Preliminary Biodiversity Assessment Report

Hillston Solar Farm, Kidman Way, Hillston NSW

Prepared for Green Gold Energy

January 2024

The Environmental Factor

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Revision	Author/s	Internal Review	Date Submitted	Client Review and Approval	
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1.0	T McMahon	B.Turner	22/01/2024		
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This Report has been prepared by The Environmental Factor (TEF) on behalf of Green Gold Energy (The Client), to assess the ecological impacts arising from the proposed construction of a 4.95 MW solar farm within a portion of Lot 1 DP 626213 at Hillston NSW (the Proposal).

The purpose of this report is to document the biodiversity assets found on site, to assess those that are likely to be impacted either directly or indirectly as a result of the Proposal and determine whether the Proposal is required to participate in the Biodiversity Offset Scheme (BOS).

This document is not intended to be utilised or relied upon by any persons other than the Client and their appointed contractors nor to be used for any purpose other than that articulated above. TEF accepts no responsibility in any way whatsoever for the use of this report by any other persons or for any other purpose.

The information, statements, recommendations and commentary (together the "Information") contained in this report have been prepared by TEF on the basis of information provided by the Client and from material provided by the NSW Department of Planning and the Environment (DPE) and the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) and through the survey process. This report has been developed in accordance with the NPWS Guidelines for Preparing a Review of Environmental Factors, developed by the DPE (2022). TEF has not sought any independent confirmation of the reliability, accuracy or completeness of this information. It should not be construed that TEF has carried out any form of audit of the information which has been relied upon.

Accordingly, whilst the statements made in this report are given in good faith, TEF accepts no responsibility for any errors in the information provided by the Client nor the effect of any such errors on the analysis undertaken, suggestions provided, or this report. Site conditions may change after the date of this report. TEF does not accept responsibility arising from, or in connection with, any change to the site conditions. TEF is also not responsible for updating this report if site conditions change.

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Abbreviations

Abbreviation	Description
AOBV	Areas of Outstanding Biodiversity Value
BAM	Biodiversity Assessment Methodology
BC Act	Biodiversity Conservation Act 2016
BOS	Biodiversity Offset Scheme
DCCEEW	Department of Climate Change, Energy, the Environment and Water (formerly DAWE)
DPI	Department of Primary Industries
DPE	Department of Planning and Environment (formerly OEH)
EPA	Environmental Protection Agency
EPBC Act	Environmental Protection and Biodiversity Conservation Act 1999
FM Act	Fisheries Management Act 1994
HTE	High Threat Exotic
LEP	Local Environment Plan
MNES	Matters of National Environmental Significance
OEH	Office of Environment and Heritage
POEO Act	Protection of the Environment Operations Act 1997
SSC	Singleton Shire Council
TEC	Threatened Ecological Community
TEF	The Environmental Factor
WoNS	Weeds of National Significance

Executive Summary

The Environmental Factor (TEF) was commissioned by Green Gold Energy (the Client) to undertake a Preliminary Biodiversity Assessment Report (PBAR) to consider the potential ecological impacts arising from the proposed construction of a 4.95 MW solar farm within a portion of Lot 1 DP 626213 (12.35 ha), (Kidman Way, Hillston NSW) (The Proposal).

The Subject Land occurs on the outskirts of Hillston NSW, located approximately 3.5 km south of the town centre. Land use of the surrounding area includes agricultural paddocks to the north, east, south and west, as well as Hillston Airport further to the north. Subsequently, only scattered stands of native vegetation or species habitat remain within the Assessment Area. The Subject Land contains a relatively large patch of remnant woodland in the eastern portion, with the remainder of the Subject Land comprised of a cropped agricultural paddock surrounded by small areas of partially cleared remnant woodland along the property boundary. No waterways, wetlands or soaks occur within the Subject Land, however one (1) man-made irrigation channel occurs along the western boundary, and there is evidence across the Subject Land of periodic inundation during flood events.

During field investigations, the condition and habitat values of the vegetation present was assessed in accordance with the Biodiversity Assessment Method (BAM), including habitat identification, vegetation community mapping, identification of Threatened Ecological Communities (TECs), collection of floristic data, and opportunistic threatened flora and fauna surveys.

The area proposed for the construction of the solar farm infrastructure (subject site) occurs in the western portion of the Subject Land. This area consists of a cleared and sown agricultural paddock comprised of cereal crops and some weeds. The subject site also encompasses a small area of remnant woodland on the southern boundary of the Subject Land, which contains a small number of native trees and mixed native and exotic ground cover vegetation.

A total of ninety-one (91) species were recorded both incidentally and within the vegetation integrity plots (flora plots) undertaken across the Subject Land. Species composition consisted of fifty-eight (58) native species and thirty-three (33) exotic species, including three (3) weeds classified as High-Threat Exotics (HTE), one (1) regionally listed species and Weed of National Significance (WoNS).

Native vegetation within the Subject Land was comprised of two (2) PCT's:

- PCTID 15 *Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)* – located within and surrounding the subject site, and in the western portion of the large remnant stand,
- PCTID 105 *Poplar Box grassy woodland on flats mainly in the Cobar Peneplain Bioregion and Murray Darling Depression Bioregion*- located in the eastern portion of the large remnant stand.

Based on the field surveys and validation of vegetation condition on site, one (1) Threatened Ecological Community (TEC) was recorded in the Subject Land; portions of the vegetation aligning with PCTID 105 was consistent with the TEC *Poplar Box Grassy Woodland on Alluvial Plains*, listed as Endangered under the EPBC Act.

In total, 22.95 ha of degraded to moderate condition *Poplar Box Grassy Woodland on Alluvial Plains* (Poplar Box Woodland) TEC in remnant woodland form occurs within the Subject Land. However, this TEC does not occur in close proximity to the subject site and is unlikely to be directly or indirectly impacted by the Proposal. As such, a significant Impact Criteria Assessment (SICA) under the EPBC Act was not required.

No species of threatened flora were recorded within the Subject Land and no species of threatened flora are likely to occur within the subject site owing to the historic clearing and current agricultural land use.

A total of thirty-two (32) fauna species were incidentally recorded during the surveys. This included thirty (30) native bird species, such as Galah (*Eolophus roseicapillus*), Australian Ringneck (*Barnardius zonarius*) and Noisy Miner (*Manorina melanocephala*), one (1) native mammal (Eastern Grey Kangaroo; *Macropus giganteus*) and one (1) native reptile (Eastern Brown Snake; *Pseudonaja textilis*). The site contained a high diversity and abundance of native fauna with evidence of bird activity primarily within the remnant woodland patch in the east of the Subject Land, which contained a high number of tree hollows and habitat resources.

Three (3) species of threatened fauna were recorded within the Subject Land during field surveys. Nine (9) individuals of Grey-crowned Babbler (*Pomatostomus temporalis temporalis*) and two (2) Major Mitchell Cockatoo (*Lophochroa leadbeateri*) were recorded within the large remnant woodland patch in the eastern portion of the Subject Land. Eight (8) White-fronted Chats (*Epthianura albifrons*) were observed foraging and flying within agricultural land and along the irrigation channel in the subject site.

Impacts to threatened species considered likely to occur within and utilise resources within the subject site included:

- Brown Treecreeper (eastern subspecies) (*Climacteris picumnus victoriae*)
- Diamond Firetail (*Stagonopleura guttata*)
- Superb Parrot (*Polytelis swainsonii*)
- Turquoise Parrot (*Neophema pulchella*)
- White-fronted Chat (*Epthianura albifrons*)
- Grey-crowned Babbler (*Pomatostomus temporalis temporalis*)

These species were assessed pursuant to Section 7.3 of the BC Act (5-part test), and the Significant Impact Criteria Assessment for EPBC Matters of National Environmental Significance – Significant impact guidelines 1.1 (DEWHA, 2009). The outcome of these assessments determined that the Proposal would be **unlikely** to have a significant impact on threatened biota.

The Subject Land measures a total area of **62.66 ha** with a total direct impact area of **12.358 ha**. This includes:

- Impacts to **0.01 ha** of native vegetation, consisting of PCTID 15 to facilitate the proposed powerline easement.
- Impacts to **12.34 ha** of non-native vegetation to facilitate the installation and construction of the solar array, access road, laydown areas, major electrical devices, powerline devices, powerline easement, Asset Protection Zone (APZ) and site parking.

The minimum lot size for the Subject Land is 10 – 49.99 ha; subsequently the clearing threshold for the site based on the minimum lot size, is 0.5 ha. The Proposal will result in the removal of up to 0.01 ha of native vegetation. Subsequently, as per the requirements of the BOS outlined in Section 2.2.3, the clearing threshold for native vegetation **will not be exceeded** by this Proposal.

No areas of high biodiversity as identified on the Biodiversity Values Map (BVM) occur within the Subject Land therefore no impacts to mapped BVM areas would occur as a result of the proposal. Additionally, as the proposal will not impact significantly on any threatened species, ecological communities or their habitats occurring within the Subject Land, it is determined that **participation in the BOS is not required**.

Vegetation and habitat removal should take place outside of key breeding seasons for fauna (June - January). Further, preclearance surveys and the presence of a fauna spotter are recommended to be undertaken prior to and during the removal of any native vegetation or habitat on the site.

1 Introduction

1.1 Overview

The Environmental Factor (TEF) was commissioned by Green Gold Energy (the Client) to undertake a Preliminary Biodiversity Assessment Report (PBAR) to consider the potential ecological impacts arising from the proposed construction of a 4.95 MW solar farm within a portion of Lot 1 DP 626213 (22 ha), (Kidman Way, Hillston NSW) (The Proposal).

To progress the Development Application (DA) for the Proposal, Council requires the completion of a PBAR, to inform their decision to grant development approval. The PBAR assesses the biodiversity values of the site and determines if the Proposal will exceed the maximum clearing threshold as outlined in Section 2.2.5 of this report, and subsequently trigger entry into the Biodiversity Offsets Scheme (BOS).

This PBAR provides an assessment of potential impacts to native biota as a result of the Proposal to a level sufficient to inform the approval determination under both the *NSW Biodiversity Conservation Act 2016* (BC Act) and the *Environmental Planning and Assessment Act 1979* (EP&A Act).

The assessment and conclusions contained in this report are based on information obtained through database searches and site assessment, in conjunction with details provided by the Client.

1.2 The Proposal

The Proposal would consist of the following key features:

- Construction of a 4.95 MW solar farm within a maximum impact footprint of 12.35 ha within the subject site (Lot 1 DP 626213)
- Additional impacts associated with ancillary features including a transmission line connection, access road, laydown areas, major electrical devices, powerline devices, powerline easement. 10 m wide Asset Protection Zone (APZ) and site parking

The following assessment includes an investigation of the biodiversity values present in the Subject Land, to determine the maximum impact of the proposed solar farm on the site. Site assessment was conducted to determine the presence and condition of native vegetation on site (if any), and to allow calculations of impacts to native vegetation. The subject site is located within an area of cleared and cropped vegetation near Hillston NSW within the Carrathool Shire Local Government Area (LGA) and is subject to the planning provisions of the Carrathool Local Environmental Plan (LEP) 2012. To facilitate the Proposal, up to 0.01 ha of native vegetation and 11.27 ha of predominately exotic groundcover has the potential to be impacted.

The Subject Land is currently zoned as RU1 Primary Production and would not be rezoned.

1.2.1 Subject Land overview

The Subject Land (Lot 1 DP 626213) is located within an area of low, flat agricultural land in a predominantly cleared landscape. The Subject Land is comprised of areas of both remnant open woodland and cleared non-native agricultural pasture. The site occurs in a landscape consisting of mostly historically cleared or partially cleared grazing and copping land. Areas of remnant woodland and riparian vegetation are present in road corridors and agricultural paddocks throughout the area, as well as along the nearby Lachlan River riparian corridor.

The area proposed for the location of the solar farm (subject site) occurs in the western portion of the Subject Land. This area consists of a cleared and sown agricultural paddock comprised of exotic pasture grasses and some weeds. The subject site also includes a small linear strip of remnant woodland on the southern boundary of the Subject Land, which contains sparse, remnant native eucalypts and predominantly exotic ground cover vegetation. No waterways, farm dams or soaks were present within the Subject Land or subject site, however one (1) man-made drainage channel occurred on the western boundary of the site.

Habitat connectivity is moderate in the surrounding Subject Land, with similarly sized remnant vegetation patches within the Assessment Area, and vegetation along Kidman Way, provided patchily connected movement habitat to areas of higher quality habitat along the Lachlan River and within Lachlan Valley National Park and Nombinnie Nature Reserve to the north of Hillston.

1.2.2 Aim of this report

The purpose of this PBAR is to:

- Describe the biodiversity values of the existing environment within the Subject Land, including vegetation types, fauna habitats and flora and fauna species known or likely to occur (as at 4th October 2023)
- Assess the condition and conservation significance of native vegetation and habitats in the Proposal site.
- Compile a list of threatened biota previously recorded or predicted to occur in the locality and assess their potential to occur within the Proposal site.
- Assess the likely impacts on threatened biota as a result of the Proposal.
- Recommend mitigation measures to reduce impacts on biodiversity values.
- Determine if the Proposal will exceed the BOS threshold clearing for native vegetation, and subsequently trigger the BOS.
- Assess the likely significance of impact of the proposed works on Biodiversity Conservation Act 2016 (BC Act) listed threatened biota or Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) matters of national environmental significance (MNES).

Field data was collected by Senior Ecologist and BAM Accredited Assessor Brianna Turner (BAAS 23021) in accordance with the Biodiversity Assessment Method (BAM). Reporting and analyses were completed by Brianna Turner, Tom McMahon, and Janet Sanderson with sign-off undertaken by Brianna Turner as an Accredited Assessor.

1.2.3 Terms and definitions

The following terms are used in this report:

Table 1 Terms and definitions

Subject site	The area to be directly affected by the Proposal. Includes impacts as a result of earthworks and vegetation clearing associated with: • 7.82 ha for the proposed solar array • 0.35 ha for the proposed access road • 0.62 ha for the existing road • 0.12 ha to allow for the proposed laydown areas • 0.01 ha for the major electrical devices

	• 0.09 ha to allow for a powerline easement through non-native vegetation • 0.01 ha to allow for a powerline easement through PCT 15 woodland • 0.03 ha to allow for site parking • 2.24 ha to allow for a construction footprint surrounding the solar array • 1.07 ha to allow for a 10 m wide APZ surrounding the solar array Measuring a combined area of **12.35 ha**, of which native vegetation comprises **0.01 ha**.
Subject Land	Includes the subject site (as described above) and any proximal areas that could be potentially directly or indirectly impacted by the Proposal. For the purposes of this report the Subject Land encompasses Lot 1 DP 626213, measuring a combined total area of **62.66 ha** of which native vegetation equals **38.87 ha**.
Assessment Area	Includes the Subject Land plus a 1.5 km buffer surrounding the Subject Land; total area **1277.21 ha** of which native vegetation comprises **175.70 ha**.
The Locality	The area within 10 kilometres of the Subject Land.

Figure 1 Subject Land and Proposed Development

2 Legislative Context

2.1 Commonwealth (Federal) Legislation

2.1.1 Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

The *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) provides a mechanism for the assessment of environmental impacts caused by activities or developments on 'matters of national environmental significance' (MNES). Under the EPBC Act a referral is required to the Australian Government for proposed actions that have the potential to significantly impact on MNES or the environment of Commonwealth land.

MNES include:

- World heritage properties
- National heritage places
- Wetlands of international importance (RAMSAR)
- Listed threatened species and ecological communities
- Listed migratory species
- Commonwealth marine areas
- Nuclear actions

Activities and developments likely to have a significant impact on MNES must be referred to the Commonwealth Minister for the Environment, who then determines if further assessment and approval under the EPBC Act is required.

Federally listed threatened species and ecological communities with the potential to be impacted by the Proposal have been assessed as part of this PBAR; these assessments concluded **no significant impact** to Commonwealth listed species or ecological communities is anticipated (refer Section 6.2).

2.2 State (NSW) Legislation, Policies and Guidelines

2.2.1 Environmental Planning and Assessment Act 1979 (EP&A Act)

The *Environmental Planning and Assessment Act 1979* (EP&A Act) forms the legal and policy platform for the assessment and approval of works in NSW and aims to ensure that public authorities examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment before they undertake or approve activities that do not require development consent.

All development in NSW is assessed in accordance with the provisions of the EP&A Act and the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation).

The proposal is being assessed as 'development that requires consent', in line with Part 4 Section 4.2 of the EP&A Act.

2.2.2 Biodiversity Conservation Act 2016 (BC Act)

Sections 7.2 and 7.8 of the Biodiversity Conservation Act 2016 (BC Act) state that the determining authority must consider the effect of an activity on:

- Areas of Outstanding Biodiversity Value (AOBV), and/or
- Species, populations or ecological communities, or their habitats and whether there is likely to be a 'significant effect' on those species, populations or ecological communities.

The BC Act provides legal status for biota of conservation significance in NSW. It provides a framework for the Biodiversity Assessment Method (BAM) and the calculation of offset requirements for projects participating in the BOS.

The BC Act aims to:

- Conserve biological diversity on a bioregional and state scale
- Lists Areas of Outstanding Biodiversity Value (AOBV)
- Assess the extinction risk of species and ecological communities
- Identify Key Threatening Processes
- Slow the rate of biodiversity loss, and
- Conserve threatened species

State listed threatened species and ecological communities with the potential to be impacted by the Proposal have been assessed as part of this PBAR; these assessments concluded **no significant impact** to NSW listed species or ecological communities is anticipated (refer Section 6.2).

2.2.3 Biodiversity Conservation Regulatory Act 2017 (BC Regulatory Act)

The Biodiversity Conservation Regulation 2017 (BCR Act) provides a number of considerations and practices to be implemented as part of the BC Act, as follows:

- Identifies clearing thresholds and the Biodiversity Values Map for the application of the Biodiversity Offsets Scheme (BOS)
- Outlines principles for Serious and Irreversible Impacts (SAII) to biodiversity
- Rules for meeting biodiversity offset obligations
- Biodiversity certification criteria

Biodiversity Values Map

The BOS threshold is exceeded on land subject to clearing of native vegetation or other biodiversity impacts prescribed by clause 6.1 of the Biodiversity Regulation 2017 on land identified on the Biodiversity Values Map (BVM), except where:

- the land is subject to a planning approval made up to 90 days after the land was added to the BVM; or
- If the land was already subject to planning approval when the land was added to the BVM.

The BVM (Appendix C) shows no areas of vegetation mapped as containing High Biodiversity Values in proximity to the Subject Land.

Area Criteria Threshold

Native vegetation clearing thresholds as outlined in Part 7 of the Biodiversity Conservation Regulation 2017 (Table 2) indicates when a project would need to enter the BOS according to the minimum lot sizes and the corresponding native clearing thresholds.

Site assessment confirmed that the site contains native vegetation. The clearing threshold for the site, based on the minimum lot size, is >0.5 ha.

Table 2 Area criteria - Biodiversity Offset Scheme threshold

Minimum lot size	Threshold for clearing (ha) to enter BOS
<1 ha	>0.25
1 ha < 40 ha	>0.5
40 ha – 1000 ha	>1
>1000 ha	>2

The Proposal will result in up to **0.01 ha** of native vegetation to be directly impacted. Therefore, the clearing threshold for native vegetation **will not** be exceeded by this Proposal; and participation in the BOS is not required.

Areas of Outstanding Biodiversity Value

The Subject Land is not listed as an Area of Outstanding Biodiversity Value.

2.2.4 Fisheries Management Act 1994 (FM Act)

The *Fisheries Management Act 1994* (FM Act) aims to conserve threatened species, populations and ecological communities of fish and marine vegetation native to NSW and to promote ecologically sustainable development, including the conservation of biological diversity. It also aims to reduce the threats faced by native fish and marine vegetation in NSW.

Section 220ZZ of the FM Act states that the determining authority must consider the effect of an activity on:

- Areas of Outstanding Biodiversity Value (AOBV) as defined by the BC Act, and
- Species, populations or ecological communities, or their habitats as listed under the FM Act, and whether there is likely to be a 'significant effect' on those species, populations or ecological communities

If a planned development or activity is likely to have an impact on an aquatic threatened species, population or ecological community this must be taken into account in the development approval process. If the impact is likely to be significant, as determined through an Assessment of Significance, participation in the BOS is required.

No mapped waterways occurred within the Subject Land, although a minor man-made drainage channel existed on the western edge of the cropped paddock, which was observed to contain shallow water. No other waterways or wetlands was observed within the Subject Land, although the site exists on the Lachlan River floodplain, and there was evidence of periodic inundation in major flood events which likely creates temporary wetlands. No Key Fish Habitat is mapped as occurring with the Subject Land, although is mapped along the Lachlan River approximately 2.5 km to the west of the site. Subsequently, a permit under the FM Act **is not** required.

2.2.5 Local Land Services Amendment Act 2016 (LLSA Act)

The Local Land Services Act, as amended by the Local Land Services Amendment Act 2016 (LLSA Act), provides a regulatory framework for the management of native vegetation in NSW.

The **Native Vegetation Regulatory (NVR) Map** identifies rural land that is regulated under the land management framework. Landholders are able to review the categories of vegetation as depicted on the regulatory map for their property. The new State Environmental Planning Policy (Vegetation) 2017 (Vegetation SEPP) regulates clearing of native vegetation in urban and all other land in NSW that is zoned for environmental conservation/management.

The **Land Management (Native Vegetation) Code** supports landholders to manage their land to ensure more productive farming methods and systems, while responding to environmental risks. Some clearing under the Land Management Code will require land to be set aside, which will be listed in a new public register. Clearing of some native vegetation may be carried out without approval for the purposes of allowable activities.

Higher impact clearing will require approval from a new **Native Vegetation Panel**, and landholders will be required to assess and offset the biodiversity impacts of approved clearing.

Review of the Native Vegetation Regulatory map confirmed that the Subject Land does not contain areas mapped as Category 2 – Vulnerable or Sensitive Regulated Land (Appendix D). Consequently, the clearing regulations under the LLSA Act do not apply.

2.2.6 NSW Biosecurity Act 2015 (Biosecurity Act)

The NSW Biosecurity Act 2015 (Biosecurity Act) outlines mandatory measures that persons are to take with respect to biosecurity matters including the management of weeds (Part 2, Division 8 including Weeds of National Significance (WoNS)). Under the Biosecurity Act the responsibilities for weed management by public and private landholders are consistent reflecting that weed management is a shared community responsibility. The Act introduces the legally enforceable concept of a General Biosecurity Duty (GBD). Priority weeds are listed within Regional Strategic Weed Management Plans, however the GBD is not restricted to listed weeds.

The Biosecurity Act is administered by NSW Department of Primary Industries which determines the weed species covered by regulatory tools including Prohibited Matters, Control Orders and Biosecurity Zones. Existing Local Control Authorities (Councils) continue to be responsible for enforcing weed legislation.

Weeds identified on site are discussed in Section 5.1.4.

2.2.7 Carrathool Local Environmental Plan 2012

The Subject Land for the Proposal is located on Private Land in the Carrathool Shire Local Government Area (LGA), and is located within the following land use zones:

- RU1 Primary Production

The objectives of this zone are to:

- To encourage sustainable primary industry production by maintaining and enhancing the natural resource base.
- To encourage diversity in primary industry enterprises and systems appropriate for the area.
- To minimise the fragmentation and alienation of resource lands.

- To minimise conflict between land uses within this zone and land uses within adjoining zones.
- To facilitate farm adjustments.
- To enable agricultural support facilities to be carried out on land within the zone in a manner which does not significantly reduce the agricultural and horticultural production potential of land in the locality.
- To encourage eco-tourist facilities and tourist and visitor accommodation that minimise any adverse effect on primary industry production and scenic amenity of the area.

The Carrathool Local Environmental Plan 2012 acknowledges that electricity generating works are regulated by the *State Environmental Planning Policy (Transport and Infrastructure) 2021* (Transport and Infrastructure SEPP). The proposed solar farm, while not aligning with the objectives of RU1 land-zoning, is permissible with consent as electricity generating works are allowable on any land in a prescribed rural, industrial, or special use zone, including RU1 zones, under clause 2.36 of the Transport and Infrastructure SEPP. Therefore, the proposed development is permitted with consent.

Land Zoning within the Assessment Area is shown in Figure 5.

2.2.8 NSW Rural Fires Act 1997 - Rural Boundary Clearing Code for New South Wales 2021

The Rural Boundary Clearing Code (RBCC) allows landowners to clear certain vegetation along the boundary of their landholding to reduce the potential for the spread of bush fires. The objective of the Code is to simplify vegetation management for owners or occupiers of land for the purpose of bush fire hazard mitigation by allowing them to clear vegetation on their property within 25 metres of their property boundary.

The Code provides for vegetation clearing work on land within a holding that is:

1. within the rural zone,
2. within Boundary Clearing Code Vegetation Map; and
3. within 25 metres of the holding's boundary with adjoining land (with exceptions)

It is crucial this is undertaken with consideration of environmental impacts.

Vegetation that is **excluded** from the Code and **cannot be removed** includes:

1. Parcels of the following vegetation which are within areas mapped in the Rural Boundary Clearing online tool may not be cleared under the Rural Boundary Clearing Code. The onus is on the owner or occupier of the land to demonstrate that they did not clear any vegetation that constitutes any of the following types of vegetation:
    a. SEPP Coastal Management – Coastal Wetlands (not including the proximity area) as mapped and provided to the NSW RFS by the Department of Planning, Industry and Environment;
    b. Wetlands in the Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005 as mapped and provided to the NSW RFS by the Department of Planning, Industry and Environment;
    c. Wetlands in the Sydney Regional Environmental Plan 20 – Hawkesbury Nepean River (No 2 – 1997) as mapped and provided to the NSW RFS by the Department of Planning, Industry and Environment;
    d. SEPP Coastal Management – Littoral Rainforests (not including the proximity area) as mapped and provided to the NSW RFS by the Department of Planning, Industry and Environment,

e. Core Koala habitat identified at Attachment 'A' as mapped and provided to the NSW RFS by the Department of Planning, Industry and Environment;
f. Ramsar Wetlands;
g. vegetation within 100 metres of the coastline or estuaries of NSW;
h. any vegetation on Lord Howe Island;
i. Land mapped as Declared Area of Outstanding Biodiversity Value (as listed in Attachment A – Vegetation Types) as mapped and provided to the NSW RFS by the Department of Planning, Industry and Environment;
j. Critically Endangered Ecological Communities (as listed in Attachment A – Vegetation Types) as mapped and provided to the NSW RFS by the Department of Planning, Industry and Environment;
k. 'Land avoided for strategic biodiversity' and 'strategic conservation area' (as listed in Attachment A – Vegetation Types), whether exhibited as part of the draft Cumberland Plain Conservation Plan (CPCP) or the approved CPCP, and as mapped and provided by the Department of Planning, Industry and Environment.

2. Vegetation on land parcels (cadastre lots) which are within areas mapped in the Rural Boundary Clearing online tool are excluded from the Rural Boundary Clearing Code and may not be cleared.

Additionally, any areas mapped as protected riparian land in the Biodiversity Values Map (BVM), as well as any vegetation protected under a legal obligation including conservation or Trust agreements, Property Vegetation Plans, or Biodiversity Stewardship Agreements, are excluded from the Rural Boundary Clearing Code.

The Subject Land occurs within land mapped under the RBCC, therefore consideration of permissible clearing under the code has been applied to this Proposal. As no boundary adjustments or re-zoning are proposed as part of this development, the RBCC is not required to be applied, as all existing boundary clearing provisions will remain as is.

3 Landscape context

The following sections describe the current landscape features and condition of the Subject Land and broader locality, as observed on site and according to available resources accessed at the time of assessment.

3.1 Bioregions and landscapes

The Subject Land occurs within the Riverina Interim Biogeographic Regionalisation for Australia (IBRA) Bioregion and contains one (1) mapped NSW Soil Landscape (previously Mitchell Soil Landscape). Details on these are provided below.

3.1.1 Bioregion

A detailed description of the Subject Land IBRA sub region is provided in Table 3 below, and is based on Bioregions of New South Wales: Riverina Bioregion (NSW Environment and Heritage 2023).

Table 3 Subject Land IBRA region and subregion

Category	Description
IBRA region	Riverina
IBRA sub region	Lachlan
Characteristics	***Geology*** Quaternary alluvial sediments. Clay dominant. Groundwater lakes present. Lower river discharge than other streams. ***Characteristic landforms*** Complex alluvial fan with numerous distributary channels and floodplains, depression plains, and abandoned lake beds with lunettes. Limited source-bordering dunes. ***Typical soils*** Red and brown clays, red brown texture contrast soils on levees and terraces, minor deep sands. ***Vegetation*** Black Box and River Red Gum on channels. Black Box, Lignum and Cane Grass in swamps. Saltbush and Bluebush with Old Man Saltbush, Cottonbush, Myall and grasses on the plains. White Cypress Pine on sandhills.

3.1.2 NSW Landscape (Mitchell Landscapes)

The Subject Land is mapped as occurring on Lachlan Depression Plains (Ldp) NSW Landscapes (Figure 3):

Lachlan Depression Plains - Ldp

Quaternary alluvial plains with numerous circular depressions interpreted as high floodplains or low terraces beyond the reach of average floodwaters. Sandy rises and levees trace ancestral streams and stand above the general plain, relief 1 to 3m. Grey and brown cracking and non-cracking clays often with gilgai on the plains. Sands and red or brown texture contrast soils on the higher ground. Isolated Black Box (*Eucalyptus largiflorens*), patches of Myall (*Acacia pendula*) and Prickly Wattle (*Acacia victoriae*) on the eastern plains with annual Saltbushes *(Atriplex sp*.) and grasses. Scattered White Cypress Pine (*Callitris glaucophylla*), Rosewood (*Alectryon oleifolius*), Belah (*Casuarina cristata*), Wilga (*Geijera parviflora*), Narrow-leaf Hopbush (*Dodonaea*

attenuata) and grasses on sands. Bladder Saltbush (*Atriplex vesicaria*), Annual Saltbush, burrs and grasses on scalded levees.

3.2 Waterways and wetlands

The Subject Land contains no mapped wetlands or waterways (Figure 2). A minor man-made irrigation channel occurs on the western edge of the cropped paddock, which was observed to contain shallow water at the time of surveys. No other waterways or wetlands were observed within the Subject Land, although the site exists on the Lachlan River floodplain, and there was evidence of periodic inundation in major flood events or during high rainfall resulting in overland flow, which likely creates temporary wetlands and wet areas on site.

No Key Fish Habitat is mapped as occurring within the Subject Land, however, does occur along the Lachlan River approximately 2.5 km to the west of the site within The Locality.

3.3 Native vegetation extent and connectivity

The extent of native vegetation predicted to occur in the Assessment Area was mapped using the State Vegetation Types for Carrathool LGA (NSW LPI) v1.1 CRS - GDA94 MGA zone 55, within a 1,500 m buffer as specified under the BAM. Vegetation within the Subject Land was later verified during the site assessment.

Table 4 Mapped native vegetation extent within the Assessment Area

Plant Community Type	Area (ha)
PCTID 0: Non-native vegetation	1,101.51
PCTID 13: Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	11.50
PCTID 15: Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	110.58
PCTID 26: Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion	14.34
PCTID 45: Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion	7.45
PCTID 57: Belah/Black Oak - Western Rosewood - Wilga woodland of central NSW including the Cobar Peneplain Bioregion	12.99
PCTID 72: White Cypress Pine - Poplar Box woodland on footslopes and peneplains mainly in the Cobar Peneplain Bioregion	5.30
PCTID 166: Disturbed annual saltbush forbland on clay plains and inundation zones mainly of south-western NSW	5.74
PCTID 174: Mallee - Gum Coolabah woodland on red earth flats of the eastern Cobar Peneplain Bioregion	1.03
PCTID 216: Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion	6.78
Total Mapped Vegetation within the Assessment Area (ha):	**1,277.21**

Total Native Vegetation within the Assessment Area (ha):	**175.70**

Kidman Way Solar Farm, Hillston - Ground and Surface Water within the Assessment Area

Legend

- Assessment Area
- Subject Land
- Suburb
- Lot Boundary

Roads

- Arterial Road
- Local Road
- Urban Service Lane

Waterways

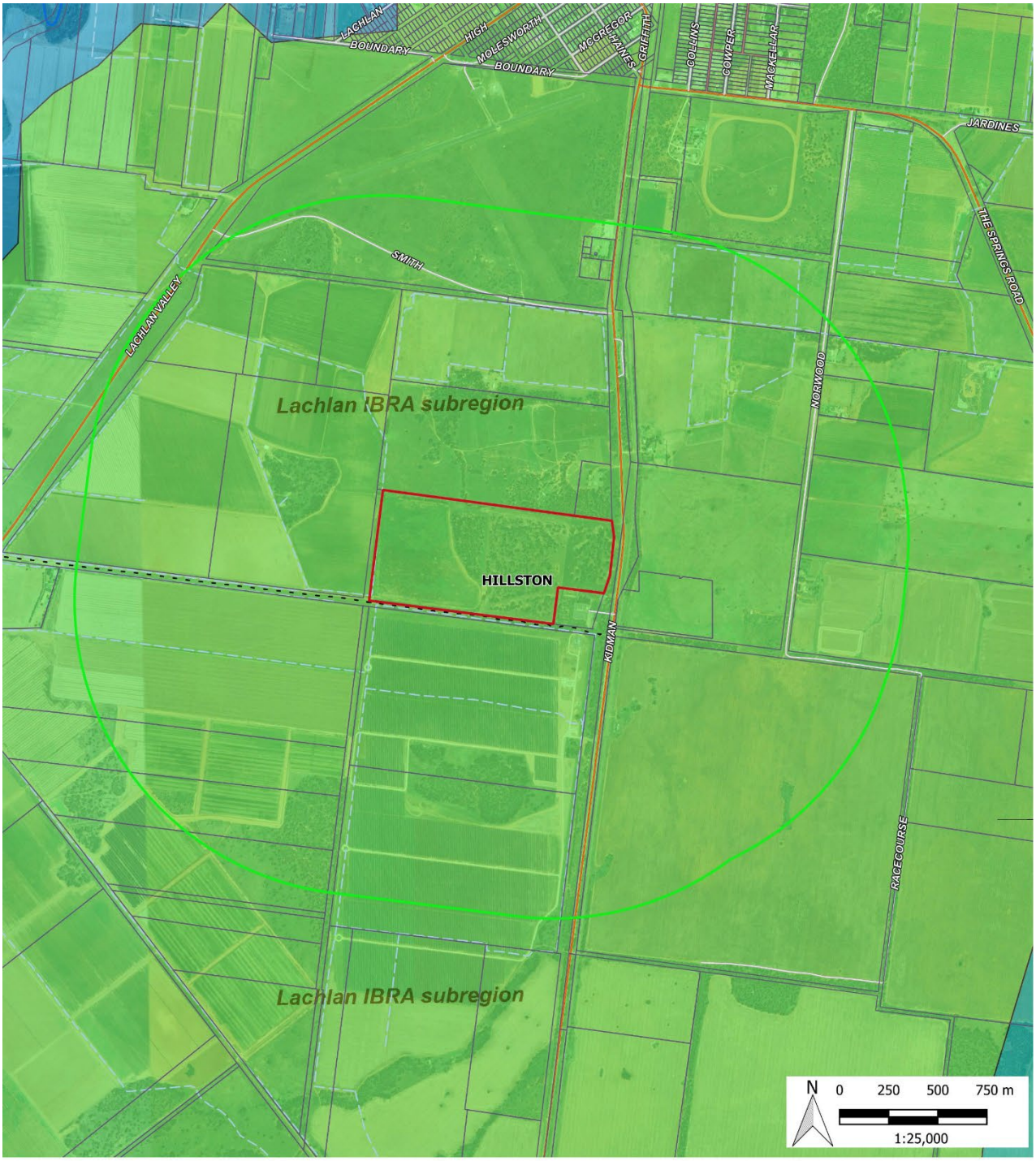
- River
- 1st, 2nd & 3rd order unnamed waterways

- Groundwater Vulnerability
- Key Fish Habitat

N 0 300 600 900 m

1:30,000

Figure 2 Waterways, Riparian Corridors and Key Fish Habitat within the Assessment Area



Kidman Way Solar Farm, Hillston - NSW (Mitchell) Landscape Soils and IBRA Subregions within the Assessment Area

Legend

- Assessment Area
- Subject Land
- Suburb
- Lot Boundary

Roads

- Arterial Road
- Local Road
- Urban Service Lane

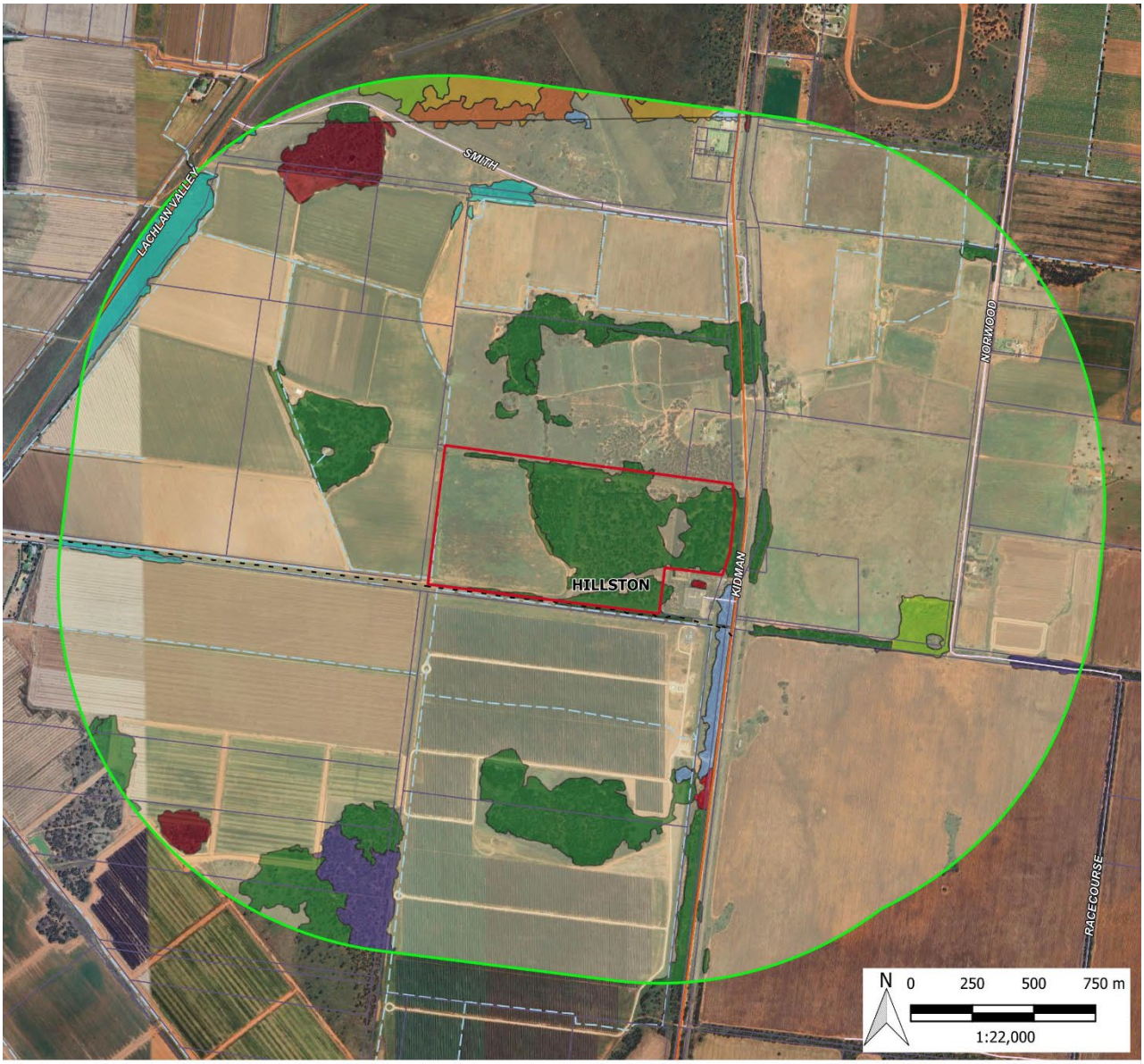
Waterways

- River
- 1st, 2nd & 3rd order unnamed waterwa

NSW (Mitchell) Landscapes

- Hillston Sandplains
- Lachlan Channels and Floodplains
- Lachlan Depression Plains

Figure 3 NSW (Mitchell) Landscape Soils within the Assessment Area



Kidman Way Solar Farm, Hillston - Habitat Connectivity, Plant Community Types within the Assessment Area

Legend

- Assessment Area
- Subject Land
- Suburb
- Lot Boundary

Roads

- Arterial Road
- Local Road

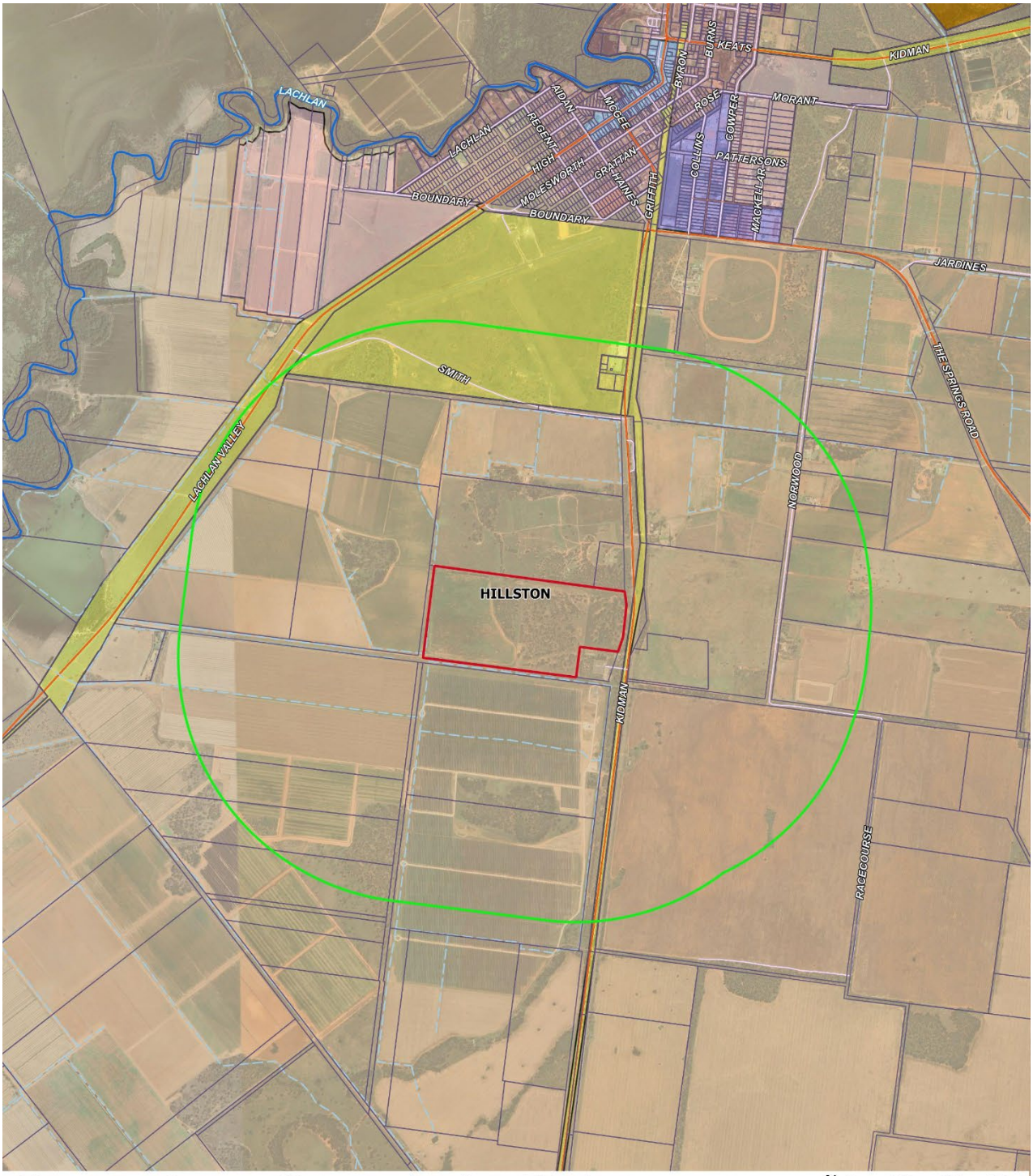
Waterways

- 1st, 2nd & 3rd order unnamed waterways

NSW State Vegetation

- PCTID: 0 - Not native vegetation
- PCTID: 13 - Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
- PCTID: 15 - Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
- PCTID: 166 - Disturbed annual saltbush forbland on clay plains and inundation zones mainly of south-western NSW
- PCTID: 174 - Mallee - Gum Coolabah woodland on red earth flats of the eastern Cobar Peneplain Bioregion
- PCTID: 216 - Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion
- PCTID: 26 - Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion
- PCTID: 45 - Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion
- PCTID: 57 - Belah/Black Oak - Western Rosewood - Wilga woodland of central NSW including the Cobar Peneplain Bioregion
- PCTID: 72 - White Cypress Pine - Poplar Box woodland on footslopes and peneplains mainly in the Cobar Peneplain Bioregion

Figure 4 Plant Community Types mapped within the Assessment Area



Kidman Way Solar Farm, Hillston - Land Zoning within the Assessment Area

N 0 300 600 900 m

1:30,000

Legend

- Assessment Area
- Subject Land
- Suburb
- Lot Boundary

Roads

- Arterial Road
- Local Road
- Urban Service Lane

Waterways

- River
- 1st, 2nd & 3rd order unnamed waterways

Land Zoning

- C1 - National Parks and Nature Reserves
- E1 - Local Centre
- E4 - General Industrial
- R5 - Large Lot Residential
- RU1 - Primary Production
- RU5 - Village
- SP2 - Infrastructure

CRS: GDA2020 / MGA zone 55. Author: J Sanderson. Date: 25/10/2023

Figure 5 Land Zoning within the Assessment Area

4 Methodology

The following section outlines the methodology used to complete the desktop and site assessment that was used to inform the preparation of this PBAR.

4.1 Desktop assessment

A desktop review was undertaken to determine threatened flora and fauna species, populations and ecological communities (threatened biota) listed under the BC Act and FM Act, and MNES listed under the EPBC Act, that could occur in The Locality based on previous records, known distribution ranges, and habitats present. Biodiversity and environmental databases, and existing literature that were reviewed included the following:

- Department of Agriculture, Water and the Environment (DECCW) EPBC Act Protected Matters Search Tool – for a 10 kilometre radius around the Subject Land
- DECCW online Species profiles and threats database (SPRAT)
- NSW Department of Planning and Environment (DPE) BioNet Atlas for records of threatened biota previously recorded in the locality (website for the Atlas of NSW Wildlife) and Threatened Biodiversity Data Collection (TBDC) profiles of threatened species listed under the BC Act
- Biodiversity Values Map and Threshold Tool, NSW Government for biodiversity values that would require further assessment under the BOS
- DPE Threatened biodiversity profile search online database for threatened ecological communities and species listed under the BC Act
- NSW BioNet Vegetation Classification to identify matching plant community types (PCTs) in the study area
- NSW Department of Primary Industries (DPI) priority weed declarations – Riverina
- Threatened Species Survey and Assessment: Guidelines for developments and activities. Working Draft (DEC 2004)
- NSW Guideline to Surveying Threatened Plants and their Habitats (DPIE 2020)
- Survey guidelines for Australia's threatened birds: Guidelines for detecting birds listed as threatened under the Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth of Australia 2010)
- Survey guidelines for Australia's threatened mammals. Guidelines for detecting mammals listed as threatened under the Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth of Australia 2011)

4.2 Spatial data

To inform GIS calculations and produce figures, the following spatial databases were accessed:

- NSW Base Imagery Service SIX Maps (SSSDS, 2021)
- Google Satellite Imagery
- Spot 6 & 7 Satellite Imagery (NSW SPP, 2020)
- State Vegetation Types SVMT v1.1 (DPE)
- Riparian Lands Watercourses (EPI)
- Bionet Atlas Threatened Species list (DPE, 2023)
- Mitchell Landscape Soil v3.1 (DPE)
- Carrathool Shire LGA spatial layers (roads, hydrolines, railway lines)(DFSI)

4.3 Site assessment

Site assessment was undertaken over three (3) days on 20 June 2023, 3 October 2023 and 4 October 2023 by TEF Senior Ecologist Brianna Turner (BAAS 23021) and Ecologist Tom McMahon. During the site assessment, the following activities were undertaken:

- Identification and mapping of vegetation communities present on the Subject Land, including the identification of threatened ecological communities (TECs)
- Random meander transect surveys (Cropper, S. 1993) across the Subject Land to record incidental flora, and determine the presence of detectable threatened species and high threat exotics (WoNS and NSW Priority Weeds)
- Incidental sightings of fauna species within or adjacent to the Subject Land
- Identification of fauna habitat features (i.e. nesting, roosting or foraging microhabitats)
- Assessment of the presence and suitability of habitat of value to threatened and regionally significant fauna including, where applicable:
    - Tree hollows (habitat for threatened large forest owls, parrots, cockatoos, bats and arboreal mammals)
    - Caves and crevices (habitat for threatened reptiles, small mammals and microbats),
    - Termite mounds (habitat for threatened reptiles and the echidna)
    - Waterbodies (habitat for threatened fish, frogs and water birds)
    - Fruiting / flowering trees (food for threatened birds and mammals)
    - Rocky outcrops and overhangs (habitat for threatened microbats, herpetofauna and marsupials)
    - Trees and shrubs supporting nest structures (habitat for threatened birds and arboreal mammals)
    - Any other habitat features that may support fauna (particularly threatened) species
- Assessment of the connectivity and quality of the vegetation within the Subject Land and surrounding area.

4.3.1 Native Vegetation Assessment

Native vegetation was assessed within the Subject Land to categorise PCTs and determine quality and extent of vegetation present, with particular emphasis on vegetation occurring within the Subject Site. A combination of vegetation integrity plots (BAM plots), Rapid Data Points (RDPs) placed in vegetation patches too small to fit a BAM plot, and random meander surveys on foot were completed to assess vegetation composition and structure, including dominant native species and the extent of weed occupation of the site.

BAM plots and RDPs were completed in each potential condition zone present within the PCTs recorded in the Subject Land. In total, six (6) vegetation integrity plots and numerous RDP were completed, consistent with the method outlined in Section 4.3 of the BAM 2020 (Figure 6) in order to identify the extent and type of vegetation present, assign a condition to each community present, and to assess the floristic attributes (species richness, cover and abundance) within different PCTs and condition zones present.

The identification of PCTs was conducted in accordance with the NSW PCT classification as described in the BioNet Vegetation Classification database (OEH 2019). PCT identification was determined by identifying species dominance across stratums (canopy, shrub and groundcover), geographic distribution (based upon IBRA subregions) and vegetation and landform formation. Reference was given to previous ecological surveys

(existing data) and existing State Vegetation Type Mapping (SVTM) for the locality, to inform the selection of PCTs where applicable.

Vegetation occurring outside of the Subject Land, and subsequently outside of the areas of direct or indirect impacts, was not ground-truthed as part of the site assessment, with PCTs in these areas assigned based on available data for OEH State Vegetation Type Mapping (SVTM) (OEH 2019).

Access across the Subject Land was on-foot or within a four-wheel drive vehicle. All areas of the Subject Land to be impacted (subject site) were accessed and verified during site surveys.

Incidental flora observations

Incidental flora observations species during field surveys. Species observed during the site surveys (outside of the vegetation integrity plots) were recorded.

Threatened flora surveys

Targeted threatened flora transect surveys in the correct survey periods for individual species were not undertaken as part of this assessment. Threatened flora assessment was limited to habitat assessment of potentially suitable habitat (if any) and incidental observations only. The Subject Land was surveyed incidentally for detectable threatened flora species via random meander transect surveys. Habitat quality for species with potential to occur along the trail was assessed to determine the likelihood of species occurrence within the site. Locations of threatened species (if observed) were recorded using handheld GPS units (mobile phones / tablets) equipped with Avenza mapping software.

4.3.2 Terrestrial Fauna Assessment

Incidental observations

Incidental observations of fauna species were recorded at all times during field surveys. All species observed or heard utilising the site during surveys were recorded. Any observed evidence of faunal activity (tracks, scats, feathers, pellets) were noted and specimens collected of potential threatened species (if applicable) were sent for analysis (Scats About 2020) and identification. Disturbance caused by animals including diggings and burrows were noted and any road/driveway kill was recorded.

Habitat assessment

In addition to incidental observations, the following general habitat features were recorded by TEF ecologists at the time of the site assessments:

- Trees with bird nests or other potential fauna roosts
- Burrows, dens and warrens, bridges, culverts and hollow-bearing trees for evidence (e.g. guano or bat droppings) of roosting microbats
- Hollow-bearing trees and logs which provide refuge, nest and den sites for a range of threatened fauna species
- Koala food trees and/or evidence of scratches or scats
- Distinctive scats or latrine sites, owl whitewash and regurgitated pellets under roost sites
- Tracks or animal remains
- Evidence of activity such as feeding scars, scratches and diggings
- Leaf litter and fallen timber were inspected for reptile habitat
- Presence of potential habitat for threatened frog species.

Table 5 Survey methods and effort

Survey Method	Description			
Survey Effort	**Date**	**# of days**	**# of staff**	**Total hours**
	20/06/2023	1	1	8
	03/10/2023	2	2	16
Vegetation identification and PCT mapping	Vegetation identification and PCT classification were undertaken across the Subject Land			
Flora transects	Undertaken within areas of potential impact or suitable species habitat			
Vegetation integrity plots (BAM plots)	Six (6) Vegetation integrity plots (BAM plots) within different vegetation types and conditions throughout the Subject Land			
Rapid Data Points	Numerous rapid data points within native vegetation stands too small to fit a BAM plot; used to cross-check on-ground vegetation against PCTs			
Fauna habitat surveys	Throughout the subject site and within the Subject Land			
Incidental general surveys	Throughout the Subject Land			

4.4 Survey conditions and limitations

Site conditions were cool and partly cloudy with light wind at times. No rain fell during surveys. The site assessment was subject to the following weather conditions preceding and at the time of surveys, as outlined in Table 6 below.

Table 6 Weather conditions preceding and during site assessment (weather station: Hillston Airport 075032, Bureau of Meteorology 2023)

Date	Temperature (°C)		Total Rain (mm)	Max Wind Speed 9am km/hr	Wind direction
	Minimum	Maximum			
18/06/2023	-	18.2	0	-	-
19/06/2023	1.5	15.1	0	4	NNE
20/06/2023	-2	10.5	1.0	Calm	-
01/10/2023	14.0	**35.0**	0	**11**	WNW
02/10/2023	10.0	33.5	0	Calm	-
03/10/2023	22.5	30.0	0	Calm	-
04/10/2023	10.5	14.0	**10.2**	7	S

Given the nature and timing of the surveys undertaken, it is likely that some species that occur in the Subject Land either permanently, seasonally or transiently were not detected during the survey. These species may include annual, ephemeral or cryptic flora and fauna species; nocturnal fauna; birds and frogs which call at other times of year; and mobile or transient fauna in general.

The habitat assessment conducted allows for identification of habitat resources for such species, in order to assess their likelihood of occurring within the Subject Land. As such, the survey was not designed to detect all species, rather to provide an overall assessment of the ecological values within the Proposal footprint in

accordance with the BAM. This information was used to predict potential impacts of the Proposal on ecological values and to provide this as input to design development, so that impacts to native biota can be avoided, mitigated and / or offset through the BOS.

4.5 Likelihood of Occurrence of threatened biota and migratory species

Following collation of database records and review of species and community profiles, a 'likelihood of occurrence' assessment was prepared with reference to the habitats contained within the Subject Land based on information provided in the species profiles, recovery plans, journal articles, and the field staffs' knowledge of species habitat requirements. The likelihood of occurrence assessment was refined after field surveys based on habitat features recorded within the Subject Land. The likelihood of threatened and migratory biota occurring in the subject site was assessed based on presence of records from the locality for the last 20 years (since 2000), species distribution and habitat preferences, and the suitability of potential habitat present in the Subject Land. The results of this assessment are provided in Appendix E.

For ecological communities or threatened species determined known or with a moderate to high likelihood of being impacted by the Proposal, assessment of the likely significance of impacts resulting from the proposal were prepared in accordance with Section 1.7 of the EP&A Act and the EPBC Act *Matters of National Environmental Significance – Significant Impact Criteria Guidelines* (DEWHA, 2013) where relevant. These are provided in Appendix F and Appendix G respectively.

5 Results

The following chapters describe the findings of the desktop and onsite investigations completed for the proposal, within the categories of vegetation types, vegetation zones, vegetation integrity, flora and fauna species, weeds and threatened species.

5.1 Flora

A total of ninety-one (91) species were recorded both incidentally and within the vegetation integrity plots (flora plots) and incidentally within the Subject Land. Species composition consisted of fifty-eight (58) native species and thirty-three (33) exotic species, including three (3) weeds classified as High-Threat Exotics (HTE) and one (1) Weed of National Significance (WoNS). The field data collected is available in Appendix B. Threatened flora results are discussed in Section 5.3.2.

5.1.1 Native Vegetation

Vegetation within the Subject Land was comprised of a large stand of degraded to moderate condition native woodland and a large area of cropped pasture surrounded by a narrow strip of remnant woodland. Remnant vegetation within the site included native overstorey species with a mixed exotic and native ground layer and somewhat intact shrub layer with occurrences of woody weeds throughout. Open areas of the site were dominated by mixed exotic and native grasses and weed species, and exotic pasture species in the cropped paddock.

The Assessment Area is currently mapped as supporting nine (9) PCT's, and one (1) additional vegetation type that did not conform to a PCT, as outlined in Table 4 and mapped in Figure 4.

The site assessment confirmed the following PCT's were present within the Subject Land:

- PCTID 15: *Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)*
- PCTID 105: *Poplar Box grassy woodland on flats mainly in the Cobar Peneplain Bioregion and Murray Darling Depression Bioregion*

One (1) additional vegetation type that did not conform to a PCT also occurred within the Subject Land: Non-native vegetation.

5.1.2 Nominated Plant Community Types for the Subject Land

Based on the assessment process described in Section 4.3.1 above, the PCTs in Table 8 below are nominated as the most appropriate for the species assemblages present within the Subject Land.

Table 7 PCT Nominations for Vegetation Formations occurring within the Subject Land

Vegetation Formation	Potential Plant Community Types	Nominated PCT and Justification
Semi-arid Woodlands (Grassy sub-formation)	Option 1: PCTID 15: Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW	**PCTID 15:** *Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)*

	(mainly Riverina Bioregion and Murray Darling Depression Bioregion)	This PCT is characterised by the floristic and structural vegetation attributes observed on site including a sole remnant canopy species, *Eucalyptus largiflorens*, and an understorey of chenopod shrubs and very sparse occurrences of Lignum (*Muehlenbeckia florulenta*). Given the degraded nature of vegetation on the Subject Land the canopy species assemblage was used for best fit against a PCT. This PCT contained the best fit ratio and assemblage of species recorded on the site and is mapped within the Subject Land. PCT 13 is mapped as occurring within the Assessment Area however it lists *Eucalyptus camaldulensis* as one of the potential canopy species for that PCT, which did not occur within the Subject Land. PCT 16 is also suitable in terms of canopy assemblage, however, does not contain tall saltbushes or bluebushes in their descriptive attributes, which were recorded within the Subject Land. All options are listed as occurring within the Carrathool LGA and on local substrates. However, the descriptive attributes of PCT 15 best align with the conditions and species assemblage recorded within the Subject Land during surveys.
	Option 2: PCTID 13: Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	
	Option 3: PCTID 16: Black Box grassy open woodland wetland of rarely flooded depressions in south western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	
Semi-arid Woodlands (Shrubby sub-formation)	Option 1: PCTID 105: Poplar Box grassy woodland on flats mainly in the Cobar Peneplain Bioregion and Murray Darling Depression Bioregion	**PCTID 105**: *Poplar Box grassy woodland on flats mainly in the Cobar Peneplain Bioregion and Murray Darling Depression Bioregion* This PCT is characterised by the floristic and structural vegetation attributes observed on site including remnant canopy species of *Eucalyptus populneus* and *E. largiflorens* also common, with a sparse to absent mid-storey. Given the degraded nature of vegetation on the Subject Land the canopy species assemblage was used for best fit against a PCT. This PCT contained the best fit ratio and assemblage of species recorded on the site and is mapped within close proximity to the Subject Land. PCT 103 is not mapped as occurring within the Assessment Area and lists White Cypress Pine as one of the potential canopy species for that PCT, which does not occur within the Subject Land. PCT 72 is mapped as occurring within the Assessment Area, however this PCT similarly lists White Cypress Pine which did not occur.
	Option 2: PCTID 103: Poplar Box - Gum Coolabah - White Cypress Pine shrubby woodland mainly in the Cobar Peneplain Bioregion	
	Option 3: PCTID 72: White Cypress Pine - Poplar Box woodland on footslopes and peneplains mainly in the Cobar Peneplain Bioregion	

		All options are listed as occurring within the Carrathool LGA and on local substrates. However, the descriptive attributes of PCT 105 best align with the conditions and species assemblage recorded within the Subject Land during surveys.

5.1.3 Plant Community Type descriptions

Detailed PCT descriptions are provided below, including information on vegetation formation, class and condition. The VI scores have not been calculated. A map showing PCT distribution within the Subject Land is presented in Figure 4.

PCTID 15: Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	
 Plate 1 PCTID 15	
Structure	Semi-arid Woodland and Derived Native Grassland (DNG)
Landscape position	Plains
Overstorey	Pure stands of Black Box (*Eucalyptus largiflorens*)
Mid Stratum	Largely absent although there were localised occurrences of *Lycium ferocissimum*
Ground Stratum	Included an abundant cover of mixed exotic grasses and weeds, native grasses and forbs, and native chenopods. Exotic grasses included *Bromus rubens* (Red Brome), *Hordeum leporinum* (Barley Grass) and *Lolium rigidum* (Annual Ryegrass), with exotic weeds such as *Medicago truncatula* (Barrel Medic) and *Cucumis myriocarpus* (Paddy Melon) also present. Native grasses and forbs included *Austrostipa nodosa* (Knotty Speargrass), *Enteropogon acicularis* (Curly Windmill Grass), *Leiocarpa websteri*, *Rhodanthe corymbifolia* (Small White Sunray). Native chenopods included *Enchylaena tomentosa* (Ruby Saltbush), *Sclerolaena birchii* (Galvanized Burr) and *Einadia nutans* (Climbing Saltbush).
Vegetation formation	Semi-arid Woodland (Grassy sub-formation)

Vegetation class	Inland Floodplain Woodlands
PCT condition in Subject Land	Remnant woodland and DNG in moderate condition with mixed non-native and native understorey with moderate levels of weed encroachment
Conservation Status	This PCT is not associated with any Threatened Ecological Community (TEC)
PCT estimated remaining	50 % remaining
Threatened species	No threatened species were recorded within this PCT during surveys; however, a number of threatened biota (flora and fauna) are associated with this PCT and were also recorded in adjacent areas
Comments	This PCT occurred in the approximate centre of the Subject Land, as well as on the northern and southern boundary fences of the cropped paddock in the west of the Subject Land. The PCT was quite degraded by agricultural activities including grazing, and weed encroachment from adjacent pasture areas , although moderate levels of native grasses, forbs and chenopods were still present. In areas of this PCT, including along powerline easements and along fence lines, the remnant canopy species had been cleared and the PCT occurred as moderate condition DNG. This PCT graded into PCT 105 which occurred in the east of the Subject Land.
Justification	Site assessment determined that the vegetation identified on site aligns with the species composition (pure stands of Black Box). The landscape positioning (Lachlan River floodplain) woodland formation (open woodland with remnant grass and forb species) and vegetation composition (degraded due to landuse, however containing the correct canopy species and some remnant grass and forb species consistent with the PCT description) matches the diagnostic requirements for PCT 15. Additionally, the Subject Land occurs in the correct IBRA region and subregion for this PCT and subsequently PCT 15 is considered the best fit vegetation community for the site.

PCTID 105: Poplar Box grassy woodland on flats mainly in the Cobar Peneplain Bioregion and Murray Darling Depression Bioregion

Plate 2 PCTID 105 (Plot 4)

Structure	Semi-arid Woodland and Derived Native Grassland (DNG)
Landscape position	Plains
Overstorey	Dominant canopy species of Poplar Box (*Eucalyptus populnea*), with occurrences of Black Box, and a single occurrence of Gum Coolibah (*Eucalyptus intertexta*)
Mid Stratum	Largely absent although there were localised occurrences of *Lycium ferocissimum*
Ground Stratum	Included an abundant cover of mixed exotic grasses and weeds, native grasses and forbs, and native chenopods. Exotic grasses included *Bromus rubens, Hordeum leporinum* and *Lolium rigidum*, with exotic weeds such as *Echium plantagineum* (Patterson's Curse), which dominated extensive areas, *Medicago laciniata* (Tattered Medic) and *Sisymbrium erysimoides* (Smooth Mustard) also dominated extensive areas. Native grasses and forbs included *Austrostipa nodosa*, *Enteropogon acicularis, Chloris truncata* (Windmill Grass), *Eragrostis brownii* (Brown's Lovegrass), *Rhodantha corymbifolia* and *Wahlenbergia sp.* (Bluebell). Native chenopods included *Enchylaena tomentosa*, *Sclerolaena birchii,* and *Rhagodia parabolicum* (Fragrant Saltbush).
Vegetation formation	Semi-arid Woodland (Shrubby sub-formation)
Vegetation class	Western Peneplain Woodlands
PCT condition in Subject Land	Remnant woodland and DNG in degraded to moderate condition with mixed non-native and native understorey with moderate levels of weed encroachment
Conservation Status	This PCT is associated with the **EPBC Act listed Endangered Ecological Community** (EEC) - *Poplar Box Grassy Woodland on Alluvial Plains* (Poplar Box Woodland). In the Subject Land the community had a mixed canopy of predominantly Poplar Box with some Black Box, with a single

	occurrence of Gum Coolibah, and was present in an open semi-arid and DNG form. This PCT is not listed under the NSW BC Act. Although this particular PCTID is not identified as Poplar Box Woodland , the characteristics of the woodland on site meet the key diagnostic characteristics for listing as Poplar Box Woodland EEC, which includes: • a crown tree cover of over 10 % • a grassy woodland structure • Poplar Box as the dominant tree species • a mid layer crown cover of less than 30 %. Subsequently woodland present on site is identified as conforming to the EPBC Act listed Poplar Box Woodland EEC.
PCT estimated remaining	66 % remaining
Threatened species	Several threatened species were recorded within this PCT during field surveys, including Grey-crowned Babbler (*Pomatostomus temporalis*) and Major Mitchell's Cockatoo (*Lophochroa leadbeateri*). A number of other threatened biota (flora and fauna) are also associated with this PCT.
Comments	This PCT occurred in the eastern portion of the Subject Land. The PCT was quite degraded by agricultural activities including grazing by goats, and adjacent pasture areas, which has resulted in moderate levels of weed encroachment, although moderate levels of native grasses, forbs and chenopods were present. In areas of this PCT, including along powerline easements and along fence lines, the remnant canopy species had been cleared and the PCT occurred as DNG. In a cleared area in the approximate centre of this PCT the canopy species had been removed and a higher cover of exotic weeds was present, and as such, this area did not meet the requirements for EPBC Act listed EEC. This PCT graded into PCT 15 which occurred to the west.
Justification	Site assessment determined that the vegetation identified on site aligns with the species composition (canopy dominance of Poplar Box, Black Box also present). The landscape positioning (Lachlan River floodplain), woodland formation (open woodland with remnant grass and forb species) and vegetation composition (degraded due to landuse, however containing the correct canopy species and some remnant grass and forb species consistent with the PCT description) matches the diagnostic requirements for PCT 105. Additionally, the Subject Land occurs in the correct IBRA region and subregion for this PCT and subsequently PCT 105 is considered the best fit vegetation community for the site.

Table 8 Vegetation and PCT's recorded within the Subject Land and Subject Site

Plant Community Type	Zone	Subject Land (ha)	Subject site (ha)
PCTID 15: Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	DNG	23.79	0.0
PCTID 15: Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Woodland	4.93	0.01
PCTID 105: Poplar Box grassy woodland on flats mainly in the Cobar Peneplain Bioregion and Murray Darling Depression Bioregion	DNG	22.95	0.0

PCTID 105: Poplar Box grassy woodland on flats mainly in the Cobar Peneplain Bioregion and Murray Darling Depression Bioregion	Woodland	2.29	0.0
PCTID 0: Non-native	Non-native	8.69	12.34
Total Area (ha):		**62.66**	**12.35**
Total Native Vegetation (ha):		**38.87**	**0.01**
Percentage Native Vegetation (ha):		**62%**	**0.08%**

5.1.4 Exotic Vegetation

The Subject Land and surrounding areas have experienced a high proportion of disturbance from historic land management (clearing for agriculture and grazing). This disturbance, along with the introduction of exotic pasture species, has likely encouraged the proliferation of common exotic species to dominate the site including listed High Threat Exotic's (HTEs) and Weeds of National Significance (WoNs) (Table 10) throughout.

The subject site was comprised of a cropped paddock and a small area of degraded remnant woodland and pasture, which was largely dominated by exotic pasture grasses including *Hordeum leporinum, Bromus rubens* and *Lolium rigidum*. and agricultural weeds such as *Capsella bursa-pastoris* (Sheperd's Purse) and *Limonium lobatum* (Winged Sea Lavender). Weed cover and diversity across the entire Subject Land was moderate with woody WoNS *Lycium ferocissimum* (African Boxtthorn) and HTE species *Carthamus lanatus* (Saffron Thistle) and *Xanthium occidentale* (Noogoora Burr) occurring in remnant woodland within the Subject Land (Plate 7). Weeds listed as HTE, WoNS, and/or Priority Weeds for the Western region are listed in Table 10 below.

Table 9 High Threat Weeds recorded within the Subject Land

Scientific Name	Common Name	Status	Regional/National Listing
Carthamus lanatus	Saffron Thistle	HTE	-
Lycium ferocissimum	African Boxthorn	HTE	*WoNS;* *Western Priority Weed – Regional Recommended Measure;* *Prohibition on certain dealings*
Xanthium occidentale	Noogoora Burr	HTE	-

Plate 3 PCT 105 within the Subject Land

Plate 4 PCT 15 within the subject site at the location of the proposed powerline easement

Plate 5 The existing access road from Kidman Way

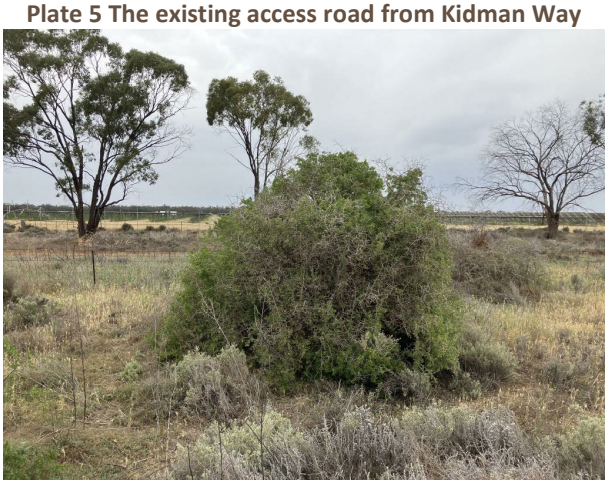


Plate 6 Non-native vegetation within the subject site

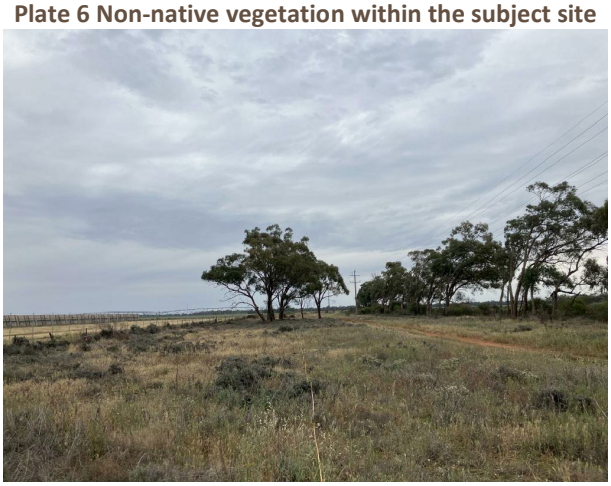


Plate 7 African Boxthorn (WoNS) within the subject site

Plate 8 PCT 15 Derived Native Grassland within the subject site at the location of the proposed powerline easement

5.2 Fauna

A total of thirty-two (32) fauna species were incidentally recorded during the surveys. This included thirty (30) native bird species, such as Galah (*Eolophus roseicapillus*), Australian Ringneck (*Barnardius zonarius*) and Noisy Miner (*Manorina melanocephala*), one (1) native mammal (Eastern Grey Kangaroo; *Macropus giganteus*) and one (1) reptile (Eastern Brown Snake; *Pseudonaja textilis*). A full list of species is provided in Table 16 (Appendix B).

The site contained a high diversity and abundance of native fauna with evidence of bird activity, including foraging and nesting primarily within woodland patches within the Subject Land (Plate 9, Plate 12, Plate 13).

Threatened fauna results are discussed below in Section 5.3.3.

5.2.1 Fauna habitats

The Subject Land contained a large patch of degraded to moderate remnant habitat, isolated patches of moderate remnant woodland along fence lines, areas of predominantly native ground cover, and a large, completely cleared paddock area dominated by cropped pasture species (Plate 3, Plate 4, Plate 6). Habitat within the subject site was limited to grassland foraging habitat suitable for open area, disturbance tolerant

bird species and terrestrial fauna, as well as a small area of remnant woodland which provides potential foraging habitat for woodland fauna species, although no nesting or breeding resources were observed in these areas (Plate 4).

Native vegetation within the Subject Land, consisting of remnant woodland (Plate 1) and DNG (Plate 8) provides suitable potential foraging and roosting resources for a range of woodland and disturbance tolerant fauna including threatened woodland birds including Grey-crowned Babbler (*Pomatostomus temporalis temporalis*) Noisy Minors (*Manorina melanocephala*) and Singing Honeyeaters (*Gavicalis virescens*) and , which were observed within woodlands frequently during field surveys. Non-native vegetation within the cropped paddock was also observed to provide suitable foraging habitat for White-fronted Chat (*Epthianura albifrons*) and Magpie-larks (*Grallina cyanoleuca*) during field surveys (Plate 10, Plate 15), with other disturbance tolerant fauna likely to also utilise these areas for transient foraging.

Hollow bearing trees (HBTs), within the large remnant stand in the eastern portion of the Subject Land, provide suitable nesting and sheltering habitat for a range of native fauna including nesting parrots such as Galahs, Australian Ringnecks and Mulga Parrots (*Psephotus varius*). HBTs were restricted to the eastern portion of the Subject Land, outside of the subject site, where they were abundant, and contained hollows ranging in size from <5 cm to >30 cm (Plate 12). Numerous bird nests were also observed in the eastern remnant woodland area (Plate 13). Large remnant trees and dense stands of smaller juvenile trees were also observed to provide suitable habitat for groups of less mobile avian species such as White-winged Chough (*Corcorax melanorhamphos*) and Grey-crowned Babbler (Plate 14, Plate 16).

The Subject Land is surrounded by predominantly cleared agricultural paddocks, although similarly sized remnant woodland patches existed within the Assessment Area. These other remnant patches, and remnant vegetation along Kidman Way, provide patchy connectivity to larger areas of high quality fauna habitat in the broader locality, including the Lachlan River, approximately 2.3 km to the west, and to Lachlan Valley National Park and Nombinnie Nature Reserve, to the north of the locality.

Leaf litter, low shrubs, dense groundcover, and abundant fallen timber within the large remnant woodland patch also provides suitable habitat for reptiles, including lizards and snakes, including Eastern Brown Snake which was observed within shrubs on the edge of cleared agricultural land in the subject site during field surveys.

No mapped waterways occurred within the Subject Land, although a minor man-made drainage channel existed on the western edge of the cropped paddock, which was observed to contain shallow water, and provide foraging habitat for a group of White-fronted Chats (Plate 15). No other water habitat was observed within the Subject Land, although the site exists on the Lachlan River floodplain, and there was evidence of periodic inundation in major flood events which likely creates wetland habitat for a range of fauna species (Plate 16).

5.2.2 Habitat connectivity

The Subject Land is surrounded by predominantly cleared agricultural paddocks, although similarly sized remnant woodland patches existed within the Assessment Area. These other remnant patches, and remnant vegetation along Kidman Way, provide patchy connectivity to larger areas of high quality fauna habitat in the broader locality, including the Lachlan River, approximately 2.3 km to the west, and to Lachlan Valley National Park and Nombinnie Nature Reserve, to the north of the locality.

Less mobile fauna species, such as Grey-crowned Babblers and White-winged Choughs were observed within the Subject Land, and likely permanently inhabit the remnant woodland in the site given the observed behaviour on site.

Plate 9 Remnant woodland with abundant fauna habitat resources

Plate 10 Foraging habitat within the open paddock

Plate 11 Foraging habitat within grassland and a small remant woodlan patch within the subject site

Plate 12 Tree hollow within the Subject Land

Plate 13 Bird's nest within the Subject Land

Plate 14 Grey-crowned Babbler habitat

Plate 15 Drainage channel adjacent to the cropped paddock containing White-fronted Chats

Plate 16 Evidence of water inundation on juvenile trees & Grey-crowned Babbler habitat

5.3 Conservation significance

The following section describes the conservation significance of vegetation communities and species likely to be present within the Subject Land.

Threatened biota and migratory species that are known or predicted to occur in the locality are presented in Appendix E.

The habitat resources present at the site (determined during the site survey) were compared with the known habitat associations/requirements of the threatened and migratory biota identified through the desktop review. This was used to determine the likelihood of each threatened ecological community, endangered population and threatened or migratory species occurring within the Subject Land. The results of this assessment are presented in Appendix E.

The threatened biota and migratory species recorded during surveys, or that are considered likely to occur and to be affected by the Proposal, are discussed below.

5.3.1 Threatened ecological communities

One (1) Threatened Ecological Community (TEC) was recorded as occurring within the Subject Land during surveys.

PCTID 105 was confirmed as occurring within the Subject Land as Grassy Woodland in both woodland and Derived Native Grassland (DNG) formations in a degraded to moderate condition. This PCT aligns with the listed Threatened Ecological Community (TEC) *Poplar Box Grassy Woodland on Alluvial Plains*, listed as Endangered under the EPBC Act only. This TEC is not listed under the NSW BC Act. Vegetation within the Subject Land met the condition benchmark for the EPBC Act listed *Poplar Box Grassy Woodland on Alluvial Plains* TEC, as:

- The Subject Land occurs in the Riverina IBRA bioregion
- The Subject Land is associated with ancient and recent depositional alluvial plains with clay-loam soils as part of the currently defined Lachlan River floodplain
- The PCT occurs as a grassy woodland with a tree crown cover of more than 10%

- The tree canopy contains Poplar Box, Black Box and Gum Coolibah which are capable of reaching 10 m or more in height; and is dominated by Poplar Box
- The mid-layer crown cover of shrubs and small trees is less than 30%.

This community occurred in the eastern portion of the Subject Land and does not occur in close proximity to the area of direct impact, and is unlikely to be indirectly impacted by the Proposal given the distance from, and the relatively minor nature, of the proposed works. As such, an 'Assessment of Significance' has not been prepared for this community under the EPBC Act as this community is unlikely to be impacted by the Proposal.

5.3.2 Threatened flora species

No species of threatened flora were recorded within the Subject Land during surveys, and no previous records for threatened species occur within the Subject Land. However, seasonal targeted surveys were not undertaken as part of this assessment.

Three (3) threatened flora species have recorded within the locality, including:

- *Dodonaea sinuolata var. acrodentata* – listed as Endangered, BC Act
- *Leptorhynchos orientalis* (Lanky Buttons) – listed as Endangered, BC Act
- *Swainsona murrayana* (Slender Darling Pea) – listed Vulnerable, BC & EPBC Act

Areas of remnant woodland have the potential to provide suitable habitat for some of these species within the broader Subject Land in areas of higher quality woodland habitat. Areas within the subject site are not considered suitable habitat for these species, as they have been highly disturbed by agricultural activities, including sowing of exotic pasture species resulting in ground disturbance through ploughing, and by grazing of livestock. The subject site subsequently contains a groundcover stratum with a high level of exotic species and is unlikely to support the occurrence of threatened flora. These species may occur in remnant woodland and DNG in the wider Subject Land, however impacts are not proposed to occur in these areas. A full list of threatened flora species recorded in the locality or predicted to occur is provided in Appendix E, together with their habitat requirements and likelihood of occurrence.

5.3.3 Threatened fauna species

Three (3) threatened fauna species were identified within the Subject Land during the site assessment, including:

- Grey-crowned Babbler (*Pomatostomus temporalis temporalis*) – listed as Vulnerable, BC Act
- Major Mitchell's Cockatoo (*Lophochroa leadbeateri*) – listed as Vulnerable, BC Act
- White-fronted Chat (*Epthianura albifrons*) – listed as Vulnerable, BC Act; Endangered, EPBC Act

Twelve (12) additional species of threatened fauna have records within the locality (Figure 8), however few of these records occur within the Assessment Area and none occur within close proximity to the Subject Land.

A summary of the threatened fauna species and their use of the Subject Land is provided below:

- A group of nine (9) Grey-crowned Babblers were observed to be inhabiting the Subject Land. The group was located within the remnant woodland patch in the eastern portion of the Subject Land, and were noted to be in habitat that contained large habitat trees as well as dense stands of smaller juvenile trees which typically tend to be preferred feed trees for the species.

- Two (2) Major Mitchell's Cockatoo was observed within the remnant woodland patch in the eastern portion of the Subject Land. Both were observed flying over the site and landing on medium-sized remnant trees within remnant Poplar Box Wodland.
- A group of eight (8) White-fronted Chats, including two (2) breeding pairs, were observed on the western boundary of the Subject Land. This threatened species was noted to be perching on and flying just above the crops in the paddock adjacent to the Subject Land, as well as landing in some shallow water and mud which was present within the man-made drainage channel on the Subject Land.

Additionally, the woodland habitat within the eastern portion of the Subject Land contained abundant tree hollows and foraging resources which were potentially suitable for a range of threatened fauna species including Brown Treecreeper (eastern subspecies)(*Climacteris picumnus victoriae*) and Diamond Firetail (*Stagonopleura guttata*). Open areas of the Subject Land may provide hunting habitat for other threatened species including Spotted Harrier (*Circus assimilis*).

Consideration of impacts to threatened species is provided below in Section 6.2.2.

5.3.4 Migratory fauna

No migratory species were recorded during field surveys, and no migratory species habitat was recorded within the Subject Land at the time of survey, past periodically inundated floodplains and degraded open areas.

A full list of migratory fauna species recorded in the locality or predicted to occur is provided in Appendix E, together with their habitat requirements and likelihood of occurrence.

Important habitat for migratory birds is defined in the significance criteria for listed migratory species (DoE 2013) as follows:

- Habitat utilised by a migratory species occasionally or periodically within the region that supports an ecologically significant proportion of the population of the species.
- Habitat that is of critical importance to the species at particular life-cycle stages.
- Habitat utilised by a migratory species which is at the limit of the species range.
- Habitat within an area where the species is declining.

Habitat in the Proposal site is unlikely to be important for these species as defined in the significance criteria (DoE 2013) given the absence of migratory species habitat, and the extent of fragmentation and previous and ongoing disturbance. Habitat in the Subject Land would not support an ecologically significant proportion of the population, is not critical to the lifecycle of these species and is not at the limit of these species' range. While these species may occur on occasion, they would not rely on the habitats present for their persistence in the locality, given the availability of preferred habitat in adjacent areas.

Figure 6 Survey Effort and verified PCT's

Figure 7 Development Direct Impact Footprint within Subject Land

6 Impact Assessment

The following chapters detail the impact assessment completed for the Proposal, in order to determine whether the Proposal will be required to enter the BOS or be referred to the NSW or Commonwealth Minister for Environment for further assessment. Impacts assessed include direct and indirect impacts arising from the proposal to native vegetation, threatened species, ecological communities and their habitats, and Key Threatening Processes (KTP).

6.1 Direct Impacts

6.1.1 Loss of native vegetation

Impacts to allow for the future construction of the proposed solar farm and associated infrastructure will result in direct impacts to up to **0.01 ha** of native vegetation in the form of remnant woodland, and **11.27 ha** of non-native vegetation consisting primarily of exotic cropped pasture species (Table 11 below, Figure 7).

Table 10 Impacts to vegetation

Plant Community Type (PCT) to be impacted	Subject Land (Indirect impacts) ha	Subject Site (Direct impacts) ha
PCTID 15: Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	10.98	0.01
PCTID 105: Poplar Box grassy woodland on flats mainly in the Cobar Peneplain Bioregion and Murray Darling Depression Bioregion	27.88	0.0
PCTID 0: Non-native	23.79	12.34
Total (ha):	62.66	12.35
Total native vegetation removed (ha):		0.01

Impacts would occur as follows:

- 7.82 ha for the proposed solar array
- 0.35 ha for the proposed access road
- 0.62 ha for the existing road
- 0.12 ha to allow for the proposed laydown areas
- 0.01 ha for the major electrical devices
- 0.09 ha to allow for a powerline easement through non-native vegetation
- 0.01 ha to allow for a powerline easement through PCT 15 woodland
- 0.03 ha to allow for site parking
- 2.24 ha to allow for a construction footprint surrounding the solar array
- 1.07 ha to allow for a 10 m wide APZ surrounding the solar array

The total fenced solar farm site would be larger than 12.35 ha, however, not all areas within the fenced area would be impacted by the construction.

Proposed impacts are predominantly within non-native groundcover vegetation comprised as mostly cereal crops and exotic pasture grasses such as *Lolium perenne, Bromus rubens* and *Hordeum leporinum,* and exotic weeds such as *Capsella bursa-pastoris* and *Lactuca serriola*.

Impacts to native vegetation are anticipated to occur to 0.01 ha of PCT 15 woodland to allow for the connection of a transmission line easement. This area contained some native species including *Eucalyptus largiflorens*, *Chloris truncata, Austrostipa scabra* and *Enchylaena tomentosa*. Impacts to this community would involve the removal of a small area of Black Box trees that do not contain hollows or nesting habitat (at the time of surveys), and the destruction of some native groundcover species.

6.1.2 Fauna habitat loss and fragmentation

The loss of up to 0.01 ha of remnant PCT 15 within the Subject Land has the potential to minorly reduce the availability of foraging and movement resources for fauna within the Subject Land and surrounding Assessment Area. No large trees or hollow bearing trees occur within the subject site or within close proximity, and as such no breeding or nesting resources are likely to be impacted by the Proposal.

Given the nature and limited extent of possible impacts, the Proposal will not result in a substantial increase in fragmentation given the nature of the Subject Land and locality, and the avoided impacts to isolated paddock trees and remnant native vegetation within the site.

Safeguard and management measures to reduce the risk of habitat loss and fragmentation are presented in Section 7.

6.1.3 Fauna injury and mortality

There is the potential for fauna injury or mortality during vegetation clearing and disturbance. Less mobile fauna present such as small terrestrial fauna including lizards, snakes and frogs are most at risk of becoming trapped, injured or killed as part of excavation works or vegetation removal. Direct injury/mortality to these species is unlikely due to the minor impacts of the proposed works (i.e no habitat trees to be removed) and the heavily degraded nature of the majority of the subject site, lacking leaf litter and fallen timber or rocks. No large, habitat providing trees will be removed as a part of the Proposal, with impacts restricted to a small number of small trees.

Safeguard and management measures to reduce the likelihood of fauna injury and mortality are presented in Section 7.

6.2 Impacts to Threatened Biota

6.2.1 Impacts to Threatened Ecological Communities

No impacts to TECs are anticipated to occur as a result of the Proposal as they do not occur within or in close proximity to the subject site.

As such, assessments of the likely significance of impacts of the Proposal on TECs within the Subject Land pursuant to Section 7.3 of the BC Act (5-part test) and the significant impact assessment criteria for EPBC Matters of National Environmental Significance – Significant impact guidelines 1.1 (DEWHA, 2009) have not been prepared.

Safeguards and management measures have been developed to further ensure no impacts occur to native vegetation outside of the subject site and will be implemented during construction (Section 7).

6.2.2 Impacts to Threatened Species

The following species listed under either the NSW BC Act and/or the Commonwealth EPBC Act, have the potential to be impacted by the Proposal:

- Brown Treecreeper (eastern subspecies) (*Climacteris picumnus victoriae*), listed as Vulnerable under BC Act & EPBC Act
- Diamond Firetail (*Stagonopleura guttata*), listed as Vulnerable under BC Act & EPBC Act
- Superb Parrot (*Polytelis swainsonii*), listed as Vulnerable under BC Act & EPBC Act
- Turquoise Parrot (*Neophema pulchella*), listed as Vulnerable under BC Act only
- White-fronted Chat (*Epthianura albifrons*), listed as Vulnerable under BC Act only
- Grey-crowned Babbler (Pomatostomus temporalis temporalis) – listed as Vulnerable, BC Act

Subsequently an assessment of the likely significance of impacts of the Proposal on these threatened species pursuant to Section 7.3 of the BC Act (5-part test) and/or the significant impact assessment criteria for *EPBC Matters of National Environmental Significance – Significant impact guidelines 1.1* (DEWHA, 2009) have been prepared to assess the potential direct impacts to these species (Appendix F and Appendix G). The outcome of these assessments is summarised in Section 6.5.3 below.

Safeguards and management measures have been developed to minimise impacts to threatened species and their habitats outside of the subject site and will be implemented during construction (Section 7).

6.3 Indirect Impacts

Indirect impact to the Subject Land includes possible impacts to an area comprising 62.66 ha of which native vegetation equals 38.87 ha. However, given the nature of the Proposed works to be undertaken, indirect impacts are likely to be contained within close proximity to the proposed construction area and of a minor nature. In this instance, indirect impacts would be contained predominately to the existing open paddock area and a minor amount of PCT 15 woodland.

Safeguard and mitigation measures have been recommended to reduce indirect impacts to native flora and fauna as a result of the Proposal (Section 7).

6.3.1 Invasion and spread of weeds, pests and pathogens

The Proposal has the potential to result in further introduction and spread of exotic plants throughout the site as a result of construction activities. The further disturbance of soil for construction creates an environment conducive to the spread of weeds. Additionally, inappropriate hygiene measures associated with imported materials and vehicle and machinery movements also increases the risk of introducing and spreading weeds.

Exotic plants already occur throughout the site, and High Threat Exotics and WONS were recorded within the Subject Land during the site assessment (Section 5.1.4). Given the current condition of the site, further spread of existing weed species is unlikely to have a significant impact on the existing environment. Nonetheless, safeguard and management measures (Section 7) would be implemented to limit the spread of existing weeds to the site, and to minimise the likelihood of new exotic species being introduced.

6.3.2 Noise and vibration disturbance

The Proposal would result in an increase in noise and vibration disturbance due to the use of machinery during construction. Noise and vibration levels during the construction period would result in a slight increase above existing background levels for the duration of construction, however, will generally be characteristic of existing noise and vibration disturbances in the area due to the existing agricultural land (i.e. machinery and vehicle noise), adjacent roads and nearby airport. Although, no indirect impacts outside of that which already occurs on site are anticipated, safeguard and mitigation measures to reduce the likelihood of impacts of noise and vibration on fauna in the environment have been outlined in Section 7.

6.4 Key Threatening Processes

A key threatening process (KTP) is defined in the BC Act as an action, activity or proposal that:

- Adversely affects two or more threatened species, populations or ecological communities
- Could cause species, populations or ecological communities that are not currently threatened to become threatened

There are currently thirty-nine (39) KTPs listed under the BC Act (DPIE 2021) eight (8) listed under the FM Act (DPI 2021) and twenty-one (21) under the EPBC Act (DCCEEW 2022). Several KTPs are listed under more than one Act. The current Proposal has the potential to add in a minor way to the following KTP's:

Table 11 Key Threatening Processes for relevance to the Proposal

Key Threatening Process	Status	Comment
Clearing of native vegetation	BC Act; EPBC Act	Native vegetation is made up of plant communities, comprising primarily indigenous species and includes canopy trees (where present), understorey, ground cover and below ground biomass (roots, bulbs and the seed bank). For the purposes of this determination native vegetation does not include marine vegetation within the meaning of the *Fisheries Management Act 1994.* Clearing, as defined by the determination, refers to the destruction of a sufficient proportion of one or more strata (layers) within a stand or stands of native vegetation. The proposal would result in the clearing of up to 0.01 ha of native vegetation.
Infection of frogs by amphibian chytrid causing the disease chytridiomycosis	BC Act; EPBC Act	Chytridiomycosis is potentially fatal to all native species of amphibian. As such, all frog species that are listed under the schedules of the Act may be affected by the disease. Fifty species of Australian frogs have been found infected with the chytrid fungus. High altitude (>400m) populations are more severely affected by chytridiomycosis. Such population declines have been reported from the NSW uplands (Gillespie and Hines 1999, Hines et al. 1999). Stream-associated frog species are more likely to be infected because the pathogen is waterborne.

		The proposal could result in a slight increase in the risk of the spread of chytrid due to improper machinery hygiene on site during construction. This would be managed via mitigation measures and safeguards outlined in Section 7.
Invasion of native plant communities by exotic perennial grasses	BC Act	Exotic perennial grasses are those that are not native to NSW and have a life-span of more than one growing season. More than a hundred species of exotic perennial grasses occur in New South Wales. A relatively small number of these perennial grasses threaten native plant communities, and it is these species which are of concern. Further disturbance within and near remnant stands of native vegetation within the Subject Land could lead to further invasion of exotic grasses within the site. However, given the high abundance of exotic grasses and weeds prevalent throughout the Subject Land, it is unlikely that the proposal would result in a significant increase in the risk of further spread of these weeds across the site.
Removal of dead wood and dead trees	BC Act	Dead fallen timber and standing dead trees provide valuable habitat for a range of native fauna. Remnant stands of woodland within the Subject Land contain fallen dead timber which has the potential to be impacted by vegetation clearing. Therefore, the Proposal would provide a risk of this KTP increasing within the Subject Land.

6.5 Biodiversity Offset Scheme

The Biodiversity Offset Scheme (BOS) applies to local development (assessed under Part 4 of the Environmental Planning and Assessment Act 1979) that is likely to significantly affect threatened species. Local development is likely to significantly affect threatened species and require a biodiversity development assessment report (section 7.7 of the Biodiversity Conservation Act 2016) if impacts:

- exceed the Biodiversity Offsets Scheme are clearing threshold (BC Act, section 7.4); the threshold includes clearing on land within the Biodiversity Values Map or clearing of an area that exceeds the threshold, or
- are carried out on an Area of Outstanding Biodiversity Value (AOBV), or
- are likely to significantly affect threatened species, ecological communities and their habitats according to the test in section 7.3 of the BC Act

6.5.1 Area Clearing Threshold

The minimum lot size for the Subject Land is 10 – 49.9 ha; subsequently the clearing threshold for the site based on the minimum lot size, is 0.5 ha.

The proposal will result in the removal of up to **0.01 ha** of native vegetation to facilitate the construction of the proposed powerline easement. Subsequently, as per the requirements of the BOS outlined in Section 2.2.3, the clearing threshold for native vegetation will not be exceeded by this Proposal. Therefore, **the BOS is not** triggered by this mechanism.

6.5.2 Biodiversity Values Mapping

No areas of High Biodiversity Value are mapped as occurring in the Subject Land (see Appendix C).

As such, the Proposal will) not impact on areas of mapped Biodiversity Value. Therefore, **the BOS is not** triggered by this mechanism.

6.5.3 Assessment of Significance Threshold

Threatened species and ecological communities recorded during surveys or with the potential to occur within the locality (Figure 6, Figure 8) were considered for their potential to be supported by habitat features present within the subject site, or to use the site at some stage during their lifecycle, and therefore be impacted by the Proposal. Threatened biotas determined to have a moderate or higher likelihood of being impacted were assessed against state and/or federal guidelines to determine the level of expected impacts for each biota (Table 13, Appendix F and Appendix G).

Assessments of significance pursuant to Section 7.3 of the BC Act (5-part test) were prepared (Appendix F) to assess the impacts of the Proposal on these threatened biotas under the NSW legislation. Additionally, impacts to biota listed under Commonwealth legislation were assessed against the significant impact assessment criteria for EPBC Matters of National Environmental Significance – Significant impact guidelines 1.1 (DEWHA, 2009) (Appendix G).

These assessments determined the following:

Table 12 Assessment of Significance summary

Species	BC Act	EPBC Act	AoS outcome
Woodland Birds			
Brown Treecreeper (eastern subspecies)	V	V	No significant impact
Diamond Firetail	V	V	No significant impact
Superb Parrot	V	V	No significant impact
Turquoise Parrot	V	-	No significant impact
Recorded threatened species			
White-fronted Chat	V	-	No significant impact
Grey-crowned Babbler	C	-	No significant impact

No further threated species are considered likely to reside or depend on resources present within the subject site beyond opportunistic resources use given the minor availability of modified and degraded habitat present (Appendix E).

Subsequently, the Proposal is deemed unlikely to have a significant negative effect on TEC's, species or populations and no Species Impact Statements and / or Referral to the Environment Minister is required.

As no thresholds are triggered for entry into the BOS, **participation in the BOS is not required**.

7 Safeguards and Mitigation Measures

This section outlines recommended efforts to avoid and minimise impacts on biodiversity values associated with the Proposal.

The following Environmental Safeguards (Table 14) are provided to further mitigate or manage impacts resulting from the Proposal.

Table 13 Environmental safeguards and mitigation measures

Biodiversity impact	Mitigation measure	Responsibility and timing
General	Ensure all workers are provided with an environmental induction prior to the commencement of works to outline key biodiversity features of the site (i.e. Paddock trees, native vegetation, drainage channel, remnant woodland), and the management measures in place to protect biodiversity during construction. Site is to be kept tidy and free from rubbish at all times, to prevent wastes being blown into adjacent areas of native vegetation or waterways.	Project and site manager Pre-construction and construction
Native vegetation loss	Clearly delineate vegetation to be removed/retained, and induct all site personnel as to the approved extent of clearing. Vehicles and machinery to utilise existing roads, fire trails or existing cleared areas where possible, and are not to extend beyond the direct impact footprint.	Project and site manager Pre-construction and construction
Invasion and spread of weeds and pests	Develop and implement an active weed and pest management plan prior to construction commencing, to reduce the risk of weed spread and safety issues arising from pest and weed presence (e.g. blackberry). Declared weeds within the subject site must be managed according to requirements under the Biosecurity Act 2015. It is recommended that all Weeds of National Significance and NSW Priority Weeds should be controlled, and where possible, eradicate to reduce the risk of further spread. The Client should implement an ongoing weed control program throughout the Subject Land to manage the spread of weeds across the site. Strict hygiene protocols must be followed. If weeds are accidentally transported to site, or identified during construction activities, all weed material should be immediately contained and removed from site.	Project and site manager Pre-construction and construction
Habitat loss and fragmentation	Prior to clearing, a preclearance survey should be undertaken including inspection for threatened species (flora and fauna), and habitat features (i.e nests or burrows) to confirm occupation by fauna. Care should be taken to identify nests and/or roosting sites. If fauna habitat is present	Project and site manager Pre-construction and construction

	the appointed contractor would contact the project ecologist for further advice prior to clearing.	
Fauna injury and mortality	Where practicable, it is recommended that any vegetation and fauna habitat removal should occur outside of key breeding seasons (fledging of active nests/roosts) (approximately June to January) for species likely to utilise the site to avoid or minimise the chance of nest abandonment, injury or death to native fauna. Where vegetation and habitat removal is required, an ecologist or fauna spotter catcher must be present at all times during pre-clearing and clearing activities to remove and relocate wildlife as necessary, and to attend to any wildlife that are injured as a result of works.	Project and site manager Pre-construction and construction
Impacts to waterways, chemical contamination and sedimentation	All erosion, sedimentation and contamination control plans should be established and implemented prior to construction. Sediment and erosion controls must be installed downslope of any disturbance areas prior to any earthworks. Soils to be stockpiled at designated stockpile locations in a cleared area, within pre-approved zones away from waterways, drainage lines and native vegetation, and are appropriately stabilized in accordance with the 'Blue Book' (Landcom 2004). Chemicals or pollutants on site to be stored appropriately in bunded areas to prevent pollution of soils or waters which may impact upon biodiversity. Any use of herbicide is to be safe for environmentally sensitive areas and registered for use within waterways to reduce potential for impacts to aquatic fauna and amphibia. Recently disturbed soils must be stabilised progressively and promptly after works are completed to prevent erosion and sediment migration. Maintain Vegetation Protection Zones outside direct impact area to avoid compaction of soils. This includes no movement of excavation machinery or parking or storing equipment outside designated clearing areas or laydown areas. Vegetation existing along gullies or eroded areas should be retained and protected where possible, to ensure future erosion potential is minimised.	Project and site manager Pre-construction and construction
Introduction and spread of pathogens and disease	Development and implementation of a pathogen management procedure as part of the CEMP. Strict hygiene protocols, as outlined in the CEMP should be implemented and followed including:	Project and site manager Pre-construction and construction

	• All machinery entering the site must be appropriately washed down and disinfected prior to work on site to prevent the potential spread of weeds and pathogens • Protocols to prevent introduction or spread of chytrid fungus should be implemented following hygiene protocol for the control of disease in frogs (DECC 2008b).	

8 Conclusion

Surveys undertaken to assess ecological attributes present within the Subject Land at Lot 1 DP 626213 (62.66 ha), Hillston, NSW, included habitat identification, confirmation of vegetation community mapping, identification of TECs, collection of BAM data, as well as incidental threatened flora and fauna observations.

The Subject Land occurs on the outskirts of Hillston NSW, located approximately 3.5 km south of the town centre. Land use of the surrounding area includes agricultural paddocks to the north, east, south and west, as well as Hillston Airport further to the north. Subsequently, only scattered stands of native vegetation or species habitat remain within the Assessment Area. The Subject Land contains a relatively large patch of remnant woodland in the eastern portion, with the remainder of the Subject Land comprised of a cropped agricultural paddock surrounded by small areas of partially cleared remnant woodland along the property boundary. No waterways, wetlands or soaks occur within the Subject Land, however one (1) man-made irrigation channel occurs along the western boundary, and there is evidence across the Subject Land of periodic inundation during flood events.

The area proposed for the location of the solar farm (subject site) occurs in the western portion of the Subject Land. This area consists of a cleared and sown agricultural paddock comprised of non-native pasture grasses and some weeds. The subject site also encompasses a small area of remnant woodland on the southern boundary of the Subject Land, which contains a small number of native trees and mixed native and exotic ground cover vegetation.

A total of ninety-one (91) species were recorded both incidentally and within the vegetation integrity plots (flora plots) undertaken across the Subject Land. Species composition consisted of fifty-eight (58) native species and thirty-three (33) exotic species, including three (3) weeds classified as High-Threat Exotics (HTE), one (1) regionally listed species and Weed of National Significance (WoNS).

Native vegetation within the Subject Land was comprised of two (2) PCT's:

- PCTID 15 *Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)* – located within and surrounding the subject site, and in the western portion of the large remnant stand,
- PCTID 105 *Poplar Box grassy woodland on flats mainly in the Cobar Peneplain Bioregion and Murray Darling Depression Bioregion*- located in the eastern portion of the large remnant stand.

Based on the field surveys and validation of vegetation condition on site, one (1) Threatened Ecological Community (TEC) was recorded in the Subject Land; portions of the vegetation aligning with PCTID 105 was consistent with the TEC Poplar Box Woodland, listed as Endangered under the EPBC Act. In total, 22.95 ha of degraded to moderate condition *Poplar Box Grassy Woodland on Alluvial Plains* TEC in remnant woodland form occurs within the Subject Land. However, this TEC does not occur in close proximity to the subject site and is unlikely to be directly or indirectly impacted by the Proposal. As such, a significant Impact Criteria Assessment (SICA) under the EPBC Act was not required.

No species of threatened flora were recorded within the Subject Land and no species of threatened flora are likely to occur within the subject site owing to the historic clearing and current agricultural land use.

A total of thirty-two (32) fauna species were incidentally recorded during the surveys. This included thirty (30) native bird species, such as Galah (*Eolophus roseicapillus*), Australian Ringneck (*Barnardius zonarius*) and Noisy

Miner (*Manorina melanocephala*), one (1) native mammal (Eastern Grey Kangaroo; *Macropus giganteus*) and one (1) native reptile (Eastern Brown Snake; *Pseudonaja textilis*). The site contained a high diversity and abundance of native bird species with evidence of bird activity primarily within the remnant woodland patch in the east of the Subject Land, which contained a high number of tree hollows and habitat resources.

Three (3) species of threatened fauna were recorded within the Subject Land during field surveys. Nine (9) individuals of Grey-crowned Babbler (*Pomatostomus temporalis temporalis*) and two (2) Major Mitchell Cockatoos (*Lophochroa leadbeateri*) were recorded within the large remnant woodland patch in the eastern portion of the Subject Land. Eight (8) White-fronted Chats (*Epthianura albifrons*) were observed flying just above and perching on crops in the paddock to the direct west of the Subject Land, and were also observed within the man-made drainage channel on the site's western boundary.

Impacts to threatened species considered likely to occur within and utilise resources within the subject site included:

- Brown Treecreeper (eastern subspecies) (*Climacteris picumnus victoriae*)
- Diamond Firetail (*Stagonopleura guttata*)
- Superb Parrot (*Polytelis swainsonii*)
- Turquoise Parrot (*Neophema pulchella*)
- White-fronted Chat (*Epthianura albifrons*)
- Grey-crowned Babbler (*Pomatostomus temporalis temporalis*)

These species were assessed pursuant to Section 7.3 of the BC Act (5-part test), and the Significant Impact Criteria Assessment for EPBC Matters of National Environmental Significance – Significant impact guidelines 1.1 (DEWHA, 2009). The outcome of these assessments determined that the Proposal would be **unlikely** to have a significant impact on threatened biota.

The Subject Land measures a total area of **62.66 ha** with a total direct impact area of **12.35 ha**. This includes:

- Impacts to **0.01 ha** of native vegetation, consisting of PCT 15 *Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)* remnant woodland to facilitate the proposed powerline easement.
- Impacts to **11.27 ha** of non-native vegetation to facilitate the installation and construction of the solar array, access road, laydown areas, major electrical devices, powerline devices, powerline easement and site parking.

The minimum lot size for the subject land is 10 – 49.99 ha; subsequently the clearing threshold for the site based on the minimum lot size, is 0.5 ha. The Proposal will result in the removal of up to 0.01 ha of native vegetation. Subsequently, as per the requirements of the BOS outlined in Section 2.2.3, the clearing threshold for native vegetation **will not be exceeded** by this proposal.

No areas of high biodiversity as identified on the Biodiversity Values Map (BVM) occur within the Subject Land, therefore no impacts to mapped BVM areas would occur as a result of the proposal. Additionally, as the proposal will not impact significantly on any threatened species, ecological communities or their habitats occurring within the Subject Land, it is determined that **participation in the BOS is not required.**

Vegetation and habitat removal should take place outside of key breeding seasons for fauna (June - January). Further, preclearance surveys and the presence of a fauna spotter are recommended to be undertaken prior to and during the removal of any native vegetation or habitat on the site.

9 References

Bureau of Meteorology (2023) Climate Statistics for Australian Locations, Summary statistics Hillston Airport. Retrieved 20 June 2023, from http://www.bom.gov.au/climate/dwo/IDCJDW2059.latest.shtml

Commonwealth of Australia 2010, Survey guidelines for Australia's threatened birds. Guidelines for detecting birds listed as threatened under the Environment Protection and Biodiversity Conservation Act 1999

Commonwealth of Australia 2010, Survey guidelines for Australia's threatened bats. Guidelines for detecting bats listed as threatened under the Environment Protection and Biodiversity Conservation Act 1999

Commonwealth of Australia 2011, Survey guidelines for Australia's threatened mammals. Guidelines for detecting mammals listed as threatened under the Environment Protection and Biodiversity. Conservation Act 1999

Commonwealth of Australia 2013, Survey Guidelines for Australia's Threatened Orchids. Guidelines for detecting orchids listed as threatened under the Environment Protection and Biodiversity. Conservation Act 1999

Department of Climate Change, Environment and Water (DECCW) (2023) Species Profile and Threats Databases. Retrieved from http://www.environment.gov.au/cgi-bin/sprat/public/publicthreatenedlist.pl

Department of Climate Change, Environment and Water (DECCW) (2023) Protected Matters Search Tool for MNES listed under the EPBC Act. Retrieved from http://www.environment.gov.au/epbc/protected-matters-search-tool

DEC 2004, Threatened Species Survey and Assessment: Guidelines for developments and activities. Working Draft

Department of Environment and Climate Change (2002) Descriptions for NSW (Mitchell) Landscapes Version 2.

Department of Planning and Environment (DPE) (2023) Threatened Ecological Communities Profiles: Scientific determinations for threatened ecological communities NSW

Department of Planning and Environment (DPE) (2023) Key threatening processes. Retrieved 2023 from http://www.environment.nsw.gov.au/topics/animals-and-plants/threatened-species/about-threatened-species/key-threatening-processes

Department of Planning and Environment (DPE) (2023) Areas of Outstanding Biodiversity Value Register. Retrieved from https://www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity/areas-of-outstanding-biodiversity-value/area-of-outstanding-biodiversity-value-register

Department of Planning and Environment (DPE) (2023) Biodiversity Values Map. Retrieved from https://www.lmbc.nsw.gov.au/Maps/index.html?viewer=BOSETMap

Department of Planning, Industry and Environment (DPIE) (2020), Surveying threatened plants and their habitats: NSW Survey guide for the Biodiversity Assessment Method. https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Animals-and-plants/Biodiversity/surveying-threatened-plants-and-habitats-nsw-survey-guide-biodiversity-assessment-method-200146.pdf

Department of Planning, Industry and Environment (DPIE) (2020), NSW Survey Guide for Threatened Frogs: A guide for the survey of threatened frogs and their habitats for the Biodiversity Assessment Method https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Animals-and-plants/Threatened-species/nsw-survey-guide-for-threatened-frogs-200440.pdf

Department of Planning, Industry and Environment (DPE) (2023), NSW Bionet Wildlife Atlas http://www.bionet.nsw.gov.au/

Department of Primary Industries (DPI) 2007. Key Fish Habitat mapping layer

Department of Primary Industries (DPI) 2023. Priority Weeds for Riverina

Keith, D, 2004, Ocean shores to desert dunes: the native vegetation of New South Wales and the ACT. NSW Department of Environment and Conservation, Sydney

NSW Planning and Environment Department (2023), planning portal http://www.planning.nsw.gov.au/

New South Wales Flora online, PlantNET, http://plantnet.rbgsyd.nsw.gov.au/floraonline.htm,

NSW Government (2020) Biodiversity Conservation Act 2016 No 63. Version current 17 July 2020.

NSW Department of Infrastructure, Planning and Natural Resources (2004b) Draft Native Vegetation Regulation 2004: Environmental Outcomes Assessment Methodology NSW Government

Office of Environment and Heritage (2014) South East Local Land Services Vegetation layer

Office of Environment and Heritage Forest (2015) Forest Ecosystems: Vegetation of the Southern Forests VIS ID 3858 Biometric Vegetation layer

OEH 2016, NSW Guideline to Surveying Threatened Plants

OEH Office of Environment and Heritage (2018) Great Soil Group (GSG) Soil type map of NSW.

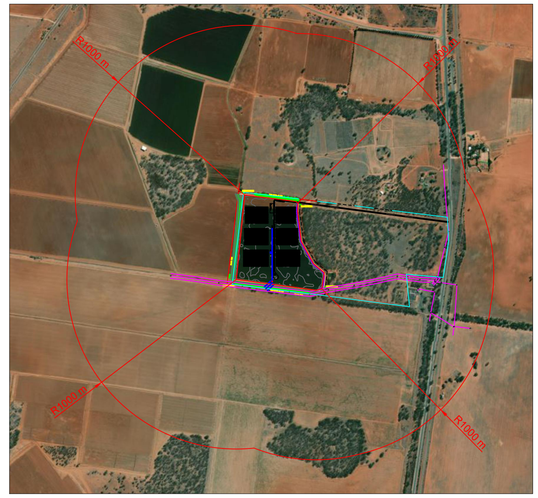
OEH 2019, New South Wales Vegetation Information System (VIS)

Spatial Services (2021) Spatial Information Exchange (SIX). https://maps.six.nsw.gov.au/

10 Appendices

Appendix	Item
Appendix A	Proposal Design Plans
Appendix B	Species Lists
Appendix C	Biodiversity Values Map and Threshold Report
Appendix D	Native Vegetation Regulatory Map
Appendix E	Threatened Species Likelihood of Occurrence
Appendix F	Assessment of Significance BC Act
Appendix G	Significant Impact Criteria Assessment EPBC Act
Appendix H	BAM Data Sheets
Appendix I	Climate Data

Appendix A – Proposed Design Plans



NOTES

1. ACTUAL DIMENSIONS AND CLEARANCES MAY VARY SUBJECT TO SITE CONDITIONS.
2. DIMENSIONS OF ELECTRICAL EQUIPMENT ARE INDICATIVE ONLY. ACTUAL DIMENSIONS TO BE CONFIRMED.
3. EXISTING ESSENTIAL ENERGY 33kV POLE IS FOR ILLUSTRATION ONLY. ACTUAL POSITION IS SUBJECT TO THE ACTUAL MEASUREMENT ON SITE.
4. TWO NEW POLES WILL BE INSTALLED TO CARRY OVERHEAD TRANSMISSION LINES AND CONNECT TO ESSENTIAL ENERGY NETWORK.
5. SITE STORAGE AND AMENITY FACILITIES TO BE ON SITE ONLY DURING CONSTRUCTION PHASE. NO PERMANENT BUILDINGS TO BE KEPT ON SITE AFTER CONSTRUCTION COMPLETED.

LEGEND

- PROPOSED PV ARRAY
- SECURITY FENCE
- PROPERTY BOUNDARY
- 33kV HV CABLES WITH EASEMENT
- NEW OVERHEAD 33kV HV CABLES WITH EASEMENT
- NEW UNDERGROUND 33kV HV CABLES

SYSTEM SPECIFICATIONS				
DC	6.15	MW	TOTAL MODULES	11178
MODULE CAPACITY	550	W	MODULES PER STRING	27
NUMBER OF INVERTERS	2	-	NUMBER OF STRINGS	414
INVERTER MODEL	SMA2660	-	MODULE MODEL	LR5-72HPH-550M

FOR INFORMATION

No	DATE	DRN	CHK	ENG	Q.A.	PROJECT	DESCRIPTION
D	20/11/23	D.S.	ACE	D.S.	ACE	NSW-147	CALIBRATE SITE LOCATION
C	06/07/23	D.S.	ACE	D.S.	ACE	NSW-147	UPDATE ROAD LOCATION
B	19/06/23	D.S.	ACE	D.S.	ACE	NSW-147	UPDATED SITE PLAN
A	07/10/22	ACE	ACE	ACE	ACE	NSW-147	ISSUED FOR INFORMATION

REVISION | NUMBER | TITLE | REFERENCE DRAWINGS

GREEN GOLD ENERGY

22-28 LACHLAN ST, HILLSTON, NSW 2675
4.95 MW PV EXPORT SYSTEM
SITE PLAN

DATE: 20/11/23	DRN: D.S.	CHK: ACE	ENG: D.S.	Q.A: ACE	SCALE: 1:1500
PROJ No NSW-147	DRG No				REV D

AUTOCAD A1SHEET

Appendix B – Species Lists

Table 14 Flora species recorded during surveys within the Subject Land

Scientific name	Common name	Exotic	Weed listing status
Acacia salicina	Cooba	N	-
Aira cupaniana	Silvery Hairgrass	E	-
Alternanthera denticulata	Lesser Joyweed	N	-
Alternanthera spp.	Joyweed	N	-
Arctotheca calendula	Capeweed	E	-
Atriplex semibaccata	Creeping Saltbush	N	-
Atriplex spp.	A Saltbush	N	-
Austrostipa nodosa	A Speargrass	N	-
Austrostipa scabra	Speargrass	N	-
Avena barbata	Bearded Oats	E	-
Avena fatua	Wild Oats	E	-
Bromus rubens	Red Brome	E	-
Bulbine alata	Native Onion	N	-
Bulbine semibarbata	Wild Onion	N	-
Calandrinia eremaea	Small Purslane	N	-
Calotis lappulacea	Yellow Burr-daisy	N	-
Capsella bursa-pastoris	Shepherd's Purse	E	-
Carthamus lanatus	Saffron Thistle	E	HTE
Centaurea melitensis	Maltese Cockspur	E	-
Centaurea spp.	Thistle	E	-
Chamaesyce drummondii	Caustic Weed	N	-
Chenopodium album	Fat Hen	E	-
Chloris truncata	Windmill Grass	N	-
Citrullus lanatus var. lanatus	Wild Melon, Camel Melon,Bitter	E	-
Convolvulus angustissimus	0	N	-
Convolvulus erubescens	Pink Bindweed	N	-
Conyza bonariensis	Flaxleaf Fleabane	E	-

Scientific name	Common name	Exotic	Weed listing status
Conyza spp.	A Fleabane	E	-
Crassula colorata	Dense Stonecrop	N	-
Crassula sieberiana	Australian Stonecrop	N	-
Cucumis myriocarpus subsp. leptodermis	Paddy Melon	E	-
Daucus glochidiatus	Native Carrot	N	-
Dissocarpus biflorus	Twin-horned Cpperburr	N	-
Duma florulenta	Lignum	N	-
Echium plantagineum	Patterson's Curse	E	-
Eclipta platyglossa	Yellow Twin-heads	N	-
Einadia nutans	Climbing Saltbush	N	-
Enchylaena tomentosa	Ruby Saltbush	N	-
Enteropogon acicularis	Curly Windmill Grass	N	-
Eragrostis brownii	Brown's Lovegrass	N	-
Eremophila longifolia	Emubush	N	-
Erodium crinitum	Blue Crowfoot	N	-
Eucalyptus intertexta	Gum Coolibah	N	-
Eucalyptus largiflorens	Black Box	N	-
Eucalyptus populnea subsp. bimbil	Bimble Box	N	-
Euchiton sphaericus	Star Cudweed	N	-
Geijera parviflora	Wilga	N	-
Goodenia fascicularis	Mallee Goodenia	N	-
Goodenia glauca	Pale Goodenia	N	-
Hordeum leporinum	Barley Grass	E	-
Juncus flavidus	0	N	-
Lachnagrostis filiformis	Blown Grass	N	-
Lactuca serriola	Prickly Lettuce	E	-
Leiocarpa websteri	0	N	-
Limonium lobatum	Winged Sea Lavender	E	-
Lolium perenne	Perennial Ryegrass	E	-
Lycium ferocissimum	African Boxthorn	E	*WoNS; HTE;*

Scientific name	Common name	Exotic	Weed listing status
			Priority Weed – Prohibition on certain dealing; Regional recommended measure
Malva parviflora	Small-flowered Mallow	E	-
Marrubium vulgare	White Horehound	E	-
Medicago laciniata	Cut-leaved Medic	E	-
Medicago truncatula	Barrel Medic	E	-
Oxalis perennans	Yellow Wood-Sorrel	N	-
Oxalis spp.	0	N	-
Panicum capillare	Witchgrass	E	-
Paspalidium constrictum	Knottybutt Grass	N	-
Phalaris aquatica	Phalaris	E	-
Pittosporum angustifolium	Butterbush	N	-
Pseudognaphalium luteoalbum	Jersey Cudweed	N	-
Ptilotus nobilis	Yellowtails	N	-
Rapistrum rugosum	Turnip Weed	E	-
Rhagodia parabolica	Fragrant Saltbush	N	-
Rhagodia spinescens	Thorny Saltbush	N	-
Rhodanthe corymbiflora	Small White Sunray	N	-
Rytidosperma spp.	0	N	-
Salvia verbenaca	Vervain	E	-
Sclerolaena birchii	Galvinized Burr	N	-
Sclerolaena muricata	Black Rolypoly	N	-
Senna artemisioides subsp. zygophylla	0	N	-
Sisymbrium erysimoides	Smooth Mustard	E	-
Solanum esuriale	Quena	N	-
Solanum nigrum	Black-berry Nightshade	E	-
Sonchus oleraceus	Common Sowthistle	E	-
Tetragonia moorei	0	N	-

Scientific name	Common name	Exotic	Weed listing status
Teucrium racemosum	Grey Germander	N	-
Verbena supina	Trailing Verbena	E	-
Vittadinia cuneata	A Fuzzweed	N	-
Vittadinia gracilis	Woolly New Holland Daisy	N	-
Wahlenbergia spp.	Bluebell	N	-
Wahlenbergia stricta	Tall Bluebell	N	-
Walwhalleya proluta	Rigid Panic	N	-
Xanthium occidentale	Noogoora Burr	E	HTE

Native (N), Exotic (E), High Threat Exotic (HTE), Weed of National Significance (WoNS)

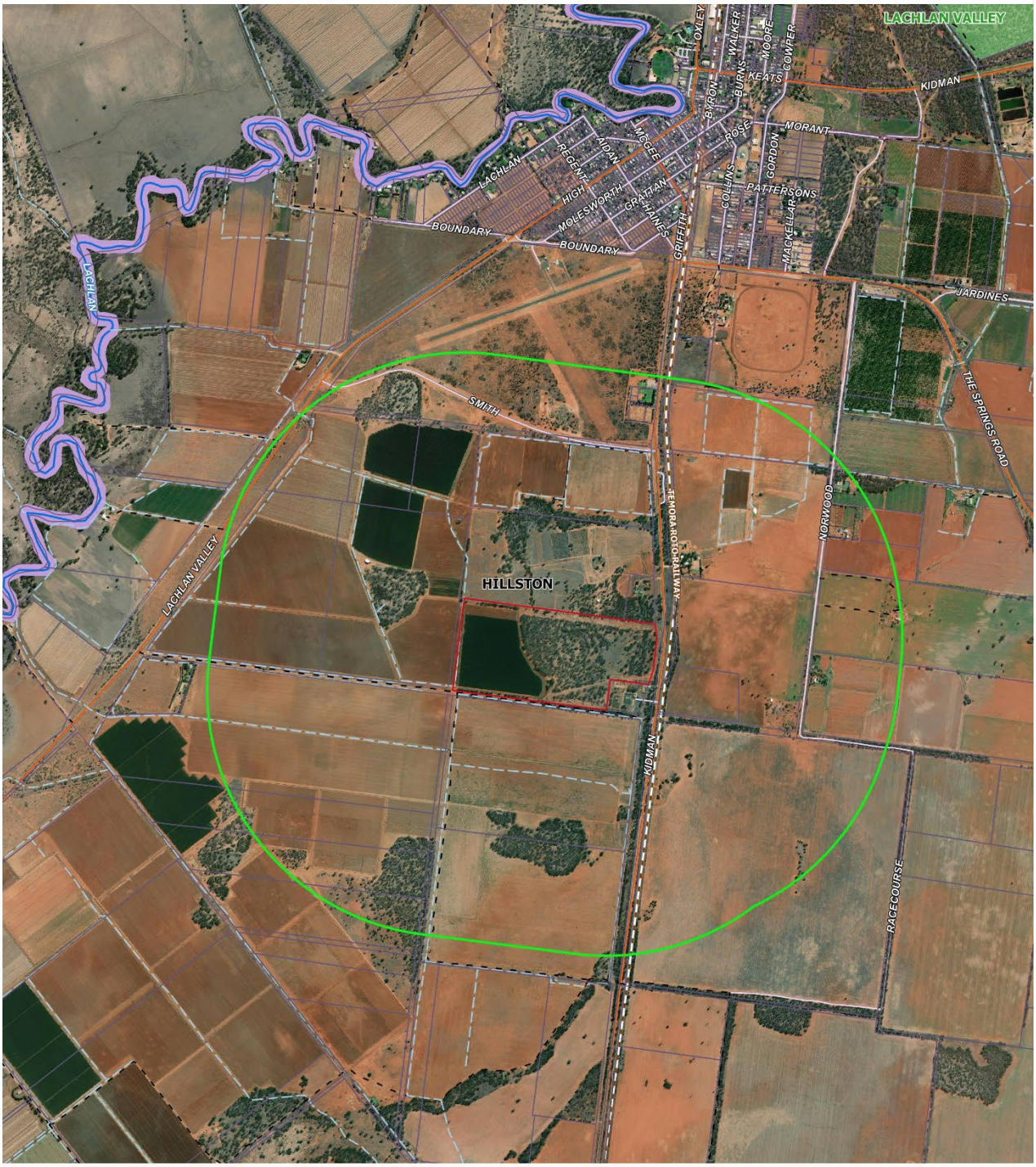
Table 15 Fauna species recorded during surveys within the Subject Land

Class	Common Name	*Scientific name*	Conservation Status	Observation
Aves	Australian Magpie	*Cracticus tibicen*	P	OW
Aves	Australian Raven	*Corvus coronoides*	P	OW
Aves	Australian Ringneck	*Barnardius zonarius*	P	O
Aves	Black-faced Cuckoo-shrike	*Coracina novaehollandiae*	P	OW
Aves	Blue Bonnet	*Northiella haematogaster*	P	OW
Aves	Blue-faced Honeyeater	*Entomyzon cyanotis*	P	OW
Aves	Cockatiel	*Nymphicus hollandicus*	P	H
Aves	Common Bronzewing	*Phaps chalcoptera*	P	O
Aves	Crested Pigeon	*Ocyphaps lophotes*	P	OW
Aves	Galah	*Eolophus roseicapillus*	P	OW
Aves	Grey Shrike-thrush	*Colluricincla harmonica*	P	W
Aves	Grey-crowned Babbler (eastern subspecies)	*Pomatostomus temporalis temporalis*	V,P	OW
Aves	Little Corella	*Cacatua sanguinea*	P	OW
Aves	Little Pied Cormorant	*Microcarbo melanoleucos*	P	O
Aves	Magpie-lark	*Grallina cyanoleuca*	P	OW
Aves	Major Mitchell's Cockatoo	*Lophochroa leadbeateri*	V,P,2	OW
Aves	Mulga Parrot	*Psephotus varius*	P	O

Class	Common Name	*Scientific name*	Conservation Status	Observation
Aves	Noisy Miner	*Manorina melanocephala*	P	OW
Aves	Peaceful Dove	*Geopelia striata*	P	O
Aves	Pied Butcherbird	*Cracticus nigrogularis*	P	W
Aves	Red-rumped Parrot	*Psephotus haematonotus*	P	OW
Aves	Singing Honeyeater	*Gavicalis virescens*	P	OW
Aves	Striated Pardalote	*Pardalotus striatus*	P	OW
Aves	Sulphur-crested Cockatoo	*Cacatua galerita*	P	OW
Aves	Variegated Fairy-wren	*Malurus lamberti*	P	OW
Aves	White-faced Heron	*Egretta novaehollandiae*	P	O
Aves	White-fronted Chat	*Epthianura albifrons*	E2,V,P	O
Aves	White-winged Chough	*Corcorax melanorhamphos*	P	OW
Aves	White-winged Triller	*Lalage sueurii*	P	O
Aves	Willie Wagtail	*Rhipidura leucophrys*	P	O
Mammalia	Eastern Grey Kangaroo	*Macropus giganteus*	P	O
Reptilia	Eastern Brown Snake	*Pseudonaja textilis*	P	O

Observed (O), Heard (W)

Appendix C – Biodiversity Values Map and Threshold Report



Hillston Solar Farm - Biodiveristy Values within the Assessment Area of the Proposal Location

N

0 340 680 1,020 m

1:30,000

Legend

- Assessment Area
- Subject Land
- Suburb
- Lot Boundary

Roads

- Arterial Road
- Local Road
- Track-Vehicular

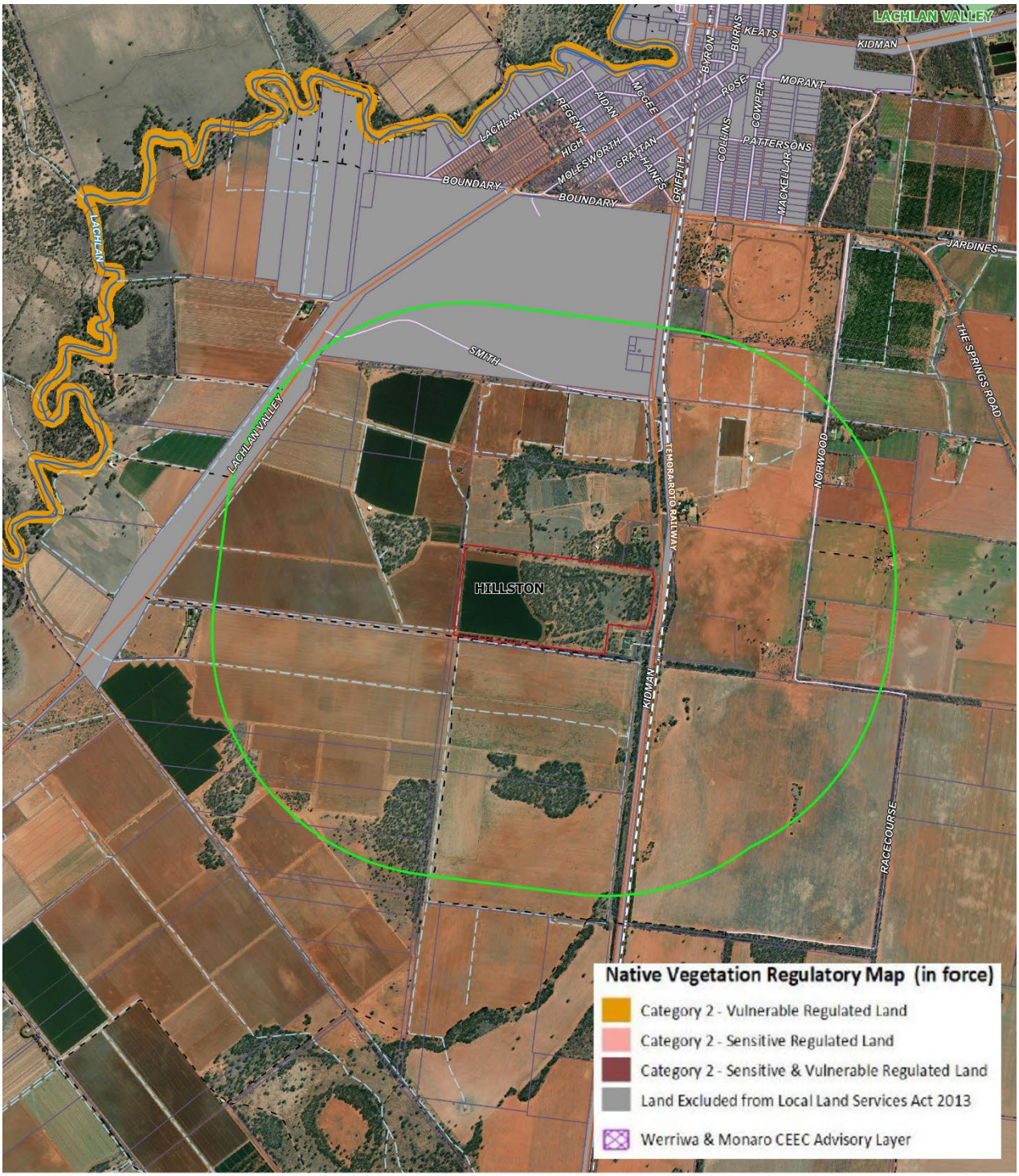
Waterways

- River
- 1st, 2nd & 3rd order unnamed waterways

Biodiversity Values

- Biodiversity Values

Appendix D – Native Vegetation Regulatory Map



Hillston Solar Farm - Native Vegetation Regulatory Map within the Assessment Area

Legend

- Assessment Area
- Subject Land
- Suburb
- Lot Boundary

Roads

- Arterial Road
- Local Road
- Track-Vehicular
- Urban Service Lane

Waterways

- River
- 1st, 2nd & 3rd order unnamed waterways

N

0 320 640 960 m

1:30,000

Appendix E – Threatened Species Likelihood of Occurrence

The below map (Figure 8) and assessment includes national and state significant species from the following sources:

- BioNET Database (accessed June 2023)
- DECCW database (PMST accessed June 2023).
- Search area is 10 km radius.
- Not considered further pelagic seabirds, shorebirds, sandpipers, turtles, whales, sharks - no preferred marine or coastal habitat in Subject Land.

All habitat information is taken from NSW OEH and Commonwealth DEE Threatened Species profiles (DPIE 2023 DEE 2023) unless otherwise stated. The codes used in this table are:

- CE – Critically Endangered
- E – Endangered
- V – Vulnerable
- EP – Endangered Population
- C – CAMBA
- J – JAMBA
- R – ROKAMBA
- CEEC – Critically Endangered Ecological Community
- EEC – Endangered Ecological Community

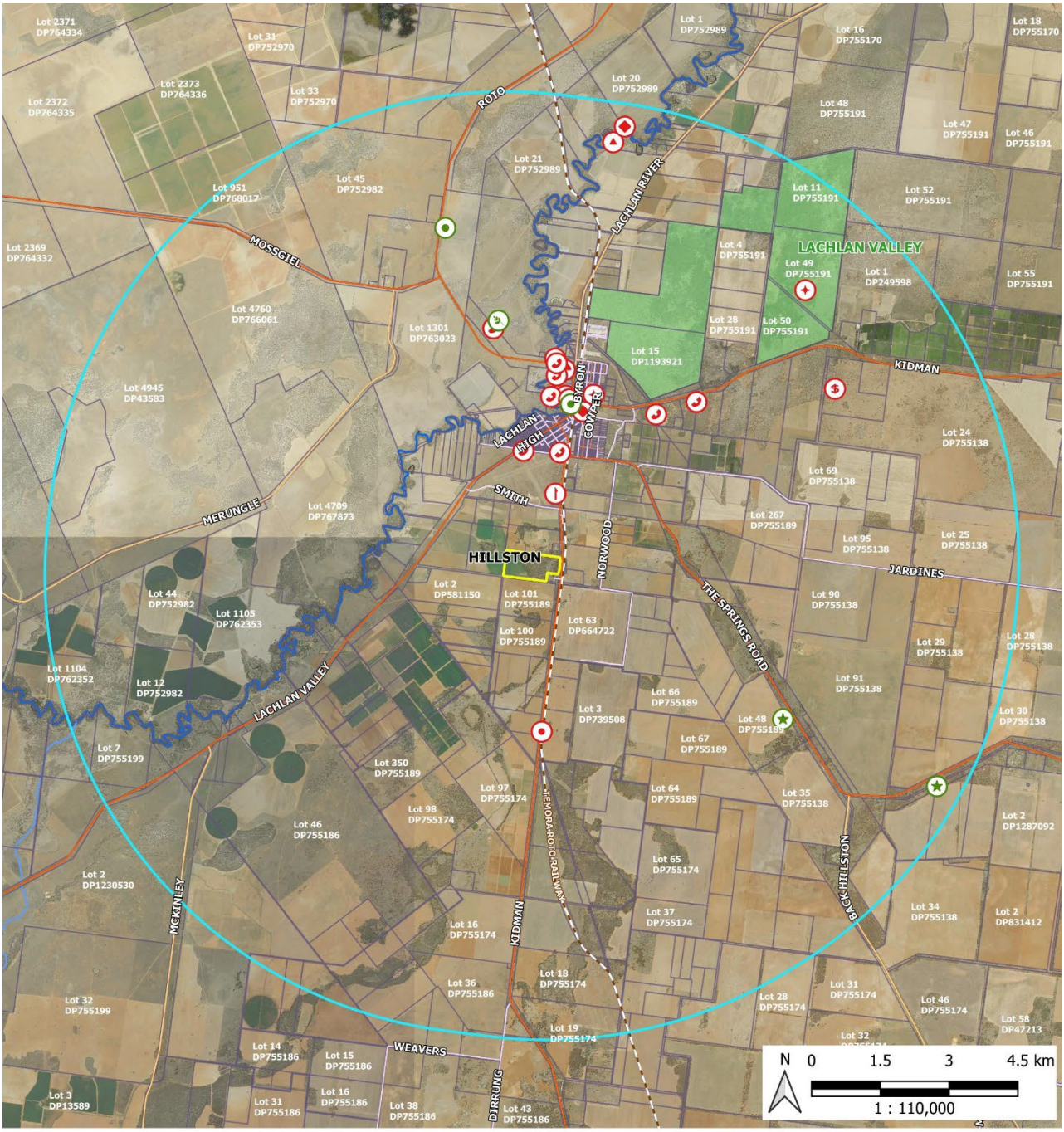
The Likelihood of Occurrence below includes migratory species not captured in the BAM. It is assumed that all other threatened species with the potential to occur on the site have been captured through the BAM process.

Likelihood of Occurrence definitions:

Likelihood of occurrence	Definition
Known	Species recorded in the subject site or Subject Land
Likely	Species previously recorded within a 10 kilometre radius of the Subject Land and suitable habitat occurs within the Subject Site.
Possible	Species previously recorded within a 10 kilometre radius of the Subject Land but only marginal suitable habitat recorded within the Subject Site. OR Species not previously recorded within a 10 kilometre radius of the Subject Land, but the Proposal footprint is within the species known distribution and suitable habitat occurs within the Subject Site.
Unlikely	Species previously recorded within a 10 kilometre radius of the Subject Land but no suitable habitat recorded within the Subject Site.
Nil	Species not previously recorded within a 10 kilometre radius of the Subject Land and no suitable habitat occurs in the area.

Likelihood of impact definitions:

Likelihood of impact	Definition
Nil	Species / community and its habitat will not be impacted by the Proposal.
Low	Species / community has been determined as 'possible', 'likely' or 'known' to occur within the Subject Land but is unlikely to be impacted by the Proposal due to avoidance of individuals and / or their broad habitats within the subject site. Impact to important habitat resources will not occur or has been avoided / reduced through the design process.
Moderate	Species / community is 'known' or 'likely' to occur within the Subject Land and the Proposal will impact on an area of habitat / resources. Impact to individuals / important habitat resources is unlikely or has been avoided / reduced through the design process.
High	Species / community is known or likely to occur within the Subject Land and the Proposal will impact on important habitat resources or individuals.



Green Gold Energy Proposed Solar Farm - Threatened Species within 10km Radius of Lot 1 in DP 626213, Kidman Way, Hillston, NSW

Legend

- Subject Land
- 10km Radius
- Lot Boundary
- Suburb Boundary
- NPWS Reserve

Waterways

- Creek
- River
- Railway

Roads

- Arterial Road
- Local Road
- Primary Road
- Sub Arterial Road

Threatened Species

- A Hopbush
- Barking Owl
- Black Falcon
- Blue-billed Duck
- Brown Treecreeper (eastern subspecies)
- Diamond Firetail
- Grey-crowned Babbler (eastern subspecies)
- Gull-billed Tern
- Lanky Buttons
- Little Eagle
- Major Mitchell's Cockatoo
- Marsh Sandpiper
- Slender Darling Pea
- Spotted Harrier
- Superb Parrot
- Turquoise Parrot
- Varied Sittella
- Wood Sandpiper

Figure 8 Threatened species recorded within the locality

Likelihood of Occurrence Assessment Table

Scientific name	Common name	BC Act	EPBC Act	Habitat	Record source	Likelihood of occurrence	Likelihood of impact
Aves							
Actitis hypoleucos	Common Sandpiper	-	Mi	In Australia, the Common Sandpiper is found in coastal or inland wetlands, both saline or fresh. It is found mainly on muddy edges or rocky shores. When in Australia, the population is concentrated in northern and western Australia.	PMST	Unlikely – No records of this species exist within the locality and only highly marginally suitable habitat occurs within the Subject Land.	Low – No impacts to potential habitat will occur as a result of the Proposal.
Aphelocephala leucopsis	Southern Whiteface	-	V	Southern Whiteface occurs across most of mainland Australia south of the tropics. The species lives in a wide range of open woodlands and shrublands where there is an understorey of grasses or shrubs, or both. These areas are usually dominated by acacias or eucalypts on ranges, foothills and lowlands, and plains. Favours relatively undisturbed habitat with low tree densities and an herbaceous understorey litter cover. The species almost exclusively forages on the ground, mainly feeding on insects, spiders and seeds, largely gleaned from the bare ground or leaf litter. Birds build large bulky domed nests of grass, bark and roots, usually in a living or dead trees with hollows or crevices, although sometimes in low bushes. Breeds from July to October throughout most of the species range.	PMST	Unlikely – No records of this species exist within the locality and limited habitat occurs within the Subject Land.	Low – The species is unlikely to occur and subsequently will not be impacted by the minor impacts proposed
Apus pacificus	Fork-tailed Swift	-	Mi	In Australia, the Fork-tailed Swift mostly occurs over dry or open habitats, including inland plains, riparian woodland and tea-tree swamps, low scrub, heathland, saltmarsh and sometimes above foothills or in coastal areas spending most of their time in the air, or roosting on cliffs or walls. They	PMST	Unlikely – No records for this species exist within the locality and only marginal habitat is present	Low – No impacts to potential marginal habitat will occur as a result of the Proposal.

Scientific name	Common name	BC Act	EPBC Act	Habitat	Record source	Likelihood of occurrence	Likelihood of impact
				also occur over settled areas, including towns, urban areas and cities. They are also found at treeless grassland and sandplains covered with spinifex, open farmland and inland and coastal sand-dunes. An aerial eater, flying anywhere from 1 m to 300 m above the ground to forage on insects including small bees, wasps, termites and moths. (DCCEEW 2022)		for the species, potentially utilizing the site when passing via migration.	
Botaurus poiciloptilus	Australasian Bittern	E	E	Australasian Bitterns are widespread but uncommon over south-eastern Australia. In NSW they may be found over most of the state except for the far north-west. The Species favours permanent freshwater wetlands with tall, dense vegetation, particularly bullrushes (Typha spp.) and spikerushes (Eleocharis spp.), it hides during the day amongst dense reeds or rushes and feed mainly at night on frogs, fish, yabbies, spiders, insects and snails. The species may construct feeding platforms over deeper water from reeds trampled by the bird; platforms are often littered with prey remains.	PMST	Unlikely – No records for this species exist within the locality and minimal potential habitat is present for the species in the Subject Land.	Low – No impacts to potential foraging habitat will occur as a result of the Proposal.
Calidris acuminata	Sharp-tailed Sandpiper	-	Mi	The Sharp-tailed Sandpiper prefers the grassy edges of shallow inland freshwater wetlands. It is also found around sewage farms, flooded fields, mudflats, mangroves, rocky shores and beaches. Its breeding habitat in Siberia is the peat-hummock and lichen tundra of the high Arctic.	PMST	Unlikely – No records for this species exist within the locality and minimal potential habitat is present for the species in the Subject Land.	Low – No impacts to potential foraging habitat will occur as a result of the Proposal.
Calidris ferruginea	Curlew Sandpiper	E	Mi - CE	The Curlew Sandpiper is distributed around most of the Australian coastline (including Tasmania). It occurs along the entire coast of NSW, particularly in the Hunter Estuary, and sometimes in	PMST	Unlikely – No records of this species exist within the locality	Low – No impacts to potential habitat will occur as a result of the Proposal.

Scientific name	Common name	BC Act	EPBC Act	Habitat	Record source	Likelihood of occurrence	Likelihood of impact
				freshwater wetlands in the Murray-Darling Basin. Inland records are probably mainly of birds pausing for a few days during migration. The Curlew Sandpiper breeds in Siberia and migrates to Australia (as well as Africa and Asia) for the non-breeding period, arriving in Australia between August and November, and departing between March and mid-April. It generally occupies littoral and estuarine habitats, and in New South Wales is mainly found in intertidal mudflats of sheltered coasts. It also occurs in non-tidal swamps, lakes and lagoons on the coast and sometimes inland.		and only marginally suitable habitat occurs within the Subject Land.	
Calidris melanotos	Pectoral Sandpiper	-	Mi	These birds forage on grasslands and mudflats, picking up food by sight, sometimes by probing. They mainly eat arthropods and other invertebrates. Some Asian breeders winter in southern Australia and NZ.	PMST	Unlikely – No records for this species exist within the locality and minimal potential habitat is present for the species in the Subject Land.	Low – No impacts to potential foraging habitat will occur as a result of the Proposal.
Circus assimilis	Spotted Harrier	V	-	Occurs throughout the Australian mainland, except in densely forested or wooded habitats of the coast, escarpment and ranges. Individuals disperse widely in NSW and comprise a single population. Occurs in grassy open woodland including Acacia and mallee remnants, inland riparian woodland, grassland and shrub steppe. It is found most commonly in native grassland, but also occurs in agricultural land, foraging over open habitats including edges of inland wetlands. Preys on terrestrial mammals (eg bandicoots, bettongs, and rodents), birds and reptile, occasionally	Bionet (4)	Possible – Only two (2) records occur for this species within the last 20 years, however marginal suitable habitat occurs around remnant grassy woodland within the Subject Land.	Low – Potential habitat resources for this species will not be impacted as a result of the Proposal.

Scientific name	Common name	BC Act	EPBC Act	Habitat	Record source	Likelihood of occurrence	Likelihood of impact
				insects and rarely carrion. Builds a stick nest in a tree and lays eggs in spring (or sometimes autumn), with young remaining in the nest for several months.			
Climacteris picumnus victoriae	Brown Treecreeper (south-eastern)	V	V	Endemic to eastern Australia and occurs in eucalypt forests and woodlands of inland plains and slopes of the Great Dividing Range. It is less commonly found on coastal plains and ranges. Mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey, sometimes with one or more shrub species; also found in mallee and River Red Gum (Eucalyptus camaldulensis) Forest bordering wetlands with an open understorey of acacias, saltbush, lignum, cumbungi and grasses. Sedentary, considered to be resident in many locations throughout its range; present in all seasons or year-round at many sites; territorial year-round. Up to 80% of the diet is comprised of ants; other invertebrates (including spiders, insects larvae, moths, beetles, flies, hemipteran bugs, cockroaches, termites and lacewings) make up the remaining percentage; nectar from Mugga Ironbark (*Eucalyptus sideroxylon*) and paperbarks, and sap from an unidentified eucalypt are also eaten. Hollows in standing dead or live trees and tree stumps are essential for nesting. Breeds in pairs or co-operatively in territories which range in size from 1.1 to 10.7 ha (mean = 4.4 ha).	Bionet (2), PMST	Possible – No records exist beyond 1998 for this species, however potential suitable habitat is present around the remnant grassy woodland and hollow-bearing trees present within the Subject Land.	Moderate – Potential foraging habitat for this species will be impacted by the Proposal.

Scientific name	Common name	BC Act	EPBC Act	Habitat	Record source	Likelihood of occurrence	Likelihood of impact
Daphoenositta chrysoptera	Varied Sittella	V	-	The Varied Sittella is sedentary and inhabits most of mainland Australia except the treeless deserts and open grasslands. Distribution in NSW is nearly continuous from the coast to the far west. The Varied Sittella's population size in NSW is uncertain but is believed to have undergone a moderate reduction over the past several decades. Inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and Acacia woodland. Feeds on arthropods gleaned from crevices in rough or decorticating bark, dead branches, standing dead trees and small branches and twigs in the tree canopy.	Bionet (1)	Possible – Only one (1) record for this species occurs, areas of only marginally suitable habitat occur around remnant woodland vegetation within the Subject Land.	Low – The species is unlikely to occur and subsequently will not be impacted by the minor impacts proposed
Epthianura albifrons	White-fronted Chat	V	-	"The White-fronted Chat is found across the southern half of Australia, from southernmost Queensland to southern Tasmania, and across to Western Australia as far north as Carnarvon. Found mostly in temperate to arid climates and very rarely sub-tropical areas, it occupies foothills and lowlands up to 1000 m above sea level. In NSW, it occurs mostly in the southern half of the state, in damp open habitats along the coast, and near waterways in the western part of the state. Along the coastline, it is found predominantly in saltmarsh vegetation but also in open grasslands and sometimes in low shrubs bordering wetland areas. Gregarious species, usually found foraging on bare or grassy ground in wetland areas, singly or in pairs. They are insectivorous, feeding mainly on flies and beetles caught from or close to the ground."	Observed	Known – Species was observed foraging on site during surveys.	Moderate – Foraging habitat for this species will be impacted by the Proposal.

Scientific name	Common name	BC Act	EPBC Act	Habitat	Record source	Likelihood of occurrence	Likelihood of impact
Falco hypoleucos	Grey Falcon	V	V	The Grey Falcon is sparsely distributed in NSW, chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range. The breeding range has contracted since the 1950s with most breeding now confined to arid parts of the range. There are possibly less than 5000 individuals left. Population trends are unclear, though it is believed to be extinct in areas with more than 500mm rainfall in NSW. Usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast. Also occurs near wetlands where surface water attracts prey.	PMST	Unlikely – No records of this species exist within the locality and some marginal foraging habitat is present in the Subject Land	Low – Impacts proposed are unlikely to remove habitat utilised by the species or deter it from accessing the site
Falco subniger	Black Falcon	V	-	Mostly occurring inland NSW. Inhabits woodland, shrubland and grassland in arid and semi-arid zones including agricultural land with scattered remnant trees. Usually associated with wetlands as they look for prey, and use standing dead trees to use as lookout posts. Habitat choice is often influenced by food availability.	Bionet (1)	Possible – Only one (1) record of this species exists within the locality, although from 1990, however potential suitable habitat is present within the Subject Land.	Low – Impacts proposed are unlikely to remove habitat utilised by the species or deter it from accessing the site
Gallinago hardwickii	Latham's Snipe, Japanese Snipe	-	Mi	Latham's Snipe are seen in small groups or singly in freshwater wetlands on or near the coast, generally among dense cover. They are found in any vegetation around wetlands, in sedges, grasses, lignum, reeds and rushes and also in saltmarsh and creek edges on migration. They also use crops and pasture (DCCEEW 2022).	PMST	Unlikely – No records of this species exist within the locality and limited habitat is present within the Subject Land.	Low – Habitat for this species will not be impacted by the Proposal.

Scientific name	Common name	BC Act	EPBC Act	Habitat	Record source	Likelihood of occurrence	Likelihood of impact
Gelochelidon nilotica	Gull-billed Tern	-	Mi - C	Found on all continents except Antarctica, occupying freshwater swamps, beaches, estuarine mudflats, floodwaters, sewage farms, irrigated croplands and grasslands.	Bionet (1)	Unlikely – This species was last recorded in the locality in 1989, and only marginally suitable open area occurs within the subject site.	Low – The species is unlikely to occur and be impacted by the Proposal given the availability of alternate habitat and relative suitability of the subject site.
Grantiella picta	Painted Honeyeater	V	V	Nomadic, occurring in low densities across most of NSW. Highest concentrations and almost all breeding occur on inland slopes of the Great Dividing Range. Inhabits Boree, Brigalow and Box Gum woodlands and Box-Ironbark forests. Specialist forager on the fruits of mistletoes, preferably of the Amyema genus. Nests in outer tree canopy. A specialist feeder on the fruits of mistletoes growing on woodland eucalypts and acacias. Prefers mistletoes of the genus Amyema.	PMST	Possible – No records of this species exist within the locality, however potential habitat trees are present within the Subject Land.	Low – The minor impacts proposed (loss of minor component of marginal habitat) are unlikely to substantially reduce resources in the surrounding area or deter the species from using the site if it were to occur
Hieraaetus morphnoides	Little Eagle	V	-	The Little Eagle is found throughout the Australian mainland excepting the most densely forested parts of the Dividing Range escarpment. It occurs as a single population throughout NSW. Occupies open eucalypt forest, woodland or open woodland. Sheoak or Acacia woodlands and riparian woodlands of interior NSW are also used.	Bionet (3)	Unlikely – Only one (1) record is relevant within the last 20 years and minimal marginally suitable habitat is present within the Subject Land.	Low - Potential habitat resources for this species are limited within the Subject Land and are unlikely to be impacted by the Proposal.
Lathamus discolor	Swift Parrot	E	CE	Breeds in Tasmania during spring and summer, migrating in the autumn and winter months to south-eastern Australia from Victoria and the eastern parts of South Australia to south-east	PMST	Unlikely – No records of this species exist within the locality	Low – Limited habitat for this species within the Subject Land will not be directly

Scientific name	Common name	BC Act	EPBC Act	Habitat	Record source	Likelihood of occurrence	Likelihood of impact
				Queensland. In NSW mostly occurs on the coast and south west slopes. On the mainland they occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations. Favoured feed trees include winter flowering species such as Swamp Mahogany *Eucalyptus robusta*, Spotted Gum *Corymbia maculata*, Red Bloodwood *C. gummifera*, Mugga Ironbark *E. sideroxylon*, and White Box *E. albens*. Commonly used lerp infested trees include Inland Grey Box *E. microcarpa*, Grey Box *E. moluccana* and Blackbutt *E. pilularis*.		and very limited habitat for this species occurs within the Subject Land.	impacted by the Proposal.
Leipoa ocellata	Malleefowl	E	V	Occurs in semi-arid to arid mallee country in the south-west of NSW. Its NSW stronghold is centred on Mallee Cliffs NP, extending east to Balranald and with scattered records north to Mungo NP. There are also populations near Dubbo (Goonoo forest). Occasional records exist from the Pilliga, around Cobar and Goulburn River NP. Predominantly inhabit mallee communities, preferring the tall, dense and floristically-rich mallee found in higher rainfall (300 - 450 mm mean annual rainfall) areas. Utilises mallee with a spinifex understorey, but usually at lower densities than in areas with a shrub understorey. Less frequently found in other eucalypt woodlands, such as Inland Grey Box, Ironbark or Bimble Box Woodlands with thick understorey, or in other woodlands such dominated by Mulga or native Cypress Pine species. Prefers areas of light sandy to sandy loam soils and habitats with a dense but discontinuous canopy and dense and diverse shrub and herb layers.	PMST	Nil – No suitable mallee habitat occurs within the locality.	Nil – The species does not occur.

Scientific name	Common name	BC Act	EPBC Act	Habitat	Record source	Likelihood of occurrence	Likelihood of impact
Lophochroa leadbeateri	Major Mitchell's Cockatoo	V	E	In NSW Major Mitchell's Cockatoo is found across the arid and semi-arid inland and is regularly as far east as about Bourke and Griffith, and sporadically further east than that. The species inhabits a wide range of treed and treeless inland habitats, always within easy reach of water. It feeds mostly on the ground, especially on the seeds of native and exotic melons and on the seeds of species of saltbush, wattles and cypress pines.	Bionet (4), PMST	Known – This species was heard and seen within the Subject Land during surveys.	Low – The minor impacts proposed (loss of minor component of marginal habitat) are unlikely to substantially reduce resources in the surrounding area or deter the species from using the site given it is highly mobile
Melanodryas cucullata cucullata	South-eastern Hooded Robin, Hooded Robin (south-eastern)	V	E	The Hooded Robin is widespread, found across Australia, except for the driest deserts and the wetter coastal areas - northern and eastern coastal Queensland and Tasmania. However, it is common in few places, and rarely found on the coast. It is considered a sedentary species, but local seasonal movements are possible. The south-eastern form (subspecies cucullata) is found from Brisbane to Adelaide and throughout much of inland NSW, with the exception of the extreme north-west, where it is replaced by subspecies picata. Two other subspecies occur outside NSW. Prefers lightly wooded country, usually open eucalypt woodland, acacia scrub and mallee, often in or near clearings or open areas. Requires structurally diverse habitats featuring mature eucalypts, saplings, some small shrubs and a ground layer of moderately tall native grasses.	PMST	Unlikely – No records of this species exist within the locality and very limited habitat for this species occurs within the Subject Land.	Low – The minor impacts proposed (loss of minor component of marginal habitat) are unlikely to substantially reduce resources in the surrounding area or deter the species from using the site if it were to occur
Motacilla flava	Yellow Wagtail	-	Mi	The Yellow Wagtail is an extremely rare visitor to Australia and may be recorded as a vagrant on occasion. It prefers a range of damp or wet	PMST	Unlikely – No suitable habitat occurs within the	Low – Very limited habitat resources occur within the

Scientific name	Common name	BC Act	EPBC Act	Habitat	Record source	Likelihood of occurrence	Likelihood of impact
				habitats with low vegetation, including damp meadows, pastures near water, and can even be found occupying sewage farms and bogs. It breeds from April to August, although this varies with latitude. The nest is a grass cup lined with hair and placed on or close to the ground in a shallow scrape. It feeds on a wide variety of terrestrial and aquatic invertebrates as well as some plant material, particularly seeds. (Birdlife.org 2022)		locality for the species and would only utilize the site due to migration.	Subject Land and are not likely to be impacted due to the Proposal.
Neophema chrysostoma	Blue-winged Parrot	V	V	Blue-winged Parrots breed on mainland Australia south of the Great Dividing Range in Victoria, South Australia and Tasmania. During the non-breeding period, from autumn to early spring, birds are recorded in western New South Wales and sometimes south-eastern NSW, particularly on the southern migration. Birds inhabit a range of habitats from coastal, sub-coastal and inland areas through to semi-arid zones. They tend to favour grasslands and grassy woodlands and are often found near wetlands. Can also be found in altered environments such as airfields, golf-courses and paddocks. Forage mainly near or on the ground for seeds of a wide range of native and introduced grasses, herbs and shrubs. Nests are made in hollows, preferably with a vertical opening, in live or dead trees or stumps, in eucalypt forests and woodlands within the breeding range.	PMST	Unlikely – No records of this species exist within the locality and very limited habitat for this species occurs within the Subject Land.	Low – The minor impacts proposed (loss of minor component of marginal habitat) are unlikely to substantially reduce resources in the surrounding area or deter the species from using the site if it were to occur
Neophema pulchella	Turquoise Parrot	V	-	The Turquoise Parrot's range extends from southern Queensland through to northern Victoria, from the coastal plains to the western slopes of the Great Dividing Range. Lives on the edges of eucalypt woodland adjoining clearings, timbered ridges and creeks in farmland.	Bionet (1)	Possible – One (1) record for this species exists within the locality and marginal suitable habitat is	Moderate – Foraging habitat for this species will be impacted by the Proposal.

Scientific name	Common name	BC Act	EPBC Act	Habitat	Record source	Likelihood of occurrence	Likelihood of impact
						present within the Subject Land.	
Ninox connivens	Barking Owl	V	-	The Barking Owl is found throughout continental Australia except for the central arid regions. The owls sometimes extend their home range into urban areas, hunting birds in garden trees and insects attracted to streetlights. Extensive wildfires in 2019-20 reduced habitat quality further, burnt many old, hollow-bearing trees needed as refuge by prey species and reduced the viability of some regional owl populations. The species inhabit woodland and open forest, including fragmented remnants and partly cleared farmland. It is flexible in its habitat use, and hunting can extend in to closed forest and more open areas. Sometimes able to successfully breed along timbered watercourses in heavily cleared habitats (e.g. western NSW) due to the higher density of prey found on these fertile riparian soils. The species typically roost in shaded portions of tree canopies, including tall midstorey trees with dense foliage such as Acacia and Casuarina species.	Bionet (1)	Unlikely – No records for this species exist beyond 1983, areas of marginally suitable habitat occur around remnant woodland with limited habitat trees within the Subject Area.	Low – The Proposal is unlikely to impact on habitat utilised by this species.
Oxyura australis	Blue-billed Duck	V	-	The Blue-billed Duck is endemic to south-eastern and south-western Australia. It is widespread in NSW, but most common in the southern Murray-Darling Basin area. The species disperses during the breeding season to deep swamps up to 300 km away, and is generally only during summer or in drier years that they are seen in coastal areas. The Blue-billed Duck prefers deep water in large permanent wetlands and swamps with dense aquatic vegetation. The species is completely aquatic, swimming low in the water along the	Bionet (1)	Unlikely – No records of this species occur after 2000 and no habitat of wetlands or waterbodies occur within the locality.	Low – The proposal would not impact wetland habitat utilised by this species

Scientific name	Common name	BC Act	EPBC Act	Habitat	Record source	Likelihood of occurrence	Likelihood of impact
				edge of dense cover. It will fly if disturbed, but prefers to dive if approached.			
Pedionomus torquatus	Plains-wanderer	E	CE	The vast majority (>99%) of records of Plains-wanderers in NSW over the past 30 years come from an area of the western Riverina bounded by Hay and Narrandera on the Murrumbidgee River in the north, the Cobb Highway in the west, the Billabong Creek in the south, and Urana in the east. Even within its western Riverina stronghold, the Plains-wanderer has a very patchy distribution. Surveys in the 1990s across 5,000km2 of the western Riverina covering 37 properties found only 5% of the total area comprised suitable habitat. The amount of high quality habitat in the Riverina drops to 1-2% during very wet or dry years when grasslands become too dense or are grazed too bare for Plains-wanderers. Plains-wanderers live in semi-arid, lowland native grasslands that typically occur on hard red-brown soils. These grasslands support a high diversity of plant species, including a number of state and nationally threatened species. Habitat structure appears to play a more important role than plant species composition. Preferred habitat of the Plains-wanderer typically comprises 50% bare ground, 10% fallen litter, and 40% herbs, forbs and grasses.	PMST	Unlikely – No records of this species exist within the locality and very limited habitat occurs within the Subject Land.	Low – Limited habitat for this species within the Subject Land will not be impacted by the Proposal.
Pezoporus occidentalis	Night Parrot	Ex	E	The Night Parrot is known to occur within Spinifex grasslands in stony or sandy areas and samphire and chenopod associations on floodplains, salt lakes and clay pans. Suitable habitat is characterized by the presence of large and dense clumps of Spinifex, and it may prefer mature	PMST	Unlikely - No records of this species exist within the locality and very limited habitat occurs	Low – This species will not be impacted as no habitat occurs ion site

Scientific name	Common name	BC Act	EPBC Act	Habitat	Record source	Likelihood of occurrence	Likelihood of impact
				spinifex that is long and unburnt. The Night Parrot is a nocturnal bird that forages on the ground, becoming active during dusk and, generally flies to water to drink prior to foraging. During the day it rests within clumps of spinifex. Appears to be highly nomadic, moving in response to availability of food and water. After periods of heavy rain with abundant seeding of spinifex, the species was often locally common. However, during droughts, the species would disappear from formerly suitable habitat. The Night Parrot is said to feed on the seeds of grasses and herbs, particularly those of Spinifex. It builds its nest which consists of a few small sticks at the end of a 'tunnel' that is formed in a Spinifex tussock or a small bush. Up to four white eggs are laid in this nest. Some unconfirmed reports have claimed that the Night Parrot may nest or roost in caves, and one unverified source claimed that it may also excavate burrows in sandy soils.		within the Subject Land, specifically Spinifex grasslands.	
Polytelis swainsonii	Superb Parrot	V	V	The Superb Parrot is found throughout eastern inland NSW. On the South-western Slopes their core breeding area is roughly bounded by Cowra and Yass in the east, and Grenfell, Cootamundra and Coolac in the west. Birds breeding in this region are mainly absent during winter, when they migrate north to the region of the upper Namoi and Gwydir Rivers. The other main breeding sites are in the Riverina along the corridors of the Murray, Edward and Murrumbidgee Rivers where birds are present all year round. In the Riverina the birds nest in the hollows of large trees (dead or alive) mainly in tall riparian River Red Gum Forest or Woodland. On the South West Slopes nest trees can be in open Box-Gum	Bionet (1), PMST	Unlikely – Only one (1) record of this species was recorded within the locality and limited habitat primarily in the form of hollow bearing trees are present in the Subject Land for the species.	Moderate – Potential foraging habitat for this species will be impacted by the Proposal.

Scientific name	Common name	BC Act	EPBC Act	Habitat	Record source	Likelihood of occurrence	Likelihood of impact
				Woodland or isolated paddock trees. Species known to be used are Blakely's Red Gum, Yellow Box, Apple Box and Red Box. Inhabit Box-Gum, Box-Cypress-pine and Boree Woodlands and River Red Gum Forest.			
Pomatostomus temporalis temporalis	Grey-crowned Babbler (eastern subspecies)	V	-	The eastern subspecies (temporalis occurs from Cape York south through Queensland, NSW and Victoria and formerly to the south east of South Australia. This subspecies also occurs in the Trans-Fly Region in southern New Guinea. In NSW, the eastern sub-species occurs on the western slopes of the Great Dividing Range, and on the western plains reaching as far as Louth and Balranald. It also occurs in woodlands in the Hunter Valley and in several locations on the north coast of NSW. It may be extinct in the southern, central and New England tablelands. Inhabits open Box-Gum Woodlands on the slopes, and Box-Cypress-pine and open Box Woodlands on alluvial plains. Woodlands on fertile soils in coastal regions.	Bionet (14)	Known – This species was heard calling to the north-west of the Subject Land during surveys and relevant records are present within the locality in the past 20 years.	Moderate – Habitat resources present on site utilised by this species would be impacted by the Proposal
Rostratula australis	Australian Painted Snipe	E	E	In NSW many records of the Australian Painted Snipe are from the Murray-Darling Basin including the Paroo wetlands, Lake Cowal, Macquarie Marshes, Fivebough Swamp and more recently, swamps near Balldale and Wanganella. Other important locations with recent records include wetlands on the Hawkesbury River and the Clarence and lower Hunter Valleys. The species prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber.	PMST	Unlikely – No records of this species are within the locality. Suitable habitat occurs within the locality along Lachlan River.	Low – No impacts to potential habitat proposed.
Stagonopleura guttata	Diamond Firetail	V	V	The Diamond Firetail is endemic to south-eastern Australia, extending from central Queensland to	Bionet (2), PMST	Possible – Records for this	Moderate – Foraging habitat for the species

Scientific name	Common name	BC Act	EPBC Act	Habitat	Record source	Likelihood of occurrence	Likelihood of impact
				the Eyre Peninsula in South Australia. It is widely distributed in NSW, with a concentration of records from the Northern, Central and Southern Tablelands, the Northern, Central and South Western Slopes and the North West Plains and Riverina. Not commonly found in coastal districts, though there are records from near Sydney, the Hunter Valley and the Bega Valley. This species has a scattered distribution over the rest of NSW, though is very rare west of the Darling River. Found in grassy eucalypt woodlands, including Box-Gum Woodlands and Snow Gum Eucalyptus pauciflora Woodlands. Also occurs in open forest, mallee, Natural Temperate Grassland, and in secondary grassland derived from other communities. Often found in riparian areas (rivers and creeks), and sometimes in lightly wooded farmland.		species occur in the locality. There are areas of marginally suitable habitat within the Subject Land however is unlikely to support the species permanently.	will be impacted by the Proposal.
Tringa glareola	Wood Sandpiper	-	Mi – C,J,K	In NSW there are records east of the Great Divide, from Stratheden and Casino, south to Nowra and elsewhere, mostly from the Riverina, but also from the Upper and Lower Western Regions. The Wood Sandpiper uses well-vegetated, shallow, freshwater wetlands, such as swamps, billabongs, lakes, pools and waterholes. They are typically associated with emergent, aquatic plants or grass, and dominated by taller fringing vegetation, such as dense stands of rushes or reeds, shrubs, or dead or live trees, especially Melaleuca and River Red Gums Eucalyptus camaldulensis and often with fallen timber. They also frequent inundated grasslands, short herbage or wooded floodplains, where floodwaters are temporary or receding, and irrigated crops. (Sourced from Australian	Bionet (1)	Unlikely – A record for this species exists within the locality but no suitable habitat occurs within the subject site.	Low – The species is unlikely to occur and no habitat for this species will be impacted by the Proposal.

Scientific name	Common name	BC Act	EPBC Act	Habitat	Record source	Likelihood of occurrence	Likelihood of impact
				Government Department of Agriculture, Water and the Environment - Species Profile - 2022)			
Fish							
Bidyanus bidyanus	Silver Perch, Bidyan	-	CE	Silver Perch are a moderate to large freshwater fish native to the Murray-Darling river system. They were once widespread and abundant throughout most of the Murray-Darling river system. They have now declined to low numbers or disappeared from most of their former range. Only one remaining secure and self-sustaining population occurs in NSW in the central Murray River downstream of Yarrawonga weir, as well as several anabranches and tributaries.	PMST	Unlikely – No records of this species exist within the locality and no suitable habitat was recorded during surveys within the Subject Land.	Nil – No habitat supporting this species will be impacted.
Galaxias rostratus	Flathead Galaxias, Beaked Minnow, Flat-headed Galaxias, Flat-headed Jollytail, Flat-headed Minnow	-	CE	The species is generally found mid-water in still and gently moving waters of small streams, lakes, lagoons, billabongs and backwaters. Its habitat consists of coarse sand or mud substrate and aquatic vegetation. It is thought that the species may be locally extinct from the lower Murray, Murrumbidgee, Macquarie and Lachlan Rivers.	PMST	Unlikely – No records of this species exist within the locality and no suitable habitat was recorded during surveys within the Subject Land.	Nil – No habitat supporting this species will be impacted.
Maccullochella macquariensis	Trout Cod	-	E	The Trout Cod is endemic to the southern Murray-Darling river system, including the Murrumbidgee and Murray Rivers, and the Macquarie River in central NSW. The species was once widespread and abundant in these areas but has undergone dramatic declines in its distribution and abundance over the past century. The last known reproducing population of Trout Cod is confined to the Murray River below Yarrawonga downstream to Tocumwal.	PMST	Unlikely – No records of this species exist within the locality and no suitable habitat was recorded during surveys within the Subject Land.	Nil – No habitat supporting this species will be impacted.

Scientific name	Common name	BC Act	EPBC Act	Habitat	Record source	Likelihood of occurrence	Likelihood of impact
Maccullochella peelii	Murray Cod	-	V	Occurs throughout the Murray-Darling Basin. Can live in a wide range of habitats, from clear, rocky streams in the upper western slopes regions of New South Wales to the slow flowing, turbid rivers and billabongs of the western plains. Generally, they are found in waters up to 5m deep and in sheltered areas with cover from rocks, timber or overhanging banks. The presence of wood debris has been shown to be the primary factor determining Murray cod presence.	PMST	Unlikely – No records of this species exist within the locality and no suitable habitat was recorded during surveys within the Subject Land.	Nil – No habitat supporting this species will be impacted.
Macquaria australasica	Macquarie Perch	-	E	Occurs in the upper reaches of the Lachlan, Murrumbidgee and Murray Rivers, and in parts of the Hawkesbury and Shoalhaven catchment areas. Inhabits river and lake habitats, especially the upper reaches of rivers and their tributaries. Requires clear water with deep, rocky holes and abundant cover (including aquatic vegetation, woody debris, large boulders and overhanging banks). Spawning occurs in spring and summer in shallow upland streams or flowing sections of river systems.	PMST	Unlikely – No records of this species exist within the locality and no suitable habitat was recorded during surveys within the Subject Land.	Nil – No habitat supporting this species will be impacted.
Flora							
Acacia curranii	Curly-bark Wattle	V	V	Known from near Cobar south to Hillston area. Also in Gundabooka National Park near Bourke and Nombinnie Nature Reserve. There are about 20 populations with fewer than 5000 individuals. Grows in Acacia shrubland and mallee. Prefers acidic, skeletal soils in rocky habitats and occupies specialised habitats comprising rocky ridges and deeply weathered sandstone. Associated species in NSW populations include *Eucalyptus dwyeri, E. populneus subsp. bimbil, E. intertexta, E. microcarpa, E. morrisii, Callitris glaucophylla,*	PMST	Possible – While no record of this species was present on site, marginally suitable habitat occurs within the Subject Land, particularly due to associated species present on site.	Low - Potential habitat resources for this species are limited within the Subject Land and are unlikely to be impacted by the Proposal.

Scientific name	Common name	BC Act	EPBC Act	Habitat	Record source	Likelihood of occurrence	Likelihood of impact
				Acacia doratoxylon, A. havilandiorum, A. aneura and *Eremophila spp.*			
Austrostipa metatoris	-	V	V	Most records occur in the Murray Valley with sites including Cunninyeuk Station, Stony Crossing, Kyalite State Forest (now part of Murrumbidgee Valley Regional Park) and Lake Benanee. Scattered records also occur in central NSW including Lake Cargelligo, east of Goolgowi, Condobolin and south west of Nymagee. Otherwise only known from near Bordertown in south east South Australia, where it may be locally extinct. Grows in sandy areas of the Murray Valley; habitats include sandhills, sandridges, undulating plains and flat open mallee country, with red to red-brown clay-loam to sandy-loam soils. Associated species include Eucalyptus populnea, E. intertexta, Callitris glaucophylla, Casuarina cristata, Santalum acuminatum and Dodonaea viscosa.	PMST	Possible – While no record of this species was present on site, marginally suitable habitat occurs within the Subject Land, particularly due to associated species present on site.	Low - Potential habitat resources for this species are limited within the Subject Land and are unlikely to be impacted by the Proposal.
Brachyscome papillosa	Mossgiel Daisy	V	V	The Mossgiel Daisy is endemic to NSW and chiefly occurs within the Riverina Bioregion, from Mossgiel in the north, Murrumbidgee Valley (Yanga) National Park in the south west to Urana in the south east. Sites are scattered across this Bioregion including the Jerilderie area, the Hay Plain (Maude and Oxley) and around Darlington Point. In addition, there are a number of records from the Willandra Lakes World Heritage Area (including Mungo National Park) with a north-western outlier at Byrnedale Station, north of Menindee. The only known site on South Western Slopes is Ganmain Reserve. Recorded primarily in clay soils on Bladder Saltbush (Atriplex vesicaria) and Leafless Bluebush (Maireana aphylla) plains,	PMST	Unlikely – Species not recorded on site and no records for this species occur within the locality. Very limited habitat for this species occurs within the Subject Land.	Low – This species will not be impacted by the Proposal.

Scientific name	Common name	BC Act	EPBC Act	Habitat	Record source	Likelihood of occurrence	Likelihood of impact
				but also in grassland and in Inland Grey Box (Eucalyptus microcarpa) - Cypress Pine (Callitris spp.) woodland.			
Dodonaea sinuolata subsp. acrodentata	A Hopbush	E	-	In NSW, known from only two locations south-west plains: one near Hillston, and another north of Ivanhoe. The species is also known from central south-west Qld, in the Warrego and Maranoa districts. Grows on stony ridges and sandy 'jump-ups' in arid and semi-arid areas. Substrates are commonly stony red sandy-loams with limonite and quartzite pebbles. Common associated species include open woodlands of *Acacia aneura* (Mulga), *A. harpophylla, Eucalyptus melanophloia, E. populnea* and *E. cambageana* (Qld).	Bionet (1)	Possible – Only one (1) record of this species occurs within the Subject Land in 1967, however suitable habitat occurs within the Subject Land particularly due to associated species present on site.	Low – Potential habitat resources for this species will not be impacted by the Proposal.
Lepidium monoplocoides	Winged Pepper-cress	E	E	Widespread in the semi-arid western plains regions of NSW. Collected from widely scattered localities, with large numbers of historical records but few recent collections. Also previously recorded from Bourke, Cobar, Urana, Lake Cargelligo, Balranald, Wanganella and Deniliquin. Recorded more recently from the Hay Plain, south-eastern Riverina, and from near Pooncarie. Occurs on seasonally moist to waterlogged sites, on heavy fertile soils, with a mean annual rainfall of around 300-500 mm. Predominant vegetation is usually an open woodland dominated by Allocasuarina luehmannii (Bulloak) and/or eucalypts, particularly Eucalyptus largiflorens (Black Box) or Eucalyptus populnea (Poplar Box). The field layer of the surrounding woodland is dominated by tussock grasses.	PMST	Possible – While no record of this species was present on site, marginally suitable habitat occurs within the Subject Land, particularly due to associated species present on site.	Low - Potential habitat resources for this species within the Subject Land are unlikely to be impacted by the Proposal.

Scientific name	Common name	BC Act	EPBC Act	Habitat	Record source	Likelihood of occurrence	Likelihood of impact
				Recorded in a wetland-grassland community comprising *Eragrostis australasicus, Agrostis avenacea, Austrodanthonia duttoniana, Homopholis proluta, Myriophyllum crispatum, Utricularia dichotoma* and *Pycnosorus globosus*, on waterlogged grey-brown clay. Also recorded from a Maireana pyramidata shrubland.			
Leptorhynchos orientalis	Lanky Buttons	E	-	Recorded from several Hay Plain and southern Riverina localities, including Willanthry east of Hillston, Zara-Wanganella via Hay, McKinley Road SW of Hillston, and "Morundah" navy land west of Buckingbong SF. A large population has most recently been recorded from Cowl Cowl Station SSW of Hillston along a TSR. Grows in woodland or grassland, sometimes on the margins of swamps. Communities include a Bimble Box plain in red-brown soil, dense Acacia pendula woodland with herbaceous understorey on red clay to clay-loam, open grassland areas on red soils, and red clay plains at the edge of a Canegrass swamp.	Bionet (2)	Possible – Relevant records exist within the locality in the past 20 years, and marginally suitable habitat exists within the Subject Land.	Low – Potential habitat resources are limited within the Subject Land and are unlikely to be impacted due to the Proposal.
Swainsona murrayana	Slender Darling-pea, Slender Swainson, Murray Swainson-pea	V	V	Found throughout NSW , it has been recorded in the Jerilderie and Deniliquin areas of the southern riverine plain, the Hay plain as far north as Willandra National Park, near Broken Hill and in various localities between Dubbo and Moree. Occurs in grassland, herbland and open Black-box woodland. Associated with low chenopod shrubs Maireana species, wallaby-grass Austrodanthonia species and spear grass Austrostipa species. Flowers from spring to early summer. Grows on heavy grey or brown clay, loam, or red cracking clays. Grows in a variety of vegetation types including bladder saltbush, black box and grassland	Bionet (2), PMST	Possible – While no records exist for this species since 1985 within the locality, suitable habitat due to species association is present within the Subject Land.	Low – Potential habitat resources will not be impacted by the Proposal.

Scientific name	Common name	BC Act	EPBC Act	Habitat	Record source	Likelihood of occurrence	Likelihood of impact
				communities on level plains, floodplains and depressions and is often found with Maireana species. Plants have been found in remnant native grasslands or grassy woodlands that have been intermittently grazed or cultivated.			
Mammals							
Nyctophilus corbeni	Corben's Long-eared Bat, South-eastern Long-eared Bat	V	V	Overall, the distribution of the south eastern form coincides approximately with the Murray Darling Basin with the Pilliga Scrub region being the distinct stronghold for this species. Inhabits a variety of vegetation types, including mallee, bulloke Allocasuarina leuhmanni and box eucalypt dominated communities, but it is distinctly more common in box/ironbark/cypress-pine vegetation that occurs in a north-south belt along the western slopes and plains of NSW and southern Queensland.	PMST	Possible – No records for this species exist within the locality however marginally suitable habitat occurs within the Subject Land/	Low – Potential habitat will not be impacted by the Proposal.
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)	Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory)	-	E	The Koala has a fragmented distribution throughout eastern Australia from north-east Queensland to the Eyre Peninsula in South Australia. In New South Wales, koala populations are found on the central and north coasts, southern highlands, southern and northern tablelands, Blue Mountains, southern coastal forests, with some smaller populations on the plains west of the Great Dividing Range. The species inhabit eucalypt woodlands and forests, and feed on the foliage of more than 70 eucalypt species and 30 non-eucalypt species, but in any one area will select preferred browse species.	PMST	Unlikely – No records for this species exist within the locality and very limited suitable foraging habitat occurs within the Subject Land.	Low – Marginal potential habitat for this species will not be impacted by the Proposal.
Reptiles							
Aprasia parapulchella	Pink-tailed Worm-lizard,	V	V	Populations occur in the Queanbeyan/Canberra district, Cooma, Yass, Bathurst, Albury and West	PMST	Unlikely – No records for this	Low – No suitable habitat for this species

Scientific name	Common name	BC Act	EPBC Act	Habitat	Record source	Likelihood of occurrence	Likelihood of impact
	Pink-tailed Legless Lizard			Wyalong areas. Inhabits grassland and open woodland with substantial embedded rock cover in sunny situations. Recorded in both native and non-native grasslands. Usually recorded under small rocks (150 - 600 mm basal area) shallowly embedded in the soil (2 - 5 cm, and use ant burrows under these rocks.		species exist within the locality and no suitable habitat occurs within the Subject Land.	will be impacted by the Proposal.
Hemiaspis damelii	Grey Snake	E	E	Distributed throughout the eastern interior, from central inland New South Wales, north to coastal areas near Rockhampton in Queensland (Cogger 2000; Hobson 2003; Wilson and Swan 2010; Hobson 2012). *Hemiaspis damelii* favours woodlands (typically brigalow *Acacia harpophylla* and belah *Casuarina cristata*), usually on heavier, cracking clay soils, particularly in association with water bodies or in areas with small gullies and ditches (gilgais) (Wilson and Swan 2010; Hobson 2012). (QLD Gov - Targeted Species Survey Guidelines - 2023)	PMST	Unlikely – No records for this species exist within the locality and no suitable habitat occurs within the study area.	Low – No suitable habitat for this species will be impacted by the Proposal.
Threatened Ecological Community							
Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions		-	E	The woodlands are distributed widely across the bioregions, occurring in tracts or as patches within open forests or woodlands dominated by other species. A feature common to many areas where the woodlands occur is the presence of clayey and/or alkaline sub-soils. In many of the South Australian areas, massive calcrete underlies the sub-soil at depths of less than one metre. The nominated woodland's component communities are generally characterised as woodland or open woodland with a well developed ground stratum that is usually grassy, but also includes many subshrubs and herbs; some component	PMST	Nil – This community was not recorded as occurring within the Subject Land.	Nil – This community will not be impacted by the Proposal.

Scientific name	Common name	BC Act	EPBC Act	Habitat	Record source	Likelihood of occurrence	Likelihood of impact
				communities have understoreys that are predominantly shrubby or herbaceous. Most component communities lack a well-developed tall shrub layer. This community is poorly represented in conservation areas throughout its range.			
Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia		-	E	*Eucalyptus microcarpa* (Inland Grey Box), is often found in association *with E.populnea subsp. bimbil* (Bimble or Poplar Box), *Callitris glaucophylla* (White Cypress Pine), *Brachychiton populneus* (Kurrajong*), Allocasuarina luehmannii* (Bulloak) or *E. melliodora* (Yellow Box), and sometimes with *E. albens* (White Box). Shrubs are typically sparse or absent, although this component can be diverse and may be locally common, especially in drier western portions of the community. A variable ground layer of grass and herbaceous species is present at most sites. At severely disturbed sites the ground layer may be absent.	PMST	Possible – While this TEC was not recorded as present on site, associated species are present within the Subject Land that could allow conformance to this TEC.	Low – Minimal associated species are present within the Subject Land and Subject Land does not meet benchmark criteria to constitute adhering to this TEC.
Mallee Bird Community of the Murray Darling Depression Bioregion		-	E	The Mallee Bird Community is an assemblage of 20 bird species that rely on mallee habitats for their continued persistence within the MDD bioregion. The assemblage represents 11 families, the most common being the honeyeaters (Meliphagidae; six species) and wrens (Maluridae; three species). Thirteen species are individually listed as threatened by at least one jurisdiction, and six are listed as nationally threatened, either at the species or an infraspecific level. Component bird species of the community are mallee specialists; Black-eared Miner, Chestnut Quail-thrush, Mallee Emu-wren, Malleefowl, Red-lored	PMST	Nil – This community was not recorded as occurring within the Subject Land.	Nil – This community will not be impacted by the Proposal.

Scientific name	Common name	BC Act	EPBC Act	Habitat	Record source	Likelihood of occurrence	Likelihood of impact
				Whistler, Scarlet-chested Parrot, Striated Grasswren and Mallee Western Whipbird; and mallee dependents; Crested Bellbird, Grey-fronted Honeyeater, Jacky Winter, Purple-gaped Honeyeater, Regent Parrot, Shy Heathwren, Southern Scrub-robin, Splendid fairywren, Spotted Pardalote, White-eared Honeyeater, White-fronted Honeyeater and Yellow-plumed Honeyeater.			
Poplar Box Grassy Woodland on Alluvial Plains		-	E	Poplar Box Grassy Woodland on Alluvial Plains covers native grassy eucalypt woodland where poplar/bimble box is the main tree canopy species present. Other tree species may occasionally occur depending on the characteristics of the site, these include *Callitris glaucophylla* (white cypress pine), *Casuarina cristata* (belah), *Eucalyptus coolabah* (coolibah), *Eucalyptus largiflorens* (black box), *Eucalyptus melanophloia* (silver-leaved ironbark), *Eucalyptus microcarpa* (inland grey box) and *Eucalyptus pilligaensis* (narrow-leaved grey box).	Field surveys	Known – This community was recorded within the Subject Land.	Low – This community occurs outside of the subject site and is unlikely to be impacted by the Proposal.
Weeping Myall Woodlands		-	E	Weeping Myall Woodlands occur in a range of forms from open woodlands to woodlands*, in which weeping myall (Acacia pendula) trees are the sole or dominant overstorey species. Although weeping myall trees are often the only tree species in these woodlands, other trees can occur in the overstorey of the ecological community. This community typically occurs in red-brown earths and heavy textured grey and brown alluvial soils in areas receiving between 375 and 500 mm mean annual rainfall.	PMST	Nil – This community was not recorded as occurring within the Subject Land.	Nil – This community will not be impacted by the Proposal.

Appendix F – Assessments of Significance BC Act

ASSESSMENTS OF SIGNIFICANCE FOR STATE LISTED THREATENED BIOTA

Section 1.7 of the EP&A Act lists considerations that must be taken into account in the determination of the significance of potential impacts of a proposed Proposal on 'threatened species, populations or ecological communities (or their habitats)' listed under the BC Act. The Assessment of Significance is used to determine whether a Proposal is 'likely' to impose 'a significant effect' on threatened biota and thus whether a Species Impact Statement (SIS) is required. Should the Assessment of Significance conclude that there is likely to be a 'significant effect' on a listed species, population or endangered ecological community, an SIS must be prepared or participation in the Biodiversity Offset Scheme.

Biodiversity Conservation Act 2016 Part 7.3 sets out the following Assessment of Significance considerations which must be addressed to determine whether a significant impact is likely to occur.

The following threatened biota listed under the BC Act have been assessed:

Scientific name	Common name	BC Act	Summary of AoS
Woodland birds and grassland foraging parrots			
Climacteris picumnus victoriae	Brown Treecreeper	V	No significant impact
Stagonopleura guttata	Diamond Firetail	V	No significant impact
Polytelis swainsonii	Superb Parrot	V	No significant impact
Neophema pulchella	Turquoise Parrot	V	No significant impact
Pomatostomus temporalis temporalis	Grey-crowned Babbler	V	No significant impact
Grassland and shrubland bird			
Epthianura albifrons	White-fronted Chat	V	No significant impact

The assessments of significance concluded that significant impacts to these species are unlikely. Consequently, a Referral to the Minister is not warranted.

Woodland Birds and grassland foraging parrots

Climacteris picumnus victoriae, Brown Treecreeper – Vulnerable
Stagonopleura guttata, Diamond Firetail – Vulnerable
Polytelis swainsonii, Superb Parrot – Vulnerable
Neophema pulchella, Turquoise Parrot – Vulnerable

Description:

Brown Treecreeper: Endemic to eastern Australia and occurs in eucalypt forests and woodlands of inland plains and slopes of the Great Dividing Range. It is less commonly found on coastal plains and ranges. Mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey, sometimes with one or more shrub species; also found in mallee and River Red Gum (*Eucalyptus camaldulensis*) Forest bordering wetlands with an open understorey of acacias, saltbush, lignum, cumbungi and grasses. Sedentary, considered to be resident in many locations throughout its range; present in all seasons or year-round at many sites; territorial year-round. Up to 80% of the diet is comprised of ants; other invertebrates (including spiders, insects larvae, moths, beetles, flies, hemipteran bugs, cockroaches, termites and lacewings) make up the remaining percentage; nectar from Mugga Ironbark (*Eucalyptus sideroxylon*) and paperbarks, and sap from an unidentified eucalypt are also eaten. Hollows in standing dead or live trees and tree stumps are essential for nesting. Breeds in pairs or co-operatively in territories which range in size from 1.1 to 10.7 ha (mean = 4.4 ha).

Diamond Firetail: Found in grassy eucalypt woodlands, including Box-Gum Woodlands and Snow Gum Eucalyptus pauciflora Woodlands. Also occurs in open forest, mallee, Natural Temperate Grassland, and in secondary grassland derived from other communities. Feeds exclusively on the ground, on ripe and partly ripe grass and herb seeds and green leaves, and on insects (especially in the breeding season). Nests are globular structures built either in the shrubby understorey, or higher up, especially under hawk's or raven's nests. Birds roost in dense shrubs or in smaller nests built especially for roosting. Appears to be sedentary, though some populations move locally.

Superb Parrot: Typically nest in colonies and return to the same location over generations. During the summer they return from wintering in northern NSW to breed. Nest trees can be in open Box-Gum Woodland or isolated paddock trees. Species known to be used are Blakely's Red Gum, Yellow Box, Apple Box and Red Box, among others. Forages in grassy box woodland up to 10km from the nesting site and feeds in trees and understorey shrubs and on the ground. Their diet consists mainly of grass seeds and herbaceous plants, however, fruits, berries, nectar, buds, flowers, insects and grain is also eaten.

Turquoise Parrot: The Turquoise Parrot's range extends from southern Queensland through to northern Victoria, from the coastal plains to the western slopes of the Great Dividing Range. Lives on the edges of eucalypt woodland adjoining clearings, timbered ridges and creeks in farmland.

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,

Records for these species occur within the locality of the subject site. The Subject Land contains moderate tracts of contiguous intact remnant vegetation which these species may inhabit. The Proposal will see direct

impacts to 12.35 ha of non-native groundcover vegetation comprising exotic pasture grasses and exotic weeds within the cleared land, and a small area of Black Box trees not observed to contain hollows or nesting habitat and some native ground cover species within the powerline easement works. These impacts will impact potential foraging habitat. No impacts to the breeding cycle of these species are considered likely to occur as a result of the minor work proposed. Therefore, given the minor impacts proposed (0.1 ha) to low quality habitat and the availability of higher quality resources in the surrounding area, it is unlikely that the Proposal would have an adverse impact on the lifecycle of these species such that a viable local population would be placed at risk of extinction.	
In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:	
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,	Not applicable to these species.
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 to these species.
In relation to the habitat of a threatened species or ecological community:	
the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity	The Proposal will see direct impacts to 12.35 ha of non-native vegetation in an agricultural paddock consisting of predominantly sown cereal crops, and a small area of Black Box trees and some native groundcover in the powerline easement area, which constitutes marginal foraging habitat for these species. No important habitat features such as logs, HBTs or habitat trees, shrubs, stumps or banks were observed within the direct impact footprint at time of survey. However, remnant woodland occurs within close proximity and will only experience slight indirect impacts that are unlikely to modify this habitat.
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,	The subject site consists of a cleared agricultural paddock surrounded by large tracts of agricultural land in similar condition which will not be impacted. Remnant vegetation stands within the Subject Land will not be impacted by the Proposal and the minor works proposed to woodland along the fence line will not add to localised fragmentation, with connectivity around the proposed solar farm remaining largely similar to existing levels.

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,	Given the availability of large areas of preferred remnant habitat in adjacent areas, the vegetation to be impacted is likely to be marginal foraging habitat for these species only as it is subject to existing modification and disturbance. The minor impacts proposed by the Proposal is unlikely to result in modification, fragmentation or isolation of habitat to an extent that would put the long-term survival of these species at risk

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),

The site does not support any declared Areas of Outstanding Biodiversity Value (formerly critical habitat): https://www.environment.nsw.gov.au/criticalhabitat/CriticalHabitatProtectionByDoctype.htm

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.

The following Key Threatening Process have the potential to increase as a result of the Proposal if the appropriate environmental safeguards are not implemented and adhered to:

- Clearing of native vegetation
- Invasion of native plant communities by exotic perennial grasses
- Removal of dead wood and dead trees

Conclusion

Given that:

- Direct impacts are limited to 12.35 ha of non-native groundcover vegetation comprising predominantly sown cereal pasture, exotic grasses and exotic weeds, and a small area (0.1 ha) of Black Box trees would not substantial reduce foraging habitat or future nesting opportunities for species
- The removal of proposed native vegetation would not result in any additional fragmentation of habitat beyond what already occurs throughout the landscape, which are traversable for these species
- Availability of areas of preferred intact remnant vegetation providing suitable habitat for these species within the immediate locality which will not be impacted as a result of the Proposal
- No direct impacts to important habitat features, such as HBT trees, shrubs, remnant woodland, logs, stumps or banks, (at time of survey) will occur as a result of the Proposal

Therefore, it is concluded that the proposed development is unlikely to result in a significant impact on these vulnerable woodland bird species.

Threatened birds recorded on site *Epthianura albifrons,* White-fronted Chat – Vulnerable *Pomatostomus temporalis temporalis,* Grey-crowned Babbler - Vulnerable
Description: White-fronted Chat: The White-fronted Chat is found across the southern half of Australia, from southernmost Queensland to southern Tasmania, and across to Western Australia as far north as Carnarvon. Found mostly in temperate to arid climates and very rarely sub-tropical areas, it occupies foothills and lowlands up to 1000 m above sea level. In NSW, it occurs mostly in the southern half of the state, in damp open habitats along the coast, and near waterways in the western part of the state. Along the coastline, it is found predominantly in saltmarsh vegetation but also in open grasslands and sometimes in low shrubs bordering wetland areas. Gregarious species, usually found foraging on bare or grassy ground in wetland areas, singly or in pairs. They are insectivorous, feeding mainly on flies and beetles caught from or close to the ground. Grey-crowned Babbler: Feeds on invertebrates, either by foraging on the trunks and branches of eucalypts and other woodland trees or on the ground, digging and probing amongst litter and tussock grasses. The species makes nests in low shrubs and trees. This species was observed foraging in the proposal site, and historical records exist within the broader locality. No nests were observed during surveys, however given the local activity of this species during surveys it is certain this species was nesting within Subject Land Contiguous. Continuous vegetation is particularly important for GCB's to allow ease of movement throughout home ranges and habitat resources, as this species are unable to cross large open areas. Therefore, it is important to assess the landscape and habitat fragmentation potential of the proposal and the impact this may have on this species.
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,
Both the White-fronted Chat and Grey-crowned Babbler were observed on site during surveys. The subject site contains moderate tracts of contiguous intact remnant vegetation which these species may inhabit. The Proposal will see direct impacts to 12.35 ha of non-native groundcover vegetation and sown cereal crops, and a small area of Black Box trees not containing hollows or nesting habitat and some native ground cover species within the powerline easement works. These impacts will impact potential foraging habitat, however these impacts are to be minor and not significant to the species. No impacts to adjacent areas of intact remnant vegetation which constitute suitable habitat for these species will occur as a result of the proposed works. No impacts to the breeding cycle of these species are considered likely to occur as a result of the proposed works given the minor nature of proposed vegetation removal. Therefore, it is considered that impacts to a highly degraded and modified agricultural paddock in an agricultural landscape with available intact remnant vegetation that will not be impacted, is unlikely to have an adverse impacts on the lifecycle of these species such that a viable local population would be placed at risk of extinction.
In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

is likely to have an adverse effect on the extent of the ecological community such that its local	Not applicable to these species.

occurrence is likely to be placed at risk of extinction,	
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 to these species.
In relation to the habitat of a threatened species or ecological community:	
the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity	The Proposal will see direct impacts to 12.35 ha of non-native vegetation in an agricultural paddock consisting of predominantly sown cereal crops, and a small area of Black Box trees and some native groundcover in the powerline easement area, which constitutes marginal foraging habitat for these species. No important habitat features such as logs, HBTs or habitat trees, shrubs, stumps or banks were observed within the direct impact footprint at time of survey. However, remnant woodland occurs within close proximity and will only experience slight indirect impacts that are unlikely to modify this habitat.
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,	The subject site consists of a cleared agricultural paddock surrounded by large tracts of agricultural land in similar condition which will not be impacted. Remnant vegetation stands within the Subject Land will not be impacted by the Proposal and the minor works proposed to woodland along the fence line will not add to localised fragmentation, with connectivity around the proposed solar farm remaining largely similar to existing levels.
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,	Given the availability of large areas of preferred remnant habitat in adjacent areas, the vegetation to be impacted is likely to be marginal foraging habitat for these species only as it is subject to existing modification and disturbance. The minor impacts proposed by the Proposal is unlikely to result in modification, fragmentation or isolation of habitat to an extent that would put the long-term survival of these species at risk
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),	
The site does not support any declared Areas of Outstanding Biodiversity Value (formerly critical habitat): https://www.environment.nsw.gov.au/criticalhabitat/CriticalHabitatProtectionByDoctype.htm	
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.	
The following Key Threatening Process have the potential to increase as a result of the Proposal if the appropriate environmental safeguards are not implemented and adhered to: • Clearing of native vegetation	

- Invasion of native plant communities by exotic perennial grasses
- Removal of dead wood and dead trees

Conclusion

Given that:

- Direct impacts are limited to 12.35 ha of non-native groundcover vegetation comprising predominantly sown cereal pasture, exotic grasses and exotic weeds, and a small area (0.1 ha) of Black Box trees would not substantially reduce foraging habitat or future nesting opportunities for species
- Availability of areas of preferred intact remnant vegetation providing suitable habitat for this species within the immediate locality which will not be impacted as a result of the Proposal
- No direct impacts to important habitat features, such as HBT trees, shrubs, remnant woodland, logs, stumps or banks, (at time of survey) will occur as a result of the Proposal
- The removal of proposed native vegetation would not result in any additional fragmentation of habitat beyond what already occurs throughout the landscape, which are traversable for these species

Therefore, it is concluded that the proposed development is unlikely to result in a significant impact on threatened birds recorded on site.

Appendix G – Significant Impact Criteria Assessment EPBC Act

Significant impact criteria assessments have been provided for threatened biota of concern to provide an indication of the potential level of impact of the proposal based on past records and habitats present. The following assessments have relied on species habitat information and records available via OEH Saving Our Species, DEE SPRAT profiles unless otherwise stated.

The following species listed under the EPBC Act are included in these assessments:

Scientific name	Common name	EPBC Act	Summary of AoS
Woodland birds			
Climacteris picumnus victoriae	Brown Treecreeper	V	No significant impact
Stagonopleura guttata	Diamond Firetail	V	No significant impact
Polytelis swainsonii	Superb Parrot	V	No significant impact

The significant impact criteria assessment concluded that significant impacts to this species is unlikely. Consequently, a Referral to the Minister is not warranted.

Vulnerable species	***Climacteris picumnus victoriae* Brown Treecreeper** ***Stagonopleura guttata* Diamond Firetail** ***Polytelis swainsonii* Superb Parrot**

Description:

Brown Treecreeper: Endemic to eastern Australia and occurs in eucalypt forests and woodlands of inland plains and slopes of the Great Dividing Range. It is less commonly found on coastal plains and ranges. Mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey, sometimes with one or more shrub species; also found in mallee and River Red Gum (*Eucalyptus camaldulensis*) Forest bordering wetlands with an open understorey of acacias, saltbush, lignum, cumbungi and grasses. Sedentary, considered to be resident in many locations throughout its range; present in all seasons or year-round at many sites; territorial year-round. Up to 80% of the diet is comprised of ants; other invertebrates (including spiders, insects larvae, moths, beetles, flies, hemipteran bugs, cockroaches, termites and lacewings) make up the remaining percentage; nectar from Mugga Ironbark (*Eucalyptus sideroxylon*) and paperbarks, and sap from an unidentified eucalypt are also eaten. Hollows in standing dead or live trees and tree stumps are essential for nesting. Breeds in pairs or co-operatively in territories which range in size from 1.1 to 10.7 ha (mean = 4.4 ha).

Diamond Firetail: Found in grassy eucalypt woodlands, including Box-Gum Woodlands and Snow Gum Eucalyptus pauciflora Woodlands. Also occurs in open forest, mallee, Natural Temperate Grassland, and in secondary grassland derived from other communities. Feeds exclusively on the ground, on ripe and partly ripe grass and herb seeds and green leaves, and on insects (especially in the breeding season). Nests are globular structures built either in the shrubby understorey, or higher up, especially under hawk's or raven's nests. Birds roost in dense shrubs or in smaller nests built especially for roosting. Appears to be sedentary, though some populations move locally.

Superb Parrot: Typically nest in colonies and return to the same location over generations. During the summer they return from wintering in northern NSW to breed. Nest trees can be in open Box-Gum Woodland or isolated paddock trees. Species known to be used are Blakely's Red Gum, Yellow Box, Apple Box and Red Box, among others. Forages in grassy box woodland up to 10km from the nesting site and feeds in trees and understorey shrubs and on the ground. Their diet consists mainly of grass seeds and herbaceous plants, however, fruits, berries, nectar, buds, flowers, insects and grain is also eaten.

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it would:

Lead to a long-term decrease in the size of an important population of a species,

An 'important population' is a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are:

- *key source populations either for breeding or dispersal*
- *populations that are necessary for maintaining genetic diversity, and/or*
- *populations that are near the limit of the species range.)*

Records for Brown Treecreeper, Superb Parrot, and Diamond Firetail exist within the locality, but not in close proximity to the Subject Land. The Proposal will see direct impacts to 12.35 ha of non-native vegetation in an agricultural paddock consisting of predominantly sown cereal crops, and a small area of Black Box trees and some native groundcover in the powerline easement area, which constitutes marginal foraging habitat for these species. No impacts to adjacent areas of intact remnant vegetation which constitute preferred habitat for these species will occur as a result of the Proposed works, apart from adjacent remnant woodland which may experience minimal indirect effects that are unlikely to deter these species. Therefore, it is considered impacts to an area of marginal foraging habitat in a degraded condition in a highly cleared agricultural landscape, with adjacent tracts of intact remnant vegetation constituting preferred habitat for these species that will not be impacted, is unlikely to lead to a long-term decrease in the size of an important population of these species.

Reduce the area of occupancy of an important population,

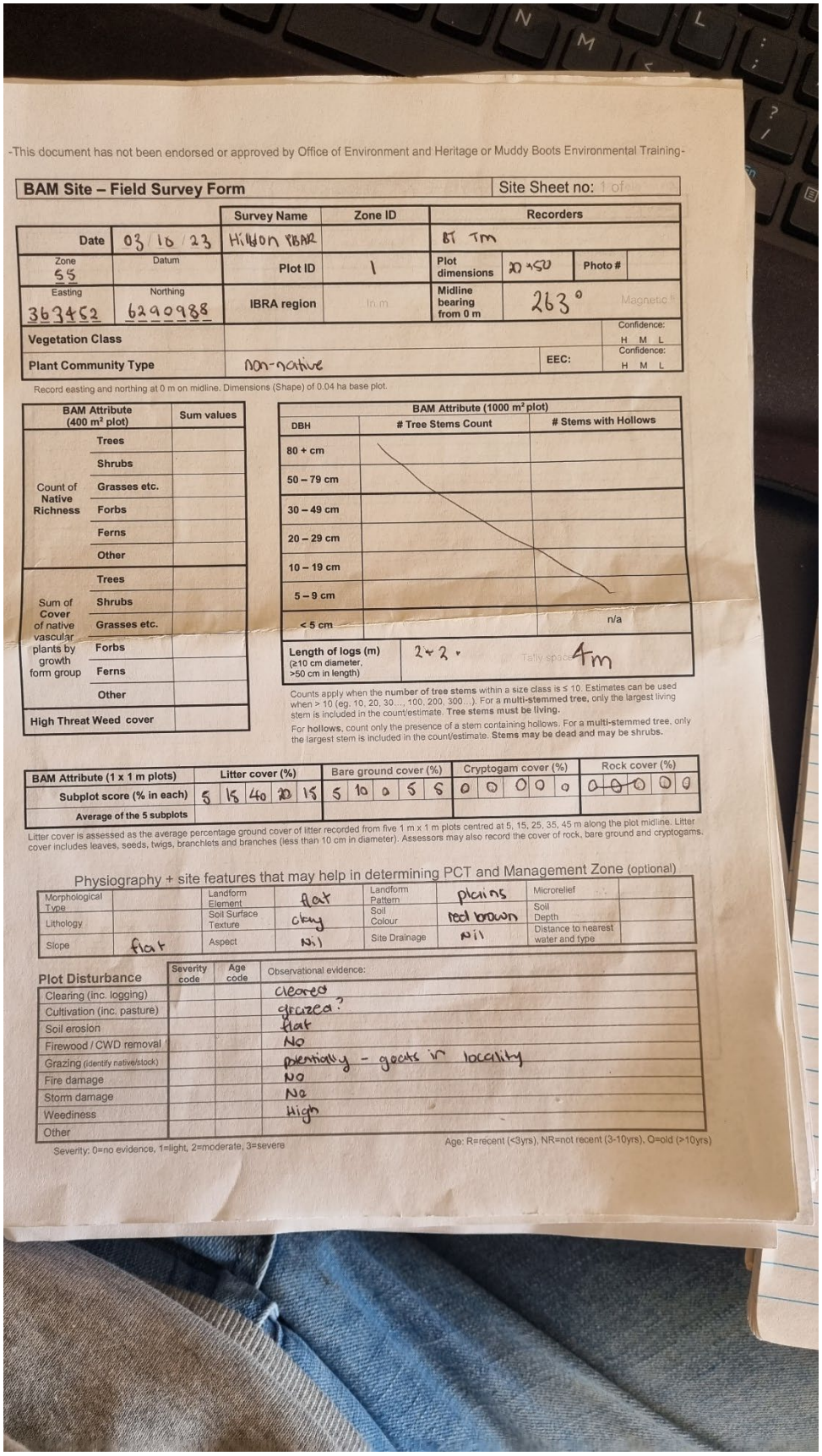
The Proposal will result in the modification of non-native forging habitat by up to 12.35 ha and the loss of up to 0.1 ha of native vegetation. Impacts will occur within an area exposed to previous historic clearing, with no direct impacts to any hollow bearing trees or observable nests (at time of survey). Foraging on groundcover vegetation would still be possible after the construction and remediation of the Solar Farm, as solar panels do not result in the total loss of groundcover vegetation. The Subject Land contains tracts of intact remnant vegetation which will not be impacted, and only adjacent remnant woodland in close proximity may experience minimal indirect noise and dust effects. Given the availability of preferred remnant habitat in adjacent areas, and the availability of large areas of agricultural land in similar condition to the subject site the Proposal is unlikely to reduce the area of occupancy of an important population of these species.

Fragment an existing important population into two or more populations

Construction upon 12.35 ha of an agricultural paddock previously subject to clearing and the removal of up to 0.1 ha of native vegetation from a modified environment would not increase the gaps in vegetation cover beyond what already occurs in the surrounding area. Subsequently, the Proposal will not result in any

additional fragmentation of the landscape to an extent that would lead to the fragmentation of an existing population of these species.
Adversely affect habitat critical to the survival of a species
No critical habitat for these species occurs within the Subject Land. No direct impacts to remnant woodland on site will occur as a result of this Proposal. Remnant adjacent woodland may experience minimal indirect noise and dust effects, however, this is not habitat that is critical to the survival of these species.
Disrupt the breeding cycle of an important population
The Superb Parrot is unlikely to breed within the site. Additionally, no hollow-bearing trees proposed to be impacted and subsequently breeding habitat for Brown Treecreeper is unlikely to be impacted. Given the minor impacts proposed to a narrow, linear strip of degraded native vegetation, it is unlikely that breeding habitat for the Diamond Firetail would be present. Subsequently, it is unlikely that the Proposal would disrupt an important lifecycle for these species.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline
he Proposal will see direct impacts to 12.35 ha of non-native vegetation in an agricultural paddock consisting of predominantly sown cereal crops, and a small area of Black Box trees and some native groundcover in the powerline easement area, which constitutes marginal foraging habitat for these species. The Subject Land contains tracts of contiguous intact remnant vegetation away from the development footprint which will not be impacted, and adjacent woodland in close proximity will only be periodically indirectly impacted by noise and dust. Impacts within an area previously subject to clearing and within a landscape of extensively available similar habitat is unlikely to substantially modify available habitat for these species beyond existing levels. Given the availability of areas of preferred remnant habitat in adjacent areas, and the availability of agricultural land in similar condition to the subject site, the vegetation to be impacted is likely to be marginal habitat for these species and the minor impacts proposed are unlikely to result in the decline of these species.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat
The Subject Land contains high levels of existing invasive groundcover weeds due to previous clearing and land-use practices. It is likely the Subject Land and Assessment Area contains these invasive species already given their high prevalence within the landscape. The implementation of management measures outlined in Section 7 would reduce the likelihood of introduction and further spread of invasive species within the Subject Land.
Interfere substantially with the recovery of the species.
The minor impacts associated with this Proposal are unlikely to result in detrimental impacts to the recovery of these species
Conclusion Given the above, it is deemed that no significant impact to these vulnerable woodland birds is likely as a result of the Proposal. Therefore, a referral to the Minister is not required.

Appendix H – BAM Data Sheets



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BAM Site – Field Survey Form Site Sheet no: 1 of

Survey Name	Zone ID	Recorders
Hillston FBAR		BT TM

Date	Zone	Datum	Plot ID	Plot dimensions	Photo #
03/10/23	55		1	20 x 50	

Easting	Northing	IBRA region	Midline bearing from 0 m
363452	6290988		263° Magnetic

Vegetation Class — Confidence: H M L

Plant Community Type: non-native — EEC: — Confidence: H M L

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
Sum of Cover of native vascular plants by growth form group	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
High Threat Weed cover		

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm		
50 – 79 cm		
30 – 49 cm		
20 – 29 cm		
10 – 19 cm		
5 – 9 cm		
< 5 cm		n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)	2+2	Tally space 4m

Counts apply when the **number of tree stems** within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30..., 100, 200, 300 ...). For a **multi-stemmed tree**, only the largest living stem is included in the count/estimate. **Tree stems must be living.**

For **hollows**, count only the presence of a stem containing hollows. For a **multi-stemmed tree**, only the largest stem is included in the count/estimate. **Stems may be dead and may be shrubs.**

BAM Attribute (1 x 1 m plots)	Litter cover (%)					Bare ground cover (%)					Cryptogam cover (%)					Rock cover (%)				
Subplot score (% in each)	5	15	40	20	15	5	10	0	5	5	0	0	0	0	0	0	0	0	0	0
Average of the 5 subplots																				

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

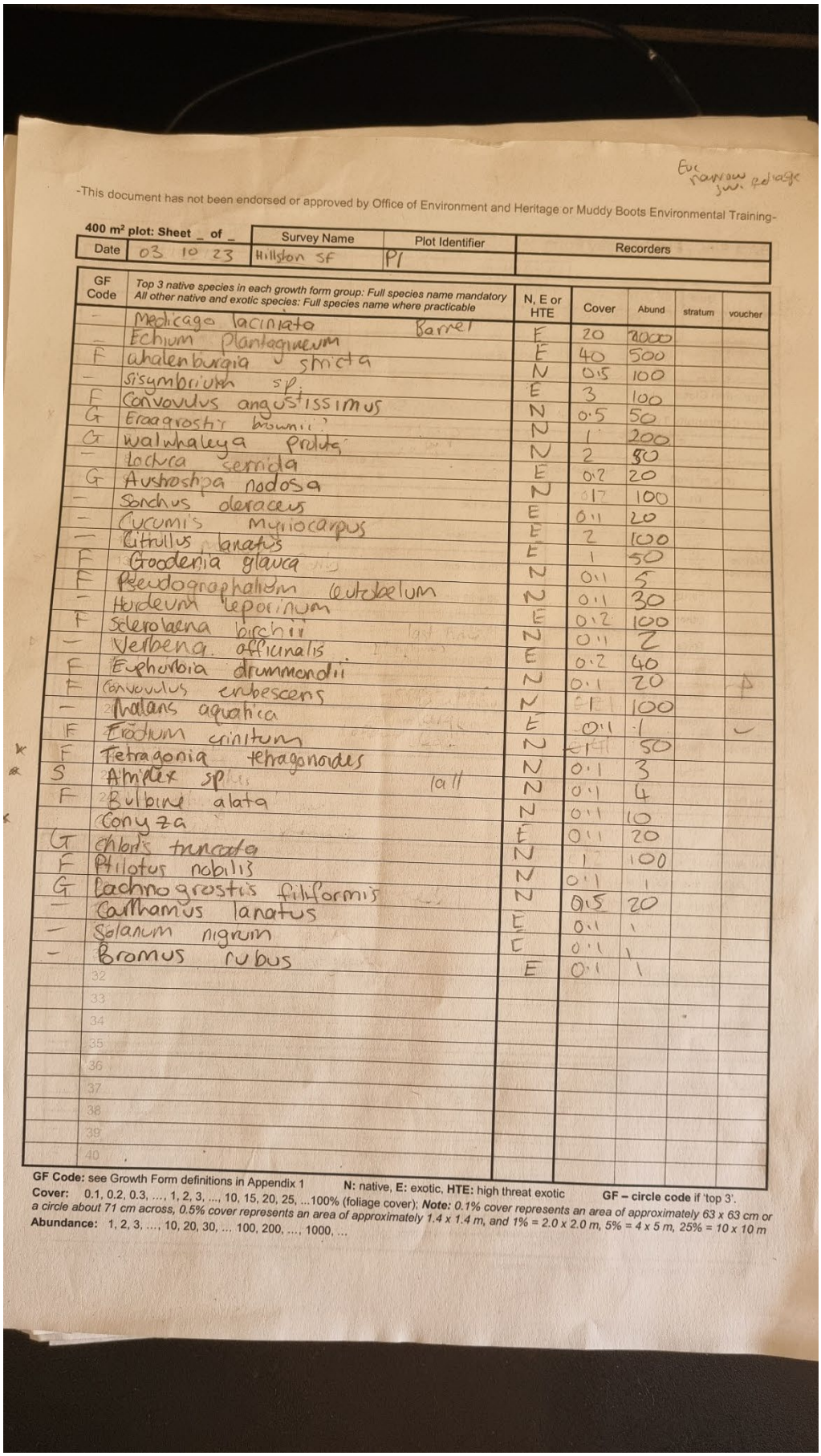
Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element	flat	Landform Pattern	plains	Microrelief	
Lithology		Soil Surface Texture	clay	Soil Colour	red brown	Soil Depth	
Slope	flat	Aspect	Nil	Site Drainage	Nil	Distance to nearest water and type	

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			cleared
Cultivation (inc. pasture)			grazed?
Soil erosion			flat
Firewood / CWD removal			No
Grazing (identify native/stock)			potentially - goats in locality
Fire damage			No
Storm damage			No
Weediness			High
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)



For narrow juv. foliage

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400 m² plot: Sheet _ of _

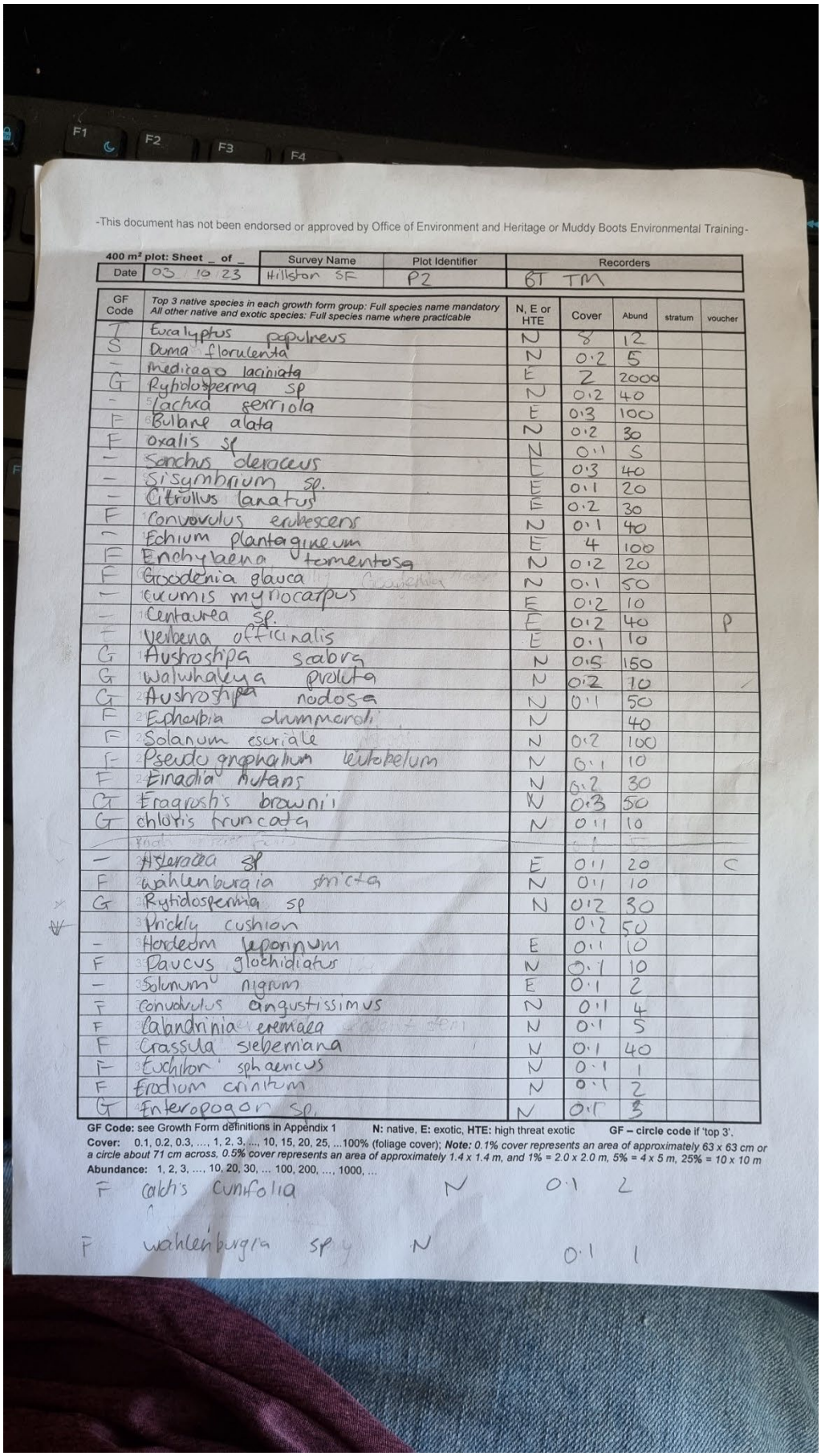
Date	Survey Name	Plot Identifier	Recorders
03 10 23	Hillston SF	P1	

	GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
1	–	Medicago laciniata Barrel	E	20	2000		
2	–	Echium plantagineum	E	40	500		
3	F	Whalenbergia stricta	N	0.5	100		
4	–	Sisymbrium sp.	E	3	100		
5	F	Convovulus angustissimus	N	0.5	50		
6	G	Eragrostis brownii	N	1	200		
7	G	Walwhaleya proluta	N	2	80		
8	–	Lactuca serricla	E	0.2	20		
9	G	Austrostipa nodosa	N	17	100		
10	–	Sonchus oleraceus	E	0.1	20		
11	–	Cucumis myriocarpus	E	2	100		
12	–	Citrullus lanatus	E	1	50		
13	F	Goodenia glauca	N	0.1	5		
14	F	Pseudographalium cutabelum	N	0.1	30		
15	–	Hordeum leporinum	E	0.2	100		
16	F	Sclerolaena birchii	N	0.1	2		
17	–	Verbena officinalis	E	0.2	40		
18	F	Euphorbia drummondii	N	0.1	20		
19	F	Convovulus erubescens	N	1	100		
20	–	Nalans aquatica	E	0.1	1		
21	F	Erodium cinitum	N	1	50		
22	F	Tetragonia tetragonoides	N	0.1	3		
23	S	Atriplex sp. tall	N	0.1	4		
24	F	Bulbine alata	N	0.1	10		
25		Conyza	E	0.1	20		
26	G	Chloris truncata	N	1	100		
27	F	Philotus nobilis	N	0.1	1		
28	G	Lachnogrostis filiformis	N	0.5	20		
29	–	Carthamus lanatus	E	0.1	1		
30	–	Solanum nigrum	E	0.1	1		
31	–	Bromus rubus	E	0.1	1		
32							
33							
34							
35							
36							
37							
38							
39							
40							

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.

Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*

Abundance: 1, 2, 3, ..., 10, 20, 30, ..., 100, 200, ..., 1000, ...



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400 m² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date 03/10/23	Hillston SF	P2	BT TM

GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
T	Eucalyptus populnevs	N	8	12		
S	Duma florulenta	N	0.2	5		
-	Medicago laciniata	E	2	2000		
G	Rybdosperma sp	N	0.2	40		
-	Lactuca serriola	E	0.3	100		
F	Bulbine alata	N	0.2	30		
F	Oxalis sp	N	0.1	5		
-	Sonchus oleraceus	E	0.3	40		
-	Sisymbrium sp.	E	0.1	20		
-	Citrullus lanatus	E	0.2	30		
F	Convovulus erubescens	N	0.1	40		
-	Echium plantagineum	E	4	100		
F	Enchylaena tomentosa	N	0.2	20		
F	Goodenia glauca	N	0.1	50		
-	Cucumis myriocarpus	E	0.2	10		
-	Centaurea sp.	E	0.2	40		P
F	Verbena officinalis	E	0.1	10		
G	Austrostipa scabra	N	0.5	150		
G	Walwhalleya proluta	N	0.2	10		
G	Austrostipa nodosa	N	0.1	50		
F	Echarbia drummondi	N		40		
F	Solanum esuriale	N	0.2	100		
F	Pseudognaphalium leutobelum	N	0.1	10		
F	Einadia nutans	N	0.2	30		
G	Eragrostis brownii	N	0.3	50		
G	chloris truncata	N	0.1	10		
-	Asteraceae sp	E	0.1	20		C
F	wahlenburgia stricta	N	0.1	10		
G	Rytidosperma sp	N	0.2	30		
	Prickly cushion		0.2	50		
-	Hordeum leporinum	E	0.1	10		
F	Daucus glochidiatus	N	0.1	10		
-	Solanum nigrum	E	0.1	2		
F	Convolvulus angustissimus	N	0.1	4		
F	Calandrinia eremaea	N	0.1	5		
F	Crassula sieberiana	N	0.1	40		
F	Euchlora sphaericus	N	0.1	1		
F	Erodium cinitum	N	0.1	2		
G	Enteropogon sp.	N	0.1	3		

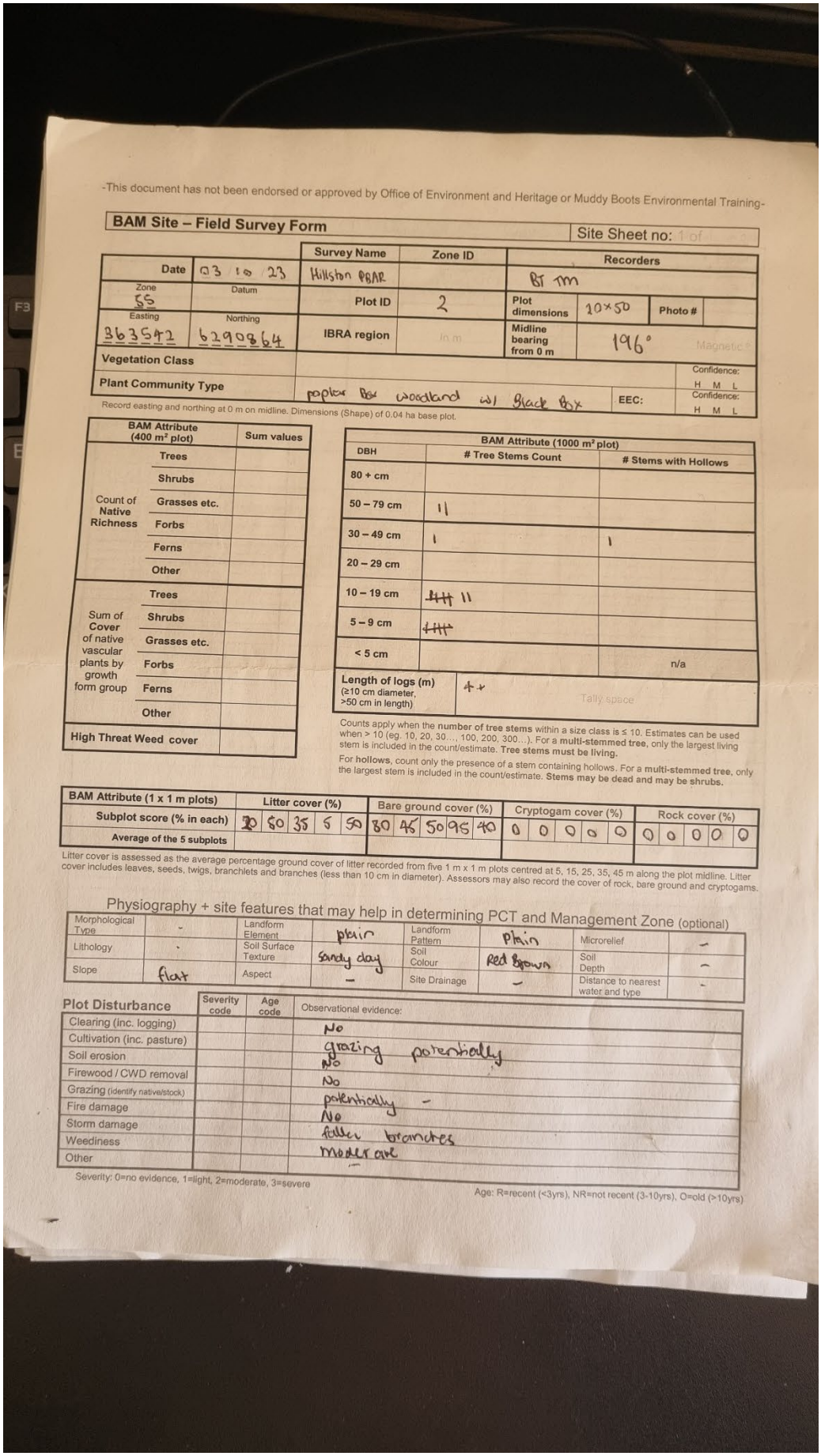
GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.

Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*

Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

F Calchis cunifolia N 0.1 2

F wahlenburgia sp N 0.1 1



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BAM Site – Field Survey Form Site Sheet no: 1 of 2

		Survey Name	Zone ID	Recorders			
Date	03 10 23	Hillston PBAR		BT TM			
Zone 55	Datum	Plot ID	2	Plot dimensions	10×50	Photo #	
Easting 363542	Northing 6290864	IBRA region	In m	Midline bearing from 0 m	196°	Magnetic?	
Vegetation Class							Confidence: H M L
Plant Community Type	poplar box woodland w/ Black Box			EEC:			Confidence: H M L

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
Sum of Cover of native vascular plants by growth form group	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
High Threat Weed cover		

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm		
50 – 79 cm	11	
30 – 49 cm	1	1
20 – 29 cm		
10 – 19 cm	𝍸 11	
5 – 9 cm	𝍸	
< 5 cm		n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)	4+ Tally space	

Counts apply when the **number of tree stems** within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30..., 100, 200, 300...). For a **multi-stemmed tree**, only the largest living stem is included in the count/estimate. **Tree stems must be living.**

For **hollows**, count only the presence of a stem containing hollows. For a **multi-stemmed tree**, only the largest stem is included in the count/estimate. **Stems may be dead and may be shrubs.**

BAM Attribute (1 x 1 m plots)	Litter cover (%)					Bare ground cover (%)					Cryptogam cover (%)					Rock cover (%)				
Subplot score (% in each)	20	50	35	5	50	80	45	50	95	40	0	0	0	0	0	0	0	0	0	0
Average of the 5 subplots																				

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

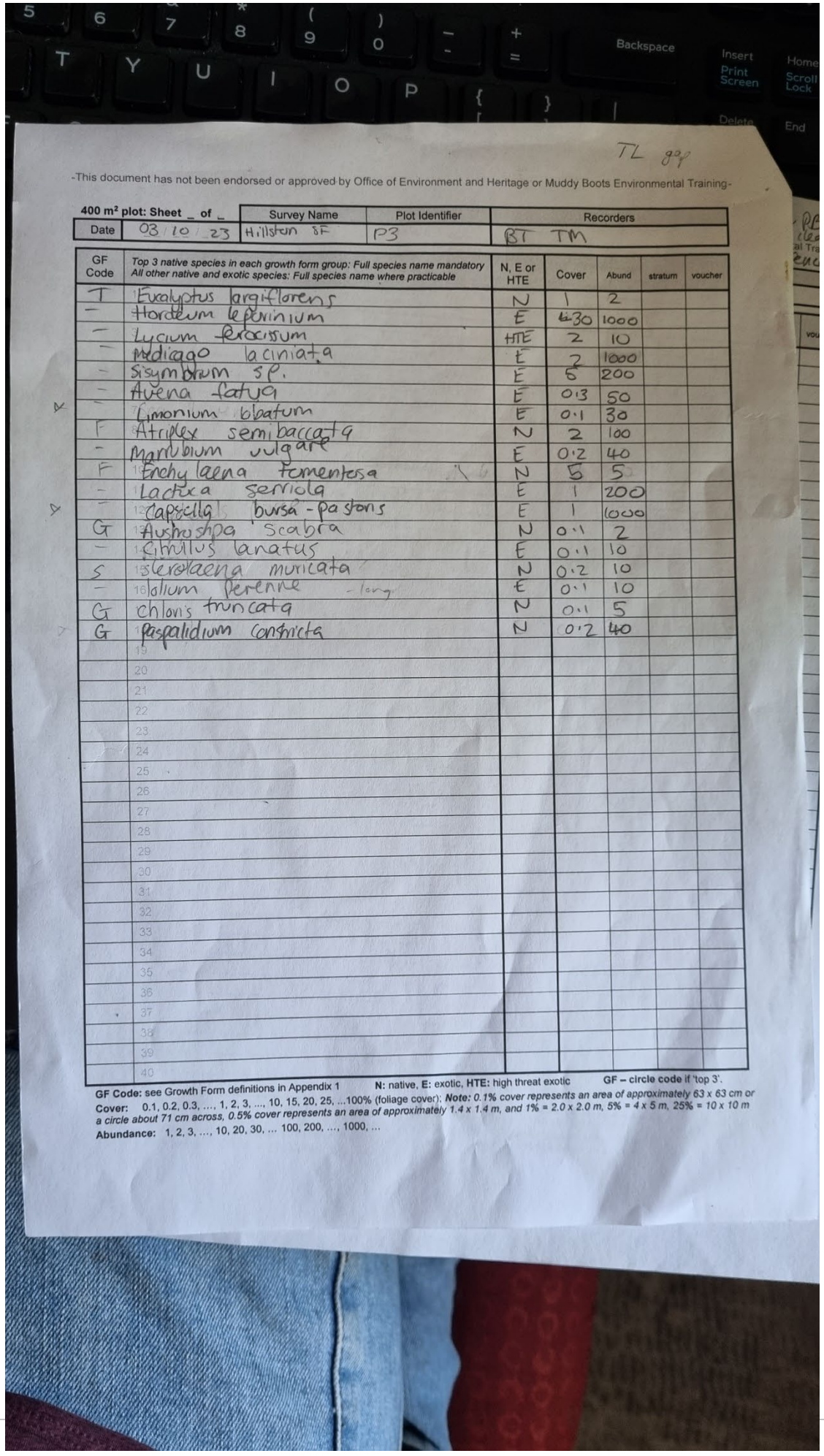
Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type	-	Landform Element	plain	Landform Pattern	Plain	Microrelief	-
Lithology	-	Soil Surface Texture	sandy clay	Soil Colour	Red Brown	Soil Depth	-
Slope	flat	Aspect	-	Site Drainage	-	Distance to nearest water and type	-

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			No
Cultivation (inc. pasture)			grazing potentially
Soil erosion			No
Firewood / CWD removal			No
Grazing (identify native/stock)			potentially -
Fire damage			No
Storm damage			fallen branches
Weediness			moderate
Other			-

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)



TL 9pp

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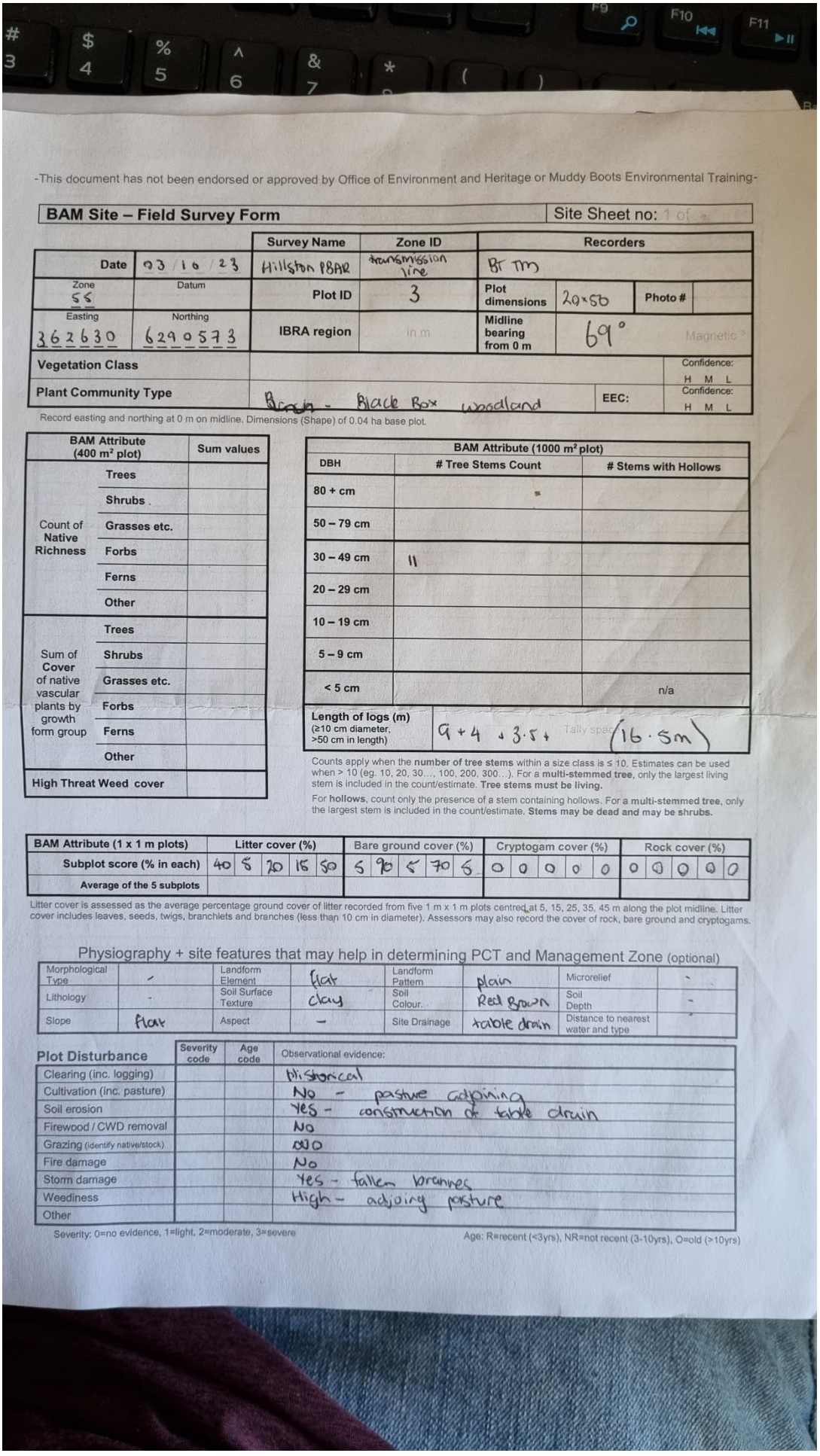
400 m² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date 03/10/23	Hillston SF	P3	BT TM

GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
T	1 Eucalyptus largiflorens	N	1	2		
–	2 Hordeum leporinum	E	30	1000		
–	3 Lycium ferocissum	HTE	2	10		
–	4 Medicago laciniata	E	2	1000		
–	5 Sisymbrium sp.	E	5	200		
–	6 Avena fatua	E	0.3	50		
–	7 Limonium sinuatum	E	0.1	30		
F	8 Atriplex semibaccata	N	2	100		
–	9 Marrubium vulgare	E	0.2	40		
F	10 Enchylaena tomentosa	N	5	5		
–	11 Lactuca serriola	E	1	200		
–	12 Capsella bursa-pastoris	E	1	1000		
G	13 Austrostipa scabra	N	0.1	2		
–	14 Citrullus lanatus	E	0.1	10		
S	15 Sclerolaena muricata	N	0.2	10		
–	16 Solium perenne - long	E	0.1	10		
G	17 Chloris truncata	N	0.1	5		
G	18 Paspalidium constricta	N	0.2	40		
	19					
	20					
	21					
	22					
	23					
	24					
	25					
	26					
	27					
	28					
	29					
	30					
	31					
	32					
	33					
	34					
	35					
	36					
	37					
	38					
	39					
	40					

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.

Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover): ***Note:*** *0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*

Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...



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BAM Site – Field Survey Form Site Sheet no: 1 of

		Survey Name	Zone ID	Recorders
Date	03 / 10 / 23	Hillston PBAR	transmission line	BT TM
Zone 55	Datum	Plot ID	3	Plot dimensions 20×50 Photo #
Easting 362630	Northing 6290573	IBRA region	In m	Midline bearing from 0 m 69° Magnetic °
Vegetation Class				Confidence: H M L
Plant Community Type	Brigalow - Black Box woodland			EEC: Confidence: H M L

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
Sum of Cover of native vascular plants by growth form group	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
High Threat Weed cover		

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm		
50 – 79 cm		
30 – 49 cm	11	
20 – 29 cm		
10 – 19 cm		
5 – 9 cm		
< 5 cm		n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)	9 + 4 + 3.5 +	Tally space (16.5m)

Counts apply when the **number of tree stems** within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30…, 100, 200, 300…). For a **multi-stemmed tree**, only the largest living stem is included in the count/estimate. **Tree stems must be living.**

For **hollows**, count only the presence of a stem containing hollows. For a **multi-stemmed tree**, only the largest stem is included in the count/estimate. **Stems may be dead and may be shrubs.**

BAM Attribute (1 x 1 m plots)	Litter cover (%)					Bare ground cover (%)					Cryptogam cover (%)					Rock cover (%)				
Subplot score (% in each)	40	5	20	15	50	5	90	5	70	5	0	0	0	0	0	0	0	0	0	0
Average of the 5 subplots																				

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

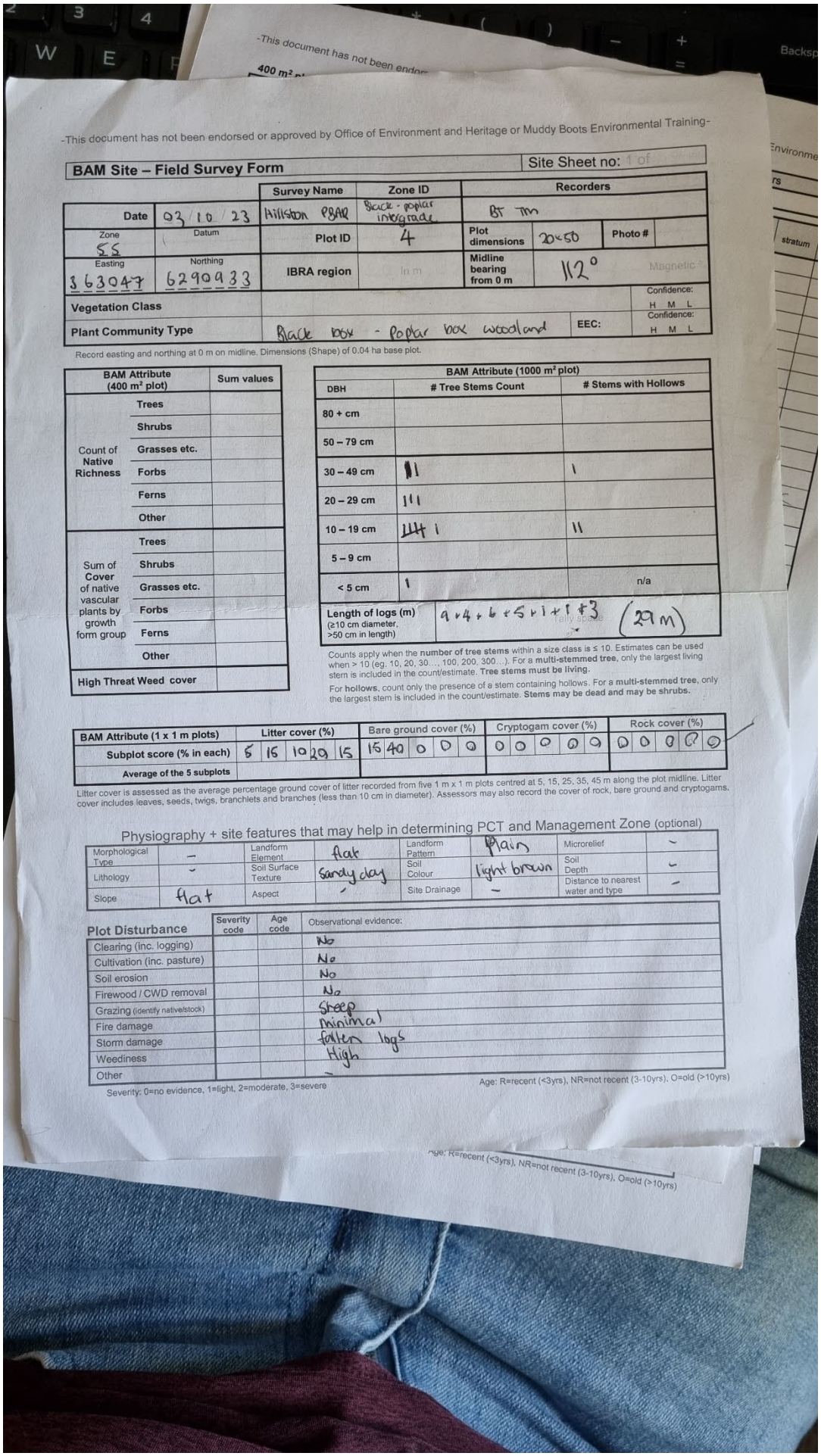
Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type	-	Landform Element	flat	Landform Pattern	plain	Microrelief	-
Lithology	-	Soil Surface Texture	clay	Soil Colour.	Red Brown	Soil Depth	-
Slope	flat	Aspect	-	Site Drainage	table drain	Distance to nearest water and type	-

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			Historical
Cultivation (inc. pasture)			No - pasture adjoining
Soil erosion			Yes - construction of table drain
Firewood / CWD removal			No
Grazing (identify native/stock)			NO
Fire damage			No
Storm damage			Yes - fallen branches
Weediness			High - adjoing pasture
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)



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BAM Site – Field Survey Form Site Sheet no: 1 of

		Survey Name	Zone ID	Recorders			
Date	03/10/23	Hillston PBAR	Black - poplar intergrade	BT TM			
Zone 55	Datum	Plot ID	4	Plot dimensions	20x50	Photo #	
Easting 363047	Northing 6290933	IBRA region	In m	Midline bearing from 0 m	112°	Magnetic	
Vegetation Class						Confidence: H M L	
Plant Community Type	Black box - Poplar box woodland			EEC:		Confidence: H M L	

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
Sum of Cover of native vascular plants by growth form group	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
High Threat Weed cover		

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm		
50 – 79 cm		
30 – 49 cm	II	I
20 – 29 cm	III	
10 – 19 cm	IIII I	II
5 – 9 cm		
< 5 cm	I	n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)	9+4+6+5+1+1+3 (29m)	

Counts apply when the **number of tree stems** within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30..., 100, 200, 300...). For a **multi-stemmed tree**, only the largest living stem is included in the count/estimate. **Tree stems must be living.**

For **hollows**, count only the presence of a stem containing hollows. For a **multi-stemmed tree**, only the largest stem is included in the count/estimate. **Stems may be dead and may be shrubs.**

BAM Attribute (1 x 1 m plots)	Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)	5 15 10 20 15	15 40 0 0 0	0 0 0 0 0	0 0 0 0 0
Average of the 5 subplots				

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

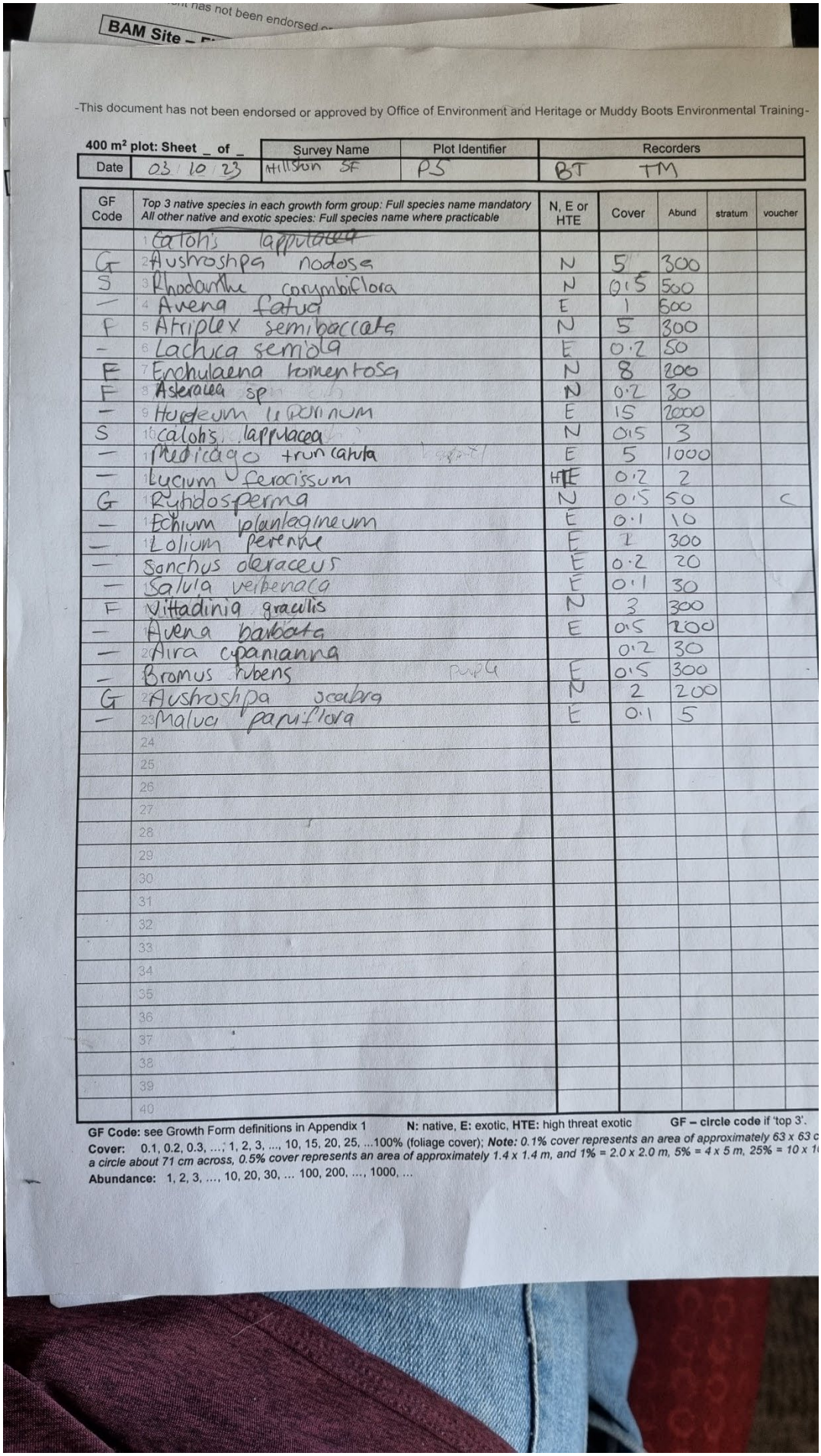
Morphological Type	–	Landform Element	flat	Landform Pattern	Plain	Microrelief	–
Lithology	–	Soil Surface Texture	Sandy clay	Soil Colour	light brown	Soil Depth	–
Slope	flat	Aspect	–	Site Drainage	–	Distance to nearest water and type	–

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			No
Cultivation (inc. pasture)			No
Soil erosion			No
Firewood / CWD removal			No
Grazing (identify native/stock)			Sheep
Fire damage			minimal
Storm damage			fallen logs
Weediness			High
Other			–

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)



BAM Site – F…

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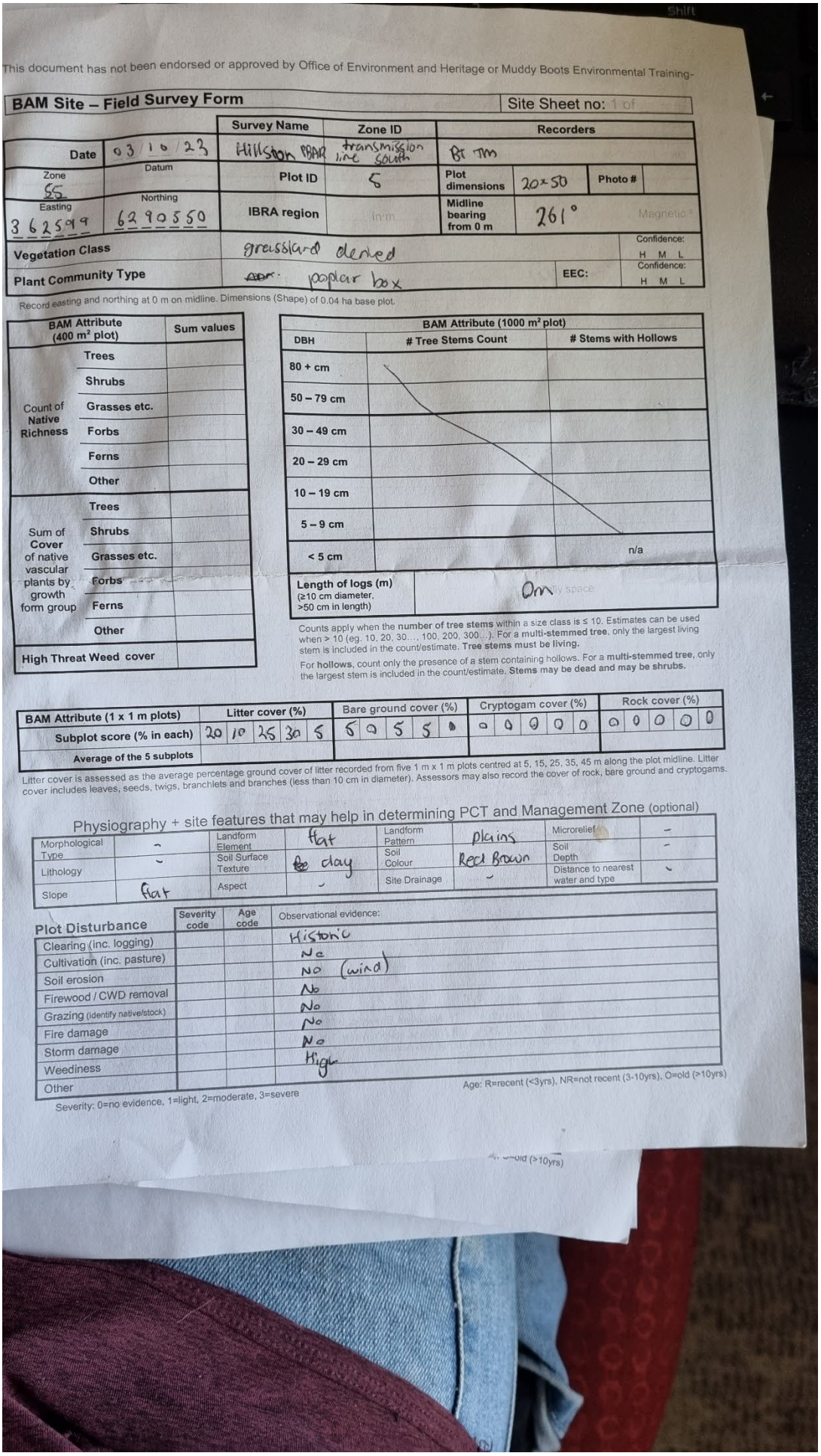
400 m² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date 03/10/23	Hillston SF	P5	BT TM

GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
	1 Eatoh's lappulacea					
G	2 Austroshpa nodosa	N	5	300		
S	3 Rhodanthe corymbiflora	N	0.5	500		
–	4 Avena fatua	E	1	500		
F	5 Atriplex semibaccata	N	5	300		
–	6 Lachuca serriola	E	0.2	50		
F	7 Enchylaena tomentosa	N	8	200		
F	8 Asteracea sp	N	0.2	30		
–	9 Hordeum leporinum	E	15	2000		
S	10 calohis lappulacea	N	0.5	3		
–	11 Medicago truncatula	E	5	1000		
–	12 Lycium ferocissum	HTE	0.2	2		
G	13 Rhodosperma	N	0.5	50		C
–	14 Echium plantagineum	E	0.1	10		
–	15 Lolium perenne	E	1	300		
–	16 Sonchus oleraceus	E	0.2	20		
–	17 Salvia verbenaca	E	0.1	30		
F	18 Vittadinia gracilis	N	3	300		
–	19 Avena barbata	E	0.5	200		
–	20 Aira cupaniana		0.2	30		
–	21 Bromus rubens	E	0.5	300		
G	22 Austroshpa scabra	N	2	200		
–	23 Malva parviflora	E	0.1	5		
	24					
	25					
	26					
	27					
	28					
	29					
	30					
	31					
	32					
	33					
	34					
	35					
	36					
	37					
	38					
	39					
	40					

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.

Cover: 0.1, 0.2, 0.3, ...; 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 c… a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 1…*

Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...



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BAM Site – Field Survey Form Site Sheet no: 1 of

		Survey Name	Zone ID	Recorders			
Date	03/10/23	Hillston PPAR	transmission line south	BT TM			
Zone	Datum	Plot ID	5	Plot dimensions	20×50	Photo #	
55							
Easting	Northing	IBRA region		Midline bearing from 0 m	261°	Magnetic	
362599	6290550						
Vegetation Class		grassland cleared				Confidence: H M L	
Plant Community Type		~~poor~~ poplar box		EEC:		Confidence: H M L	

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
Sum of Cover of native vascular plants by growth form group	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
High Threat Weed cover		

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm		
50 – 79 cm		
30 – 49 cm		
20 – 29 cm		
10 – 19 cm		
5 – 9 cm		
< 5 cm		n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)	0m	

Counts apply when the **number of tree stems** within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30…, 100, 200, 300…). For a **multi-stemmed tree**, only the largest living stem is included in the count/estimate. **Tree stems must be living.**

For **hollows**, count only the presence of a stem containing hollows. For a **multi-stemmed tree**, only the largest stem is included in the count/estimate. **Stems may be dead and may be shrubs.**

BAM Attribute (1 x 1 m plots)	Litter cover (%)					Bare ground cover (%)					Cryptogam cover (%)					Rock cover (%)				
Subplot score (% in each)	20	10	25	30	5	5	0	5	5	0	0	0	0	0	0	0	0	0	0	0
Average of the 5 subplots																				

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

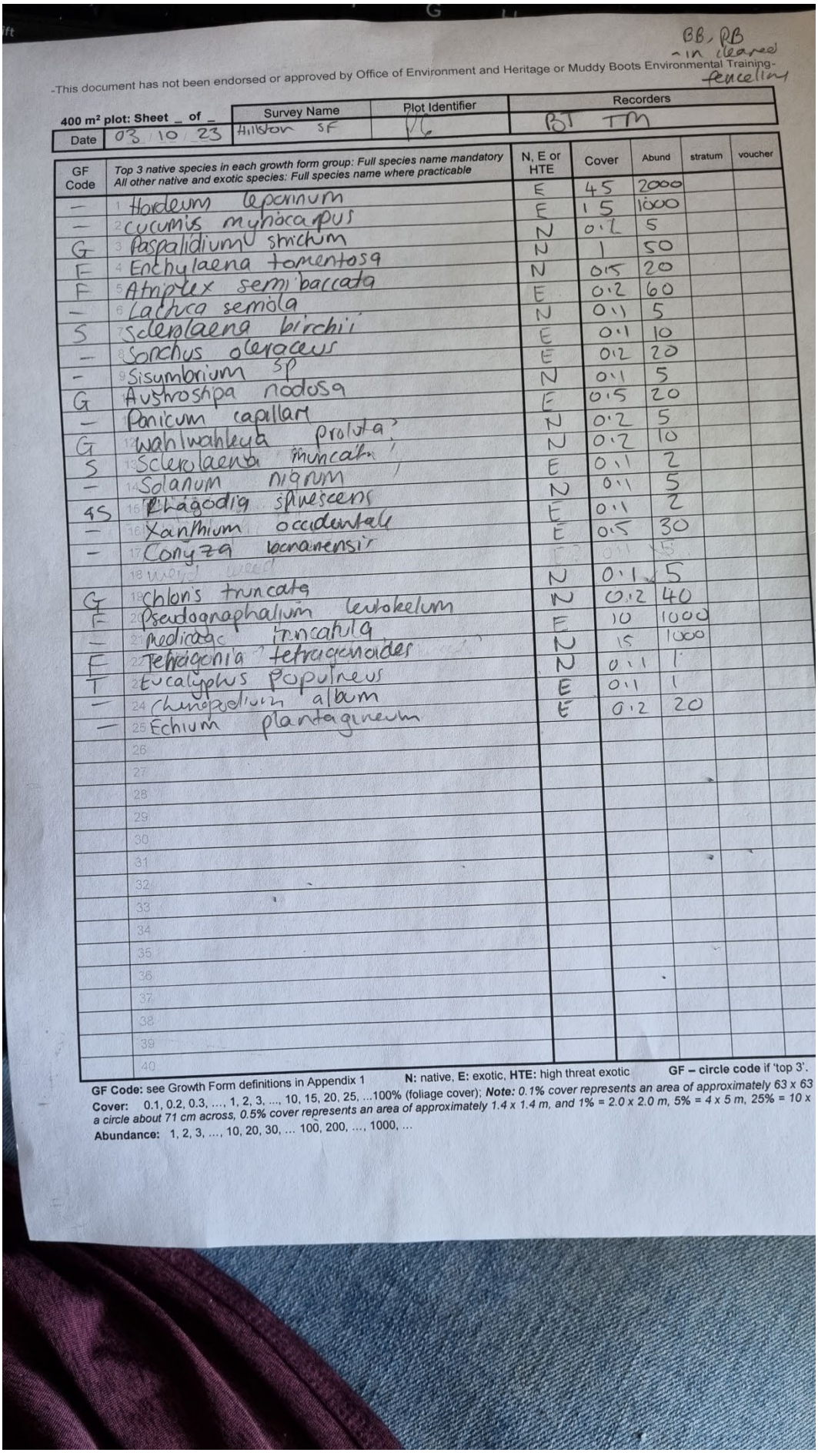
Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type	-	Landform Element	flat	Landform Pattern	plains	Microrelief	-
Lithology	-	Soil Surface Texture	clay	Soil Colour	Red Brown	Soil Depth	-
Slope	flat	Aspect	-	Site Drainage	-	Distance to nearest water and type	-

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			Historic
Cultivation (inc. pasture)			No
Soil erosion			No (wind)
Firewood / CWD removal			No
Grazing (identify native/stock)			No
Fire damage			No
Storm damage			No
Weediness			No
Other			High

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)



BB, RB
- in cleared fenceline

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400 m² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date 03 / 10 / 23	Hillston SF	P6	BJ TM

GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
—	1 Hordeum leporinum	E	45	2000		
—	2 Cucumis myriocarpus	E	15	1000		
G	3 Paspalidium strictum	N	0.2	5		
F	4 Enchylaena tomentosa	N	1	50		
F	5 Atriplex semibarrata	N	0.5	20		
—	6 Lactuca serriola	E	0.2	60		
S	7 Sclerolaena birchii	N	0.1	5		
—	8 Sonchus oleraceus	E	0.1	10		
—	9 Sisymbrium sp	E	0.2	20		
G	10 Austrostipa nodosa	N	0.1	5		
—	11 Panicum capillare	E	0.5	20		
G	12 Wahlenbergia [illegible]	N	0.2	5		
S	13 Sclerolaena muricata	N	0.2	10		
—	14 Solanum nigrum	E	0.1	2		
4S	15 Rhagodia spinescens	N	0.1	5		
—	16 Xanthium occidentale	E	0.1	2		
—	17 Conyza bonariensis	E	0.5	30		
	18 [illegible]	[illegible]	[illegible]	[illegible]		
G	19 Chloris truncata	N	0.1	5		
F	20 Pseudognaphalium luteoalbum	N	0.2	40		
—	21 Medicago truncatula	E	10	1000		
F	22 Tetragonia tetragonoides	N	15	1000		
T	23 Eucalyptus populnea	N	0.1	1		
—	24 Chenopodium album	E	0.1	1		
—	25 Echium plantagineum	E	0.2	20		
	26					
	27					
	28					
	29					
	30					
	31					
	32					
	33					
	34					
	35					
	36					
	37					
	38					
	39					
	40					

GF Code: see Growth Form definitions in Appendix 1 **N:** native, **E:** exotic, **HTE:** high threat exotic **GF – circle code** if 'top 3'.

Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); ***Note:*** *0.1% cover represents an area of approximately 63 x 63 a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x*

Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

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BAM Site – Field Survey Form

Site Sheet no: 1 of

		Survey Name	Zone ID	Recorders			
Date	03 / 10 / 23	Hillston PBAL		BT TM			
Zone	Datum	Plot ID	6	Plot dimensions	20×50	Photo #	
Easting	Northing	IBRA region	In m	Midline bearing from 0 m	87°	Magnetic °	
363057	6290525						
Vegetation Class						Confidence:	H M L
Plant Community Type	non-native			EEC:		Confidence:	H M L

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
Sum of Cover of native vascular plants by growth form group	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
High Threat Weed cover		

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm		
50 – 79 cm		
30 – 49 cm		
20 – 29 cm		
10 – 19 cm		
5 – 9 cm		
< 5 cm		n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)	51m	Tally space

Counts apply when the **number of tree stems** within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30…, 100, 200, 300…). For a **multi-stemmed tree**, only the largest living stem is included in the count/estimate. **Tree stems must be living.**

For **hollows**, count only the presence of a stem containing hollows. For a **multi-stemmed tree**, only the largest stem is included in the count/estimate. **Stems may be dead and may be shrubs.**

BAM Attribute (1 x 1 m plots)	Litter cover (%)					Bare ground cover (%)					Cryptogam cover (%)					Rock cover (%)				
Subplot score (% in each)	5	1	10	5	5	9	5	5	0	0	0	0	0	0	0	0	0	0	0	0
Average of the 5 subplots																				

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type	-	Landform Element	flat	Landform Pattern	plain	Microrelief	-
Lithology	-	Soil Surface Texture	clay w/sand	Soil Colour	Red brown	Soil Depth	-
Slope	-	Aspect	-	Site Drainage	-	Distance to nearest water and type	-

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			yes - cleared trees stack in large pile in plot
Cultivation (inc. pasture)			grazed?
Soil erosion			-
Firewood / CWD removal			log pile
Grazing (identify native/stock)			creep.
Fire damage			No
Storm damage			No
Weediness			High
Other			log pile

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Appendix I – Climate Data

Hillston, New South Wales
June 2023 Daily Weather Observations

Australian Government
Bureau of Meteorology

Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9am						3pm					
		Min	Max				Dirn	Spd	Time	Temp	RH	Cld	Dirn	Spd	MSLP	Temp	RH	Cld	Dirn	Spd	MSLP
		°C	°C	mm	mm	hours		km/h	local	°C	%	eighths		km/h	hPa	°C	%	eighths		km/h	hPa
1	Th		24.0	0																	
2	Fr	8.0	23.0	0						13.0	88	8		Calm							
3	Sa	11.5	25.5	0						15.0	79	0	N	4							
4	Su	9.5	23.8	0						15.5	74	8	NE	19							
5	Mo	7.5	17.8	0.4						13.8	91	6	E	19							
6	Tu	12.5	20.5	14.2						13.8	91	4	N	4							
7	We	12.5	24.5	0.4						16.0	90	6	NNE	7							
8	Th	11.8	17.5	14.2						12.8	91	3		Calm							
9	Fr	7.5	17.0	0.2						11.5	91	6	W	4							
10	Sa	2.0	17.2							7.8	96	0		Calm							
11	Su	2.0	17.0	0						9.0	87	0		Calm							
12	Mo	4.5	18.0	0.2						10.0	97	6	NNE	4							
13	Tu	7.0	17.0	0.4						8.0	93	6		Calm							
14	We	2.0	16.0	0.6						4.5	92	3		Calm							
15	Th	3.0	16.5							7.0	88	6	SSE	4							
16	Fr	4.8	18.5	0						6.0	97	0		Calm							
17	Sa	3.8		0						13.8	78	0	N	11							
18	Su		18.2	0																	
19	Mo	1.5	15.1	0						4.0	97	2	NNE	4							
20	Tu	-2.0	10.5	1.0						0.0	96	6		Calm							
21	We	-4.0	13.2	0						-2.2	100	2		Calm							
22	Th		12.8							7.5	90	6	NNE	7							
23	Fr	5.0	15.0	3.0						6.5	93	0									
24	Sa	3.5	17.0	0						11.2	80	0	NNE	4							
25	Su	4.0	16.0	0						12.0	74	0		Calm							
26	Mo	1.5	17.0	0						4.0	97	2	NNE	7							
27	Tu	2.8	13.2	0						6.0	93	8		Calm							
28	We	5.0	10.5	10.0						9.0	93	8	NNE	4							
29	Th	6.0	12.0	6.0						7.0	97	8	WNW	4							
30	Fr	5.5	11.8	0.2						8.5	93	8	WNW	4							
Statistics for June 2023																					
	Mean	5.1	17.1							9.0	90	4		4							
	Lowest	-4.0	10.5							-2.2	74	0		Calm							
	Highest	12.5	25.5	14.2						16.0	100	8	#	19							
	Total			50.8																	

Observations were drawn from Hillston Airport (station 075032)

Hillston, New South Wales
October 2023 Daily Weather Observations

Australian Government
Bureau of Meteorology

Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9am						3pm					
		Min	Max				Dirn	Spd	Time	Temp	RH	Cld	Dirn	Spd	MSLP	Temp	RH	Cld	Dirn	Spd	MSLP
		°C	°C	mm	mm	hours		km/h	local	°C	%	eighths		km/h	hPa	°C	%	eighths		km/h	hPa
1	Su	14.0	35.0	0						29.2		3	WNW	11							
2	Mo	10.0	33.5	0								6		Calm							
3	Tu	22.5	30.0							24.5	51	7		Calm							
4	We	10.5	14.0	10.2						11.0	90	8	S	7							
5	Th	5.5	18.0	15.4						7.5	72	0		Calm							
6	Fr	6.5	21.0	0						12.0	76	5	NNW	7							
7	Sa	4.0	23.2	0						9.0	71	0	SE	4							
8	Su	6.0	25.8	0						16.0	87	0	NNE	4							
9	Mo	7.0	28.0	0						14.8	78			Calm							
10	Tu	11.0	27.5							14.0	80	3	ESE	4							
11	We	6.0	29.8	0						11.5	84	0		Calm							
12	Th	10.2	31.0	0						19.0	48	2	NNE	4							
13	Fr	5.5	22.0	0						10.0	84	2		Calm							
14	Sa	8.5	24.5	0						13.5	80	0		Calm							
15	Su	6.8	25.0	0						16.0	71	0		Calm							
16	Mo	10.0	21.2	0						14.2	88	2	W	7							
17	Tu	5.0		0						8.5	77	0	S	4							
18	We		26.0	0																	
19	Th	10.0	30.2	0						17.2	76	0	E	11							
20	Fr	11.5	34.0	0						17.5	75	3	NE	4							
21	Sa	14.2	30.0	0						24.5	61	2	WNW	4							
22	Su	7.8	22.8	0						13.2	84	0	W	15							
23	Mo	7.2	25.2	0						11.0	85	4	SSW	4							
24	Tu	8.5	33.5	0						15.0	70	1	NNE	4							
25	We	9.0		0						11.5	79	0	WSW	19							
Statistics for the first 25 days of October 2023																					
	Mean	9.0	26.6							14.8	75	2		4							
	Lowest	4.0	14.0							7.5	48	0		Calm							
	Highest	22.5	35.0	15.4						29.2	90	8	WSW	19							
	Total			25.6																	

Observations were drawn from Hillston Airport (station 075032)