KLEINFELDER
Bright People. Right Solutions.

Flora and Fauna Assessment Report

KDC Pty Ltd

Boggabri Solar Farm

Lot 151 DP 755475, 211 Vine Lane, Boggabri, NSW

14 December 2020

Flora and Fauna Assessment Report

Boggabri Solar Farm

Lot 151 DP 755475, 211 Vine Lane, Boggabri, NSW

Kleinfelder Document Number: NCA20R119114
File Name: NCA20R119114_BoggabriFFAR_Draft20201201
Project No: 20212718

Prepared for:

KDC PTY LTD

Document Control:

Version	Description	Date	Author	Peer Reviewer
1.0	Draft for Client Review	04 December 2020	C. Whyte	G. Whyte
2.0	Final Report	14 December 2020	C. Whyte	G. Whyte

Contents

Tables

Figures

Plates

Appendices

1. INTRODUCTION

1.1 PROJECT BACKGROUND

Kleinfelder has been engaged by KDC Pty Ltd (KDC) on behalf of Providence Asset Group to prepare a Flora and Fauna Assessment Report for a proposed solar farm located at Lot 151 DP 755475, 211 Vine Lane, Boggabri 2382 (**Figure 1**). The project will be assessed under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) with Narrabri Shire Council as the determining authority.

The following terms are used throughout this report to describe geographical areas (**Figure 2**):

- Study area – Lot 151 DP 755475 (23.87 ha).
- Subject site (development footprint) – areas of the study area proposed for development (13.5 ha).
- Locality – land within a 5 km radius of the study area.

This report identifies flora, fauna and threatened species present, or likely to occur within the study area based on species and/or habitats detected during field surveys and threatened flora and fauna records from the locality. An assessment of the likely impacts on identified threatened species, habitat features, wildlife corridors and vegetation communities as a result of the proposed development has also undertaken.

1.2 SITE DESCRIPTION

The study area is located on the outskirts of the township of Boggabri, approximately 50 km from the township of Narrabri within the Narrabri Shire Local Government Area (LGA). The study area is zoned 'RU1 – Primary Production under the *Narrabri Local Environmental Plan 2012* (LEP).

The eastern boundary of the study area is bordered by Werris Creek Mungindi Railway. An unnamed access road runs from Vine Lane through the study area to a rural dwelling in the north west portion of the study area. Surrounding lands are predominantly used for agricultural purposes, as the topography within the area is relatively flat. The study area has a somewhat even topography with an elevation ranging from 211 m in south west to 300 m in the north

east. The native vegetation within the study area has previously been cleared and cultivated (see historical aerial photography). Remaining native vegetation consists of areas of woodland and native grassland communities.

There are three mapped waterways which pass through the study area in an eastern direction. These are comprised of a third order stream and two first order streams that converge in the central southern portion of the site. The converged waterway is a tributary of the Namoi River which occurs approximately three km to the northeast. No other major wetlands or streams are mapped within the study area.

Site photographs are provided in **Appendix 1.**

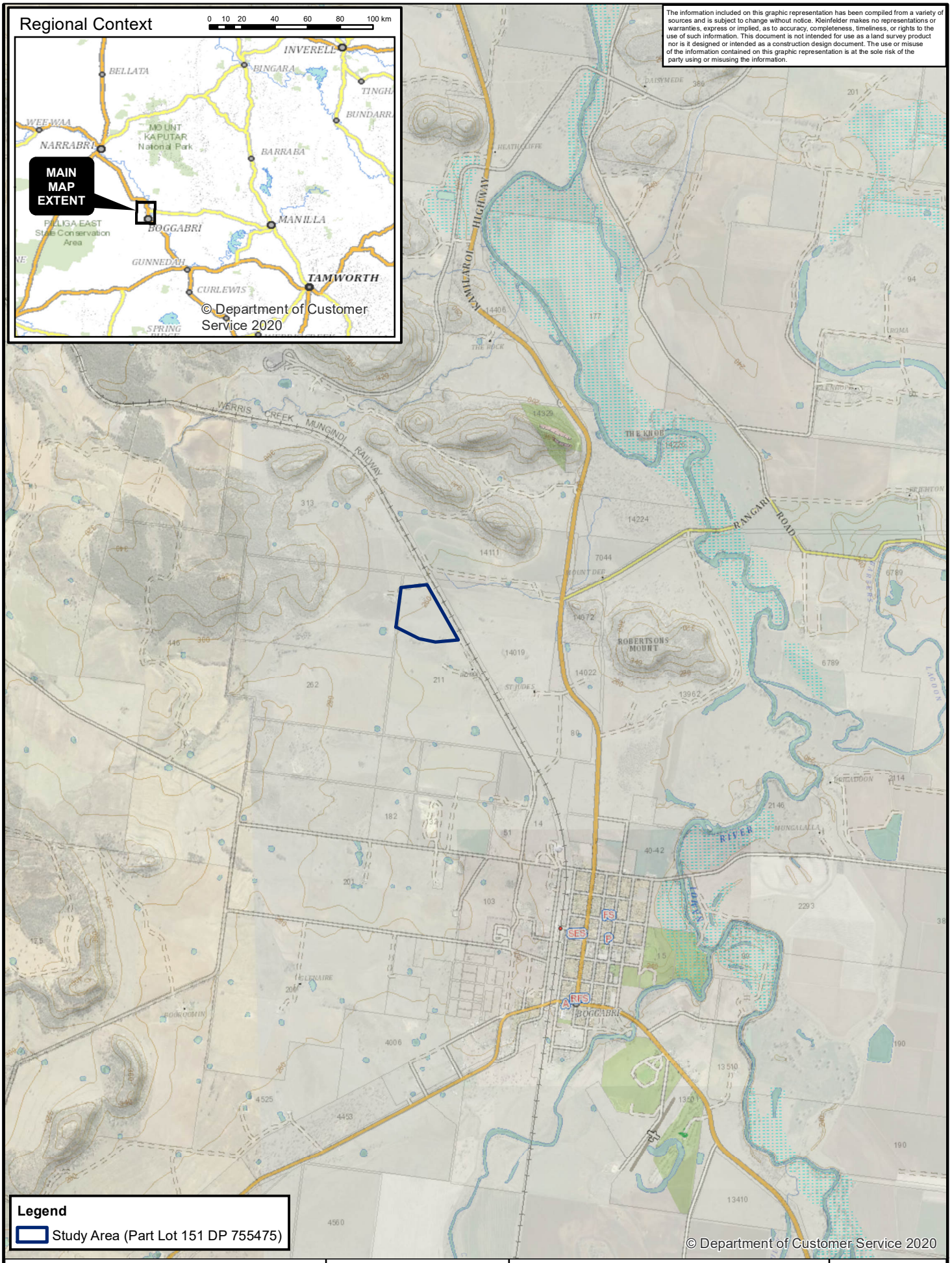
1.3 PROPOSED DEVELOPMENT

The Boggabri Solar Farm project will include a 5 MW grid-connected solar PV installation. The proposed project layout is approximately 13.5 ha in area and is provided in **Figure 3**. The location of the proposed solar farm is situated in the centre of the study area. Access and connection to the grid will be achieved via Vine Lane.

1.4 REPORT OBJECTIVES

The objectives of the Flora and Fauna Assessment Report include:

- Describe the flora and fauna (and their habitats) present on, or likely to occur on the subject site.
- Assess the relevance and value of the subject site for threatened species and ecological communities (and their habitats) listed under the NSW *Biodiversity Conservation Act 2016* (BC Act).
- Assess the potential impacts of the proposed development on threatened species and ecological communities, pursuant to Section 7.3 of the BC Act (5-part test).
- Comment on the likely occurrence and relevance of matters of national environmental significance listed under the Commonwealth *Environment Planning and Biodiversity Conservation Act 1999* (EPBC Act).
- Describe steps to avoid and mitigate any identified impacts on flora and fauna and to protect the natural environment of the subject site.



KLEINFELDER
Bright People. Right Solutions.
www.kleinfelder.com

PROJECT REFERENCE: 20212647

DATE DRAWN: 2020/11/26 22:47 Version 1

DRAWN BY: GJoyce

DATA SOURCE:
NSW DFSI - 2020
KDC - 2020

Locality

Flora and Fauna Assessment Report
Boggabri Solar Farm
Lot 151 DP 755475
211 Vine Lane, Boggabri NSW

FIGURE:

1

L:\GIS FOLDER\00 CLIENT FILES\130060_KDC_PtyLtd\20212647_FFAR_GlenInnes_Warral_Boggabri\Boggabri\Mapping\20212647_Fig1_Locality.mxd

Metres
0 25 50 100 150 200 250
N

KLEINFELDER
Bright People. Right Solutions.
www.kleinfelder.com

PROJECT REFERENCE: 20212647

DATE DRAWN: 2020/11/26 23:27 Version 1

DRAWN BY: GJoyce

DATA SOURCE:
NSW DFSI - 2020
KDC - 2020
Nearmap - 2020

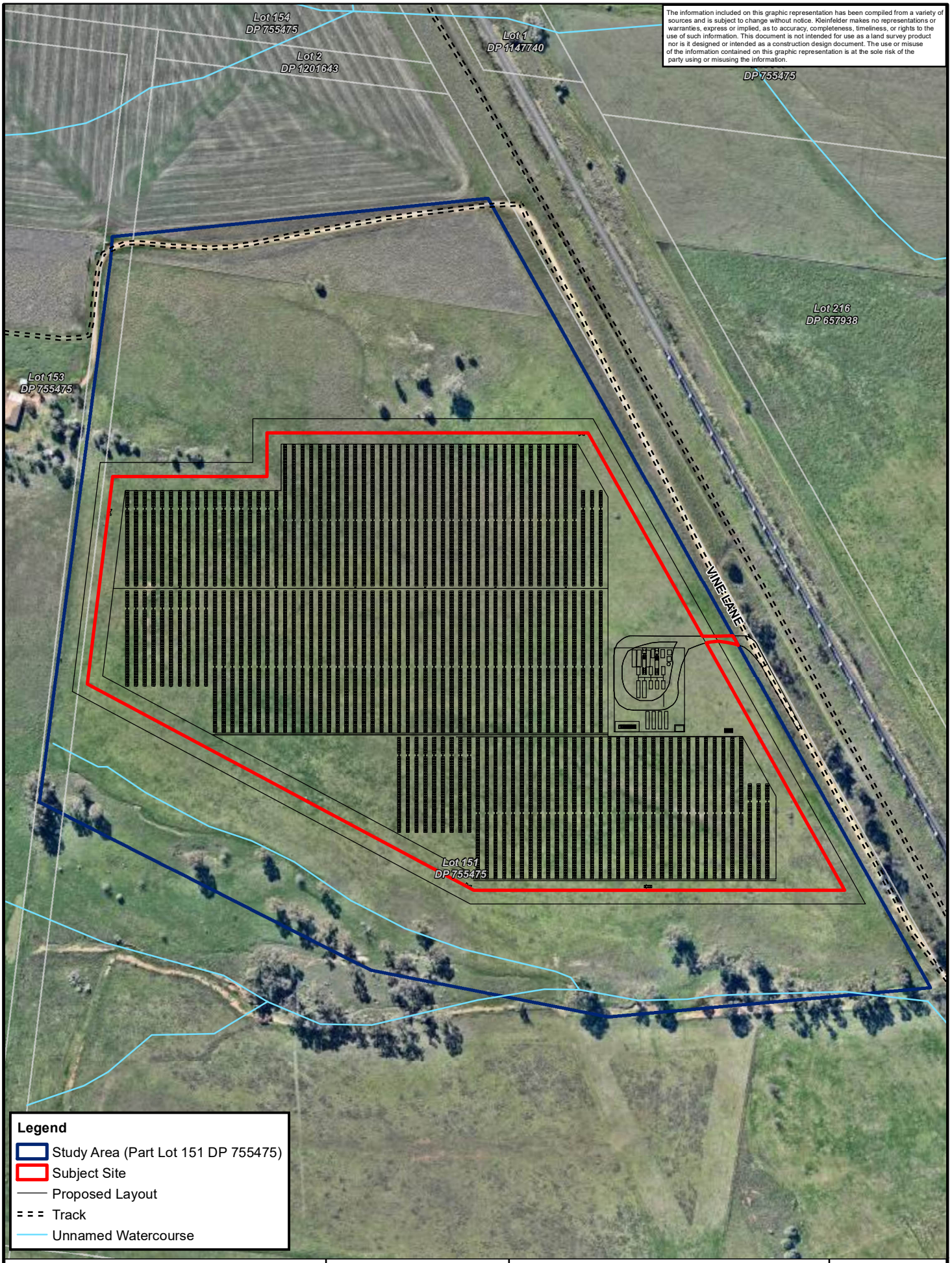
Study Area and Subject Site

Flora and Fauna Assessment Report
Boggabri Solar Farm
Lot 151 DP 755475
211 Vine Lane, Boggabri NSW

FIGURE:

2

L:\GIS FOLDER\00 CLIENT FILES\130060_KDC_PtyLtd\20212647_FFAR_GlenInnes_Warral_Boggabri\Boggabri\Mapping\20212647_Fig2_StudyArea_SubjectSite.mxd



Metres
0 25 50 100 150 200
N

KLEINFELDER
Bright People. Right Solutions.
www.kleinfelder.com

PROJECT REFERENCE: 20212647
DATE DRAWN: 2020/11/26 23:26 Version 1
DRAWN BY: GJoyce
DATA SOURCE:
NSW DFSI - 2020
KDC - 2020
Nearmap - 2020

Proposed Site Layout

Flora and Fauna Assessment Report
Boggabri Solar Farm
Lot 151 DP 755475
211 Vine Lane, Boggabri NSW

FIGURE:
3

L:\GIS FOLDER\00 CLIENT FILES\130060_KDC_PtyLtd\20212647_FFAR_GlenInnes_Warral_Boggabri\Boggabri\Mapping\20212647_Fig3_ProposedSiteLayout.mxd

2. LEGISLATIVE CONTEXT

2.1 COMMONWEALTH LEGISLATION

2.1.1 Environment Protection & Biodiversity Conservation Act 1999

The purpose of the EPBC Act is to ensure that actions likely to cause a significant impact on 'matters of national environmental significance' undergo an assessment and approval process. Under the EPBC Act, an action includes a proposal, a development, an undertaking, an activity or a series of activities, or an alteration of any of these things. An action that 'has, will have or is likely to have a significant impact on a Matter of National Environmental Significance (MNES) is deemed to be a 'controlled action' and may not be undertaken without prior approval from the Australian Minister for the Environment.

The EPBC Act identifies nine MNES:

- World heritage properties.
- National heritage places.
- Wetlands of international importance (Ramsar Wetlands).
- Threatened species and ecological communities.
- Migratory species.
- Commonwealth marine areas.
- The Great Barrier Reef Marine Park.
- Nuclear actions (including uranium mining).
- A water resource, in relation to coal seam gas development and large coal mining development.

As part of the current assessment, MNES that are predicted to occur within the locality (applying a 5 km buffer) were obtained from the on-line Protected Matters Search Tool (DAWE, 2020a). These records are discussed in **Section 4**. The EPBC Act has been further addressed in this assessment through:

- Field surveys for EPBC Act listed threatened biota and migratory species.
- Assessment of potential impacts on EPBC Act listed threatened species and migratory biota.

- Identification of suitable impact mitigation and environmental management measures for EPBC Act listed threatened species and migratory biota.

2.2 STATE LEGISLATION

2.2.1 Environmental Planning and Assessment Act 1979

The EP&A Act forms the legal and policy platform for proposal assessment and approval in NSW and aims to '*encourage the proper management, development and conservation of natural and artificial resources'*. All development in NSW is assessed in accordance with the provisions of the EP&A Act and the EP&A Regulation 2000.

Development activities that require consent are assessed and determined in accordance with Part 4 of the EP&A Act. The determining authority for the project is Narrabri Shire Council.

2.2.2 Biodiversity Conservation Act 2016

The NSW BC Act, the NSW *Biodiversity Conservation Regulation 2017* (NSW BC Regulation) and amendments to the NSW *Local Land Services Act 2013* (LLS Act) commenced on 25 August 2017. The legislation aims to deliver "a strategic approach to conservation in NSW while supporting improved farm productivity and sustainable development". The NSW BC Act repeals several pre-existing Acts, most notably the NSW *Threatened Species Conservation Act 1995,* the NSW *Nature Conservation Trust Act 2001* and the *NSW Native Vegetation Act 2003*.

In accordance with the NSW BC Act, entry into the Biodiversity Offsets Scheme (BOS) is not required for the proposed development due to the following:

- The proposed development is not deemed to be 'State Significant' under the NSW EP&A Act.
- The proposed development will not impact an Area of Outstanding Biodiversity Value (AOBV) as listed under Part 3 of the NSW BC Act.
- The proposed development is unlikely to cause a significant impact on a threatened species, population or ecological community, as listed under Schedules 1 and 2 of the NSW BC Act, as determined by application of a five-part-test of significance under Section 7.3 of the NSW BC Act.

- The proposed development will not impact areas mapped as having 'high biodiversity value' as indicated by the NSW Biodiversity Values Map (BV Map).
- The proposed development will directly remove 0.54 ha of low condition derived native grassland (further discussed in **Section 5.1.1**). The project will not exceed the BOS threshold for the site (1 ha threshold for a minimum lot size of 100 ha) as determined by the NSW *Biodiversity Conservation Regulation 2017*.

In consideration of the criteria listed above, a Biodiversity Development Assessment Report (BDAR) is not required for the proposed development. As part of the current assessment, threatened species and ecological communities as listed under the NSW BC Act that have previously been recorded within the locality (applying a 5 km buffer) were obtained from the on-line BioNet Atlas of NSW Wildlife (DPIE, 2020a). These records are discussed in **Section 4** of this report.

The NSW BC Act has been further addressed in this assessment through:

- Field surveys to assess the presence of threatened species, populations and ecological communities, as listed under Schedules 1 and 2 of the NSW BC Act, within the subject site.
- Assessment of potential impacts threatened species, populations and ecological communities, as listed under Schedules 1 and 2 of the NSW BC Act, as determined by application of a five-part-test of significance under Section 7.3 of the NSW BC Act.
- Identification of suitable impact mitigation and environmental management measures.

2.2.3 Biosecurity Act 2015

The *NSW Biosecurity Act 2015* provides a streamlined statutory framework to protect the NSW economy, environment and community from the negative impact of pests, diseases and weeds. The primary objective of the Act is to provide a framework for the prevention, elimination and minimisation of biosecurity risks posed by biosecurity matter, dealing with biosecurity matter, carriers and potential carriers, and other activities that involve biosecurity matter, carriers or potential carriers.

In NSW, all plants are regulated with a general biosecurity duty to prevent, eliminate or minimise any biosecurity risk they may pose. Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable.

Weed species recorded within the subject site during the current investigation are discussed in **Section 4**.

2.2.4 National Parks and Wildlife Act 1974

The NSW *National Parks and Wildlife Act 1979* (NPWS Act) aims to conserve nature, objects, places or features (including biological diversity) of cultural value within the landscape. The Act also aims to foster public appreciation, understanding and enjoyment of nature and cultural heritage, and provides for the preservation and management of national parks, historic sites and certain other areas identified under the Act.

No areas of National Park estate occur within or adjacent to the subject site.

2.2.5 Water Management Act 2000

Controlled activities carried out in, on or under waterfront land are regulated by the NSW WM Act. The NSW Natural Resource Asset Regulator (NRAR) administers the WM Act and is required to assess the impact of any proposed controlled activity to ensure that no more than minimal harm will be done to 'waterfront land' as a consequence of carrying out the controlled activity. Waterfront land includes the bed and bank of any river, lake or estuary and all land within 40 m of the highest bank of the river, lake or estuary (NRAR, 2018). This means that a controlled activity approval must be obtained from the NRAR before commencing the activity.

Mapped waterways pass through the southern portion of the study area in an eastern direction. The proposed site layout has been designed to avoid the mapped waterways, which are between 46 m and 67 m from the southern edge of the development footprint. No vegetation clearing or disruption to the creek is likely to occur as a result of the construction of the solar array or the grid connection.

Notwithstanding, the application of the WM Act and an assessment of indirect impacts of the proposed development on aquatic habitat and downstream aquatic habitats is provided in **Section 5.1**.

2.2.6 State Environmental Planning Policy (Koala Habitat Protection) 2019

State Environmental Planning Policy (Koala Habitat Protection) aims to encourage the conservation and management of areas of natural vegetation that provide habitat for Koalas to support a permanent free-living population over their present range and reverse the current trend of Koala population decline.

A Koala Plan of Management (KPoM) has not been prepared for the study area; therefore, provisions of Clause 9 of the SEPP (Koala Habitat Protection) is applicable to the proposed development. As such, Council must take into account the requirements of the Koala Habitat Assessment Guideline (DPIE, 2020b), or information prepared by a suitably qualified and experienced person in accordance with the guideline to determine if the land is classified as Highly Suitable Koala Habitat or Core Koala Habitat.

See **Section 4.9** for a summary of the Koala habitat assessment.

2.3 LOCAL PLANNING INSTRUMENTS

2.3.1 Narrabri Local Environmental Plan 2012

The study area is located within the Narrabri Shire Council LGA. The Narrabri Shire LEP 2012 (LEP) is the principal legal document for controlling development at a Local Government level. The zoning provisions establish acceptability of uses and standards regulate the degree of development.

2.3.2 Narrabri Shire Council Development Control Plans

The Narrabri Shire Development Control Plans (DCP's) provide a clear guideline regarding the types of development that may occur on specific sites. DCP's are prepared and adopted by Council after consultation with the community. DCP's are supporting documents to Council's LEP.

3. MATERIALS AND METHODS

3.1 DESKTOP ASSESSMENT

Existing information on the flora and fauna of the subject site and the locality, including relevant threatened biota was obtained from:

- Regional vegetation mapping: *Border Rivers Gwydir / Namoi Regional Native Vegetation Map Version 2.0. VIS_ID 4204* (OEH 2015).
- The BioNet Atlas of NSW Wildlife (DPIE, 2020a) for previous records of threatened species, populations and ecological communities (as listed under the BC Act) within a 5 km radius of the subject site (data retrieved 25/11/2020).
- The Department of the Environment and Energy (DAWE, 2020a) Protected Matters Search Tool, which involved a search for matters of national environmental significance within a 5 km radius of the subject site (conducted on 25/11/2020).
- Relevant published literature on threatened biota (see References).

The results of the database searches were used to compile a list of threatened species, populations and communities, as listed under the BC Act and EPBC Act that could potentially occur on the subject site, and their likelihood of occurrence.

3.2 FIELD SURVEY

3.2.1 Vegetation Assessment

A diurnal inspection of the subject site and surrounds was undertaken on 11 November 2020 to provide specific observations for this report.

Native vegetation types were identified based on dominant flora species present within each structural layer (i.e. canopy, shrub and ground layers). Exotic or highly modified native vegetation was defined based on structure and species composition. Boundaries of vegetation types and communities were marked with a hand-held GPS and mapped using geographical information system (GIS) software.

Vegetation types were assessed against identification criteria for State and Commonwealth listed threatened ecological communities (DAWE, 2020c; DPIE, 2020c). Vegetation and habitats were compared with descriptions provided in the BioNet Vegetation Classification to identify Plant Community Types (PCTs).

Four 400 m² floristic plot/transects were sampled in accordance with Section 5.3.4 of the NSW Biodiversity Assessment Method (BAM) (OEH, 2017). Percentage cover and relative abundance was recorded for all plant species within each plot/transect. Plot/ transects were positioned to sample areas that were most representative of the floristic characteristics of each PCT.

Plant identification and nomenclature were based on species descriptions presented within The Flora of New South Wales Volumes 1 to 4 (Harden, 1993) and with reference to taxonomic updates in PlantNET - The Plant Information Network System of Botanic Gardens Trust, Sydney, Australia (Botanic Gardens Trust, 2020). The locations of all floristic plot/ transects are presented in **Figure 4**.

3.2.2 Fauna Habitat Assessment

The locations of any important habitat features, such as microbat roosting habitat, hollow-bearing trees, terrestrial refugia and nests/burrows were captured with a handheld GPS device and photographed where appropriate.

Searches for potential habitat for threatened fauna species included but were not limited to:

- Koala feed trees.
- Foraging trees for threatened birds.
- Hollow-bearing trees.
- Potential roosts for microbats.
- Vegetated ponds, riparian vegetation and drainage lines for frogs and waterbirds.
- Woody debris, leaf litter and bush rock.

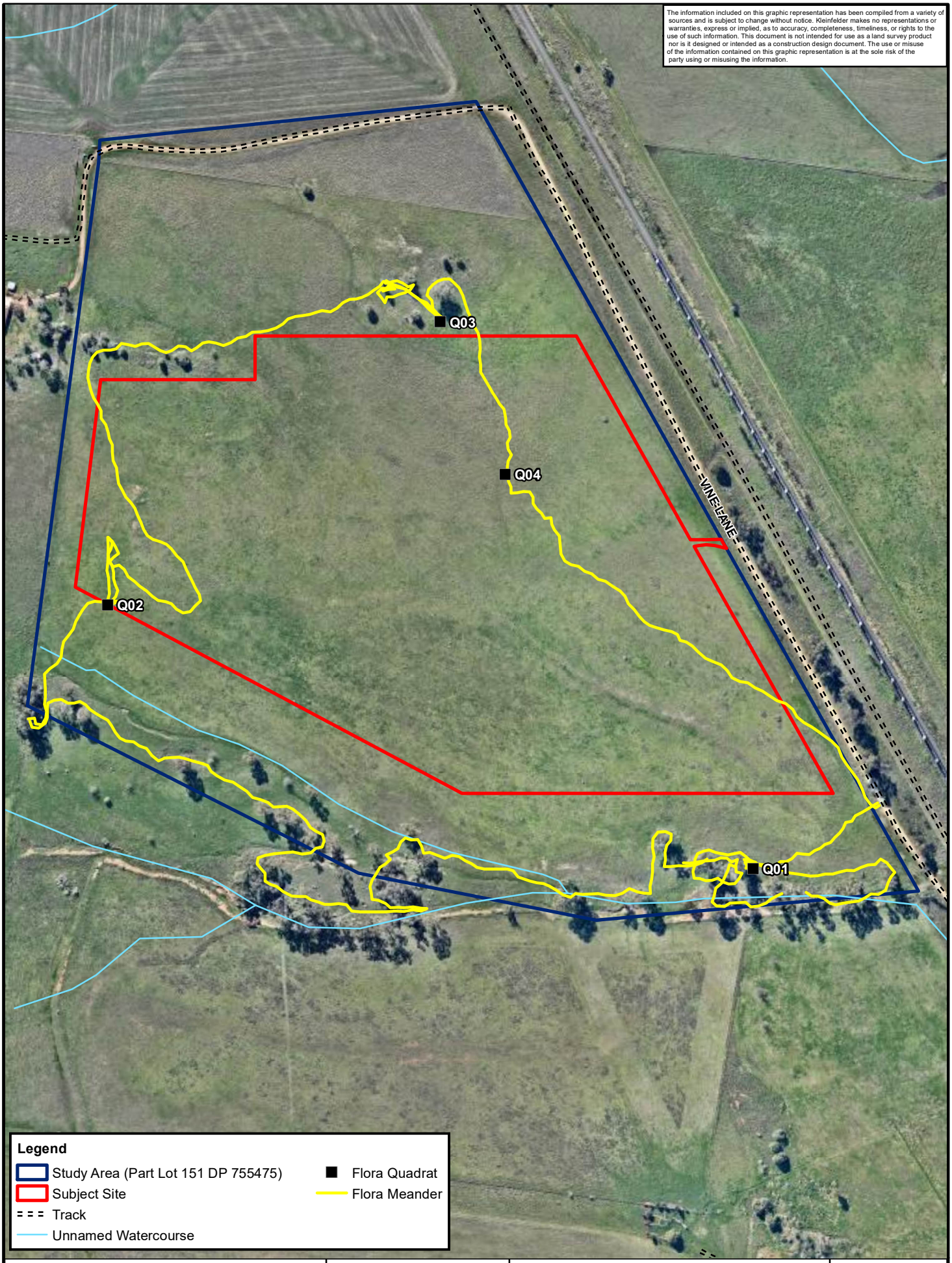
Diurnal opportunistic observations of fauna species and fauna activity such as scats, tracks, burrows or other traces were recorded during survey.

3.3 SURVEY LIMITATIONS

The survey techniques and survey effort applied for this study were commensurate with the nature and condition of the subject site. Due to these limitations, priority was given to habitat assessment for relevant threatened biota. A 'likelihood of occurrence' assessment was applied to all species previously recorded or predicted to occur within the locality based on State and Commonwealth information sources.

The field survey was undertaken during an eight-hour survey period by one ecologist. While a moderate diversity of native and exotic flora species was recorded, a longer survey duration or multiple seasonal surveys would likely result in the detection of a greater diversity of species. The majority of the subject site is considered to be degraded and unsuitable for most threatened plant species known to occur in the locality; therefore, the survey effort that is recommended in *The NSW Guide to Surveying Threatened Plants* (OEH, 2016) is not considered to be applicable.

No targeted fauna surveys, microchiropteran bat surveys (i.e. Anabat), fauna trapping or targeted surveys for cryptic fauna species was undertaken, as the proposed development will avoid the watercourses and will not clear any significant habitat features. No 'call playback' for arboreal fauna, large forest owl species were conducted. Given the historical use of the site as agricultural land and the limited amount of clearing required for the proposed development, the survey effort was considered adequate.



Legend

- Study Area (Part Lot 151 DP 755475)
- Subject Site
- Track
- Unnamed Watercourse
- Flora Quadrat
- Flora Meander

Metres
0 25 50 100 150 200
N

KLEINFELDER
Bright People. Right Solutions.
www.kleinfelder.com

PROJECT REFERENCE: 20212647
DATE DRAWN: 2020/11/26 23:27 Version 1
DRAWN BY: GJoyce
DATA SOURCE:
NSW DFSI - 2020
KDC - 2020
Nearmap - 2020

Survey Effort

Flora and Fauna Assessment Report
Boggabri Solar Farm
Lot 151 DP 755475
211 Vine Lane, Boggabri NSW

FIGURE:
4

L:\GIS FOLDER\00 CLIENT FILES\130060_KDC_PtyLtd\20212647_FFAR_GlenInnes_Warral_Boggabri\Boggabri\Mapping\20212647_Fig4_SurveyEffort.mxd

4. RESULTS

4.1 PLANT DIVERSITY

A total of 48 plant species were identified during the assessment. These were comprised of 23 exotics and 25 natives. A complete list of flora species is presented in **Appendix 2**. The majority of the exotic plant species were comprised of annual herbs and grasses associated with the grasslands. Native plant species were comprised mainly of grasses and low-lying shrubs (Chenopods). Native tree and shrub species were restricted to woodland areas outside the development footprint.

4.2 WEEDS

No major infestations of priority weeds (DPI, 2020) or Weeds of National Significance (DAWE, 2020d) were identified. Minor infestations of weeds were identified, including the following species:

- Prickly Pear *Opuntia stricta.*
- African Box Thorn *Lycium ferocissimum*

Mitigation measures to prevent the spread of weeds are presented in **Section 5.2.**

4.3 PLANT COMMUNITY TYPES

The Regional vegetation mapping for the study area identifies two small patches of woodland vegetation within the study area as *PCT 101 - Poplar Box - Yellow Box - Western Grey Box grassy woodland on cracking clay soils mainly in the Liverpool Plains, Brigalow Belt South Bioregion.* PCT 101 is dominated by Poplar Box *Eucalyptus populnea*, Yellow Box *E. melliodora* and Grey Box *E. microcarpa*.

The assessment determined that the regional vegetation mapping for the area is reasonably accurate with PCT 101 occurring within areas to the north and south of the proposed development area.

The assessment revealed that the entirety of the subject site is comprised of degraded native grassland. The grasslands were very dry at the time of the assessment; however, the dominant species observed was *Aristida aristiglumis* (Plains Grass). Other groundcover species that occurred to a lesser extent include *Austrostipa verticillata* (Slender Bamboo Grass), *Chloris truncata* (Windmill Grass), *Vittadinia cuneata* (Fuzzweed), *Solanum esuriale* (Quena), *Sida corrugata* (Corrugated Sida), *Portulaca oleracea* (Pigweed) and *Boerhavia dominii* (Tarvine). *Sclerolaena birchii* (Galvanised Burr) and *Sclerolaena muricata* (Black Roly-poly) were also dominant in some areas of the study area.

Despite the occurrence of native grasses and herbs, the grasslands are considered to be degraded (low condition) due to the high coverage of exotic plant species. The dominant exotic species were *Bromus catharticus* (Prairie Grass), *Malva parviflora* (Small-flowered Mallow), *Carthamus lanatus* (Saffron Thistle), *Rapistrum rugosum* (Wild Mustard), *Centaurea solstitialis* (St Barnaby's Thistle), *Sida rhombifolia* (Paddy's Lucerne), *Echium plantagineum* (Patterson's Curse), *Medicago polymorpha* (Burr Medic), *Erodium cicutarium* (Common Storksbill), *Trifolium pratense* (Red Clover), *Lactuca serriola* (Prickly Lettuce), and *Silybum marianum* (Variegated Thistle).

The grasslands contain low densities of leaf litter and woody debris. In addition to the high coverage of exotic flora, this suggested that the site has a long history of agricultural development.

4.4 THREATENED ECOLOGICAL COMMUNITIES

One Threatened Ecological Community (TEC) listed as endangered under the BC Act occurs within the study area (i.e. to the north and south of the development footprint). Areas mapped as PCT 101 are commensurate with *Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions,* which is listed as "endangered" under the BC Act (NSW Scientific Committee, 2011). Although this community is generally dominated by *Eucalyptus microcarpa* (Inland Grey Box), *Eucalyptus populnea* is also listed in the scientific determination as an associated species.

The woodland vegetation described above also likely to be commensurate with *Poplar Box Grassy Woodland on Alluvial Plains,* which is listed as "endangered" under the EPBC Act (DAWE, 2020b).

The potential for impacts to the TEC have been assessed via an 'assessment of significance' pursuant to Section 7.3 of the BC Act in **Appendix 5**.

Given that the community will not be directly impacted, an Assessment of Significance using the EPBC Significant Impact Criteria is not relevant.

4.5 THREATENED FLORA SPECIES

No threatened flora species were identified within the subject site during the assessment.

A search of the BioNet Atlas of NSW Wildlife (DPIE, 2020a) returned one record of a threatened plant species within a 5 km radius of the study area: Finger Panic Grass *Digitaria porrecta*. A "likelihood of occurrence" assessment determined that habitat for this species does occur within the subject site (**Appendix 3**).

An EPBC Protected Matters Search returned a list of five threatened plant species predicted to occur within a 5 km radius of the study area (**Appendix 4**). A "likelihood of occurrence' assessment determined that habitat is not present within the subject site for any of the predicted matters.

The potential for impacts to Finger Panic Grass have been assessed via an 'assessment of significance' pursuant to Section 7.3 of the BC Act in **Appendix 5**.

4.6 FAUNA HABITAT

The assessment revealed that the vegetation within the subject site is comprised mainly of grassland with occasional scattered paddock trees. At the time of the assessment, the grasslands were sparse and dry. Leaf-litter and woody debris was generally absent. A total of six hollow bearing trees (Poplar Box *Eucalyptus populnea*) were identified within the study area, none of which occur within the subject site.

The subject site was found to lack vegetation with a complex structure, shrubs and midstorey species were generally absent. The habitat is likely to support a low diversity of native fauna, including birds and mammal species common within agricultural landscapes. In summary, the fauna habitat assessment determined the following:

- The isolated trees within the subject site may provide marginal foraging and nesting habitat for several common native bird species.
- The grasslands may provide foraging habitat for a range of native birds and terrestrial mammals such as macropods (Kangaroos and Wallabies).
- The grasslands may provide hunting habitat for native predatory birds, such as Falcons, Kestrels and Large Forest Owls.
- No hollow-bearing trees, nests or rocky outcrops were identified within the subject site.

4.7 FAUNA SPECIES

Opportunistic fauna observations included sightings of common bird species such as Apostlebirds (*Struthidea cinerea*). No reptile or amphibian species were opportunistically identified during survey.

4.8 THREATENED FAUNA SPECIES

No threatened fauna species were detected within the subject site. A search of the BioNet Atlas of NSW Wildlife (DPIE, 2020a) returned a list of 13 threatened fauna species that have previously been recorded within 5 km radius of the subject site.

A “likelihood of occurrence” assessment determined that the habitat is too degraded and does not contain suitable habitat to support populations of any of these species (**Appendix 3**).

4.9 KOALA HABITAT

Poplar Box is a listed preferred Koala food tree species under Schedule 2 of the SEPP for Koala Habitat Protection (2019) for the Northwest Slopes region, however this species does not occur within the subject site and will not be impacted by the proposed development.

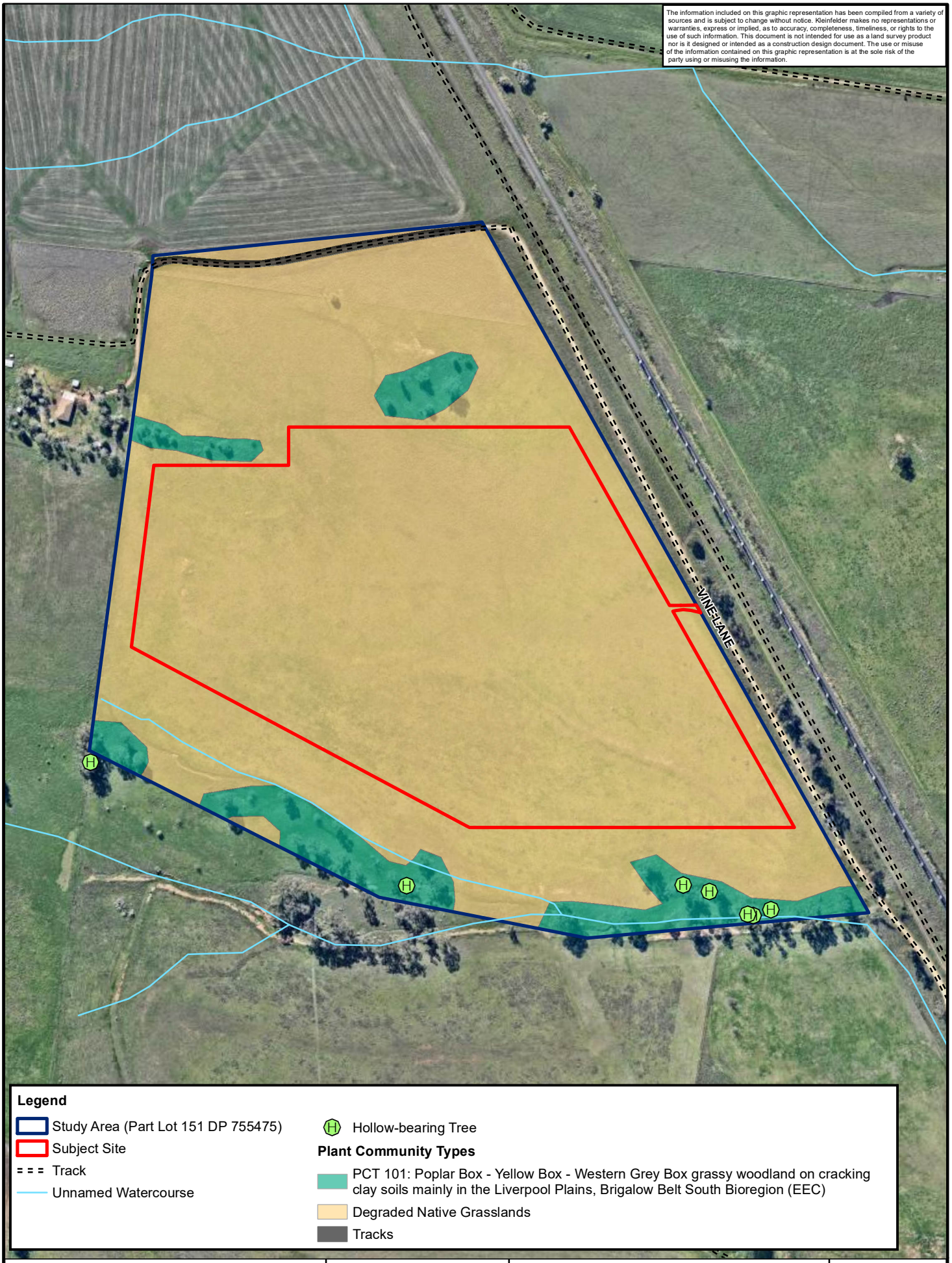
An assessment of Koala habitat within the subject site determined that no Highly Suitable Koala Habitat, or Core Koala Habitat is present. This is based on the following:

- No evidence of a resident population of Koalas was detected during the assessment (i.e. No Koala individuals, scats or scratch marks were identified).
- There are no Koala feed trees within the subject site.

4.10 EPBC ACT PROTECTED MATTERS

A 'likelihood of occurrence' assessment was conducted for all threatened species and migratory species returned by the EPBC Protected Matters Search (**Appendix 3**). The habitats present within the subject site were considered to be too degraded for all species, with the exception of the Fork-tailed Swift *Apus pacificus* and the White-throated Needletail *Hirundapus caudacutus.*

Both of these bird species may forage aerially over a very wide range of habitats including vegetated and non-vegetated areas. The proposed development will not remove habitat features considered to be important to these species. The extent of foraging habitat is likely to be unaffected.



Legend

- Study Area (Part Lot 151 DP 755475)
- Subject Site
- Track
- Unnamed Watercourse
- Hollow-bearing Tree

Plant Community Types

- PCT 101: Poplar Box - Yellow Box - Western Grey Box grassy woodland on cracking clay soils mainly in the Liverpool Plains, Brigalow Belt South Bioregion (EEC)
- Degraded Native Grasslands
- Tracks

Metres
0 25 50 100 150 200
N

KLEINFELDER
Bright People. Right Solutions.
www.kleinfelder.com

PROJECT REFERENCE: 20212647
DATE DRAWN: 2020/11/26 23:32 Version 1
DRAWN BY: GJoyce
DATA SOURCE:
NSW DFSI - 2020
KDC - 2020
Nearmap - 2020

Vegetation Mapping and Habitat Trees

Flora and Fauna Assessment Report
Boggabri Solar Farm
Lot 151 DP 755475
211 Vine Lane, Boggabri NSW

FIGURE:
5

L:\GIS FOLDER\00 CLIENT FILES\130060_KDC_PtyLtd\20212647_FFAR_GlenInnes_Warral_Boggabri\Boggabri\Mapping\20212647_Fig5_Vegetation_HabitatTrees.mxd

5. DISCUSSION

5.1 IMPACT ASSESSMENT

5.1.1 Removal of Native Vegetation

Removal of native vegetation within the subject site will be limited to the removal of native groundcover (**Figure 5**). It is estimated via GIS analysis that approximately 0.54 ha of native vegetation will be disturbed/ removed as shown in **Table 1**.

Table 1 Vegetation (Groundcover) Removal for the proposed development

Activity	Length (m)	Width (m)	Qty	Area (m2)
Trenching	920	1	1	920.0
Piling (3 string tracker)	0.153162	0.1016	1320	20.5
Piling (3 string tracker)	0.153162	0.1016	344	5.4
Hardstand/Roads	-	-	-	3446.0
Berm for Stormwater detention basin	-	-	-	240.0
Security Fence	1469	0.5	1	734.5
			Total (m2)	5366
			Total (Ha)	0.54

5.1.2 Impacts to Fauna

Potential indirect impacts of the proposed development on resident fauna populations include the following:

- Noise and lighting during the construction phase may cause minor disturbance to resident fauna within the locality and disrupt their natural behaviour.
- Pollution such as chemical spills from construction machinery may have adverse effects on the water quality and biota within the constructed dam and aquatic habitat.
- Ground disturbance by machinery during the construction phase may create dust and facilitate the movement of sediment. Sedimentation could adversely affect the water quality within the aquatic habitat.

Management measures are presented in **Section 5.2** to reduce the potential for these impacts.

5.1.3 Impacts to Threatened Species

No threatened species were identified during the assessment. A “likelihood of occurrence” assessment determined that habitat occurs within the subject site for Finger Panic Grass. In accordance with Section 7.3 of the BC Act, an ‘assessment of significance’ determined that the proposed development is unlikely to have a significant impact on this species.

5.1.4 Impacts to Threatened Ecological Communities

One TEC listed under the BC Act and the EPBC Act was identified within the study area, *Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia*. This community does not occur within the subject site and will not be directly impacted by the proposed development.

The potential for impacts to *Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia* have been assessed via an ‘assessment of significance’ pursuant to Section 7.3 of the BC Act in **Appendix 5**.

5.1.5 Impacts to Aquatic Habitat

The proposed development has been designed to avoid directly impacting the mapped waterways within the study area. Potential indirect impacts include the following:

- The excavation of soil within the subject site during the construction phase has the potential to facilitate erosion and sediment movement. Runoff from the subject site has the potential to introduce nutrients and other toxins to aquatic habitats.
- The introduction of chemicals such as fuels for vehicles and machinery during the construction phase has the potential to cause pollution to downstream aquatic habitat.

Recommendations to reduce the potential for adverse environmental impacts to aquatic habitat are presented in **Section 5.2.**

5.1.6 Cumulative Impacts

Cumulative impacts arise from the interaction of individual elements associated with the proposed development and the additive effects of other external projects. No other known

projects within the locality are known to have relevance to this project that could exacerbate cumulative impacts.

5.2 IMPACT AMELIORATION

5.2.1 Avoidance Measures

Impacts on biodiversity values have been addressed through an iterative design process to avoid areas of higher biodiversity value within the subject site. The design of the solar panel array will ensure that few trees and native vegetation will be removed within the study area.

5.2.2 Erosion Control

Mitigation measures to reduce soil erosion and pollutant run-off during construction activities should include:

- Installation of erosion and sediment control structures within 40 m of any water features prior to any construction works.
- Regular inspection of erosion and sediment control measures, particularly following rainfall events to ensure their ongoing functionality.
- The immediate removal offsite of any excavated materials.
- Avoid stockpiling of materials adjacent to native vegetation, but instead use areas that are already cleared/ disturbed.
- Undertake maintenance of silt fences and other mitigation measures to isolate runoff.

5.2.3 Dust Control

Specific measures to minimise the generation of dust and associated impacts on adjacent natural environments should include:

- Setting maximum speed limits for all traffic within the subject site to limit dust generation.
- Use of a water tanker to spray unpaved access tracks during the construction phase where required.
- Application of dust suppressants or covers on soil stockpiles.

5.2.4 Chemical Spills

Specific measures to minimise the potential for chemical spills and associated impacts on adjacent natural environments should include the following:

- All chemicals must be kept in clearly marked bunded areas.
- Regularly inspect vehicles and mechanical plant for leakage of fuel or oil.
- No re-fuelling of vehicles, washing of vehicles or maintenance of vehicles and plant to be undertaken within 20 m of natural drainage lines and / or water features.

5.2.5 Weed Management

The following recommendations are to be implemented during construction and operation to minimise the impact of weeds within the Subject Site:

- All vehicles should be cleaned prior to entering the site to prevent the introduction of new weed species,
- The site should be monitored during and after construction to ensure that Priority Weeds for the region and Weeds of National Significance are not introduced.

5.2.6 Offset Provisions

As described previously in **Section 2.2.2**, entry into the Biodiversity Offsets Scheme (BOS) is not required for the proposed development.

5.3 CONCLUSION

The proposed development will mainly affect areas of degraded native grassland (agricultural land). The habitat is considered to be generally unsuitable habitat for threatened species; therefore, the proposed development is unlikely to cause a significant impact to any threatened species, populations or ecological communities listed under the NSW BC Act. Entry into the NSW BOS is not triggered by the proposed development.

No EPBC listed species, ecological communities, migratory species or important habitat for such entities was identified within the subject site. The assessment determined that impacts to MNES are unlikely; therefore, an EPBC referral to the Commonwealth Minister for the Environment is not recommended.

Avoidance and mitigation measures have been presented to reduce potential impacts to biodiversity values within the subject site and the environment.

REFERENCES

Botanic Gardens Trust. (2020). New South Wales Flora online - PlantNET. Retrieved from http://plantnet.rbgsyd.nsw.gov.au/.

DAWE. (2020a). *EPBC Protected Matters Search Tool*. Commonwealth of Australia

DAWE. (2020b). *Poplar Box Grassy Woodland on Alluvial Plains - Species Profile*. Retrieved from http://www.environment.gov.au/cgi-bin/sprat/public/publicshowcommunity.pl?id=141

DAWE. (2020c). *Species Profile and Threats Database (SPRAT)*. Commonwealth of Australia

DAWE. (2020d). *Weeds of National Significance*. Retrieved from http://www.environment.gov.au/biodiversity/invasive/weeds/weeds/lists/wons.html

DPI. (2020). *NSW WeedWise*. Retrieved from http://weeds.dpi.nsw.gov.au/

DPIE. (2020a). *Bionet Atlas of NSW Wildlife*. Retrieved from https://www.environment.nsw.gov.au/atlaspublicapp/UI_Modules/ATLAS_/AtlasSearch.aspx

DPIE. (2020b). *Koala Habitat Protection Guideline*.

DPIE. (2020c). *Threatened Species Profile Database*. Retrieved from https://www.environment.nsw.gov.au/threatenedSpeciesApp/

Harden, G. (1993). *Flora of New South Wales Volumes 1–4*.

NRAR. (2018). *Guidelines for controlled activities on waterfront land. Riparian corridors.* Sydney

NSW Scientific Committee. (2011). *Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions - endangered ecological community listing*. Retrieved from

https://www.environment.nsw.gov.au/topics/animals-and-plants/threatened-species/nsw-threatened-species-scientific-committee/determinations/final-determinations/2004-2007/inland-grey-box-woodland-endangered-ecological-community-listing

OEH. (2016). *NSW Guide to Surveying Threatened Plants*. 59 Goulbourn Street Sydney NSW 2000

OEH. (2017). *Biodiversity Assessment Method*. NSW Office of Environment and Heritage Retrieved from https://www.environment.nsw.gov.au/biodiversity/assessmentmethod.htm

LEP (2012) Narrabri Local Environmental Plan 2012 - NSW Legislation. Retrieved 25 November 2020.

APPENDIX 1: SITE PHOTOGRAPHS

Plate 1: **Native grassland (degraded) within the central portion of the study area**

Plate 2: **Grassy Woodland in the southern portion of the study area**

APPENDIX 2: FLORA SPECIES LIST

Table 2: Flora list

Growth Form	Species	Q1		Q2		Q3		Q4	
		Cov.	Abun.	Cov.	Abun.	Cov.	Abun.	Cov.	Abun.
Exotic Cactus	*Opuntia stricta*	0.1	2	1	1			1	5
Exotic Grass	*Bromus catharticus*			0.1	20				
Exotic Grass	*Hordeum leporinum*			1	100				
Exotic Grass	*Lolium rigidum*	5	1000	20	1000	5	100		
Exotic Grass	*Phalaris aquaticus*							2	500
Exotic Herb	*Carthamus lanatus*	0.5	200	1	50			40	10000
Exotic Herb	*Centaurea solstitialis*			5	500	2	500	2	500
Exotic Herb	*Datura ferox*	0.1	20						
Exotic Herb	*Echium plantagineum*	2	200	0.1	20	2	100	2	50
Exotic Herb	*Erodium cicutarium*	1	20					0.1	20
Exotic Herb	*Gomphocarpus physocarpus*			0.1	2				
Exotic Herb	*Lactuca serriola*	0.5	100			0.5	50		
Exotic Herb	*Lupinus sp.*							0.1	50
Exotic Herb	*Malva parviflora*	40	10000			5	1000	0.1	5
Exotic Herb	*Medicago polymorpha*	1	1000			2	1000	2	500
Exotic Herb	*Plantago lanceolata*							0.1	10
Exotic Herb	*Rapistrum rugosum*	10	500			0.5	50		
Exotic Herb	*Rumex crispidus*			0.1	10				
Exotic Herb	*Sida rhombifolia*	2	200			5	100		
Exotic Herb	*Silybum marianum*			0.1	10	0.1	5	0.5	20
Exotic Herb	*Sonchus oleraceus*					0.1	20		
Exotic Herb	*Trifolium pratense*					0.1	5	1	100

Growth Form	Species	Q1		Q2		Q3		Q4	
		Cov.	Abun.	Cov.	Abun.	Cov.	Abun.	Cov.	Abun.
Exotic Shrub	*Lycium ferocissimum*	10	20						
Native Chenopod	*Einadia trigonos*	0.1	1			0.5	50	0.1	5
Native Chenopod	*Sclerolaena birchii*	20	1000	30	500	5	100	2	50
Native Chenopod	*Sclerolaena muricata*	10	1000	40	500			1	20
Native Grass	*Austrostipa aristiglumis*			5	500	70	10000	50	10000
Native Grass	*Austrostipa verticillata*	2	1000						
Native Grass	*Chloris truncata*	0.1	10					0.1	10
Native Herb	*Boerhavia dominii*	1	20			0.1	10		
Native Herb	*Calotis lappulacea*					0.1	20		
Native Herb	*Calotis sp.*			5	500				
Native Herb	*Dichopogon sp.*					0.1	1	0.1	10
Native Herb	*Euchiton sphacelata*							0.1	5
Native Herb	*Oxalis perrenans*	0.1	10	0.1	50	0.1	20		
Native Herb	*Polymeria longifolia*			0.1	20				
Native Herb	*Portulaca oleracea*	0.1	50	0.1	20	1	500		
Native Herb	*Sida corrugata*	1	10	2	500				
Native Herb	*Sida trichopoda*							0.1	20
Native Herb	*Solanum esuriale*	2	200	1	20	0.1	20		
Native Herb	*Tribulus terrestris*	1	20			0.1	5		
Native Herb	*Vittadinia cuneata*	21	500	1	100			1	50
Native Herb	*Wahlenbergia communis*			0.1	20			0.1	5
Native Shrub	*Notelaea microcarpa*	5	2						
Native Tree	*Brachychiton populneus*	0.1	1			5	1		
Native Tree	*Callitris glaucophylla*					5	1		
Native Tree	*Eucalyptus populnea*	30	3						
Native Tree	*Geijera parviflora*	5	3			5	1		

Notes: High Threat exotics (HTE) are classified in accordance with the DPIE HTE List. Growth forms were classified in accordance with the DPIE growth forms data.

APPENDIX 3: THREATENED SPECIES 'LIKELIHOOD OF OCCURRENCE'

Table 3: Likelihood of occurrence

No.	Species	Legal Status*		No. of Records	Source#	Habitat Preferences	Likelihood of occurrence	Potential Impact
		BC Act	EPBC Act					
Flora								
1.	*Androcalva procumbens*	V	V	-	PMST	Endemic to NSW, mainly confined to the Dubbo-Mendooran-Gilgandra region, but also in the Pilliga and Nymagee areas. Recent collections made from the Upper Hunter region. Grows in sandy sites, often along roadsides. Recorded in *Eucalyptus dealbata* and *Eucalyptus sideroxylon* communities, *Melaleuca uncinata* scrub, under mallee eucalypts with a *Calytrix tetragona* understorey, and in a recently burnt Ironbark and Callitris area. Other associated species include *Acacia triptera, Callitris endlicheri, Eucalyptus melliodora, Allocasuarina diminuta, Philotheca salsolifolia, Xanthorrhoea species, Exocarpos cupressiformis, Leptospermum parvifolium* and *Kunzea parvifolia.* **A readily identifiable species that is detectible at all times of year. The subject site lacks most of the species commonly associated with its occurrence. The species was not detected within the subject site during the assessment.**	Low	Low

No.	Species	Legal Status*		No. of Records	Source#	Habitat Preferences	Likelihood of occurrence	Potential Impact
		BC Act	EPBC Act					
2.	*Cadellia pentastylis*	V	V	-	PMST	Occurs along the western edge of the North West Slopes from north of Gunnedah to west of Tenterfield. The natural range of Ooline is from 24ºS to 30ºS in the 500 to 750 mm per annum rainfall belt. Forms a closed or open canopy mixing with eucalypt and cypress pine species. There appears to be a strong correlation between the presence of Ooline and low- to medium-nutrient soils of sandy clay or clayey consistencies, with a typical soil profile having a sandy loam surface layer, grading from a light clay to a medium clay with depth. **A readily identifiable species that is detectible at all times of year. The species was not detected within the subject site during the assessment.**	Low	Low
3.	*Digitaria porrecta* Finger Panic Grass	E	-	356	BioNet	Finger Panic Grass occurs in NSW and Queensland. In NSW it is found on the North West Slopes and Plains, from near Moree south to Tambar Springs and from Tamworth to Coonabarabran. It is often associated with *Eucalyptus albens* and *Acacia pendula*. Common grasses and forbs include *Austrostipa aristiglumis*, *Enteropogon acicularis*, *Cyperus bifax, Hibiscus trionum* and *Neptunia gracilis.* It is found in native grassland, woodlands or open forest with a grassy understorey, on richer soils and along roadsides and travelling stock routes where there is light grazing and occasional fire. **A readily identifiable species that is detectible at all times of year. The subject site lacks most of the species commonly associated with its occurrence. The species was not detected within the subject site during the assessment, however potential habitat is present. There are a large number of records within the locality.**	Low - Moderate	Low

No.	Species	Legal Status*		No. of Records	Source#	Habitat Preferences	Likelihood of occurrence	Potential Impact
		BC Act	EPBC Act					
4.	*Dichanthium setosum* Bluegrass	V	V	-	PMST	Bluegrass occurs on the New England Tablelands, North West Slopes and Plains and the Central Western Slopes of NSW, extending to northern Queensland. It is associated with heavy basaltic black soils and red-brown loams with clay subsoil. It is often found in moderately disturbed areas such as cleared woodland, grassy roadside remnants and highly disturbed pasture. (Often collected from disturbed open grassy woodlands on the northern tablelands, where the habitat has been variously grazed, nutrient-enriched and water-enriched). **Was not detected within the subject site during the assessment, no records in the locality.**	Low	Low
5.	*Swainsona murrayana* Slender Darling Pea	V	V	-	PMST	Found throughout NSW, it has been recorded in the southern riverine plain, the Hay plain as far north as Willandra National Park and in various localities between Dubbo and Moree. Grows in a variety of vegetation types including bladder saltbush, black box and grassland 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. **A readily identifiable species that was detectable during the time of survey. The species was not detected within the subject site during the assessment.**	Low	Low
6.	*Tylophora linearis*	V	E	-	PMST	Grows in dry scrub and open forest. Recorded from low-altitude sedimentary flats in dry woodlands of *Eucalyptus fibrosa, Eucalyptus sideroxylon, Eucalyptus albens, Callitris endlicheri, Callitris glaucophylla* and *Allocasuarina luehmannii.* **The majority of the subject site has been grazed by cattle. The species was not detected within the site during the assessment. The site is considered to be too degraded to support a population of this species.**	Low	Low

No.	Species	Legal Status*		No. of Records	Source#	Habitat Preferences	Likelihood of occurrence	Potential Impact
		BC Act	EPBC Act					
Threatened Ecological Communities								
1.	*Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions*	E	E	-	PMST	The structure of the community may vary from tall riparian woodlands to very open 'savanna like' grassy woodlands with a sparse midstorey of shrubs and saplings. Typically, these woodlands form mosaics with grasslands and wetlands, and are characterised by Coolibah (*Eucalyptus coolabah*) and, in some areas, Black Box (*E. largiflorens*). Other tree species may be present including River Cooba (*Acacia stenophylla*), Cooba (*A. salicina*), Belah (*Casuarina cristata*) and Eurah (*Eremophila bignoniiflora*). **The community was not detected within the subject site during the assessment.**	Nil	Nil
2.	*Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia*	E	E	-	PMST	Inland Grey Box Woodland includes those woodlands in which the most characteristic tree species, *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. **The community was detected within the study area during the assessment. This community does not occur within the subject site boundary.**	High	Low

No.	Species	Legal Status*		No. of Records	Source#	Habitat Preferences	Likelihood of occurrence	Potential Impact
		BC Act	EPBC Act					
3.	*Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland*	-	CE	-	PMST	is strongly reliant on soil type as it is associated with fine textured, often cracking clays* derived from either basalt or quaternary* alluvium. The ecological community generally occurs on flat to low slopes, of no more than 5% (or less than 1 degree) inclination. As slope increases, grassy woodlands dominated by trees such as *Acacia pendula* (weeping myall), *Eucalyptus coolabah* (coolibah), *E. populnea* (poplar box) or *E. melliodora* (yellow box) occur. **The community was not detected within the subject site during the assessment.**	Nil	Nil
4.	*Poplar Box Grassy Woodland on Alluvial Plains*	-	E	-	PMST	Temperate to semi-arid grassy eucalypt woodland that is sparsely scattered inland of the Great Dividing Range from around Cowra in NSW to near Collinsville in Queensland. This eucalypt woodland is mainly associated with alluvial plains including back plains, higher terraces and levees along rivers, ephemeral watercourses and depressions. The ecological community varies from a grassy woodland to grassy open woodland with an overstorey dominated by *Eucalyptus populnea* (poplar/bimble box) and an understorey mostly composed of native perennial forbs and grasses but may include some shrubs and sedges, depending on the season, rainfall and location in the landscape. Patches of the ecological community generally lack a substantial mid (tall shrub) layer. **The community was not detected within the subject site during the assessment.**	Nil	Nil

No.	Species	Legal Status*		No. of Records	Source#	Habitat Preferences	Likelihood of occurrence	Potential Impact
		BC Act	EPBC Act					
5.	*Weeping Myall Woodlands*	-	E	-	PMST	Occurs on the inland alluvial plains west of the Great Dividing Range in NSW and QLD**, g**enerally on flat areas, shallow depressions or Gilgai's on raised alluvial plains. The Weeping Myall Woodlands range from open woodlands to woodlands, generally, 4 to 12m high. The overstorey is dominated by Weeping Myall (*Acacia pendula*) trees and in some cases this species may be the only tree canopy species. **The community was not detected within the subject site during the assessment.**	Nil	Nil
6.	*White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland*	CE	CE	-	PMST	An open woodland community (sometimes occurring as a forest formation), in which the most obvious species are one or more of the following: White Box *Eucalyptus albens*, Yellow Box *E. melliodora* and Blakely's Red Gum *E. blakelyi*. Intact sites contain a high diversity of plant species, including the main tree species, additional tree species, some shrub species, several climbing plant species, many grasses and a very high diversity of herbs. **The community was not detected within the subject site during the assessment.**	Nil	Nil
Birds								
1.	*Artamus cyanopterus cyanopterus* Dusky Woodswallow	V	-	1	BioNet	Primarily inhabit dry, open eucalypt forests and woodlands with an open or sparse understorey of eucalypt saplings, acacias and other shrubs, and groundcover of grasses or sedges and fallen woody debris. Also found in farmland, usually at the edges of forest or woodland. **May aerially forage over the subject site. More suitable habitat is available in the study area and surrounding lands.**	Low	Low

No.	Species	Legal Status*		No. of Records	Source#	Habitat Preferences	Likelihood of occurrence	Potential Impact
		BC Act	EPBC Act					
2.	*Chthonicola sagittate* Speckled Warbler	V	-	11	BioNet	The Speckled Warbler lives in a wide range of *Eucalyptus* dominated communities that have a grassy understory, often on rocky ridges or in gullies. Typical habitat would include scattered native tussock grasses, a sparse shrub layer, some eucalypt regrowth and an open canopy. Large, relatively undisturbed remnants are required for the species to persist in an area. **May aerially forage over the subject site. More suitable habitat is available in the study area and surrounding lands.**	Low - Moderate	Low
3.	*Daphoenositta chrysoptera* Varied Sittella	V	-	1	BioNet	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. **The subject site is comprised of agricultural lands that contain few native trees. The habitat in the subject site is unsuitable for this species.**	Low	Low
4.	*Glossopsitta pusilla* Little Lorikeet	V	-	6	BioNet	Forages primarily in the canopy of open Eucalyptus forest and woodland, yet also finds food in Angophora, Melaleuca and other tree species. Riparian habitats are particularly used, due to higher soil fertility and hence greater productivity. Isolated flowering trees in open country, e.g. paddocks, roadside remnants and urban trees also help sustain viable populations of the species. **May aerially forage over the subject site. More suitable habitat is available in the study area and surrounding lands.**	Low	Low

No.	Species	Legal Status*		No. of Records	Source#	Habitat Preferences	Likelihood of occurrence	Potential Impact
		BC Act	EPBC Act					
5.	*Grantiella picta* Painted Honeyeater	V	V	1	BioNet PMST	Inhabits Boree/ Weeping Myall (*Acacia pendula*), Brigalow (*A. harpophylla*) and Box-Gum Woodlands and Box-Ironbark Forests. This species is a specialist feeder on the fruits of mistletoes growing on woodland Eucalypts and Acacias. Prefers mistletoes of the genus Amyema. **The subject site is comprised of agricultural lands that contain few native trees. No mistletoe was identified. The habitat is considered to be too degraded to support this species.**	Low	Low
6.	*Ninox connivens* Barking Owl	V	-	2	BioNet	Inhabits woodland and open forest, including fragmented remnants and partly cleared farmland. Sometimes able to successfully breed along timbered watercourses in heavily cleared habitats due to the higher density of prey found on these fertile riparian soils. Roost in shaded portions of tree canopies, including tall midstorey trees with dense foliage such as Acacia and Casuarina species. During nesting season, the male perches in a nearby tree overlooking the hollow entrance. **May use the subject site for foraging, however no roost sites or tall midstorey trees with dense foliage are present within the subject site.**	Low	Low
7.	*Pomatostomus temporalis temporalis* Grey-crowned Babbler (eastern subspecies)	V	-	1	BioNet	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. **May use the subject site for aerial foraging.**	Low	Low

No.	Species	Legal Status*		No. of Records	Source#	Habitat Preferences	Likelihood of occurrence	Potential Impact
		BC Act	EPBC Act					
2.	*Anthochaera phrygia* Regent Honeyeater	CE	CE	-	PMST	Inhabits dry open forest and woodland, particularly Box-Ironbark woodland, and riparian forests of River Sheoak. Regent Honeyeaters inhabit woodlands that support a significantly high abundance and species richness of bird species. **The subject site is comprised of agricultural lands that contain few native trees. The habitat is considered to be too degraded to support this species.**	Low	Low
3.	*Botaurus poiciloptilus* Australasian Bittern	E	E	-	PMST	Favours permanent freshwater wetlands with tall, dense vegetation, particularly bullrushes (*Typha spp*.) and spikerushes (*Eleocharis spp*.). **No suitable aquatic habitat is present within the subject site.**	Nil	Nil
4.	*Calidris ferruginea* Curlew Sandpiper	E	CE	-	PMST	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. **No suitable estuarine habitat is present within the subject site.**	Nil	Nil

No.	Species	Legal Status*		No. of Records	Source#	Habitat Preferences	Likelihood of occurrence	Potential Impact
		BC Act	EPBC Act					
6.	*Falco subniger* Black Falcon	V	-	2	Bionet PMST	The Black Falcon is widely, but sparsely, distributed in New South Wales, mostly occurring in inland regions. Some reports of 'Black Falcons' on the tablelands and coast of New South Wales are likely to be preferable to the Brown Falcon. In New South Wales there is assumed to be a single population that is continuous with a broader continental population, given that falcons are highly mobile, commonly travelling hundreds of kilometres (Marchant & Higgins 1993). The Black Falcon occurs as solitary individuals, in pairs, or in family groups of parents and offspring. **The subject site is comprised of agricultural lands that contain few native trees. May aerially forage over the subject site.**	Low	Low
7.	*Falco hypoleucos* Grey Falcon	E	-	-	PMST	The Grey Falcon is sparsely distributed in NSW, chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range. 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. **No suitable habitat is present within the subject site. May aerially forage over the subject site.**	Low - Moderate	Low
11.	*Rostratula australis* Australian Painted Snipe	E	E		PMST	Prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber. **No suitable aquatic habitat is present within the subject site.**	Nil	Nil
Mammals								

No.	Species	Legal Status*		No. of Records	Source#	Habitat Preferences	Likelihood of occurrence	Potential Impact
		BC Act	EPBC Act					
1.	*Chalinolobus dwyeri* Large-eared Pied Bat	V	V	-	PMST	Roosts in caves (near their entrances), crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the Fairy Martin (*Petrochelidon ariel*), frequenting low to mid-elevation dry open forest and woodland close to these features. **No cave habitat is present within the subject site.**	Nil	Nil
2.	*Dasyurus maculatus (SE mainland population)* Spot-tailed Quoll	V	E	4	BioNet PMST	This species has been recorded across a range of habitat types, including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline. Individual animals use hollow-bearing trees, fallen logs, small caves, rock outcrops and rocky-cliff faces as den sites. **The subject site is comprised of agricultural lands that contain few native trees. The habitat is considered to be too degraded to support this species.**	Nil	Nil
3.	*Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)* Koala	V	V	-	BioNet	In NSW, Koalas occur along the coast, extending west to the Darling Riverine Plains and Mulga Lands bioregions in the north of the state; to the Cobar Peneplain bioregion in the centre of the state; and to the Riverina and eastern most parts of the Murray-Darling Depression bioregions in the south. The koala is found in a variety of forest types. 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. **No Koalas or Koala feed trees were identified during assessment within the subject site.**	Low	Low

No.	Species	Legal Status*		No. of Records	Source#	Habitat Preferences	Likelihood of occurrence	Potential Impact
		BC Act	EPBC Act					
4.	*Saccolaimus flaviventris* Yellow-bellied Sheathtail-bat	V	-	-	BioNet	Roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows. When foraging for insects, flies high and fast over the forest canopy, but lower in more open country. Forages in most habitats across its very wide range, with and without trees; appears to defend an aerial territory. **The subject site provides marginal foraging habitat. The habitat is not considered to be important to this species.**	Low	Low
5.	*Nyctophilus corbeni* Corben's Long-eared Bat	V	V		BioNet PMST	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. **The subject site is comprised of agricultural lands that contain few native trees. The habitat is considered to be too degraded to support this species.**	Low	Low
6.	*Vespadelus troughtoni* Eastern Cave Bat	V	-		BioNet	A cave-roosting species that is usually found in dry open forest and woodland, near cliffs or rocky overhangs; has been recorded roosting in disused mine workings. Occasionally found along cliff-lines in wet eucalypt forest and rainforest. **The subject site does not contain suitable habitat.**	Nil	Nil
7.	*Pteropus poliocephalus* Grey-headed Flying-fox	V	V	12	PMST	Occurs across a wide range of habitat types along the eastern seaboard of Australia, depending on food availability. Fruit from myrtaceous trees and rainforest trees form the major components of their diet. **Potential marginal foraging habitat is present; however, no camps were detected. The habitat is not considered to be important to this species.**	Low	Low
Reptiles								

No.	Species	Legal Status*		No. of Records	Source#	Habitat Preferences	Likelihood of occurrence	Potential Impact
		BC Act	EPBC Act					
1.	*Aprasia parapulchella* Pink-tailed Worm Lizard	V	V	-	PMST	Inhabits sloping, open woodland areas with predominantly native grassy groundlayers, particularly those dominated by Kangaroo Grass (*Themeda australis*). Sites are typically well-drained, with rocky outcrops or scattered, partially buried rocks. **The subject site is comprised of agricultural lands that contain few native trees. The subject site does not contain suitable habitat for this species.**	Nil	Nil
Migratory Species								
1.	*Apus pacificus* Fork-tailed Swift	-	M	-	PMST	Forages aerially over a very wide range of habitats includes both vegetated and non- vegetated areas. **Potential aerial foraging habitat above the subject site.**	Moderate	Low
2.	*Hirundapus caudacutus* White-throated Needletail	-	M	-	PMST	Forages in high open spaces over varied habitat types. **Potential aerial foraging habitat above subject site.**	Moderate	Low
3.	*Motacilla flava* Yellow Wagtail	-	M	-	PMST	Typically inhabits inundated fields, saltmarsh and wetlands and occasionally coastal areas. **No suitable habitat within the subject site.**	Nil	Low
4.	*Myiagra cyanoleuca* Satin Flycatcher	-	M	-	PMST	Found in tall forests, preferring wetter habitats such as heavily forested gullies, but not rainforests. **No suitable habitat within the subject site.**	Nil	Low

APPENDIX 4: EPBC ACT PROTECTED MATTERS SEARCH REPORT

Australian Government

Department of Agriculture, Water and the Environment

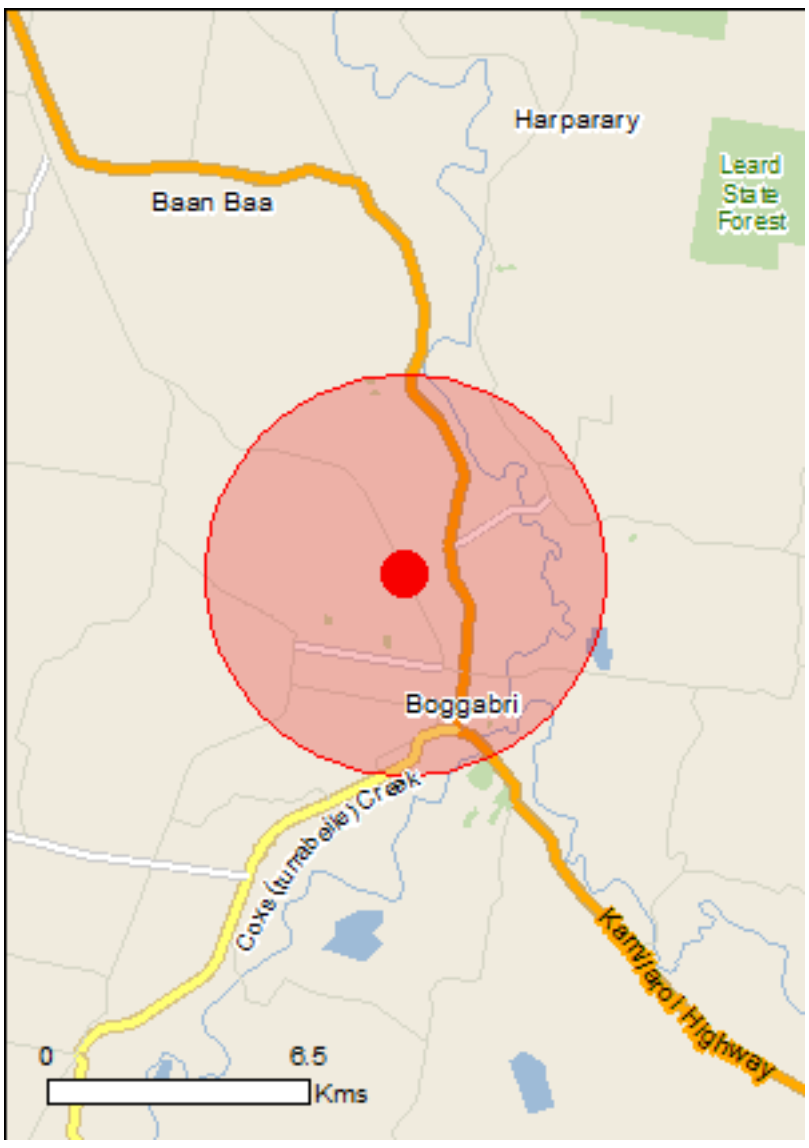
EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

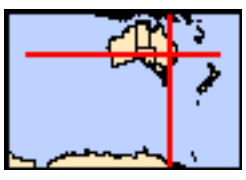
Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

Report created: 25/11/20 13:40:33



Coordinates

Buffer: 5.0Km



Summary

Matters of National Environmental Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	3
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	6
Listed Threatened Species:	20
Listed Migratory Species:	9

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Land:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	15
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

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

State and Territory Reserves:	None
Regional Forest Agreements:	None
Invasive Species:	25
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar) [Resource Information]

Name	Proximity
Banrock station wetland complex	900 - 1000km upstream
Riverland	900 - 1000km upstream
The coorong, and lakes alexandrina and albert wetland	1100 - 1200km

Listed Threatened Ecological Communities [Resource Information]

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

Name	Status	Type of Presence
Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions	Endangered	Community may occur within area
Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	Endangered	Community may occur within area
Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland	Critically Endangered	Community likely to occur within area
Poplar Box Grassy Woodland on Alluvial Plains	Endangered	Community likely to occur within area
Weeping Myall Woodlands	Endangered	Community may occur within area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community likely to occur within area

Listed Threatened Species [Resource Information]

Name	Status	Type of Presence
Birds		
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Foraging, feeding or related behaviour may occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat known to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species

Name	Status	Type of Presence
		habitat likely to occur within area
Rostratula australis		
Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
Fish		
Maccullochella peelii		
Murray Cod [66633]	Vulnerable	Species or species habitat known to occur within area
Mammals		
Chalinolobus dwyeri		
Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat likely to occur within area
Dasyurus maculatus maculatus (SE mainland population)		
Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat may occur within area
Nyctophilus corbeni		
Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat likely to occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)		
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat known to occur within area
Pteropus poliocephalus		
Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour may occur within area
Plants		
Androcalva procumbens		
[87153]	Vulnerable	Species or species habitat likely to occur within area
Cadellia pentastylis		
Ooline [9828]	Vulnerable	Species or species habitat likely to occur within area
Dichanthium setosum		
bluegrass [14159]	Vulnerable	Species or species habitat likely to occur within area
Swainsona murrayana		
Slender Darling-pea, Slender Swainson, Murray Swainson-pea [6765]	Vulnerable	Species or species habitat likely to occur within area
Tylophora linearis		
[55231]	Endangered	Species or species habitat may occur within area
Reptiles		
Aprasia parapulchella		
Pink-tailed Worm-lizard, Pink-tailed Legless Lizard [1665]	Vulnerable	Species or species habitat likely to occur within area

Listed Migratory Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Hirundapus caudacutus		
White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area

Name	Threatened	Type of Presence
Motacilla flava		
Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca		
Satin Flycatcher [612]		Species or species habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos		
Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata		
Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos		
Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii		
Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Name
Commonwealth Land - Telstra Corporation Limited

Listed Marine Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos		
Common Sandpiper [59309]		Species or species habitat may occur within area
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba		
Great Egret, White Egret [59541]		Species or species habitat likely to occur within area
Ardea ibis		
Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata		
Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area

Name	Threatened	Type of Presence
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Chrysococcyx osculans Black-eared Cuckoo [705]		Species or species habitat likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat may occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area

Extra Information

Invasive Species [Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Turdus merula Common Blackbird, Eurasian Blackbird [596]		Species or species habitat likely to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Capra hircus Goat [2]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Cylindropuntia spp. Prickly Pears [85131]		Species or species habitat likely to occur within area
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat likely to occur within area
Opuntia spp. Prickly Pears [82753]		Species or species habitat likely to occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within

Name	Status	Type of Presence
		area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Solanum elaeagnifolium Silver Nightshade, Silver-leaved Nightshade, White Horse Nettle, Silver-leaf Nightshade, Tomato Weed, White Nightshade, Bull-nettle, Prairie-berry, Satansbos, Silver-leaf Bitter-apple, Silverleaf-nettle, Trompillo [12323]		Species or species habitat likely to occur within area
Tamarix aphylla Athel Pine, Athel Tree, Tamarisk, Athel Tamarisk, Athel Tamarix, Desert Tamarisk, Flowering Cypress, Salt Cedar [16018]		Species or species habitat likely to occur within area

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

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

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

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

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

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

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

Coordinates

-30.67949 150.03014

Acknowledgements

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

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

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

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

Department of Agriculture Water and the Environment
GPO Box 858
Canberra City ACT 2601 Australia
+61 2 6274 1111

Document Set ID: 1831773
Version: 1, Version Date: 05/01/2021

APPENDIX 5: ASSESSMENT OF SIGNIFICANCE (PURSUANT TO SECTION 7.3 OF THE BC ACT)

Factors of Assessment - *Biodiversity Conservation Act 2016*

The five factors considered in the test of significance under s.7.3 of BC Act are shown in the table below. The tests of significance for all threatened species, populations and ecological communities considered likely to occur within the study area are provided in the proceeding sub-sections.

Table 4: Factors addressed in the assessment of significance

Factor	Species	Population	Ecological Community
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.	X		
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, or 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			X
in relation to the habitat of a threatened species, population or ecological community: the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality	X		X
whether the proposed development or activity is likely to have an adverse effect any declared area of outstanding biodiversity value (either directly or indirectly).	NA	NA	NA
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.	X	X	X

Threatened Flora

Table 5: Finger Panic Grass *Digitaria porrecta*

Factors	Assessment of Significance
(a) Effect on life cycle	Finger Panic Grass *Dicanthium setosum* was not detected within the subject site during the assessment; however, records of the species occur in the locality and suitable habitat has been identified within the subject site. The proposed development will require ground disturbance that would result in the removal of some groundcover vegetation; however, most of the grasslands will be retained in their current state. Given that no areas of the subject site were found to contain Finger Panic Grass and the majority of the habitat for the species will be retained, it is unlikely that the proposed development will adversely affect the lifecycle of the species, such that a local population would be at risk of extinction.
(c) (i) Habitat Removal	The majority of the habitat for the species will be retained within the subject site following the proposed development.
(c) (ii) Habitat Fragmentation	The groundcover habitat to be removed is comprised of exotic/native agricultural grassland. This vegetation is widespread within the study area and surrounding lands. The proposed development will not cause further habitat fragmentation for the species within the locality.
(c) (iii) Habitat importance	The habitat to be removed is comprised of exotic/native grassland and is not considered important to the species. Removal of this habitat is unlikely to put a local population at risk of extinction.
(d) Effect on biodiversity value	The proposed development does not occur within an Area of Outstanding Biodiversity Value (AOBV).
(e) KTP	The following KTPs are listed in order of their relevance to the species and the proposed development: • Removal of native vegetation Given that the subject site is already a highly modified environment the proposed development is likely to facilitate the above listed KTPs to a minor extent. Impacts are likely to be negligible.
Conclusion	As the proposed development will not impact an area containing a known occurrence of Finger Panic Grass and the majority of the habitat for the species will be retained. The proposed development is considered unlikely to have a significant impact on this species in the locality.

Threatened Ecological Community

Table 6: Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia

(a) Effect on life cycle	Not applicable
(b) Effect on Ecological Community	The proposed activity does not require the removal of any of Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands community. The Grey Box Grassy Woodlands and Derived Native Grasslands occurs approximately 50 m from the subject site. The proposed activity is unlikely to place this TEC at risk of local extinction.
(C) (i) Habitat Removal	The proposal will not result in the removal of any of this community. The impacts on this TEC due to the proposed development is expected to be minimal to negligent.
(C) (ii) Habitat Fragmentation	No clearing of habitat will result from the proposed activity; therefore, it is unlikely to cause or increase any habitat fragmentation.
(C) (iii) Habitat importance	No clearing of habitat will result from the proposed activity; therefore, it is unlikely to cause a decrease in the importance of this TEC within the locality.
(d) Effect on biodiversity value	The proposed action is not within or in close proximity to any mapped Areas of Outstanding Biodiversity Value.
(E) Key threatening process	The proposal will contribute to one key threatening process relevant to these species: • Clearing of native vegetation. The proposal also has the potential to contribute to: • Anthropogenic climate change • Infection of native plants by *Phytophthora cinnamomi* • Invasion, establishment and spread of *Lantana camara.* • Introduction and establishment of Exotic Rust Fungi of the order *Pucciniales* pathogenic on plants of the family *Myrtaceae* The mitigation measures outlined in **Section 5** would avoid and minimise the risk of these key threatening processes as a result of the proposed action.
Conclusion	No clearing of habitat will result from the proposed activity. As a result, the proposed activity is unlikely to significantly affect the occurrence of this TEC within the locality or significantly hinder any species that may utilise the habitat.

APPENDIX 6: LICENSES AND PERMITS

Kleinfelder employees involved in the current study are licensed or approved under the *National Parks and Wildlife Act 1974* (License Number: SL100730, Expiry: 31 March 2021) and the *Animal Research Act 1985* to harm/trap/release protected native fauna and to pick for identification purposes native flora and to undertake fauna surveys.