), Verticordia densiflora (compact featherflower), Kunzea recurva (recurved kunzea) and Banksia telmatiaea over sedges. Vegetation within the proposed action area is dominated by Open Woodland of Eucalyptus marginata (Jarrah), Corymbia calophylla (Marri), Pinus pinaster (pines), Eucalyptus gomphocephala (tuart) ove Kunzea glabrescens and mixed native/non-native shrubs and grasses on predominantly light grey sand. | **Unlikely** due to absence of preferred habitat. |
| *Caladenia huegelii* | T | Endangered | A slender orchid 30 to 50 cm tall. One or two striking flowers characterised by a greenish-cream lower petal with a maroon tip. Other petals are cream with red or pink suffusions. Habitat for this species occurs within well-drained, deep sandy soils in low mixed Banksia, Allocasuarina and Jarrah woodlands (Western Australian Herbarium 1998-, DEE 2018b). | **Possible** due to presence of potential habitat. |
| *Diuris micrantha* | T | Vulnerable | A slender orchid to 60 cm tall. Flowers are yellow with reddish-brown markings and visible from September to October. Habitat for this species occurs within clay-loam substrates in winter-wet depressions or swamps (DEE 2018b). | **Unlikely** due to absence of preferred habitat. |
| *Diuris purdiei* | T | Endangered | A slender orchid to 0.35 m tall. Flowers are yellow and visible from September to October. Habitat for this species is grey-black sand substrates in winter-wet swamps which have high moisture (Western Australian Herbarium 1998-). Diuris purdiei occurs from Perth south to near the Whicher Range, within the Swan (Western Australia) Natural Resource Management Region. It grows on sand to sandy clay soils, in areas subject to winter inundation, and amongst native sedges and dense heath with scattered emergent Melaleuca preissiana, Corymbia calophylla, E. marginata and Nuytsia floribunda (DEE 2018b). | **Unlikely** due to absence of preferred habitat. |
| *Dodonaea hackettiana* | P4 | | An erect shrub or tree, 100 to 500 cm tall. Flowers are yellow to green/red and occur mainly from July to October. Habitat for this species occurs in sand and outcropping limestone (Western Australian Herbarium 1998-). | **Possible** due to presence of potential habitat. |

| Species | Conservation status | | Description | Potential to occur |
|---|---|---|---|---|
| | WC Act | EPBC Act | | |
| *Drakaea elastica* | T | Endangered | A slender orchid to 30 cm tall with a prostrate, round to heart shaped leaf. Singular, bright green, glossy flower. Habitat for this species is within bare patches of white sand over dark sandy loams on damp areas mostly in Kunzea glabrescens thickets (DotE 2015d). | **Unlikely** due to absence of preferred habitat. |
| *Eleocharis keigheryi* | T | Vulnerable | A rhizomatous, clumped perennial grass-like herb to 40 cm tall. Flowers are green and visible from August to November. Habitat for this species occurs in clay or sandy loam in freshwater creeks and claypans (Western Australian Herbarium 1998-). | **Unlikely** due to absence of preferred habitat. |
| *Lepidosperma rostratum* | T | Endangered | A rhizomatous, tufted perennial, grass-like or herb (sedge), 50 cm tall. Flowers are brown and flowering occurs from May to June. Habitat for this species occurs in peaty sand or clay and within seasonally wet swamps (Western Australian Herbarium 1998-, DotE 2015d). | **Unlikely** due to absence of preferred habitat. |
| *Pimelea calcicola* | P3 | | An erect to spreading shrub to 1 m tall. Flowers are pink and visible between September to November. Habitat for this species occurs in sand on coastal limestone ridges (Western Australian Herbarium 1998-). | **Unlikely** due to absence of preferred habitat. |
| *Stylidium paludicola* | P3 | | Reed-like perennial, herb, 35 to 100 cm tall. Leaves are tufted, linear or subulate or narrowly oblanceolate. Flowers are pink and occur in October to December. Habitat for this species occurs in peaty sand over clay and winter wet areas, often in Marri and Melaleuca woodland or Melaleuca shrubland (Western Australian Herbarium 1998-). | **Unlikely** due to absence of preferred habitat. |

***Discussion***

The flora, vegetation and black cockatoo habitat assessment of the Survey Area was conducted during February 2018, which is outside of the prime flowering time for majority of species within the region.

Vegetation largely comprised shrubland of *Adenanthos cygnorum* and / or *Allocasuarina humilis*, with a small area of degraded Banksia woodland which, when considered alongside adjacent remnant vegetation containing banksia woodland, meets diagnostic criteria for forming part of the *Banksia woodlands of the Swan Coastal Plain* TEC. While this small area of vegetation meets the diagnostic criteria, its degraded condition, high perimeter to area ratio and small size mean it unlikely clearing would cause a significant impact to the TEC.

An assessment of the likelihood of Threatened or Priority flora species occurring within the Survey Area indicated the following two species have the potential to occur:

- *Caladenia huegelii* (T, Endangered)
- *Dodonaea hackettiana* (P4).

While there is potential for the above species to occur within the site based on habitat, given the historical disturbance, it is unlikely that populations of these species would been sustained.

Up to 1.74 ha of very poor black cockatoo foraging habitat was recorded within the site. Table 8 assesses the site against referral triggers identified in the Referral Guidelines for black cockatoos, should the site be cleared.

Table 8: Assessment of the proposed action against the black cockatoo Referral Guidelines

| Referral trigger | Assessment of proposed action against referral trigger |
|---|---|
| Clearing of any known nesting tree | A Black Cockatoo habitat assessment was undertaken over the entire site, in accordance with surveys methods outlined in the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) referral guidelines for three threatened black cockatoo species.<br>No evidence that trees have been used or were currently being used by black cockatoos for nesting purposes was recorded within the proposed action area. Also, no known black cockatoo breeding sites have been recorded within the proposed action site.<br>Therefore, the proposed action will not result in the clearing of any known nesting trees. |
| Clearing or degradation of any part of a vegetation community known to contain breeding habitat | No known breeding habitat on site or in proximity to the site. No significant trees were recorded within the proposed project area. |
| Clearing or degradation of more than 1 ha of quality foraging habitat | 1.74 ha of very poor habitat for Carnaby's Black Cockatoo occur within the site.<br>Given the lack of good quality foraging habitat within the site, clearing of the site would be unlikely to trigger a referral. |
| Clearing or degradation of a known night roosting tree | No known night roosting trees have been recorded within the proposed action area. Given this, the proposed action will not result in the clearing of any known roosting trees. |
| Creating a gap of more than 4 km between patches of black cockatoo habitat | Given the small size of the site, clearing of the site will not create a gap of more than 4 km between existing patches of black cockatoo habitat. |

## *Conclusions*

Clearing of the site is unlikely to have a significant impact on the Endangered Carnaby's black-cockatoo, and the Vulnerable Forest red-tailed black cockatoo. This is primarily due to the following factors:

- large areas of reserved potential habitat for all species exist nearby to the project area

- the habitat proposed to be cleared within the project area is of poor quality; the vegetation remaining represents the best representation of habitat within the proposed action area.

Clearing of the site is also unlikely to have a significant impact on the Endangered *Banksia woodlands of the Swan Coastal Plain TEC*. This is primarily due to the following factors:

- the vegetation within the site that forms part of the TEC is rated as degraded and unlikely to continue to exist as a self-sustaining ecosystem
- clearing of the vegetation within the site that is part of the TEC will not impact the viability of the adjacent remnant vegetation to remain part of the TEC
- only 0.15 ha of the TEC would be cleared as part of the development.

Strategen considers it unlikely that clearing within the site would be identified as a controlled action if the project was referred to the DEE. Ultimately, the only way to achieve complete legislative certainty is to refer the project to the DEE; however, under the provisions of the EPBC Act the decision on referral rests with the proponent.

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## Appendix 1
## Species by Site Matrix

| Taxa | Site | | | | |
|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | Opportunistic |
| *Acacia stenoptera* | | + | | | |
| *Adenanthos cygnorum* | + | + | | + | |
| *Allocasuarina fraseriana* | + | | | | |
| *Allocasuarina humilis* | + | + | + | + | |
| *Anigozanthos manglesii* | + | | | | |
| *Banksia attenuata* | + | | | | |
| *Banksia menziesii* | | | + | | |
| *Cassytha* sp. | | + | | | |
| *Conostephium pendulum* | + | | | | |
| *Dasypogon bromeliifolius* | + | | | | |
| *Daviesia triflora* | + | | | | |
| **Ehrharta calycina* | + | | + | + | |
| *Eucalyptus todtiana* | | | | | + |
| *Gastrolobium capitatum* | | | + | | |
| **Gladiolus sp.* | + | + | + | + | |
| *Gompholobium tomentosum* | + | + | + | | |
| *Grevillea* sp. | + | | | | |
| *Hemiandra pungens* | | | | + | |
| *Hibbertia hypericoides* | + | + | | + | |
| *Hypocalymma angustifolium* | + | | | | |
| *Jacksonia furcellata* | | | | + | |
| *Laxmannia squarrosa* | + | + | + | + | |
| *Leucopogon* sp. | + | + | + | + | |
| *Lyginia barbata* | + | + | | + | |
| *Mesomelaena pseudostygia* | + | | + | | |
| *Neurachne alopecuroidea* | | | + | | |
| *Patersonia occidentalis* | | | | + | |
| *Platysace compressa* | + | | | | |
| *Scholtzia involucrata* | + | + | + | + | |
| *Stirlingia latifolia* | + | | | | |
| *Stylidium repens* | | | + | | |

# Appendix 2
# Desktop assessment results (Parks and Wildlife 2007-, DEE 2017c)

NatureMap
Mapping Western Australia's biodiversity

# NatureMap Species Report - Flora

*Created By Tristan Sleigh on 16/04/2018*

**Kingdom** Plantae
**Conservation Status** Conservation Taxon (T, X, IA, S, P1-P5)
**Current Names Only** Yes
**Core Datasets Only** Yes
**Method** 'By Circle'
**Centre** 115° 51' 21" E,32° 10' 23" S
**Buffer** 5km

| | Name ID | Species Name | Naturalised | Conservation Code | [1]Endemic To Query Area |
|---|---|---|---|---|---|
| 1. | 1596 | *Caladenia huegelii (Grand Spider Orchid)* | | T | |
| 2. | 16245 | *Cyathochaeta teretifolia* | | P3 | |
| 3. | 12938 | *Diuris micrantha* | | T | |
| 4. | 4763 | *Dodonaea hackettiana (Hackett's Hopbush)* | | P4 | |
| 5. | 1639 | *Drakaea elastica (Glossy-leaved Hammer Orchid)* | | T | |
| 6. | 20462 | *Jacksonia gracillima* | | P3 | |
| 7. | 4035 | *Kennedia beckxiana (Cape Arid Kennedia)* | | P4 | |
| 8. | 5237 | *Pimelea calcicola* | | P3 | |
| 9. | 8163 | *Pithocarpa corymbulosa (Corymbose Pithocarpa)* | | P3 | |
| 10. | 25800 | *Stylidium paludicola* | | P3 | |
| 11. | 44444 | *Tripterococcus sp. Brachylobus (A.S. George 14234)* | | P4 | |
| 12. | 14714 | *Verticordia lindleyi subsp. lindleyi* | | P4 | |

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

[1] For NatureMap's purposes, species flagged as endemic are those whose records are wholely contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.

NatureMap
Mapping Western Australia's biodiversity

# NatureMap Species Report - Fauna

*Created By Tristan Sleigh on 13/04/2018*

**Kingdom** Animalia
**Conservation Status** Conservation Taxon (T, X, IA, S, P1-P5)
**Current Names Only** Yes
**Core Datasets Only** Yes
**Method** 'By Circle'
**Centre** 115° 51' 21" E,32° 10' 23" S
**Buffer** 5km

| | Name ID | Species Name | Naturalised | Conservation Code | [1]Endemic To Query Area |
|---|---|---|---|---|---|
| 1. | 41324 | *Ardea modesta (great egret, white egret)* | | IA | |
| 2. | 24779 | *Calidris acuminata (Sharp-tailed Sandpiper)* | | IA | |
| 3. | 24784 | *Calidris ferruginea (Curlew Sandpiper)* | | T | |
| 4. | 24786 | *Calidris melanotos (Pectoral Sandpiper)* | | IA | |
| 5. | 24788 | *Calidris ruficollis (Red-necked Stint)* | | IA | |
| 6. | 24789 | *Calidris subminuta (Long-toed Stint)* | | IA | |
| 7. | 24731 | *Calyptorhynchus banksii subsp. naso (Forest Red-tailed Black-Cockatoo)* | | T | |
| 8. | 24734 | *Calyptorhynchus latirostris (Carnaby's Cockatoo (short-billed black-cockatoo), Carnaby's Cockatoo)* | | T | |
| 9. | 48400 | *Calyptorhynchus sp. (white-tailed black cockatoo)* | | T | |
| 10. | 41332 | *Chlidonias leucopterus (White-winged Black Tern)* | | IA | |
| 11. | 24092 | *Dasyurus geoffroii (Chuditch, Western Quoll)* | | T | |
| 12. | 25624 | *Falco peregrinus (Peregrine Falcon)* | | S | |
| 13. | 24189 | *Falsistrellus mackenziei (Western False Pipistrelle, Western Falsistrelle)* | | P4 | |
| 14. | 47954 | *Gelochelidon nilotica (Gull-billed Tern)* | | IA | |
| 15. | 24215 | *Hydromys chrysogaster (Water-rat, Rakali)* | | P4 | |
| 16. | 25478 | *Isoodon obesulus (Southern Brown Bandicoot)* | | P4 | |
| 17. | 24153 | *Isoodon obesulus subsp. fusciventer (Quenda, Southern Brown Bandicoot)* | | P4 | |
| 18. | 47975 | *Ixobrychus dubius (Australian Little Bittern)* | | P4 | |
| 19. | 25147 | *Lerista lineata (Perth Slider, Lined Skink)* | | P3 | |
| 20. | 25741 | *Limosa limosa (Black-tailed Godwit)* | | IA | |
| 21. | 24131 | *Macropus eugenii subsp. derbianus (Tammar Wallaby (WA subsp))* | | P4 | |
| 22. | 24133 | *Macropus irma (Western Brush Wallaby)* | | P4 | |
| 23. | 24598 | *Merops ornatus (Rainbow Bee-eater)* | | IA | |
| 24. | 24146 | *Myrmecobius fasciatus (Numbat, Walpurti)* | | T | |
| 25. | 25249 | *Neelaps calonotos (Black-striped Snake, black-striped burrowing snake)* | | P3 | |
| 26. | 24328 | *Oxyura australis (Blue-billed Duck)* | | P4 | |
| 27. | 24663 | *Phaethon rubricauda (Red-tailed Tropicbird)* | | P4 | |
| 28. | 24843 | *Plegadis falcinellus (Glossy Ibis)* | | IA | |
| 29. | 33992 | *Synemon gratiosa (Graceful Sunmoth)* | | P4 | |
| 30. | 48135 | *Thinornis rubricollis (Hooded Plover, Hooded Dotterel)* | | P4 | |
| 31. | 24806 | *Tringa glareola (Wood Sandpiper)* | | IA | |
| 32. | 24808 | *Tringa nebularia (Common Greenshank, greenshank)* | | IA | |

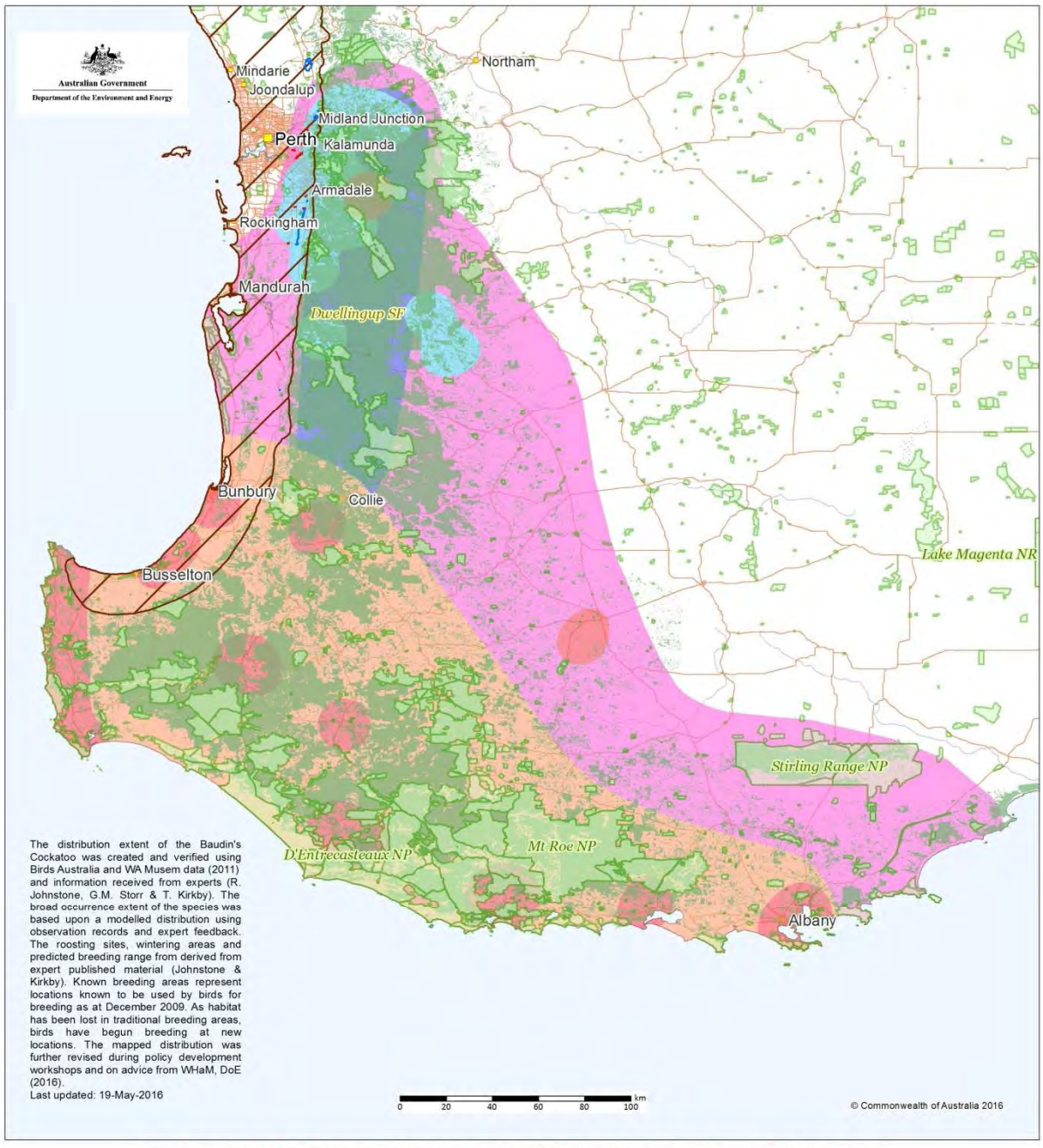
**Conservation Codes**
T - Rare or likely to become extinct
X - Presumed extinct
IA - Protected under international agreement
S - Other specially protected fauna
1 - Priority 1
2 - Priority 2
3 - Priority 3
4 - Priority 4
5 - Priority 5

[1] For NatureMap's purposes, species flagged as endemic are those whose records are wholely contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.

## Appendix 3
## Black cockatoo distribution maps

## Appendix A – Distribution maps for the three black cockatoos

Map 2: Modelled distribution for Baudin's Cockatoo
(*Calyptorhynchus baudinii*)




INDICATIVE MAP ONLY: For the latest departmental information, please refer to the Protected Matters Search Tool and the Species Profiles & Threats Database at

**Produced by:**
Environmental Resources Information Network 2016

**Contextual data source:**
National Vegetation Information System (NVIS 4.2) 2016
Interim Biogeographic Regionalisation for Australia (IBRA) version 7 2012
Collaborative Australian Protected Area Database (CAPAD) 2014
Geoscience Australia GEODATA TOPO 250K Topographic Data Series 3 2006

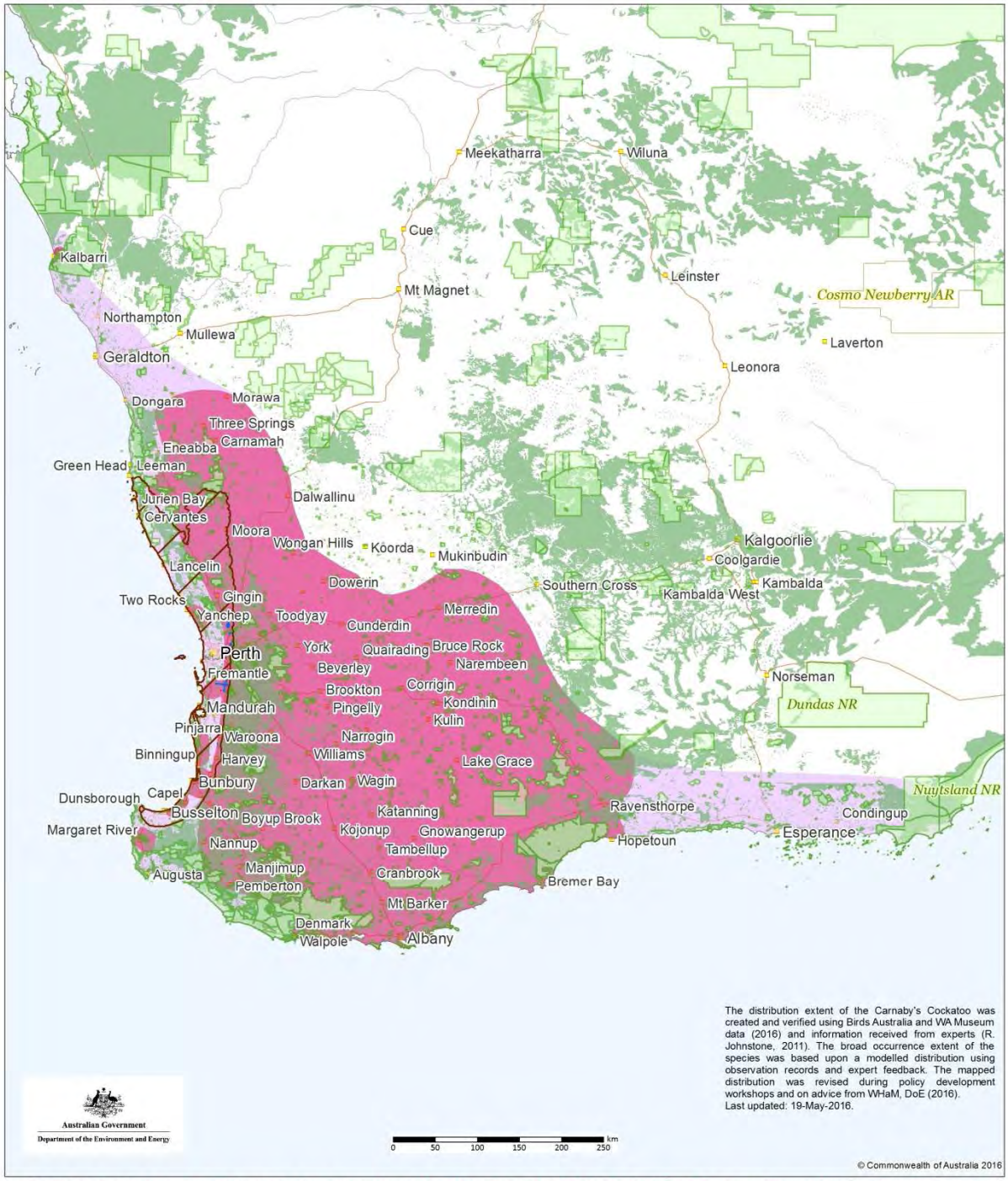
Projection: Geographic
Datum: GDA94

**Ecological Communities**
- Corymbia calophylla - Xanthorrhea preissii woodlands and shrublands of the Swan Coastal Plain
- Corymbia calophylla - Kingia australis woodlands on heavy soils of the Swan Coastal Plain
- Banksia Woodlands of the Swan Coastal Plain
- Conservation Areas
- Jarrah, Karri and Marri (NVIS 4.2)

**Species**
- Known Breeding Areas
- Predicted Breeding Range
- Known Foraging Areas
- Main Wintering Area
- Species Likely to Occur

- Cities & Towns
- Roads (sealed)
- Roads (unsealed)
- State Border
- Major Rivers
- Lakes/Reservoirs
- Non-perennial Lakes

Map 3: Modelled distribution for Carnaby's Cockatoo
(*Calyptorhynchus latirostris*)




INDICATIVE MAP ONLY: For the latest departmental information, please refer to the Protected Matters Search Tool and the Species Profiles & Threats Database at http://www.environment.gov.au/biodiversity/threatened/index.html

**Produced by:**
Environmental Resources Information Network 2016

**Contextual data source:**
National Vegetation Information System (NVIS 4.2) 2016
Interim Biogeographic Regionalisation for Australia (IBRA) version 7 2012
Collaborative Australian Protected Area Database (CAPAD) 2014
Geoscience Australia GEODATA TOPO 250K Topographic Data Series 3 2006

Projection: Geographic
Datum: GDA94

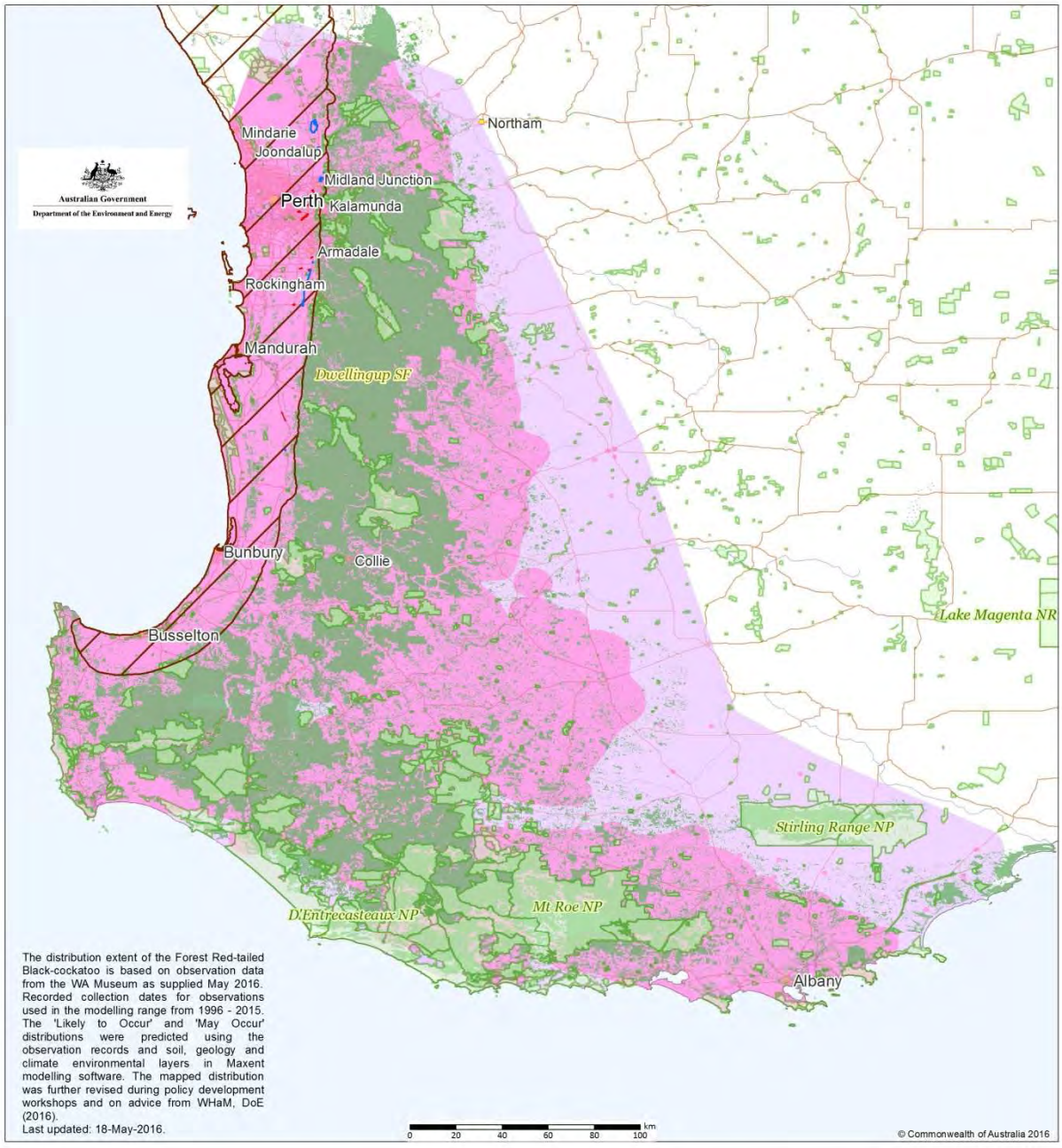
Conservation Areas
Jarrah, Karri, Marri, Salmon Gum, Wandoo, Banksia, Grevillea, Dryandra and Hakea (NVIS 4.2)

**Species**
Breeding Range
Non-breeding Range

**Ecological Communites**
Corymbia calophylla - Xanthorrhea preissii woodlands and shrublands of the Swan Coastal Plain
Corymbia calophylla - Kingia australis woodlands on heavy soils of the Swan Coastal Plain
Banksia Woodlands of the Swan Coastal Plain

Cities & Towns
Roads (sealed)
Roads (unsealed)
State Border
Major Rivers
Lakes/Reservoirs
Non-perennial Lakes

Map 4: Modelled distribution for Forest Red-tailed Black-Cockatoo (*Calyptorhynchus banksii naso*)




INDICATIVE MAP ONLY: For the latest departmental information, please refer to the Protected Matters Search Tool and the Species Profiles & Threats Database at http://www.environment.gov.au/biodiversity/threatened/index.html

**Produced by:**
Environmental Resources Information Network 2016

**Contextual data source:**
National Vegetation Information System (NVIS 4.2) 2016
Interim Biogeographic Regionalisation for Australia (IBRA) version 7 2012
Collaborative Australian Protected Area Database (CAPAD) 2014
Geoscience Australia GEODATA TOPO 250K Topographic Data Series 3 2006

Projection: Geographic
Datum: GDA94

Conservation Areas
Jarrah, Karri and Marri (NVIS 4.2)

**Species**
Likely to Occur
May Occur

**Ecological Communities**
Corymbia calophylla - Xanthorrhea preissii woodlands and shrublands of the Swan Coastal Plain
Corymbia calophylla - Kingia australis woodlands on heavy soils of the Swan Coastal Plain
Banksia Woodlands of the Swan Coastal Plain

Cities & Towns
Roads (sealed)
Roads (unsealed)
State Border
Major Rivers
Lakes/Reservoirs
Non-perennial Lakes