Cannie Wind Farm Transmission Corridor Options

Desktop Ecological Assessment

PREPARED FOR

RES Australia Pty Ltd

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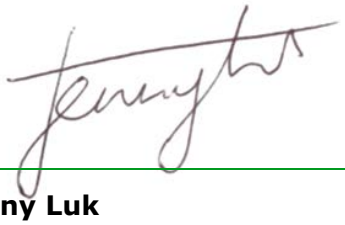

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ACRONYMS AND ABBREVIATIONS

	Description
BCS	Biodiversity Conservation Status
BONN	Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention)
BUS	Bird utilisation survey

CaLP Act	*Catchment and Land Protection Act 1994* (Victoria)
Cannie WF	Cannie Wind Farm
CAMBA	China-Australia Migratory Bird Agreement
CFA	Country Fire Authority (Victoria)
DAWE	Department of Agriculture, Water, and the Environment (Commonwealth) [now DCCEEW]
DCCEEW	Department of Climate Change, Energy, the Environment and Water (Commonwealth)
DEECA	Department of Energy, Environment and Climate Action (Victoria)
DELWP	Department of Environment, Land, Water and Planning (Victoria) [Now DEECA]
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth)
ERM	Environmental Resource Management Australia Pty Ltd
EVC	Ecological Vegetation Class
FFG Act	*Flora and Fauna Guarantee Act 1988* (Victoria)
GHU	General Habitat Unit
Guidelines	*Guidelines for the removal, destruction or lopping of native vegetation* (DELWP 2017)
HIM	Habitat Importance Map (DEECA)
JAMBA	Japan-Australia Migratory Bird Agreement
MNES	Matters of National Environmental Significance
NVCR	Native Vegetation Credit Register (DEECA)
NVR Report	Native Vegetation Removal Report (DEECA)
PMST	Protection Matters Search Tool (DCCEEW)
Study Area	The area directly impacted by the proposed project transmission corridors plus a 1km buffer.
Ramsar	The Convention on Wetlands
ROKAMBA	Republic of Korea-Australia Migratory Bird Agreement
SBV	Strategic Biodiversity Value
SHU	Species Habitat Unit

EXECUTIVE SUMMARY

Environmental Resources Management Australia Pty Ltd was engaged by RES Australia Pty Ltd to prepare a Desktop Ecological Assessment for the Transmission Corridor Study Area for the Cannie Wind Farm project. Three transmission corridor options were investigated in areas identified as 'Study Area A', 'Study Area B', and 'Study Area C'. These corridor routesrs are 2 km in width, with an assumed transmission easement width of 70 m.

The transmission corridors were found to traverse land primarily used for agriculture, providing low-quality fauna habitat and that is unlikely to support native vegetation and threatened flora, fauna, or ecological communities. The key areas of ecological significance are mainly restricted to riparian zones including those associated with Avoca River and Loddon River, and remnant patches in road reserves. These features were found to likely provide important habitat connectivity across the broader landscape, and support listed matters.

Across the Study Area there is opportunity to avoid and minimise impacts to native vegetation through the micro-siting of Project infrastructure and implementing appropriate mitigation measures. Study Area C was found to have the highest potential to impact areas of higher biodiversity value. As such, impacts from Study Area C on fauna may also be greater relative to Areas A and B, due to requiring additional road and riparian traversal, but these are likely to be easily mitigated.

Planning controls relevant to biodiversity were found to be similar across each Study Area. Aside from the requirement to satisfy the objectives of these provisions as part of an any permit application, it was noted that securing suitable offsets in the form of Species Habitat Units may be difficult to obtain if impacts to native vegetation are not sufficiently addressed in the design of the transmission corridor.

1. INTRODUCTION

Environmental Resources Management Australia Pty Ltd (ERM) was engaged by RES Australia Pty Ltd (RES) to seek the approvals required to support the development and delivery of the Cannie Wind Farm Project (the Project).

1.1 PROJECT DESCRIPTION

The Project is to be located in the north-west region of Victoria, approximately 33 kilometres (km) west of Kerang and 25 km south of the Murray River and Victoria-New South Wales border. The Project Area comprises the Cannie Wind Farm (Cannie WF) site and the Transmission Corridor Study Area. The total Project Area is 82,606 hectares.

The Cannie WF site has an area of 17,870 hectares (178.70 km^2). It will accommodate up to 174 wind turbine generators (WTGs) with ~ 1,300 MW generation capacity. The development will also include a Battery Energy Storage System (BESS) with up to 200 MW / 800 MWh storage capacity. The wind farm site will connect to the Victoria to NSW Interconnector West project (VNI West), being delivered by Government, through the Transmission Corridor Study Area which has an area of 64,728 ha (647.28 km^2).

Three transmission corridor options are currently being investigated. The selection of the preferred corridor will be informed through community engagement, engineering design, and environmental investigations. The final easement will generally be 70 metres (m) in width and cleared of trees and any existing structures to facilitate maintenance access in operations.

1.2 PURPOSE OF THIS ASSESSMENT

This assessment has been prepared to provide a desktop ecological assessment of the transmission study area to evaluate the ecological values and constraints within three potential transmission corridors to support connection of the proposed Cannie Wind Farm to the VNI West network.

The objectives of this assessment comprise:

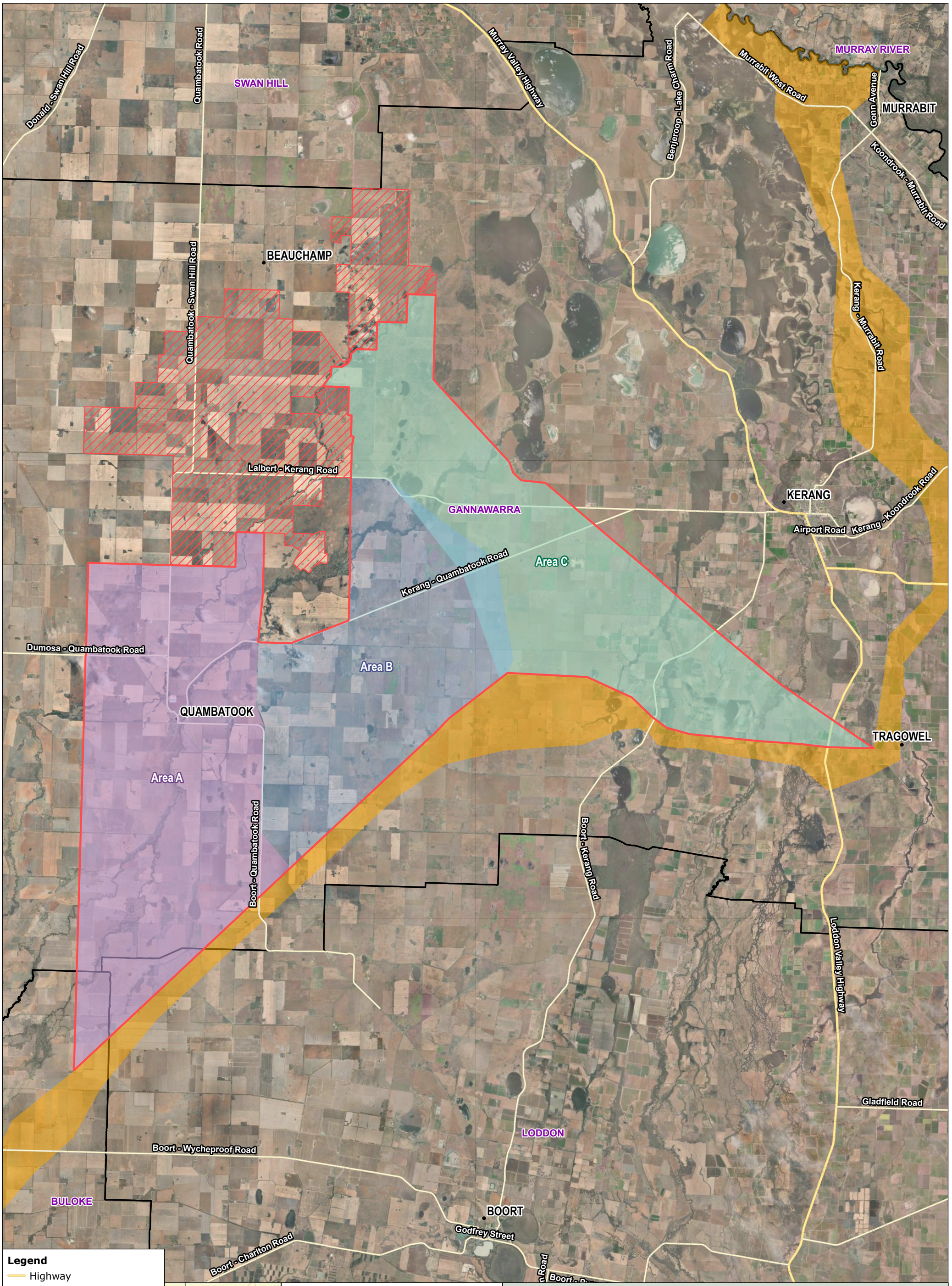
- Identification of the potential presence of listed threatened species and their associated habitat;
- Describe and map ecologically significant flora and fauna habitats;
- Inform decision-making for avoidance of impacts to biodiversity values with respect to transmission corridor determination and design; and
- Provide recommendations and guidance for a fieldwork program to assist in determining mitigation and management of potential impacts to ecological values.

For this report, biodiversity values include native species and communities, with a particular focus on those listed under the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) and the Victorian *Flora and Fauna Guarantee Act 1988* (FFG Act).

1.3 STUDY AREA AND LOCALITY

The three transmission corridors were investigated in the three Study Areas as shown in Figure 1-1 and described below:

- **Study Area A**: located directly south of the Cannie WF and west of Boort-Quambatook Road, and would include a corridor length of up to 70 km (approximately).
- **Study Area B**: located generally south of the Cannie WF and east of Boort-Quambatook Road, and would include a corridor length of up to 40 km (approximately).
- **Study Area C**: located generally to the south-east of the Cannie WF, and would include a corridor length of up to 45 km (approximately).



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2. METHODOLOGY

2.1 DESKTOP REVIEW

A desktop assessment of ecological values known or predicted to be present within each Study Area was undertaken using the government databases and spatial datasets outlined below.

2.1.1 DATABASE SEARCH

Publicly available desktop sources were examined to review and document the listed ecological values potentially present within each Study Area (see Table 2-1).

TABLE 2-1 DATABASE DESKTOP SEARCHES

Data source	Data description
EPBC Act Protected Matters Report*	The EPBC Act Protected Matters Search Tool (PMST) report (DCCEEW 2023) provides predictive results on the occurrence of MNES based on mapping of known and potential species distribution, habitat, threatened ecological communities (TEC) and wetlands within a defined area. For assessments of large projects, areas with connectivity or habitat linkages to regions of high biodiversity or potentially poorly studies areas, a standard buffer of 10 km is applied to each Study Area to capture a more comprehensive predictive dataset.
The Victorian Biodiversity Atlas	The Victorian Biodiversity Atlas (VBA) database provides a list of flora and fauna species recorded within a 10 km radius around each Study Area. VBA searches were limited to the restricted 1M grid species and those within the VBA_25 database. VBA_100 database records were disregarded on the basis of locational uncertainty. This database has a locational uncertainty ranging from 500m-10km.
NatureKit	NatureKit provides GIS mapping, maintained by the Department of Energy, Environment and Climate Change (DEECA) including modelled mapping of extant and pre-1750 Ecological Vegetation Classes (EVCs) and known threatened species records.
NVR Map	The NVR Map tool – which provides the Location Map, the Current Wetland Layer, the Strategic Biodiversity Score and the Native Vegetation Condition Score for the Study Area.
VicPlan	VicPlan is an online tool maintained by the Victorian Department of Transport and Planning (DTP) that provides mapping of Planning Scheme controls and other resources including those relating to property, administration, catchments and heritage (DTP 2022).

*The *EPBC Act Protected Matters Report* for each corridor is provided in Appendix A–C

2.1.2 LIKELIHOOD OF OCCURRENCE

A preliminary likelihood of occurrence (LoO) assessment was undertaken for within 10 km of each Study Area, informed by desktop sources (i.e., PMST and VBA search results). For this assessment, all threatened species or ecological communities either known to occur within 10 km of each respective Study Area or for which modelled habitat is present have been assumed to have the "potential to occur".

The following listed matters were considered as part of this assessment:

- Flora listed as threatened under the EPBC Act;

- Fauna listed as threatened and/or migratory under the EPBC Act;
- Flora and fauna listed as threatened under the FFG Act; and
- Ecological communities listed under the EPBC Act and FFG Act.

The preliminary LoO assessment is provided in Appendix D for flora and Appendix E for fauna.

2.2 LIMITATIONS AND ASSUMPTIONS

No field surveys have been completed for this report. Desktops assessment and results analysis are based on the data obtained from the various sources outlined in Table 2-1. The accuracy of information in these databases is reliant on internal standards. However, accuracy of historical records cannot be guaranteed. The absence of a species from a database list or observational studies does not confirm its absence within the Study Areas. The lack of existing records from databases is may indicate a low historic sampling effort in the region, as opposed to an absence of a species.

The extent, type, and condition of native vegetation within each Study Area presented in this report is as per modelling by the state environment department. Verification of this data requires site assessment by a suitably qualifies ecologist.

Analysis of impacts to native vegetation assumes a worst-case scenario (i.e. total removal of native vegetation within a 70 m easement) and does not include consideration of large trees in patches or scattered trees, as these require a site assessment to identify and quantify as per the *Guidelines for the removal, destruction or lopping of native vegetation* (the Guidelines).

3. RESULTS

3.1 SITE OVERVIEW

Each Study Area was located across two bioregions: the Victorian Riverina and the Murray Mallee, summarised in Table 3-1 below. The three transmission corridor options are located south of the Murray River, which runs along the Victorian-New South Wales border.

The Avoca River spans from the south to the north of Study Area A, and continues north to Study Area B and Study Area C. The landscape is relatively flat and is characterised by large open paddocks, with pockets of native vegetation (primarily in road reserves and along watercourses) and existing infrastructure, including sealed and unsealed roads, residential and agricultural buildings, with the Quambatook township located approximately 2 km to the west of Study Area A. The predominate land use is agricultural farmland including cropping and grazing pasture, for which much of the region has been historically cleared of native vegetation. The Kerang Wetlands Ramsar site is located approximately 0.67 km east of Study Area C. All transmission corridors intersect land owned by various private landholders.

TABLE 3-1 STUDY AREA OVERVIEW

Area	LGA	CMA	Bioregion
Study Area A	Gannawarra Shire	North Central	Mostly Murray Mallee with small patches of Victorian Riverina.
Study Area B	Gannawarra Shire	North Central	Mostly Victorian Riverina with small patches of Murray Mallee.
Study Area C	Gannawarra Shire	North Central	Murray Mallee in the east and west, with the Victorian Riverina in the centre.

3.2 PLANNING OVERVIEW

3.2.1 PLANNING PROVISIONS

The following local and State planning provisions within the Gannawarra Planning Scheme are relevant to the proposed development of the transmission corridors connecting Cannie WF to the future VNI West project.

3.2.2 CLAUSE 12.01 BIODIVERSITY

Clause 12.01 of the Victorian Planning Provisions aims to ensure consideration is given to biodiversity issues when assessing an application for a Planning Permit.

3.2.3 CLAUSE 52.17 NATIVE VEGETATION

Under Clause 52.17 of the Victorian Planning Provisions, a permit is required to remove, destroy, or lop native vegetation. Exemptions are available such as for planted vegetation, which may be applicable to vegetation within each Study Area.

3.2.4 ZONING

Like much of the surrounding region, the three transmission corridors mainly traverse land declared as Farming Zone (FZ), with Public Conservation Reserve Zone (PCRZ) applied to aquatic and riparian habitats of Avoca River and Loddon River, as well as Sandhill Lake Bushland Reserve and Lake Murphy Wildlife Reserve (Figure 3-1).

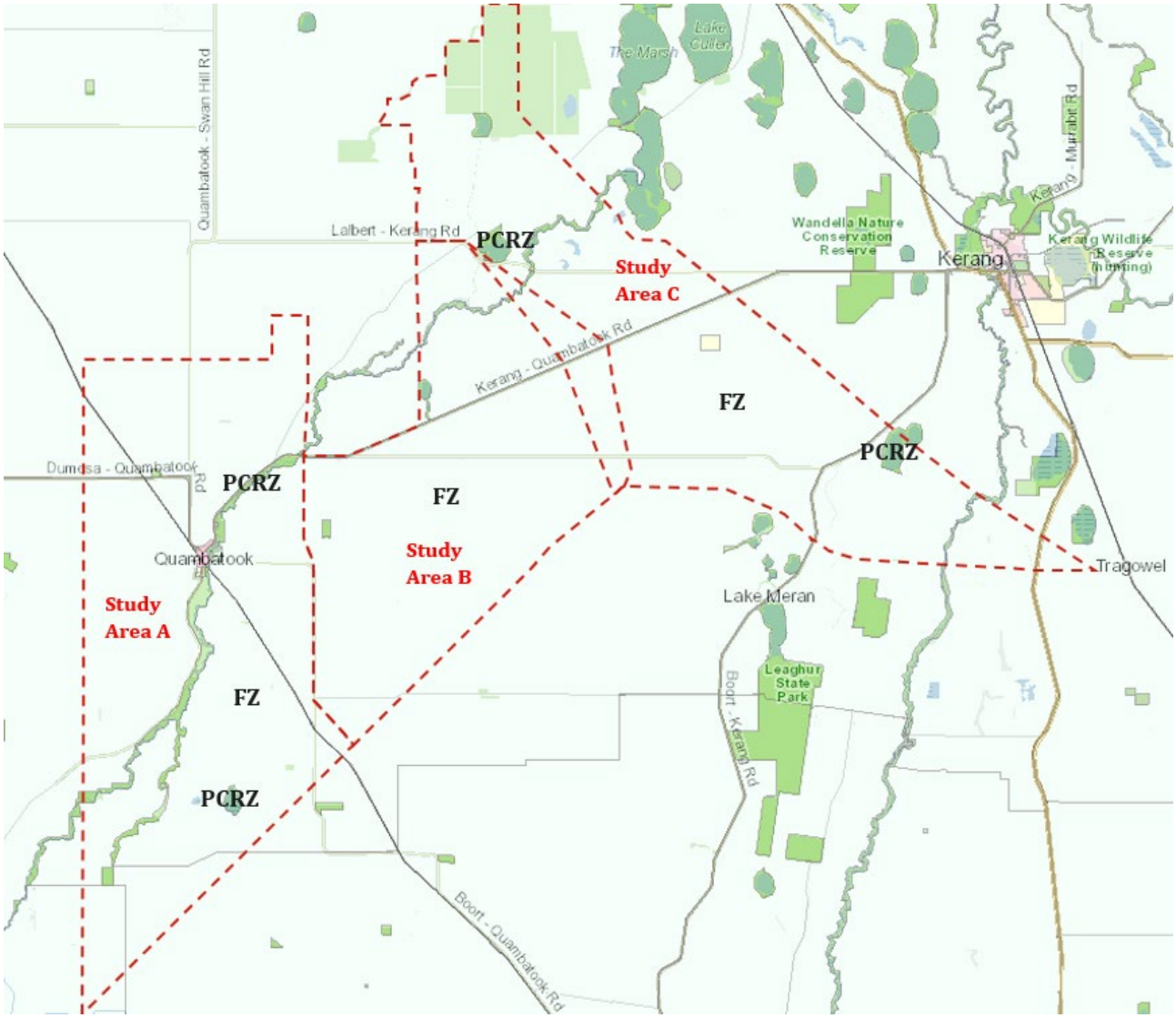


FIGURE 3-1: LAND ZONES WITHIN EACH STUDY AREA

3.2.5 OVERLAYS

Local Planning Provisions under the Gannawarra Planning Scheme relevant to ecological matters are applicable to land across each Study Area. The presence and location of relevant Planning Scheme Overlays is presented in Table 3-2 with each discussed in greater detail below.

TABLE 3-2: PLANNING OVERLAYS WITHIN EACH STUDY AREA

Overlay	Study Area A	Study Area B	Study Area C
VPO1	Associated with: • Lambert-Kerang Rd • Templeton Rd • Budgerum Bridge Rd • Lake Charm-Quambatook Rd • Kerang-Quambatook Rd • Suttle Rd • Weir Rd • Keating Rd • Ritchie Rd	Associated with: • Lake Charm-Quambatook Rd • Collins Rd • Kerang-Quambatook Rd	Associated with: • Lake Charm-Quambatook Rd • Lambert-Kerang Rd • Kerang-Quambatook Rd
VPO2	Isolated, distal patches in the centre of the corridor	N/A	Isolated, distal patches in the south
ESO1	Associated with: • Avoca River	Associated with: • Avoca River	Associated with: • Avoca River • Loddon River • Bannagher Creek
ESO2	Associated with: • Kerang-Quambatook Rd	Associated with: • Kerang-Quambatook Rd	Associated with: • Kerang-Quambatook Rd • Boort-Kerang Rd • Loddon Valley Highway
ESO3	N/A	Sandhill Lake Bushland Reserve	Lake Murphy Wildlife Reserve
ESO4	Spanning much of the corridor	Most of the northern half of the corridor	Covering the north-west of the corridor and isolated areas in the southern half.
BMO	Mainly applying to riparian vegetation along: • Avoca River • Loddon River		

3.2.5.1 VEGETATION PROTECTION OVERLAY

A small area of land within each Study Area is covered by the Vegetation Protection Overlay (VPO), as shown in Figure 3-2. Under the VPO, a permit is required for the removal, destruction or lopping of vegetation listed in any of the associated Schedules to this Clause.

VPO1

This Overlay aims to protect linear reserves and habitat corridors of remnant, treed vegetation, primarily along major road reserves.

VPO2

Isolated, intact areas of grassland, woodland and wetlands of known biodiversity significance are protected by this Schedule.

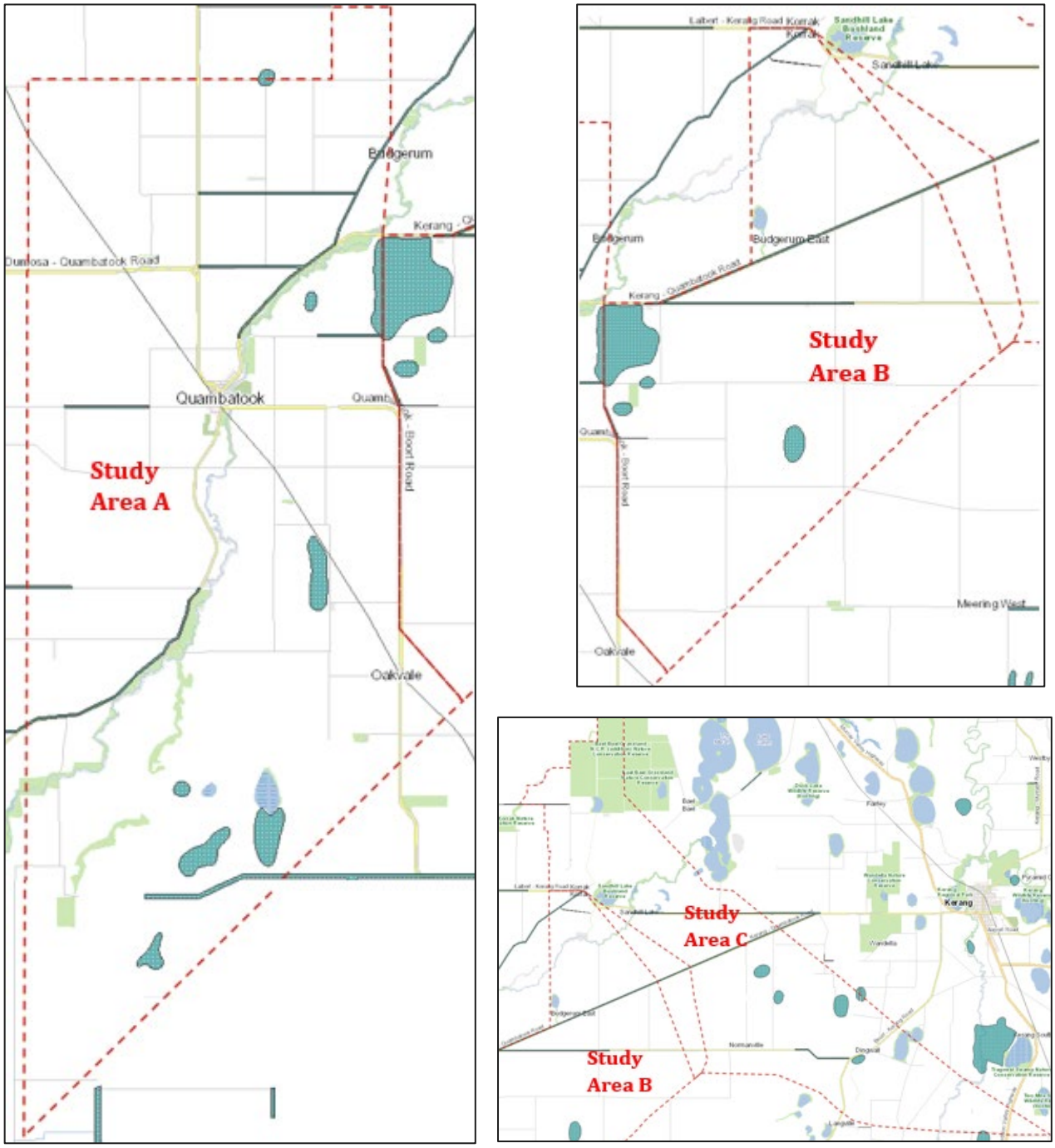


FIGURE 3-2 LOCATION OF VPO WITHIN EACH STUDY AREA

3.2.5.2 ENVIRONMENTAL SIGNIFICANCE OVERLAY

A permit is required for the removal, destruction or lopping of vegetation, unless that vegetation is specifically exempted within the associated schedules to this Clause.

The Environmental Significance Overlay (ESO) located across each Study Area is shown in Figure 3-3. The intent and implications for each of the associated schedules to the ESO are described below.

ESO1

This schedule to the ESO relates to Waterway Environs, with the following key objectives:

- To protect and enhance the biodiversity, ecological values and cultural values and the visual landscape quality of the waterway environs;
- To protect and encourage the long-term future of flora and fauna habitats along waterways; and
- To conserve existing wildlife habitats close to natural waterways and, where appropriate, to allow for generation and regeneration of habitats.

Under the ESO1, a permit is not required for buildings or works located more than 100 m from the bank of the waterway, drainage line or channel.

There are no exemptions for the removal, destruction or lopping of vegetation in the Schedule.

ESO2

This Schedule to the ESO relates to Highway Protection Environs, with the following key objectives:

- To preserve and enhance the tree lined character of the roadsides along the approaches to the towns and along main roads; and
- To ensure that all existing trees and natural features which are within the overlay area are conserved within the limits of practicability and are not wantonly damaged, destroyed or removed.

Under the ESO2, a permit is not required for buildings located more than 100 m from a road in the Transport 2 Zone, or for works that are 20 m from a road in the Transport 2 Zone.

There are no exemptions for the removal, destruction or lopping of vegetation in the Schedule.

ESO3

This Schedule to the ESO relates to Lake Environs, with the following key objectives:

- To protect and enhance the biodiversity, ecological values and cultural values of the lake environs; and
- To protect the visual and environmental quality and character of the lakes and their environs.

Under the ESO3, there are no exemptions for buildings and works (as relevant to the proposal) or for the removal, destruction or lopping of vegetation in the Schedule.

ESO4

This Schedule to the ESO relates to Areas of Poor Drainage or Potentially Subject to Inundation, with the following key objectives:

- To identify land in urban and non-urban areas which is potentially liable to inundation by overland flow or sheet flooding and is likely to suffer from poor drainage which could inhibit development.

Under the ESO4, there are no exemptions for buildings and works (as relevant to the proposal) or for the removal, destruction or lopping of vegetation in the Schedule.

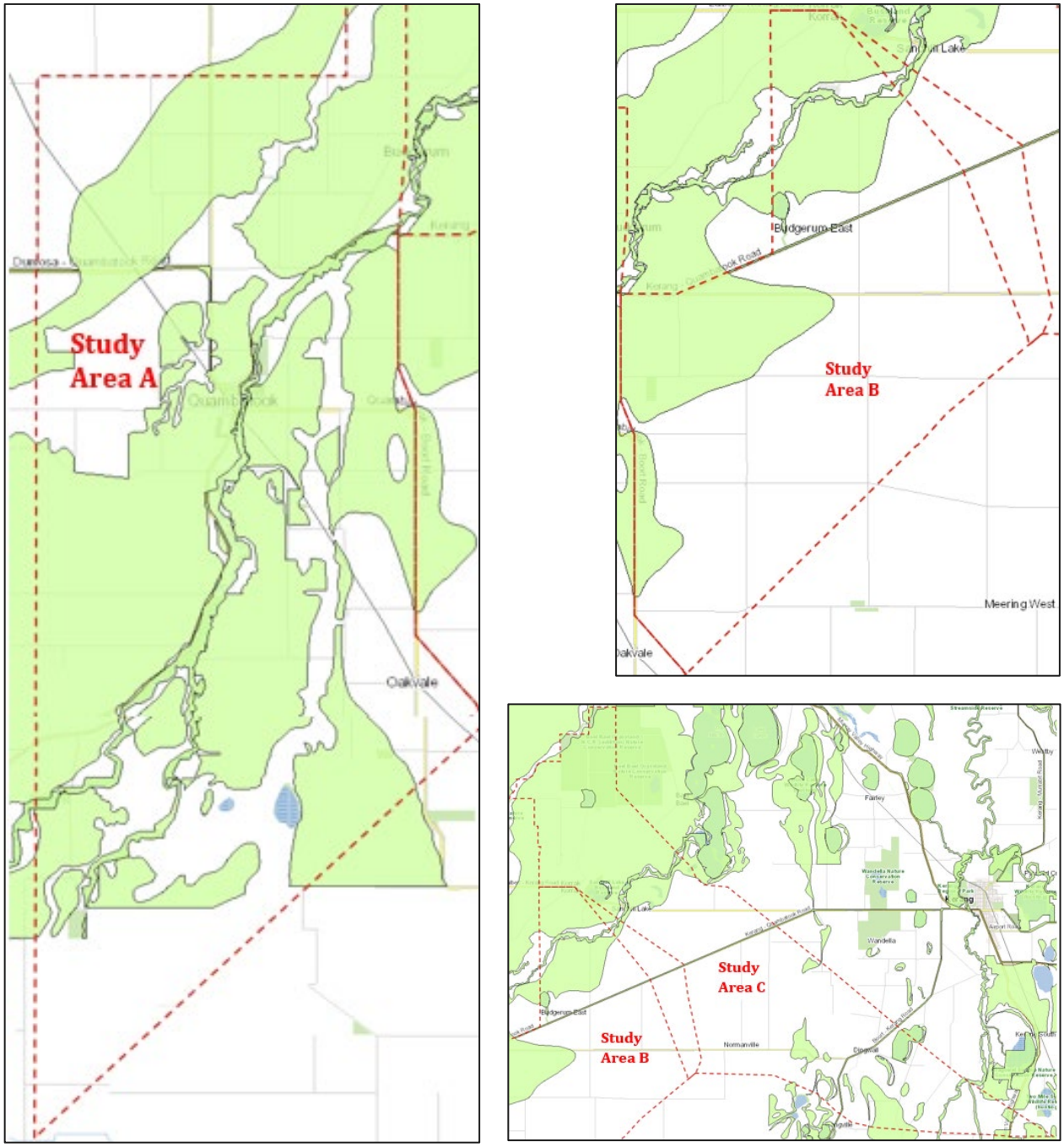


FIGURE 3-3 LOCATION OF ESO WITHIN EACH STUDY AREA

3.2.5.3 BUSHFIRE MANAGEMENT OVERLAY

While all the area in an around each of the corridor options is a designated Bushfire Prone Area (BPA), the BMO (shown in Figure 3-4) applies to areas within or in proximity to vegetation that poses an enhanced bushfire risk. Across each Study Area, this overlay is relevant in association with riparian vegetation along the Avoca and Loddon rivers. Construction of transmission lines within, or over, these areas is likely to require removal and ongoing management of native vegetation.

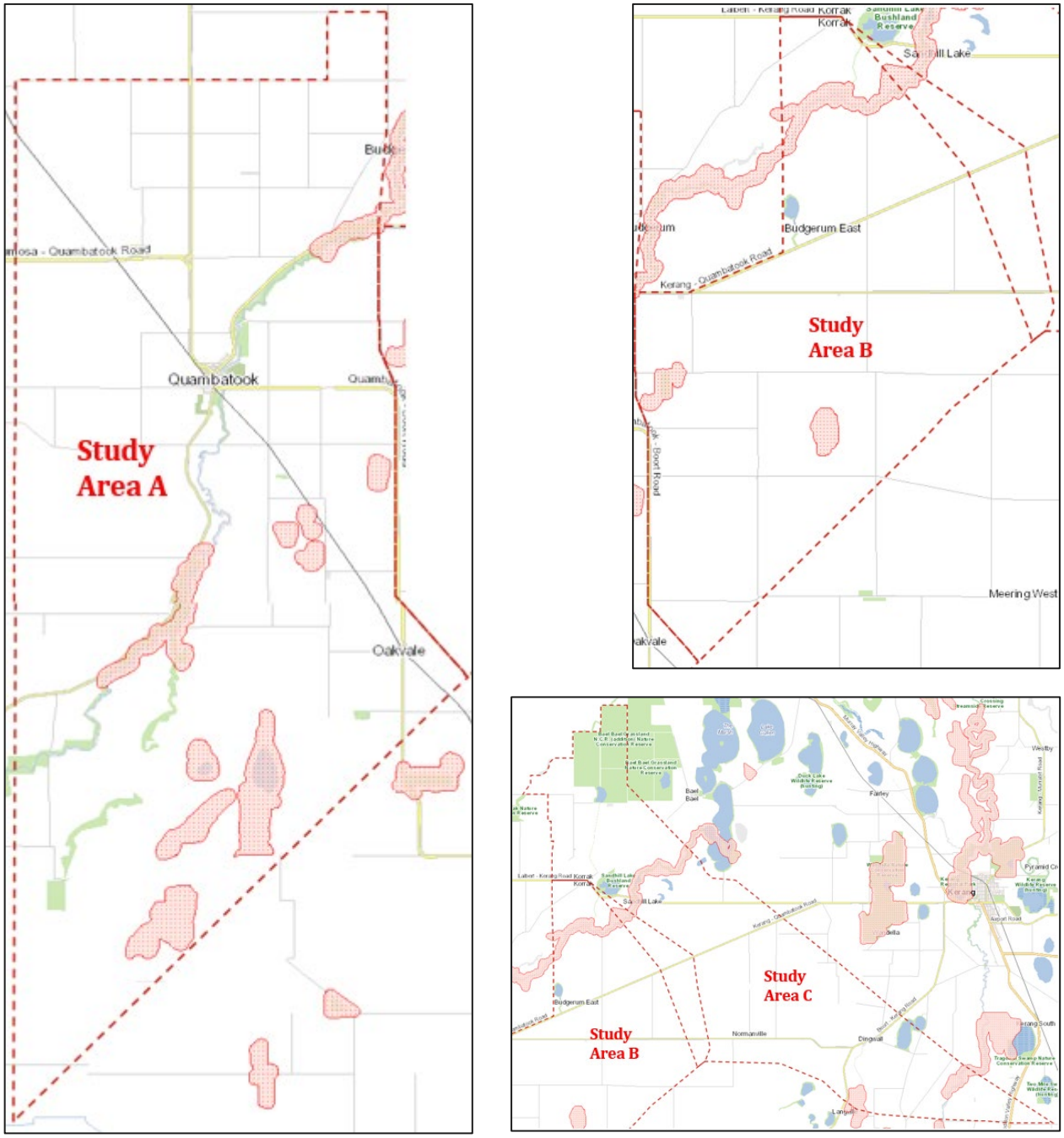


FIGURE 3-4: LOCATION OF BMO WITHIN EACH STUDY AREA

3.3 FLORA

3.3.1 NATIVE VEGETATION

3.3.1.1 ECOLOGICAL VEGETATION CLASSES

Investigation of Ecological Vegetation Classes (EVCs) mapping and modelling determined that where remnant vegetation remains it is likely to represent a range of woodland, grassland, chenopod shrubland and mallee vegetation communities.

NatureKit (DEECA 2024) indicates that various EVCs were once present across each Study Area. The EVCs modelled are outlined in Table 3-3.

TABLE 3-3 MODELLED EVCS WITHIN EACH STUDY AREA

Ecological Vegetation Class	Description	Bioregion	Bioregional Conservation Status	FFG Community	Study Area		
					A	B	C
56 - Flood Plain Riparian Woodland	An open eucalypt woodland or open forest to 20 m tall over a medium to tall shrub layer with a ground layer consisting of amphibious and aquatic herbs and sedges. Occurs along the banks and floodplains of the larger meandering rivers and major creeks, often in conjunction with one or more floodplain wetland communities. Elevation and rainfall are relatively low and soils are fertile alluviums subject to periodic flooding and inundation.	Victorian Riverina	Vulnerable	N/A			✓
66 - Low Rises Woodland	Eucalypt woodland to 15 m tall on elevated plains and low rises with a diverse shrub understorey and grassy field layer. Occurs in a range of environmental settings that have resulted in well-drained surface soils mantling clay sub-soils.	Murray Mallee	Endangered	Grey Box - Buloke Grassy Woodland	✓		✓
96 - Ridged Plains Mallee	Open, quite grassy mallee woodland to 10 m tall, typical of the gently undulating "plains" of the Wimmera and Southern Mallee. Soils are somewhat variable but are typically duplex with grey or brown sandy clay loam or clay loam topsoil of aeolian origin.	Murray Mallee	Endangered	N/A	✓	✓	✓
		Victorian Riverina	Endangered	N/A	✓	✓	
97 - Semi-arid Woodland	Non-eucalypt woodland or open forest to 12 m tall, of low rainfall areas. Occurs in a range of somewhat elevated positions not subject to flooding or inundation. The surface soils are typically light textured loamy sands or sandy loams.	Murray Mallee	Vulnerable	Semi-arid Shrubby Pine-Buloke Woodland			✓
		Victorian Riverina	Endangered	Semi-arid Shrubby Pine-Buloke Woodland		✓	✓

Ecological Vegetation Class	Description	Bioregion	Bioregional Conservation Status	FFG Community	Study Area		
					A	B	C
98 - Semi-arid Chenopod Woodland	Sparse, low non-eucalypt woodland to 12 m tall of the arid zone with a tall open chenopod shrub-dominated understorey or a treeless, tall chenopod shrubland to 3 m tall. This EVC may occur as either a woodland (typically with a very open structure but tree cover >10%) or a shrubland (tree cover <10%) with trees as an occasional emergent.	Victorian Riverina	Endangered	N/A			✓
103 - Riverine Chenopod Woodland	Eucalypt woodland to 15 m tall with a diverse shrubby and grassy understorey occurring on most elevated riverine terraces. Confined to heavy clay soils on higher level terraces within or on the margins of riverine floodplains (or former floodplains), naturally subject to only extremely infrequent incidental shallow flooding from major events if at all flooded.	Murray Mallee	Depleted	N/A	✓		✓
		Victorian Riverina	Vulnerable	N/A	✓	✓	✓
104 - Lignum Swamp	Typically, treeless shrubland to 4 m tall with robust (but sometimes patchy) growth of lignum. Widespread wetland vegetation type in low rainfall areas on heavy soils, subject to infrequent inundation resulting from overbank flows from rivers or local runoff.	Victorian Riverina	Vulnerable	N/A			✓
132 - Plains Grassland	Treeless vegetation dominated by largely grass and herb life forms. Shrubs and trees may be also occasionally present.	Murray Mallee	Endangered	Northern Plains Grassland	✓		

Ecological Vegetation Class	Description	Bioregion	Bioregional Conservation Status	FFG Community	Study Area		
					A	B	C
803 - Plains Woodland	Grassy or sedgy woodland to 15 m tall (typically dominated by *Eucalyptus largiflorens* in the north-western part of its range) with large inter-tussock spaces potentially supporting a range of annual or geophytic herbs adapted to low summer rainfall, with low overall biomass. Mostly occurs on terrain of low relief in areas receiving <600 mm rainfall per annum. Fertile, sometimes seasonally waterlogged, mostly silty, loamy or clay topsoils, with heavy subsoils, derived largely from recent (i.e. Quaternary) fluvial or alluvial deposits.	Murray Mallee	Least of Concern	N/A	✓		✓
812 - Grassy Riverine Forest/ Riverine Swamp Forest Complex	This complex is composed of EVC 106 (Grassy Riverine Forest) and EVC 814 (Riverine Swamp Forest). EVC 106 – Grassy Riverine Forest: Occurs on the floodplain of major rivers, in a slightly elevated position where floods are infrequent, on deposited silts and sands, forming fertile alluvial soils. River Red Gum forest to 25 m tall with a ground layer dominated by graminoids. Occasional tall shrubs present. EVC 814 – Riverine Swamp Forest: Open eucalypt forest to 25 m tall with understorey dominated by obligate wetland species (or opportunistic annuals during sustained dry periods) and can range from closed sedgeland or herbland to grassy-herbaceous or extremely sparse and with cover primarily leaf-litter, black water or exposed alluvium. Occupies low-lying areas subject to reasonably regular flooding, typically flood-prone lower river terraces and low-lying areas adjacent to floodways through or within riverine forest.	Victorian Riverina	Depleted	N/A			✓
		Murray Mallee	Vulnerable	N/A	✓	✓	✓

Ecological Vegetation Class	Description	Bioregion	Bioregional Conservation Status	FFG Community	Study Area		
					A	B	C
823 - Lignum Swampy Woodland	Understorey dominated by Lignum, typically of robust character and relatively dense (at least in patches), in association with a Eucalypt and/or Acacia woodland to 15 m tall. The ground layer includes a component of obligate wetland flora that is able to persist even if dormant over dry periods.	Victorian Riverina	Vulnerable	N/A	✓	✓	✓
824 - Woorinen Mallee	Widespread mallee woodland to 12 m tall, associated with the east-west orientated calcareous dunefields of the Woorinen Formation with a low, open chenopod dominated shrub understorey. A diverse array of sub-shrubs, herbs and grasses are also present. Typically occurs on fine textured red-brown sandy loam and clay loam soils.	Murray Mallee	Vulnerable	N/A	✓	✓	✓
		Victorian Riverina	Vulnerable	N/A	✓	✓	✓
826 - Plains Savannah	A structurally diverse vegetation unit which includes 'grassy openings' of a few to many hundreds of hectares, with a variable tree density ranging from a very sparse savanna to woodland. The relative absence of eucalypts is particularly characteristic, with *Allocasuarina luehmannii* and perhaps *Callitris gracilis* ssp. *murrayensis* to 10 m tall being the dominant trees. Widespread on the northern plains.	Murray Mallee	Endangered	N/A	✓	✓	✓
		Victorian Riverina	Endangered	N/A	✓	✓	✓
829 - Chenopod Grassland	Open to sparse shrubland with a more or less continuous tussock grass sward found on heavy somewhat sodic clay plains fringing the active floodplains of major watercourses such as the Loddon and Avoca Rivers.	Murray Mallee	Endangered	N/A			✓
		Victorian Riverina	Endangered	N/A	✓		✓

Ecological Vegetation Class	Description	Bioregion	Bioregional Conservation Status	FFG Community	Study Area		
					A	B	C
946 - Riverine Swampy Woodland/ Lignum Swamp Mosaic	This complex is composed of EVC 104 (Lignum Swamp) and EVC 814 (Riverine Swamp Forest). Refer to previous EVC descriptions.	Victorian Riverina	Vulnerable	N/A			✓

3.3.1.2 PATCHES

Across each Study Area, remnant native vegetation in the form of patches, as defined under the Guidelines, has been previously mapped by DELWP at a scale of 1:25,000. This vegetation and associated EVCs are shown in Figure 3-5 and detailed below.

Study Area A was found to support 85 patches totalling 1,020.728 ha. This included 58 patches corresponding to an Endangered EVC (accounting for 650.034 ha)

There were 55 patches totalling 762.088 ha within Study Area B, with 34 of these (363.336 ha) corresponding to an Endangered EVC.

Study Area C contained 86 patches, which accounted for the largest area at 1,670.355 ha. This includes 41 patches (1,033.177 ha) representing an Endangered EVC.

TABLE 3-4 EXTENT OF NATIVE VEGETATION WITHIN EACH STUDY AREA

	Study Area A		Study Area B		Study Area C	
	No. of patches	**Area (ha)**	**No. of patches**	**Area (ha)**	**No. of patches**	**Area (ha)**
Endangered*	58	650.034	34	363.336	41	1,033.177
Total	**85**	**1,020.728**	**55**	**762.088**	**86**	**1,670.355**

*Representative of an EVC that has a Biodiversity Conservation Status (BCS) of Endangered.

The above information is preliminary, as on-ground survey of each Study Area will be required to determine the extent, condition, associated EVC and potential impacts to any identified native vegetation patches and/or scattered trees. It is likely that such modelling is an over-estimate of the actual presence, due to assumptions and ongoing degradation. However, there is also the possibility large areas of native vegetation have been misclassified as exotic, and smaller patches missed. It should also be noted that the amount of native vegetation cannot be directly correlated with calculation of impacts and opportunities to avoid and minimise such; this will be solely dependent on the preferred transmission corridor and micro-siting of infrastructure.

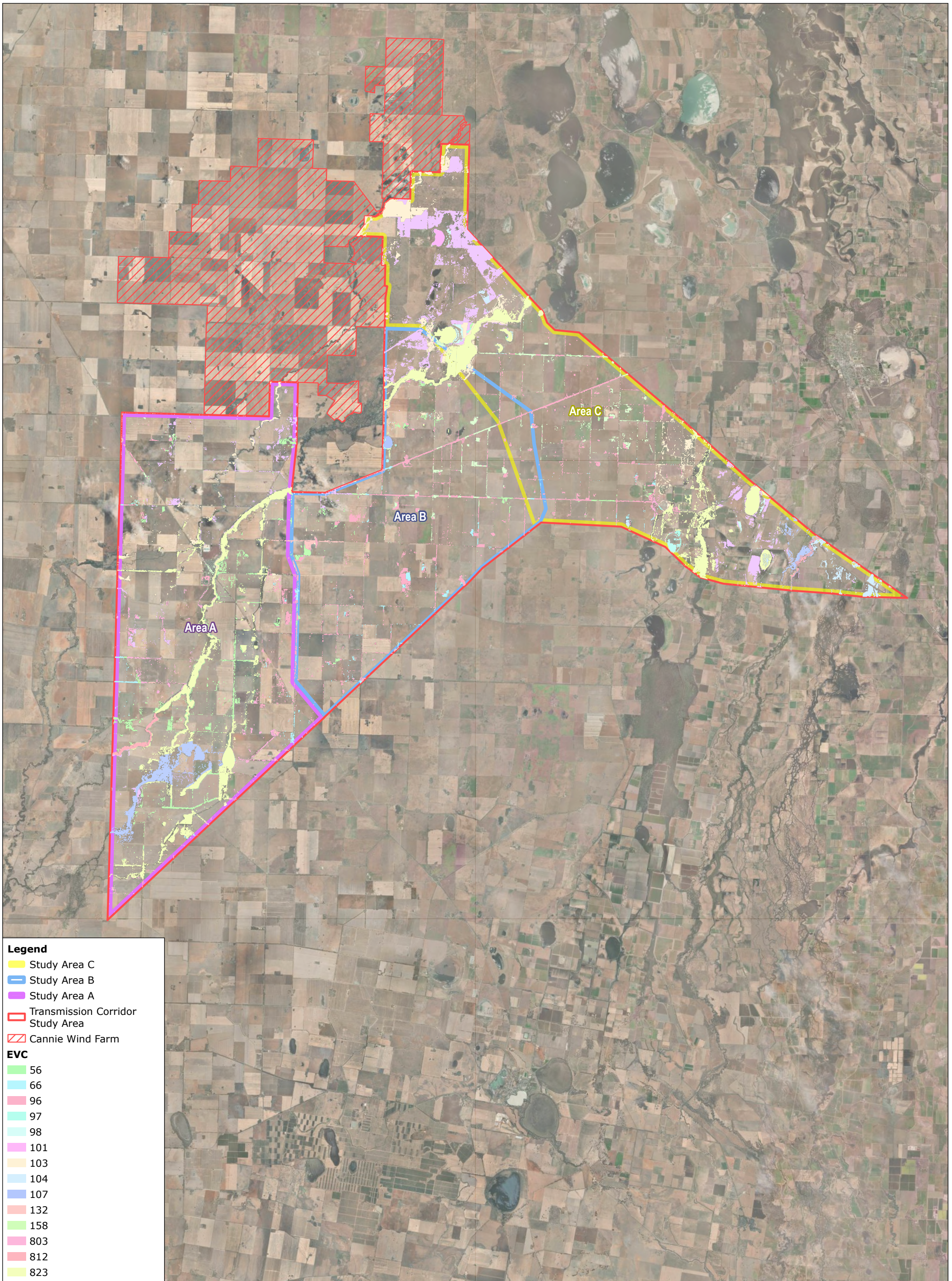
3.3.2 THREATENED SPECIES

The LoO assessment for listed flora is provided in Appendix D and the results summarised in Table 3-5 below.

There is little difference in the amount and species of EPBC Act-listed flora with potential to occur across each Study Area. A significantly higher number of flora species listed as threatened under the FFG Act have the potential to occur within Study Area C. This is primarily due to the greater diversity of habitats occurring within. Analysis of potential presence will ultimately require assessment of habitat quality for each species, and the implications for each corridor may relate to the number of targeted surveys, their respective survey timing, and the extent of area requiring surveying.

TABLE 3-5: LISTED FLORA SPECIES WITH POTENTIAL TO OCCUR IN EACH STUDY AREA

Listing	Number of species		
	Study Area A	**Study Area B**	**Study Area C**
EPBC Act	11	14	14
FFG Act	53	57	75
Both Acts	8	9	9
Total	**56**	**62**	**80**



F3-5 EVCs within the Transmission Corridor Study Area

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ERM

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3.4 FAUNA

3.4.1 FAUNA HABITAT

3.4.1.1 WOODED VEGETATION

Wooded vegetation across each Study Area is largely restricted to roadside vegetation and riparian zones associated with Avoca and Loddon Rivers and corresponding tributaries. Some larger patches of retained remnant vegetation are likely present across the site but are largely isolated and heavily fragmented.

The riparian vegetation associated with Avoca and Loddon Rivers is likely dominated by open River Red-gum (*Eucalyptus camaldulensis*) woodland and wetland. The understorey in these areas, as well as of connected waterways, is generally dominated by small shrubs, which can provide important shelter, foraging, and breeding habitat for many fauna species. A high abundance of hollows may be present in remnant trees, providing breeding habitat for avifauna and arboreal mammals, particularly owls.

Scattered paddock trees throughout each Study Area are common throughout, primarily interspersed in agricultural land, and these may provide significant fauna habitat. Buloke (*Allocasuarina leuhmanii*), in particular, may provide unique habitat and food reserves for numerous birds, and is a frequent presence in the greater area amidst otherwise exotic vegetation. Black Box (*Eucalyptus largiflorens*) and White Cypress Pine (*Callitris glaucophylla*) may also be common.

Scattered paddock trees may provide habitat for some of the larger avifauna, particularly those with large ranges such as Wedge-tailed Eagles (*Aquila audax*), Black Falcon (*Falco subniger*), Grey Flacon (*Falco hypoleucos*), Little Eagle (*Hieraaetus morphnoides*) and Barking Owl (*Ninox connivens*).

Mallee vegetation, primarily occurring in often wide road reserves, is likely to represent high quality habitat for a high diversity of bird species.

Corridors of riparian and roadside wooded vegetation are of high habitat value and provide connectivity in an otherwise largely cleared and fragmented environment with few sizeable areas of woodland remaining.

3.4.1.2 GRASSLAND

Owing to the extent of broad-acre cropping across each Study Area, limited intact grassland are present in each Study Area, with most likely comprising a mix of native and exotic grasses. These grasslands are likely to provide habitat for common fauna able to adapt to such modified landscapes. Notably, grassland in the north of Study Area C, adjacent to Bael Bael Grassland Nature Conservation Reserve may be of higher quality, with potential to support threatened terrestrial species.

3.4.1.3 AGRICULTURAL LAND

The broad acre-cropping including Canola *(Brassica rapus*), Wheat (*Triticum aestivum*), and Barley (*Hordeum vulgare*), provides foraging habitat for avifauna, particularly small to medium raptors. Exotic grass species dominate the regrowth in and around these cropped areas.

Cropping land generally provides a low quality of habitat for a range of small mammals, reptiles and grassland birds. Cropping is likely to provide habitat for other fauna, as observed during the site assessment, including snakes, lizards, and small mammals (including both native and invasive rodents). Cropped areas may occasionally support the threatened ground-dwelling bird, Plains Wanderer (*Pedionomus torquatus*).

3.4.1.4 AQUATIC HABITAT

Within each Study Area contains numerous natural and artificial waterbodies and wetlands that may have importance for fauna within the landscape. Both Avoca and Loddon Rivers are known for their biodiversity value with respect to aquatic fauna and waterbirds.

Artificial dams are present throughout each Study Area and are typically surrounded by broad acre cropping with little to no wetland vegetation.

Submerged vegetation in more permanently flooded dams and natural wetlands may support emergent or fringing vegetation important to frogs and other fauna. Ephemeral wetlands may also provide seasonally important fauna habitat, and irrigation channels are likely frequently used by water birds.

3.4.1.5 LANDSCAPE CONTEXT AND CONNECTIVITY

The surrounding broader landscape is generally consistent with the landscape within each Study Area. Private properties surrounding each Study Area are utilised for large scale, broadacre cropping and are highly modified. Native vegetation is primarily confined to road reserves and in small patches within private properties. Scattered trees, areas with scattered trees and patches of remnant vegetation do occur throughout the wider landscape.

Grassland habitat, along with riparian and woody vegetation habitat is connected to each Study Area, primarily through Avoca River and Loddon River and the small, vegetated tributaries that branch off. Notable areas which may contain suitable habitat for threatened species or high-quality native vegetation include:

- Quambatook I204 Bushland Reserve;
- Sandhill Lake Bushland Reserve;
- Lake Gilmour;
- Kerang Wetlands; and
- Bael Bael Grassland Nature Conservation Reserve.

Connectivity to these areas from habitats within each Study Area is somewhat limited due to the fragmented nature and land use of the broader landscape (broadacre cropping); however, fauna mobility and movement through linear corridors between these areas and each Study Area can occur through the Avoca River and Loddon River. Fauna habitat connectivity is also dependent on the requirements of specific fauna for distribution. Avifauna connectivity between areas of suitable habitat is an appropriate example of a group of fauna which has limited constraints in their dispersal across each Study Area and the broader landscape. As such, avifauna that use habitats outside each Study Area but within the broader landscape, particularly in higher quality areas, may have little constraint accessing the same type of habitat within each Study Area that is not connected to the broader landscape.

Although Bael Bael Grassland Nature Conservation Reserve lies outside Study Area C, it may be contiguous with remnant grassland in the north, suggesting this latter area may also be of significant value to fauna species dependent on such habitat.

3.4.2 THREATENED SPECIES

The LoO assessment for listed fauna species is provided in Appendix E and summarized in Table 3-6 below.

While Study Area C has the greatest potential to support listed fauna, these numbers are directly related to proximity to the Kerang Ramsar Wetlands, and do not necessarily imply greater constraint or greater impacts.

TABLE 3-6: LISTED FAUNA SPECIES WITH POTENTIAL TO OCCUR EACH STUDY AREA

Listing	Number of species		
	Study Area A	**Study Area B**	**Study Area C**
EPBC Act	6	29	37
FFG Act	26	58	70
Both Acts	7	27	33
Migratory	21	23	24
Total	**38**	**72**	**90**

3.5 ECOLOGICAL COMMUNITIES

3.5.1 EPBC ACT

The EPBC Act PMST identified the potential presence of seven Threatened Ecological Communities (TECs) across each Study Area, as shown in Table 3-7. Each of these TECs was modelled to occur in each of the transmission corridors.

Further verification will be required via ecological field surveys to confirm whether any patches of native vegetation, or parts thereof, in each the Study Area meet the relevant diagnostic criteria and condition thresholds for any of these TECs.

TABLE 3-7 PMST RESULTS FOR THREATENED ECOLOGICAL COMMUNITIES

Community name	**Listing status**
Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions	Endangered
*Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia*	Endangered
Mallee Bird Community of the Murray Darling Depression Bioregion	Endangered
Natural Grasslands of the Murray Valley Plains	Critically Endangered
Plains mallee box woodlands of the Murray Darling Depression, Riverina and Naracoorte Coastal Plain Bioregions	Critically Endangered

Community name	Listing status
Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains	Critically Endangered
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered

3.5.2 FFG ACT

Each Study Area has the potential to support communities listed under the FFG Act, as outlined in Table 3-3. The vegetation communities are:

- Grey Box - Buloke Grassy Woodland
- Semi-arid Shrubby Pine-Buloke Woodland
- Northern Plains Grassland

There are no condition thresholds for these communities, and presence directly corresponds to that of associated EVCs. Additionally, any mallee vegetation, primarily in road reserves, may support the Victorian Mallee Bird Community.

4. IMPACTS

4.1 NATIVE VEGETATION

To provide a baseline assessment, impacts to native vegetation for each Study Area has been calculated with the *assumption of full removal* within the 70 m easement, and are summarized in Table 4-1 below.

All three Study Areas fall under the Detailed Assessment Pathway due to removal of > 0.5 ha of native vegetation. Additionally, each transmission corridor impacts vegetation on land modelled as Location Category 3 which represents areas where removal of > 0.5 ha may have significant impacts on habitat for rare or threatened species.

TABLE 4-1: IMPACTS TO NATIVE VEGETATION FOR EACH STUDY AREA

Description	Study Area A	Study Area B	Study Area C
Native vegetation to be removed (ha)	39.567	13.799	47.823
Location category	3	3	3
Assessment pathway*	Detailed	Detailed	Detailed

*As per the Guidelines (DELWP 2017).

4.2 FAUNA HABITAT

Impacts to fauna habitat from the proposed transmission corridors are likely to be primarily confined to immediate losses due to installation of cable towers, however, such impacts may be easily minimised regardless of the corridor selected. Standard mitigation measures will likely protect wetlands, except where transmission lines cross wooded riparian vegetation that would require fuel reduction. Impacts here and to roadside woodland can be reduced by micro-

siting and are unlikely to be of significant disruption to habitat corridors or create significant habitat loss.

5. REGULATORY IMPLICATIONS

5.1 PLANNING PROVISIONS

5.1.1 ZONES

Under both the FZ and PCRZ, the use of the land for a Wind Energy Facility is a permissible use (Section 2) subject to a Planning Permit. The installation of transmission lines associated with delivery of the energy produced by the facility is included.

5.1.2 OVERLAYS

VPO

Where this overlay runs perpendicular to the transmission corridor, avoidance of impacts to native vegetation within may not be feasible. Elsewhere, there is significant scope to align the transmission corridor away from these areas. The scenario is similar for each option.

Exemptions exist for management of vegetation beneath power lines, and therefore the installation of such would trigger permit requirements regardless of immediate, direct impacts, to account for any future application of this exemption.

ESO

The coverage of the ESO in each of the corridors is such that consideration of transmission corridor determination will need to be informed by site assessment to ascertain the location, condition and extent of native vegetation within. Each corridor option is similarly affected. Fine-scale siting of transmission line supporting infrastructure is likely to play an important role in the applicability of this overlay to project objectives.

The same bushfire management exemption as under the VPO applies to this schedule, and deemed future losses to native vegetation will need to be considered as part of any permit application.

BMO

For the transmission corridor within Study Area A, there is ample opportunity to avoid the BMO completely, while for Study Area B and Study Area C avoidance is possible except for where the Avoca River is crossed. This is likely to mean native vegetation will be impacted regardless of the preferred corridor, due to the requirement for hazard management beneath power lines. Additional bushfire mitigation measures may also be required.

5.1.3 CLAUSE 52.17 NATIVE VEGETATION

The permit requirement under Clause 52.17 is the same regardless of the preferred corridor. Based on the modelled native vegetation extent used for the purpose of this assessment, there is significant scope for manipulation of the final corridor and placement of supporting infrastructure to demonstrate adherence to the guiding principles of avoiding and minimizing impacts to native vegetation in the design process.

Ground-truthing of the native vegetation extent is likely to provide even greater opportunities to avoid and minimize impacts. The primary concern for each transmission corridor is likely to be removal of roadside and riparian vegetation, and micro-siting of infrastructure can be additionally informed by Vegetation Quality Assessment to determine areas of low and high biodiversity value.

5.1.3.1 EXEMPTIONS

Exemptions to Clause 52.17 that may be applicable to patches of native vegetation within the proposed transmission corridors, include:

- Planted vegetation
- Regrowth
- Utility installation, and
- Fire Protection.

The latter two exemptions will not be applicable as an exemption for the current permit application, however, they must be considered in terms of any future modification or management of native vegetation as a consequence of the presence of electrical cables post-construction. Therefore, any future losses must be pre-emptively included in initial impact assessment of the transmission line.

5.1.3.2 OFFSETS

The offset requirements across each Study Area, as determined in the associated NVR Reports, are presented in Table 5-1. These values are reflective of the vegetation losses detailed in Section 4.1, and provide insight into potential triggers for Species Habitat Units (SHUs). While avoidance of impacts to native vegetation will greatly reduce these offset amounts, such initial calculations can inform how this can best be achieved, particularly with respect to intersection of corridors with Habitat Importance Maps (HIMs) for individual species.

Avoidance of high value areas shown in the HIMs is likely to be able to be achieved to such an extent that only offset requirements in the form of General Habitat Units (GHUs) are generated. The corresponding Strategic Biodiversity Value (SBV) for such GHUs also has the potential to be reduced by considering transmission alignment with respect to the modelled SBV. A reduction in the SBV will not alter the quantity of offsets required but can mean that more potential or registered offset sites meet the required minimum standard and may therefore be cheaper and/or more easily secured.

Note that final offsets will also include large trees, should any be unavoidably impacted in the final corridor design.

TABLE 5-1: OFFSET REQUIREMENTS FOR ASSUMED TOTAL REMOVAL OF NATIVE VEGETATION FOR EACH STUDY AREA

Offset type	Offset requirements
Study Area A	
GHUs	0
Minimum SBV	Not applicable

SHUs	• 37.783 species units of habitat for Grassland Bindweed, *Convolvulus graminetinus* • 28.032 species units of habitat for Plains-wanderer, *Pedionomus torquatus* • 35.104 species units of habitat for Hooded Scaly-foot, *Pygopus schraderi* • 38.088 species units of habitat for Yarran, *Acacia melvillei* • 37.856 species units of habitat for Chariot Wheels, *Maireana cheelii* • 30.692 species units of habitat for Bush Minuria, *Minuria cunninghamii* • 30.687 species units of habitat for Woolly Minuria, *Minuria denticulata* • 38.083 species units of habitat for Slender Darling-pea, *Swainsona murrayana* • 38.088 species units of habitat for Red Swainson-pea, *Swainsona plagiotropis* • 38.088 species units of habitat for Downy Swainson-pea, *Swainsona swainsonioides* • 38.088 species units of habitat for Winged New Holland Daisy, *Vittadinia pterochaeta* • 37.790 species units of habitat for Yellow-tongue Daisy, *Brachyscome chrysoglossa* • 33.668 species units of habitat for Pepper Grass, *Panicum laevinode* • 30.353 species units of habitat for Fuzzy New Holland Daisy, *Vittadinia cuneata* var. *hirsuta* • 33.447 species units of habitat for Common White Sunray, *Rhodanthe floribunda* • 38.088 species units of habitat for Scaly Mantle, *Eriochlamys squamata*
Study Area B	
GHUs	1.104
Minimum SBV	0.386
SHUs	• 9.902 species units of habitat for Hooded Scaly-foot, *Pygopus schraderi* • 8.002 species units of habitat for Plains-wanderer, *Pedionomus torquatus* • 6.148 species units of habitat for Downs Nutgrass, *Cyperus bifax* • 10.423 species units of habitat for Common White Sunray, *Rhodanthe floribunda* • 11.109 species units of habitat for Grassland Bindweed, *Convolvulus graminetinus*
Study Area C	
GHUs	0
Minimum SBV	Not applicable
SHUs	• 41.760 species units of habitat for Hooded Scaly-foot, *Pygopus schraderi* • 31.096 species units of habitat for Plains-wanderer, *Pedionomus torquatus* • 16.944 species units of habitat for Ground Cuckoo-shrike, *Coracina maxima* • 53.062 species units of habitat for Yarran, *Acacia melvillei* • 50.465 species units of habitat for Twin-leaf Bedstraw, *Asperula gemella* • 52.011 species units of habitat for Mealy Saltbush, *Atriplex pseudocampanulata* • 47.119 species units of habitat for Silver Saltbush, *Atriplex rhagodioides* • 16.286 species units of habitat for Downs Nutgrass, *Cyperus bifax* • 52.880 species units of habitat for Cane Grass, *Eragrostis australasica* • 53.931 species units of habitat for Purple Love-grass, *Eragrostis lacunaria* • 50.597 species units of habitat for Spreading Emu-bush, *Eremophila divaricata subsp. divaricata* • 49.291 species units of habitat for Spotted Emu-bush, *Eremophila maculata subsp. maculata* • 53.905 species units of habitat for Long Eryngium, *Eryngium paludosum* • 53.273 species units of habitat for Blue Mallee, *Eucalyptus polybractea* • 43.400 species units of habitat for Dwarf Yellow-heads, *Trichanthodium baracchianum* • 34.595 species units of habitat for Button Rush, *Lipocarpha microcephala* 49.869 species units of habitat for Chariot Wheels, *Maireana cheelii* 43.745 species units of habitat for Bush Minuria, *Minuria cunninghamii* • 34.482 species units of habitat for Woolly Minuria, *Minuria denticulata*

- 50.466 species units of habitat for Tough Scurf-pea, *Cullen tenax*
- 50.388 species units of habitat for Swamp Buttercup, *Ranunculus undosus*
- 49.187 species units of habitat for Yakka Grass, *Sporobolus caroli*
- 48.958 species units of habitat for Western Rat-tail Grass, *Sporobolus creber*
- 53.838 species units of habitat for Slender Darling-pea, *Swainsona murrayana*
- 53.531 species units of habitat for Red Swainson-pea, *Swainsona plagiotropis*
- 53.905 species units of habitat for Downy Swainson-pea, *Swainsona swainsonioides*
- 53.905 species units of habitat for Winged New Holland Daisy, *Vittadinia pterochaeta*
- 52.865 species units of habitat for Yellow-tongue Daisy, *Brachyscome chrysoglossa*
- 53.905 species units of habitat for Riverine Flax-lily, *Dianella porracea*
- 49.277 species units of habitat for Fuzzy New Holland Daisy, *Vittadinia cuneata var. hirsuta*
- 43.168 species units of habitat for Common White Sunray, *Rhodanthe floribunda*
- 53.731 species units of habitat for Scaly Mantle, *Eriochlamys squamata*
- 34.382 species units of habitat for Woolly Mantle, *Eriochlamys behrii s.s.*
- 33.940 species units of habitat for Small Podolepis, *Podolepis muelleri*
- 49.447 species units of habitat for Grassland Bindweed, *Convolvulus graminetinus*

5.1.4 OFFSET AVAILABILITY

Under Clause 52.17 of the Victorian Planning Scheme, the granting of a permit to remove native vegetation requires evidence that appropriate offsets, as determined under the Guidelines, can be secured. These offsets can be either purchased from a third-party through the Native Vegetation Credit Register (NVCR), or by the establishment of an approved, first-party offset site.

The large suite of species for which SHUs are triggered for each corridor, combined with the high individual value of for each species, means that sufficient offsets are unlikely to be available for purchase from a third-party. For example, a brief review of the NVCR revealed that there are currently no SHUs available for Downs Nutgrass: a species with modelled important habitat impacted by the transmission corridors within Study Area B and Study Area C.

5.2 ENVIRONMENT PROTECTION AND BIODIVERSITY ACT 1999

While Study Area B and Study Area C have a greater number of species listed under the EPBC Act that will require consideration, all three Study Areas have the potential to impact MNES particularly with respect to TECs occurring in riparian corridors and road reserves. Minimisation of impacts to these areas will likely be a similar requirement for each transmission corridor. Although greater proximity to the Ramsar wetlands means that more species have the potential to occur, particularly threatened and migratory birds, this does not necessarily correlate with greater potential for impacts. Further comparison of implications under the EPBC Act is limited without site assessment to determine the actual values present or potentially so. Additionally, implications will also be dependent on any impacts from the wind farm, as the significance of impacts is cumulative.

5.3 FLORA AND FAUNA GUARANTEE ACT 1988

For each Study Areas there is a high likelihood that flora species listed as threatened under the FFG Act will be present in native vegetation patches, or as scattered trees or isolated plants.

Flora protected under the FFG Act are also highly likely to be present on public land potentially impacted by the proposal. This will be particularly of relevance to roadside and riparian vegetation. A Protected Flora Permit must be obtained prior to the removal of any protected flora. This requirement also applies to impacts to any listed ecological communities.

The implications for each of these scenarios is likely to be similar for all three transmission corridors under consideration, and directly related to the amount of native vegetation impacted.

Potential impacts to fauna listed under the FFG Act will also be similar regardless of the preferred corridor, although proximity to aquatic habitats will be a factor and may generate the need for additional mitigation measures.

5.4 CATCHMENT AND LAND PROTECTION ACT 1984

All three Study Areas will have similar implications under the *Catchment and Land Protection Act 198* (CaLP Act), and this will primarily relate to management of any CaLP-listed weeds, particularly in proximity to waterways where disturbance events have greater potential for weed dispersal. Appropriate weed management can be easily undertaken with standard mitigation measures.

6. CONCLUSION

As this assessment is desktop only, the findings presented herein should be used as a general guide only. However, there is sufficient findings to inform the decision making and design process, with the overarching conclusion that the differences across the transmission corridor study areas with respect to biodiversity constraints will mainly be dependent on finer details of the development plan rather than broader considerations. Impacts to native vegetation will be the main determinant of relative corridor selection consequences.

6.1 IMPACTS TO NATIVE VEGETATION

The calculation of impacts to native vegetation presented here assume full removal within a 70 m width transmission easement. Real impacts will be reduced to:

- Direct losses from support structures for transmission lines;
- A 10 m construction buffer around each support;
- Incidental losses due to potential initial access and ongoing maintenance requirements; and
- Losses beneath electric cables where removal and/or management of vegetation is required for hazard reduction during bushfire season.

This latter requirement will primarily affect intact linear bands of wooded vegetation along riparian corridors and on roadsides. Although a maximum height of 3 m for wooded vegetation beneath power lines is recommended, the narrow extent of parches, lack of connectivity, and likely mallee form of the dominating canopy species means that bushfire behaviour in such vegetation would be less intense and with a lower flame height than typical of intact, larger stands of such woodland.

Depending on the maximum distance between support towers, there is likely to be opportunity to avoid direct impacts to native vegetation along almost the entirety of Study Area A and

Study Area B, with the main patches of considerable extent across the breadth of the corridor being those associated with Avoca River. In addition to this, Study Area C must also cross similar vegetation along Loddon River, but more notably is the land between Lake Charm-Quambatook Road and Bael Bael Grassland Nature Conservation Reserve to the north (outside but adjacent to Area C).

6.2 IMPACTS TO FAUNA

Provided standard mitigation measures are applied to construction activities, and adequate setback from sensitive fauna habitats such as wetlands are incorporated into the final design, there is little difference across the three options in terms of impacts to fauna. Some habitat loss may be unavoidable, especially to wooded vegetation in road reserves and across riparian zones, however, these are unlikely to be significant or create any decisive constraints. Impacts from Study Area C on fauna, due to requiring additional road and riparian traversal, may result in slightly greater impacts, but these are likely to be easily mitigated to an acceptable level.

6.2.1 RECOMMENDATIONS

- A preliminary site assessment of areas of potentially high biodiversity along potential corridor(s) to determine actual extent of native vegetation within, and parameters for avoidance. Such an initial assessment would be particularly beneficial for aiding corridor selection out of the wind farm and points of connectivity with the main grid, as well as areas for which any corridor is likely to have to traverse, such as when crossing Avoca River.
- Micro-siting of support towers to minimize impacts to vegetation, particularly in areas with high HIM values for individual species, reducing or eliminating the need for offsets in the form of SHUs.
- Consultation with the Country Fire Authority (CFA) regarding expectations of vegetation modification and management beneath transmission lines in the area.

APPENDIX A PROTECTED MATTERS SEARCH TOOL REPORT – STUDY AREA A

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: 11-Jan-2024

Summary
Details
- Matters of NES
- Other Matters Protected by the EPBC Act
- Extra Information

Caveat
Acknowledgements

Summary

Matters of National Environment Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	5
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	7
Listed Threatened Species:	43
Listed Migratory Species:	16

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	27
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

State and Territory Reserves:	19
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	10
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar Wetlands)		[Resource Information]
Ramsar Site Name	Proximity	Buffer Status
Banrock station wetland complex	300 - 400km upstream from Ramsar site	In buffer area only
Hattah-kulkyne lakes	100 - 150km upstream from Ramsar site	In buffer area only
Kerang wetlands	Within 10km of Ramsar site	In feature area
Riverland	200 - 300km upstream from Ramsar site	In buffer area only
The coorong, and lakes alexandrina and albert wetland	300 - 400km upstream from Ramsar site	In buffer area only

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
Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions	Endangered	Community known to occur within area	In feature area
Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	Endangered	Community likely to occur within area	In feature area
Mallee Bird Community of the Murray Darling Depression Bioregion	Endangered	Community likely to occur within area	In feature area
Natural Grasslands of the Murray Valley Plains	Critically Endangered	Community likely to occur within area	In feature area
Plains mallee box woodlands of the Murray Darling Depression, Riverina and Naracoorte Coastal Plain Bioregions	Critically Endangered	Community likely to occur within area	In feature area

Community Name	Threatened Category	Presence Text	Buffer Status
Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains	Critically Endangered	Community likely to occur within area	In buffer area only
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community may 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			
Aphelocephala leucopsis			
Southern Whiteface [529]	Vulnerable	Species or species habitat known to occur within area	In feature area
Botaurus poiciloptilus			
Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area	In feature area
Calidris acuminata			
Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris ferruginea			
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Climacteris picumnus victoriae			
Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat known to occur within area	In feature area
Falco hypoleucos			
Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Gallinago hardwickii			
Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat may occur within area	In feature area
Grantiella picta			
Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat may occur within area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat may occur within area	In feature area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Limosa limosa Black-tailed Godwit [845]	Endangered	Species or species habitat known to occur within area	In buffer area only
Lophochroa leadbeateri leadbeateri Major Mitchell's Cockatoo (eastern), Eastern Major Mitchell's Cockatoo, Pink Cockatoo (eastern) [82926]	Endangered	Species or species habitat likely to occur within area	In feature area
Melanodryas cucullata cucullata South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat known to occur within area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Pedionomus torquatus Plains-wanderer [906]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Polytelis anthopeplus monarchoides Regent Parrot (eastern) [59612]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Polytelis swainsonii Superb Parrot [738]	Vulnerable	Species or species habitat may occur within area	In feature area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Stagonopleura guttata](#) Diamond Firetail [59398]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Tringa nebularia](#) Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area	In feature area
FISH			
[Craterocephalus fluviatilis](#) Murray Hardyhead [56791]	Endangered	Species or species habitat likely to occur within area	In buffer area only
[Galaxias rostratus](#) Flathead Galaxias, Beaked Minnow, Flat-headed Galaxias, Flat-headed Jollytail, Flat-headed Minnow [84745]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
[Maccullochella peelii](#) Murray Cod [66633]	Vulnerable	Species or species habitat may occur within area	In feature area
FROG			
[Crinia sloanei](#) Sloane's Froglet [59151]	Endangered	Species or species habitat may occur within area	In buffer area only
[Litoria raniformis](#) Southern Bell Frog,, Growling Grass Frog, Green and Golden Frog, Warty Swamp Frog, Golden Bell Frog [1828]	Vulnerable	Species or species habitat may occur within area	In feature area
INSECT			
[Synemon plana](#) Golden Sun Moth [25234]	Vulnerable	Species or species habitat may occur within area	In buffer area only
MAMMAL			
[Nyctophilus corbeni](#) Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat likely to occur within area	In feature area
PLANT			
[Amphibromus fluitans](#) River Swamp Wallaby-grass, Floating Swamp Wallaby-grass [19215]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Caladenia tensa Greencomb Spider-orchid, Rigid Spider-orchid [24390]	Endangered	Species or species habitat may occur within area	In feature area
Caladenia versicolor Candy Spider-orchid [24392]	Vulnerable	Species or species habitat may occur within area	In feature area
Eleocharis obicis a spike rush [15320]	Vulnerable	Species or species habitat known to occur within area	In feature area
Lepidium aschersonii Spiny Peppercress [10976]	Vulnerable	Species or species habitat may occur within area	In feature area
Lepidium monoplocoides Winged Pepper-cress [9190]	Endangered	Species or species habitat known to occur within area	In feature area
Maireana cheelii Chariot Wheels [8008]	Vulnerable	Species or species habitat known to occur within area	In feature area
Myriophyllum porcatum Ridged Water-milfoil [19919]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Senecio behrianus Stiff Groundsel, Behr's Groundsel [14030]	Endangered	Species or species habitat may occur within area	In feature area
Swainsona murrayana Slender Darling-pea, Slender Swainson, Murray Swainson-pea [6765]	Vulnerable	Species or species habitat known to occur within area	In feature area
Swainsona plagiotropis Red Darling-pea, Red Swainson-pea [10804]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Swainsona pyrophila Yellow Swainson-pea [56344]	Vulnerable	Species or species habitat may occur within area	In buffer area only
REPTILE			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Aprasia parapulchella			
Pink-tailed Worm-lizard, Pink-tailed Legless Lizard [1665]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Delma impar			
Striped Legless Lizard, Striped Snake-lizard [1649]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Hemiaspis damelii			
Grey Snake [1179]	Endangered	Species or species habitat may occur within area	In buffer area only

Listed Migratory Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			
Hirundapus caudacutus			
White-throated Needletail [682]	Vulnerable	Species or species habitat may occur within area	In feature area
Motacilla flava			
Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area
Myiagra cyanoleuca			
Satin Flycatcher [612]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Calidris acuminata			
Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris ferruginea			
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
[Calidris ruficollis](#) Red-necked Stint [860]		Species or species habitat known to occur within area	In buffer area only
[Charadrius bicinctus](#) Double-banded Plover [895]		Species or species habitat known to occur within area	In buffer area only
[Gallinago hardwickii](#) Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat may occur within area	In feature area
[Limosa limosa](#) Black-tailed Godwit [845]	Endangered	Species or species habitat known to occur within area	In buffer area only
[Numenius minutus](#) Little Curlew, Little Whimbrel [848]		Species or species habitat known to occur within area	In buffer area only
[Philomachus pugnax](#) Ruff (Reeve) [850]		Species or species habitat known to occur within area	In buffer area only
[Tringa nebularia](#) Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area	In feature area
[Tringa stagnatilis](#) Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area	In buffer area only

Other Matters Protected by the EPBC Act

Listed Marine Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat likely to occur within area overfly marine area	In feature area
Charadrius bicinctus Double-banded Plover [895]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Charadrius ruficapillus Red-capped Plover [881]		Species or species habitat known to occur within area overfly marine area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat may occur within area overfly marine area	In feature area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area	In feature area
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat may occur within area overfly marine area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
Limosa limosa Black-tailed Godwit [845]	Endangered	Species or species habitat known to occur within area overfly marine area	In buffer area only
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat likely to occur within area overfly marine area	In feature area
Numenius minutus Little Curlew, Little Whimbrel [848]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Philomachus pugnax Ruff (Reeve) [850]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Recurvirostra novaehollandiae Red-necked Avocet [871]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
Stiltia isabella Australian Pratincole [818]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area overfly marine area	In buffer area only

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	Buffer Status
Bael Bael Grassland N.C.R.	Natural Features Reserve	VIC	In buffer area only
Bael Bael Grassland N.C.R. (addition)	Natural Features Reserve	VIC	In buffer area only
Cannie N.C.R.	Natural Features Reserve	VIC	In buffer area only
Gredgwin B.R	Natural Features Reserve	VIC	In buffer area only
Gredgwin School B.R.	Natural Features Reserve	VIC	In buffer area only
Griffith Lagoon N.C.R.	Natural Features Reserve	VIC	In buffer area only
Korrak Korrak B.R	Natural Features Reserve	VIC	In buffer area only
Korrak Korrak N.C.R.	Natural Features Reserve	VIC	In buffer area only
Lake Gilmour W.R	Natural Features Reserve	VIC	In buffer area only
Lake Lookout B.R.	Natural Features Reserve	VIC	In buffer area only
Marmal F.R	Nature Conservation Reserve	VIC	In buffer area only
Marmal I210 B.R	Natural Features Reserve	VIC	In buffer area only
Meering West B.R.	Natural Features Reserve	VIC	In buffer area only
Mosquito Creek SS.R.	Natural Features Reserve	VIC	In buffer area only
Quambatook B.R.	Natural Features Reserve	VIC	In buffer area only
Quambatook I204 B.R	Natural Features Reserve	VIC	In buffer area only
Quambatook I208 B.R	Natural Features Reserve	VIC	In buffer area only
Sandhill Lake B.R.	Natural Features Reserve	VIC	In buffer area only

Protected Area Name	Reserve Type	State	Buffer Status
Unnamed P0325	Private Nature Reserve	VIC	In buffer area only

EPBC Act Referrals

[Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Goschen Mineral Sands and Rare Earths Project, Vic	2018/8291	Controlled Action	Assessment Approach	In buffer area only
Nava-1 Cable System	2001/510	Controlled Action	Completed	In feature area
The Modified Operation of the Goulburn Murray Irrigation District	2009/5123	Controlled Action	Post-Approval	In feature area
Not controlled action				
Cannie Ridge Pipeline Project	2004/1341	Not Controlled Action	Completed	In feature area
Conversion of the North Western Victoria rail system from broad gauge to standar	2002/657	Not Controlled Action	Completed	In feature area
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed	In feature area
Lake Mokoan Decommissioning and Mid Murray Storage Project	2007/3342	Not Controlled Action	Completed	In buffer area only
Wimmera Mallee Pipeline Project	2004/1692	Not Controlled Action	Completed	In buffer area only
Not controlled action (particular manner)				
INDIGO Marine Cable Route Survey (INDIGO)	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

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

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

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

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

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APPENDIX B PROTECTED MATTERS SEARCH TOOL REPORT – STUDY AREA B

Australian Government

Department of Climate Change, Energy, the Environment and Water

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: 20-Dec-2023

Summary

Details

- Matters of NES
- Other Matters Protected by the EPBC Act
- Extra Information

Caveat

Acknowledgements

Summary

Matters of National Environment Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	5
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	7
Listed Threatened Species:	40
Listed Migratory Species:	15

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	26
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

State and Territory Reserves:	14
Regional Forest Agreements:	None
Nationally Important Wetlands:	2
EPBC Act Referrals:	8
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar Wetlands)		[Resource Information]
Ramsar Site Name	Proximity	Buffer Status
Banrock station wetland complex	300 - 400km upstream from Ramsar site	In buffer area only
Hattah-kulkyne lakes	100 - 150km upstream from Ramsar site	In buffer area only
Kerang wetlands	Within Ramsar site	In feature area
Riverland	200 - 300km upstream from Ramsar site	In buffer area only
The coorong, and lakes alexandrina and albert wetland	300 - 400km upstream from Ramsar site	In buffer area only

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
Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions	Endangered	Community may occur within area	In feature area
Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	Endangered	Community likely to occur within area	In feature area
Mallee Bird Community of the Murray Darling Depression Bioregion	Endangered	Community likely to occur within area	In feature area
Natural Grasslands of the Murray Valley Plains	Critically Endangered	Community likely to occur within area	In feature area
Plains mallee box woodlands of the Murray Darling Depression, Riverina and Naracoorte Coastal Plain Bioregions	Critically Endangered	Community likely to occur within area	In feature area

Community Name	Threatened Category	Presence Text	Buffer Status
Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains	Critically Endangered	Community likely to occur within area	In feature area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community may 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			
Aphelocephala leucopsis			
Southern Whiteface [529]	Vulnerable	Species or species habitat known to occur within area	In feature area
Botaurus poiciloptilus			
Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area	In feature area
Calidris ferruginea			
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Climacteris picumnus victoriae			
Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat known to occur within area	In feature area
Falco hypoleucos			
Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Grantiella picta			
Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Lathamus discolor			
Swift Parrot [744]	Critically Endangered	Species or species habitat may occur within area	In feature area
Leipoa ocellata			
Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Lophochroa leadbeateri leadbeateri Major Mitchell's Cockatoo (eastern), Eastern Major Mitchell's Cockatoo [82926]	Endangered	Species or species habitat likely to occur within area	In feature area
Melanodryas cucullata cucullata South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat known to occur within area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area	In feature area
Pedionomus torquatus Plains-wanderer [906]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Polytelis anthopeplus monarchoides Regent Parrot (eastern) [59612]	Vulnerable	Breeding likely to occur within area	In feature area
Polytelis swainsonii Superb Parrot [738]	Vulnerable	Species or species habitat may occur within area	In feature area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area	In feature area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat known to occur within area	In feature area
FISH			
Craterocephalus fluviatilis Murray Hardyhead [56791]	Endangered	Species or species habitat likely to occur within area	In feature area
Galaxias rostratus Flathead Galaxias, Beaked Minnow, Flat-headed Galaxias, Flat-headed Jollytail, Flat-headed Minnow [84745]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Maccullochella peelii Murray Cod [66633]	Vulnerable	Species or species habitat likely to occur within area	In feature area
FROG			

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Crinia sloanei](#) Sloane's Froglet [59151]	Endangered	Species or species habitat may occur within area	In feature area
[Litoria raniformis](#) Growling Grass Frog, Southern Bell Frog, Green and Golden Frog, Warty Swamp Frog, Golden Bell Frog [1828]	Vulnerable	Species or species habitat likely to occur within area	In feature area
MAMMAL			
[Nyctophilus corbeni](#) Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat likely to occur within area	In feature area
PLANT			
[Amphibromus fluitans](#) River Swamp Wallaby-grass, Floating Swamp Wallaby-grass [19215]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Austrostipa wakoolica](#) [66623]	Endangered	Species or species habitat may occur within area	In buffer area only
[Caladenia tensa](#) Greencomb Spider-orchid, Rigid Spider-orchid [24390]	Endangered	Species or species habitat may occur within area	In feature area
[Caladenia versicolor](#) Candy Spider-orchid [24392]	Vulnerable	Species or species habitat may occur within area	In feature area
[Dianella amoena](#) Matted Flax-lily [64886]	Endangered	Species or species habitat may occur within area	In buffer area only
[Eleocharis obicis](#) a spike rush [15320]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Lepidium aschersonii](#) Spiny Peppercress [10976]	Vulnerable	Species or species habitat may occur within area	In feature area
[Lepidium monoplocoides](#) Winged Pepper-cress [9190]	Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Maireana cheelii			
Chariot Wheels [8008]	Vulnerable	Species or species habitat known to occur within area	In feature area
Myriophyllum porcatum			
Ridged Water-milfoil [19919]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Sclerolaena napiformis			
Turnip Copperburr [11742]	Endangered	Species or species habitat may occur within area	In buffer area only
Senecio behrianus			
Stiff Groundsel, Behr's Groundsel [14030]	Endangered	Species or species habitat may occur within area	In feature area
Swainsona murrayana			
Slender Darling-pea, Slender Swainson, Murray Swainson-pea [6765]	Vulnerable	Species or species habitat known to occur within area	In feature area
Swainsona plagiotropis			
Red Darling-pea, Red Swainson-pea [10804]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Swainsona pyrophila			
Yellow Swainson-pea [56344]	Vulnerable	Species or species habitat may occur within area	In buffer area only
REPTILE			
Aprasia parapulchella			
Pink-tailed Worm-lizard, Pink-tailed Legless Lizard [1665]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Delma impar			
Striped Legless Lizard, Striped Snake-lizard [1649]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Hemiaspis damelii			
Grey Snake [1179]	Endangered	Species or species habitat may occur within area	In feature area

Listed Migratory Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Apus pacificus](#) Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			
[Motacilla flava](#) Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area
[Myiagra cyanoleuca](#) Satin Flycatcher [612]		Species or species habitat known to occur within area	In feature area
Migratory Wetlands Species			
[Actitis hypoleucos](#) Common Sandpiper [59309]		Species or species habitat likely to occur within area	In feature area
[Calidris acuminata](#) Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area	In feature area
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat likely to occur within area	In feature area
[Calidris ruficollis](#) Red-necked Stint [860]		Species or species habitat known to occur within area	In buffer area only
[Charadrius bicinctus](#) Double-banded Plover [895]		Species or species habitat known to occur within area	In buffer area only
[Gallinago hardwickii](#) Latham's Snipe, Japanese Snipe [863]		Species or species habitat likely to occur within area	In feature area
[Limosa limosa](#) Black-tailed Godwit [845]		Species or species habitat known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Numenius minutus			
Little Curlew, Little Whimbrel [848]		Species or species habitat known to occur within area	In buffer area only
Philomachus pugnax			
Ruff (Reeve) [850]		Species or species habitat known to occur within area	In buffer area only
Tringa nebularia			
Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area	In feature area
Tringa stagnatilis			
Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area	In buffer area only

Other Matters Protected by the EPBC Act

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

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat likely to occur within area overfly marine area	In feature area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat known to occur within area overfly marine area	In feature area
Charadrius bicinctus Double-banded Plover [895]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Charadrius ruficapillus Red-capped Plover [881]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat likely to occur within area overfly marine area	In feature area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Breeding known to occur within area	In feature area
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
Limosa limosa Black-tailed Godwit [845]		Species or species habitat known to occur within area overfly marine area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Numenius minutus Little Curlew, Little Whimbrel [848]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Philomachus pugnax Ruff (Reeve) [850]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Recurvirostra novaehollandiae Red-necked Avocet [871]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
Stiltia isabella Australian Pratincole [818]		Species or species habitat known to occur within area overfly marine area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Tringa nebularia			
Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area overfly marine area	In feature area
Tringa stagnatilis			
Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area overfly marine area	In buffer area only

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	Buffer Status
Bael Bael Grassland N.C.R.	Natural Features Reserve	VIC	In buffer area only
Bael Bael Grassland N.C.R. (addition)	Natural Features Reserve	VIC	In buffer area only
Great Spectacle, Little Spectacle, Round Lake, Tobacco Lake	Natural Features Reserve	VIC	In buffer area only
Koorangie W.R.	Natural Features Reserve	VIC	In buffer area only
Korrak Korrak B.R	Natural Features Reserve	VIC	In buffer area only
Korrak Korrak N.C.R.	Natural Features Reserve	VIC	In buffer area only
Lake Gilmour W.R	Natural Features Reserve	VIC	In buffer area only
Lake Lookout B.R.	Natural Features Reserve	VIC	In buffer area only
Lake Meran W.R.	Natural Features Reserve	VIC	In buffer area only
Leaghur	State Park	VIC	In buffer area only
Meering West B.R.	Natural Features Reserve	VIC	In buffer area only
Sandhill Lake B.R.	Natural Features Reserve	VIC	In feature area
Unnamed P0325	Private Nature Reserve	VIC	In feature area
Yassom Swamp N.C.R.	Nature Conservation Reserve	VIC	In buffer area only

Nationally Important Wetlands [Resource Information]

Wetland Name	State	Buffer Status
First Marsh (The Marsh)	VIC	In buffer area only
Lake Bael Bael	VIC	In buffer area only

EPBC Act Referrals [Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Goschen Mineral Sands and Rare Earths Project, Vic	2018/8291	Controlled Action	Assessment Approach	In buffer area only
The Modified Operation of the Goulburn Murray Irrigation District	2009/5123	Controlled Action	Post-Approval	In feature area
Not controlled action				
Cannie Ridge Pipeline Project	2004/1341	Not Controlled Action	Completed	In feature area
Gannawarra Solar Farm Development, Vic	2016/7807	Not Controlled Action	Completed	In buffer area only
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed	In feature area
Lake Mokoan Decommissioning and Mid Murray Storage Project	2007/3342	Not Controlled Action	Completed	In buffer area only
Not controlled action (particular manner)				
INDIGO Marine Cable Route Survey (INDIGO)	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

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

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

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

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

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APPENDIX C PROTECTED MATTERS SEARCH TOOL REPORT – STUDY AREA C

Australian Government

Department of Climate Change, Energy, the Environment and Water

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: 20-Dec-2023

Summary

Details

- Matters of NES
- Other Matters Protected by the EPBC Act
- Extra Information

Caveat

Acknowledgements

Summary

Matters of National Environment Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	5
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	7
Listed Threatened Species:	43
Listed Migratory Species:	16

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Lands:	None
Commonwealth Heritage Places:	1
Listed Marine Species:	27
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

State and Territory Reserves:	23
Regional Forest Agreements:	None
Nationally Important Wetlands:	7
EPBC Act Referrals:	12
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar Wetlands)		[Resource Information]
Ramsar Site Name	Proximity	Buffer Status
Banrock station wetland complex	300 - 400km upstream from Ramsar site	In feature area
Hattah-kulkyne lakes	100 - 150km upstream from Ramsar site	In feature area
Kerang wetlands	Within Ramsar site	In feature area
Riverland	200 - 300km upstream from Ramsar site	In feature area
The coorong, and lakes alexandrina and albert wetland	300 - 400km upstream from Ramsar site	In feature area

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
Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions	Endangered	Community may occur within area	In feature area
Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	Endangered	Community likely to occur within area	In feature area
Mallee Bird Community of the Murray Darling Depression Bioregion	Endangered	Community likely to occur within area	In feature area
Natural Grasslands of the Murray Valley Plains	Critically Endangered	Community likely to occur within area	In feature area
Plains mallee box woodlands of the Murray Darling Depression, Riverina and Naracoorte Coastal Plain Bioregions	Critically Endangered	Community likely to occur within area	In feature area

Community Name	Threatened Category	Presence Text	Buffer Status
Seasonal Herbaceous Wetlands (Freshwater) of the Temperate Lowland Plains	Critically Endangered	Community likely to occur within area	In feature area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community may 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			
Aphelocephala leucopsis Southern Whiteface [529]	Vulnerable	Species or species habitat known to occur within area	In feature area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat known to occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat known to occur within area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat may occur within area	In feature area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Lophochroa leadbeateri leadbeateri Major Mitchell's Cockatoo (eastern), Eastern Major Mitchell's Cockatoo [82926]	Endangered	Species or species habitat known to occur within area	In feature area
Melanodryas cucullata cucullata South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat known to occur within area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area	In feature area
Pedionomus torquatus Plains-wanderer [906]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Polytelis anthopeplus monarchoides Regent Parrot (eastern) [59612]	Vulnerable	Breeding likely to occur within area	In feature area
Polytelis swainsonii Superb Parrot [738]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area	In feature area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat known to occur within area	In feature area
FISH			
Bidyanus bidyanus Silver Perch, Bidyan [76155]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Craterocephalus fluviatilis Murray Hardyhead [56791]	Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Galaxias rostratus Flathead Galaxias, Beaked Minnow, Flat-headed Galaxias, Flat-headed Jollytail, Flat-headed Minnow [84745]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Maccullochella macquariensis Trout Cod [26171]	Endangered	Species or species habitat may occur within area	In feature area
Maccullochella peelii Murray Cod [66633]	Vulnerable	Species or species habitat known to occur within area	In feature area
FROG			
Crinia sloanei Sloane's Froglet [59151]	Endangered	Species or species habitat known to occur within area	In feature area
Litoria raniformis Growling Grass Frog, Southern Bell Frog, Green and Golden Frog, Warty Swamp Frog, Golden Bell Frog [1828]	Vulnerable	Species or species habitat likely to occur within area	In feature area
MAMMAL			
Nyctophilus corbeni Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat likely to occur within area	In feature area
PLANT			
Amphibromus fluitans River Swamp Wallaby-grass, Floating Swamp Wallaby-grass [19215]	Vulnerable	Species or species habitat known to occur within area	In feature area
Austrostipa wakoolica [66623]	Endangered	Species or species habitat may occur within area	In feature area
Caladenia tensa Greencomb Spider-orchid, Rigid Spider-orchid [24390]	Endangered	Species or species habitat may occur within area	In feature area
Caladenia versicolor Candy Spider-orchid [24392]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Dianella amoena Matted Flax-lily [64886]	Endangered	Species or species habitat may occur within area	In buffer area only
Eleocharis obicis a spike rush [15320]	Vulnerable	Species or species habitat known to occur within area	In feature area
Lepidium aschersonii Spiny Peppercress [10976]	Vulnerable	Species or species habitat may occur within area	In feature area
Lepidium monoplocoides Winged Pepper-cress [9190]	Endangered	Species or species habitat known to occur within area	In feature area
Maireana cheelii Chariot Wheels [8008]	Vulnerable	Species or species habitat known to occur within area	In feature area
Myriophyllum porcatum Ridged Water-milfoil [19919]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Sclerolaena napiformis Turnip Copperburr [11742]	Endangered	Species or species habitat may occur within area	In feature area
Senecio behrianus Stiff Groundsel, Behr's Groundsel [14030]	Endangered	Species or species habitat may occur within area	In feature area
Swainsona murrayana Slender Darling-pea, Slender Swainson, Murray Swainson-pea [6765]	Vulnerable	Species or species habitat known to occur within area	In feature area
Swainsona plagiotropis Red Darling-pea, Red Swainson-pea [10804]	Vulnerable	Species or species habitat may occur within area	In feature area
Swainsona pyrophila Yellow Swainson-pea [56344]	Vulnerable	Species or species habitat may occur within area	In buffer area only
REPTILE			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Aprasia parapulchella Pink-tailed Worm-lizard, Pink-tailed Legless Lizard [1665]	Vulnerable	Species or species habitat may occur within area	In feature area
Delma impar Striped Legless Lizard, Striped Snake-lizard [1649]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Hemiaspis damelii Grey Snake [1179]	Endangered	Species or species habitat may occur within area	In feature area

Listed Migratory Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area	In feature area
Charadrius bicinctus Double-banded Plover [895]		Species or species habitat known to occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area	In feature area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In buffer area only
Limosa limosa Black-tailed Godwit [845]		Species or species habitat known to occur within area	In feature area
Numenius minutus Little Curlew, Little Whimbrel [848]		Species or species habitat known to occur within area	In feature area
Philomachus pugnax Ruff (Reeve) [850]		Species or species habitat known to occur within area	In feature area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area	In feature area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area	In feature area

Other Matters Protected by the EPBC Act

Commonwealth Heritage Places			[Resource Information]
Name	State	Status	Buffer Status
Historic			
Kerang Post Office	VIC	Listed place	In buffer area only

Listed Marine Species	[Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area overfly marine area	In feature area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area overfly marine area	In feature area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat known to occur within area overfly marine area	In feature area
Charadrius bicinctus Double-banded Plover [895]		Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Charadrius ruficapillus](#) Red-capped Plover [881]		Species or species habitat known to occur within area overfly marine area	In feature area
[Gallinago hardwickii](#) Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area overfly marine area	In feature area
[Haliaeetus leucogaster](#) White-bellied Sea-Eagle [943]		Breeding known to occur within area	In feature area
[Himantopus himantopus](#) Pied Stilt, Black-winged Stilt [870]		Species or species habitat known to occur within area overfly marine area	In feature area
[Lathamus discolor](#) Swift Parrot [744]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
[Limosa lapponica](#) Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In buffer area only
[Limosa limosa](#) Black-tailed Godwit [845]		Species or species habitat known to occur within area overfly marine area	In feature area
[Merops ornatus](#) Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
[Motacilla flava](#) Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In feature area
[Myiagra cyanoleuca](#) Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Numenius minutus Little Curlew, Little Whimbrel [848]		Species or species habitat known to occur within area overfly marine area	In feature area
Philomachus pugnax Ruff (Reeve) [850]		Species or species habitat known to occur within area overfly marine area	In feature area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Species or species habitat known to occur within area overfly marine area	In feature area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
Stiltia isabella Australian Pratincole [818]		Species or species habitat known to occur within area overfly marine area	In feature area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area overfly marine area	In feature area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area overfly marine area	In feature area

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	Buffer Status
Bael Bael Grassland N.C.R.	Natural Features Reserve	VIC	In buffer area only
Bael Bael Grassland N.C.R. (addition)	Natural Features Reserve	VIC	In buffer area only
Beauchamp B.R.	Natural Features Reserve	VIC	In buffer area only
Cullens Lake W.R.	Natural Features Reserve	VIC	In buffer area only
Dry Lake B.R.	Natural Features Reserve	VIC	In buffer area only
Duck Lake W.R.	Natural Features Reserve	VIC	In buffer area only
Great Spectacle, Little Spectacle, Round Lake, Tobacco Lake	Natural Features Reserve	VIC	In buffer area only
Koorangie W.R.	Natural Features Reserve	VIC	In feature area
Korrak Korrak B.R	Natural Features Reserve	VIC	In buffer area only
Korrak Korrak N.C.R.	Natural Features Reserve	VIC	In buffer area only
Lake Elizabeth W.R	Natural Features Reserve	VIC	In buffer area only
Lake Gilmour W.R	Natural Features Reserve	VIC	In buffer area only
Lake Lookout B.R.	Natural Features Reserve	VIC	In buffer area only
Lake Meran W.R.	Natural Features Reserve	VIC	In buffer area only
Lake Murphy W.R.	Natural Features Reserve	VIC	In feature area
Leaghur	State Park	VIC	In buffer area only
Pelican Lake W.R	Nature Conservation Reserve	VIC	In buffer area only
Sandhill Lake B.R.	Natural Features Reserve	VIC	In feature area

Protected Area Name	Reserve Type	State	Buffer Status
Tragowel Swamp N.C.R.	Natural Features Reserve	VIC	In buffer area only
Two Mile Swamp W.R	Natural Features Reserve	VIC	In buffer area only
Unnamed P0325	Private Nature Reserve	VIC	In feature area
Wandella N.C.R.	Nature Conservation Reserve	VIC	In buffer area only
Yassom Swamp N.C.R.	Nature Conservation Reserve	VIC	In buffer area only

Nationally Important Wetlands

[Resource Information]

Wetland Name	State	Buffer Status
First Marsh (The Marsh)	VIC	In buffer area only
Lake Bael Bael	VIC	In buffer area only
Lake Cullen	VIC	In buffer area only
Second Marsh (Middle Marsh)	VIC	In buffer area only
Third Marsh (Top Marsh)	VIC	In buffer area only
Town Swamp	VIC	In buffer area only
Tragowel Swamp (McPhails Swamp)	VIC	In buffer area only

EPBC Act Referrals

[Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Goschen Mineral Sands and Rare Earths Project, Vic	2018/8291	Controlled Action	Assessment Approach	In buffer area only
The Modified Operation of the Goulburn Murray Irrigation District	2009/5123	Controlled Action	Post-Approval	In feature area
Not controlled action				
arrowhead weed infestations control	2004/1875	Not Controlled Action	Completed	In buffer area only
Cannie Ridge Pipeline Project	2004/1341	Not Controlled Action	Completed	In feature area
enhancement work at Middle Lake and Ibis Rookery	2004/1476	Not Controlled Action	Completed	In buffer area only
Gannawarra Solar Farm Development, Vic	2016/7807	Not Controlled Action	Completed	In feature area

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed	In feature area
Lake Mokoan Decommissioning and Mid Murray Storage Project	2007/3342	Not Controlled Action	Completed	In buffer area only
Subdivision For Rural Housing	2005/2273	Not Controlled Action	Completed	In buffer area only
Widening of Murray Valley HWY & Kerang-Quambatook Main Road Intersection	2002/893	Not Controlled Action	Completed	In buffer area only
Not controlled action (particular manner)				
INDIGO Marine Cable Route Survey (INDIGO)	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

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

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

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

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

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APPENDIX D LIKELIHOOD OF OCCURRENCE - FLORA

Scientific name	Common name	EPBC Act	FFG Act	Recorded or modelled in locality		
				Study Area A	Study Area B	Study Area C
Acacia melvillei	Yarran	-	Critically Endangered	VBA	VBA	VBA
Acacia oswaldii	Umbrella Wattle	-	Critically Endangered	VBA	VBA	VBA
Acacia pendula	Weeping Myall	-	Critically Endangered	VBA	VBA	VBA
Allocasuarina luehmannii	Buloke	-	Critically Endangered	VBA	VBA	VBA
Ammannia multiflora	Jerry-jerry	-	Endangered	VBA	VBA	VBA
Amphibromus fluitans	River Swamp Wallaby-grass	Vulnerable	-	PMST	PMST	PMST
Amyema linophylla subsp. *orientalis*	Buloke Mistletoe	-	Critically Endangered	VBA	VBA	VBA
Asperula gemella	Twin-leaf Bedstraw	-	Endangered	-	-	VBA
Aristida obscura	Rough-seed Wire-grass	-	Endangered	VBA	-	-
Austrobryonia micrantha	Mallee Cucumber	-	Endangered	VBA	VBA	VBA
Austrostipa breviglumis	Cane Spear-grass	-	Endangered	VBA	-	-

Scientific name	Common name	EPBC Act	FFG Act	Recorded or modelled in locality		
				Study Area A	Study Area B	Study Area C
Austrostipa puberula	Fine-hairy Spear-grass	-	Endangered	VBA	VBA	VBA
Austrostipa tenuifolia	Long-awn Spear-grass	-	Endangered	VBA	-	-
Austrostipa wakoolica		Endangered	-	-	PMST	PMST
Bergia trimera	Small Water-fire	-	Endangered	VBA	VBA	VBA
Caladenia tensa	Greencomb Spider-orchid	Endangered	-	PMST	PMST	PMST
Caladenia versicolor	Candy Spider-orchid	Vulnerable	Endangered	PMST	PMST	PMST
Cardamine moirensis	Riverina Bitter-cress	-	Endangered	VBA	VBA	VBA
Casuarina obesa	Swamp Sheoak	-	Critically Endangered	-	-	VBA
Centipeda crateriformis subsp. compacta	Compact Sneezeweed	-	Endangered	-	-	VBA
Centipeda crateriformis subsp. crateriformis	Lagoon Sneezeweed	-	Endangered	-	-	VBA
Centipeda thespidioides	Desert Sneezeweed	-	Endangered	VBA	VBA	VBA
Chenopodium desertorum subsp. desertorum	Frosted Goosefoot	-	Endangered	VBA	VBA	VBA
Chenopodium desertorum subsp. rectum	Frosted Goosefoot	-	Endangered	-	VBA	VBA

Scientific name	Common name	EPBC Act	FFG Act	Recorded or modelled in locality		
				Study Area A	Study Area B	Study Area C
Convolvulus graminetinus	Grassland Bindweed	-	Endangered	VBA	VBA	VBA
Cullen cinereum	Hoary Scurf-pea	-	Endangered	-	-	VBA
Cullen tenax	Tough Scurf-pea	-	Endangered	VBA	VBA	VBA
Dianella amoena	Matted Flax-lily	Endangered	Critically Endangered	-	PMST	PMST
Dianella porracea	Riverine Flax-lily	-	Critically Endangered	VBA	-	-
Dianella tarda	Late-flower Flax-lily	-	Critically Endangered	VBA	VBA	VBA
Diuris behrii	Golden Cowslips	-	Endangered	VBA	-	-
Duma horrida subsp. horrida	Spiny Lignum	-	Critically Endangered	-	-	VBA
Elacholoma prostrata	Small Monkey-flower	-	Endangered	-	VBA	VBA
Eleocharis obicis		Vulnerable	-	PMST	-	PMST
Eleocharis plana	Flat Spike-sedge	-	Critically Endangered	-	-	VBA
Eragrostis australasica	Cane Grass	-	Critically Endangered	VBA	VBA	VBA
Eragrostis lacunaria	Purple Love-grass	-	Endangered	-	-	VBA
Eragrostis setifolia	Bristly Love-grass	-	Endangered	VBA	VBA	VBA

Scientific name	Common name	EPBC Act	FFG Act	Recorded or modelled in locality		
				Study Area A	Study Area B	Study Area C
Eriochlamys squamata	Scaly Mantle	-	Endangered	VBA	VBA	VBA
Eryngium paludosum	Long Eryngium	-	Endangered	VBA	VBA	VBA
Eucalyptus X oxypoma	Deniliquin Box	-	Endangered	-	-	VBA
Goodenia lunata	Stiff Goodenia	-	Critically Endangered	VBA	VBA	VBA
Grevillea rosmarinifolia subsp. glabella	Smooth Grevillea	-	Endangered	VBA	-	-
Lepidium aschersonii	Spiny Peppercress	Vulnerable	Endangered	PMST	PMST	PMST
Lepidium monoplocoides	Winged Peppercress	Endangered	Endangered	VBA	VBA	VBA
Lepidium phlebopetalum	Veined Peppercress	-	Endangered	VBA	VBA	VBA
Leptorhynchos waitzia	Button Immortelle	-	Endangered	-	VBA	VBA
Leucochrysum molle	Soft Sunray	-	Endangered	VBA	-	VBA
Maireana cheelii	Chariot Wheels	Vulnerable	Endangered	PMST	PMST	PMST
Maireana georgei	Slit-wing Bluebush	-	Critically Endangered	VBA	VBA	VBA
Malva preissiana	Coast Hollyhock (white-flowered coastal form)	-	Endangered	-	VBA	VBA
Minuria cunninghamii	Bush Minuria	-	Vulnerable	VBA	VBA	VBA

Scientific name	Common name	EPBC Act	FFG Act	Recorded or modelled in locality		
				Study Area A	Study Area B	Study Area C
Minuria integerrima	Smooth Minuria	-	Vulnerable	VBA	VBA	VBA
Myoporum montanum	Waterbush	-	Endangered	-	-	VBA
Myriophyllum porcatum	Ridged Water-milfoil	Vulnerable	Critically Endangered	PMST	PMST	
Nicotiana goodspeedii	Small-flower Tobacco	-	Endangered	-	-	VBA
Nymphoides crenata	Wavy Marshwort	-	Endangered	-	-	VBA
Panicum laevinode	Pepper Grass	-	Vulnerable	VBA	VBA	VBA
Pomaderris paniculosa subsp. paniculosa	Inland Pomaderris	-	Endangered	VBA	VBA	VBA
Ptilotus erubescens	Hairy Tails	-	Critically Endangered	VBA	VBA	VBA
Ranunculus undosus	Swamp Buttercup	-	Endangered	-	-	VBA
Sarcozona praecox	Sarcozona	-	Endangered	VBA	-	-
Sclerolaena lanicuspis	Woolly Copperburr	-	Endangered	VBA	VBA	VBA
Sclerolaena napiformis	Turnip Copperburr	Endangered	Critically Endangered	-	VBA	VBA
Sclerolaena patenticuspis	Spear-fruit Copperburr	-	Vulnerable	VBA	-	VBA
Senecio behrianus	Stiff Groundsel, Behr's Groundsel	Endangered	Critically Endangered	PMST	PMST	-

Scientific name	Common name	EPBC Act	FFG Act	Recorded or modelled in locality		
				Study Area A	Study Area B	Study Area C
Senecio campylocarpus	Floodplain Fireweed	-	Endangered	VBA	VBA	VBA
Senecio cunninghamii var. cunninghamii	Branching Groundsel	-	Endangered	-	VBA	VBA
Senecio longicollaris	Riverina Fireweed	-	Endangered	-	-	VBA
Senecio productus subsp. productus	Riverina Groundsel	-	Endangered	-	-	VBA
Sida fibulifera	Pin Sida	-	Endangered	-	VBA	-
Sporobolus caroli	Yakka Grass	-	Endangered	VBA	VBA	VBA
Swainsona murrayana	Slender Darling-pea	Vulnerable	Endangered	PMST	PMST	PMST
Swainsona plagiotropis	Red Darling-pea	Vulnerable	Endangered	PMST	PMST	PMST
Swainsona pyrophila	Yellow Swainson-pea	Vulnerable	-	PMST	PMST	PMST
Swainsona swainsonioides	Downy Swainson-pea	-	Endangered	VBA	VBA	VBA
Tecticornia pergranulata subsp. divaricata	Blackseed Glasswort	-	Endangered	-	-	VBA
Tecticornia syncarpa	Fused Glasswort	-	Endangered	-	-	VBA
Templetonia egena	Round Templetonia	-	Endangered	VBA	VBA	VBA
Triglochin hexagona	Six-point Arrowgrass	-	Endangered	-	VBA	VBA

Scientific name	Common name	EPBC Act	FFG Act	Recorded or modelled in locality		
				Study Area A	Study Area B	Study Area C
Trigonella suavissima	Sweet Fenugreek	-	Endangered	-	VBA	VBA
Vittadinia condyloides	Club-hair New Holland Daisy	-	Endangered	VBA	VBA	VBA
Vittadinia cuneata var. hirsuta	Fuzzy New Holland Daisy	-	Endangered	VBA	VBA	VBA
Vittadinia pterochaeta	Winged New Holland Daisy	-	Endangered	VBA	VBA	VBA

Notes: EPBC Act = threatened status under the EBC Act; FFG Act = threatened status under the FFG Act.

APPENDIX E LIKELIHOOD OF OCCURRENCE – FAUNA

Scientific name	Common name	EPBC Act	FFG Act	Recorded or modelled in the locality		
				Study Area A	Study Area B	Study Area C
Birds						
Acrocephalus australis	Australian Reed-Warbler	Migratory	-	VBA	VBA	VBA
Actitis hypoleucos	Common Sandpiper	Migratory	Vulnerable	VBA	VBA	VBA
Anseranas semipalmata	Magpie Goose	-	Vulnerable	-	-	VBA
Antigone rubicunda	Brolga	-	Endangered	-	VBA	VBA
Aphelocephala leucopsis	Southern Whiteface	Vulnerable	-	-	VBA	VBA
Apus pacificus	Fork-tailed Swift	Migratory	-	VBA		VBA
Ardea alba modesta	Eastern Great Egret	Migratory	Vulnerable	VBA	VBA	VBA
Ardea intermedia plumifera	Plumed Egret	-	Critically Endangered	-	VBA	VBA
Ardeotis australis	Australian Bustard	-	Critically Endangered	VBA	-	-
Arenaria interpres	Ruddy Turnstone	Vulnerable, Migratory	Endangered	-	-	VBA
Aythya australis	Hardhead	-	Vulnerable	VBA	VBA	VBA
Biziura lobata	Musk Duck	-	Vulnerable	VBA	VBA	VBA

Scientific name	Common name	EPBC Act	FFG Act	Recorded or modelled in the locality		
				Study Area A	Study Area B	Study Area C
Botaurus poiciloptilus	Australasian Bittern	Endangered	Critically Endangered	-	VBA	VBA
Bubulcus coromandus	Eastern Cattle Egret	Migratory	-	-	VBA	VBA
Burhinus grallarius	Bush Stone-curlew	-	Critically Endangered	-	-	VBA
Calidris acuminata	Sharp-tailed Sandpiper	Vulnerable, Migratory	-	VBA	VBA	VBA
Calidris alba	Sanderling	Migratory	-	-	-	VBA
Calidris ferruginea	Curlew Sandpiper	Critically Endangered, Migratory	Critically Endangered	VBA	VBA	VBA
Calidris melanotos	Pectoral Sandpiper	Migratory	-	VBA	VBA	VBA
Calidris minuta	Little Stint	Migratory	-	-	-	VBA
Calidris ruficollis	Red-necked Stint	Migratory	-	VBA	VBA	VBA
Calidris subminuta	Long-toed Stint	Migratory	-	-	VBA	VBA
Calidris tenuirostris	Great Knot	Critically Endangered, Migratory	Critically Endangered	-	-	VBA
Charadrius bicinctus	Double-banded Plover	Migratory	-	VBA	-	VBA
Charadrius leschenaultii	Greater Sand Plover	Vulnerable, Migratory	Vulnerable	-	-	VBA
Charadrius veredus	Oriental Plover	Migratory	-	-	VBA	VBA

Scientific name	Common name	EPBC Act	FFG Act	Recorded or modelled in the locality		
				Study Area A	Study Area B	Study Area C
Chlidonias leucopterus	White-winged Black Tern	Migratory	-	-	-	VBA
Climacteris picumnus victoriae	Brown Treecreeper (south-eastern)	Vulnerable	-	-	VBA	VBA
Egretta garzetta	Little Egret	-	Endangered	-	-	VBA
Falco hypoleucos	Grey Falcon	Vulnerable	Vulnerable	-	VBA	VBA
Falco subniger	Black Falcon	-	Critically Endangered	VBA	-	VBA
Gallinago hardwickii	Latham's Snipe	Vulnerable, Migratory	-	VBA	-	-
Gelochelidon nilotica macrotarsa	Australian Gull-billed Tern	-	Endangered	VBA	VBA	VBA
Geopelia cuneata	Diamond Dove	-	Vulnerable	-	VBA	VBA
Grantiella picta	Painted Honeyeater	Vulnerable	Vulnerable	-	PMST	PMST
Haliaeetus leucogaster	White-bellied Sea-Eagle	Migratory	Endangered	VBA	VBA	VBA
Hieraaetus morphnoides	Little Eagle	-	Vulnerable	VBA	VBA	VBA
Hirundapus caudacutus	White-throated Needletail	Vulnerable, Migratory	Vulnerable	VBA	-	VBA
Hydroprogne caspia	Caspian Tern	Migratory	Vulnerable	VBA	VBA	VBA
Ixobrychus dubius	Australian Little Bittern	-	Endangered	-	-	VBA
Lathamus discolor	Swift Parrot	Critically Endangered	Critically Endangered	-	PMST	PMST

Scientific name	Common name	EPBC Act	FFG Act	Recorded or modelled in the locality		
				Study Area A	Study Area B	Study Area C
Leipoa ocellata	Malleefowl	Vulnerable	Vulnerable	-	PMST	PMST
Limosa lapponica baueri	Nunivak Bar-tailed Godwit	Vulnerable, Migratory	Vulnerable	-	-	VBA
Limosa limosa	Black-tailed Godwit	Endangered, Migratory	Critically Endangered	VBA	-	VBA
Lophochroa leadbeateri	Pink Cockatoo	Endangered	Critically Endangered	VBA	VBA	VBA
Lophoictinia isura	Square-tailed Kite	-	Vulnerable	-	VBA	VBA
Melanodryas cucullate cucllata	Hooded Robin (South eastern)	Endangered	Vulnerable	PMST	PMST	VBA
Merops ornatus	Rainbow Bee-eater	Migratory	-	VBA	VBA	VBA
Motacilla alba	White Wagtail	Migratory	-	-	VBA	VBA
Motacilla flava	Yellow Wagtail	Migratory	-	VBA	-	-
Myiagra cyanoleuca	Satin Flycatcher	Migratory	-	VBA	-	-
Neophema chrysostoma	Blue-winged Parrot	Vulnerable	-	-	VBA	VBA
Ninox connivens	Barking Owl	-	Critically Endangered	-	VBA	VBA
Numenius madagascariensis	Eastern Curlew	Critically Endangered, Migratory	Critically Endangered	-	VBA	VBA
Numenius minutus	Little Curlew	Migratory	-	VBA	VBA	VBA
Oxyura australis	Blue-billed Duck	-	Vulnerable	-	VBA	VBA

Scientific name	Common name	EPBC Act	FFG Act	Recorded or modelled in the locality		
				Study Area A	Study Area B	Study Area C
Pedionomus torquatus	Plains-wanderer	Critically Endangered	Critically Endangered	VBA	VBA	VBA
Peltohyas australis	Inland Dotterel	-	Vulnerable	VBA	VBA	VBA
Philomachus pugnax	Ruff (Reeve)	Migratory	-	VBA	-	VBA
Plegadis falcinellus	Glossy Ibis	Migratory	-	-	VBA	VBA
Pluvialis fulva	Pacific Golden Plover	Migratory	Vulnerable	-	-	VBA
Pluvialis squatarola	Grey Plover	Vulnerable, Migratory	Vulnerable	-	-	VBA
Polytelis anthopeplus monarchoides	Regent Parrot (eastern)	Vulnerable	Vulnerable	-	VBA	VBA
Polytelis swainsonii	Superb Parrot	Vulnerable	Endangered	-	PMST	PMST
Pomatostomus temporalis	Grey-crowned Babbler	-	Vulnerable	-	VBA	VBA
Rostratula australis	Australian Painted-snipe	Endangered, Migratory	Critically Endangered	-	VBA	VBA
Spatula rhynchotis	Australasian Shoveler	-	Vulnerable	VBA	VBA	VBA
Stagonopleura guttata	Diamond Firetail	Vulnerable	Vulnerable		VBA	VBA
Stictonetta naevosa	Freckled Duck	-	Endangered	VBA	VBA	VBA
Tringa glareola	Wood Sandpiper	-	Endangered		VBA	VBA

Scientific name	Common name	EPBC Act	FFG Act	Recorded or modelled in the locality		
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Tringa nebularia	Common Greenshank	Endangered, Migratory	Endangered	VBA	VBA	VBA
Tringa stagnatilis	Marsh Sandpiper	Migratory	Endangered	VBA	VBA	VBA
Turnix pyrrhothorax	Red-chested Button-quail	-	Endangered	-	-	VBA
Fish						
Bidyanus bidyanus	Silver Perch	Critically Endangered	Endangered	-	VBA	VBA
Craterocephalus fluviatilis	Murray Hardyhead	Endangered	Critically Endangered	-	VBA	VBA
Galaxias rostratus	Flat-headed Galaxias	-	Vulnerable	VBA	VBA	VBA
Maccullochella macquariensis	Trout Cod	Endangered	Endangered	-	-	PMST
Maccullochella peelii	Murray Cod	Vulnerable	Endangered	-	VBA	VBA
Tandanus tandanus	Freshwater Catfish	-	Endangered	VBA	VBA	VBA
Amphibians						
Crinia sloanei	Sloane's Froglet	Endangered	Endangered	-	PMST	PMST
Litoria raniformis	Growling Grass Frog	Vulnerable	Vulnerable	-	VBA	VBA
Pseudophryne bibronii	Brown Toadlet	-	Endangered	VBA	-	-
Invertebrates						
Temognatha flavocincta	Jewel Beetle	-	Vulnerable	-	-	VBA

Scientific name	Common name	EPBC Act	FFG Act	Recorded or modelled in the locality		
				Study Area A	Study Area B	Study Area C
Mammals						
Nyctophilus corbeni	South-eastern Long-eared Bat	Vulnerable	Endangered	-	PMST	PMST
Sminthopsis crassicaudata	Fat-tailed Dunnart	-	Vulnerable	VBA	VBA	VBA
Reptiles						
Aprasia parapulchella	Pink-tailed Worm-lizard	Vulnerable	Endangered	-	PMST	PMST
Chelodina expansa	Broad-shelled Turtle	-	Endangered	-	VBA	VBA
Delma impar	Striped Legless Lizard	Vulnerable	Endangered	-	VBA	VBA
Emydura macquarii	Murray River Turtle	-	Critically Endangered	-	VBA	VBA
Hemiaspis damelii	Grey Snake	Endangered	-	-	PMST	PMST
Morelia spilota metcalfei	Carpet Python	-	Endangered	-	VBA	VBA
Morethia adelaidensis	Samphire Skink	-	Endangered	-	VBA	VBA
Pogona barbata	Bearded Dragon	-	Vulnerable	-	VBA	VBA
Pygopus schraderi	Hooded Scaly-foot	-	Critically Endangered	VBA	VBA	VBA
Varanus varius	Lace Monitor	-	Endangered	-	VBA	VBA

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