

**Ravensthorpe Lithium Project  
Native Vegetation Clearing Permit  
Application**

**E 74/655**

**May 2022**

**Prepared By**

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## 1. PROPOSAL SUMMARY

### 1.1. Overview

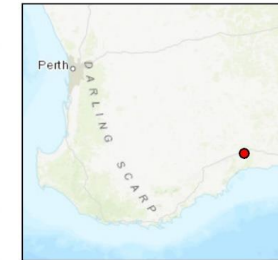
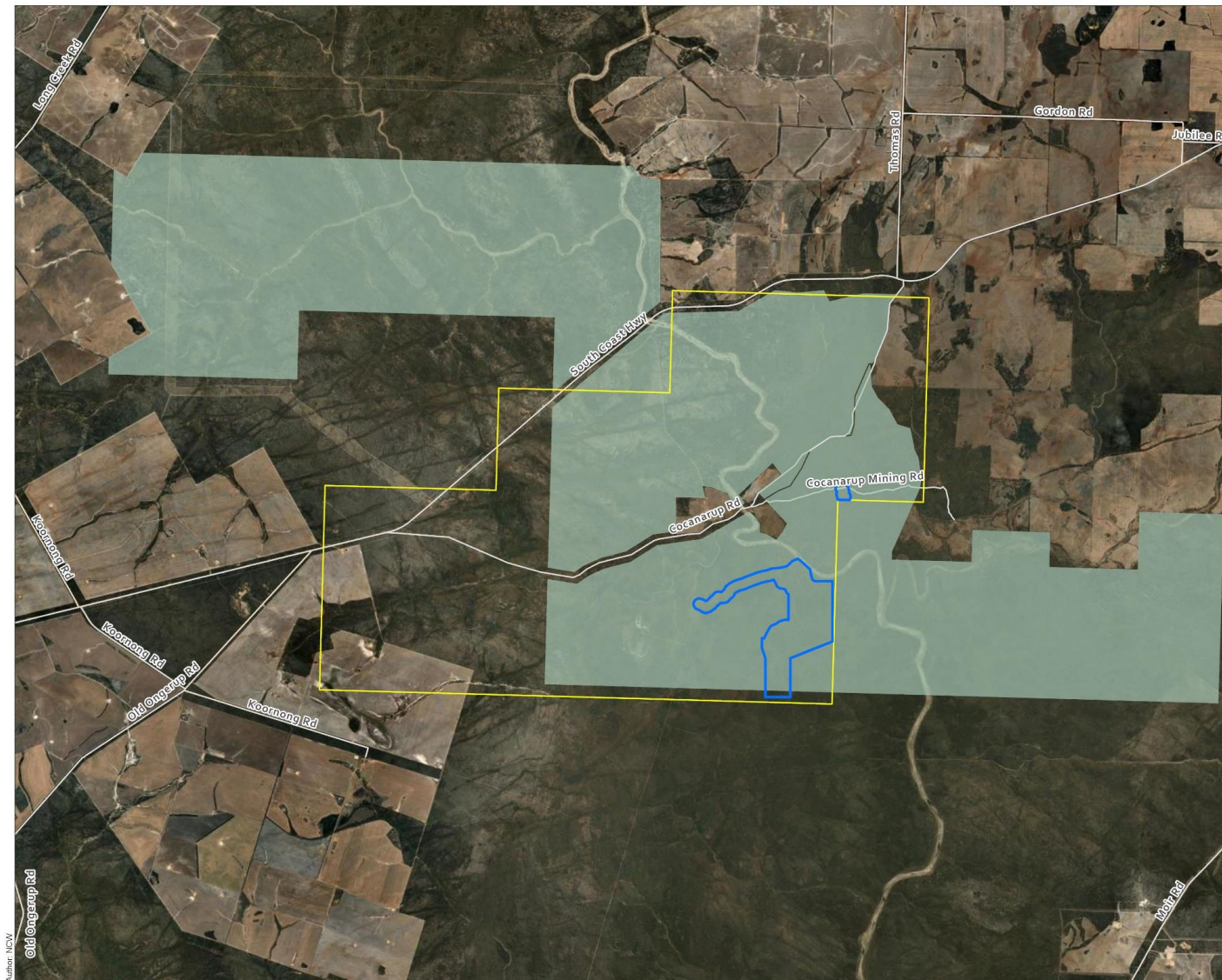
Bulletin Resources Ltd (Bulletin) plans to undertake exploration drilling of potential lithium deposits approximately 15 km southwest of the Ravensthorpe town centre (Proposal). The Proposal is located within the Cocanarup Timber Reserve on *Mining Act 1978* exploration tenement E 74/655 encompassing 57 km<sup>2</sup> (**Figure 1**).

The Proposal will require the clearing of up to 7 ha of native vegetation within a 222 hectare (ha) Proposal Area for construction of access tracks and drill pads, as presented in **Figure 2**.

### 1.2. Purpose

This document has been prepared in support of a Native Vegetation Clearing Permit (NVCP) (Purpose Permit) application per Part V Division 2 of the *Environmental Protection Act 1986* to undertake clearing for the proposed exploration drilling within E 74/655 as the Proposal is located within an Environmentally Sensitive Area and clearing exemptions do not apply.

This NVCP application will be assessed by the Department of Mines, Industry Regulation and Safety (DMIRS) as clearing will be carried out on mining tenements.



**Legend**

- Proposal Area
- E 74/655 Tenement Boundary
- Cocanarup Timber Reserve
- Road Network

Notes:

Date: 19/05/2022

Version: 1

**Figure 1: Tenement area**



A3 scale:  
0 1,500 3,000 Metres

Job No:  
Coordinate System: GDA 2020 MGAZ51





**Legend**

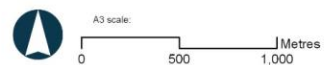
- Proposal Area
- E 74/655 Tenement Boundary
- Road Network

Notes:

Date: 19/05/2022

Version: 1

**Figure 2: Proposal area**



Job No:  
Coordinate System: GDA 2020 MGA251

## 2. PROPOSAL LEGISLATIVE CONTEXT AND CONSULTATION

### 2.1. Clearing Permit Requirement

The clearing of native vegetation in Western Australia is regulated under the EP Act and the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* (Clearing Regulations) which is administered by the Department of Water and Environmental Regulation (DWER).

The Clearing Regulations address several matters related to clearing of native vegetation, these matters include activities that do not require a permit to clear native vegetation under the Clearing Regulations. Regulation 5 lists 25 items under which clearing is exempt.

There are a number of areas where the exemptions under the Regulations do not apply. These areas are Environmentally Sensitive Areas (ESA) declared by the Minister under section 51B of the EP Act. A list of ESAs is provided in *Environmental Protection (Environmentally Sensitive Areas) Notice 2005*. The clearing of native vegetation in an ESA, or its buffered extent, requires a clearing permit.

In the context of the Proposal, Regulation 5 Item 25 generally provides an exemption for clearing that is the result of carrying out exploration under an authority granted under the *Mining Act 1978*. However, the Cocanarup Timber Reserve was listed under the Register of National Estate and meets the definition of an ESA under section 51B of the EP Act. As a result, any disturbance to native vegetation within this area, requires a clearing permit in accordance with the EP Act and the Clearing Regulations.

Other legislation of relevance for this assessment include:

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)

The key guidance documents which inform this assessment are:

- *A guide to the assessment of applications to clear native vegetation* (DER, 2014)
- *Procedure: Native vegetation clearing permits* (DWER, 2019)

### 2.2. Government Consultation

Key Government stakeholders consulted on the Proposal are summarised in **Table 1**.

**Table 1: Government Stakeholders**

Stakeholder Group	Stakeholder	Key interests	Key Contact
State Government	DMIRS	<ul style="list-style-type: none"> <li>• Administration of Part V of the EP Act (Delegated Authority)</li> <li>• Administration of the <i>Mining Act 1978</i> (Mining Act)</li> <li>• Tenement conditions</li> <li>• Program of Works</li> <li>• Closure and rehabilitation</li> <li>• Safety</li> </ul>	Brad Jakowyna Team Leader – Mining South  Damien Montague Team Leader – Native Vegetation
	DBCA	<ul style="list-style-type: none"> <li>• Administration of the BC Act</li> <li>• Flora, fauna and habitat conservation</li> </ul>	Lindsay Bourke Principal Environmental Officer
	DWER (Water)	<ul style="list-style-type: none"> <li>• Administration of the <i>Rights in Water and Irrigation Act 1914</i></li> </ul>	Sharon Stratico Program Manager South Coast Region

Stakeholder Group	Stakeholder	Key interests	Key Contact
		<ul style="list-style-type: none"> <li>Interference with the bed and banks of a water course</li> </ul>	
Local Government	Shire of Ravensthorpe	<ul style="list-style-type: none"> <li>Management of Cocanarup Timber Reserve</li> </ul>	Matthew Bird Chief Executive Officer



### 3. LOCAL AND REGIONAL CONTEXT

#### 3.1. Bioregion

The Proposal is located within the Esperance Plains bioregion under the Interim Biogeographic Regionalisation of Australia (IBRA). The Esperance Plains bioregion is divided into two sub-regions: Fitzgerald (ESP01) and Recherche (ESP02). The Proposal Area is wholly contained within the Fitzgerald sub-region (DEE, 2017).

#### 3.2. 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 formed the basis of several regional mapping systems, including the biogeographical region dataset (Interim Biogeographic Regionalisation for Australia) for Western Australia physiographic regions defined by Beard (1981).

The Proposal Area comprises two Beard (1981) vegetation associations, as presented in **Table 2**.

**Table 2: Pre-European Vegetation Associations**

Vegetation Association	Description	% remaining in IBRA Region
Ravensthorpe 352	Medium woodland; York gum	19.61
Qualup 516	Shrublands; mallee scrub, black marlock	68.96

#### 3.3. Soils and Geology

The Esperance Plains region consists of a relatively flat and monotonous plain rising gently from near sea level at the coast to about 100 m, which is broken by quartzite ranges and granite domes. The plain is formed from Tertiary sediments from the Plantagenet Group, which are Eocene sands and siltstones. Soils are chiefly sandy neutral, yellow-mottled soils containing variable amounts of ironstone gravel, alternating with leached sands that sometimes contain ironstone gravel and are underlain by a clay substrate. Valleys have hard alkaline and neutral, yellow-mottled soils (Beard 1990).

The Proposal Area coincides with both the Kybulup 1 subsystem, comprised predominately by alkaline grey shallow sandy duplex, and the Ravensthorpe 2 subsystem, comprised predominantly of calcareous loamy earth and shallow gravel

The geology in the vicinity of the Proposal Area is largely mapped as basaltic pyroclastics. There are also, significant areas mapped as porphyritic metadacite, pegmatite sheets and dykes, medium to coarse grained metadolerite and metagabbro and metamorphosed basalt (Thom et al 1984).

#### 3.4. Relevant Environmentally Sensitive Areas

The Proposal Area coincides with one ESA. As a result, no exemptions under the Clearing Regulations 2005 are applicable. The ESA is due to the Cocanarup Timber Reserve area having been listed as an area under the Register of National Estate. The statement of listing states that the 'The salmon gum (*Eucalyptus salmonophloia*) woodland and jam (*Acacia acuminata*) woodland of this reserve are significant remnants of the vegetation communities which were widespread in the wheat belt before

clearing occurred'. The site was listed in 1978; however, it is important to note that the listing is non-statutory. Furthermore, the Register of the National Estate was closed in 2007 and is no longer a statutory list. All references to the Register of the National Estate were removed from the (EPBC Act) on 19 February 2012.

## 4. ASSESSMENT METHODOLOGY

### 4.1. Desktop Assessment

The desktop assessment consisted of a review of the following:

- Threatened and Priority flora and ecological community records within 10 km and adjacent to the Proposal Area, (DBCA, BC Act)
- WA Herbarium Review records within 10 km and adjacent to the Proposal Area, (DBCA, BC Act)
- The Protected Matters Search Report (PMST), 10 km buffer applied, (Federal Dept. of Agriculture Water and Environment, EPBC Act) **Appendix 1**
- Water Register Online Tool (DWER, *Rights in Water Irrigation Act, 1914*)
- Index of Biological Surveys for Assessments Database
- Dieback Information Delivery and Management System
- Western Australia Groundwater Atlas
- Public Drinking Water Supply Areas Proclaimed Water Areas and Well-head Protection Areas datasets.

### 4.2. Literature Review

A review of biological surveys undertaken within 5 km of the Proposal Area was undertaken. The purpose of this review was to identify if the area surrounding the Proposal had been subject to survey and if so, what environmental values were recorded. The review identified three surveys, undertaken within the last 5-6 years, and are summarised in **Table 3**.

**Table 3: Summary of surveys undertaken in the surrounding area**

Report	Author	Summary	Proximity to Proposal Area
Reconnaissance Flora and Vegetation Survey E74/415, E74/617 and E74/401 Prepared for Galaxy Lithium Australia Limited	Strategen (2018)	Reconnaissance survey consisting of a flora and vegetation and fauna habitat assessment was to identify the environmental values that intersect the clearing footprint.  The survey effort consisted of: <ul style="list-style-type: none"> <li>• Undertake a desktop assessment of relevant literature, government databases and spatial datasets for Threatened/Rare and conservation significant species, Threatened Ecological Communities (TECs) and Priority Ecological Communities (PECs), that may be present in the survey area and the surrounding areas.</li> <li>• Undertake a reconnaissance flora and vegetation survey to verify the accuracy of the desktop assessment.</li> <li>• Delineate and characterise the flora and the range of vegetation units present in the survey area.</li> <li>• Define and map the native vegetation communities present, and associated condition, within the survey area.</li> <li>• Identify the potential impacts of the proposed works on identified flora, vegetation and fauna values within the survey area.</li> </ul>	4 km South
Mt Cattlin Project, Level 1 Flora and Vegetation Prepared for Kingston Resources, in support of clearing application CPS 7328/1	Woodman Environmental (2016)	Survey consisted of a Level 1 flora and vegetation assessment as defined by the Environmental Protection Authority's (EPA) Guidance Statement No. 51 (EPA 2004a), and Position Statement No. 3 (EPA 2002). The level of survey was determined to be appropriate using Table 2 of Guidance Statement No. 51, where the Bioregion Group is defined as Group 1 and scale and nature of impact is considered Low (EPA 2004a).	Overlapping and immediately adjacent the Proposal.

Report	Author	Summary	Proximity to Proposal Area
Kingston Resources, Ravensthorpe Mt Cattlin Project, Fauna Assessment Prepared for Kingston Resources, in support of clearing application CPS 7328/1	Bamford Consulting Ecologists (2016)	Survey consisted of a Level 1 fauna impact assessment (desktop review and site inspection) for proposed lithium exploration in the Ravensthorpe area (Mt Cattlin Project).	Overlapping the and immediately adjacent the Proposal.

## 5. ASSESSMENT FINDINGS

### 5.1. Flora and Vegetation

#### 5.1.1 Flora

Within 10 km of the Proposal Area, the desktop assessment identified nine DBCA listed Priority Flora taxa from 15 individual records, these included:

- *Acacia besleyi* – P1
- *Austrostipa* sp. *Carlingup Road* (S. Kern & R. Jasper LCH 18459) – P1
- *Cassinia arcuata* – P2
- *Eucalyptus desmondensis* – P4
- *Grevillea fastigiata* – P4
- *Levenhookia pulcherrima* - P3
- *Melaleuca peninsula* - P4
- *Notisia intonsa* - P3
- *Spyridium mucronatum* subsp. *recurvum* - P3

In addition, the PMST results indicate that there is the potential habitat for up to six species listed as Threatened under the EPBC Act to occur within 10 km of the Proposal Area. These species include:

- Little Kangaroo Paw (*Anigozanthos bicolor* subsp. *minor*) – Endangered
- Long-sepalled Daviesia (*Daviesia megacalyx*) – Endangered
- Fitzgerald Eremophila *Eremophila denticulata* subsp. *denticulate* - Vulnerable
- Barrens Wedding Bush *Ricinocarpos trichophorus* – Endangered
- Saltmat *Roycea pycnophylloides* – Endangered
- Sandplain Sun-orchid *Thelymitra psammophila* – Vulnerable

Woodman (2016) recorded no Threatened or Priority flora within the area surveyed.

#### 5.1.2 Threatened and Priority Ecological Communities

The Proposal Area coincides with the buffer for the State listed Priority Ecological Community (PEC) *Proteaceae Dominated Kwongan Shrublands of the Southeast Coastal Floristic Province of Western Australia* (Priority 3). This ecological community is also listed as Commonwealth TEC under the EPBC Act.

Following the review of the Woodman (2016) and Strategen (2019) surveys, no vegetation types were recorded which contained either the species diversity or structure representing the PEC/TEC. Considering this, no State-listed Threatened Ecological Communities (TEC) are known to occur within the Proposal Area.

### 5.2. Dieback

The majority of the Proposal is uninterpretable for Dieback (Woodman, 2016) as it contains limited indicator species, however the presence and spread of Dieback is a potential risk given the location of the Proposal a region that receives more than 400 mm of annual rainfall and is south of the 26th parallel of latitude (DEC, 2003).

Following discussions with the DBCA and DMIRS (Lindsey Bourke, personal communication, 22 February 2022; Brad Jakowyna, personal communication, 1 March 2022), it was acknowledged that the area where



the Proposal is located in a known dieback risk area and that hygiene procedures will be required prior to ground disturbing activities commencing.

### 5.3. Terrestrial Fauna

The assessment identified the following Threatened, and Priority species are known or likely to occur within the Proposal Area or its surrounds:

- Carnaby's black-cockatoo (*Calyptorhynchus latirostris*) (En)
- Numbat (*Myrmecobius fasciatus*) (En)
- Heath mouse (*Pseudomys shortridgei*) (En)
- Chuditch (*Dasyurus geoffroii*) (Vu)
- Malleefowl (*Leipoa ocellata*) (Vu)
- Tammar wallaby (*Macropus eugenii*) (P4)
- Southern Brown Bandicoot, Quenda (*Isodon obesulus*) (P4)

The PMST also returned several other Threatened birds. However, these are classified as migratory/water-dwelling birds likely to only occur in the regional lake systems.

Bamford (2016) recorded foraging evidence attributable to the Carnaby's Cockatoo with Woodman (2016) in their study area. The survey failed to identify any other evidence of conservation significant fauna within the study area. However, Bamford (2016) concluded that there are several species including Malleefowl, Chuditch and Red-tailed phascogale that are likely to be resident in the area, due to suitable habitat and known records within the Fitzgerald region.

Bamford (2016) stated that numbats were almost certain to be locally extinct and are considered unlikely to occur within the Proposal Area.

#### 5.3.1 Carnaby Cockatoo

The Proposal Area is within the modelled distribution and breeding range of the Carnaby's Cockatoo. Three species records occur within 3 km of the Proposal Area, and the species is expected to utilise vegetation within the Proposal Area. Birdlife Australia recognises the Cocanarup Timber Reserve area as an important breeding area for the species (Birdlife, 2019), due in part to its location at the eastern edge of its distribution.

Carnaby's first appear in Cocanarup Reserve in June/July, and breeding takes place through spring and summer. The earliest confirmed nesting record is in the first week of August, and the latest record of adults feeding young is in the first week of February. Once the young birds are ready, the birds leave Cocanarup and fly the 35-plus km to the south coast.

## **6. ASSESSMENT AGAINST THE 10 CLEARING PRINCIPLES**

In assessing whether clearing for the Proposal is likely to have a significant impact on the environment, the Proposal was assessed against the ten clearing principles (EP Act 1986, Schedule 5) in accordance with 'A Guide to the Assessment of Applications to Clear Native Vegetation' (DER, 2014). This assessment is presented in **Table 4**.

**Table 4: Assessment against the Clearing Principles**

Clearing Principle	Assessment
(a) Native vegetation should not be cleared if it comprises a high level of biological diversity.	<p><b>Flora</b></p> <p>Within 10 km of the Proposal Area, the desktop assessment identified nine DBCA listed Priority Flora taxa, from 15 individual records, these included:</p> <ul style="list-style-type: none"> <li>• <i>Acacia besleyi</i> – P1</li> <li>• <i>Austrostipa</i> sp. <i>Carlingup Road</i> (S. Kern &amp; R. Jasper LCH 18459) – P1</li> <li>• <i>Cassinia arcuata</i> – P2</li> <li>• <i>Eucalyptus desmondensis</i> – P4</li> <li>• <i>Grevillea fastigiata</i> – P4</li> <li>• <i>Levenhookia pulcherrima</i> - P3</li> <li>• <i>Melaleuca peninsula</i> - P4</li> <li>• <i>Notisia intonsa</i> - P3</li> <li>• <i>Spyridium mucronatum subsp. recurvum</i> - P3</li> </ul> <p>In addition, the PMST results indicate that there is the potential habitat for up to six species listed as Threatened under the EPBC Act to occur within 10 km of the Proposal Area. These species are also listed under the BC Act and include:</p> <ul style="list-style-type: none"> <li>• Little Kangaroo Paw (<i>Anigozanthos bicolor subsp. minor</i>) – (En)</li> <li>• Long-sepalled Daviesia (<i>Daviesia megacalyx</i>) – (En)</li> <li>• Fitzgerald Eremophila <i>Eremophila denticulata subsp. denticulate</i> – (Vu)</li> <li>• Barrens Wedding Bush <i>Ricinocarpos trichophorus</i> – (En)</li> <li>• Saltmat <i>Roycea pycnophylloides</i> – (En)</li> <li>• Sandplain Sun-orchid <i>Thelymitra psammophila</i> – (Vu)</li> </ul> <p>Further investigations into the likely presence of the above listed Threatened species was undertaken through a review of Florabase. No records of Threatened flora occurring within 10 km of the Proposal Area were identified.</p> <p>Following a review of available survey reports from the local area, specifically the Woodman (2016) which overlaps the eastern edge of the Proposal, no Priority or Threatened flora listed under the BC Act or the EPBC Act were recorded. Woodman (2016) concluded that given the habitat and soil types present, it is considered unlikely that these species occur. Noting the proximity of the Woodman (2016) study area to the Proposal Area, and the similar vegetation types and geology, the likelihood of these conservation significant taxa occurring within the Proposal Area is considered unlikely.</p> <p><b>Vegetation</b></p> <p>The Proposal will require up to 7 ha of clearing to facilitate exploration activities. Given the proximity of the Woodman (2016) it is considered likely that the vegetation values recorded extend throughout the Proposal Area. Woodman (2016), recorded 27 vegetation types (VT's) which were dominated by Eucalyptus and Acacia species, with one VT comprised of <i>Melaleuca hamulosa</i>, <i>Melaleuca incana</i> subsp. <i>tenella</i>, and <i>Melaleuca torquate</i>.</p>

Clearing Principle	Assessment
	<p>Vegetation within the Proposal Area is considered to be in a predominantly 'Excellent' condition with isolated areas of historical exploration disturbance in the most northern area of the Proposal, .</p> <p>The Proposal Area coincides with the buffer area of the Commonwealth listed threatened ecological community 'Proteaceae Dominated Kwongkan Shrublands of the Southeast Coastal Floristic Province of Western Australia' (EPBC Act: Endangered DBCA: Priority 3). The occurrence of the TEC within the Proposal is considered unlikely to occur based on the findings of Woodman (2016). This survey determined that the vegetation present lacked the required species diversity and abundance to be representative of the community.</p> <p>Woodman (2016) further stated that much of the vegetation was typically dominated by Eucalypts species in the overstorey, forming mid woodlands and low mallee forests, over dense to sparse mixed height shrublands of mostly Fabaceous shrubs. Only three Proteaceous species (<i>Hakea commutata</i>, <i>Grevillea oligantha</i> and <i>G. pectinata</i>) within two genera; none of which are defined as typical "widespread and characteristic" taxa of the Proteaceous Kwongkan Shrublands community and none of which form widespread dominant structural shrublands or heaths. Given the proximity of the survey area to the Proposal, and in discussions with other experienced botanists (Biologic, pers comm) it is considered unlikely that the community is present within the</p> <p>Furthermore, Strategen (2018) surveyed an area approximately 4 km southwest of the Proposal Area within tenement E 74/415, this survey failed to record the presence of the TEC.</p> <p><b>Fauna</b></p> <p>The desktop assessment identified the following Threatened species as likely to occur within the Proposal Area or its surrounds:</p> <ul style="list-style-type: none"> <li>• Carnaby's black-cockatoo (<i>Calyptrorhynchus latirostris</i>) (En)</li> <li>• Numbat (<i>Myrmecobius fasciatus</i>) (En)</li> <li>• Heath mouse (<i>Pseudomys shortridgei</i>) (En)</li> <li>• Chuditch (<i>Dasyurus geoffroii</i>) (Vu)</li> <li>• Malleefowl (<i>Leipoa ocellata</i>) (Vu)</li> </ul> <p>Bamford (2016) undertook a fauna assessment adjacent to the Proposal Area and concluded that a large number of significant species likely to occur as residents of the area, or at least as regular visitors. Many occur at the eastern edge of their range in the Ravensthorpe area, making their presence in the survey area significant. Carnaby's Black-Cockatoo is probably the significant species of greatest note, as the area is on the edge of the species' range and area is known to be a significant breeding site for the species. Impacts to terrestrial fauna are considered in Principle B.</p>
(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.	<p>The desktop assessment identified the following Threatened species as likely to occur within the Proposal Area or its surrounds:</p> <ul style="list-style-type: none"> <li>• Carnaby's Cockatoo (<i>Calyptrorhynchus latirostris</i>) (En)</li> <li>• Numbat (<i>Myrmecobius fasciatus</i>) (En)</li> <li>• Heath mouse (<i>Pseudomys shortridgei</i>) (En)</li> <li>• Chuditch (<i>Dasyurus geoffroii</i>) (Vu)</li> <li>• Malleefowl (<i>Leipoa ocellata</i>) (Vu)</li> </ul> <p>Bamford (2016) recorded evidence of occupancy by Carnaby's Cockatoo, Chuditch and Brush Wallaby (P4) within the Proposal Area. Other species of conservation significance considered likely to occur by Bamford (2016) included the Malleefowl and the Red-tailed</p>

Clearing Principle	Assessment
	<p>phascogale. In addition, the heath mouse was recorded within the southern portion of the reserve through a trapping program by the DBCA (CCA, 2022) while not recorded within the Proposal Area, the species may be a vagrant and an irregular visitor.</p> <p>52 numbats were translocated into the reserve between 2006 and 2009, all fitted with tracking collars and breeding records were noted between 2007 and 2011. However, the no individuals have been recorded since 2013 (visual observation), with the last radio collar recovered in 2012 from an individual that had been subject to predation (CCA, 2022). It is considered that the species will not occur within the Proposal Area.</p> <p><b><u>Black Cockatoo</u></b></p> <p>The Proposal Area is within the modelled distribution and breeding range of the Carnaby's Cockatoo. Three species records occur within 3 km of the Proposal Area, and the species is expected to utilise vegetation within the Proposal Area. Birdlife Australia recognises the Cocanarup Timber Reserve area as an important breeding area for the species (Birdlife, 2019), due in part to its location at the eastern edge of its distribution.</p> <p><b>Breeding Habitat</b></p> <p>Carnaby's first appear in Cocanarup Reserve in June/July, and breeding takes place through spring and summer. The earliest confirmed nesting record is in the first week of August, and the latest record of adults feeding young is in the first week of February. Once the young birds are ready, the birds leave Cocanarup and fly the 35-plus km to the south coast (CCA, 2022).</p> <p>While no targeted survey has been undertaken for this Proposal, Bamford (2016) recorded 28 potential breeding trees within the northern most area of the Proposal. Furthermore, the Cocanarup Conservation Alliance (CCA) have recorded a number of active nesting trees throughout the Reserve, and it is accepted that breeding is likely to occur within close proximity to the Proposal Area. The northern most section of the Proposal is considered likely to contain habitat that will support breeding for the species. There is unlikely to be suitable breeding habitat in the southern portion of the Proposal due to the lack of large salmon gums in this area.</p> <p>Prior to any ground disturbing works a targeted Black Cockatoo habitat assessment will be undertaken to identify potential and actual breeding trees. The data gathered from this survey will influence the final disturbance area to avoid large trees suitable for breeding. Disturbance buffers, approximately 10 m, will also be placed around these trees to protect the root zone and prevent incidental tree mortality.</p> <p><b>Foraging Habitat</b></p> <p>The Proposal will result in the removal of up to 7 ha of potentially suitable foraging habitat. Bamford (2016) assessed the foraging quality within the area to be of low to moderate quality, concluding that the proteaceous heaths, located further to the south in the Fitzgerald National Park region. Mallet and Salmon gums were assigned a foraging value of 3 out of 6 by Bamford (2016).</p> <p>It is noted that where foraging habitat is located near to potential breeding trees there is a high risk of significant impact. The presence of foraging habitat surrounding potential breeding trees may increase the significance of that habitat. However, when considered in the</p>



Clearing Principle	Assessment
	<p>context of the available habitat present in the local region (within 6 km and 12 km), there is approximately 1,511 ha and 6,454.9 ha of potential foraging habitat (DPIRD, 2019 and DBCA, 2020). Clearing for the Proposal will reduce available foraging habitat by &lt;0.1%.</p> <p>Flocks of Black Cockatoos move through the landscape by following vegetated corridors whilst actively avoiding cleared or open areas including dense urban areas. Ecological linkages are therefore required to facilitate this movement between habitat nodes. The Proposal Area is located within a relatively dense area of vegetation that connects to the Fitzgerald River National Gap. Clearing for the Proposal will not create a gap in the vegetation that would impede the movement of flocks through the area.</p> <p>With regards to the Malleefowl and Chuditch, Bamford (2016) did not record any direct evidence of their presence within their study area that was surveyed. It is noted this survey area did not cover the entire extent of the Proposal Area and it is accepted that these species are likely to be transient through the Proposal Area. Considering this, prior to clearing a survey will be undertaken within the disturbance area to confirm the presence or absence of Malleefowl mounds. Should any mounds be identified, the clearing area will be modified to avoid them.</p>
(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.	<p>The desktop assessment did not identify any flora species listed as 'Threatened' under the BC Act occurring within the Proposal Area, or its immediate surrounds. While the PMST search identified potentially suitable habitat for Threatened flora taxa occurring within 10 km of the Proposal Area, no records are known to occur within this radius.</p> <p>Furthermore, following a review of available survey reports from the region, specifically:</p> <ul style="list-style-type: none"> <li>• Woodman (2016) which overlaps the eastern edge of the Proposal, and</li> <li>• Strategen (2018) which involved a survey approximately 4 km southwest of the Proposal Area, within tenement E 74/415</li> </ul> <p>these surveys, in particular Woodman (2016) did not record any flora species listed as threatened under the BC Act. Woodman (2016) concluded that given the habitat, it is considered unlikely that these species occur.</p>
(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.	<p>No State listed Threatened Ecological Communities are known to occur within the Proposal Area and will not be impacted.</p> <p>The Proposal Area coincides with the buffer area for the State listed Priority Ecological Community (PEC), Proteaceae Dominated Kwongan Shrublands of the Southeast Coastal Floristic Province of Western Australia' (Priority 3). This is PEC listed as 'Endangered' under the EPBC Act and is discussed under Principal A.</p>
(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.	<p>The Proposal Area coincides with the mapped extent of Vegetation Associations 352 and 516.</p> <p>The national objectives and targets for biodiversity conservation in Australia have a target to prevent clearance of ecological communities with an extent below 30 per cent of that present pre-1750 (Commonwealth of Australia, 2001).</p> <p>Vegetation Association 352 has been subjected to widespread clearing within Western Australia, mainly to facilitate agriculture. The table below presents the vegetation statistics for Vegetation Association 352 and Vegetation Association 516.</p>

Clearing Principle	Assessment					
	<b>Pre-European Vegetation Association</b>	<b>Scale</b>	<b>Pre-European (ha)</b>	<b>Current Extent (ha)</b>	<b>% Remaining</b>	<b>% Remaining in DBCA reserves</b>
	<b>Veg Assoc No. 352</b>	<b>Statewide</b>	724,268.73	142,012.22	19.61	8.92
		<b>IBRA Bioregion</b> Esperance Plains	22,816.85	6,566.34	28.78	0.33
		<b>IBRA Sub-region</b> Fitzgerald	22,816.85	6,566.34	28.78	0.33
		<b>Local Government Authority</b> Shire of Ravensthorpe	20,570.71	5,717.67	27.80	0.38
	<b>Veg Assoc No. 516</b>	<b>Statewide</b>	607,434.08	332,848.54	54.80	44.15
		<b>IBRA Bioregion</b> Esperance Plains	318,746.74	219,798.44	68.96	41.65
		<b>IBRA Sub-region</b> Fitzgerald	219,038.35	183,114.14	83.60	45.97
		<b>Local Government Authority</b> Shire of Ravensthorpe	153,600.87	128,117.32	83.41	39.23
	<p>As presented in the above table, Vegetation Association 352 has 19.61% of its pre-1750 extent remaining Statewide, while 27.8% remains within the Shire of Ravensthorpe. Clearing associated with the drilling programme will reduce the extent of Vegetation Association 352 remaining within the Shire of Ravensthorpe by no more than 0.1%. This reduction is not considered to be significant.</p> <p>In considering the Proposals location in landscape and the surrounding vegetation, approximately 92,067 ha of native vegetation, comprised of multiple vegetation associations, remains within 20 km. Clearing for the Proposal represents &lt;0.1% (0.005%) of the native vegetation extent within 20 km.</p> <p>Vegetation Association 516 has over 80% of its pre-1750 extent remaining and will not be significantly reduced (&lt;0.1%) as a result of the proposal.</p>					

Clearing Principle	Assessment												
	Considering the above, it is unlikely that the vegetation present within the Proposal Area is significant as a remnant of native vegetation in an area that has been extensively cleared.												
(f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.	<p>Interrogation of DBCA and DWER hydrological and wetland datasets determined that no wetlands are mapped within the Proposal Area. The Philips River does intersect the Proposal Area, however final track design will void direct and indirect impacts to the Philips River. Minor, non-perennial creek lines run through the Proposal Area and are tributaries of the Philips River. Vegetation growing in association with these tributaries will be cleared for the construction of access tracks and one minor crossing.</p> <p>Considering the non-perennial nature of the creek, and that clearing will be relatively small and localised, potential impacts as result of the Proposal are not considered significant. Consultation with DWER will be undertaken to determine if a permit under s21A of the <i>Rights in Water and Irrigation Act 1914</i> (RIWI Act) will be required.</p>												
(g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.	<p>The Department of Primary Industries and Regional Development (DPIRD), provides a series of soil degradation risk mapping at the sub-system level. The Proposal Area coincides with both the Kybulup 1 subsystem, comprised predominately by alkaline grey shallow sandy duplex, and the Ravensthorpe 2 subsystem, comprised predominantly of calcareous loamy earth and shallow gravel.</p> <p>The table below summaries the soil degradation risk within the Proposal Area as defined by DPIRD for the above-mentioned soil types.</p> <table border="1"> <thead> <tr> <th>Aspect</th><th>Degradation risk</th></tr> </thead> <tbody> <tr> <td>Wind Erosion</td><td>75% of moderate to high risk</td></tr> <tr> <td>Waterlogging</td><td>&lt;3% of moderate to high risk</td></tr> <tr> <td>Water Erosion</td><td>&lt;3% of moderate to high risk</td></tr> <tr> <td>Salinity</td><td>3-10% of moderate to high risk</td></tr> <tr> <td>Flood Risk</td><td>&lt;3% of moderate to high risk</td></tr> </tbody> </table> <p>Wind erosion is the main potential soil degradation risk and is limited to the areas of clearing that are within the Kybulup 1 subsystem due to the grey shallow sands associated with the area. However, water erosion could be a risk where the soil surface is disturbed on hill slopes and gullies for access tracks and pads.</p> <p>It is unlikely that the project will cause appreciable land degradation given the relatively small amount of clearing and the implementation of appropriate measures to mitigate and manage potential erosion during exploration activities.</p>	Aspect	Degradation risk	Wind Erosion	75% of moderate to high risk	Waterlogging	<3% of moderate to high risk	Water Erosion	<3% of moderate to high risk	Salinity	3-10% of moderate to high risk	Flood Risk	<3% of moderate to high risk
Aspect	Degradation risk												
Wind Erosion	75% of moderate to high risk												
Waterlogging	<3% of moderate to high risk												
Water Erosion	<3% of moderate to high risk												
Salinity	3-10% of moderate to high risk												
Flood Risk	<3% of moderate to high risk												
(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.	<p>DER (2014) defines conservation areas as 'a conservation park, national park, nature reserve, marine nature reserve, marine park or marine management area within the meaning of the <i>Conservation and Land Management Act 1984</i> or any other land or waters reserved or managed for the purpose of, or purposes including, nature conservation'. In consideration of that definition, there are no adjacent or nearby conservation areas in relation to the Proposal Area.</p> <p>Three conservation areas/reserves are present within 15 km of the Proposal Area, which are:</p>												

Clearing Principle	Assessment
	<ul style="list-style-type: none"> <li>Long Creek Nature Reserve (13 km, NW)</li> <li>Koorngong Nature Reserve (12 km, W)</li> <li>Fitzgerald River National Park (14km, S)</li> </ul> <p>Noting the above and considering the size and nature of the clearing, the Proposal is unlikely to result in impacts to an adjacent or nearby conservation area.</p>
(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.	<p>The Philips River intersects the Proposal Area, however final track design will void direct and indirect impacts to the Philips River. Minor, non-perennial creek lines which are tributaries of the Philips River, run through the Proposal Area. Vegetation growing in association with this creek will be cleared for the construction of access tracks and one minor crossing.</p> <p>Noting the extent and nature of vegetation clearing, the Proposal will not result in a change to the local hydrology of the area. Management measures will be implemented to ensure that the quality of surface water is maintained. Consultation with DWER will be undertaken to determine if a permit under s21A of the <i>Rights in Water and Irrigation Act 1914</i> (RIWI Act) will be required.</p> <p>As no dewatering or drainage modifications are required; there will be no deterioration of underground water quality.</p>
(j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.	<p>This Proposal will require the clearing of up to 7 ha of vegetation. The removal of a relatively small area of vegetation (&lt;0.1% within 20 km), that will be rehabilitated, makes it unlikely that the incidence or intensity of flooding will increase. Annual average rainfall for the Ravensthorpe region is 448.3 mm (1991-2020) (BoM, 2022), with July and August the highest average months at 48.5 and 48.8 mm respectively. NRM SLIP data identifies that the area has 0% risk of flooding, largely attributed to the presence of sandy soil and fast infiltration rates.</p> <p>Furthermore, in considering DER (2014) it is noted in these guidelines that '<i>Consideration of this principle may require extensive modelling of the whole catchment and should only be considered for large clearing proposals</i>'. For small clearing applications ensuring that the Proposal is not at variance to Principles (g) and (j) is considered sufficient.</p> <p>Given the small amount of clearing, that vegetation will remain in the surrounding area, it is unlikely that this project will cause or exacerbate the incidence or intensity of flooding.</p>

## 7. ENVIRONMENTAL MANAGEMENT MEASURES

Biological surveys will be conducted prior to clearing to determine the presence of conservation significant Flora, Vegetation, Fauna or their habitat and assist with final delineation of access tracks and pads. The results will be provided to DMIRS and any other relevant parties.

Exploration activities will be implemented in accordance with an Exploration Environmental Management Plan prepared prior to implementation of the Proposal. The Exploration EMP will include management actions to control the potential environmental effects of the Proposal such as:

- Pre Exploration:
  - Demarcation of approved clearing areas in accordance with an internal 'Ground Disturbance Permit' procedures
  - Avoid clearing by utilising existing disturbed or open areas
  - Local topography will be reviewed to inform track design and alignment to avoid or reduce the need for cut and fill construction methods, while ensuring safe and stable tracks and pads for exploration activities
  - Demarcation of avoidance areas such as significant flora and large habitat trees
  - Operator personnel will be familiarised with demarcated areas prior to clearing works commencing to ensure no clearing beyond demarcated clearing zones
  - Inspection of all vehicles and equipment prior to site arrival to ensure they are 'clean' of soil sods and weed seeds in accordance with hygiene procedures
- During Exploration:
  - Clearing will be conducted progressively so only those areas absolutely required for operations are disturbed
  - Vegetation removal and separate stockpiling for rehabilitation
  - Fire control equipment and chemical/hydrocarbon spill response equipment stored on-site
  - Dangerous goods (e.g. hydrocarbon fuels) stored in bunded areas
  - Wastes contained and disposal at a local licensed facility, site clean-up at the end of each day
- Post-Exploration:
  - Rehabilitation of drill pads and tracks by –
    - removal of all rubbish (including drill sample bags) for off-site disposal
    - re-contouring of land surfaces and on-contour ripping of compacted ground
    - re-spreading of stockpiled soil and vegetation material
- Monitoring of rehabilitation (photographic records) to confirm successful rehabilitation



## 8. REFERENCES

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## **APPENDIX 1: DESKTOP DATABASE RESULTS**



# EPBC Act Protected Matters Report

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

Report created: 02-Feb-2022

[Summary](#)

[Details](#)

[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)

# Summary

## Matters of National Environment Significance

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

<a href="#">World Heritage Properties:</a>	None
<a href="#">National Heritage Places:</a>	None
<a href="#">Wetlands of International Importance (Ramsar</a>	None
<a href="#">Great Barrier Reef Marine Park:</a>	None
<a href="#">Commonwealth Marine Area:</a>	None
<a href="#">Listed Threatened Ecological Communities:</a>	1
<a href="#">Listed Threatened Species:</a>	19
<a href="#">Listed Migratory Species:</a>	7

## Other Matters Protected by the EPBC Act

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

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

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

<a href="#">Commonwealth Lands:</a>	None
<a href="#">Commonwealth Heritage Places:</a>	None
<a href="#">Listed Marine Species:</a>	11
<a href="#">Whales and Other Cetaceans:</a>	None
<a href="#">Critical Habitats:</a>	None
<a href="#">Commonwealth Reserves Terrestrial:</a>	None
<a href="#">Australian Marine Parks:</a>	None
<a href="#">Habitat Critical to the Survival of Marine Turtles:</a>	None

## Extra Information

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

<a href="#">State and Territory Reserves:</a>	None
<a href="#">Regional Forest Agreements:</a>	None
<a href="#">Nationally Important Wetlands:</a>	None
<a href="#">EPBC Act Referrals:</a>	3
<a href="#">Key Ecological Features (Marine):</a>	None
<a href="#">Biologically Important Areas:</a>	None
<a href="#">Bioregional Assessments:</a>	None
<a href="#">Geological and Bioregional Assessments:</a>	None

# Details

## Matters of National Environmental Significance

Listed Threatened Ecological Communities

[ Resource Information ]

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

Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Proteaceae Dominated Kwongan Shrublands of the Southeast Coastal Floristic Province of Western Australia</a>	Endangered	Community likely to occur within area	In feature area

Listed Threatened Species

[ Resource Information ]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.

Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
<a href="#">Botaurus poiciloptilus</a> Australasian Bittern [1001]	Endangered	Species or species habitat may occur within area	In feature area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
<a href="#">Dasyornis longirostris</a> Western Bristlebird [515]	Endangered	Species or species habitat likely to occur within area	In feature area
<a href="#">Falco hypoleucos</a> Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<a href="#">Leipoa ocellata</a> Malleefowl [934]	Vulnerable	Species or species habitat known to occur within area	In feature area



Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
<a href="#">Pezoporus flaviventris</a> Western Ground Parrot, Kyloring [84650]	Critically Endangered	Species or species habitat may occur within area	In buffer area only
<a href="#">Zanda latirostris listed as Calyptorhynchus latirostris</a> Carnaby's Black Cockatoo, Short-billed Black-cockatoo [87737]	Endangered	Breeding known to occur within area	In feature area
MAMMAL			
<a href="#">Dasyurus geoffroii</a> Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat may occur within area	In feature area
<a href="#">Myrmecobius fasciatus</a> Numbat [294]	Endangered	Species or species habitat known to occur within area	In feature area
<a href="#">Parantechinus apicalis</a> Dibbler [313]	Endangered	Species or species habitat likely to occur within area	In feature area
<a href="#">Phascogale calura</a> Red-tailed Phascogale, Red-tailed Wambenger, Kenngoor [316]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<a href="#">Pseudomys shortridgei</a> Heath Mouse, Dayang, Heath Rat [77]	Endangered	Species or species habitat known to occur within area	In feature area
PLANT			
<a href="#">Anigozanthos bicolor subsp. minor</a> Little Kangaroo Paw, Two-coloured Kangaroo Paw, Small Two-colour Kangaroo Paw [21241]	Endangered	Species or species habitat likely to occur within area	In feature area
<a href="#">Daviesia megacalyx</a> Long-sepalld Daviesia [56785]	Endangered	Species or species habitat likely to occur within area	In feature area
<a href="#">Eremophila denticulata subsp. denticulata</a> Fitzgerald Eremophila [64569]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Ricinocarpos trichophorus</a> Barrens Wedding Bush [19931]	Endangered	Species or species habitat likely to occur within area	In feature area
<a href="#">Roycea pycnophylloides</a> Saltmat [21161]	Endangered	Species or species habitat may occur within area	In feature area
<a href="#">Thelymitra psammophila</a> Sandplain Sun-orchid [4908]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Listed Migratory Species

[ [Resource Information](#) ]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area

Migratory Terrestrial Species			
<a href="#">Motacilla cinerea</a> Grey Wagtail [642]		Species or species habitat may occur within area	In feature area

Migratory Wetlands Species			
<a href="#">Actitis hypoleucos</a> Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
<a href="#">Calidris acuminata</a> Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
<a href="#">Calidris melanotos</a> Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area

Other Matters Protected by the EPBC Act

Listed Marine Species		[ Resource Information ]	
Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
<a href="#">Actitis hypoleucos</a> Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
<a href="#">Apus pacificus</a> Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
<a href="#">Bubulcus ibis as Ardea ibis</a> Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
<a href="#">Calidris acuminata</a> Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area
<a href="#">Calidris ferruginea</a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
<a href="#">Calidris melanotos</a> Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
<a href="#">Chalcites osculans as Chrysococcyx osculans</a> Black-eared Cuckoo [83425]		Species or species habitat likely to occur within area overfly marine area	In feature area
<a href="#">Haliaeetus leucogaster</a> White-bellied Sea-Eagle [943]		Species or species habitat may occur within area	In feature area
<a href="#">Merops ornatus</a> Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Motacilla cinerea</a> Grey Wagtail [642]		Species or species habitat may occur within area overfly marine area	In feature area
<a href="#">Numenius madagascariensis</a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area

### Extra Information

EPBC Act Referrals			[ Resource Information ]	
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
<a href="#">Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia</a>	2015/7522	Not Controlled Action	Completed	In feature area
<a href="#">INDIGO Central Submarine Telecommunications Cable</a>	2017/8127	Not Controlled Action	Completed	In feature area
Not controlled action (particular manner)				
<a href="#">INDIGO Marine Cable Route Survey (INDIGO)</a>	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval	In feature area

# Caveat

## 1 PURPOSE

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

The report contains the mapped locations of:

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

## 2 DISCLAIMER

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

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

## 3 DATA SOURCES

Threatened ecological communities

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

Threatened, migratory and marine species

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

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

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

## 4 LIMITATIONS

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

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

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

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

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

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

# Acknowledgements

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- [-Other groups and individuals](#)

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