



Premise

AC ENERGY

Dubbo Solar Farm

BIODIVERSITY ASSESSMENT

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CONTENTS

EXECUTIVE SUMMARY	1
1. INTRODUCTION	4
1.1 PROJECT DESCRIPTION	4
1.2 OBJECTIVES	5
1.3 THE STUDY AREA	5
1.4 DATABASE SEARCHES	9
2. METHODS	20
2.1 SURVEY TIMING	20
2.2 VEGETATION SAMPLING	20
2.3 FAUNA	21
3. RESULTS AND DISCUSSION	21
3.1 FLORA	21
3.2 FAUNA	25
3.3 THREATENED BIODIVERSITY	28
4. BIODIVERSITY IMPACT ASSESSMENT	28
4.1 IMPACT AVOIDANCE AND MINIMISATION MEASURES	28
4.2 RESIDUAL PROJECT IMPACTS	29
4.3 BIODIVERSITY FOR IMPACT ASSESSMENT	29
4.4 ASSESSMENTS OF SIGNIFICANCE	31
4.5 IMPACT ASSESSMENT – FIVE PART TESTS	31
4.6 ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999	36
4.7 KOALA HABITAT PROTECTION SEPP 2020	36
5. REFERENCES	36

FIGURES

Figure 1. Site Location	7
Figure 2. Solar Panel Positioning	8
Figure 3. Sample Locations and Vegetation Types	22
Table 4. Vegetation Types identified on Study Area (Figure3)	23
Figure 4. Exotic-dominated Grassland on Cropping Paddock	24
Figure 5. Secondary Native Grassland between cultivated Ground and Track	25
Table 6. Habitat trees for removal	26
Figure 6. Kurrajong in Cropping Paddock	27
Figure 7. Yellow Box Tree on Edge of Cropping Paddock and Cultivated Ground	27

TABLES

Table 1 – Solar Farm specifications	4
Table 2. Threatened Flora Species Predicted to occur near study area based on database searches	10
Table 2. Threatened Fauna Species predicted to occur on study area based on database searches.....	12
Table 3. Threatened Ecological Communities Predicted to Occur in the Surrounding Region	18
Table 5. Priority, Nationally Significant and High Threat Weeds identified on Study Area	25
Table 7. Analysis of Habitat Suitability of Study Area for potential threatened species.....	30
Table 8. Summary of Threatened Species for Impact Assessment	31

APPENDIX

APPENDIX A. PLANT SPECIES LISTS

EXECUTIVE SUMMARY

Premise Australia Pty Ltd (Premise) was commissioned by AC Energy to conduct a biodiversity assessment for the construction of a solar farm at 47R Wellington Road, Dubbo in the Dubbo Regional Council Local Government Area. The Study Area covers a total area of 22.36 hectares, which is contained within a cleared cropping paddock, and will include solar panels (10.99 ha), a car park (0.047 ha) and an off-load zone (0.076 ha). The Study Area also includes an access track (1.16 ha) along the western extent. Eulomogo Creek flows 300 m south of the Study Area.

It is our understanding that the activity will be undertaken by AC Energy Pty Ltd and will be subject to approval under Part 4 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). This report has been prepared to support a Development Application to Dubbo Regional Council for the activity.

The Project will result in the permanent loss of native vegetation in the form of two remnant trees, namely Yellow Box (*Eucalyptus melliodora*) and Kurrajong (*Brachychiton populneus*) and disturbance to a small area (0.22 ha) of secondary native grassland. Since the potential loss of native vegetation does not exceed the thresholds for entry into the Biodiversity Offsets Scheme, the impact of the Project on biodiversity has been assessed by undertaking Five Part Tests of Significance in this report.

This biodiversity assessment report (BAR) comprises:

- Searches of relevant State and Commonwealth databases and a literature review to determine which threatened biodiversity has potential to occur on the Study Area.
- A biodiversity survey conducted in early March 2021, with data collected from a total of 7 locations using 3 Biodiversity Assessment Method quadrats and 4 rapid assessment samples for flora.

Key findings of the survey

- A list of the plant species identified on the Study Area through rapid assessment sampling is given in **Appendix A**.
- Vegetation on the Project footprint was classified into three categories, disturbed ground, exotic-dominated grassland and native-dominated grassland. Disturbed ground lacking in vegetation included an area of recent cultivation and a track. Native vegetation dominated the area along Eulomogo Creek to the south of the site.
- Two species listed as High Threat Environmental Weeds by NSW Biodiversity Conservation Division (BCD) were found in the Study Area, Saffron Thistle (*Carthamus lanatus*) and Bathurst Burr (*Xanthium spinosum*). Neither are listed as Weeds of National Significance by the Australian Weeds Committee of the Commonwealth Government, nor as Priority Weeds for the Central West area under the NSW *Biosecurity Act 2015*.
- Four broad fauna habitat types were identified in the investigation area: Eulomogo Creek, riparian area, secondary native grassland and exotic grassland

Threatened Biodiversity

- No threatened flora species were identified as having potential to occur on the Study Area by database searches.
- Database searches and habitat filtering identified two threatened species with potential to occur on the Study Area: Superb Parrot (*Polytelis swainsonii*) and Yellow-bellied Sheath-tail-bat (*Saccolaimus flaviventris*)

- One Threatened Ecological Community (TEC) listed under the *Biodiversity Conservation Act 2016* (BC Act), *White Box Yellow Box Blakely's Red Gum Woodland Critically Endangered Ecological Community* (Box-Gum Woodland), was identified as occurring in the surrounding landscape. This community has been identified as potentially subject to Serious and Irreversible Impacts by disturbance.
- No endangered populations listed under the BC Act or threatened ecological communities listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) occur in the Study Area or remain if they once occurred.
- No Areas of Outstanding Biodiversity Value have been declared on or near the Study Area under the BC Act or areas of Critical Habitat under the EPBC Act.

Impact Avoidance and Mitigation

Measures to avoid or minimise impacts of the project on threatened species include:

- Erosion from exposed ground during the solar farm construction will be minimised using sediment traps, where necessary.
- An experienced and accredited wildlife handler will be present on site during tree removal to capture and translocate any hollow nesting/roosting species to suitable habitat in the surrounding landscape.
- Dust suppression measures will be put in place during earthworks.
- All rubbish and materials will be removed from the lay down areas when construction is completed.

Residual impacts

Impacts of the proposed development once impact avoidance and minimisation has taken place include:

- The removal of two remnant old growth trees with wildlife hollows, resulting in a reduction in nesting and roosting habitat for hollow-dependent wildlife.
- Any resident species utilising the remnant trees on the Study Area that are translocated to suitable habitat in the surrounding landscape would have reduced chances of survival.

Five-Part Tests

Five Part Tests of Significance showed the proposed activities are not likely to have an adverse impact on the life cycle or habitat of any threatened species identified as having potential to occur on the Study Area. Nor will the proposed activity permanently remove, modify, or fragment the habitat of the subject species. As such, Species Impact Statements or entry into the Biodiversity Offsets Scheme (BOS) are not required.

Commonwealth Environment Protection and Biodiversity Conservation Act (EPBC Act)

No flora species listed on the EPBC Act are considered likely to occur on the Study Area and are not considered as part of this BAR. One species of fauna, the Superb Parrot (*Polytelis swainsonii*), listed as Vulnerable on the EPBC Act was identified with potential to occur on the Study Area or immediate surrounds by the literature and database review.

The Project is not considered likely to have a significant impact on this species and referral of the Project to the Commonwealth is not required.

State Environmental Planning Policy (Koala Habitat Protection) 2020

The *State Environmental Planning Policy (Koala Habitat Protection) 2020* (KSEPP) aims to protect habitat utilised by the Koala, *Phascolarctos cinereus*, which is known to occur sparsely on the Central Tablelands (DPIE, 2020; DPIE, 2021c).

By reference to Schedule 1 of the KSEPP, Dubbo Regional Council LGA is not an LGA to which the KSEPP applies. Further consideration is therefore not required.

1. INTRODUCTION

Premise Australia Pty Ltd (Premise) was commissioned by AC Energy to conduct a biodiversity assessment for the construction of a micro solar farm on the property at 47R Wellington Road, Dubbo.

The land is considered to be Category 1 land where ground cover vegetation is predominantly non-native and clearing is not regulated under Part 5A of the *Local Land Services Act 2013* (LLS Act). Accordingly, under section 6.9 (3) of the NSW *Biodiversity Conservation Act 2016* (BC Act), the impacts of development on Category 1 land are not required to be assessed by the Biodiversity Assessment Method (BAM). The solar farm footprint exclusively occurs on a cleared cropping paddock (22.36 ha). High biodiversity value vegetation identified in the Dubbo Regional Council Local Environment Plan occurs along a watercourse over 300 m south of the proposed solar farm and is considered unlikely to be impacted by the Project. The only native vegetation identified for removal is two remnant eucalypt trees within the footprint of the solar panels. Small areas of secondary native grassland occur on the edges of the cropping paddock, which, although outside the footprint of the solar panels, are likely to be disturbed by vehicle movements during construction. However, this vegetation only comprises 0.22 ha, and is therefore below the threshold (1 ha for a property with a minimum lot size of 100 ha) for entry into the Biodiversity Offsets Scheme.

Given the amount of native vegetation clearing on the Study Area is below the native vegetation clearing threshold as set out in clause 7.2 of the *Biodiversity Conservation Regulation 2017* (BC Regs), the Project does not require assessment by the Biodiversity Assessment Method under the BC Act. It is our understanding that the activity will be undertaken by AC Energy Pty Ltd and will be subject to approval under Part 4 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). This report has been prepared to support a Development Application to Dubbo Regional Council for the proposed development.

This assessment relates primarily to the habitat value of two paddock trees that would be removed, disturbance to small areas of secondary native grassland and any value the cleared land may have as habitat for threatened species. Assessment of impacts is via Five Part Tests of Significance under s. 7.3 of the BC Act. The potential impact of the activity on threatened species, populations and ecological communities listed under the BC Act and *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is also considered.

1.1 PROJECT DESCRIPTION

The Proposal is for the construction of a micro solar farm on the property at 47R Wellington Road. The Study Area is 3.7 kilometres (km) south-east of Dubbo in the Dubbo Regional Council Local Government Area (LGA) within the North Western Plains of NSW.

The proposed micro solar farm contains the following specifications:

Table 1 – Solar Farm specifications

Project component	Value
Fenced Compound Area	16 Ha (approx.)
Proposed Tenure	31-year Lease
Project AC Size	4.95 MW
Total number panels	Approximately 16,128 x 450 W panels (DC)
Connection Type	11 KV Tee
Mounting Type	Single-axis Trackers

The facility contains a central power station located within the compound and comprising an inverter, transformers and switchgears. The proposed power station will be the primary conduit for electricity from the facility prior to being transferred via overhead lines into the nearby Essential Energy transformer.

Construction would involve the following sequence:

- Civil earth works, fencing and landscaping
- Delivery of long lead materials
- PV panel and LV cable installation
- HV station installation, testing and commissioning
- Site clean-up and demobilisation

1.2 OBJECTIVES

The objectives of this Biodiversity Assessment Report (BAR) are to:

- develop prior to the field survey a list of threatened flora and fauna species, populations, communities or critical habitat, listed in the schedules of the BC Act and the EPBC Act that could potentially occur on the Project area, based on searches of the BioNet Atlas of NSW Wildlife and querying of the Commonwealth Department of the Environment Protected Matters Search Tool;
- assess the likelihood of occurrence of the identified potential threatened entities by comparing the habitats on the study area with their known habitat requirements as identified in threatened species profiles on the NSW Office of Environment and Heritage and Commonwealth Department of the Environment websites;
- sample the vegetation on the Project area using standard flora survey methods;
- identify and map the vegetation communities (Plant Community Types [PCT]) present within the Project area in consideration of the NSW Vegetation Map Viewer;
- list flora and fauna species for the project area and immediate surrounds, including High Threat Environmental Weeds, Priority Weeds and Nationally Significant Weeds;
- if appropriate, conduct targeted searches for potentially occurring migratory fauna species and threatened flora and fauna species, populations, communities and critical habitat, and map any occurrences;
- undertake an analysis of the potential impacts of the proposed project on threatened flora, fauna and their habitats,
- develop avoidance and mitigation measures designed to minimise impacts on threatened flora and fauna; and
- assess residual project impacts using Five Part Tests of Significance.

1.3 THE STUDY AREA

The Study Area is located approximately 3.7 km south-west of Dubbo in the Dubbo Regional Council LGA, within the North Western Plains of NSW (**Figure 1**). It covers a total area of 22.36 hectares, which is exclusively a cleared cropping paddock, and will include solar panels (10.99 ha), a car park (0.047 ha) and an off-load zone (0.076 ha) (**Figure 2**). The Study Area also includes an access track (1.16 ha) along the western extent.

The Eulomogo Creek is a tributary of the Macquarie River and occurs 300 m south of the Study Area. It is an ephemeral stream that starts on farmland approximately 5 km east of the Study Area and meanders

downstream to Wongarbon, 9 km south-east of the Study Area. The area surrounding the Study Area is predominantly used for agricultural production, consisting of modified and exotic-dominated pastures with scattered remnant trees. Adjoining areas of the property support secondary native grasslands on fallow paddocks that are occasionally cropped. Elevation across the Study Area varies between 318 m and 325 m, as the site slopes downwards towards the Eulomogo Creek.

1.3.1 LAND USE

The Study Area occurs on the ancestral country of the Wiradjuri people. Wiradjuri means 'people of the three rivers', these rivers being the Macquarie, Lachlan and Murrumbidgee. The Macquarie River runs through Dubbo, and Aboriginal people once lived along the riverbanks and in the open land surrounding the river, depending on the food and shelter it provided. Following European settlement much of the study area was used for agriculture, associated industry and residential development. Very little of the original vegetation remains, except in isolated patches and along the flood plain areas of the Macquarie River. Current rural land use in the region includes agricultural production, including cropping and livestock grazing.

The current landholder has managed the property since 2007 and it was managed before that by his parents since 1988. Throughout this time the property has been used exclusively for livestock grazing with winter cropping of oats to provide hay for stock on this and other properties. All arable parts of the property have been cropped on rotation over that period depending on seasonal conditions. Prior to the recent severe drought, the paddock for the proposed solar farm was planned to be cropped and was partially cultivated before sowing was abandoned owing to the dry conditions. The owner has planned for a winter crop in 2021 and has cultivated the remainder of the site in preparation.

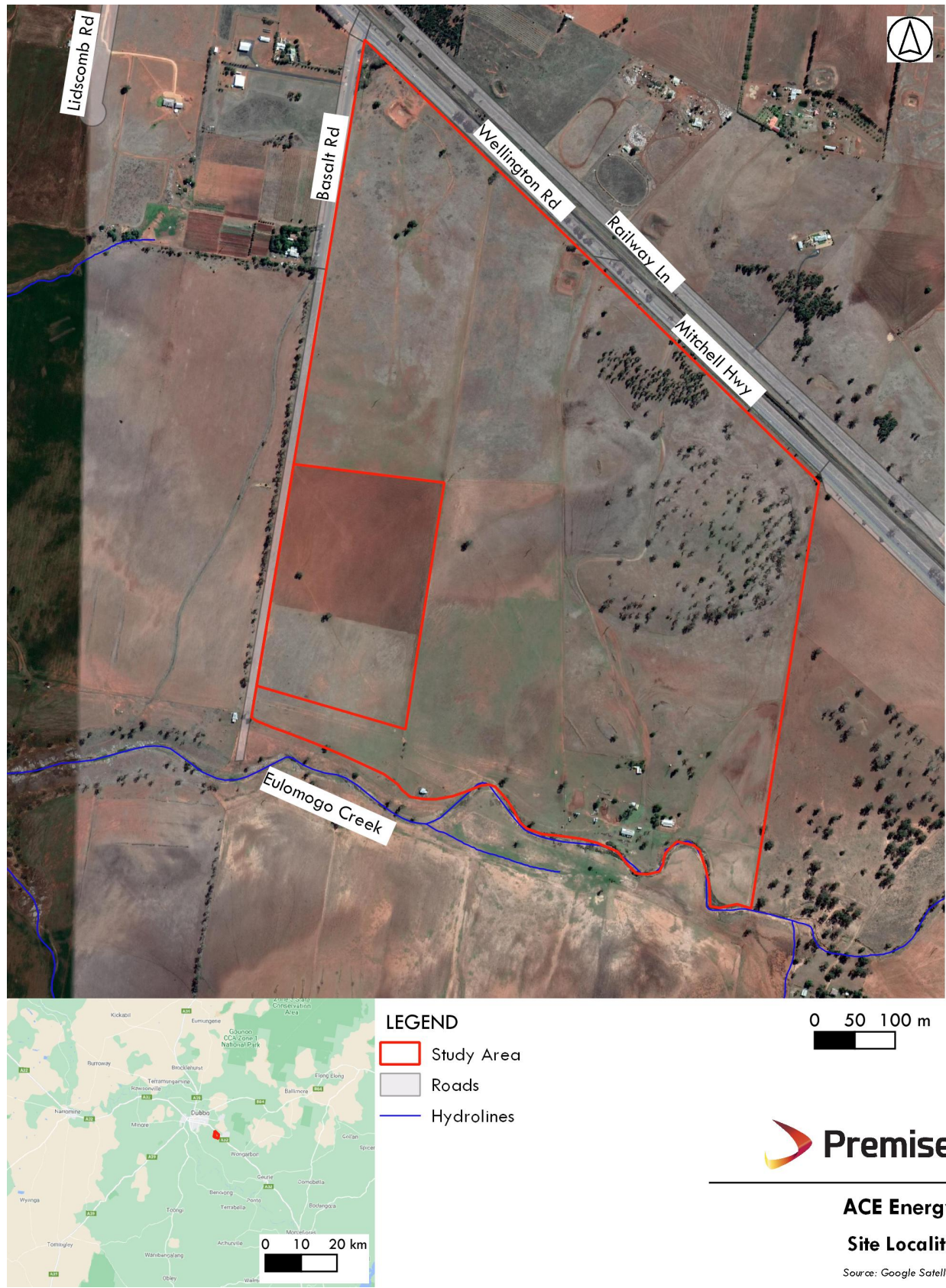
1.3.2 GEOLOGY AND SOILS

The Study Area contains the Wongarbon Soil Landscape (DPIE, 2021a). This is located 15-20 km south-east of Dubbo on undulating rises and low hills (280-360 m elevation) on basalt parent material. This soil landscape is moderately to highly fertile with high water holding capacity and moderate to high erosion potential. It includes euchrozems, red cracking clays and brown cracking clays. Euchrozems are dark reddish-brown clay loam to light clay (pH 6-8). Red cracking clays are reddish-brown medium clay (pH 8.5), and brown cracking clays are self-mulching, grading to coarse brown medium clay (pH 8.5).

1.3.3 CLIMATE

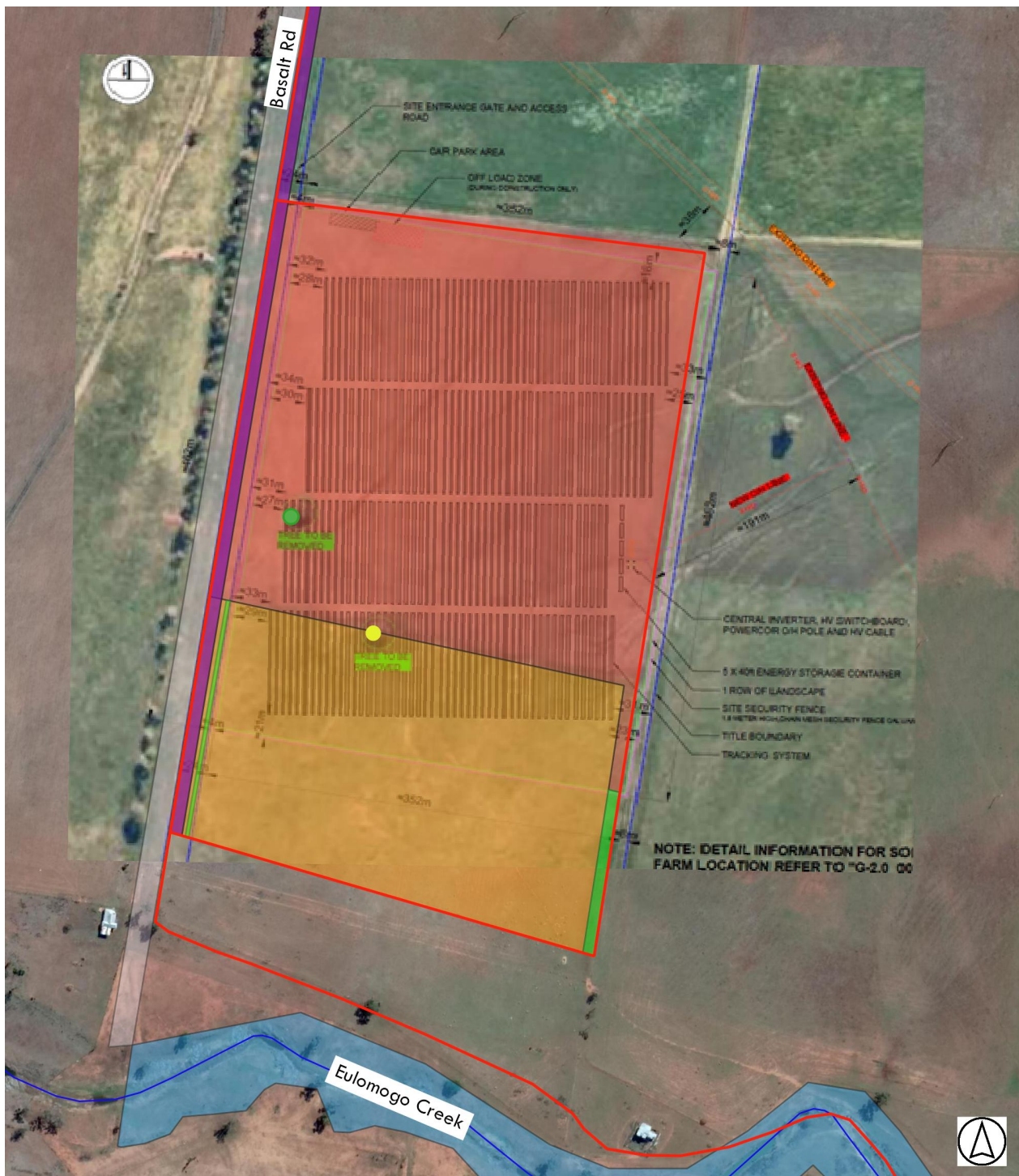
Data from the Bureau of Meteorology (BOM) weather station at Dubbo Airport (Site No. 065070) indicates the climate of the study area is generally warm to hot with high maximum temperatures in summer but cool winters (BOM, 2020). The mean daily maximum temperatures vary from 15.6 degrees C in July to 33.5 degrees C in January. The corresponding mean daily minimum temperatures vary from 3.0 degrees C in July to 18.4 degrees C in January. Rainfall is moderate by Australian standards. Average annual rainfall is 569.8 mm and is spread fairly evenly throughout the year with a tendency for higher rainfall from late spring to early autumn.

Figure 1. Site Location



EPSC-28355 Prepared by: Sally Kirby Date: 15/3/2021 Directory: O:\Synergy\Projects\221\221249\Our\GIS\Ecology.qgz

Figure 2. Solar Panel Positioning



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1.3.4 BIOGEOGRAPHICAL AND BOTANICAL REGIONS

The Study Area lies within the Talbragar Basalts NSW Landscape (Mitchell, 2002), in the Brigalow Belt South Bioregion and Talbragar Valley IBRA Subregion as defined in the Interim Biogeographic Regionalisation of Australia (IBRA) (Thackway and Cresswell, 1995).

1.4 DATABASE SEARCHES

1.4.1 THREATENED BIODIVERSITY

Database searches were undertaken in March 2021 to prepare a list of threatened species potentially occurring in the Project Footprint or surrounding area. Historical records of threatened flora and fauna species, populations, ecological communities and critical habitat were sourced from:

- BioNet website – Searches the NSW National Parks and Wildlife Service, NSW State Forests, Australian Museum and Royal Botanic Gardens Sydney databases (DPIE, 2021b). The search area comprised a 10 × 10 km square centred on the study area. This search returned a list of threatened species records from within the search area.
- Commonwealth Department of the Environment and Energy (DoAWE) website – Protected Matters Search Tool (PMST) (DoAWE, 2021a). The search area comprised the same 10 × 10 km square as for the BioNet search. The PMST uses actual records and habitat modelling to return a list of ‘protected matters’ that are known or predicted to occur in the search area, including threatened species, migratory species, ecological communities, wetlands of international significance, and national and world heritage properties.

1.4.2 THREATENED FLORA AND FAUNA SPECIES

Database and literature searches returned a total of four threatened flora and 25 threatened fauna species that may potentially occur on the study area based on geographic and ecological parameters (Table 1 and Table 2). The habitat requirements of these species have been reviewed and compared to habitat characteristics on the study area and those species considered unlikely to occur are not considered further in this report.

Of the threatened species identified, one bird and two mammals are considered potentially able to utilise the Study Area at times based on their habitat requirements and known distribution (Tables 1 and 2).

1.4.3 ENDANGERED POPULATIONS

29 flora populations and 22 terrestrial fauna populations are listed as endangered under NSW BC Act, as at 23 February 2021 (Scientific Committee, 2021). None are applicable to the study area.

1.4.4 THREATENED ECOLOGICAL COMMUNITIES

The database searches indicated that six threatened ecological communities (TECs) listed in the schedules of the NSW BC Act and/or the Commonwealth EPBC Act may potentially occur on the investigation area (**Table 4**). Two of these TECs are considered likely to have potentially occurred on the Project Footprint:

- *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland, and*
- *Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia.*

Table 2. Threatened Flora Species Predicted to occur near study area based on database searches

Scientific Name	Common Name	Database		Conservation Status		Likelihood to be on Study Area	Assessment of Likelihood
		BioNet ¹	PMST ²	BC Act	EPBC Act		
<i>Austrostipa wakoolica</i>	Spear-grass	-	✓	E	E	Nil	Perennial, densely-tufted grass distributed in central-western and south-western NSW across the floodplains of the Murray River tributaries (DPIE, 2021b). Occurs in open woodland with Grey Box (<i>Eucalyptus microcarpa</i>), White Cypress-pine (<i>Callitris glaucophylla</i>) and Climbing saltbush (<i>Einadia nutans</i>). Project Footprint is not on the inland floodplains, lacks associated species and has been cleared for cropping.
<i>Commersonia procumbens</i> (syn. <i>Androcalva procumbens</i>)		✓	✓	V	V	Nil	<i>Commersonia procumbens</i> is a species of sandstone environments and is mainly known from Pilliga Sandstone areas (DPIE, 2021b). There is one old (1887) record for Dubbo (BioNet, 2021) that probably refers to the nearby Goonoo CCA. Coarse sandy soils do not occur on the Study Area.
<i>Euphrasia arguta</i>	-	-	✓	CE	CE	Nil	<i>Euphrasia arguta</i> has been recorded from grassy areas near rivers at elevations up to 700 m above sea level, with an annual rainfall of 600 mm and grassy forests or regrowth vegetation (DPIE, 2021b). The Study Area has a much lower elevation and rainfall than known locations for this species and is much further inland than the nearest record at Bathurst (DPIE, 2021b).

¹ NSW Atlas of Wildlife (BioNet, 2021)

² Protected Matters Search Tool (DoAWE, 2021a)

E Endangered

CE Critically Endangered

V Vulnerable

Scientific Name	Common Name	Database		Conservation Status		Likelihood to be on Study Area	Assessment of Likelihood
		BioNet ¹	PMST ²	BC Act	EPBC Act		
<i>Prasophyllum</i> sp. (Wybong)	Leek Orchid	-	✓	E	CE	Nil	This taxon is considered synonymous with <i>Prasophyllum petilum</i> in NSW (PlantNet, 2021). Grows in open sites in natural temperate grassland, grassy woodland and in grassy Box-Gum Woodland. Highly susceptible to cultivation and grazing, being retained only at little-grazed travelling stock reserves and in cemeteries (DPIE, 2021b). The Study Area has been heavily grazed historically and is considered to be too disturbed for this species.

Table 3. Threatened Fauna Species predicted to occur on study area based on database searches

Scientific Name	Common Name	Database		Conservation Status		Likelihood to be on Study Area	Assessment of Likelihood
		BioNet ¹	PMST ²	BC Act	EPBC Act		
<i>Anthochaera phrygia</i>	Regent Honeyeater	-	✓	CE	CE	Nil	Occurs in patchy distributions across temperate woodlands and dry open forests of the inland slopes of south-east Australia. Commonly inhabits woodlands supporting high abundance and diversity of bird species and relies on Eucalypt species, such as White Box (<i>Eucalyptus albens</i>) and Yellow Box (<i>Eucalyptus melliodora</i>) for nectar (DPIE, 2021b). Unlikely to occur on the Project Footprint due to the lack of relatively intact woodland habitat required for nesting and foraging.
<i>Anseranas semipalmata</i>	Magpie Goose	✓	-	V	-	Nil	Magpie Geese are associated with wetlands, dry ephemeral swamps, wet grasslands and floodplains (DPIE, 2021b). There are two records on the Macquarie River at Dubbo (BioNet, 2021). Unlikely to occur on Study Area due to lack of suitable habitat wetland habitat.
<i>Botaurus poiciloptilus</i>	Australasian Bittern	-	✓	E	E	Nil	Large wetland species with a widespread, fragmented distribution across south-eastern Australia (DPIE, 2021b). Favours dense vegetation such as spikerushes (<i>Eleocharis</i> spp.) and bullrushes (<i>Typha</i> spp.). Unlikely to occur within Project Footprint due to a lack dense aquatic vegetation.
<i>Calidris ferruginea</i>	Curlew Sandpiper	-	✓	E	CE	Nil	Small migratory shorebird occurring in littoral and estuarine habitats along the NSW coastline, and freshwater wetlands of the Murray-Darling Basin. Inland sightings are likely to occur during migration from Siberia to Australia (DPIE, 2021b). Unlikely to occur on Project Footprint due to lack of suitable habitat.
<i>Falco hypoleucos</i>	Grey Falcon	-	✓	E	V	Nil	Medium-sized bird sparsely distributed across central and western NSW, predominantly throughout the Murray-Darling Basin. Commonly occurs in grassland, shrubland, wooded watercourses and near wetlands, preying on birds such as pigeons and parrots

Scientific Name	Common Name	Database		Conservation Status		Likelihood to be on Study Area	Assessment of Likelihood
		BioNet ¹	PMST ²	BC Act	EPBC Act		
							(DPIE, 2021b). Unlikely to occur on Project Footprint due to lack of riparian vegetation.
<i>Grantiella picta</i>	Painted Honeyeater	-	✓	V	V	Nil	This specialist feeder on mistletoe occurs at low densities across central and eastern NSW, occurring at higher densities on the inland slopes of the Great Dividing Range (DPIE, 2021b). Commonly inhabits Box-Ironbark Forests and Box-Gum Woodland. Often in Weeping Myall (<i>Acacia pendula</i>) trees. Unlikely to occur on Project Footprint due to the absence of mistletoe which is the core component of its diet.
<i>Hirundapus caudacutus</i>	White-throated Needletail	-	✓	-	V	Nil	Non-breeding migratory aerial specialists distributed almost exclusively across eastern and northern Australia, favouring the coast (Australian Museum, 2018). May roost in trees. Breeding occurs in northern Asia (Birdlife, 2021a). Unlikely to occur on the Study Area due to lack of potential roosting trees and the aerial lifestyle of the species.
<i>Lathamus discolor</i>	Swift Parrot	-	✓	E	CE	Nil	Species migrates to south-eastern Australia during autumn/winter (DPIE, 2021b) from its breeding grounds in Tasmania. The NSW distribution is primarily on the south west slopes and coastline. A nectar feeding species favouring Swamp Mahogany (<i>Eucalyptus robusta</i>), White Box (<i>Eucalyptus albens</i>) and Spotted Gum (<i>Corymbia maculata</i>). Unlikely to occur within Project Footprint due to lack of food trees.
<i>Leipoa ocellata</i>	Malleefowl	-	✓	-	V	Nil	Large, ground-dwelling bird found in central NSW, within tall, dense mallee communities. Species has been observed in Eucalypt woodlands, such as Bimble Box Woodlands and Inland Grey Box (DPIE, 2021b). Unlikely to occur on Project Footprint due to lack of suitable vegetation and shrub understorey.
<i>Numenius madagascariensis</i>	Eastern Curlew	-	✓	-	CE	Nil	Migratory shorebird formerly widespread across north-eastern and southern Australian coastlines (Birdlife, 2020b). Rarely

Scientific Name	Common Name	Database		Conservation Status		Likelihood to be on Study Area	Assessment of Likelihood
		BioNet ¹	PMST ²	BC Act	EPBC Act		
							observed inland due to dependence on intertidal mudflats, sandflats and seagrass for diet (crabs, molluscs). Unlikely to utilise Project Footprint due to lack of suitable habitat and dietary requirements.
<i>Polytelis swainsonii</i>	Superb Parrot	✓	✓	V	V	High	Large parrot distributed across central and eastern inland NSW (DPIE, 2021b). Species migrates during winter to upper regions of Gwydir and Namoi Rivers and nests in hollows of riparian vegetation. Found in association with Box-Cypress pine, River Red Gum Forest, Box-Gum and Boree Woodlands. Species may forage up to 10 km away from nest sites in grassy box woodland. The Superb Parrot has been recorded on the Study Area in 2000 and the Yellow Box (<i>Eucalyptus melliodora</i>) tree recorded on the site contains suitable nesting hollows (DPIE, 2021b). Species may utilise the Study Area for nesting. However, is unlikely to utilise the site for foraging due to absence of native grasses as a result of clearing for cropping.
<i>Rostratula australis</i>	Australian Painted Snipe	-	✓	E	E	Nil	Small freshwater bird distributed in south-east Australia, predominantly in the Murray-Darling Basin wetlands and swamps. Species prefers fringes of dams, swamps and wetlands with nesting occurring among tall vegetation (DPIE, 2021b). Foraging occurs on mudflats and in shallow water, feeding on worms, insects, plants and molluscs. Suitable wetland vegetation is absent from the Study Area.
<i>Pomatostomus temporalis temporalis</i>	Grey-crowned Babbler (eastern subspecies)	✓	-	V	-	Nil	The Grey-crowned Babbler is common in the Dubbo area (BioNet, 2021). It prefers open Box-Gum Woodlands on the slopes, and Box-Cypress-pine and open Box Woodlands on alluvial plains, all with dense low trees below the canopy (DPIE, 2021b). The Study Area lacks suitably dense vegetation and is severely degraded. Closest recorded sighting is 2 km east of the Study Area along Eulomogo Creek (BioNet, 2021).

Scientific Name	Common Name	Database		Conservation Status		Likelihood to be on Study Area	Assessment of Likelihood
		BioNet ¹	PMST ²	BC Act	EPBC Act		
<i>Galaxias rostratus</i>	Flathead Galaxias	*	✓	-	CE	Nil	Flathead Galaxias are a small native fish known from the southern part of the Murray Darling Basin. They have been recorded in the Macquarie, Lachlan, Murrumbidgee and Murray Rivers in NSW. Despite extensive scientific sampling there have been very few recent recorded sightings. They are considered locally extinct in the lower Murray, Murrumbidgee, Macquarie and Lachlan Rivers. The species is now only known from the upper Murray River near Tintaldra and wetland areas near Howlong.
<i>Maccullochella macquariensis</i>	Trout Cod	*	✓	-	E	Nil	Occurs in a restricted distribution, mainly confined to the southern Murray-Darling river system, especially between Yarrawonga and Barmah (EPSDD, 2019a; Bray & Thompson 2019). Species requires large permanent pools and is unlikely to occur on the Study Area due to the small size and ephemeral hydrology of Eulomogo Creek.
<i>Maccullochella peelii</i>	Murray Cod	*	✓	-	V	Nil	Large freshwater fish occurring predominantly in the Murray-Darling Basin in a range of warm water habitats varying from clear, rocky streams to slow, turbid rivers (DoAWE, n.d.). Species requires large permanent pools and is unlikely to occur on Study Area due to small size and ephemeral hydrology of Eulomogo Creek.
<i>Macquaria australasica</i>	Macquarie Perch	*	✓	-	E	Nil	Species is distributed in upstream reaches of Murray-Darling Basin of the Lachlan, Murray and Murrumbidgee rivers. Commonly occurs in shaded, cool rivers (EPSDD, 2019b). Species requires large permanent pools and is unlikely to occur on Study Area due to small size and ephemeral hydrology of Eulomogo Creek.
<i>Miniopterus orianae oceanensis</i>	Large Bent-winged Bat	✓	-	V	-	Low	The Large Bent-winged Bat is regularly recorded in the Dubbo region (BioNet, 2021). It roosts in caves and man-made structures such as mines and storm water drains and forages in wooded areas, flying above the treetops. It is unlikely to have breeding

Scientific Name	Common Name	Database		Conservation Status		Likelihood to be on Study Area	Assessment of Likelihood
		BioNet ¹	PMST ²	BC Act	EPBC Act		
							habitat in the Study Area but may forage over the woodland at the north-western extent of the site. The closest recorded sighting is 1.5 km south-east of the Study Area (BioNet, 2021).
<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheathtail Bat	✓	-	V	-	Low	The Yellow-bellied Sheathtail Bat is regularly recorded around Dubbo with the closest recorded sighting occurring 1.5 km south-east of the Study Area (BioNet, 2021). It roosts in tree hollows and forages over the tree canopy or open country (BioNet, 2021). Suitable tree hollows are present on the Study Area, and there is some potential that it may forage locally.
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	-	✓	V	V	Nil	Small to medium sized bat found in a patchy distribution in areas with extensive cliffs and caves in the NSW Southern Highlands (DPIE, 2021b). Observed in low to mid-elevation dry open forest and woodland close to cliffs and caves. Species may utilise surrounding area but is unlikely to inhabit Project Footprint due to lack of roosting habitat.
<i>Nyctophilus corbeni</i>	Corben's Long-eared Bat	-	✓	V	V	Nil	Small bat distributed across south eastern NSW, particularly within the Pilliga Scrub and Murray Darling Basin (DPIE, 2021b). Found roosting in hollows, under loose bark or within crevices in mallee and box eucalypt dominant communities with Bulloke (<i>Allocasuarina leuhmanni</i>). Closest recorded sightings are within Goonoo SCA and Goobang NP (BioNet, 2021). Species unlikely to utilise Study Area due to lack of ecosystem complexity and level of site degradation.
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	-	✓	V	V	Nil	Usually found within 200 km of eastern Australian coastline in subtropical and temperate rainforests, woodlands, tall sclerophyll forests, swamps, heaths (DPIE, 2021b). However, can be located outside of traditional range when there are natural resource shortages and can travel up to 50 km to forage. Roosting camps are commonly found in gullies, close to water and in dense vegetation. Species may utilise surrounding area but is unlikely to

Scientific Name	Common Name	Database		Conservation Status		Likelihood to be on Study Area	Assessment of Likelihood
		BioNet ¹	PMST ²	BC Act	EPBC Act		
							inhabit Project Footprint due to unsuitable roosting and foraging habitat.
<i>Dasyurus maculatus maculatus</i>	Spotted-tailed Quoll	-	✓	V	E	Nil	Generalist predator widely distributed across eastern Australia. However, sightings on mainland are considered rare (DPIE, 2021b). Species utilise a wide range of habitats including riparian forest, open forest and woodland. Hollows, logs, burrows and caves are commonly inhabited. Unlikely to occur on Project Footprint or surrounding area due to agricultural clearing and absence of suitable denning habitat.
<i>Phascolarctos cinereus</i>	Koala	-	✓	V	V	Nil	Arboreal marsupial with a fragmented distribution throughout eastern Australia. Predominately found in NSW on the central and north coasts, southern/northern tablelands, southern highlands, southern coastal forests and Blue Mountains with small populations occurring west of the Great Dividing Range (DPIE, 2021b). Species inhabit eucalypt woodlands and forests and have wide variations in home range. Species unlikely to occur in Project Footprint due to level of degradation from agriculture and the presence of one suitable, isolated feed tree.
<i>Aprasia parapulchella</i>	Pink-tailed Worm-lizard	-	✓	V	V	Nil	Species distribution includes Central and Southern Tablelands and the South Western Slopes. It inhabits rocks in well-drained, open woodland areas with native grasses, such as Kangaroo Grass (<i>Themeda australis</i>). Species unlikely to utilise Project Footprint due to close proximity to creek and lack of surface rocks.

¹ NSW Atlas of Wildlife (BioNet, 2021)

² Protected Matters Search Tool (DoAWE, 2021a)

* Listed on Fisheries Management Act 1994

E Endangered

CE Critically Endangered

V Vulnerable

Table 4. Threatened Ecological Communities Predicted to Occur in the Surrounding Region

Name of Threatened Ecological Community	Database		Conservation Status ³		Likelihood to be on Study Area	Assessment of Likelihood
	BioNet ¹	PMST ²	BC Act	EPBC Act		
Coolibah – Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions	-	✓	E	E	Nil	A woodland community found on the grey, self-mulching clays of periodically waterlogged floodplains, swamp margins, ephemeral wetlands, and stream levees. The structure of the community may vary from tall riparian woodlands to very open 'savanna like' grassy woodlands with a sparse midstorey of shrubs and saplings (DPIE, 2021b). Typically, these woodlands form mosaics with grasslands and wetlands, and are characterised by Coolibah (<i>Eucalyptus coolabah</i>) and, in some areas, Black Box (<i>Eucalyptus largiflorens</i>). While grey self-mulching clays are present across some of the Study Area, the dominant trees are absent, occurring further west at lower altitudes.
Grey Box (<i>Eucalyptus microcarpa</i>) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	-	✓	-	E	High	Inland Grey Box Woodland includes woodlands in which the most characteristic tree species, Inland Grey Box (<i>Eucalyptus microcarpa</i>), is often found in association with Poplar Box (<i>Eucalyptus populnea</i> subsp. <i>bimbi</i>), White Cypress Pine (<i>Callitris glaucophylla</i>), Kurrajong (<i>Brachychiton populneus</i>), Bulloak (<i>Allocasuarina luehmannii</i>) or Yellow Box (<i>Eucalyptus melliodora</i>), and sometimes with White Box (<i>E. albens</i>) (DSEWPC, 2012). There is a correlation between the distribution of Grey Box communities and soils of Tertiary and Quaternary alluvial origin, largely corresponding with the Red Brown Earths (DPIE, 2021b). The community is known to occur in the Dubbo region and may exist in a remnant form on the Study Area which contains both Kurrajong and Yellow Box trees.
Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland.	-	✓	-	CE	Nil	This community is strongly reliant on soil type as it is associated with fine textured, often cracking clays derived from either basalt or quaternary alluvium. The ecological community generally occurs on flat to low slopes, of no more than 5% (or less than 1 degree) inclination (DPIE, 2021b). The Study Area exclusively includes a cleared cropped paddock and characteristic species of this community are not found on or near the Study Area.
Poplar Box Grassy Woodland on Alluvial Plains	-	✓	-	E	Nil	The Poplar Box Grassy Woodland on Alluvial Plains ecological community is typically a grassy woodland with a canopy dominated by <i>Eucalyptus populnea</i> and understorey mostly of grasses and other herbs. The ecological community

Name of Threatened Ecological Community	Database		Conservation Status ³		Likelihood to be on Study Area	Assessment of Likelihood
	BioNet ¹	PMST ²	BC Act	EPBC Act		
						mostly occurs in gently undulating to flat landscapes and occasionally on gentle slopes on a wide range of soil types of alluvial and depositional origin. Poplar Box is not a dominant species anywhere on the Study Area. Accordingly, this community is absent.
Weeping Myall Woodlands	-	✓	-	E	Nil	This ecological community is scattered across the eastern parts of the alluvial plains of the Murray-Darling river system. Myall (<i>Acacia pendula</i>) woodlands occur on alluvial or stagnant alluvial soil landscapes on the lower south west slopes and plains of NSW (NSW Scientific Committee, 2021). Typically, it occurs on red-brown earths and heavy-textured grey and brown alluvial soils. Associated tree species include Belah (<i>Casuarina cristata</i>), Yarran (<i>Acacia homalophylla</i>), Miljee (<i>Acacia oswaldii</i>), Rosewood (<i>Alectryon oleifolius</i>) and Warrior Bush (<i>Apophyllum anomalum</i>). Alluvial soils occur on the Study Area, but the characteristic species of this community are absent.
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	-	✓	CE	CE	High	This ecological community, commonly known as Box-Gum Woodland, is widespread on the NSW western slopes and tablelands (DPIE, 2021b). It was formerly one of the dominant communities in the region south and east of Dubbo. It occurs on relatively deep high fertility soils, such as the Wongarbon Soil Landscape that occurs on volcanic soils in the Dubbo region and on active alluvial plains. The alluvial soils on parts of the Study Area are suitable for Box-Gum Woodland and a remnant Yellow Box tree is present.

1 NSW Atlas of Wildlife (BioNet, 2021)

2 Protected Matters Search Tool (DoAWE, 2021a)

3 E Endangered; CE Critically Endangered; V Vulnerable

2. METHODS

2.1 SURVEY TIMING

Vegetation surveys were undertaken on 9 March 2021 to identify and map vegetation types and assess habitat characteristics within the study area. The weather was clear and rainfall in preceding months made conditions favourable for plant identification due to the presence of flowering parts.

2.2 VEGETATION SAMPLING

To characterise vegetation types two sampling methods were employed in the form of three Biodiversity Assessment Method (BAM) quadrats and four rapid assessment spot samples. The BAM quadrats were randomly placed on the solar farm footprint and the spot samples were distributed in areas of interest adjacent to the solar farm footprint.

2.2.1 BAM QUADRATS

The methodology for BAM quadrats is summarised below:

- A 20 × 20 m full floristic sub-plot was conducted at one end of the 50 × 20 m BAM quadrats to gain data on vegetation structure and composition on the Study Area. A list of all vascular plant species was made on each plot with estimates of abundance and ground cover for each species.
- The full 50 × 20 m quadrat was used for estimates of leaf litter cover on five 1m² sub-plots, for counts of trees according to 7 size classes and the presence or absence of hollow limbs.

2.2.2 RAPID ASSESSMENT SPOT SAMPLING

Four rapid assessment spot samples were conducted in three areas:

- In the riparian zone of Eulomogo Creek (SS1),
- along the access track (SS2), and
- in remnant native grassland beside the solar farm footprint (SS3 and SS4)

All plant species were recorded within an approximate 20 x 20 m area centred on the point of a GPS reading. Each species was given an abundance rating according to the following approximate scale;

- | | |
|---|----------------------|
| a | Abundant (>50) |
| c | Common (11 to 50) |
| o | Occasional (6 to 10) |
| u | Uncommon (3 to 5) |
| r | Rare (1 or 2) |

2.2.3 VEGETATION AND PLANT COMMUNITY TYPES

Vegetation types were described and categorised according to the dominant species, level of disturbance and the presence or absence of exotic and native vegetation.

The Plant Community Type (PCT) present on the Study Area was identified using the DPIE BioNet Vegetation Classification System (VCS) (DPIE, 2021c). The VCS was searched for described communities containing the

dominant tree species found on and around the site (Figure 3). The appropriate PCT for the Study Area was selected from candidate communities in the VCS by comparing the characteristic tree shrub and ground cover species of the PCT with the dominant species on the study area, also considering the known geographic distribution, landscape position and soils associated with each PCT. Threatened Ecological Communities (TEC) associated with each PCT are identified in the PCT profile and conformance of the vegetation with a TEC was verified by reference to the relevant Final Determination of the NSW Scientific Committee (Scientific Committee, 2021).

2.3 FAUNA

Fauna present on the Study Area were recorded opportunistically while conducting flora spot samples and generally moving around the site.

3. RESULTS AND DISCUSSION

3.1 FLORA

3.1.1 VEGETATION TYPES

The Study Area is mapped as non-native vegetation on the NSW Government SEED map (NSW Government, 2021).

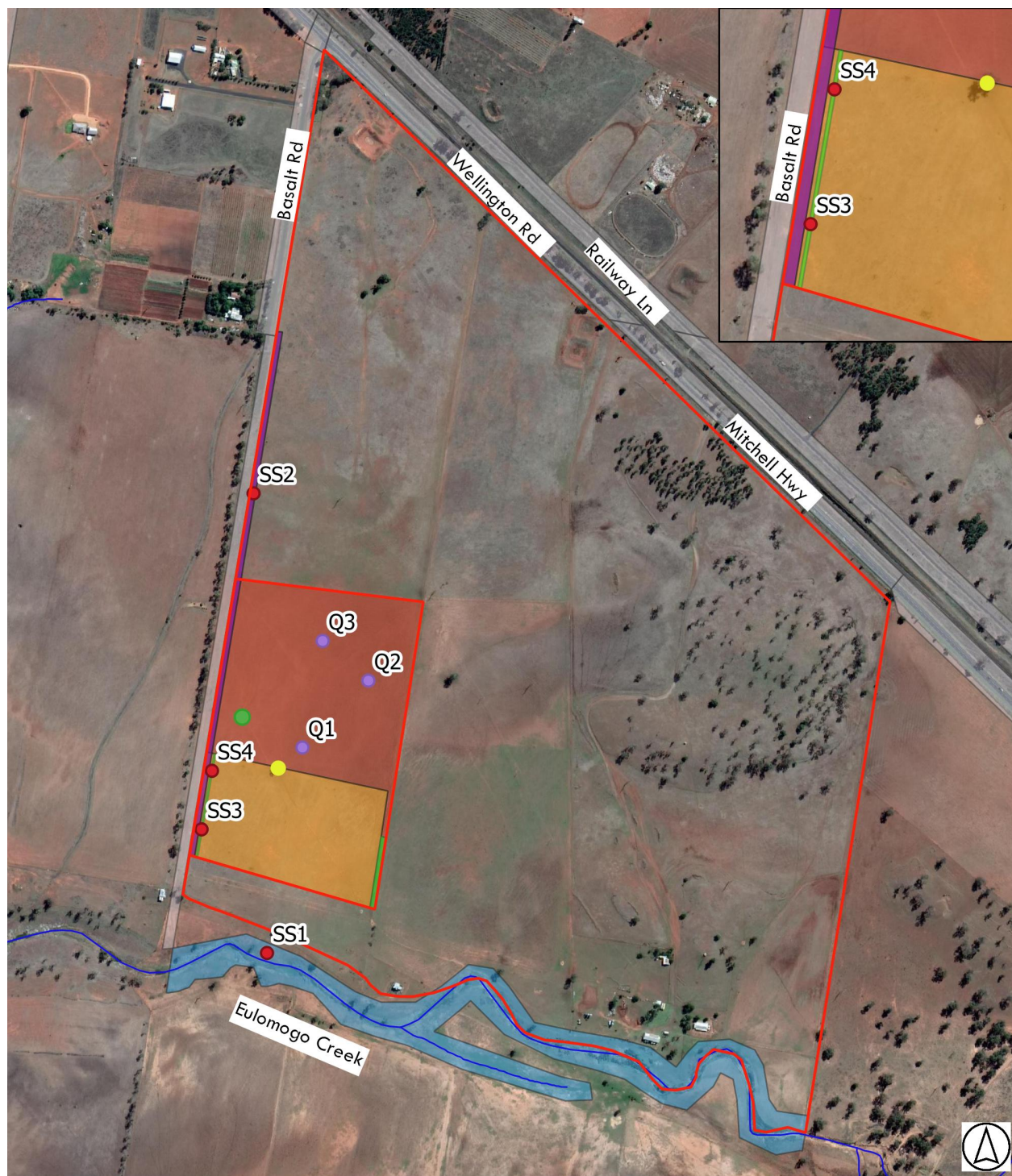
The vegetation survey determined that the Solar Farm Footprint is exclusively a cleared cropping paddock with two remnant native trees comprising one Yellow Box (*Eucalyptus melliodora*) and one Kurrajong (*Brachychiton populneus*). These remnant trees on the site, those in the surrounds, site geology and landscape position indicate that the former PCT on the site was most likely PCT 437: *Yellow Box grassy woodland on lower hillslopes and valley flats in the southern NSW Brigalow Belt South Bioregion*.

A narrow strip of derived native grassland occurs on the western border of the solar farm footprint and in the adjoining paddock to the south. This vegetation is consistent with PCT 511: *Queensland Bluegrass - Redleg Grass - Rats Tail Grass - spear grass - panic grass derived grassland of the Nandewar Bioregion and Brigalow Belt South Bioregion*.

Remnant native vegetation comprising PCT 437, dominated by native grasses, with some native forbs and occasional native trees occurs along Eulomogo Creek at the southern extent of the Study Area.

The Study Area was categorised into the following vegetation units: Exotic-dominated Grassland, Derived Native Grassland, Riparian Area and disturbed ground (**Figure 3**).

Figure 3. Sample Locations and Vegetation Types



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LEGEND

- | | | |
|---|---|---|
|  Study Area |  Roads |  Exotic Grassland |
|  Spot Sample Locations |  Track |  Cultivated Ground |
|  Quadrat Locations |  <i>Brachychiton populneus</i> |  Native Grassland |
|  Hydrolines |  <i>Eucalyptus melliodora</i> |  Riparian Area |

Table 5. Vegetation Types identified on Study Area (Figure3)

Mapping Unit	Vegetation Type		Comments
	PCT	Name	
1	-	Exotic-dominated Grassland	Cropping paddock with predominantly exotic species
2	437	Riparian Area	Ephemeral creek line with remnant native vegetation and exotics.
3	511	Secondary Native Grassland	Narrow strips approximately 3 m wide on the eastern and western sides of the cultivated area.
4	-	Cultivated ground	Southern section of solar farm footprint
4	-	Disturbed ground	Track on western side of the Study Area.

3.1.2 FLORA SPECIES

Plant species identities were confirmed using keys and descriptions from several databases and publications (PlantNet, 2021; Richardson, *et al.* 2011); Harden (1993).

3.1.3 VEGETATION COMMUNITY DESCRIPTIONS

3.1.3.1 Mapping Unit 1 – Exotic-dominated Grassland (13.98 ha)

The exotic grassland comprises land that was prepared for sowing a winter crop prior to the recent severe drought (Figure 4). Three BAM quadrat samples were taken within it (Appendix A). Following the breaking of the drought in autumn 2020, the paddock regenerated to a range of exotic species predominantly forbs including Potato Weed (*Heliotropium amplexicaule*), Wireweed (*Polygonum aviculare*), Maltese Cockspur (*Centaurea melitensis*), Skeleton Weed (*Chondrilla juncea*), Twining Toadflax (*Kickxia elatine*), Common Wheat (*Triticum aestivum*), Saffron Thistle (*Carthamus lanatus*) and several medic species (*Medicago polymorpha*, *M. truncatula* and *M. minima*). Only two native species were prominent, but did not dominate the ground cover; Awnless Barnyard Grass (*Echinonochloa colona*) and Quena (*Solanum esuriale*).

3.1.3.2 Mapping Unit 2 – Riparian Area (12.29 ha)

The Riparian Area along Eulomogo Creek is represented by Spot Sample 1 (Appendix A). Occasional Yellow Box (*Eucalyptus melliodora*) trees are present, along with the native shrub Pepper Leaf Senna (*Senna clavigera*). The stream banks are dominated by native grasses including Couch (*Cynodon dactylon*) and Warrego Grass (*Paspalidium jubiflorum*). Other native grasses included occasional Slender Bamboo Grass (*Austrostipa verticillata*), Purple Wiregrass (*Aristida ramosa*) and Plains Grass (*Austrostipa aristiglumis*). Native forbs included Kidney Weed (*Dichondra repens*) which was common, while Tarvine (*Boerhavia domini*) and Yellow Vine (*Tribulus micrococcus*) were occasional. Exotic species were dominated by Saffron Thistle (*Carthamus lanatus*), with small abundances of Flaxleaf Fleabane (*Conyza bonariensis*) and Variegated Thistle (*Silybum marianum*). The High Threat Exotic African Boxthorn (*Lycium ferocissimum*) was also occasionally observed on the site.

Figure 4. Exotic-dominated Grassland on Cropping Paddock



3.1.3.3 Mapping Unit 3 – Secondary Native Grassland (0.22 ha)

A narrow strip of Secondary Native Grassland between the cultivated area and the track was sampled by two spot samples (3 and 4) (**Appendix A**). This grassland is classified as secondary grassland because it is not considered to be remnant ground cover vegetation from clearing of the overstorey and shrub layers. Rather, since the ground has a long history of cultivation, the native vegetation has recolonised and re-established in this area. The implications of this are that the vegetation comprises primarily dispersive colonising species and tends to lack less dispersive species, especially many perennial native herbs. The main grasses present are Windmill Grass (*Chloris truncata*) and Queensland Bluegrass (*Dichantheum sericeum*). Other common native grasses are Fox-tail Speargrass (*Austrostipa scabra*), Couch (*Cynodon dactylon*), Nine-awn Grass (*Enneapogon nigricans*) and Weeping Lovegrass (*Eragrostis parviflora*). Common native forbs include Australian Bindweed (*Convolvulus graminetinus*), Kidney Weed (*Dichondra repens*) and Fuzzweed (*Vittadinia cuneata*). Common to abundant introduced species include Maltese Cockspur (*Centaurea melitensis*), Saffron Thistle (*Carthamus lanatus*) and Burr Medic (*Medicago polymorpha*).

Figure 5. Secondary Native Grassland between cultivated Ground and Track



3.1.4 PRIORITY, NATIONALLY SIGNIFICANT AND HIGH THREAT WEEDS

Two significant weed species were identified on the project footprint during the flora survey (Appendix A). Both are listed as High Threat Environmental Weeds by DPIE (DPIE, 2021d), but neither are listed as Weeds of National Significance by the Australian Weeds Committee of the Commonwealth Government (DoAWE, 2021b) nor as Priority Weeds for the Central West area under the NSW *Biosecurity Act 2015* (DPI, 2021) (**Table 6**)

Table 6. Priority, Nationally Significant and High Threat Weeds identified on Study Area

Common Name	Scientific Name	Priority Weed ¹	Weed of National Significance ²	High Threat ³
Saffron Thistle	<i>Carthamus lanatus</i>	X	X	✓
Bathurst Burr	<i>Xanthium spinosum</i>	X	X	✓

¹ DPI (2021)

² DoAWE (2021b)

³ DPIE (2021d)

3.2 FAUNA

3.2.1 FAUNA HABITAT TYPES

The Study Area has been highly modified from its original form via almost 200 years of European occupation, particularly through agricultural practices. The study area has been long cleared of its original native woodland tree and shrub cover, while only the most resilient elements of the original ground cover remain. Habitat features such as cliffs, caves, rocky outcrops, low shrubs, swamps and termite mounds do not occur

on the site. Logs, leaf litter and surface rocks are also largely absent except under the Yellow Box (*Eucalyptus melliodora*) tree and in the adjacent riparian area of the Eulomogo Creek south of the Study Area. Limited fauna habitat comprising native grassland, temporary pools, rocks and logs occur along Eulomogo Creek, and in the Native Grassland.

3.2.1.1 Eulomogo Creek

Eulomogo Creek is a tributary of the Macquarie River which flows west of Dubbo. The creek flows along the southern extent of the Study Area and lacks instream vegetation. It contains large areas of cobble-bedded substrate which may provide basking habitat for small lizards. The creek is an ephemeral intermittent watercourse which is unlikely to provide habitat for larger fish species such as Trout Cod (*Maccullochella macquariensis*) and Murray Cod (*Maccullochella peelii*). It may however, support tadpoles, small fish and frog species due to the presence of small ponds.

3.2.1.2 Riparian Area

The riparian area is dominated by native species such as Couch (*Cynodon dactylon*), Warrego Grass (*Paspalum jubiflorum*), Pepper Leaf Senna (*Senna clavigera*) and Kidney Weed (*Dichondra repens*). Native hollow-bearing Yellow Box (*Eucalyptus melliodora*) trees may provide nesting and roosting habitat for bats, arboreal mammals and birds. The stream banks also contain a small abundance of exotic species limited to the forbs Saffron Thistle (*Carthamus lanatus*), Flaxleaf Fleabane (*Conyza bonariensis*) and Variegated Thistle (*Silybum marianum*). Small numbers of the High Threat Exotic African Boxthorn (*Lycium ferocissimum*) also occur. This exotic shrub may provide shelter and nesting habitat for small birds such as the Superb Fairy-wren (*Malurus cyaneus*) and finches.

3.2.1.3 Exotic grassland

The exotic grassland in the cropping paddock may provide limited opportunities for foraging by birds of prey during mouse plagues and for seed eating birds such as rosellas, grass parrots, Galahs, Cockatoos, Crested Pigeons and possibly finches (though shrub cover is lacking for the latter).

3.2.1.4 Secondary native grassland

The area of secondary native grassland is too small to provide significant habitat for native grassland fauna species, such as quails, larks and other grassland specialists.

3.2.2 HABITAT TREES

Two mature isolated paddock trees occur on the solar farm footprint and would be removed by the project (**Table 7**). Both are very large trees containing hollows suitable for use by a variety of wildlife (**Figures 6 and 7**).

Table 7. Habitat trees for removal

Scientific Name	Common Name	Hollow Size (no.)			DBH ¹
		<5cm	5-20cm	>20cm	
<i>Brachychiton populneus</i>	Kurrajong	0	1	1	80
<i>Eucalyptus melliodora</i>	Yellow Box	1	9	1	70

¹ Diameter at Breast Height

Figure 6. Kurrajong in Cropping Paddock



Figure 7. Yellow Box Tree on Edge of Cropping Paddock and Cultivated Ground



3.2.3 OPPORTUNISTIC FAUNA RECORDS

Only one native fauna species was observed on the Study Area during the survey, the Eastern Rosella (*Platycercus eximius*).

3.3 THREATENED BIODIVERSITY

3.3.1 THREATENED ECOLOGICAL COMMUNITIES

Both PCT 437 and PCT 511 on the Study Area are part of the Box-Gum Woodland Critically Endangered Ecological Community (CEEC). This community is listed under the BC Act and the EPBC Act, as follows;

- *White Box Yellow Box Blakely's Red Gum Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions Critically Endangered Ecological Community (BC Act)*
- *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland Critically Endangered Ecological Community (EPBC Act)*

The most intact remnant of Box-Gum Woodland CEEC is that along Eulomogo Creek, which would not be cleared by the project. Although the community once occurred on the solar farm footprint, it has been eliminated by the long-term use of the site for agriculture, such that only two remnant, isolated paddock trees remain. The strip of secondary native grassland (0.22 ha) does not exceed the thresholds for entry into the NSW Biodiversity Offsets Scheme or for protection under the EPBC Act.

3.3.2 THREATENED FLORA

No threatened flora species, populations or critical habitat listed under the BC Act or the EPBC Act were identified.

3.3.3 THREATENED FAUNA

No threatened fauna species, populations or critical habitat listed under the BC Act or the EPBC Act were identified by the survey.

4. BIODIVERSITY IMPACT ASSESSMENT

4.1 IMPACT AVOIDANCE AND MINIMISATION MEASURES

The Project has been designed to avoid and minimise impacts on biodiversity, using the following strategies:

- Erosion from exposed ground during the solar farm construction will be minimised using sediment traps to prevent sediment runoff into Eulomogo Creek.
- A trained wildlife handler will be present on site to supervise tree removal and, if need be, translocate displaced species to suitable trees in the surrounding landscape.
- Dust suppression measures will be put in place during earthworks.
- All rubbish and materials will be removed from the site when construction is completed.

4.2 RESIDUAL PROJECT IMPACTS

4.2.1 DIRECT IMPACTS

After implementation of impact minimisation measures, residual impacts would include:

- The removal of the two existing remnant native trees on the solar farm footprint.
- The loss of potential nesting and/or roosting habitat for bats and birds. Owing to the isolation of the trees in the landscape it is unlikely they would be used by arboreal mammals.
- A small reduction in roosting and nesting opportunities for hollow-dependent wildlife locally.
- Resident species utilising the remnant trees on the Study Area that are translocated to suitable habitat in the surrounding landscape would have reduced chances of survival.

4.2.2 INDIRECT AND LONG-TERM IMPACTS

The project is considered unlikely to cause significant indirect or long-term impacts. The indirect and long-term impacts would include:

- Reduction in habitat ultimately means a small reduction in hollow-dependent wildlife populations in the landscape.
- Opportunistic bird species such as the Australian Magpie (*Cracticus tibicen*), Magpie-lark (*Grallina cyanoleuca*), Willie Wagtail (*Rhipidura leucophrys*) and Crested Pigeons (*Ocyphaps lophotes*), may increase in abundance during solar farm construction due to increased human activity which may temporarily increase feeding opportunities.

4.2.3 CUMULATIVE IMPACTS

The activity is unlikely to result in a loss of native groundcover diversity as the Study Area is mostly dominated by exotic species of low conservation significance. In any event, disturbance to ground cover, including the secondary native grassland remnant, is considered likely to be temporary with full recovery, given that the soil seedbank is likely to remain intact.

4.2.4 SERIOUS AND IRREVERSIBLE IMPACTS

One entity found on the Study Area, Box-Gum Woodland CEEC, is listed in the Threatened Species Data Collection (DPIE, 2021c) as a candidate for potentially being subject to Serious and Irreversible Impacts (SAII) from developments. SAIIs are only required to be assessed as part of the Biodiversity Offsets Scheme (BOS). Since this project does not exceed the clearing thresholds for entry into the BOS, assessment under the SAII guidelines is not undertaken in this report.

4.3 BIODIVERSITY FOR IMPACT ASSESSMENT

Tables 2-4 of this report list the threatened species predicted to occur in the region surrounding the Study Area. Matching the known habitat requirements of the threatened entities to the resources available on the study area, it was possible to determine the likelihood of species being present on the study area (**Table 8**). This section assesses the potential impact of the activity on each of the species that are considered to have potential to occur.

Table 8. Analysis of Habitat Suitability of Study Area for potential threatened species

(X = factor missing or unsuitable, ✓ = factor present, blank = not applicable)

Species		Factor											Special Requirements	Comments	Habitat suitable?
	Nectar	Native seed	Rushes and sedges	Shrub cover	Litter	Shallow water	Open areas	Tree Canopy	Tree hollows	Logs	Rocks	Caves			
Superb Parrot	✓	✓		X			✓	X	✓				Inhabits Box-Gum Woodlands nesting in riparian hollows or isolated paddock trees. Foraging occurs in grassy box woodland, relying on understorey shrubs, especially seeding acacias and grasses.	The remnant Yellow Box (<i>Eucalyptus melliodora</i>) on the Study Area contains suitable hollows (5-20 cm and >20 cm) but the Study Area and surrounds lack the required shrub understory for foraging.	Yes (nesting)
Yellow-bellied Sheathtail-bat				X			✓	X	✓			X	Relies on tree hollows for roosting. Foraging occurs in open grasslands with and without trees.	Site contains suitable foraging environment and roosting sites are available in hollow-bearing trees on the Study Area.	Yes (roosting and foraging)
Large Bent-winged Bat				X			✓	X	✓			X	Roosting requires man-made structures or caves. Foraging for insects occurs in forested areas.	Site lack suitable canopy cover required for foraging. Species is sensitive to human disturbance such as traffic.	No

4.4 ASSESSMENTS OF SIGNIFICANCE

The habitat filtering (**Tables 2 and 3**) and habitat suitability (**Table 8**) analyses identified two threatened fauna species which may potentially be impacted by the proposal on the study area as summarised in **Table 9**.

Table 9. Summary of Threatened Species for Impact Assessment

Scientific Name	Common Name	Likely Status
<i>Polytelis swainsonii</i>	Superb Parrot	Nesting
<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheathtail-bat	Roosting and foraging

4.4.1 THREATENED ECOLOGICAL COMMUNITIES

One Threatened Ecological Community (TEC), *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland*, was identified as potentially occurring on the study area. This exists as two isolated paddock trees and a small remnant of secondary native grassland (0.22 ha). A Five Part Test of Significance is conducted below for this community.

4.4.2 THREATENED FLORA

No threatened flora species were identified as having potential to occur on the Study Area based on literature and database searches. Also, no threatened flora species were recorded during flora surveys.

4.4.3 THREATENED FAUNA

The fauna species for assessment include the Superb Parrot (*Polytelis swainsonii*) and the Yellow-bellied Sheathtail-bat (*Saccolaimus flaviventris*) (**Table 8**).

The Superb Parrot may nest in the hollow-bearing trees present on and surrounding the Study Area, as they commonly inhabit Box-Gum Woodland riparian hollows or isolated paddock trees. Suitable nesting trees such as Yellow Box (*Eucalyptus melliodora*) were recorded on the Study Area, as well as in the riparian zone during vegetation surveys. In the surrounding area, the Superb Parrot is widely distributed across the Central Tablelands, with breeding areas recorded near Cowra and surrounding Mandurama, Carcoar and Blayney (Baker-Gabb, 2011). This species is recorded regularly in the Dubbo/Narromine/Bodangora areas (BioNet, 2021).

The Yellow-bellied Sheathtail-bat (*Saccolaimus flaviventris*) is dependent on hollows, loose bark or man-made structures for roosting. During vegetation surveys it was determined that both remnant trees, Yellow Box (*Eucalyptus melliodora*) and Kurrajong (*Brachychiton populneus*) contain numerous hollows suitable for roosting (Table 6). The Yellow-bellied Sheathtail-bat (*Saccolaimus flaviventris*) may also use the site for foraging activities. It forages over open grasslands for insects. The closest record of this species is 1.5 km south-east of the Study Area along Eulomogo Creek, as well as numerous recordings along the Macquarie River near Dubbo (BioNet, 2021).

4.5 IMPACT ASSESSMENT – FIVE PART TESTS

4.5.1 THREATENED ECOLOGICAL COMMUNITIES

White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC.

(1) the following is to be taken into account for the purposes of determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats:

(a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

Not applicable

(b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

The project would have only a very small impact on the CEEC, which is very widespread locally, regionally and across the slopes and tablelands of New South Wales (DEH, 2006). The project would result in the permanent loss of two remnant paddock trees belonging to the CEEC and disturbance to 0.22 ha of secondary native grassland. Both large, hollow-bearing remnant paddock trees and similar native grasslands are widespread in the surrounds of the Study Area and within the wider region in this community. DPIE SEED mapping shows that grassland PCT 511 is common and widespread on farming properties surrounding the Study Area (NSW Government, 2021). Neither the loss of the paddock trees, nor disturbance to the native grassland would place the CEEC at risk of extinction locally.

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

The composition of the remnant CEEC on the study area has already been highly degraded by past use of the land for agriculture. The community is highly simplified with only two isolated trees remaining and a very small area (0.22 ha) of depauperate secondary grassland extant. The remnants cannot be considered viable or representative examples of the original community, which has been almost completely removed from the site historically. Given that similar degraded remnants are widespread in the surrounds, the loss of these remnants is not considered likely to lead to the extinction of the community locally.

(c) in relation to the habitat of a threatened species or ecological community:

(i) The extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and

The entire Study Area represents potential habitat for the CEEC, i.e. soils and landscape that once supported the community. In theory, the Solar Farm is temporary, having a 30 year life, after which it may be removed and the site restored to its current condition. Accordingly, the habitat is not destined to be permanently modified or removed. The potential for the site to return as potential habitat for the CEEC would remain.

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and

The site does not form part of a wildlife corridor and is not part of a link between vegetation patches in the landscape. The removal of the two paddock trees and disturbance to 0.22 ha of secondary native grassland will not fragment or isolate other areas of habitat due to the lack of connectivity currently existing on the Study Area as a result of historical clearing for agricultural production.

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,

As indicated above, the project represents a very small loss of CEEC from the Study Area, only two isolated paddock trees and disturbance to a small area (0.22 ha) of native grassland. The structures are not permanent such that potential habitat for the CEEC would remain after the project is dismantled in the future. Similarly, the project would not result in increased habitat isolation or fragmentation since the Study area is not part of a vegetation linkage across the landscape.

Within the regional context, the removal of two isolated paddock trees would not significantly affect the long-term survival of the CEEC. It is expected that the native grassland would recover from the disturbance and may increase naturally once grazing is withdrawn from the Study Area.

(d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),

No areas of outstanding biodiversity value occur on the Study Area, nor would any areas of outstanding biodiversity value be adversely affected by the proposed project.

(e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.

Two Key Threatening Processes listed under the BC Act apply to the CEEC for this Project:

- *Clearing of Native Vegetation*, and
- *loss of hollow-bearing trees*.

The removal of two remnant mature trees, a Yellow Box (*Eucalyptus melliodora*) and a Kurrajong (*Brachychiton populneus*), represent clearing of native vegetation. Whilst this level of clearing does represent an increase in loss of the CEEC, it is not considered to be significant in the context of the CEEC both locally or regionally.

Both trees that would be removed are old growth hollow-bearing trees that have the potential to support wildlife characteristic of the CEEC. Their loss represents a loss of wildlife habitat from the site, and a reduction in wildlife habitat within the local area and region. However, the loss is very small in relation to the large numbers of similar trees that persist in the landscape locally and regionally.

CONCLUSION

This Five Part Test indicates the proposed activities are not considered likely to have a significant adverse impact on the Box-Gum Woodland CEEC locally or in the region. A Species Impact Statement is not required under Section 7.8 of the BC Act, nor does the proposed activity trigger the Biodiversity Offsets Scheme under Section 7.2 of the BC Act.

4.5.2 FAUNA SPECIES

Superb Parrot (*Polytelis swainsonii*) and the Yellow-bellied Sheath-tail-bat (*Saccolaimus flaviventris*)

(1) the following is to be taken into account for the purposes of determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats:

(f) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

The Project will temporarily disturb localised areas of exotic-dominated grassland and secondary native grassland. **Table 8** outlines the specific breeding and foraging habitat requirements of the fauna species being considered in this assessment: Superb Parrot (*Polytelis swainsonii*) and Yellow-bellied Sheathtail-bat (*Saccolaimus flaviventris*).

The Superb Parrot is relatively common in the area with a known sighting recorded on the Study Area (2000), as well as throughout the Narromine/Dubbo/Bodangora region. Suitable nesting habitat (hollow-bearing trees), in the form of the remnant Yellow box (*Eucalyptus melliodora*), is present on the Study Area and will be removed by the solar farm construction. This is unlikely to have a significant adverse impact on the life cycle of the Superb Parrot due to its wide distribution in the surrounding landscape. The loss of a single hollow-bearing tree, which may or may not be suitable for Superb Parrot nesting, is considered unlikely to result in the extinction of the local population.

The Yellow-bellied Sheathtail-bat is predicted to potentially utilise the Study Area for roosting and foraging. This species roosts in tree hollows and suitable roosting habitat may occur in the remnant paddock trees on the site. The closest record of this species is 1.5 km south-east of the Study Area along Eulomogo Creek, as well as numerous sightings along the Macquarie River near Dubbo. The removal of two hollow-bearing trees on the Study Area is unlikely to have a significant adverse effect on the life cycle of this species as it is regularly recorded along the Macquarie River and associated tributaries north-west of the site. While there may be a small loss of potential roosting habitat for the Study Area, there appears to be a viable population and widespread habitat in the surrounding region.

The Yellow-bellied Sheathtail-bat is also predicted to utilise the Study Area for foraging as it is known to forage over open areas collecting insects in flight. It is considered unlikely the presence of the solar farm would deter foraging by this species over the Study Area, as it is unlikely to reduce the abundance of insects in the air and may in fact increase their occurrence through greater insect habitat in the ungrazed ground cover between the panels. In addition, the Study Area may return to natural grassland in the absence of regular cropping and the use of pesticides and herbicides. It is considered unlikely that the Project would adversely impact on the life cycle of the Yellow-bellied Sheathtail-bat since it seems likely foraging conditions may improve after the completion of works.

(g) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

(iii) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

Not applicable.

(iv) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Not applicable.

(h) in relation to the habitat of a threatened species or ecological community:

(iv) The extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and

The removal of nesting and roosting habitat in the form of two hollow-bearing trees may reduce nesting/roosting opportunities for both the Superb Parrot and the Yellow-bellied Sheathtail-bat,

potentially leading to a small reduction in the local populations. However, similar habitat is widespread in the surrounding region, such that the loss of two trees is considered unlikely to result in a significant increase in the risk of extinction of the local populations of either species.

The construction of the solar farm may improve the future foraging habitat quality by allowing the Study Area to transition from a cropped paddock to native grassland over time, increasing the abundance and diversity of prey species.

(v) *whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and*

The Superb Parrot and the Yellow-bellied Sheathtail-bat are both mobile species with much larger home ranges than the Study Area. Both species move freely across the landscape between habitat patches and such movements would not be affected by small habitat changes on the Study Area. In addition, the habitat trees for both species on the Study Area are already highly isolated from other patches of native vegetation that may be used by these species. Accordingly, removal of the two paddock trees will not significantly fragment or isolate other areas of habitat due to the existing lack of connectivity as a result of historical clearing for agricultural production.

(vi) *the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,*

The removal of two potential nesting and roosting habitat trees for the Superb Parrot and the Yellow-bellied Sheathtail-bat, as well as the modification of potential foraging habitat for the Yellow-bellied Sheathtail-bat is not considered likely to significantly impact the long-term survival of these threatened species in the locality. This is because the amount of habitat to be removed is very small in comparison with the very widespread areas of similar habitat in the surrounds. The Yellow-bellied Sheathtail-bat is considered likely to continue foraging over the Study Area once the solar farm is constructed and as the current exotic ground cover in the cropping paddock gradually returns to native grassland.

Within the regional context, the removal of two isolated paddock trees is not expected to affect the long-term survival of these threatened species.

(i) *whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),*

No areas of outstanding biodiversity value occur on the Study Area, nor would any areas of outstanding biodiversity value be adversely affected by the proposed project.

(j) *whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.*

Two Key Threatening Processes listed under the BC Act apply to the Superb Parrot and the Yellow-bellied Sheathtail-bat for this Project:

- *Clearing of Native Vegetation, and*
- *loss of hollow-bearing trees.*

The removal of two remnant mature trees, a Yellow Box (*Eucalyptus melliodora*) and a Kurrajong (*Brachychiton populneus*), represent clearing of native vegetation. Whilst this level of clearing does represent a loss of habitat, it is not considered to be significant in the context of the availability of similar habitat both locally and regionally.

Both trees that would be removed are old growth hollow-bearing trees that have the potential to support wildlife characteristic of the CEEC. Their loss represents a loss of wildlife habitat from the site,

and a reduction in wildlife habitat within the local area and region. However, the loss is very small in relation to the large numbers of similar trees that persist in the landscape locally and regionally.

CONCLUSION

The proposed activities are not considered likely to have a significant adverse impact on the life cycle or habitat of either threatened species assessed in this Five Part Test. The proposed activity will result in the removal of one Yellow Box (*Eucalyptus melliodora*) tree and one Kurrajong (*Brachychiton populneus*) tree. However, the removal of this potential nesting and roosting habitat is not considered likely to have a significant adverse impact on the two threatened species. Inadvertently, the potential modification of cleared cropping to restored native grassland over time may beneficially affect foraging habitat for the Yellow-bellied Sheathtail-bat. A Species Impact Statement is not required under Section 7.8 of the BC Act, nor does the proposed activity trigger the Biodiversity Offsets Scheme under Section 7.2 of the BC Act.

4.6 ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999

No flora species listed on the EPBC Act are considered likely to occur on the Study Area and are not considered as part of this BAR. The Superb Parrot (*Polytelis swainsonii*), is listed as Vulnerable on the EPBC Act and was identified with potential to occur on the Study Area and surrounds by the literature and database review.

This assessment has shown that neither species is considered likely to be significantly impacted by the Project and referral to the Commonwealth is not required.

4.7 KOALA HABITAT PROTECTION SEPP 2020

The *State Environmental Planning Policy* (DPIE, 2021e) aims to protect habitat utilised by the Koala, *Phascolarctos cinereus*, which is known to occur sparsely on the Western Slopes (DPIE, 2021b).

The Koala Habitat Protection SEPP 2020 does not apply to Dubbo Regional Council LGA.

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APPENDIX A

PLANT SPECIES LISTS

1. Plant Species Lists on BAM Quadrats on Solar Farm Footprint.

Status ¹	Stratum ²	Species	Common name	Q1		Q2		Q3	
				Cover	Abundance	Cover	Abundance	Cover	Abundance
E	FG	<i>Centaurea melitensis</i>	Maltese Cockspur	20	200	0.1	50	0.1	1
E	FG	<i>Chondrilla juncea</i>	Skeleton Weed			0.2	100	0.2	50
E	FG	<i>Conyza bonariensis</i>	Flaxleaf Fleabane					0.1	5
E	FG	<i>Conyza</i> sp.	Fleabane	0.1	2				
E	FG	<i>Cucumis myriocarpus</i> subsp. <i>myriocarpus</i>	Paddy Melon	0.1	1				
E	FG	<i>Echium plantagineum</i>	Paterson's Curse			0.1	10		
E	GG	<i>Eragrostis cilianensis</i>	Stinkgrass			0.1	5	0.1	20
E	FG	<i>Heliotropium europaeum</i>	Potato Weed	7	400	20	1000	20	1000
E	FG	<i>Kickxia elatine</i>	Twining Toad-flax	0.5	200				
E	FG	<i>Medicago polymorpha</i>	Burr Medic	0.1	100				
E	FG	<i>Medicago minima</i>	Woolly Burr Medic	0.1	100	0.1	200		
E	FG	<i>Medicago truncatula</i>	Barrel Medic	0.1	100	0.1	100		
E	FG	<i>Polygonum aviculare</i>	Wireweed	60	400	15	500	20	500
E	FG	<i>Sonchus oleraceus</i>	Common Sowthistle	0.1	1				
E	FG	<i>Trifolium glomeratum</i>	Clustered Clover					0.1	5
E	GG	<i>Triticum aestivum</i>	Common Wheat	5	200	5	200		
HTE	FG	<i>Carthamus lanatus</i>	Saffron Thistle	0.2	100	0.1	50	0.2	100
HTE	FG	<i>Xanthium spinosum</i>	Bathurst Burr	0.1	1				
N	GG	<i>Austrostipa scabra</i>	Speargrass	0.1	1			0.1	10
N	GG	<i>Bothriochloa biloba</i>	Lobed Bluegrass	0.1	2				
N	GG	<i>Chloris truncata</i>	Windmill Grass			0.1	1		
N	GG	<i>Cynodon dactylon</i>	Couch	0.5	10	1	30		
N	FG	<i>Dysphania pumilio</i>	Small Crumbweed	0.1	20	0.1	30		
N	GG	<i>Echinochloa colona</i>	Awnless Barnyard Grass	10	600	0.5	200	0.5	100
N	FG	<i>Euphorbia drummondii</i>	Caustic Weed	0.1	10			0.1	1

Status ¹	Stratum ²	Species	Common name	Q1		Q2		Q3	
				Cover	Abundance	Cover	Abundance	Cover	Abundance
N	FG	<i>Oxalis perennans</i>	Grassland Wood-sorrel	0.2	100			0.1	10
N	FG	<i>Sida corrugata</i>	Corrugated Sida					0.2	10
N	FG	<i>Solanum esuriale</i>	Quena	2	300	0.2	100	2	200
N	FG	<i>Vittadinia cuneata</i>	Fuzzweed	0.1	5			0.1	5
N	FG	<i>Vittadinia cervicularis</i>				0.1	2		

¹ N = Native, E = Exotic, HTE = High Threat Exotic

² SG = Shrub; GG = Grass and Grasslike; FG = Forb

2. Plant Species Lists and Abundance Ratings on Rapid Assessment Sample Sites (SS).

Scientific Name	Common Name	Status ¹	Abundance			
			SS1	SS2	SS3	SS4
<i>Centaurea melitensis</i>	Maltese Cockspur	E			C	C
<i>Chondrilla juncea</i>	Skeleton Weed	E		U		
<i>Conyza bonariensis</i>	Flaxleaf Fleabane	E	O		R	
<i>Eragrostis curvula</i>	African Lovegrass	E		O		
<i>Heliotropium europaeum</i>	Potato Weed	E				O
<i>Kickxia elatine</i>	Twining Toad-flax	E			U	
<i>Marrubium vulgare</i>	White Horehound	E		U		
<i>Medicago polymorpha</i>	Burr Medic	E			C	A
<i>Silybum marianum</i>	Variegated Thistle	E	O			
<i>Tragopogon porrifolius</i>	Salsify	E			R	R
<i>Carthamus lanatus</i>	Saffron Thistle	HTE	A	R	C	C
<i>Lycium ferocissimum</i>	African Boxthorn	HTE	O			
<i>Xanthium spinosum</i>	Bathurst Burr	HTE				R
<i>Aristida behriana</i>	Bunch Wiregrass	N	O		O	
<i>Aristida ramosa</i>	Purple Wiregrass	N	O		U	
<i>Austrostipa verticillata</i>	Slender Bamboo Grass	N	O			
<i>Austrostipa aristiglumis</i>	Plains Grass	N	O		U	
<i>Austrostipa scabra</i>	Speargrass	N		C	O	O
<i>Austrostipa densiflora</i>	Fox-tail Spear Grass	N				C
<i>Boerhavia dominii</i>	Tarvine	N	O			
<i>Bothriochloa macra</i>	Red-leg Grass	N				O
<i>Calotis lappulacea</i>	Yellow Burr-Daisy	N	U			
<i>Carex sp.</i>		N			R	
<i>Chloris truncata</i>	Windmill Grass	N		U	A	A
<i>Convolvulus angustissimus</i>	Australian Bindweed	N	R		O	O
<i>Convolvulus graminetinus</i>	Bindweed	N	O	O	A	C
<i>Cynodon dactylon</i>	Couch	N	A			C
<i>Dichanthium sericeum subsp. sericeum</i>	Queensland Bluegrass	N			A	A
<i>Dichondra repens</i>	Kidney Weed	N	C		A	O
<i>Digitaria brownii</i>	Cotton Panic Grass	N	R	C	O	
<i>Digitaria divaricatissima</i>	Umbrella Grass	N		C	O	U
<i>Dysphania sp.</i>	Goosefoot	N	R			
<i>Einadia nutans</i>	Climbing Saltbush	N	U			
<i>Einadia polygonoides</i>	Knotted goosefoot	N			R	
<i>Enneapogon nigricans</i>	Nine-awn Grass	N		C	C	
<i>Enteropogon acicularis</i>	Curly Windmill Grass	N			R	
<i>Eragrostis lacunaria</i>	Purple Lovegrass	N			R	
<i>Eragrostis leptostachya</i>	Paddock Lovegrass	N		O		R
<i>Eragrostis parviflora</i>	Weeping Lovegrass	N			C	
<i>Eucalyptus melliodora</i>	Yellow Box	N	O			

Scientific Name	Common Name	Status ¹	Abundance			
			SS1	SS2	SS3	SS4
<i>Euphorbia drummondii</i>	Caustic Weed	N			U	
<i>Haloragis sp.</i>		N			U	
<i>Panicum simile</i>	Two-colour Panic	N		O		
<i>Paspalidium constrictum</i>	Knottybutt Grass	N			O	
<i>Paspalidium jubiflorum</i>	Warrego Grass	N	A			
<i>Portulaca oleracea</i>	Pigweed	N	R			
<i>Senna clavigera</i>	Pepper Leaf Senna	N	C			
<i>Sida corrugata</i>	Corrugated Sida	N	U	O	O	
<i>Solanum esuriale</i>	Quena	N		O		U
<i>Tragus australianus</i>	Small Burrgrass	N			U	
<i>Tribulus micrococcus</i>	Yellow Vine	N	O			
<i>Vittadinia cuneata</i>	Fuzzweed	N	U		C	
<i>Vittadinia cervicalis</i>		N		R		U

¹ N = Native, E = Exotic, HTE = High Threat Exotic