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**RED-GUM**  
Environmental Consulting



By email on 5/5/2021 to [zaznam@itpau.com.au](mailto:zaznam@itpau.com.au)

**Re: Biodiversity inspection report – Boorowa 1B Solar Farm, Meads Lane, Boorowa, NSW 2586.**

Dear Zaed,

Thank-you for the opportunity to assist with the project. Please be advised that in this engagement, I am assuming the role of your Ecological Consultant and Biodiversity Assessment Method (BAM) Accredited Assessor. I confirm that I am listed on the Biodiversity Assessment Method (BAM) Accredited Person database.

#### **Desk-top review**

Database searches concluded that the likely Plant Community Type (PCT) adjacent to the area is either PCT 282 (Blakely's Red-gum - White Box - Yellow box, Black cypress pine box grass/shrub woodland), PCT 796 (Derived grassland) or PCT 277 (Blakely's Red-gum - Yellow box grassy tall woodland) in the NSW south western slope bioregion. Aerial photography confirmed that as at 30/3/2021 the entire site is likely cleared of native shrubs and trees, but native grasses may persist under a likely grazing regime.

#### **EPBC Protected Matters Online Search Tool**

Consultation with the EPBC Protected Matters Online Search Tool searched a 5km radius of the site area for threatened **Flora** and **Vegetation Communities** returning 7 threatened species and 3 threatened communities. Of which there were 4 Vulnerable, and 3 Endangered species whose habitat may occur within that specified geographic range. **Table 1** considers their likelihood of occurring in the proposed site. Consultation with the same online database for threatened **Fauna** in the same geographic range returned 13 Vulnerable, 21 Migratory, 8 Endangered and 9 Critically Endangered species. **Table 2** considers their likelihood of occurring in the proposed site.

#### **NSW BioNet (The Atlas of NSW Wildlife)**

Consultation with NSW BioNet (The Atlas of NSW Wildlife) for listed **Flora** considered threatened in NSW, returned 2 species recorded within 10km by 10km radius of the site (**Map 1**). Yass Daisy (*Ammobium craspedioides*) listed as Vulnerable and Tarengo Leek Orchid (*Prasophyllum petilum*) listed as Endangered. These species were not recorded on site during the inspection period and are considered not present due to a lack of suitable habitat and structure.

Consultation with the same online database for threatened **Fauna** in the same geographic range returned 6 species records, 5 Vulnerable and 1 Endangered. **Table 3** considers their likelihood of occurring in the proposed site. Of note was a single record of a Superb Parrot (*Polytelis swainsonii*), listed as 'Vulnerable' under both the EPBC Act and BC Act, has previously been recorded on the northern end of the revegetation plot in the site. This sighting was recorded in 2002 and all other details of the recording have been 'withheld'.



**Map 1: Plant Community Types surrounding the site (PCT), NSW BioNET. Data download, 30/3/21**



**Map 2: Recorded threatened species. NSW BioNET. Data download, 30/3/21**



### **Biodiversity Values Map and Threshold Tool**

The Biodiversity Offsets Scheme Threshold (BOSET) is a test used to determine when is necessary to engage an accredited assessor to apply the Biodiversity Assessment Method (the BAM) to assess the impacts of a proposal. A search conducted on 30/3/21 revealed that the project site does not intersect any areas mapped as possessing 'Biodiversity Values' (**Attachment 4**).

### **Koala Assessment**

In 2018, the then Office of Environment & Heritage (now DPIE) produced 'A review of koala tree use across New South Wales' which assessed evidence of koala tree use, for whatever purpose, across New South Wales. The study was intended as a platform to inform the predictive modelling of koala tree species and to contribute to a koala habitat suitability information base and importantly, the data collected for the seven (7) Koala Management Areas (KMAs) (after Phillips 2000 & DECC 2008) 'allows for a bottom-up consideration of a fundamental driver of koala habitat selection – local tree use patterns and tree associations' (OEH, 2018).

The assessment site at Boorowa is in the Central and Southern Tablelands KMA in which the study identified 28 tree species regularly used by koalas; these included 24 Eucalyptus species (comprising 24% of 105 species with >9 records within the BioNet VIS database), and four non-eucalyptus 'species', the latter including 'Acacia' species as one. Species from two eucalypt sub-genera were used, in roughly similar proportions: *Symphomyrtus* (13 species used of 60 with >9 BioNet VIS records in the KMA) and Eucalyptus (monocalypts) (11 species used of 45 with >9 BioNet VIS records). Two species were designated as a regional high use species, brittle gum (*E. mannifera*), and scribbly gum (*E. rossii*), but their use, and that of other eucalypts, varies across locations, potentially in response to site quality and available tree associations.

Pre-inspection database searches revealed zero sightings of Koala (*Phascolarctos cinereus*) within a 10 km buffer of the site. Whilst koala have not been previously sighted in the area it does not mean that koalas are not present in the area and lack of sightings could be explained by a lack of survey effort. It is entirely feasible that Koala could be using the Riparian vegetation corridor along Ryan's creek to the east of the site, however none have been recorded in that zone previously.

### **Site inspection**

Site inspection on 5/4/2021 was conducted mid-morning, conditions were clear and 10°C. The designated 'clear zone' was thoroughly inspected in accordance with *Guide 1: Pre-clearing process of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (RTA 2011)*. I confirm that the proposed area for development will not see the loss of >1 ha of native grass or any dead or alive remnant trees. The following observations were made at the time of inspection:

1. If any threatened native fauna (woodland birds) are present in the surrounding connected native vegetation (in particular Superb Parrot) they were not recorded during the survey on the loss site on 5/4/2021 and the nesting period for these species is closed (both typically breed between June and December) meaning that the possibility of harming a fledgling is unlikely.
2. The site is a highly modified paddock, currently sown with canola, there are nil native grasses present (aside from those under the revegetation on the west boundary) with an obvious history of cultivation.
3. No threatened species, scats or other evidence of the use of this zone or the development site were recorded during the survey effort.
4. No Koalas, scats or other evidence of use of this zone or the development site were recorded during the survey effort.

## **Summary of Findings**

Red-Gum contends that the project requires no loss of native grass and zero remnant native trees. The proposed activities are unlikely to have an adverse effect on the foraging ability or the life cycle of threatened species that may be opportunistically using the site or surrounding areas. Given the zero loss of native vegetation, the development will not endanger or have a significant effect on any existing native vegetation, habitats within the site, or fauna species that may be using the site. This project will not displace any rare or threatened species. While the proposed works are unlikely to introduce noxious weeds, vermin, feral species or genetically modified organisms into an area, the movement of vehicles, plant, equipment and people on and off the subject site/s has the potential to introduce such impacts. Wherever possible, removal of weeds should be undertaken prior to seed developing, which for most species occurs during the warmer months (i.e. summer).

The typical home ranges of Koalas are from 2 ha of connected vegetation to hundreds of hectares. Koala feed almost exclusively on a few preferred tree species which are of primary and secondary importance. The occurrence of both primary and secondary tree species varies widely on a regional, local and even a seasonal basis, meaning that koalas are unevenly distributed across their range. In the study area, primary tree species are Brittle gum (*E. mannifera*), Scribbly gum (*E. rossii*), Ribbon gum (*E. viminalis*), Broad-leaved peppermint (*E. dives*) and Red stringybark (*E. macrorhyncha*).

A small revegetation plot is along the west boundary, however these are not designated for removal and there are connected vegetation zones surrounding the site which represent areas of viable Koala habitat – particularly to the east along the creek. The site is highly unlikely to be traversed or used by the species who are much more likely to stay within the connected canopy of the riparian vegetation corridor along Ryan's creek to the east of the site. I am of the opinion that the activities as proposed will not have a significant effect on any threatened species and ecological communities and/or their conservation as noted within this assessment.

## **Recommendations**

By way of a clearing process that minimizes the risk to threatened species that may be opportunistically using the site, I recommend:

- I. Construction limits and exclusion zones clearly identified prior to work;
- II. A visual inspection is conducted by environmental staff before construction commences to identify any areas of site that might be supporting native fauna;
- III. Vehicle movements around the site will be restricted to the construction footprint and away from any existing planted trees and flagging exclusion fencing to be installed.
- IV. Soil disturbance by vehicle and pedestrian access is to be kept to a minimum outside the construction footprint.
- V. Any weeds removed (particularly those bearing seeds) are to be disposed of appropriately at the nearest waste management facility.

Regards



Mr Damian Wall

**Managing Director**

BAppSc, MEnvMgt, GradCert CHM, MAACAI

## Attachment 1: Database Search Results v Likelihood Tables

<sup>1</sup> Five categories for the 'likelihood of occurrence' of species has been used. The categories are based on recorded sightings listed in credible databases, the presence or absence of suitable habitat, other features of the site, results of the field survey and professional judgement. The 5 categories are:

<b>'Yes'</b>	The species/community was or has been observed on the site.
<b>'Likely'</b>	A medium to High probability that a species uses the site
<b>'Potential'</b>	A suitable habitat for a species occurs on the site, but there is insufficient information to categorise the species as 'likely' or 'unlikely' to occur.
<b>'Unlikely'</b>	A Very Low to Low probability that a species uses the site.
<b>'No'</b>	Habitat on the site and in the vicinity is unsuitable for the species.

**Table 1: EPBC Protected Matters Database results – Flora (5km x 5km)**

Species	Preferred Habitat	EPBC Act Status	Likelihood <sup>1</sup>
White Box-Yellow Box Blakely's Red-Gum Grassy Woodland and Derived Native Grassland		Critically Endangered	No
Grey Box ( <i>Eucalyptus microcarpa</i> ) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia		Endangered	No
Natural Temperate Grassland of the South Eastern Highlands		Critically Endangered	No
<i>Ammobium craspedioides</i> - Yass daisy	Associated with Box-Gum Woodland and secondary grassland derived from clearing of these communities	Vulnerable	No
<i>Amphibromus fluitans</i> - River Swamp Wallaby-grass	Inhabits both natural and man-made water-bodies, including swamps, lagoons, billabongs and dams.	Vulnerable	No
<i>Leucochrysum albicans</i> subsp. <i>Tricolor</i> – Hoary Sunray	Occurs in a wide variety of grassland, woodland and forest habitats, generally on relatively heavy soils.	Endangered	No
<i>Prasophyllum petilum</i> - Tarengo Leek Orchid	Grows in open sites within Natural Temperate Grassland at the Boorowa and Delegate sites.	Endangered	No
<i>Senecio macrocarpus</i> – Large-fruit Fireweed	Grassland, sedgeland, woodland and shrubland, generally on relatively heavy soils.	Vulnerable	No
<i>Swainsona recta</i> – Small Purple-pea	It is associated with the Box Gum Grassy Woodland Threatened Ecological Community.	Endangered	No
<i>Thesium austral</i> – Austral Toadflax	Grasslands, grassy woodlands or sub-alpine grassy heathlands, often in damp sites	Vulnerable	No

**Table 2: EPBC Protected Matters Database results – Fauna (5km x 5km)**

Species	Preferred Habitat	EPBC Act Status	Likelihood <sup>1</sup>
<b>Birds</b>			
<i>Anthochaera hrygia</i> – Regent Honeyeater	Dry open forest and woodlands on inland slopes and valleys particularly Box Woodlands.	Critically Endangered	Unlikely
<i>Hirundapus caudacutus</i> - White-throated Needle-tail	Feed, drink and rest on the wing in large groups. May rest at night in forested country.	Vulnerable	No
<i>Falco hypoleucos</i> - Grey Falcon	Usually restricted to shrubland, grassland and wooded watercourses of arid regions	Vulnerable	No
<i>Lathamus discolor</i> – Swift Parrot	Forests and woodlands dominated by winter flowering eucalypts	Critically Endangered	Unlikely
<i>Rostratula australis</i> – Australian Painted Snipe	Margins of densely vegetated swamps and wetlands	Endangered	No
<i>Numenius madagascariensis</i> Eastern Curlew	Found in Australia in August (migratory), feed on crabs and molluscs in intertidal mudflats.	Critically endangered	No
<i>Botaurus poiciloptilus</i> – Australasian Bittern	Found in wetlands with tall, dense vegetation, favours permanent freshwater habitats.	Endangered	No
<i>Calidris ferruginea</i> – Curlew Sandpiper	Occur on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons	Critically Endangered	No
<i>Polytelis swainsonii</i> – Superb Parrot	Mainly inhabits forests and woodlands dominated by eucalypts.	Vulnerable	Potential. Previously recorded on site in 2002
<i>Grantiella picta</i> – Painted Honeyeater	Inhabits Boree/ Weeping Myall ( <i>Acacia pendula</i> ), Brigalow and Box-Gum Woodlands	Vulnerable	No
<b>Mammals</b>			
<i>Dasyurus maculatus</i> – Spot-tailed Quoll	Mature wet forest habitat in areas with rainfall 600 mm/year.	Endangered	No
<i>Nyctophilus corbeni</i> – Corben's Long-eared Bat	Mallee, bullock, Allocasuarina and box eucalypt dominated communities, but more common in box/ironbark/cypress-pine.	Vulnerable	No
<i>Pteropus poliocephalus</i> – Grey-headed Flying-fox	Requires foraging resources and roosting sites.	Vulnerable	No
<i>Phascolarctos cinereus</i> – Koala	Temperate, sub-tropical and tropical forest, woodland and semi-arid communities dominated by Eucalyptus species	Vulnerable	Unlikely
<i>Chalinolobus dwyeri</i> – Large-eared Pied Bat	Roosts in caves (near their entrances), crevices in cliffs, old mine workings and in the disused, mud nests of the Fairy Martin ( <i>Petrochelidon ariel</i> ).	Vulnerable	No
<b>Reptiles</b>			
<i>Aprasia parapulchella</i> – Pink-tailed Worm-lizard	Small rocks (15–60 cm basal area) shallowly embedded in the soil.	Vulnerable	No
<i>Delma impar</i> - Striped legless lizard	Grassland dominated by perennial, tussock-forming grasses such as Kangaroo Grass, spear-grasses, poa tussocks, etc.	Vulnerable	No
<b>Fish</b>			
<i>Maccullochella macquariensis</i> - Trout Cod	Favour deep, fast flowing waters, often found sheltering under snags (woody debris).	Endangered	No
<i>Maccullochella peelii</i> - Murray Cod	Slow flowing turbid rivers and billabongs	Vulnerable	No
<i>Macquaria australasica</i> - Macquarie Perch	Found in both river and lake habitats; especially the upper reaches of rivers and their tributaries	Endangered	No
<b>Frogs</b>			
<i>Litoria booroolongensis</i> - Booroolong Frog	Found along permanent streams with some fringing vegetation cover such as ferns, sedges or grasses.	Endangered	No

Species	Preferred Habitat	EPBC Act Status	Likelihood <sup>1</sup>
<b>Insects</b>			
<i>Synemon plana</i> – Golden sun moth	Natural Temperate Grasslands and grassy Box-Gum Woodlands in which ground layer is dominated by wallaby grasses	Critically endangered	No
<b>Migratory Marine Birds</b>			
<i>Apus pacificus</i> – Fork-tailed Swift	Spend most their life airborne. Build their nests on cliffs.	Migratory	No
<b>Migratory Terrestrial Birds</b>			
<i>Hirundapus caudacutus</i> – White-throated Needletail	Feed, drink and rest on the wing in large groups. May rest at night in forested country.	Vulnerable	No
<i>Motacilla flava</i> – Yellow Wagtail	Found in short grass, bare ground, swamp margins, sewage ponds and town lawns.	Migratory	No
<i>Myiagra cyanoleuca</i> – Satin Flycatcher	Tall wet eucalypt forests of SE Australia.	Migratory	No
<i>Rhipidura rufifrons</i> – Rufous Fantail	Occurs in open woodlands, shrublands, grasslands and forests including riparian areas.	Migratory	No
<b>Migratory Wetland Birds</b>			
<i>Calidris ferruginea</i> – Curlew Sandpiper	Occur on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons	Critically Endangered	No
<i>Gallinago hardwickii</i> – Latham's Snipe	Freshwater swamps and marshes as well as salt marshes and mud flats	Migratory	No
<i>Actitis hypoleucos</i> – Common Sandpiper	Found in coastal or inland wetlands, both saline or fresh.	Migratory	No
<i>Calidris acuminata</i> - Sharp-tailed Sandpiper	Prefers the grassy edges of shallow inland freshwater wetlands.	Migratory	No
<i>Calidris melanotos</i> – Pectoral Sandpiper	Prefers the grassy edges of shallow inland freshwater wetlands.	Migratory	No
<i>Numenius madagascariensis</i> - Eastern Curlew	Found in Australia in August (migratory), feed on crabs and molluscs in intertidal mudflats.	Critically endangered	No
<b>Listed Marine Birds</b>			
<i>Apus pacificus</i> – Fork-tailed Swift	Spend most their life airborne. Build their nests on cliffs.	Migratory	No
<i>Ardea ibis</i> – Cattle Egret	Shallow water and open dry grassy habitats	Migratory	No
<i>Ardea alba</i> – Great Egret	Wetland habitats, inland and coastal, freshwater and saline, permanent and ephemeral water.	Migratory	No
<i>Rostratula benghalensis</i> ( <i>sensu lato</i> ) – Painted Snipe	Generally inhabits shallow terrestrial freshwater (occasionally brackish) wetlands	Endangered	No
<i>Hirundapus caudacutus</i> – White-throated Needletail	Feed, drink and rest on the wing in large groups. May rest at night in forested country.	Vulnerable	No
<i>Motacilla flava</i> – Yellow Wagtail	Found in short grass, bare ground, swamp margins, sewage ponds and town lawns.	Migratory	No
<i>Myiagra cyanoleuca</i> – Satin Flycatcher	Tall wet eucalypt forests of SE Australia.	Migratory	No
<i>Calidris ferruginea</i> - Curlew Sandpiper	Occur on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons	Critically Endangered	No
<i>Gallinago hardwickii</i> - Latham's Snipe	Freshwater swamps and marshes as well as salt marshes and mud flats	Migratory	No
<i>Haliaeetus leucogaster</i> - White-bellied Sea-Eagle	Surface waters along coasts, islands, inlets also along larger inland rivers and lakes.	Migratory	No
<i>Merops ornatus</i> - Rainbow Bee-eater	Occurs in open woodlands, shrublands, grasslands and forests including riparian areas.	Migratory	No
<i>Lathamus discolor</i> - Swift Parrot	Forests and woodlands dominated by winter flowering eucalypts	Endangered	Unlikely
<i>Actitis hypoleucos</i> - Common Sandpiper	Found in coastal or inland wetlands, both saline or fresh.	Migratory	No

Species	Preferred Habitat	EPBC Act Status	Likelihood <sup>1</sup>
<i>Calidris acuminata</i> - Sharp-tailed Sandpiper	Grassy edges of shallow inland freshwater wetlands.	Migratory	No
<i>Calidris melanotos</i> – Pectoral Sandpiper	Prefers shallow fresh to saline wetlands.	Migratory	No
<i>Chrysococcyx osculans</i> - Black-eared Cuckoo	Found in drier country where species such as mulga and mallee form open woodlands	Migratory	No
<i>Rhipidura rufifrons</i> – Rufous Fantail	Rainforest, dense wet forests, swamp woodlands and mangroves, preferring deep shade.	Migratory	No
<i>Numenius madagascariensis</i> - Eastern Curlew	Found in Australia in August (migratory), feed on crabs and molluscs in intertidal mudflats.	Critically endangered	No

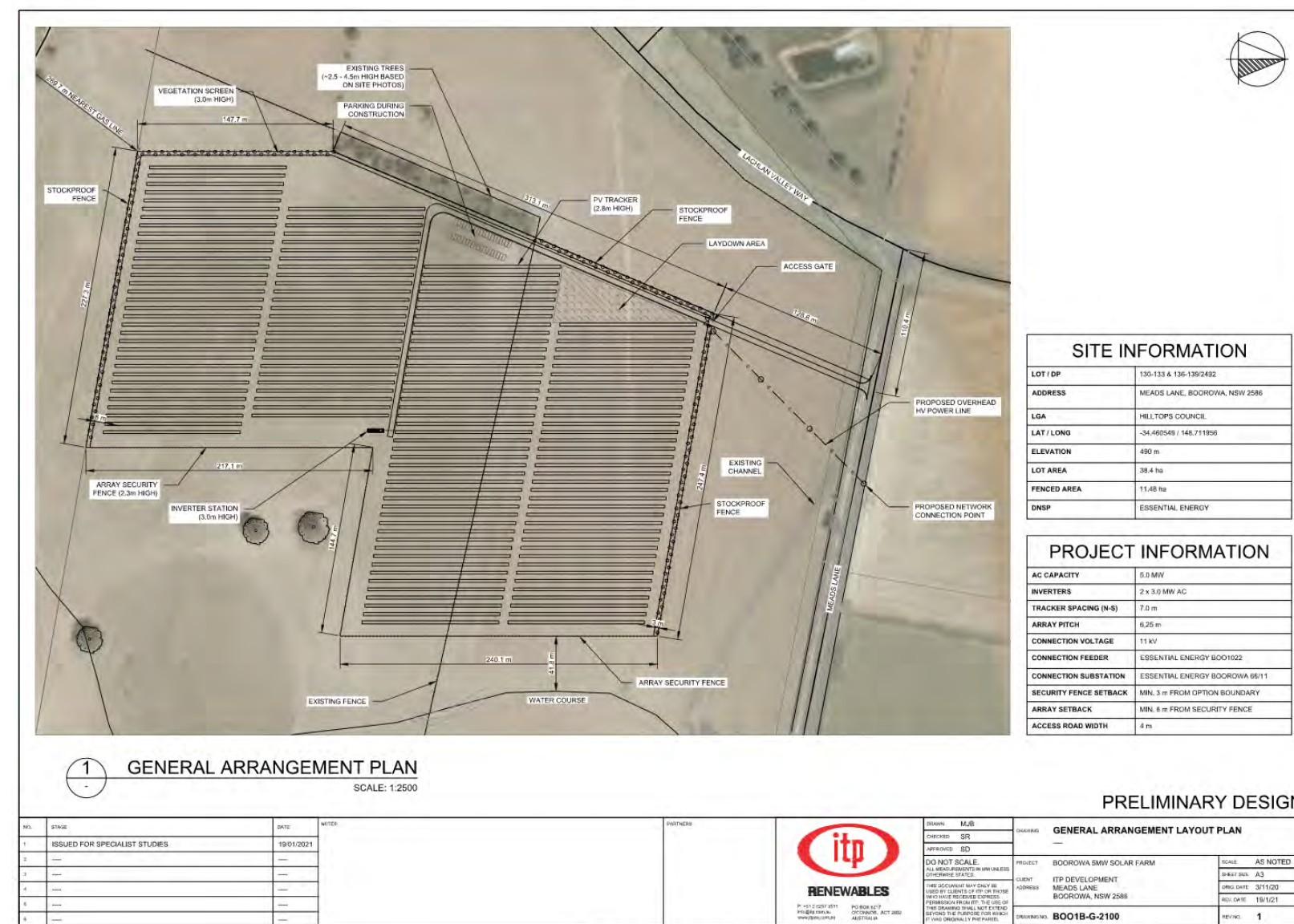
**Table 3: BioNet Atlas of NSW Wildlife – Fauna (10km x 10km)**

Species	Preferred Habitat	BC Act Status	Likelihood <sup>1</sup>
<b>Aves</b>			
<i>Hieraaetus morphnoides</i> - Little Eagle	Open eucalypt forest, woodland or open woodland. Nests in tall living trees within a remnant patch, where pairs build a large stick nest in winter.	Vulnerable	No
<i>Climacteris picumnus victoriae</i> - Brown Treecreeper (eastern subspecies)	Inhabits dry eucalypt woodland and adjoining vegetation, though absent from degraded woodlands and steep rocky hills.	Vulnerable	No
<i>Epthianura albifrons</i> - White-fronted Chat	Salt marshes and other damp areas with low vegetation such as swampy farmland and roadside verges.	Vulnerable	No
<i>Polytelis swainsonii</i> – Superb Parrot	Inhabit Box-Gum, Box-Cypress-pine and Boree Woodlands and River Red Gum Forest. Nest in the hollows of large trees.	Vulnerable	Potential. Previously recorded on site in 2002
<b>Mammalia</b>			
<i>Pteropus poliocephalus</i> - Grey-headed Flying-fox	Temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps. Requires foraging resources and roosting sites.	Vulnerable	No
<b>Insecta</b>			
<i>Synemon plana</i> – Golden Sun Moth	Natural Temperate Grasslands and grassy Box-Gum Woodlands in which ground layer is dominated by wallaby grasses	Endangered	No

**Table 4: BioNet Atlas of NSW Wildlife – Flora (10km x 10km)**

Species	Preferred Habitat	BC Act Status	Likelihood <sup>1</sup>
<i>Ammobium craspedioides</i> - Yass Daisy	Associated with Box-Gum Woodland and secondary grassland derived from clearing of these communities	Vulnerable	No
<i>Prasophyllum petilum</i> -Tarengo Leek Orchid	Grows in open sites within Natural Temperate Grassland at the Boorowa and Delegate sites.	Endangered	No







### Attachment 3: Photos from the Site Inspection – 5/4/21



Photo 1: Roadside vegetation near site access point, east orientation. Exotic grass. D. Wall 2021



Photo 2: Planted native vegetation, north end, south orientation. D. Wall 2021





**Photo 3: High weed load & exotic grass dominated by Phalaris west of revegetation, south orientation. D. Wall 2021**



**Photo 4: High weed load & exotic grass dominated by Phalaris west of revegetation, east orientation. D. Wall 2021**





**Photo 5: Two remnant eucalypts on east boundary outside of the development area. D. Wall 2021**



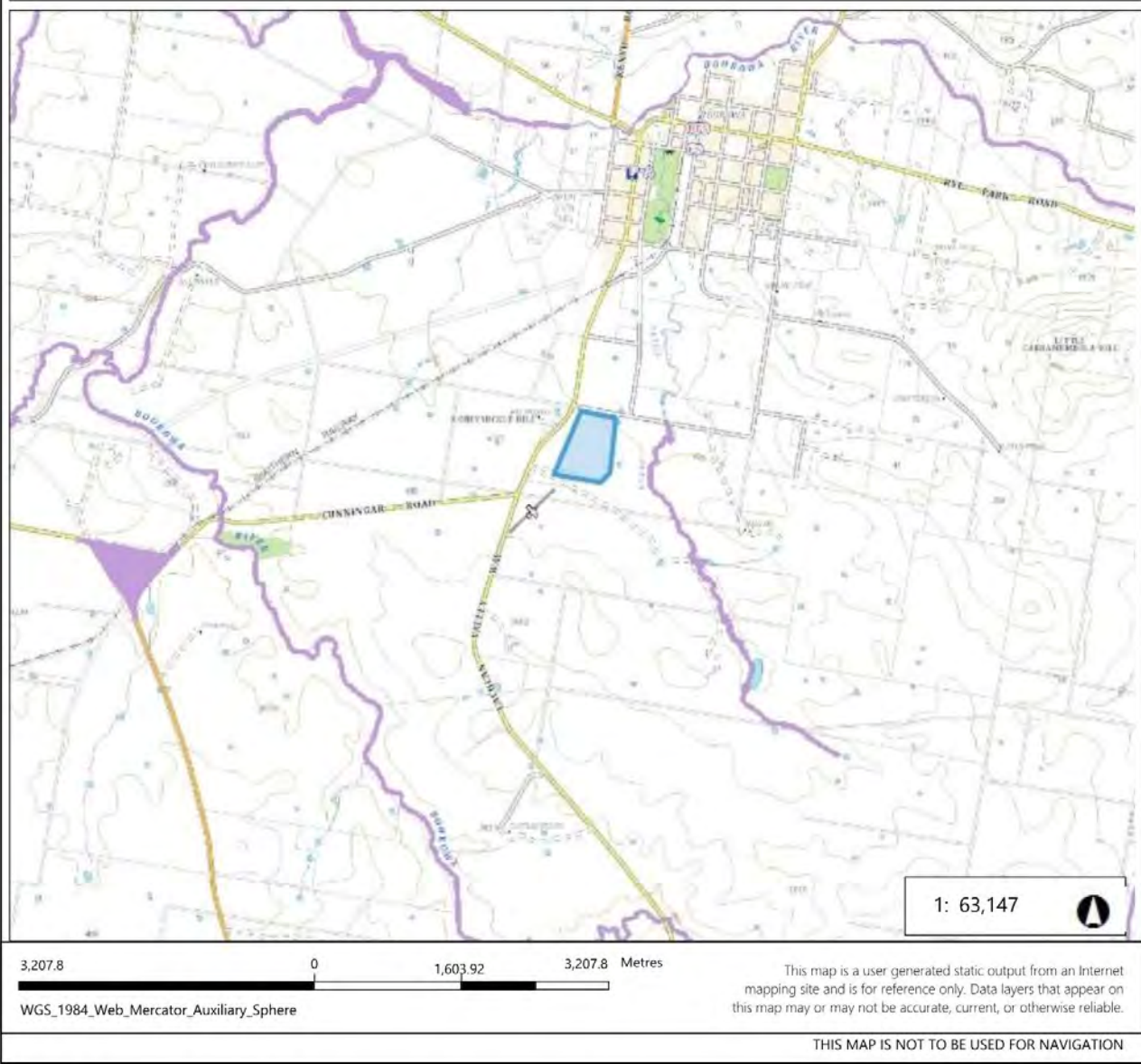
**Photo 6: General site conditions, mid site, west orientation. D. Wall 2021**



Attachment 4: BOSET Report Results



Biodiversity Offset Scheme (BOS) Entry Threshold Map



Legend

- Biodiversity Values that have been mapped for more than 90 days
- Biodiversity Values added within last 90 days

Notes

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