Coolamon Shire Council

Coolamon industrial subdivision

Biodiversity assessment

July 2020

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1. Introduction

1.1 Proposal background

Coolamon Shire Council (Council) is proposing a new industrial subdivision at Wade Street, Coolamon (the proposal), and requires the preparation of a biodiversity assessment (BA) determine the biodiversity impacts of the proposal. As part of the proposal, Council has rezoned land in the proposal site to light industrial.

Coolamon is a small, growing rural community in the Riverina region of NSW, located about 35 kilometres north-west of Wagga Wagga. Recently, the town has seen an increase in development types including vehicle mechanics, plumbers, and other trades (light industrial) seeking to establish their respective developments on land that is zoned RU5 Village or RU4 Rural Small Holdings. In the case of many small businesses, they cannot operate under the Home Business or Home Industry land use definition, as it is considered that these developments do not meet the relevant Local Environment Plan (LEP) controls. The provision of light industrial land would more appropriately serve these businesses and reduce the potential for land use conflict in the future.

Coolamon will benefit from increased access to industrial businesses, as it is an important resource for employment and economic outputs that can significantly contribute to the sustainability of small rural towns.

1.2 The proposal

Council has amended the Coolamon LEP 2011 'Land Zoning Map and Lot Size Map Sheet', and rezoned approximately six hectares of land at Lot 2 DP 838319, and about one hectare of land of part Lot 2 DP 1221837, Wade Street, Coolamon to light industrial (see Figure 1-1). The proposed industrial development includes subdivision of the proposal site into about 21 new light industrial lots of about 50 by 50 metres in size. The industrial subdivision includes service lots to allow for the establishment of power lines, drainage paths, water mains and sewerage mains.

1.2.1 Key features of the proposal

- Subdivision of the proposal site into 21 smaller industrial lots
- Establishment of two easement/service lots to cater for power lines, drainage paths, water mains and sewerage mains
- Clearing of all vegetation, including mostly introduced groundcover, and some native, non-native, and non-locally native shrubs and trees from within lot boundaries
- Removal and limb-lopping of mature Sugar Gums (*Eucalyptus cladocalyx)*, and minimal vegetation associated with remanent native vegetation to facilitate the construction of drive-way access to the lots.

1.2.2 Construction environmental management plan

A construction environmental management plan (CEMP) would guide construction activities to ensure works are carried out to Council specifications and to incorporate all safeguards described in this ecological assessment and other supporting documents including the Review of Environmental (REF) and erosion and sediment control plan.

1.3 Legislative context

1.3.1 State legislation

NSW Environmental Planning and Assessment Act 1979

The Environmental Planning and Assessment Act 1979 (EP&A Act) provides the statutory basis for planning and environmental assessment in NSW. The EP&A Act provides the framework for environmental planning and development approvals, and includes provisions to ensure that the potential environmental impacts of a development are assessed and considered in the decision making process.

Application of Part 5 of the EP&A Act

As a result of the application of the State Environmental Planning Policy (Infrastructure) 2007 the proposal is permissible without consent, and is therefore subject to Part 5 (Division 5.1) of the EP&A Act.

Section 5.1 of the EP&A Act defines a determining authority as 'a Minister or public authority and, in relation to any activity, means the Minister or public authority by or on whose behalf the activity is or is to be carried out or any Minister or public authority whose approval is required in order to enable the activity to be carried out'. Council is the proponent and determining authority for the proposal. This biodiversity impact assessment has been prepared to accompany a Review of Environmental Factors (REF) to satisfy Council's obligations as a determining authority under the EP&A Act.

In relation to Part 5 activities, Section 5.5 of the EP&A Act imposes a duty on a determining authority to 'examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of that activity'. Section 5.5 also lists a number of matters that the determining authority must consider as part of the determination of the proposal.

The factors that need to be taken into account when considering the likely impact of an activity on the environment are provided in Clause 228 of the Regulation. A summary of the results of the assessment of the proposal in accordance with the Clause 228 factors is provided in section 4.1.

NSW Biodiversity Conservation Act 2016

The Biodiversity Conservation Act 2016 (BC Act), together with the Biodiversity Conservation Regulation 2017, provide a mechanism to address impacts on biodiversity from land clearing associated with development. Self-determining authorities can assess impacts of Part 5 developments on threatened biota listed under the BC Act via Part 7.3 of the BC Act and Section 1.7 of the EP&A Act. This requires assessment of potential impacts on threatened biodiversity via the test of significance, and if significant impacts are likely, a species impact statement (SIS) or assessment under the Biodiversity Assessment Methodology (BAM) would be required.

The potential for impacts on ecology have been considered in section 3.7.4 of this report. The assessment concludes that the proposal would be unlikely to have a significant impact on any threatened species, populations or ecological communities listed under the BC Act. A species impact statement or assessment under the BAM is therefore not required.

Biosecurity Act 2015

The Biosecurity Act 2015 (Biosecurity Act) specifies the duties of public and private landholders as to the control of priority weeds. Under the Act, priority weeds have been identified for Local

Government Areas and assigned duties of control. Under Part 3 of the Biosecurity Act any person who deals with biosecurity matters (i.e. listed weed species) and who knows, or ought reasonably to know, the biosecurity risk posed or likely to be posed by biosecurity matters has the duty to ensure that, so far as is reasonably practicable, the biosecurity risk is prevented, eliminated and minimised.

Priority weeds identified within the broader study area, and which may occur within the proposal site under the correct conditions, would be managed in accordance with the requirements of the Biosecurity Act. Specific weed management safeguards have been developed to avoid the contamination and spread of priority weeds, and can be found in section 5.

During site surveys signage that indicated the presence of Spiny Burr Grass was documented. The species itself was not recorded during surveys however caution and proper weed management practices should be implemented to mitigate the risk of spread of the weed.

1.3.2 Commonwealth legislation

Environment Protection and 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' is deemed to be a 'controlled action' and may not be undertaken without prior approval from the Australian Minister for the Environment. MNES relevant to this report include threatened species and ecological communities and migratory species.

The EPBC Act has been considered in this assessment through:

- Desktop review to determine the listed biodiversity matters that are predicted to occur within the locality of the proposal and hence could occur, subject to the habitats present
- Targeted field surveys for listed threatened biota and migratory species
- Assessment of potential impacts on threatened and migratory biota, which concluded that no assessments of significance in accordance with the EPBC Act Significant Impact Guidelines 3.1 are required
- Identification of suitable impact mitigation and environmental management measures for threatened and migratory biota, where required.

1.4 Purpose of this report

1.4.1 Scope and limitations

This report: has been prepared by GHD for Coolamon Shire Council and may only be used and relied on by Coolamon Shire Council for the purpose agreed between GHD and Coolamon Shire Council as set out in section 2.1 of this report.

GHD otherwise disclaims responsibility to any person other than Coolamon Shire Council arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

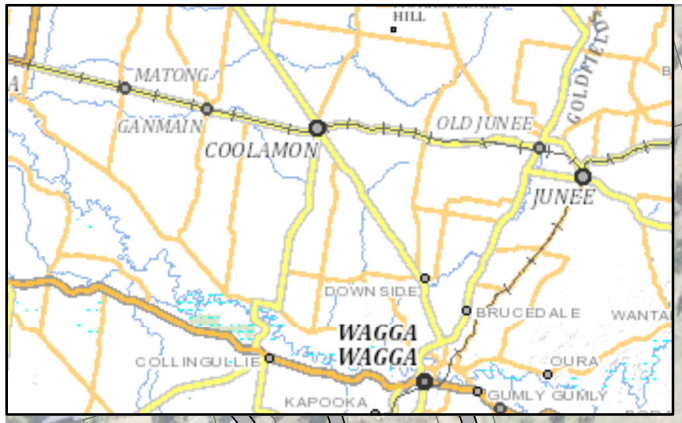
The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no

responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report (refer section 1.2 of this report). GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this report on the basis of information provided by Coolamon Shire Council and others who provided information to GHD (including Government authorities), which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.



Legend

Proposal site

Paper Size ISO A4

0 50 100 150

Meters

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

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GHD

Coolamon Shire Council

Coolamon industrial subdivision
Biodiversity assessment

The proposal site

Project No. **12527688**
Revision No. **-**
Date **04/06/2020**

FIGURE 1-1

G:\23\12527688\GIS\Maps\Deliverables\12527688_Z001_SiteOverview.mxd
Print date: 02 Jul 2020 - 12:34

Data source: Imagery: NSW LPI; Topo Basemap: NSW LPI; Cadastre: SIXMAPS, 04/06/2020; Roads: SIXMAPS, 04/06/2020; © Department of Finance, Services & Innovation 2017. Created by: LAMaloney

2. Methods

2.1 Background research

A brief landscape analysis was conducted to gauge the landscape value of the vegetation in the study area. The landscape assessment has taken into account the spatial configuration of vegetation, vegetation cover, connectivity and adjacent native vegetation.

Vegetation within a two kilometre radius of the proposal site was viewed using satellite imagery. This analysis was strictly limited to an analysis of the over-storey vegetation. The class and quality of over-storey was not comprehensively assessed for vegetation in the surrounding landscape.

2.1.1 Database review

A search of relevant databases was conducted to obtain records of threatened and migratory species, populations and ecological communities within the region. The search included all species, populations and ecological communities listed under the NSW BC Act and Commonwealth EPBC Act with the potential to occur in the locality. The assessment included a review of:

- BioNet Atlas – threatened species web application, species sightings. Search of all terrestrial threatened flora and fauna species (within a 10 kilometre radius of the proposal site) (searched June 2020) (BCD 2020a)
- BioNet Atlas – threatened species web application, threatened biodiversity profiles (2020b) NSW, online profiles
- BioNet Atlas – vegetation classification for plant community types in the study area
- DAWE (2020a) EPBC Act Protected Matters Search Tool – for a 10 kilometre radius around the proposal site (searched March 2020)
- DAWE (2020b) Species profile and threats database, online profiles
- NSW Department of Primary Industries (DPI) priority weed declarations – Riverina region (DPI 2019) (searched March 2020)
- Any other relevant spatial data such as soils, geology and topography.

The literature review and database searches undertaken assist in overcoming some of the limitations associated with a short survey period, survey timing and the types of survey methods employed.

2.2 Habitat assessment

An assessment of the likelihood of occurrence was completed for listed species, populations and ecological communities with the potential to occur in the study area of the proposal site.

In assessing which of these species, populations and ecological communities are 'likely' to occur within the study area (as described in '*Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities Working Draft*)' (DEC 2004) the following factors were taken into consideration:

- The presence of potential habitat within the study area
- Condition and approximate extent of potential habitat within the study area
- Species occurrence within the locality and region (including results of current and previous surveys and results of database searches and literature review).

It was determined that no species were considered likely to be impacted by the proposal due to the location of the proposal site, and the lack of suitable, connected habitat at the site for species to occur in.

2.3 Field surveys

Field based surveys were conducted by two ecologists over one day on the 18 May 2020.

Where appropriate, field surveys were conducted in accordance with *Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities Working Draft* (DEC 2004) and other relevant flora and fauna group species guidelines.

The primary objectives of the field surveys were to:

- Determine the area of threatened species habitat, vegetation communities, threatened ecological communities and endangered populations likely to be directly and indirectly affected by the proposal
- List the threatened biota previously recorded, or predicted to occur in the locality and assess their potential to occur in the study area based on the desktop review and site assessment
- Identify the flora and fauna species occurring within the study area at the time of survey and determine the habitat potential within the study area for any additional flora and fauna species including threatened species listed under the BC Act and EPBC Act;
- Identify any habitat features for threatened and migratory species (e.g. wetlands, waterbodies, rocky outcrops etc.)
- Determine the contribution of the proposal to cumulative impacts on flora and fauna species and their habitat, populations, ecological communities, critical habitats, migratory species and habitats in a local context
- Develop mitigation measures to reduce the potential direct and indirect impacts of the proposal on flora and fauna species in the study area
- Determine the value of the habitat in the study area for flora and fauna species, particularly for threatened species and species of conservation significance, and describe potential impacts that would result from the proposal
- Describe the flora and fauna species, habitat, populations and ecological communities in the study area in relation to their occurrence and quality in the locality
- Determine the condition and extent of vegetation removal required for the proposal.

Survey effort for the proposal is summarised in Table 2-1.

Table 2-1: Summary of survey effort for biodiversity assessment

Survey method	Effort
Flora plot and transect surveys (see Figure 4-1)	Two 20 metre by 50 metre plots within the proposal site to characterise dominant species and abundance. Walking transects were conducted for the length of the proposed development area to characterise vegetation and assess habitat within the site.
Hollow-bearing tree survey	All hollow-bearing trees within the proposal site that have the potential to be impacted were recorded with a GPS.

Survey method	Effort
Fauna habitat assessment	Potential fauna habitat identified within areas of potential vegetation clearing including lot locations, easements and access driveways.
Opportunistic fauna observations	Opportunistic fauna observations for all flora and fauna species encountered during flora surveys and habitat assessment.

2.3.1 Weather conditions

Weather conditions were fine and still during field surveys, with a maximum daytime temperature of 18.6 degrees celsius and a low of 7.5 degrees celsius. Daytime wind gusts reached a maximum of 35 kilometres an hour in an east-north easterly direction. No rain was recorded during surveys.

2.3.2 Flora

Flora surveys were conducted in the subject site and study area using transect and plot surveys (Table 2-1). For the transect survey, the entire length of the proposal site was walked.

Two plots of dimensions 20 metres by 50 metres were surveyed throughout the subject site to assist with species identification and plant community type classification. The following vegetation and habitat characteristics were recorded within each plot:

- Description of vegetation
- Dominant canopy vegetation
- Dominant understorey vegetation
- Groundcover species and abundance
- Any signs of previous disturbance and grazing.

2.3.3 Plant community types

Surveys of vegetation communities in the study area were carried out to characterise vegetation formation, class, structure and condition. Plant community composition is especially important for those areas that have the potential to be a threatened ecological community including derived native grasslands.

Flora surveys enabled determination of the composition and extent of ecological communities occurring in the study area. The study area was investigated to identify vegetation communities present and to identify any areas with the potential to be classified as a threatened ecological community.

For areas with the potential to classify as a threatened ecological community, an analysis was carried out using the criteria for classification under the BC Act and EPBC Act.

Vegetation communities with the potential to be a threatened ecological community were surveyed through characterisation of all vegetation within a plot (50 metres by 20 metres) placed randomly within the vegetation community. Plots were surveyed as detailed in Table 2-1.

2.3.4 Hollow-bearing tree survey

Hollow-bearing trees were surveyed by collecting a GPS position at the location of each tree. For each hollow-bearing tree the following characteristics were recorded:

- Species

- Diameter at breast height (DBH)
- Number of hollows
- Size of hollows (diameter at entrance).

2.3.5 Fauna

Fauna surveys comprised incidental observation and habitat assessment only. Habitat assessments were conducted for all fauna group and, observations of fauna signs. Fauna habitat resources were assessed to identify areas of potential habitat within the study area. Specific resources such as shelter, basking, roosting, nesting and foraging sites for birds, bats, arboreal mammals, amphibians, ground-dwelling mammals and reptiles were noted.

2.4 Habitat assessment

An assessment of the likelihood of occurrence was completed for listed species, populations and ecological communities with the potential to occur in the study area.

In assessing which of these species, populations and ecological communities are 'likely' to occur within the study area (as described in '*Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities Working Draft*)' (DEC 2004) the following factors were taken into consideration:

- The presence of potential habitat within the study area
- Condition and approximate extent of potential habitat within the study area
- Species occurrence within the locality and region (including results of current and previous surveys and results of database searches and literature review).

Criteria used for assessment of the likelihood of occurrence are:

- *Recorded* **–** The species was observed in the study area during the current survey
- *High* **–** It is highly likely that a species inhabits the study area and is dependent on identified suitable habitat (ie. for breeding or important life cycle periods such as winter flowering resources), has been recorded recently in the locality (10 kilometre radius) and is known or likely to maintain resident populations in the study area. Also includes species known or likely to visit the study area during regular seasonal movements or migration
- *Moderate* **–** Potential habitat is present in the study area. Species unlikely to maintain sedentary populations, however may seasonally use resources within the study area opportunistically or during migration. The species is unlikely to be dependent (ie. for breeding or important life cycle periods such as winter flowering resources) on habitat within the study area, or habitat is in a modified or degraded state. Includes cryptic flowering flora species that were not seasonally targeted by surveys and that have not been recorded
- *Low* **–** It is unlikely that the species inhabits the study area and has not been recorded recently in the locality (within 10 kilometres). It may be an occasional visitor, but habitat similar to the study area is widely distributed in the local area, meaning that the species is not dependent (ie. for breeding or important life cycle periods such as winter flowering resources) on available habitat. Specific habitat is not present in the study area or the species is a non-cryptic perennial flora species that were specifically targeted by surveys and not recorded
- *None* – Suitable habitat is absent from the study area.

For each species, population or ecological community with a likelihood of occurrence category of recorded, high or moderate, and likely to be impacted by the proposal, an EP&A Act Test of Significance (5-Part Test) and/or EPBC Act significance assessment was completed.

2.5 Limitations

The timing of flora and fauna surveys for the proposal was not suitable for detection of some key flora and fauna species. However, some fauna species are mobile and transient in their use of resources. Consequently, it is likely that not all species either resident or transitory at the site would have been recorded during the field surveys. The disadvantage of this limitation was reduced by database searches, and by assessing the habitat value of the study area for threatened and migratory species known to occur in the region, to determine their likelihood of occurrence.

Due to the limited habitat value of the small woodland patches in the study area and the lack of other habitat features, fauna surveys were restricted to opportunistic observations and habitat assessment only. Field surveys were not designed to enable all species, either resident or transitory in the study area, to be detected. Instead, they were aimed at identifying the ecological values of the study area, with particular emphasis on threatened and migratory species, to allow an assessment of the potential impacts of the proposal.

For those species of conservation significance that were not detected but likely to occur in the study area, an assessment of the likelihood of their occurrence was made based on known habitat requirements.

Weather conditions during the field surveys were fine and did not affect the results of the surveys. Ecologists had full access to the proposal site.

3. Existing environment

3.1 General description

3.1.1 Bioregion, vegetation and surrounding landuse

The study area occurs in the NSW South West Slopes Bioregion. This bioregion covers the lower inland slopes of the Great Dividing Range extending from north of Cowra through southern NSW into western Victoria.

The proposal site occurs within a mostly cleared and vacant lot running parallel to Wade Street, Coolamon. Surrounding landuse is comprised of residential dwellings, local businesses, railway line, grains silos and agricultural use in the wider study area.

The proposed lots contain mostly introduced groundcover vegetation, with some planted native, non-locally native and introduced trees and shrubs occurring intermittently, particularly along Wade Street. A small patch of native woodland occurs along Wade Street at the eastern end of the proposal site. The woodland is restricted to the immediate roadside, and is no more than 3-4 metres wide. It is isolated from other areas of woodland by the adjacent road and vacant lot.

3.2 Terrain, soils, geology and drainage

Terrain within the project site and wider study area is typically flat to gently undulating. The study area occur in the Ardlethan Hills Mitchell Landscape, which comprises rolling hills and rises on Ordovician quartzose sandstone, greywacke, chert, and phyllite. General elevation is 200 to 412 metres and local relief is 50 to 60 metres.

The site occurs on the Ardlethan Hills Mitchell Landscape, which typically contains stony red and brown texture-contrast soils merging to calcareous red earth on valley floors (Mitchell 2002).

There are no named watercourses in the study area. Two man-made drainage lines cross the proposal site, perpendicular to Wade Street (see Figure 4-1). The site was moderately wet and retained some water in drainage areas after rainfall.

3.3 Climate

In the Coolamon area, the climate is classified as warm semi-arid with a mean annual rainfall of 571.4 millimetres, recorded from the Wagga Wagga weather station (072150). Summers are generally warm to hot while winters are cold. The mean maximum annual temperature is 31.9 degrees celsius, recorded in January, while the mean minimum annual temperature is 2.8 degrees celsius recorded in July from the Wagga Wagga weather station (BoM 2020).

3.4 Groundwater dependent ecosystems

No groundwater dependent ecosystems exist within the proposal site.

3.5 Flora

3.5.1 Flora survey results

The survey of the proposal site identified 79 flora species, of which 33 are native and 46 are introduced (Appendix A).

Within the proposal site, the groundcover vegetation is dominated by introduced species such as Wild oats *(Avena fatua),* Common Storksbill *(Erodium botrys*), Soursob *(Oxalis pes-caprae*)

and wild Gazanias (*Gazania rigens)*. Commonly occurring native species included Ringed Wallaby Grass (*Rytidosperma caespitosum),* Windmill Grass (*Chloris truncata*) and Rigid Panic (*Walwhalleya proluta*). Some native shrubs occurred throughout the site, however mostly this was restricted to non-local, planted species such as *Melaleuca* species. Some naturally occurring shrubs were present in the patch of Grey Box woodland at the eastern extent of the site along Wade Street. This included Wilga (*Geijera parviflora),* and Hakea Wattle (*Acacia hakeoides).*

Although there are patches of grassland across the proposal site that have more native grass cover of Windmill Grass, these patches are small (usually less than 10 metres by 10 metres) and localised within the wider patch which is dominated by mostly introduced groundcover species.

Various tree species occurred throughout the site, however mostly this included planted non-locally native and introduced species such as Sugar Gums (*Eucalyptus cladocalyx*) and Silver-leaved Ironbark (*Eucalyptus melanophloia)*. Some locally native tree species occurred within the proposal site, such as Kurrajong trees (*Brachychiton populneus),* White Cypress Pine (*Callitris glaucophylla)* and Mugga Ironbark (*Eucalyptus sideroxylon).* However, most native occurring canopy species were restricted to the small patch of woodland located along Wade Street at the eastern end of the proposal site. This woodland patch contained Grey Box (*Eucalyptus microcarpa)*, White Cypress Pine (*Callitris glaucophylla)* and Yellow Box (*Eucalyptus melliodora)* along with various native groundcover species such as Blueberry Lilies (*Dianella revoluta* and *Dianella longifolia),* Rock Ferns, (*Cheilanthes austrotenuifolia)* and Purple Wiregrass (*Aristida ramosa).*

There are large number of planted introduced tree species including Peppercorns (*Schinus areira*) and Pine trees (*Pinus radiata*). Most of these occur within the proposed lots rather than in the roadside corridor of Wade Street (see Photo 1).

Hollow-bearing trees were recorded along Wade Street along the proposal site boundary.

Priority weeds

One priority weed species listed for the Riverina control area were identified during surveys, African Boxthorn (*Lycium ferocissimum*). This was located at the eastern end pf the proposal site in native vegetation along Wade Street.

Additionally, Council weed marking signs were observed on site, indicating that part of the proposal site contains Spiny Burr Grass (*Cenchrus longispinus*). Despite a thorough search of the proposal site, this species was not identified within the proposal site by ecologists. However weed markers were recorded and included in Figure 4-1 for reference.

Both weed species carry a General Biosecurity risk, to prevent, eliminate or minimise any biosecurity risk they hold. Additionally African Boxthorn carries a ‘Prohibition on dealings’ duty and must not be imported into the State or sold.

African Boxthorn is also listed as a Weed of National Significance (WONS). WONS species are nationally prioritised weeds based on their invasiveness, potential for spread and environmental, social and economic impacts.

Photo 1: Planted introduced trees and non-locally native trees within the proposal site.

Plant community type

The small patch of woodland occurring along Wade Street at the eastern end of the proposal site meets the classification as the PCT *Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions (PCTID 76)* as per the NSW BioNet Vegetation classification database (see Photo 2).

This plant community type (PCT) meets the classification criteria for the BC Act listed endangered ecology community of Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions (Grey Box Woodland), however it does not meet the criteria for the EPBC Act listing of the community due to the limited diversity of the groundcover species, small size of trees and unconnected patch to larger areas of the same community.

Photo 2: Grey Box woodland at the eastern end of Wade Street road reserve.

3.6 Fauna

3.6.1 Fauna habitats

Field surveys recorded 12 fauna species, three of which are introduced (see Appendix A).

Fauna habitat within the proposal site is generally very limited. The site is mostly cleared and modified, and contains little native vegetation or canopy cover.

Scattered canopy species, and introduced groundcover within the proposal site may provide some limited movement and foraging habitat for common fauna species such as Crested Pigeons (*Ocyphaps lophotes),* Galahs (*Eolophus roseicapillus),* and Blue-faced Honeyeater (*Entomyzon cyanotis)* which were all recorded during site surveys. These species may forage on flowering eucalypts or seeds from groundcover species within the proposal site.

Some hollow-bearing trees were recorded adjacent to the proposal site in the Wade Street road reserve. Where possible it is recommended that hollow-bearing trees are retained. Further details of hollow-bearing trees are provided in Table 3-1.

Woodland

Woodland at the eastern end of the proposal site contains mostly dense White Cypress Pine regrowth and introduced groundcover species. The woodland is restricted to a strip of road reserve only about 3-4 metres wide and 400 metres long (to the boundary of the proposal site), and is unlikely to provide significant habitat for fauna species due to its location in a built up area, and its isolation from other areas of potential habitat.

Canopy vegetation in the woodland on site may provide some sheltering, movement and foraging habitat for small woodland birds such as the Yellow-rumped Thornbill (*Acanthiza chrysorrhoa)* and Pied Butcherbird (*Cracticus nigrogularis).*

Shrubs and native grasses within the woodland in the proposal site are also likely to provide foraging habitat for commonly occurring birds, reptiles and mammal species that may occur at the site intermittently. Introduced groundcover within the woodland can also provide marginal habitat for fauna species.

Hollow-bearing trees were recorded during surveys along the Wade Street roadside reserve. In total 14 hollow-bearing trees were recorded along the roadside reserve, including 11 Sugar Gums and two Yellow Box trees containing a total of 28 hollows. Details of hollow bearing trees are provided below in Table 3-1. No hollow-bearing trees were recorded from within the proposed lots, and all are restricted to the roadside reserve along Wade Street.

Most of the hollow-bearing trees have either very small hollows or hollows that are only just beginning to form. This is likely due to the young age of the trees (planted about 50-70 years ago). Due to the height of some of these hollows above the ground and the hollows just beginning to form, it was difficult to determine if some of the hollows had depth. Some of the hollows in Table 3-1 may not have much depth and therefore have reduced hollow habitat potential.

Table 3-1: Potential hollow-bearing tree species and size classes

ID	Common name *Species name*	DBH (cm)	Hollow size classes (cm)				
			<5	5 to 10	10 to 20	20 to 30	>30
HBT1	Sugar Gum *Eucalyptus cladocalyx*	60-70	0	2	0	0	0
HBT2	Sugar Gum *Eucalyptus cladocalyx*	80-90	0	1	0	0	0
HBT3	Sugar Gum *Eucalyptus cladocalyx*	80-100	0	1	1	0	0
HBT4	Sugar Gum *Eucalyptus cladocalyx*	80-100	0	0	1	0	0
HBT5	Sugar Gum *Eucalyptus cladocalyx*	80-100	0	2	0	0	0
HBT6	Sugar Gum *Eucalyptus cladocalyx*	80-100	0	0	1	1	0
HBT7	Sugar Gum *Eucalyptus cladocalyx*	80-100	0	2	0	0	0
HBT8	Sugar Gum *Eucalyptus cladocalyx*	100-110	0	2	0	0	0
HBT9	Sugar Gum *Eucalyptus cladocalyx*	100-120	1	1	0	0	0
HBT10	Sugar Gum *Eucalyptus cladocalyx*	100-120	2	2	1	0	0
HBT11	Sugar Gum *Eucalyptus cladocalyx*	80-100	1	1	0	0	0
HBT12	Yellow Box *Eucalyptus melliodora*	50-60	0	1	1	0	0
HBT13	Yellow Box *Eucalyptus melliodora*	50-60	0	0	2	0	0

Aquatic habitat

Some man made drainage lines were recorded on site. These were dry during site surveys. Given the lack of native fringing vegetation at the site, and the location of the site in a highly

disturbed area isolated from areas of more suitable, permanent habitat, it is unlikely to provide significant wetland or aquatic habitat for species. Drainage lines may provide temporary habitat for mobile amphibian species such as the Spotted Grass Frog (*Limnodynastes tasmaniensis)* in times of rain, but as discussed above, this is unlikely to be significant. No permanent aquatic habitat or Key Fish Habitat (KFH) occurs on site or is mapped as occurring within the study area.

3.7 Threatened and migratory biota

This section describes the threatened biodiversity and other species of conservation concern present, or likely to occur within the study area based on records from within the locality and the nature of the habitat present within the study area and locality.

3.7.1 Threatened ecological communities

The PCT *Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions (PCTID 76)* was recorded on site. This PCT forms part of the BC Act listed endangered ecological community of Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions (Grey Box woodland). While the PCT present on site meets the criteria for the BC Act listing of this community, it does not meet the criteria for the EPBC Act listing of this community due to the mostly degraded and introduced state of the groundcover stratum, small size of trees and unconnected patch to larger areas of the same community.

3.7.2 Threatened flora

No threatened flora listed under the BC Act or EPBC Act were recorded during field surveys within the study area.

3.7.3 Threatened fauna

No threatened fauna listed under the BC Act of EPBC Act were recorded during field surveys within the study area.

3.7.4 Summary of NSW listed species, communities and populations

Literature reviews, database searches and field surveys identified 19 bird species, three mammal species, five plant species, one amphibian species, three fish species and one reptile species listed under the BC Act that can potentially occur in the study area (see Appendix B).

One ecological community listed under the BC Act was recorded in the study area during surveys. The endangered Grey Box woodland community was recorded in the road reserve within the assessment area (see Figure 4-1), and is likely to require some removal to facilitate the proposal. In total, 0.36 hectares of Grey Box woodland was recorded in the proposal site and the proposal would potentially require the removal of some, or all of this isolated patch of the community. The community is limited to a narrow strip of remnant woodland in the road reserve, approximately 10 metres wide, and is isolated from other native woodland and remnant habitat.

3.7.5 Summary of MNES

Matters of national environmental significance (MNES) are listed and protected under the EPBC Act. The act identifies three MNES relevant to this ecological assessment:

- Threatened species and ecological communities
- Migratory species

- Ramsar wetlands

The literature review, database search and field surveys identified three ecological communities, four flora species, 14 birds, three mammals, one reptiles, three fish species and one frog listed under the EPBC Act that could potentially occur in the locality (see Appendix B).

Of these, no species or ecological communities are considered to have a high or moderate likelihood of occurrence in the study area.

As no species, populations or ecological communities were considered to have a high or moderate likelihood of occurrence and are not likely to be impacted, it was not necessary to prepare significant impact guidelines to assist in determining the significance of the potential impacts of the proposal on MNES.

Migratory species

Migratory species are protected under the international agreements to which Australia is a signatory, including the *Japan-Australia Migratory Bird Agreement* (JAMBA), the *China-Australia Migratory Bird Agreement* (CAMBA), the *Republic of Korea-Australia Migratory Bird Agreement* (RoKAMBA) and the *Bonn Convention on the Conservation of Migratory Species of Wild Animals.* Migratory species are considered MNES and are protected under the EPBC Act.

Three migratory species are considered to possibly occur in the study area, however no migratory bird species were recorded or are considered likely to be impacted by the proposal.

4. Potential impacts

4.1 Direct impacts

4.1.1 Removal of native vegetation

The proposal could remove up to 6.68 hectares of vegetation including both native and introduced vegetation (Table 2-1). Remnant native vegetation to be removed is about 0.36 hectares of Grey Box woodland (Table 2-1). All other vegetation to be removed is not NSW locally native and has been planted or is introduced trees and the groundcover is dominated by introduced species with scattered occurrences of native grasses (see Figure 4-1).

Table 4-1: Summary of vegetation removal for the proposal

Vegetation type	Area (ha)
Introduced grassland	5.72
Planted non local trees and introduced grassland in roadside	0.6
Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina bioregions (PCT ID76) – BC Act Grey Box Woodland	0.36

The removal of native and non-native vegetation includes the mix of trees. Details of tree species and size classes that could be removed by the proposal are shown in Table 4-2. Vegetation to be removed consists of mostly introduced groundcover, and introduced and non-locally native trees. Some native tree species that occur within the proposal site will be required to be removed, including three sapling White Cypress Pine trees and six Kurrajong trees of various sizes. An additional three Grey Box trees occur within the proposal site towards the eastern end of the proposal site near the Wade Street roadside reserve. Although removal of all roadside vegetation has been included in impact assessment, wherever practicable, Council may retain mature trees for visual and aesthetic purposes (see section 5.1.1).

Table 4-2: Tree removal species and size class

Common name *Species name*	Tree size classes (cm)							
	<10	10-20	20-40	40-60	60-80	80-100	>100	Total
Grey Box (*Eucalyptus microcarpa*)	1	0	1	2	0	0	0	4
White Cypress Pine (*Callitris glaucophylla)*	3	0	0	0	0	0	0	3
Kurrajong (*Brachychiton populneus*)	2	2	0	2	0	0	0	6
Native planted trees (within lots)	25	15	2	0	0	0	0	42
Non-native species (no size recorded)	0	0	0	0	0	0	0	0
Roadside vegetation	12	4	1	0	5	9	3	34

About 0.36 hectares of the endangered ecological community of Grey Box woodland listed under the BC Act was recorded along the road edge at the eastern end of the proposal site. As discussed previously, this woodland is unlikely to provide significant habitat for fauna species due to its isolation from other areas of habitat. Given the density of White Cypress Pine trees within the community, access to lots where this community occurs would not be possible without removing most of the occurrence of this community. Wherever possible, the Grey Box trees from this community should be retained for habitat, visual and aesthetic purposes (see section 5.1.1).

4.1.2 Hollow-bearing tree removal

Hollow-bearing trees were recorded during site surveys adjacent to the proposal site along the roadside reserve of Wade Street (see Figure 4-1). No hollow-bearing trees occur within the proposed lots. Where hollow-bearing trees occur at the roadside entrance to lots, these should be retained wherever practicable. However, where this is not practical, removal of Sugar Gum trees with shallow hollows is not likely to result in a loss of good quality habitat within the proposal site and the removal of this habitat has been taken into consideration when applying impact assessment criteria and guidelines (see Appendix C).

4.1.3 Injury and mortality

During construction, death or injury may occur to fauna present during clearing of trees and vegetation. If birds are present but not nesting during construction they will generally move away from the proposal site to escape disturbance. Given the nature of the site, its location within a highly modified landscape within the town of Coolamon, and the lack of significant woodland habitat likely to support a large amount of fauna species, it is unlikely that the proposal will result in a significant increase in fauna movement at the site or in the surrounding study area. Given the 50 kilometre per hour speed limit along Wade Street, vehicle collisions with fauna are unlikely to occur, and therefore be unlikely to cause substantial impacts to any threatened or non-threatened fauna species in the area.

4.1.4 Disturbance of fauna

The proposal has the potential to temporarily affect the use of the study area by fauna as a result of increased disturbance during construction. The use of machinery may temporarily deter some fauna species from using potential habitat in the study area during construction.

Noise can cause change in behaviours such as foraging, requiring additional energy expenditure if fauna need to forage further afield. Given the lack of suitable permanent and potential habitat for fauna species, it is unlikely that fauna will reliably occur at the site or be impacted by changes in the acoustic environment of the area. Impacts during construction would be short-term and temporary, and would be unlikely to deter fauna from using the study area in the long term.

With the implementation of safeguards in section 5.1.2 the proposal would be unlikely to substantially affect fauna in the study area.

4.1.5 Changes in surface hydrology

Construction of the proposal may affect surface runoff characteristics near the proposal site. There is an increased risk of sediment entering the table drains during the construction period following clearing,. The proposal is unlikely to cause any long-term changes in surface hydrology that would adversely impact biota in the study area. The additional surface area of the road is unlikely to have more than a minor impact.

Vegetation type

- Introduced vegetation
- PCTID76: Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregion (BC Act listed - Grey Box Woodland)
- Planted woodland

Paper Size A3

0 40 80 160

Meters

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

N

- Hollow-bearing tree
- Flora plot
- Spiny Burr-grass marker
- Proposal site boundary

Coolamon Shire Council
Industrial subdivision biodiversity assessment

Plant community type and survey effort

Job Number	12527688
Revision	A
Date	02 Jul 2020

FIGURE 4.1

C:\Users\Bturner\Documents\Projects\Coolamon BA\Figures\Coolamon_Biodiversity_10062020.mxd

Suite 3, Level 1, 161-169 Baylis Street Wagga Wagga NSW 2650 Australia **T** 61 2 6923 7400 **F** 61 2 6971 9565 **E** wgamail@ghd.com **W** www.ghd.com

Data source: NSW Government (LPI): Aerial photograph - 2015; roads, waterways - 2012; MIA Renewal Alliance: Early Works proposal footprint - 2017. Created by:bturner

4.2 Indirect impacts

4.2.1 Wildlife connectivity and habitat fragmentation

The small isolated woodland patch within the project site and study area is minimal and highly fragmented by the development of the surrounding area. The site is not well connected to remnant habitat, and woodland within the roadside only occupies about 0.36 hectares.

Due to the limited amount of isolated trees and introduced vegetation proposed to be removed, and the small 0.36 hectares isolated patch of Grey Box woodland to be, it is unlikely that the proposal would fragment woodland habitat in the study area. Fauna would remain able to traverse the study area and wider locality. It is unlikely that species limited in their dispersal abilities would be restrained by the proposed removal of vegetation. Treed vegetation patches in the study area and locality would remain connected.

4.2.2 Invasion and spread of weeds

Groundcover vegetation in the study area is affected by some introduced species and escaped garden varieties including Gazania. The proposal has the potential to further introduce and spread weeds in the study area by movement of machinery and light vehicle traffic during construction of the proposal.

One priority weed species was identified, and one known to occur were recorded during field surveys, African Boxthorn and Spiny-Burr Grass.

The spread of weeds would be managed by implementing safeguards identified in section 5.1.2.

4.2.3 Contamination, erosion and sedimentation

The proposal has the potential to cause impacts to native flora and fauna through spills of fuels and chemicals. This may occur during refuelling operations or during preparation and use of chemicals for weed management. Spills could potentially have localised impacts on terrestrial fauna.

The construction of the proposal has the potential to result in erosion of the area where soils are exposed. This could lead to sedimentation of the table drain, with the potential for sediment to be carried offsite during wet weather events into local drainage lines.

Contamination impacts have the potential to occur during construction. These impacts would be unlikely to be substantial due to the limited area of impact and the implementation of safeguards detailed in section 5.1.2.

4.2.4 Invasion and spread of pathogens

The proposal has the potential to result in the spread of pathogens such as bacteria and fungi. This could occur through the spread of soils on vehicle tyres and operatives' footwear. Impacts of pathogens include spread of known diseases that are detrimental to fauna such as the amphibian chytrid fungus.

Invasion and spread of pathogens and disease have the potential to occur during construction.

The potential spread of pathogens would be minimised through the implementation of safeguards outlined in section 5.1.2.

4.2.5 Bushfire

The proposal has the potential to cause bushfire during construction. Impacts of bushfires may include death and injury to fauna, loss of woodland habitat including hollow bearing trees and loss of potential feed resources. In addition, bushfires may result in changes to structure and

function of woodland communities including changes to groundcover composition. This would be unlikely given the lack of woodland habitat in the surrounding study area .

4.3 Cumulative impacts

The proposal may have minor cumulative impacts associated with the future subdivision and associated residential development in the Coolamon area. This includes small lot rural residential developments to the north and south of Coolamon. However, most of these other residential developments have occurred in previously cleared land or have resulted in removal of native vegetation of less than half a hectare. Given the small scale of vegetation removal, and impacts to fauna habitats associated with the proposal, cumulative impacts are expected to be negligible.

4.4 Assessment of significance

The assessment of likelihood of occurrence found that the proposal is unlikely to impact on any threatened species or communities listed under the BC Act or EPBC Act in the study area and locality, given the low impacts of the proposal on native vegetation (about 0.36 hectares) or habitat of value.

In summary:

- The proposal will remove about 0.36 hectares of isolated Grey Box woodland listed as a threatened ecological community under the NSW BC Act.
- Trees to be removed from the site consisted of mostly planted non-native and non-locally native species
- Native trees to be removed from the site consisted mostly of juvenile and sapling trees
- The site occurs in a highly modified environment surrounded by residential and industrial developments, and is unlikely to provide significant habitat for native flora and fauna.

5. Avoid, minimise and mitigate impacts

Development of the proposal has incorporated a hierarchy of avoiding, minimising and mitigating impacts wherever possible.

5.1.1 Avoidance and minimisation

To allow for the rezoning to establish new light industrial development lots, clearing of existing vegetation at the site is required. To avoid and minimise vegetation impacts on site, native canopy vegetation and trees providing habitat values are recommended to be retained where possible.

Three Grey Box trees occur within the proposal site towards the southern end of the proposal site near the roadside, and it is recommended that these be retained where possible. Given they occur on the roadside edge of the block, where possible and practical, it is recommended that some of these mature native trees should be retained to provide both habitat and aesthetic benefit to the site.

The 0.36 hectare isolated patch of BC Act listed Grey Box woodland at the southern end of Wade Street would require removal to facilitate access to the proposed lots (see Figure 4-1). Where possible, mature trees from the community should be retained. However, clearing of the entire patch given its isolated and regrowth nature is not likely to impact the local occurrence of the community.

Non-locally native planted Sugar Gums containing shallow hollows occur in the roadside reserve of Wade Street (see Figure 4-1). There is some space available between trees to allow for the establishment of driveways and utilities access. However, where impacts to these trees is unavoidable the removal of these trees would occur.

5.1.2 Safeguards and management measures

The safeguards and management measures detailed in Table 5-1 would be implemented to minimise the impacts of the proposal on the environment in the study area. These safeguards and management measures would be incorporated into a CEMP to be implemented during construction.

Table 5-1: Safeguards and management measures

Impact	Safeguards and management measures	Timing
Removal of native vegetation	• Construction boundaries will be clearly marked prior to commencing construction • Ant trees to be retained will be clearly marked on maps and on the ground prior to commencing construction • Roadside trees along Wade Street will be retained whereever practicable. • No native vegetation will be removed beyond the proposal site for either permanent or temporary construction impacts.	Pre-construction
Impacts to fauna	If required, fauna handling during vegetation removal will be undertaken by a licensed fauna ecologist or wildlife carer.	Construction

Impact	Safeguards and management measures	Timing
General	All construction vehicles will be parked in areas already cleared of native vegetation.	Construction
Sediment and erosion control	• Temporary sediment and silt control fencing will be placed on the perimeter of works before commencement of earthworks • Weather forecasts will be checked before construction. If rainfall is predicted for the day of construction, construction will be delayed until no rainfall is predicted and access tracks are dry.	Pre-construction and construction
Spread of weeds	• Care to be taken when working in the vicinity of the area signed as containing Spiny Burr Grass (see Figure 4-1). All topsoil and vegetation matter removed from this area to be disposed of at a licensed facility. No top soil from areas potentially containing the weed should be reused on site or elsewhere. • All other soil excavated during construction will be stockpiled within existing cleared areas for immediate reuse after construction. Any surplus fill will be removed from site and disposed of at an appropriate facility.	Construction
Unexpected threatened species	If unexpected threatened fauna, flora or ecological communities are discovered, works will stop immediately in the vicinity of the find. The environment manager will be notified immediately and an assessment of the likely impacts of the proposal on the threatened species will be completed.	Construction

6. Conclusion

The surrounding study area has been previously cleared and modified for residential, rural and industrial uses. The proposal site is mostly modified and degraded, with canopy species at the site mostly planted non-locally native and introduced species, and groundcover dominated by introduced weeds with smaller patches of native grasses scattered throughout.

An isolated patch Grey Box woodland (0.36 hectares) occurs in the roadside reserve at the eastern end of the proposal site. This patch meets the listing requirements for classification as the BC Act endangered ecological community of Inland Grey Box woodland, as it contains the necessary canopy composition. However, it is unlikely to meet the requirements of the EPBC Act listing of the community due to a lack of floristic diversity of the groundcover stratum, patch size and size of trees.

About six hectares of mostly introduced groundcover, and 113 mostly introduced and planted trees would be removed from within the proposal site. Of the 113 trees, 13 are locally native species such as White Cypress Pine and Kurrajong trees.

Vegetation within the site is generally degraded and poorly connected other areas of habitat due to the sites location in the township of Coolamon amongst various residential and industrial developments. The site does not contain significant native habitat of value to native flora and fauna species.

A number of safeguards and mitigation measures are proposed to minimise the impacts of the proposal on native flora and fauna. It is not considered likely that any flora or fauna listed under the NSW BC Act or Commonwealth EPBC Act will be impacted by the proposal.

7. References

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Appendices

Appendix A – Species list

Flora species list

* denotes an introduced species

Scientific Name	Common Name	Plot 1 % cover	Plot 2 % cover	Incidental
Acacia spp.	-	-	-	✓
Acacia baileyana	Cootamundra Wattle	-	-	✓
Acacia hakeoides	Hakea Wattle	-	0.1	✓
*Arctotheca calendula**	Capeweed	0.2	1	✓
Aristida behriana	Bunch Wiregrass	0.1	-	
Aristida ramosa	Purple Wiregrass	-	-	✓
*Asphodelus fistulosus**	Onion Weed	-	-	✓
Atriplex semibaccata	Creeping Saltbush	-	-	✓
Austrostipa scabra	Speargrass	0.5	0.1	✓
*Avena fatua**	Wild Oats	25	0.5	✓
Bothriochloa macra	Red Grass	-	-	✓
Brachychiton populneus	Kurrajong	-	-	✓
*Brassica rapa subsp. campestris**	Turnip	-	-	✓
Callitris glaucophylla	White Cypress Pine	-	0.1	
*Cenchrus clandestinum**	Kikuyu Grass	-	-	✓
Cheilanthes austrotenuifolia	Rock Fern	-	-	✓
Chloris truncata	Windmill Grass	1	25	-
*Cichorium intybus**	Chicory	0.1	-	-
*Cirsium vulgare**	Spear Thistle	-	-	✓
*Conyza bonariensis**	Flaxleaf Fleabane	-	-	✓
*Cyperus eragrostis**	Umbrella Sedge	-	-	✓
Dianella longifolia	Blueberry Lily	-	-	✓
Dianella revoluta	Blueberry Lily	-	-	✓
*Echium plantagineum**	Patterson's Curse	-	-	✓
Einadia nutans	Climbing Saltbush	-	0.1	-
Epilobium hirsutum	Hoary Willow Herb	-	-	✓
*Eragrostis cilianensis**	Stinkgrass	-	-	✓
*Erodium botrys**	Long Storksbill	5	2	-
*Erodium moschatum**	Musky Crowfoot	0.5	-	-
Eucalyptus cladocalyx	Sugar Gum	-	-	✓
Eucalyptus melanophloia	Silver-leaved Ironbark	-	-	✓
Eucalyptus melliodora	Yellow Box	-	-	✓
Eucalyptus microcarpa	Western Grey Box	-	3	✓
Eucalyptus sideroxylon	Mugga Ironbark	-	-	✓
*Euphorbia spp.**		-	-	✓
*Gazania spp.**	Gazania	5	0.2	✓
Geijera parviflora	Wilga	-	-	✓

Scientific Name	Common Name	Plot 1 % cover	Plot 2 % cover	Incidental
*Heliotropium europaeum**	Potato Weed	0.3	-	-
*Hypericum perforatum**	St. Johns Wort	0.1	-	-
*Hypochaeris radicata**	Catsear	-	-	✓
*Lactuca serriola**	Prickly Lettuce	-	-	✓
*Lepidium africanum**	Common Peppercress	0.1	-	-
Lomandra filiformis	Wattle Matt-rush	-	-	✓
*Lycium ferocissimum**	African Boxthorn	-	-	✓
*Lythrum hyssopifolia**	Hyssop Loosestrife	-	-	✓
Maireana enchylaenoides	Wingless Fissure-weed	-	0.2	-
*Malva parviflora**	Small-flowered Mallow	0.1	-	✓
Melaleuca spp.		-	-	✓
*Modiola caroliniana**	Red-flowered Mallow	-	-	✓
*Olea europaea**	Common Olive	-	-	✓
*Oxalis latifolia**		-	0.1	-
*Oxalis pes-caprae**	Soursob	-	1	-
*Papaver somniferum**	Opium Poppy	-	-	✓
*Paspalum dilatatum**	Paspalum	-	-	✓
*Paspalum spp.**		-	-	✓
*Pinus radiata**	Radiata Pine	-	-	✓
*Poa annua**	Winter Grass	-	-	✓
*Portulaca oleracea**	Pigweed	-	-	✓
*Romulea minutiflora**	Small-flowered Onion Grass	-	-	✓
*Romulea rosea var. australis**	Onion Grass	-	0.1	-
*Rumex crispus**	Curled Dock	-	-	✓
Rytidosperma caespitosum	Ringed Wallaby Grass	-	0.1	✓
Rytidosperma pallidum	Redanther Wallaby Grass	-	-	✓
*Salvia verbenaca**	Vervain	-	-	✓
*Schinus areira**	Pepper Tree	-	-	✓
Sclerolaena muricata	Black Rolypoly	-	-	✓
*Setaria verticillata**	Whorled Pigeon Grass	0.2	-	✓
Sida corrugata	Corrugated Sida	0.1	0.1	-
*Sonchus oleraceus**	Common Sowthistle	-	-	✓
*Trifolium angustifolium**	Narrow-leaved Clover	-	-	✓
*Trifolium arvense**	Haresfoot Clover	-	-	✓
*Trifolium glomeratum**	Clustered Clover	-	0.2	✓
*Trifolium subterraneum**	Subterranean Clover	-	-	✓
*Verbascum virgatum**	Twiggy Mullein	-	-	✓
Vittadinia cuneata var. cuneata	A Fuzzweed	-	0.1	-
Wahlenbergia stricta	Tall Bluebell	-	0.1	-
Walwhalleya proluta		0.5	-	✓

Fauna species list

* denotes an introduced species

Observation type – O = observed, W = heard

None of the species recorded were listed as threatened under the NSW BC Act or Commonwealth EPBC Act.

Scientific Name	Common Name	Observation type
**Columba livia*	Rock Dove	O
Anthochaera carunculata	Red Wattlebird	W
Entomyzon cyanotis	Blue-faced Honeyeater	OW
**Passer domesticus*	House Sparrow	O
**Oryctolagus cuniculus*	Rabbit	S
Strepera graculina	Pied Currawong	OW
Eolophus roseicapillus	Galah	OW
Cracticus tibicen	Australian Magpie	OW
Ocyphaps lophotes	Crested Pigeon	O
Cracticus nigrogularis	Pied Butcherbird	O
Acanthiza chrysorrhoa	Yellow-rumped Thornbill	O
Pachycephala rufiventris	Rufous Whistler	W

Appendix B – Likelihood of occurrence

An evaluation of the likelihood and extent of impact to threatened and migratory fauna recorded from within the Coolamon local government area (BC Act threatened species); and within a 10 kilometre radius of the proposal site (EPBC Act threatened and migratory species). Records are from the EPBC Environmental Reporting Tool available from the Department of Agrculture, Water and the Environment (DAWE) website. Biodiversity information has been obtained from the Threatened Species Profiles on the NSW OEH website (http://www.environment.nsw.gov.au/threatenedspecies/) and from the Species Profiles and Threats Database on the Commonwealth DotEE website (http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl).

Status

- National - Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.
- NSW - *Biodiversity Conservation Act 2016*
- E Endangered
- CE Critically Endangered
- EP Endangered population
- V Vulnerable
- Mi Migratory

Likelihood of occurrence in study area

Recorded – The species was observed in the study area during the current survey

High – It is highly likely that a species inhabits the study area and is dependent on identified suitable habitat (i.e. for breeding or important life cycle periods such as winter flowering resources), has been recorded recently in the locality (within 10 kilometres) and is known or likely to maintain resident populations in the study area. Also includes species known or likely to visit the study area during regular seasonal movements or migration

Moderate – Potential habitat is present in the study area. Species unlikely to maintain sedentary populations, however may seasonally use resources within the study area opportunistically or during migration. The species is unlikely to be dependent (ie. for breeding or important life cycle periods such as winter flowering resources) on habitat within the study area, or habitat is in a modified or degraded state. Includes cryptic flowering flora species that were not seasonally targeted by surveys and that have not been recorded

Low – It is unlikely that the species inhabits the study area and has not been recorded recently in the locality (within 10 kilometres). It may be an occasional visitor, but habitat similar to the study area is widely distributed in the local area, meaning that the species is not dependent (i.e. for breeding or important life cycle periods such as winter flowering resources) on available habitat. Specific habitat is not present in the study area or the species are a non-cryptic perennial flora species that were specifically targeted by surveys and not recorded

None – Suitable habitat is absent from the study area.

Species / Communities	Status		Habitat requirements	Likelihood of occurrence in the proposal site and likelihood of impact
	EPBC Act	BC Act		
Ecological communities				
Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions	-	E	Community occurs on brown loam or clay, alluvial or colluvial soils on prior streams and abandoned channels or slight depressions on undulating plains or flats of the western slopes. Community often occurs upslope from River Red Gum communities above frequently inundated areas of the floodplain. It also occurs on colluvium soils on lower slopes and valley flats. Occurs on alluvial soils of the South West Slopes, Brigalow Belt South and Darling Riverine Plains Bioregions. Mainly in the Dubbo-Narromine-Parkes-Forbes area. Predicted to occur in the locality (BCD, 2020).	**Low:** This community was not recorded during site surveys and is unlikely to be impacted by the proposal.
Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions (BC Act) Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia (EPBC Act)	E	E	Predominantly occurs on the drier edge of the temperate grassy eucalypt woodland belt (375-700 mm rainfall) ranging from central New South Wales through northern and central Victoria into South Australia. Grey Box Grassy Woodlands usually occur in flat to undulating landscapes, such as plains, low slopes and rises, or occasionally in drainage depressions. Patches of this community tend to occur on relatively productive soils. Predicted to occur in the locality (BCD, 2020) Predicted to occur within 20 kilometres of the proposal site using the PMST search (DAWE, 2020)	**Recorded:** This community was recorded during site surveys, and 0.36 hectares of an isolated patch of the community would be removed.
Mallee and Mallee-Broombush dominated woodland and shrubland, lacking Triodia, in the NSW South Western Slopes Bioregion	-	E	Mallee and Mallee-Broombush dominated woodland and shrubland, lacking Triodia, in the NSW South Western Slopes has a very highly restricted distribution, with known occurrences falling with a region of less than 4000 square kilometres bounded by Lake Cowal - Temora - Ardlethan - Ungarie. It is estimated that the total area remaining is	**Low:** This community was not recorded during site surveys and is unlikely to be impacted by the proposal.

Species / Communities	Status		Habitat requirements	Likelihood of occurrence in the proposal site and likelihood of impact
	EPBC Act	BC Act		
			around 2300 hectares within the local government areas of Bland and Temora. Most remaining areas are on private property or within roadside easements, though small areas are known from the following Natures Reserves: Buddigower, The Charcoal Tank, portions of South West Woodland (former Blue Mallee Flora Reserve and State Forest and Wyalong State Forest) and possibly Big Bush. Predicted to occur in the locality (BCD, 2020).	
Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions	-	E	Sandhill Pine Woodland has been recorded in the far south-western portion of the NSW South Western Slopes bioregion near Urana, extending through the Riverina bioregion, from the Urana – Narranderra district in the east, into the southern part of the Murray-Darling Depression bioregion, as far west as the South Australian border. In the Riverina bioregion and the far south-western portion of the NSW South Western Slopes bioregion, the community is typically associated with prior streams and aeolian source-bordering dunes, which are scattered within an extensive alluvial clay plain dominated by chenopod shrublands. Sandhill Pine Woodland typically occupies red-brown loamy sands with alkaline sub-soils on the alluvial plain of the Murray River and its tributaries, and on parts of the sandplain in south-western NSW. Predicted to occur in the locality (BCD, 2020)	**Low:** This community was not recorded during site surveys and is unlikely to be impacted by the proposal.
White Box Yellow Box Blakely's Red Gum Woodland (BC Act) White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (Box-Gum Woodland) (EPBC Act)	CE	E	Characterised by the presence or prior occurrence of White Box, Yellow Box and/or Blakely's Red Gum. The trees may occur as pure stands, mixtures of the three species or in mixtures with other trees, including wattles. Commonly co-occurring eucalypts include *Eucalyptus bridgesiana, E. polyanthemos, E. rubida, E. pauciflora, E. cinerea, E. mannifera, E. macrorhyncha, E. microcarpa* and others.	**Low:** This community was not recorded during site surveys and is unlikely to be impacted by the proposal.

Species / Communities	Status		Habitat requirements	Likelihood of occurrence in the proposal site and likelihood of impact
	EPBC Act	BC Act		
			Predicted to occur in the locality (BCD, 2020) Predicted to occur within 20 kilometres of the proposal site using the PMST search (DAWE, 2020)	
Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions (BC Act) Weeping Myall woodlands (EPBC Act)	E	E	The Weeping Myall Woodlands occurs on the inland alluvial plains west of the Great Dividing Range in NSW and QLD. It occurs in the Riverina, NSW South Western Slopes, Darling Riverine Plains, Brigalow Belt South, Murray-Darling Depression, Nandewar and Cobar Peneplain Interim Biogeographic Regionalisation for Australia (IBRA) bioregions. Predicted to occur in the locality (BCD, 2020) Predicted to occur within 20 kilometres of the proposal site using the PMST search (DAWE, 2020)	**Low:** This community was not recorded during site surveys and is unlikely to be impacted by the proposal.
Plants				
Austrostipa wakoolica A spear-grass	E	E	Confined to the floodplains of the Murray River tributaries of central-western and south-western NSW, with localities including Manna State Forest, Matong, Lake Tooim, Merran Creek, Tulla, Cunninyeuk and Mairjimmy State Forest (now part of South West Woodland Nature Reserve). Grows on floodplains of the Murray River tributaries, in open woodland on grey, silty clay or sandy loam soils; habitats include the edges of a lignum swamp with box and mallee; creek banks in grey, silty clay; mallee and lignum sandy-loam flat; open Cypress Pine forest on low sandy range; and a low, rocky rise. Predicted to occur within 20 kilometres of the proposal site using the PMST search (DAWE, 2020).	**Low:** Specific habitat requirements and associated species for this species are not present within the proposal site. The site is highly modified and degraded, and it is unlikely that this species would persist on site.
Caladenia arenaria Sand-hill Spider-Orchid	E	E	Caladenia arenaria is found mostly on the south west plains and western south west slopes. The original description is of a plant from Nangus, west of Gundagai (1865) and there is a report of the species from Adelong near Tumut. A record near Cootamundra needs verifying. The Sand-hill Spider	**Low:** The species is unlikely to occur in the study area due to its degraded nature, the dominance of introduced species and lack of favoured sandy habitat. The nearest records in the region are from Yarrenjerry

Species / Communities	Status		Habitat requirements	Likelihood of occurrence in the proposal site and likelihood of impact
	EPBC Act	BC Act		
			Orchid is currently only known to occur in the Riverina between Urana and Narranderra. Occurs in woodland with sandy soil, especially that dominated by White Cypress Pine (Callitris glaucophylla) This species is known or was predicted to occur within a 10 kilometre radius of the proposal site using the PMST.	State Forest about 50 kilometres to the north.
Diuris tricolor Pine Donkey Orchid	-	V	Sporadically distributed on the western slopes of NSW, extending from south of Narrandera all the way to the north of NSW. Localities in the south include Red Hill north of Narrandera, Coolamon, and several sites west of Wagga Wagga. Condobolin-Nymagee road, Wattamondara towards Cowra, Eugowra, Girilambone, Dubbo and Cooyal, in the Central West. Pilliga SCA, Pilliga National Park and Bibblewindi State Forest in the north and Muswellbrook in the east. Disturbance regimes are not known, although the species is usually recorded from disturbed habitats. Associated species include Callitris glaucophylla, Eucalyptus populnea, Eucalyptus intertexta, Ironbark and Acacia shrubland. The understorey is often grassy with herbaceous plants such as Bulbine species. Predicted to occur in the locality (BCD, 2020)	**Low:** This species is known from locations in the Coolamon locality in suitable habitat. The proposal site was surveyed, and due to the highly modified and degraded nature of the site, and the lack of suitable associated habitat for the species, it is unlikely to occur.
Swainsona murrayana Slender Darling-pea	V	V	Found throughout NSW , it has been recorded in the Jerilderie and Deniliquin areas of the southern riverine plain, the Hay plain as far north as Willandra National Park, near Broken Hill and in various localities between Dubbo and Moree. Occurs in grassland, herbland and open Black-box woodland. Associated with low chenopod shrubs *Maireana* species, wallaby-grass *Austrodanthonia* species and spear grass *Austrostipa* species. Flowers from spring to early summer. Grows on heavy grey or brown clay, loam, or red cracking clays. Grows in a variety of vegetation types including bladder saltbush, black box and grassland communities on level	**Low:** Associated habitat components and species (chenopod shrublands) are not present within the proposal site or are likely to be present in the wider study area. It is unlikely that this species will occur in the proposal site or study area.

Species / Communities	Status		Habitat requirements	Likelihood of occurrence in the proposal site and likelihood of impact
	EPBC Act	BC Act		
			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. Predicted to occur within 20 kilometres of the proposal site using the PMST search (DAWE, 2020)	
Tylophora linearis	E	V	Majority of records occur in the central western region. Records from Goonoo, Pillaga West, Pillaga East, Bibblewindi, Cumbil and Eura State Forests, Coolbaggie NR, Goobang NP and Beni SCA. Also has been recorded Hiawatha State Forest near West Wyalong in the south and there are old records as far north as Crow Mountain near Barraba and near Glenmorgan in the western Darling Downs. 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.* Predicted to occur within 20 kilometres of the proposal site using the PMST search (DAWE, 2020).	**Low:** Associated habitat components for this species are not found within the proposal site, and no records exist in the wider study area. It is unlikely that this species will occur within the proposal site or the wider study area.

Fauna

Species	Status		Habitat requirements	Likelihood of occurrence in the proposal site and study area and likelihood of impact
	EPBC Act	BC/FM Act		
Birds				
Australasian Bittern *Botaurus poiciloptilus*	E	E	This species favours permanent freshwater wetlands with tall, dense vegetation, particularly bullrushes (Typha spp.) and spikerushes (Eleocharis spp.). Hides during the day among	**Low:** No suitable wetland habitat occurs on site or will be impacted by the proposal. This species is

Species	Status		Habitat requirements	Likelihood of occurrence in the proposal site and study area and likelihood of impact
	EPBC Act	BC/FM Act		
			dense reeds or rushes and feed mainly at night on frogs, fish, yabbies, spiders, insects and snails. Predicted to occur within 20 kilometres of the proposal site using the PMST search (DAWE, 2020)	unlikely to occur due to a lack of suitable potential habitat.
Australian Painted Snipe *Rostratula australis*	E	E	Prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber. Nests on the ground among tall vegetation, such as grasses, tussocks or reeds. Forages nocturnally on mud-flats and in shallow water. Predicted to occur within 20 kilometres of the proposal site using the PMST search (DAWE, 2020)	**Low:** No suitable wetland habitat occurs on site or will be impacted by the proposal. This species is unlikely to occur due to a lack of suitable potential habitat.
Brown Treecreeper (eastern subspecies) *Climacteris picumnus Victoriae*	-	V	Found in eucalypt woodlands (including Box-Gum Woodland) and dry open forest of the inland slopes and plains inland of the Great Dividing Range. The species mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey, sometimes with one or more shrub species, and is also found in mallee and River Red Gum Forest bordering wetlands with an open understorey of acacias, saltbush, lignum, cumbungi and grasses. They are usually not found in woodlands with a dense shrub layer. Multiple recent records exist in the locality. The closest records occurs four kilometres north of the proposal site (BCD, 2020).	**Low:** The species may occur as an occasional visitor to the study area and proposal site, but is unlikely to be reliant on any vegetation to be impacted by the proposal due to its low habitat value and unconnected remnant native vegetation. This species is unlikely to be impacted by the proposal.
Curlew Sandpiper *Calidris ferruginea*	CE	E	The Curlew Sandpiper is distributed around most of the Australian coastline (including Tasmania). It occurs along the entire coast of NSW, particularly in the Hunter Estuary, and sometimes in freshwater wetlands in the Murray-Darling Basin. Inland records are probably mainly of birds pausing for a few days during migration. The Curlew Sandpiper breeds in Siberia and migrates to Australia (as well as Africa and Asia) for the non-breeding	**Low:** No suitable wetland habitat occurs on site or will be impacted by the proposal. This species is unlikely to occur due to a lack of suitable potential habitat.

Species	Status		Habitat requirements	Likelihood of occurrence in the proposal site and study area and likelihood of impact
	EPBC Act	BC/FM Act		
			period, arriving in Australia between August and November, and departing between March and mid-April. It generally occupies littoral and estuarine habitats, and in New South Wales is mainly found in intertidal mudflats of sheltered coasts. It also occurs in non-tidal swamps, lakes and lagoons on the coast and sometimes inland. Predicted to occur within 20 kilometres of the proposal site using the PMST search (DAWE, 2020)	
Dusky Woodswallow *Artamus cyanopterus cyanopterus*	-	V	Dusky woodswallows are widespread in eastern, southern and south western Australia. The species occurs throughout most of New South Wales, but is sparsely scattered in, or largely absent from, much of the upper western region. Most breeding activity occurs on the western slopes of the Great Dividing Range. Primarily inhabit dry, open eucalypt forests and woodlands, including mallee associations, with an open or sparse understorey of eucalypt saplings, acacias and other shrubs, and ground-cover of grasses or sedges and fallen woody debris. It has also been recorded in shrublands, heathlands and very occasionally in moist forest or rainforest. Also found in farmland, usually at the edges of forest or woodland.. Multiple recent records exist in the locality. The closest records occurs 4 kilometres north of the proposal site (BCD, 2020)	**Moderate:** The species may occur as an occasional visitor to the study area and proposal site, but is unlikely to be reliant on any vegetation to be impacted by the proposal due to its low habitat value. This species is unlikely to be impacted by the proposal
Eastern Curlew *Numenius madagascarriensis*	CE	-	The Curlew is a migratory bird that travels from Australia to Russia. In Australia it is primarily coastal, residing in estuaries, bays, harbours, inlets and coastal lagoons. Forages on crabs and molluscs on mudflats (Marchant and Higgins, 1993). Predicted to occur within 20 kilometres of the proposal site using the PMST search (DAWE, 2020)	**Low:** No suitable wetland habitat occurs on site or will be impacted by the proposal. This species is unlikely to occur due to a lack of suitable potential habitat.

Species	Status		Habitat requirements	Likelihood of occurrence in the proposal site and study area and likelihood of impact
	EPBC Act	BC/FM Act		
Flame Robin *Petroica phoenicea*	-	V	The Flame Robin is endemic to south eastern Australia, and ranges from near the Queensland border to south east South Australia and also in Tasmania. In NSW, it breeds in upland areas and in winter, many birds move to the inland slopes and plains. It is likely that there are two separate populations in NSW, one in the Northern Tablelands, and another ranging from the Central to Southern Tablelands. Breeds in upland tall moist eucalypt forests and woodlands, often on ridges and slopes. Prefers clearings or areas with open understoreys. The groundlayer of the breeding habitat is dominated by native grasses and the shrub layer may be either sparse or dense. Multiple recent records exist in the locality. The closest records occurs 4.8 kilometres north of the proposal site (BCD, 2020)	**Moderate:** The species may occur as an occasional visitor to the study area and proposal site, but is unlikely to be reliant on any vegetation to be impacted by the proposal due to its low habitat value. This species is unlikely to be impacted by the proposal due to a lack of suitable potential habitat.
Grey-crowned Babbler *Pomatostomus temporalis temporalis*	-	V	The eastern subspecies (temporalis occurs from Cape York south through Queensland, NSW and Victoria and formerly to the south east of South Australia. This subspecies also occurs in the Trans-Fly Region in southern New Guinea. In NSW, the eastern sub-species occurs on the western slopes of the Great Dividing Range, and on the western plains reaching as far as Louth and Balranald. It also occurs in woodlands in the Hunter Valley and in several locations on the north coast of NSW. It may be extinct in the southern, central and New England tablelands. Inhabits open Box-Gum Woodlands on the slopes, and Box-Cypress-pine and open Box Woodlands on alluvial plains. Woodlands on fertile soils in coastal regions. Multiple recent records exist in the locality. The closest records occurs 4.8 kilometres north of the proposal site (BCD, 2020)	**Low:** The species may occur as an occasional visitor to the study area and proposal site as it often forages in Grey Box woodland containing White Cypress Pine. The removal of 0.36 hectares of unconnected native vegetation is unlikely to impact on the potential habitat for this species.
Glossy Black-Cockatoo	-	V	The species is uncommon although widespread throughout suitable forest and woodland habitats, from the central	**Low:** The species may occur intermittently around the site occasionally, but no suitable habitat exists

Species	Status		Habitat requirements	Likelihood of occurrence in the proposal site and study area and likelihood of impact
	EPBC Act	BC/FM Act		
Calyptorhynchus lathami			Queensland coast to East Gippsland in Victoria, and inland to the southern tablelands and central western plains of NSW, with a small population in the Riverina. An isolated population exists on Kangaroo Island, South Australia. Inhabits open forest and woodlands of the coast and the Great Dividing Range where stands of sheoak occur. Black Sheoak (*Allocasuarina littoralis*) and Forest Sheoak (*A. torulosa*) are important foods. Inland populations feed on a wide range of sheoaks, including Drooping Sheoak, *Allocasuaraina diminuta,* and *A. gymnathera*. Belah is also utilised and may be a critical food source for some populations. The species is known to occur over Coolamon intermittently, and has been recorded 1.3 kilometres south of the proposal site.	for the species on site and it is unlikely to reliably occur due to a lack of suitable potential habitat.
Glossy Ibis *Plegadis falcinellus*	Mi	-	The Glossy Ibis is the smallest Ibis known in Australia, and is generally located east of the Kimberly in Western Australia and Eyre Peninsula in South Australia. The species is known to be patchily distributed in the rest of Western Australia and is rare or a vagrant in Tasmania. The Glossy ibis prefers fresh water marshes at the edges of lakes, rivers, agoons, flood-plains, swamps, wet meadows and cultivated areas under irrigation, and is often found in the company of other Ibis species. Predicted to occur within 20 kilometres of the proposal site using the PMST search (DAWE, 2020)	**Low:** No suitable wetland habitat occurs on site or will be impacted by the proposal. This species is unlikely to occur due to a lack of suitable potential habitat.
Hooded Robin *Melanodryas cucullata cucullata*	-	V	The Hooded Robin is widespread, found across Australia, except for the driest deserts and the wetter coastal areas - northern and eastern coastal Queensland and Tasmania. However, it is common in few places, and rarely found on the coast. It is considered a sedentary species, but local seasonal movements are possible. The south-eastern form (subspecies cucullata) is found from Brisbane to Adelaide and throughout much of inland NSW, with the exception of the	**Moderate:** The species may occur as an occasional visitor to the study area and proposal site, but is unlikely to be reliant on any vegetation to be impacted by the proposal due to its low habitat value. This species is unlikely to be impacted by the proposal due to a lack of suitable potential habitat.

Species	Status		Habitat requirements	Likelihood of occurrence in the proposal site and study area and likelihood of impact
	EPBC Act	BC/FM Act		
			extreme north-west, where it is replaced by subspecies picata. Two other subspecies occur outside NSW. Prefers lightly wooded country, usually open eucalypt woodland, acacia scrub and mallee, often in or near clearings or open areas. Requires structurally diverse habitats featuring mature eucalypts, saplings, some small shrubs and a ground layer of moderately tall native grasses. A record for the species exists in the locality. The closest records occurs 4.8 kilometres north of the proposal site (BCD, 2020)	
Little Eagle *Hieraaetus morphnoides*	-	V	The Little Eagle is found throughout the Australian mainland excepting the most densely forested parts of the Dividing Range escarpment. It occurs as a single population throughout NSW. Occupies open eucalypt forest, woodland or open woodland. Sheoak or Acacia woodlands and riparian woodlands of interior NSW are also used. A record for the species exists in the locality. The closest records occurs 4.8 kilometres north of the proposal site (BCD, 2020)	**Low:** The species may occur in the wider study area, but is unlikely to utilise the proposal site as it lacks any suitable habitat for the species.
Major Mitchell's Cockatoo *Lophochroa leadbeateri*	-	V	Found across the arid and semi-arid inland, from south-western Queensland south to north-west Victoria, through most of South Australia, north into the south-west Northern Territory and across to the west coast between Shark Bay and about Jurien. In NSW it is found regularly as far east as about Bourke and Griffith, and sporadically further east than that. Inhabits a wide range of treed and treeless inland habitats, always within easy reach of water. Feeds mostly on the ground, especially on the seeds of native and exotic melons and on the seeds of species of saltbush, wattles and cypress pines. Two historical records from 1998 and 1999 for this species exist within the wider study area, approximately four kilometres from the proposal site.	**Low:** The species may occur intermittently around the site occasionally, but no suitable habitat exists for the species on site and it is unlikely to reliably occur.

Species	Status		Habitat requirements	Likelihood of occurrence in the proposal site and study area and likelihood of impact
	EPBC Act	BC/FM Act		
			The species is known to occur in Coolamon occasionally, and has been recorded 1.3 kilometres south of the proposal site.	
Malleefowl *Leipoa ocellata*	V	E	Occurs in semi-arid to arid mallee country in the south-west of NSW. Its NSW stronghold is centred on Mallee Cliffs NP, extending east to Balranald and with scattered records north to Mungo NP. There are also populations near Dubbo (Goonoo forest). Occasional records exist from the Pilliga, around Cobar and Goulburn River NP. Predominantly inhabit mallee communities, preferring the tall, dense and floristically-rich mallee found in higher rainfall (300 - 450 mm mean annual rainfall) areas. Utilises mallee with a spinifex understorey, but usually at lower densities than in areas with a shrub understorey. Less frequently found in other eucalypt woodlands, such as Inland Grey Box, Ironbark or Bimble Box Woodlands with thick understorey, or in other woodlands such dominated by Mulga or native Cypress Pine species. Prefers areas of light sandy to sandy loam soils and habitats with a dense but discontinuous canopy and dense and diverse shrub and herb layers. Predicted to occur within 20 kilometres of the proposal site using the PMST search (DAWE, 2020)	**Low:** No suitable mallee habitat occurs on site or will be impacted by the proposal. This species is unlikely to occur due to a lack of suitable potential habitat.
Painted Honeyeater *Grantiella picta*	V	V	Nomadic, occurring in low densities across most of NSW. Highest concentrations and almost all breeding occur on inland slopes of the Great Dividing Range. Inhabits Boree, Brigalow and Box Gum woodlands and Box-Ironbark forests. Specialist forager on the fruits of mistletoes, preferably of the Amyema genus. Nests in outer tree canopy. A specialist feeder on the fruits of mistletoes growing on woodland eucalypts and acacias. Prefers mistletoes of the genus *Amyema*. Predicted to occur within 20 kilometres of the proposal site using the PMST search (DAWE, 2020)	**Low:** The proposal site does not contain habitat likely to support the species, the species is unlikely to occur due to a lack of suitable potential habitat.

Species	Status		Habitat requirements	Likelihood of occurrence in the proposal site and study area and likelihood of impact
	EPBC Act	BC/FM Act		
Regent Honeyeater *Anthochaera phrygia*	CE	CE	The species 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. These woodlands have significantly large numbers of mature trees, high canopy cover and abundance of mistletoes. Predicted to occur within 20 kilometres of the proposal site using the PMST search (DAWE, 2020)	**Low:** The proposal site does not contain habitat likely to support the species, the species is unlikely to occur due to a lack of suitable potential habitat.
Speckled Warbler *Chthonicola sagittata*	-	V	The Speckled Warbler has a patchy distribution throughout south-eastern Queensland, the eastern half of NSW and into Victoria, as far west as the Grampians. The species is most frequently reported from the hills and tablelands of the Great Dividing Range, and rarely from the coast. The Speckled Warbler lives in a wide range of Eucalyptus dominated communities that have a grassy understorey, 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. A record for the species exists in the locality. The closest records occurs 4.8 kilometres north of the proposal site (BCD, 2020)	**Low:** The proposal site does not contain habitat likely to support the species, as no large, relatively undisturbed habitat exists in the study area. The species is unlikely to occur due to a lack of suitable potential habitat.
Superb Parrot *Polytelis swainsonii*	V	V	The Superb Parrot is found throughout eastern inland NSW. On the South-western Slopes their core breeding area is roughly bounded by Cowra and Yass in the east, and Grenfell, Cootamundra and Coolac in the west. Birds breeding in this region are mainly absent during winter, when they migrate north to the region of the upper Namoi and Gwydir Rivers. The other main breeding sites are in the Riverina along the corridors of the Murray, Edward and Murrumbidgee Rivers where birds are present all year round. In the Riverina the birds nest in the hollows of large trees	**Low:** The species may occur as an occasional visitor to the study area and proposal site, but is unlikely to be reliant on any vegetation to be impacted by the proposal due to its low habitat value. This species is unlikely to be impacted by the proposal.

Species	Status		Habitat requirements	Likelihood of occurrence in the proposal site and study area and likelihood of impact
	EPBC Act	BC/FM Act		
			(dead or alive) mainly in tall riparian River Red Gum Forest or Woodland. On the South West Slopes nest trees can be in open Box-Gum Woodland or isolated paddock trees. Species known to be used are Blakely's Red Gum, Yellow Box, Apple Box and Red Box. Inhabit Box-Gum, Box-Cypress-pine and Boree Woodlands and River Red Gum Forest. The species is known to occur in the Coolamon area an a record for the species exists 2.1 kilometres west of the proposal site (BCD, 2020). Predicted to occur within 20 kilometres of the proposal site using the PMST search (DAWE, 2020).	
Swift Parrot *Lathamus discolor*	CE	E	Breeds in Tasmania during spring and summer, migrating in the autumn and winter months to south-eastern Australia from Victoria and the eastern parts of South Australia to south-east Queensland. In NSW mostly occurs on the coast and south west slopes. On the mainland they occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations. Favoured feed trees include winter flowering species such as Swamp Mahogany Eucalyptus robusta, Spotted Gum Corymbia maculata, Red Bloodwood C. gummifera, Mugga Ironbark E. sideroxylon, and White Box E. albens. Commonly used lerp infested trees include Inland Grey Box E. microcarpa, Grey Box E. moluccana and Blackbutt E. pilularis. Predicted to occur within 20 kilometres of the proposal site using the PMST search (DAWE, 2020)	**Low:** The proposal site does not contain habitat likely to support the species, the species is unlikely to occur due to a lack of suitable potential habitat.
White-fronted Chat *Epthianura albifrons*	-	V	The White-fronted Chat is found across the southern half of Australia, from southernmost Queensland to southern Tasmania, and across to Western Australia as far north as Carnarvon. Found mostly in temperate to arid climates and very rarely sub-tropical areas, it occupies foothills and lowlands up to 1000 m above sea level. In NSW, it occurs mostly in the southern half of the state, in damp open habitats along the	**Moderate:** The species may occur as an occasional visitor to the study area and proposal site, but is unlikely to be reliant on any vegetation to be impacted by the proposal due to its low habitat value. This species is unlikely to be

Species	Status		Habitat requirements	Likelihood of occurrence in the proposal site and study area and likelihood of impact
	EPBC Act	BC/FM Act		
			coast, and near waterways in the western part of the state. Along the coastline, it is found predominantly in saltmarsh vegetation but also in open grasslands and sometimes in low shrubs bordering wetland areas. Gregarious species, usually found foraging on bare or grassy ground in wetland areas, singly or in pairs. They are insectivorous, feeding mainly on flies and beetles caught from or close to the ground. A record for the species exists in the locality. The closest records occurs 4.8 kilometres north of the proposal site (BCD, 2020)	impacted by the proposal due the small scale of impacts and the lack of suitable potential habitat.
White-throated Needletail *Hirundapus caudacutus*	Mi	-	The White-throated Needletail is widespread in eastern and south-eastern Australia. In eastern Australia, it is recorded in all coastal regions of Queensland and NSW, extending inland to the western slopes of the Great Divide and occasionally onto the adjacent inland plains. A large proportion of the White-throated Needletails of the nominate subspecies would occur in Australia as non-breeding visitors. Most White-throated Needletails spend the non-breeding season in Australasia, mainly in Australia, and occasionally in New Guinea and New Zealand, though it has been suggested that some may overwinter in parts of South-East Asia. As the Needletails that occur in Australia migrate from breeding areas in the Northern Hemisphere, they would be affected by global threats. Predicted to occur within 20 kilometres of the proposal site using the PMST search (DAWE, 2020)	**Low:** This species may occur aerially of the proposal site, but will not be impacted by the proposal as no habitat of value for the species will be impacted.
Mammals				
Corben's Long-eared Bat *Nycotophilus corbeni*	V	V	Overall, the distribution of the south eastern form coincides approximately with the Murray Darling Basin with the Pilliga Scrub region being the distinct stronghold for this species. Inhabits a variety of vegetation types, including mallee, bulloke and box eucalypt dominated communities, but it is distinctly	**Low:** This species is unlikely to occur as no woodland habitat suitable for this species occurs in the study area. The removal of 0.36 hectares of unconnected native vegetation is unlikely to impact on the potential habitat for this species

Species	Status		Habitat requirements	Likelihood of occurrence in the proposal site and study area and likelihood of impact
	EPBC Act	BC/FM Act		
			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. Predicted to occur within 20 kilometres of the proposal site using the PMST search (DAWE, 2020)	
Koala *Phascolarctos cinereus*	V	V	The Koala has a fragmented distribution throughout eastern Australia from north-east Queensland to the Eyre Peninsula in South Australia. In NSW it mainly occurs on the central and north coasts with some populations in the west of the Great Dividing Range. It was briefly historically abundant in the 1890s in the Bega District on the south coast of NSW, although not elsewhere, but it now occurs in sparse and possibly disjunct populations. Koalas are also known from several sites on the southern tablelands. 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. Predicted to occur within 20 kilometres of the proposal site using the PMST search (DAWE, 2020).	**Low:** This species is unlikely to occur as no woodland habitat suitable for this species occurs in the study area. This species is unlikely to be impacted by the proposal due to a lack of suitable potential habitat within the proposal site.
Grey-headed Flying Fox *Pteropus poliocephalus*	V	V	Roosts in camps within 20km of a regular food source, typically in gullies, close to water and in vegetation with a dense canopy. Forages in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths, swamps and street trees, particularly in eucalypts, melaleucas and banksias. Highly mobile with movements largely determined by food availability (Eby & Law, 2008). Will also forage in urban gardens and cultivated fruit crops. Predicted to occur within 20 kilometres of the proposal site using the PMST search (DAWE, 2020).	**Low:** This species is unlikely to occur as no woodland habitat suitable for this species occurs in the study area. This species is unlikely to be impacted by the proposal due to a lack of suitable potential habitat within the proposal site.

Species	Status		Habitat requirements	Likelihood of occurrence in the proposal site and study area and likelihood of impact
	EPBC Act	BC/FM Act		
Flathead Galaxias *Galaxias rostratus*	CE	CE	The species is generally found mid-water in still and gently moving waters of small streams, lakes, lagoons, billabongs and backwaters. Its habitat consists of coarse sand or mud substrate and aquatic vegetation. It is thought that the species may be locally extinct from the lower Murray, Murrumbidgee, Macquarie and Lachlan Rivers. Predicted to occur within 20 kilometres of the proposal site using the PMST search (DAWE, 2020).	**None:** No suitable aquatic habitat occurs on site for this species
Macquarie Perch *Macquaria australasica*	E	E	Occurs in the upper reaches of the Lachlan, Murrumbidgee and Murray Rivers, and in parts of the Hawkesbury and Shoalhaven catchment areas. Inhabits river and lake habitats, especially the upper reaches of rivers and their tributaries. Requires clear water with deep, rocky holes and abundant cover (including aquatic vegetation, woody debris, large boulders and overhanging banks). Spawning occurs in spring and summer in shallow upland streams or flowing sections of river systems. Predicted to occur within 20 kilometres of the proposal site using the PMST search (DAWE, 2020).	**None:** No suitable aquatic habitat occurs on site for this species
Murray Cod *Maccullochella peelii peelii*	V	-	Occurs throughout the Murray-Darling Basin. Can live in a wide range of habitats, from clear, rocky streams in the upper western slopes regions of New South Wales to the slow flowing, turbid rivers and billabongs of the western plains. Generally, they are found in waters up to 5m deep and in sheltered areas with cover from rocks, timber or overhanging banks. The presence of wood debris has been shown to be the primary factor determining Murray cod presence. Predicted to occur within 20 kilometres of the proposal site using the PMST search (DAWE, 2020).	**None:** No suitable aquatic habitat occurs on site for this species
Pink-tailed Worm Lizard *Aprasia parapulchella*	V	V	Populations occur in the Queanbeyan/Canberra district, Cooma, Yass, Bathurst, Albury and West Wyalong areas. Inhabits grassland and open woodland with substantial embedded rock cover in sunny situations. Recorded in both	**Low:** No suitable rocky habitat occurs on site for this species.

Species	Status		Habitat requirements	Likelihood of occurrence in the proposal site and study area and likelihood of impact
	EPBC Act	BC/FM Act		
			native and non-native grasslands. Usually recorded under small rocks (150 - 600 mm basal area) shallowly embedded in the soil (2 - 5 cm, and use ant burrows under these rocks. Predicted to occur within 20 kilometres of the proposal site using the PMST search (DAWE, 2020).	
Southern Bell Frog *Litoria raniformis*	V	E	In NSW the species was once distributed along the Murray and Murrumbidgee Rivers and their tributaries, the southern slopes of the Monaro district and the central southern tablelands as far north as Tarana, near Bathurst. Currently, the species is known to exist only in isolated populations in the Coleambally Irrigation Area, the Lowbidgee floodplain and around Lake Victoria. A few yet unconfirmed records have also been made in the Murray Irrigation Area in recent years. The species is also found in Victoria, Tasmania and South Australia, where it has also become endangered. Usually found in or around permanent or ephemeral Black Box/Lignum/Nitre Goosefoot swamps, Lignum/Typha swamps and River Red Gum swamps or billabongs along floodplains and river valleys. They are also found in irrigated rice crops, particularly where there is no available natural habitat. Predicted to occur within 20 kilometres of the proposal site using the PMST search (DAWE, 2020).	**Low:** No suitable aquatic or wetland habitat occurs on site for this species.

Appendix C – Assessments of significance

EP&A Act assessments of significance (Biodiversity Conservation Act)

Section 7.3 of the *Biodiversity Conservation Act 2016* and section 1.7 of the EP&A Act lists five factors that must be taken into account in the determination of the significance of potential impacts of an activity on 'threatened species', populations or ecological communities (or their habitats) listed under the BC Act.

The ' test of significance or 5-part test' is used to determine whether an activity is 'likely' to impose 'a significant effect' on threatened biota and thus whether a species impact statement (SIS) is required. Should the Test of Significance conclude that a significant effect is likely, an SIS must be prepared.

A five part tests has been provided for the threatened community to be impacted by the proposal.

Section 1.7 assessments **Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions (Grey Box Woodland)**	
a)	**in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,**

A threatened species is not the subject of this assessment of significance

b)	**in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:**
(i)	**is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or**

The proposal would remove up to 0.36 hectares of Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregion (Grey Box Woodland). The roadside woodland to be removed is comprised of most White Cypress Pine (*Callitris glaucophylla)* regrowth, some native shrubs and trees such as Wilga (*Geijera parviflora)* and Kurrajong (*Brachychiton populneus)* and some mature Grey Box (*Eucalyptus microcarpa)* and Yellow Box (*Eucalyptus melliodora)* trees. The remnant woodland patch is restricted to a small (up to 10 metres wide but mostly 3 to 4 metres wide) stretch between the roadway and the proposed subdivision lots. In total, about 0.36 hectares of woodland occurs in the proposal site, and would be removed by the proposal. Where possible, mature eucalypts would be retained.

Woodland in the patch (along the Wade Street roadside) is isolated from all other woodland communities in the surrounding study area, as the site occurs in the residential area of the township of Coolamon, and adjacent landuse has modified the surrounding area. Some planted trees and shrubs occur in the area surrounding the woodland patch, but this mostly consists of garden plantings, roadside plantings and isolated non-locally native planted trees and shrubs.

Alternate native woodland patches are available within the road reserve of Canola Way (Wade Street) and Curtis Street to the east and south, and woodland patches occur to the north along Bredins Lane, and within the Coolamon Golf Course. Woodland patches to the north connect to Kindra State Forrest, and approximately 80 hectare remnant Grey Box woodland patch in the study area.

Given its location within the township of Coolamon, and its isolation from other areas of good quality, it is unlikely that woodland to be removed for the proposal represents quality habitat in the study area. The woodland is very narrow, and does not contain significant suitable habitat likely to support fauna species. The woodland patch may be used as a stepping stone for fauna to traverse the site to higher quality woodland in Kindra State Forrest, however significant woodland, non-native and planted vegetation is available outside of the proposal site to still allow for this.

The proposed removal of Grey Box woodland from the proposal site would be unlikely to have an adverse effect on the extent of Grey Box Woodland for the reasons described above, and as such it is unlikely to place a local occurrence of this community at risk of extinction.

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

The proposal has the potential to modify the composition of the ecological community by creating conditions conducive to the spread of weed species. This could occur through general disturbance from machinery, vehicles and foot traffic. These conditions could lead to the spread of invasive species such as African Boxthorn, which is already present in the study area.

Given the occurrence of the small patch of Grey Box woodland in an isolated location surrounded by significantly modified and highly degraded exotic grasslands containing a high composition of invasive and introduced species, it is unlikely that works in the proposal site would substantially and adversely modify the composition of the ecological community such that its local occurrence would be placed at risk of extinction.

c) in relation to the habitat of a threatened species or ecological community:
(i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and

The proposal would remove up to 0.36 hectares of Grey Box Woodland from the roadside corridor within the proposal site. The roadside vegetation to be removed is comprised of trees, shrubs and groundcover vegetation. The majority of the trees to be removed from site are White Cypress Pine regrowth. Also included in the removal is various native trees and shrubs such as Wilga and Kurrajong trees, Grey Box and Yellow Box. Where possible, mature eucalypts would be retained.

The patch to be disturbed is already modified and subject to edge effects and fragmentation due to residential developments within Coolamon.

The Grey Box Woodland patch is very small and is unlikely to represent significant habitat for species. The woodland to be removed is comprised of mostly White Cypress Pine, with few mature eucalypts to be removed. The proposal would also remove and impact on shrubs and groundcover vegetation generally dominated by native flora species. Where possible, mature eucalypts would be retained.

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

The woodland in the study area is fragmented by nearby residential developments within Coolamon and by linear infrastructure such as roads, including Wade Street. Vegetation connectivity is limited in the proposal site, and is restricted to planted non-native and native species, and some remnant roadside vegetation along Canola Way (east of Wade Street). Patchy woodland connectivity is available to the north of the proposal site via native and planted patches of woodland along roadsides, in private lots and within the Coolamon Golf Course. These woodland patches connect to Kindra State Forrest, a large remnant Grey Box woodland patch north-east of Coolamon.

The removal of 0.36 hectares of Grey-Box Woodland is unlikely to result in significant additional fragmentation to that which has already occurred due to removal being limited to the edges of the existing road where the groundcover contains a higher proportion of introduced species compared to the surrounding woodland. Where possible, mature eucalypts would be retained. The proposal would not sever or isolate any patches of habitat.

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

Grey Box Woodland in the proposal site is of low quality, and is mostly comprised of White Cypress Pine regrowth. The woodland has been degraded by residential developments and the construction of

the road in the study area. It is also lacks substantial habitat components and is unlikely to provide suitable habitat for species in the study area.

Due to the removal of only a very small area of Grey Box Woodland by the proposal, which represents only a minor fraction of the woodland present in the study area and locality the area of Grey Box the proposal is unlikely to put the long-term survival of the ecological community in the locality at risk.

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

No areas of outstanding biodiversity value exist in the study area

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

The proposed action constitutes one listed key threatening process relevant to the Grey Box Woodland ecological community:

- Clearing of native vegetation – the proposal would remove 0.36 hectares of Grey Box Woodland. This is unlikely to represent a significant loss of the Grey Box Woodland ecological community, as described above.

Conclusion

The proposal would be unlikely to have a significant effect on the endangered Grey Box Woodland ecological community as:

- Only a small area of vegetation representative of the community would be removed from an isolated patch compared to the extent of the community in the study area and locality (about 0.36 hectares)
- The small amount of isolated woodland removal from the ecological community is unlikely to result in significant additional fragmentation to that which has already occurred
- The isolated woodland to be removed is unlikely to represent significant habitat for species due to its small size, location in a built-up area and isolation from other areas of habitat
- Parts of the community to be removed are mainly comprised of regrowth White Cypress Pine.

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