Flora and Fauna Assessment

PROPOSED ROAD WIDENING

PINE GULLY ROAD, WAGGA WAGGA

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Revision	Date	Prepared by		Checked by		Approved by	
draft	20.02.09	name	Kelly Simpson and Amy Currey	name	Erwin Budde	name	Erwin Budde
		name		name		name	

*102/63-65 johnston st **wagga wagga** nsw 2650 australia **t** 61 2 6971 9696 **f** 61 2 6971 9693*

***web**: www.nghenvironmental.com.au **email**: ngh@nghenvironmental.com.au*

206/410 elizabeth st surry hills
nsw 2010 australia
***t** 61 2 8202 8333 **f** 61 2 9211 1374*

1/216 carp street (po box 470) bega
nsw 2550 australia
***t** 61 2 6492 8333 **f** 61 2 6494 7773*

suite 4/4, 234 naturaliste terrace
dunsborough
wa** 6281 **australia
***t** 61 8 9759 1985 **f** 61 2 6494 7773*

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1 INTRODUCTION & BACKGROUND INFORMATION

1.1 INTRODUCTION

Wagga Wagga City Council is proposing to upgrade a section of Pine Gully Road, located south-west of the suburb of Estella in North Wagga Wagga. During a five year sample period there have been six car accidents involving eight vehicles along this stretch of Pine Gully Road, one crash of which resulted in a fatality and two other crashes resulting in serious injury. Pine Gully Road has been nominated as a National Black Spot and has been proposed to be upgraded to reduce the number of car accidents from Harris Road in the south to the Charles Sturt University (CSU) boundary in the north.

Wagga Wagga City Council have engaged **ngh**environmental to undertake and prepare a Flora and Fauna Impact Assessment on the proposed upgrade and widening on this section of Pine Gully Road. The Assessment has been prepared to address the concerns and requirements in regards to biodiversity values of the proposed study area. Thus the objectives of this report are to identify the likely impacts on flora and fauna from the proposed widening of approximately 750 m of road as well as propose appropriate mitigation measures to ameliorate any potential impacts.

1.2 DESCRIPTION OF THE PROPOSAL

The proposal site is located approximately 6 kms north of Wagga Wagga near the suburb of Estella along Pine Gully Road. The southern boundary of the proposal is located near Harris Road, while the northern boundary borders Charles Sturt University. The location of the proposal and a surveyors drawing provided by WWCC is provided in Figure 1-1 and Figure 1-2. The proposal is to widen approximately 750 m of Pine Gully Road to increase shoulder width and sight distance, thereby reducing the potential for car accidents. Estella Road runs off to the east near the centre of the proposed study area, and will not be affected by the proposed upgrade.

The proposed activity will involve widening the existing road pavement, with the majority of works taking place along the western side of the road verge. Some tree lopping and minor works may need to be undertaken along the eastern side of the road verge; however this will be quite minor. Additionally, the table drain along the western side may be realigned where necessary. It is estimated that an impact zone of approximately 5 m will be affected on the western side of the road verge as a result of the widening project. At this stage, no culvert drainage works will need to be undertaken as the existing drainage line located on the eastern side of the study area near Estella Road is currently working well.

Based upon the surveyors plans it is evident that some minor clearing/pruning may be required along the eastern side of the road verge, however the Project Co-ordinator indicated that the major widening process will take place along the western road verge with an impact zone of no greater than 5 m.

Construction is likely to comprise the following works:

- Clearing of ground cover vegetation;
- Tree lopping;

- Removal of mid storey vegetation;
- Possible removal and impact of hollow bearing trees;
- Pavement works on shoulders;
- Reshaping of batters and drains; and
- Sealing and furnishing of the road.

1.3 DEFINITION OF THE STUDY AREA

The study area is located within the Wagga Wagga LGA approximately 6 kms north of central Wagga Wagga near the suburb of Estella, along a section of Pine Gully Road near the intersection of Estella Road. The study area is shown in Figure 1-1, while plans from the Wagga Wagga City Council (WWCC) are shown in Figure 1-2.

The following definitions are used throughout this report:

Study Area As outlined in red on Figure 1-1.

Study Locality Land within 5 km of the study area.

Photos of the study area are provided in Appendix A.

Figure 1-1: Location of the proposal site and outline of the study area shown in red (Source: Google Earth)

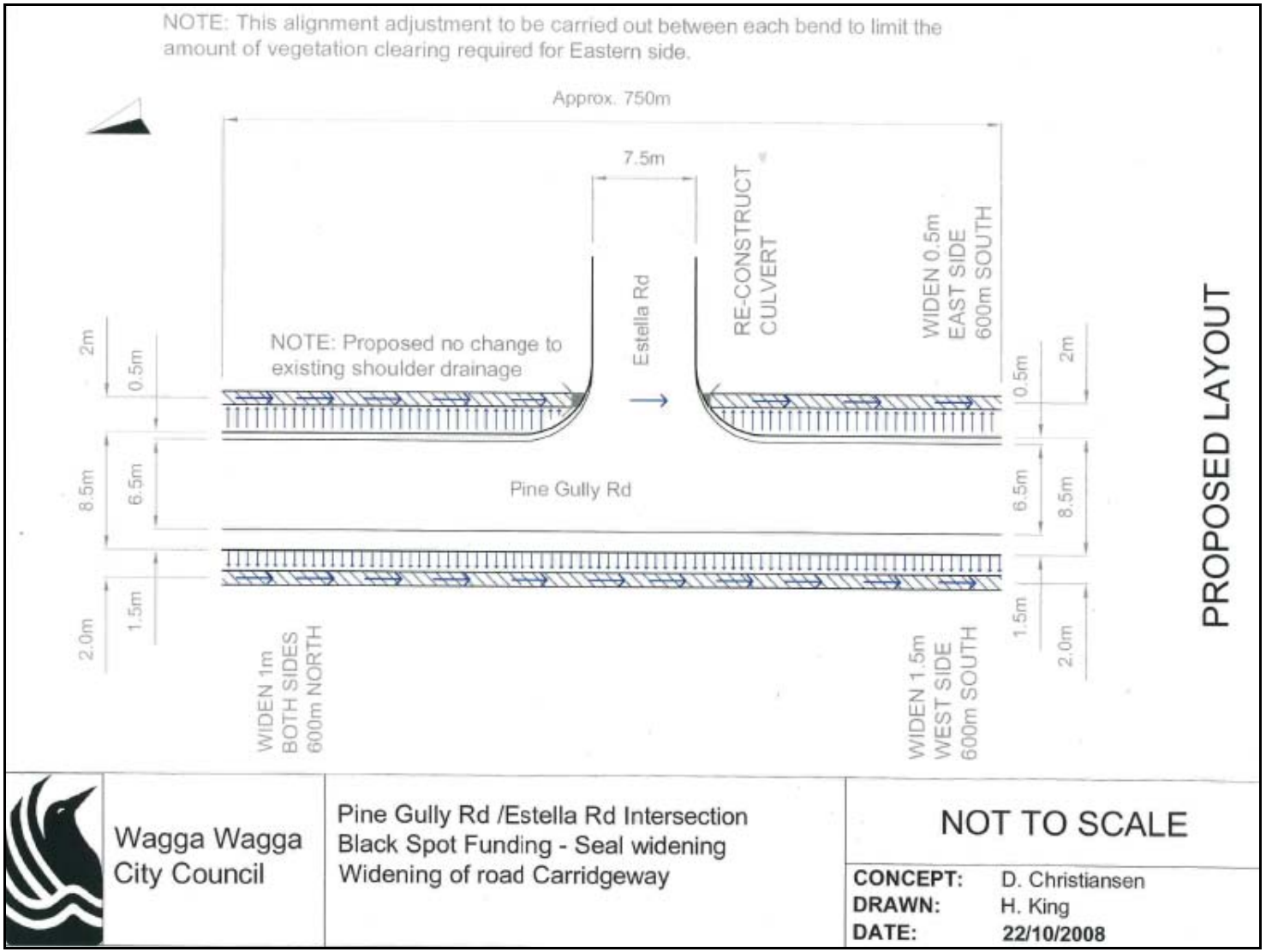

Figure 1-2: Surveyors plan of the proposed upgrade and widening of this section of Pine Gully Road (Source: Wagga Wagga City Council)

2 LEGISLATIVE CONTEXT

This Flora and Fauna Assessment has been undertaken in the context of relevant state and federal legislation. Key legislation relevant to flora and fauna assessment and protection in the region is summarised in Table 2-1 below.

Table 2-1: Legislation relevant to this Flora and Fauna Assessment report

Legislation	**Key element**	**Relevant to this assessment**
Threatened Species Conservation Act 1995 (TSC Act)	Threatened flora and fauna species assessment	Yes
Fisheries Management Act 1994 (FM Act)	Threatened fish assessment	No
Environmental Planning and Assessment Act 1979	Management, development and conservation of natural and artificial resources	Yes
National Parks and Wildlife Act 1974 (NPW Act)	Protection of native fauna and flora	Yes
Native Vegetation Act 2003 (NV Act)	Assessment of clearing of native vegetation	No. Project exempt as a Part 5 project
Water Management Act 2000	Controlled activity approvals	No
Wagga Wagga Tree Management Policy	Tree preservation	No. Project exempt as a Part 5 project.
Wagga Wagga Rural Local Environmental Plan 1985 Wagga Wagga Local Environmental Plan 2008 (consideration of)	Development controls	No. Project does not require formal Council consent under Part 5 of the EP&A Act.
Noxious Weeds Act 1993	Imposes requirements for weed control for those species which have been declared noxious	Yes
Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)	Matters of National Environmental Significance assessment	Yes

3 METHODOLOGY

3.1 BACKGROUND REVIEW

Prior to undertaking field investigations, a desktop review was conducted to obtain information on the flora and fauna characteristics of the study area and locality (Appendix B). The following was undertaken:

- Review of relevant databases;
- Review of vegetation maps for the region; and
- Review of literature pertaining to threatened species in the region.

3.1.1 Database searches

The desktop review ensures that the results from surveys conducted during different climatic and seasonal periods are considered. This approach increases the probability of considering the presence of, and possible impacts on, all known and likely native species, particularly any plants and animals that are of regional, state or national conservation significance that were not located during the field survey.

Database searches were conducted for records of threatened biota located within the Wagga Wagga 1:100,000 mapsheet area using:

- DECC Wildlife Atlas;
- Previous surveys undertaken in the region including:
    - The Native Vegetation and Threatened Species of the City of Wagga Wagga (Priday & Mulvaney 2005);
    - A state-wide classification of vegetation in NSW (Keith 2004); and
    - New South Wales Vegetation Classification and Assessment of the NSW South-western Slopes (Benson 2008).
    - CSU Biocertification Report (**ngh**environmental, 2008)
- Bionet;
- The EPBC Protected Matters search tool;
- Rare or Threatened Australian Plants (RoTAP) (PlantNET database);

3.1.2 Review of vegetation maps and threatened species literature

An analysis of existing vegetation maps, topographic maps and aerial photographs was undertaken to locate sensitive sites within, and in proximity to the study area. The results of the database searches were also used to give an indication of the location of any such sites. The following online databases were reviewed for further information on threatened species and vegetation mapping:

- EPBC Species Profile and Threats Database;
- PlantNET;
- Threatened species profiles obtained from the Department of Environment and Climate Change website (http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/index.aspx);
- The Native Vegetation and Threatened Species of the City of Wagga Wagga (Priday & Mulvaney 2005)
- New South Wales Vegetation Classification and Assessment: Part 2: Plant communities of the NSW South-western Slopes Bioregion and Update of NSW Western Plains plant communities, Version 2 of the NSWVCA database (Benson 2008); and
- Bioregions of New South Wales: their biodiversity, conservation and history (NPWS 2003).

Refer to Chapter 9 for a full list of reference material.

3.2 FIELD INVESTIGATIONS

3.2.1 General

The field work for this proposal was designed to build upon detailed flora and fauna surveys undertaken in the study area by **ngh**environmental in 2008 for Charles Sturt University. In particular, the fauna surveys were designed to assess the habitats present and compare against the habitats surveys in the locality previously, as well as determine the suitability of these habitats for threatened species.

nghenvironmental undertook a general field survey of the study area on the 23rd January 2009. The aim of this work was to provide a general description of the vegetation characteristics and biodiversity values of the site, in order to assist with the planning of widening this section of Pine Gully Road. The site visit confirmed the presence of the endangered ecological community (EEC) Box Gum Woodland as defined under the *TSC Act* and under the EPBC Act. Refer to Section 4.2.4 for more information regarding this EEC.

Field investigations were undertaken in one day with a total of six person hours devoted to the flora fauna surveys. Weather conditions during the site visit ranged from a minimum of 19.8°C to a maximum of 35.5°C with a maximum of 16.6 mm of rain falling the previous two days prior to the site visit.

3.2.2 Flora survey

The flora survey comprised a random meander along both sides of Pine Gully Road within the study area and recording all locally indigenous and exotic species observed as well as their relative abundance. Relative

abundance/cover for each species was estimated within each vegetation type and included uncommon/sparse (U), occasional/moderately frequent (O) or common/abundant (C). Potential rare or threatened species identified during the background searches at local, regional, state and national levels were also targeted. Observations were made in relation to vegetation communities, the structure and condition of vegetation including noxious weeds and potential constraints.

A list of all field guides and standard texts used during the field investigation and for plant identification are included in Section 9.

The naming of plants follows Harden (1990-93) with subsequent updates as provided by the Royal Botanic Gardens, Sydney and PlantNET. The classification of those vegetation communities recorded in the study area is described according to Priday and Mulvaney (2005) as well as Benson (2008).

The conservation significance of those plants, animals and vegetation communities recorded is made with reference to the:

- *EPBC* and *TSC Acts*; and
- DECC, Threatened Species, populations and ecological communities of NSW, homepage.

The plant species recorded in this snapshot survey will be an underestimate of the actual species present with further survey required at different times of the year to account for seasonal variation. Nevertheless, the level of survey undertaken is considered adequate for the purpose of this report.

3.2.3 Fauna survey and habitat assessment

A generalised fauna was conducted across the entire length of the study area, focusing on key habitat areas along both sides of the road verge with a greater emphasis on the western side (refer to Figure 3-1). A detailed habitat assessment was also conducted within the study area to determine the presence and abundance of hollow bearing trees. The fauna survey included the following:

- Open transect bird survey of entire length of site within road verge vegetation;
- Targeted searches within suitable habitat for threatened diurnal fauna species with an emphasis on woodland bird species;
- General consideration of potential reptile and amphibian habitat within the drainage areas;
- Opportunistic sightings of fauna during site visit;
- An assessment of habitat types and quality with an emphasis on abundance and size of hollows and vegetation structure; and
- Incidental sightings of evidence of fauna (scat collection, scratch marks, footprints, etc).

Constraints and Limitations

Several constraints to the current study were encountered including:

- Medium and long-term climatic conditions (i.e. drought) have resulted in a lack of abundance of annual species; and

- Snapshot survey limitations. The survey was conducted over a brief period of time to obtain an indicative assessment of the proposed site. Survey results may vary during different seasonal patterns and if conducted over a longer period of time.

Figure 3-1: Bird Census Survey Areas shown in green (source: Google Earth).

4 RESULTS

4.1 BACKGROUND REVIEW

4.1.1 General information

The study area is located within the southern section of the South Western Slopes Bioregion (Figure 4-1). The NSW South Western Slopes Bioregion is an extensive area of foothills and isolated ranges comprising the lower inland slopes of the Great Dividing Range extending from north of Cowra through southern NSW into western Victoria with an area of 8,657,426 ha. About 8,070,608 ha or 93.22% of this bioregion occurs in NSW, with the remainder in Victoria. The NSW portion of the bioregion occupies about 10.1% of the state (NPWS 2003).

The bioregion includes parts of the Murray, Murrumbidgee, Lachlan and Macquarie River catchments. It is located within a temperate climate zone, characterised by hot summers and no dry season. Mean annual temperature increases across the bioregion from mild temperatures in the south and east to higher temperatures in the north and west. Rainfall follows a similar distribution with higher rainfall (1200mm per year) in the south east falling to low rainfall (400 mm per year) in the west.

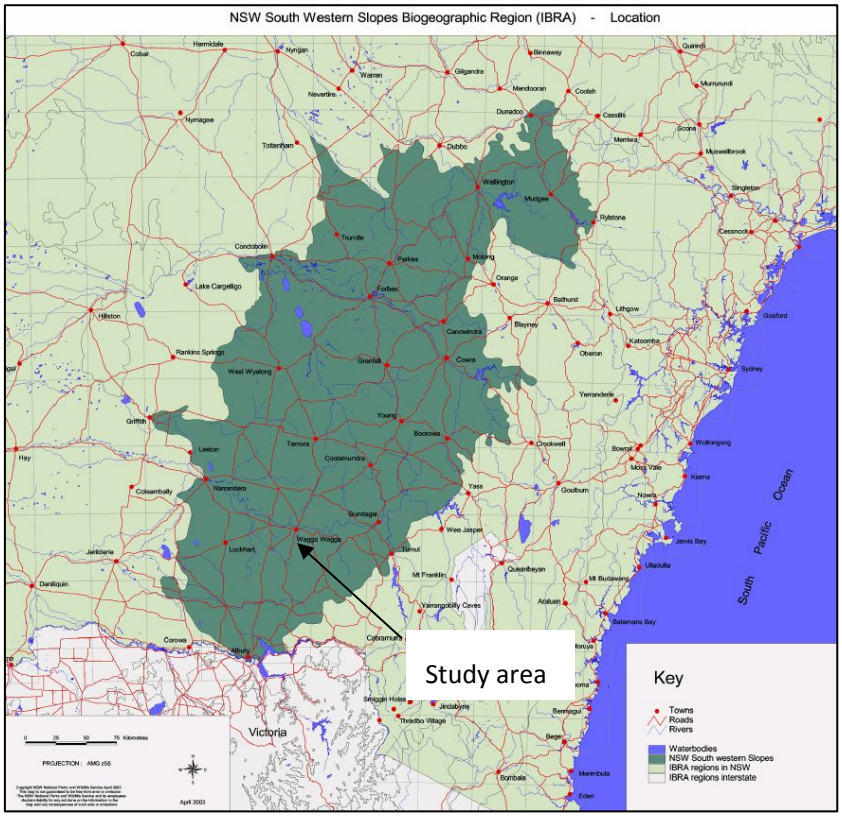

Figure 4-1: South Western Slopes Bioregion

Land uses within the study area include residential, rural residential, agricultural land and major road networks. Large areas of bushland surround the study area including Lighthouse Hill to the west and the Murrumbidgee River to the south. No National Parks or State Conservation Areas are located within 10 kms of the study area.

4.1.2 Vegetation Mapping

Recent vegetation classification for the NSW South-western Slopes Bioregion undertaken by Benson (2008) describes a total of 135 plant communities for the area. Over 80% of the native vegetation in the bioregion has been cleared, with the extant vegetation predominately comprising *Eucalyptus*-dominated grassy or shrubby woodlands and open forests. Vegetation at the site is most consistent with Bensons (2008) vegetation community ID 277 Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South-western Slopes Bioregion. This community is widely distributed on flats and on gentle slopes mainly in the upper slopes sub-region of the NSW South-western Slopes Bioregion and occurs on fertile deep, loam or clay soils derived from a range of substrates.

Based upon vegetation mapping produced by Priday and Mulvaney (2005) for the Wagga Wagga Local Government Area (LGA) the study area is located within an area mapped as Yellow Box Woodland. Yellow Box Woodland is dominated by Yellow Box (*Eucalyptus melliodora*) and occurs as open woodland to 20 metres tall with a predominately grassy understorey and very sparse shrub layer. There are a number of variants within this community however; Yellow Box typically dominates the community. Yellow Box Woodland occurs on the alluvial flats above the Murrumbidgee River and along most of the major creek systems in Wagga Wagga.

Mapping undertaken by **ngh**environmental (2008) in the locality suggests that Yellow Box Woodland is present on nearby land at similar elevation and on similar soil to that in the study area.

Yellow Box Woodland is included within the definition of Box-Gum Woodland, which is listed as an Endangered Ecological Community under the *Threatened Species Conservation Act* and a critically endangered ecological community under the EPBC Act.

4.1.3 Species of Conservation Significance

Background searches for threatened flora and fauna species revealed a range of species which have previously been recorded in the study locality or which may occur if suitable habitat is present (Appendix B). A list of these species as well as their state and national conservation significance, their habitat requirements, location of nearest records, their potential to occur in the study area and the likelihood of impact is provided in Appendix C. Those species that may occur in the study area, and whose habitat could be affected by the proposed development (based on this desktop assessment) are listed in Table 4-1.

Table 4-1: Threatened species that could possibly occur in the study area, and that could potentially be impacted by the proposed development.

Species & Listing*	Presence of Habitat	Nearest Records	Likelihood of Occurrence	Possible Impact?
EEC				
White Box Yellow Box Blakely's Red Gum Woodland *TSC-EEC* *EPBC-CEEC*	**Yes** –Mature trees at the site include Yellow Box (*Eucalyptus melliodora)* and Blakely's Red Gum (*E. blakelyi).* Understorey vegetation at the site is predominately grassy	This EEC is present within the Wagga Wagga LGA.	**Present –** Vegetation within the study area complies with the definition of Box Gum Woodland under the TSC Act and the EPBC Act. Refer to Section 4.2.4.	**Yes**. 7 Part Test applied.

Species & Listing*	Presence of Habitat	Nearest Records	Likelihood of Occurrence	Possible Impact?
	with a number of native perennial grass species recorded.			
FAUNA				
Speckled Warbler *Pyrrholaemus sagittatus* *TSC-V*	**Yes** – Species is known to occupy eucalypt dominated communities with a grassy understory.	Species was recently recorded by **ngh**environmental ecologists in August 2008 approximately 2kms west of the site	**Possible**. The study area supports a grassy understorey and sparse shrub layer. This species was observed along a road approximately 2kms from the site with similar vegetation.	**Yes. 7 part test required.**
Gang Gang cockatoo *Callocephalon fimbriatum* TSC-V	**Yes** – Species may occur at lower altitudes in drier more open eucalypt forests and woodlands, and often found in urban areas.	Recorded approximately 30kms south of the study area in Livingstone National Park in 1979 and also at The Rock Nature Reserve in 1985	**Possible**. Species may utilise study area as a flyover and as roosting and breeding habitat as there are a number of hollow bearing trees along the road verge	**Yes. 7 Part test required.**
Major Mitchell Cockatoo *Cacatua leadbeateri* *TSC-V*	**Yes** – Species inhabits a variety of habitats with or without tree species present.	Previously recorded in 1999 near Estella just east of the study area.	**Possible**. Species may utilise study area as a flyover and as roosting and breeding habitat as there are a number of hollow bearing trees along the road verge	**Yes. 7 Part test required.**
Brown treecreeper *Climacteris* *picumnus* *TSC-V*	**Yes –** Although the study area may provide some foraging habitat this species prefers areas of stringybarks in open grassy areas.	Recently recorded in 2001 just 15kms south of the study area.	**Possible**. The study area supports a number of hollow bearing trees along the road verges, some of which may be impacted upon as a result of the proposal. There is very minimal fallen timber evident and as such the study area may be used as foraging habitat or as a movement corridor.	**Yes. 7 Part test required.**
Black Chinned Honeyeater *Melithreptus gularis gularis*	**Yes –** Species is known to inhabit areas of White box and Yellow box species.	Recently recorded in 2001 10kms south of the study area. Anecdotal evidence of its presence in the locality.	**Possible**. Study area comprises both box eucalypt species. There may be some removal of old growth trees along the western road verge.	**Yes. 7 Part test required.**

Species & Listing*	Presence of Habitat	Nearest Records	Likelihood of Occurrence	Possible Impact?
TSC-V				
Hooded Robin *Melanodryas cucullate* TSC-V	**Yes –** Species does inhabit open cleared areas, however requires structurally diverse habitats including mature eucalyptus, saplings and some shrubs.	Species has been recorded within Wagga Wagga LGA at a number of locations including Livingstone National Park and just west of Wagga Wagga town centre. Most recent sighting was recorded in 2007.	**Possible**. Species may use the study area as foraging habitat; however it does not support a structural diverse range of habitats as no shrub layers are evident.	**Yes. 7 Part test applied.**
Turquoise Parrot *Neophema pulchella* *TSC-V*	**Yes** – Lives on the edges of eucalypt woodlands near clearings.	Previously recorded roughly 30kms from study area near Livingstone National Park in 2001.	**Possible**. Study area contains potential habitat, including a variety of grasses and herbaceous plants with a number of hollow bearing trees present along the road verges.	**Yes. 7 Part Test applied.**
Superb Parrot *Polytelis swainsonii* *TSC-V* *EPBC-V*	**Yes –** Study area provides some hollow bearing trees for roosting and foraging habitat is present.	**ngh**environmental staff have recorded this species within 2kms of the study area in August 2008	**Possible.** Study area supports a number of hollow bearing trees which could provide suitable roosting and breeding habitat for this species.	**Yes. 7 Part test applied.**
Squirrel Glider *Petaurus norfolcensis* TSC-V	**Yes –** Study area supports some remnant tree hollows for this species.	A number of records found within Livingstone National Park, just south of the study area in 2005.	**Possible –** Although the study area supports some suitable habitat for this species, the majority of the site is surrounded by cleared farming areas. The proposal may remove a hollow bearing tree.	**Yes. 7 Part test required.**
Inland Forest Bat *Vespadelus baverstocki* TSC-V	**Yes** – Species roosts in tree hollows and was recorded in locality	Species was last recorded within Wagga Wagga LGA just north-west of the town centre in 2007.	**Possible**. Study area supports a number of hollow bearing tress, especially along the western road verge, some of which may require removal	**Yes. 7 Part test required.**

* Listing:

TSC-V: Threatened Species Conservation Act-Vulnerable species

TSC-EEC: Threatened Species Conservation Act-Endangered Ecological Community

EPBC-V: Environment Protection and Biodiversity Conservation Act-Vulnerable species

4.2 FLORA FIELD SURVEY RESULTS

4.2.1 Diversity of Flora Species Recorded

A total of 32 species were recorded during the field survey (refer to Appendix D). This is unlikely to represent all plants present within the study area, given the survey constraints, however it is considered to provide adequate information to assess the types of vegetation communities and habitats present in the study area and determine the likelihood of the presence of threatened biota.

Of the 32 species recorded, approximately 12 (37.5%) are exotic species. The cover abundances of all species recorded within the study area were generalised across the community and are provided in Appendix D. In general, the study area contains mature Yellow Box (*Eucalyptus melliodora*) with Blakely's Red Gum (*E. blakelyi*) to a lesser extent. Hickory wattle (*Acacia implexa)*, white cypress pine (*Callitris glaucophylla)* and kurrajong (*Brachychiton populneus)* are also present throughout the site, along with the exotic pepper tree and olive which is particularly dominant through the site specifically around the bases of large eucalypts. The groundlayer at the site is dominated by native grass species including *Austrodanthonia* sp. (wallaby grasses), *Austrostipa* sp. (spear grasses) and Aristida sp. (wiregrass).

Noxious Weeds

Two species of noxious weed were found to occur within the study area: Paterson's Curse (*Echium plantagineum*) and African Boxthorn (*Lycium ferrocissimum*). Two individual plants of African boxthorn approximately 1.2-1.5m tall were identified along the western side of the road edge. Patterson's Curse was noted as being uncommon across the site and was mainly concentrated within drainage depressions and along the western fence line adjacent to paddock areas. Both of these noxious weed species have been categorised as Class 4 within the Wagga Wagga LGA. The legal requirement for this weed category is as follows: "The growth and spread of the plant must be controlled according to the measures specified in a management plan published by the local control authority" (DPI, 2008).

4.2.2 Vegetation Communities

Vegetation at the site is consistent with Yellow Box Woodland as defined by Priday & Mulvaney (2005) and Benson's (2008) description of Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South-western Slopes Bioregion (ID277). These communities were most likely widespread throughout the floodplain areas of the South-western Slopes bioregion although the majority has now been cleared and modified for agricultural purposes so that very few remnants remain of good quality. These remnants are predominately located within road reserves and other public lands such as Travelling Stock Reserves (TSRs) where minimal grazing pressures have occurred. The northern section of the study area along Pine Gully Road (approximately 60-70 metres in length) has been cleared of tree and shrub species and is dominated by exotic grass species.

Table **4-2** below outlines the structural and floral characteristics of the vegetation at the site. Figure 4-2 illustrates the spatial extent of this community within the study area and surrounding study locality.

Table 4-2: Description of vegetation within the study area.

Yellow Box – Blakely's Red Gum Grassy Woodland	
Occurrence	This community occurs throughout the study area on both sides of Pine Gully Road
Structure	Mature trees: 15-20m, 10% cover Upper Mid-storey: 8-12m, 40% cover Lower Mid-storey: 4-5m, 30% cover Ground: up to 80cm, 80% cover, Bare earth 20%.
Conservation Status	The dominant tree species at the site include Yellow Box (*E. melliodora)* and Blakely's Red Gum (*E. blakelyi).* This vegetation would qualify as Box Gum Woodland under the TSC Act and the EPBC Act (refer to Section 4.2.4). This vegetation would be consistent with the definition of Native Vegetation under the *Native Vegetation Act 2003 (NV Act)*.
Common Species	The dominant mature tree species recorded include Yellow Box (*Eucalyptus melliodora)* and Blakely's Red Gum (*E. blakelyi).* An upper mid-storey of *Acacia implexa* and younger eucalypts is prevalent through most of the site. The lower mid-storey is dominated by the exotic species *Olea europaea* ssp. *cuspidata* (African Olive) and *Schinus areira* (Pepper tree). Younger individuals of kurrajong and *Callitris glaucophylla* are also present, though at the site. The ground stratum is dominated by native grass species including Austrostipa, Austrodanthonia, and Aristida with a number of Lomandra spp also present. The native forbs *Sida corrugata* and *Wahlenbergia* sp. were noted as being uncommon across the site along with two native species of *Glycine*.
Equivalent vegetation types	This area has been mapped as Yellow Box Woodland (Priday & Mulvaney 2005) and is consistent with Benson's (2008) community description Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South-western Slopes Bioregion (ID277).
Site Examples	  Yellow Box – Blakely's Red Gum Grassy Woodland along Pine Gully Road.

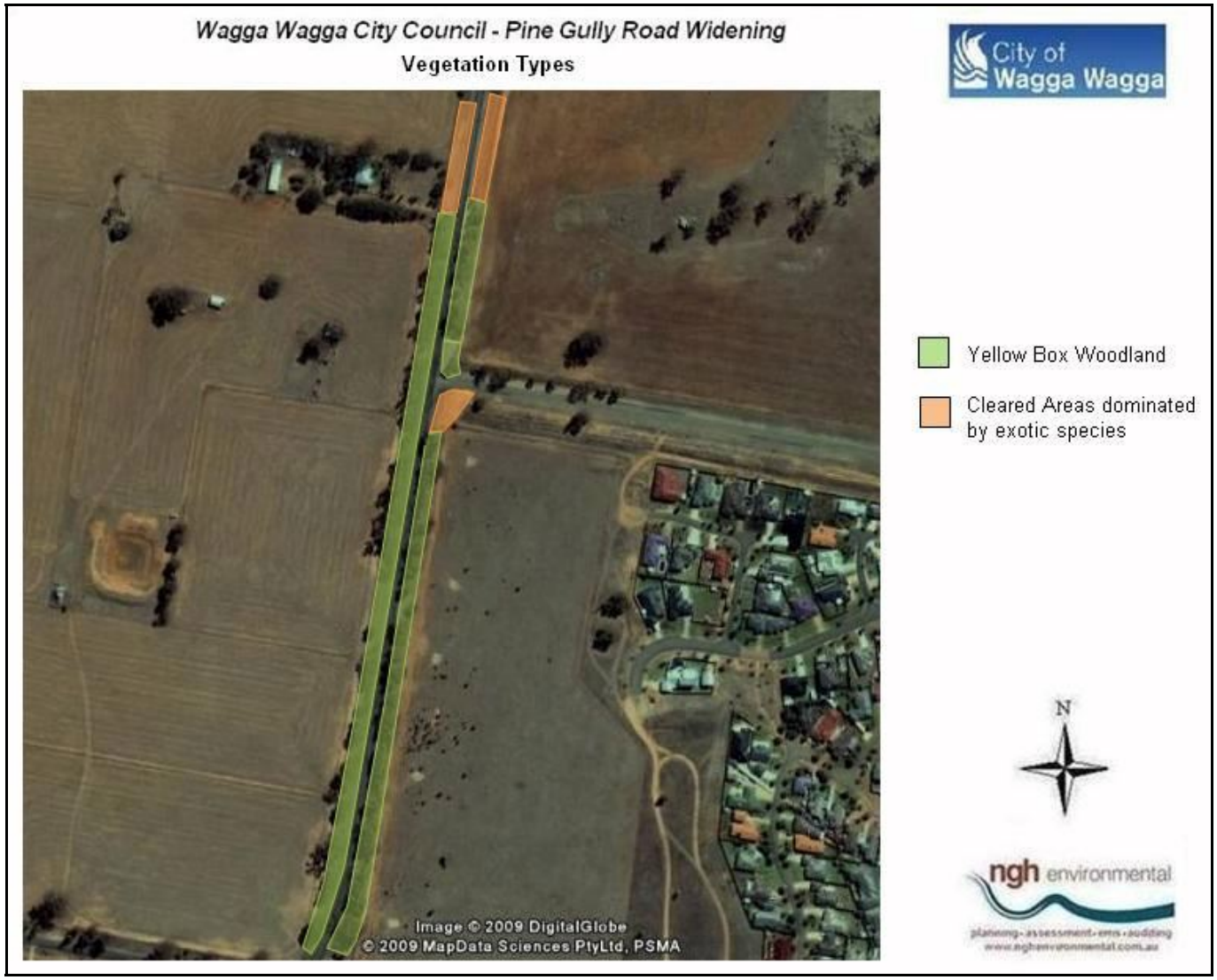

Figure 4-2: Vegetation types within the study area (Source: Google Earth).

4.2.3 Species of Conservation Significance

No flora species or populations listed as threatened under the *TSC* or *EPBC Acts* were found to occur within the study area. Further, no flora listed as a RoTAP species was recorded during the survey. Based upon the background searches and the habitat assessment table provided in Appendix C, no threatened flora species/populations have the potential to be present at the site.

4.2.4 Vegetation of Conservation Significance

Box Gum Woodland (as defined under the TSC Act)

Based upon the field surveys the Yellow Box Woodland vegetation at the site complies with the definition of Box Gum Woodland under the *TSC Act* and the process of determination is provided in Table 4-3 below. Hence a 7-part test under the *TSC Act* was undertaken for this EEC and is provided in Appendix E. The results of this assessment are summarised in Section 5.2.

Table 4-3: Determination of Box Gum Woodland under the TSC Act.

TSC Requirement for Box Gum Woodland	Response
Is the site in the NSW North Coast, New England Tableland Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands or NSW South Western Slopes Bioregions?	Yes. The site occurs in the NSW South Western Slopes Bioregion.
Are there native species in the understorey, and could the site respond to assisted natural regeneration?	The site does have native species in the understorey, predominantly native perennial grass species, and the site could respond to assisted natural regeneration through targeted spraying of annual exotic plants.
Does the site have trees?	Mature trees are present at the site.
Is White Box, Yellow Box or Blakely's Red Gum, or a combination of these species, present, or were they present?	Both Yellow Box and Blakely's Red Gum are present at the site.
Is the understorey of the site dominated by shrubs excluding pioneer species (see section on The Understorey: page 2)?	The understorey of the site is predominately grassy and dominated by common native perennial species. The exotic olive which is prevalent throughout the site has formed an artificial shrub layer, mostly around the bases of mature trees.
Conclusion – TSC Box-Gum Woodland It is concluded that the vegetation at the site qualifies as Box-Gum Woodland as defined under the NSW *Threatened Species Conservation Act 1995*.	

Box Gum Woodland (as defined under the EPBC Act)

The vegetation is considered to meet the requirements of Box Gum Woodland EEC under the *EPBC Act*. This conclusion is outlined in Table 4-4 below.

Table 4-4: Determination of Box Gum Woodland under the EPBC Act.

EPBC Requirement for Box Gum Woodland	Response
Is, or was previously, at least one of the most common overstorey species White Box, Yellow Box or Blakely's Red Gum (or Western Grey Box or Coastal Grey Box in the Nandewar Bioregion)?	Yes, mature individuals of Yellow Box and Blakely's Red Gum are present at the site.
Does the patch[1] have a predominately native understorey[2]?	Yes, the study area is approximately 1.65ha with Yellow Box Woodland and native grass species prevalent through most of the site.
Is the patch 0.1ha or greater in size?	Yes, the entire study area is approximately 1.65ha. Vegetation also extends to the south of the study area and for several hundred meters along Harris Road. In total, the patch size is estimated at a maximum of 2.6ha.
Are there 12 or more native understorey species present (excluding grasses)? There must be at least one important species[3].	No, while three important species were recorded, the majority of native understorey species present at the site were grasses.
If no, then is the patch 2 ha or greater in size?	Yes, the patch is estimated to be 2.6ha in size.
If yes, then does the patch have an average of 20 or more mature trees per hectare or is there natural regeneration of the dominant overstorey eucalypts?	Natural regeneration of the dominant overstorey eucalypts is occurring.
If yes, then it is is listed as the ecological community.	
Conclusion – The vegetation at the site complies with Box Gum Woodland EEC under the EPBC Act.	

4.3 FAUNA FIELD SURVEY RESULTS

4.3.1 Diversity of Fauna Species Recorded

A total of 23 fauna species (21 birds and 2 mammals) were recorded in the study area during the field investigations (Appendix D). The majority of species are commonly found in woodland and open grassland vegetation in western NSW. No threatened fauna species listed under the NSW *TSC Act* or the Commonwealth EPBC Act were recorded within the study area. Three introduced species were recorded

[1] Patch – is a continuous area containing the EEC and is the large of:

- an area that contains five or more trees in which no tree is greater than 75m from another tree, or
- the area over which the understorey is predominately native.

Patches must be assessed at a scale of 0.1ha or greater.

[2] where at least 50% of the perennial vegetation cover in the ground layer is made up of native species.

[3] see www.deh.gov.au/box-gum

during the field investigations including two birds and one mammal. Given the timing and snapshot mature of the surveys it is expected that a range of other species, particularly bird species, including threatened species, could occur in the study area at other times of the year (see Appendix 3 and Table 4-1).

4.3.2 Fauna Habitat types

Two habitat types were identified during the field surveys (see Figure 4-2):

- Box Gum Woodland; and
- Cleared areas dominated by exotic species.

These two habitat areas correlate with the vegetation communities previously described in section 4.2. Please refer to the vegetation communities map (Figure 4-2) for fauna habitat areas.

Box Gum Woodland

The majority of the study area comprised of Box Gum woodland along both the eastern and western road verges. There are a number of hollow bearing trees along the road verge area consisting of Blakely's Red Gum *(Eucalyptus blakelyi)* and Yellow Box (*Eucalyptus melliodora*). Although most of the road verge comprised this habitat type it was still open with only scattered remnant trees present. In some areas there was evidence of natural regeneration and some shrub species, generating good vegetation structure and composition along some parts of this habitat type.

There was little fallen timber present within this habitat type and no rocky outcrop areas were evident. This habitat was surrounded by cleared farming land, which comprises habitats of minimal value to most native fauna species, with the exception of some possible old remnant paddock trees. Pine Gully Road could act as a barrier to movement for some non flight mobile species.

The Woodland habitat in the study area is an imperative part of the fauna habitats in the locality as it provides ideal breeding and roosting resources for a variety of hollow dependant fauna species and would act as a movement corridor to other higher quality stands of vegetation within the landscape (refer to **Error! Reference source not found.** for a map of potential corridors within the landscape).

Dominant ground cover species within this habitat type include *Austrostipa, Austrodanthonia,* and *Aristida* with a number of *Lomandra spp.* Mid storey species comprised of young eucalypt species along with *Acacia implexa* and some exotic species including *Olea europaea* ssp. *cuspidata* (African Olive) and *Schinus areira* (Pepper tree).

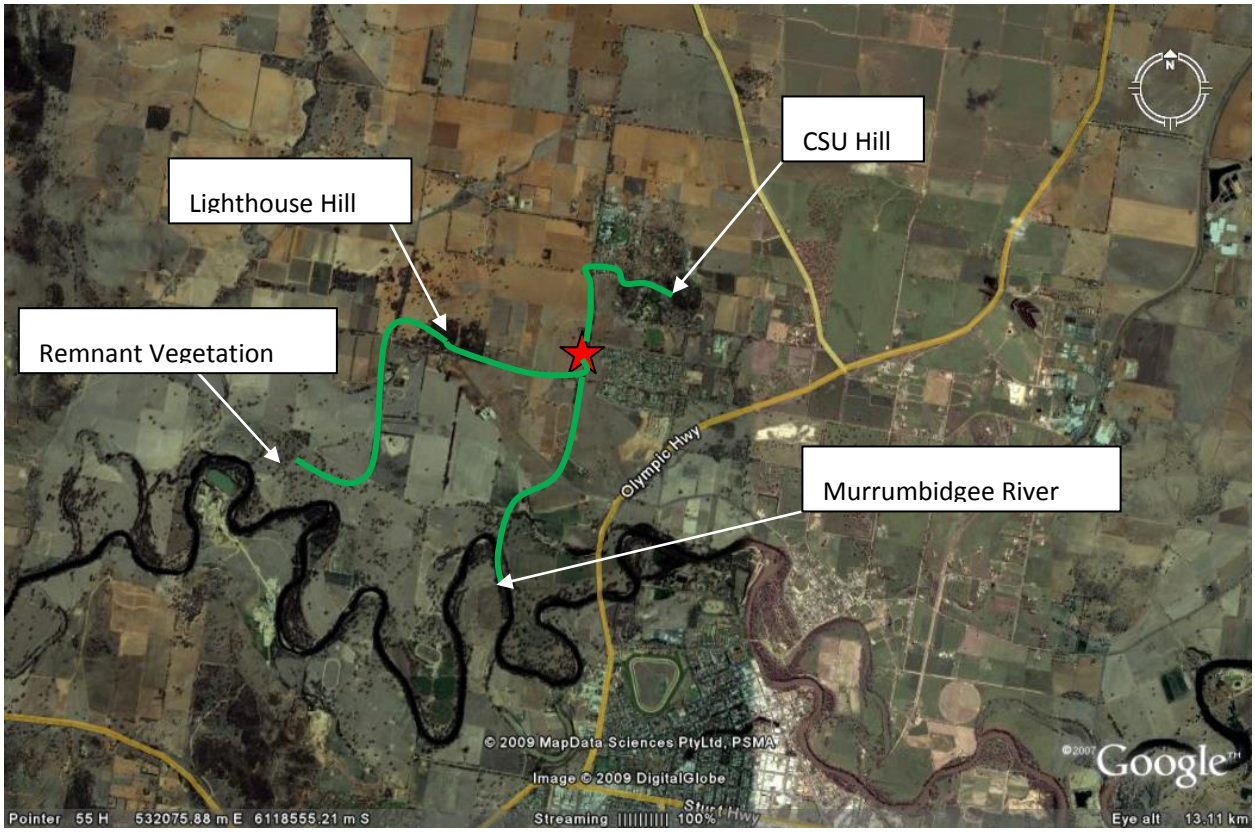

Figure 4-3 – Potential Movement Corridors (as shown in green)

Cleared areas dominated by exotic species

This habitat type was evident in the northern area of the study area where no upper or mid storey species were present. The area was dominated by a variety of exotic ground cover species including fleabane (*Conyza* sp.), Paterson's Curse (*Echium plantagineum),* Flatweed *(Hypochaeris radicata),* and Prickly Lettuce *(Lactuca serriola).* Some native species were also evident including Corkscrew Grass *(Austrostipa sp.)* Red Stem Grass *(Bothriochloa macra)* and Hairy Panic *(Panicum effusum).*

Bare earth was evident throughout the entire area of this habitat type, with no areas of fallen timber or rocky outcrop areas. The habitat value of the vegetation within this cleared habitat area is mainly limited to value for roosting and breeding, particularly for most flight mobile species, predominately bird species.

4.3.3 Hollow Bearing Trees

A number of hollow bearing trees were present along both sides of the road reserve within this section of Pine Gully road, providing important roosting and breeding habitat for a range of hollow dependant fauna species including threatened species predicted or known to occur within the study area such as the Superb Parrot and Squirrel Glider. The following table displays all hollow bearing trees recorded within the road reserve along this section of Pine Gully Road.

Table 4-5 – Hollow Bearing tree Register

No.	Tree Species and Information	Total of Hollows	Small < 10 cm	Medium 10 – 20 cm	Large > 20 cm	D.B.H	Photo
1	Dead Yellow Box E 531553 N 6119077 Tree located on eastern verge.	3	1	0	2	90 cm	
2	Yellow Box E 532536 N 6119100 Tree located on western verge.	10	5	3	2	80 cm	
3	Yellow Box E 531545 N 6119154 Tree located on western verge.	6	4	2	0	95 cm	

No.	Tree Species and Information	Total of Hollows	Small < 10 cm	Medium 10 – 20 cm	Large > 20 cm	D.B.H	Photo
4	Blakely's Red Gum E 531566 N 6119237 Tree located on western verge. Nest present at top of tree	14	8	3	3	110 cm	
5	Blakely's Red Gum E 531600 N 6119409 Tree located on eastern verge.	8	6	2	0	100 cm	
6	Yellow Box E 531599 N 6119371 May need to be lopped.	2	2	0	0	90 cm	

No.	Tree Species and Information	Total of Hollows	Small < 10 cm	Medium 10 – 20 cm	Large > 20 cm	D.B.H	Photo
7	Blakely's Red Gum E 531601 N 6119444 Tree located on western verge, adjacent Estella Road intersection. Possible removal	13	8	4	1	120 cm	
8	Yellow Box E 531595 N 6119438 Tree located on eastern verge.	2	2	0	0	60 cm	
9	Yellow Box E 531608 N 6119499 Tree located on western verge.	2	2	0	0	100 cm	

No.	Tree Species and Information	Total of Hollows	Small < 10 cm	Medium 10 – 20 cm	Large > 20 cm	D.B.H	Photo
10	Dead Stag E 531610 N 6119551 Tree located on western verge.	6	0	3	3	80 cm	
11	Yellow Box E 531610 N 6119557 Tree located on western verge.	6	3	2	1	90 cm	
12	Blakely's Red Gum E 531610 N 611963 Tree located on western verge.	11	3	8	0	100 cm	
	Total =	**83**	**44**	**27**	**12**		

A total of twelve hollow bearing trees were recorded within the study area, with an approximate total of 83 hollows of varying sizes ranging from less than 10 cm to over 30 cm on diameter. These hollows

provide important habitat for roosting and breeding for a range of fauna species that may occupy the area.

4.3.4 Threatened Species

The study area supports a number of hollow bearing trees providing roosting and nesting habitat for a variety of threatened hollow dependant fauna species. The road reserve forms an important part of the landscape as it provides an ideal movement corridor for many fauna species, especially flight mobile species as the majority of the landscape is cleared agricultural farming land. Most vegetation within the study locality is evident within road reserve areas with some remnant vegetated woodland areas to the west at Lighthouse Hill and south along the Murrumbidgee River.

A number of threatened bird species could potentially utilise the study area at different times for foraging, roosting and breeding. The study area provides ideal habitat for a number of threatened fauna species in terms of the hollow bearing trees present and the vegetation structure of some areas along the road verge where mid storey species and regeneration of eucalypts and Callitris is evident.

The area of impact within the study area mostly comprises of bare earth for 1 -2 m, than vegetation is evident. It is intended that a 5 m impact zone will be adhered to on the western road reserve, therefore the removal of vegetation will be limited to mostly ground cover species, some regeneration and possibly one or two hollow bearing trees. It is recommended that if any hollow bearing trees are to be removed as a result of the proposed activity than an ecologist is present.

5 FLORA AND FAUNA IMPACT ASSESSMENT

5.1 POTENTIAL IMPACTS

The proposal is likely to result in a number of direct and indirect impacts on flora and fauna which are not considered to be significant. It is expected that a 5 m impact zone will be adhered to for the upgrade of this section of Pine Gully Road. As such the majority of the impact area comprises mostly bare earth for 1 – 2 m with ground cover species and some smaller mid storey species growing close to the road that may be removed as a result of the proposed activity. Several hollow bearing trees may also be impacted upon as a result of the upgrade as there are a few remnant trees located close to the road edge. Based upon the surveyor's plans and discussions with Project Co-ordinator the following impacts are expected:

1. Removal and disturbance of some ground cover species, mostly along the western side of the road as this is where the majority of widening works will take place;
2. Clearing of some mid storey species located close to the western road verge area;
3. Possible removal of several hollow bearing trees;
4. Noise and construction activity impact on fauna behaviour during construction activities; and
5. Potential for weeds to be imported, exported or spread.

The vegetation communities, flora species and fauna species which occur in the study area are typical of the broader region. The study area comprises typical road verge vegetation consisting of some areas of remnant old growth trees, some cleared grassland areas and areas with ideal vegetation structure with mid storey species present. None of the species found to occur during the site visit, or that are expected to occur, are unique to the study area, and nor would they be dependent on particular resources within the study area.The majority of the impact zone comprises of bare earth with some ground cover species, mid storey species and possibly several remnant trees. This is small in scale and will not impact on the existing movement corridor present or potential foraging, breeding and roosting habitat within the study area. Notwithstanding this, the vegetation is of importance and clearing should be minimised to that assessed in this Report.

It is possible that several hollow bearing trees would be removed or impacted upon by the proposal. Hollow-bearing trees are of particular ecological importance in the slopes and plains bioregions as many bird and mammal species are dependent upon them for breeding, including many threatened species. Hollows develop only in certain types of trees and only in mature or over-mature trees. As such they are a limited resource. There are a number of hollow bearing trees present along the road corridor (refer to

Table 4-5) and the removal of only a few trees would not significantly reduce the availability of this resource locally. Although some species may utilise the mid storey species or regeneration areas as

nesting and roosting habitat, these areas are unlikely to provide suitable habitat for fauna species that are dependent on larger, hollow bearing trees. It is recommended that a qualified ecologist be present if any hollow bearing trees are to be removed to ensure any fauna inhabiting the trees can be safely relocated.

During construction additional noise and air pollution impacts from dust are likely to occur. Whilst the majority of species present or likely to be present in the study area are tolerant of such impacts, some may temporarily abandon this area. Most fauna species recorded within the study area (Appendix D) are highly mobile and can easily traverse to adjacent habitat areas. However, this is unlikely to affect the long-term behaviour of these animals and it is highly likely that they would return to the area after works are completed.

The proposal has the potential to import, export or spread weeds, including noxious weeds. A number of noxious weed species were found to occur within the study area including Paterson's Curse (*Echium plantagineum*) and African Boxthorn (*Lycium ferocissimum*), both of which have been categorised as Class 4 within the Wagga Wagga LGA.

5.2 THREATENED SPECIES ASSESSMENTS

5.2.1 Species and populations

No threatened species or populations were observed in the study area during the field investigations. A range of threatened species could occur within the study area given the presence of some suitable habitat, records of their presence in the study locality and predicted distribution maps (Appendix C). An assessment of the potential likelihood of occurrence of these species at the proposal site has been completed in Table 4-1. It is possible that the Speckled Warbler, Gang Gang Cockatoo, Major Mitchell Cockatoo, Brown Treecreeper, Black Chinned Honeyeater, Hooded Robin, Turquoise Parrot, Superb Parrot, Inland Forest Bat and Squirrel Glider could be present within the study area given nearby records and potential suitable habitat. None of the other threatened species that have been recorded in the Wagga Wagga area are considered likely to occur in the study area, nor to be dependent on resources in the study area. Furthermore, the proposal would not significantly affect any potentially suitable habitat, movement corridors or any other aspects of these species' life cycles.

7-Part Tests have therefore been conducted for the Speckled Warbler, Gang Gang Cockatoo, Major Mitchell Cockatoo, Brown Treecreeper, Black Chinned Honeyeater, Hooded Robin, Turquoise Parrot, Superb Parrot, Inland Forest Bat, Squirrel Glider and Box Gum Woodland (Appendix E). Note, the Superb Parrot is also listed under the EPBC Act as threatened species, and it is considered possible that this species could be impacted upon by the proposal. An EPBC Act assessment of significance has been completed for these species (Appendix E).

The 7-Part Tests and EPBC Act Test of Significance have concluded that:

- The vegetation within the study area is not of a structural diversity that would provide significant roosting or nesting habitat for the Hooded Robin, speckled Warbler, Black Chinned Honeyeater or Brown Treecreeper.

- The main area of impact comprises mostly bare earth of the western road verge with some impact on existing vegetation. This area of impact provides minimal if any potential foraging habitat for threatened species. Better quality stands of habitat are evident within the study area, and as such these areas will be mostly unaffected by the proposal.

- It is possible that several hollow bearing trees will be removed or impacted by the proposal, however there are numerous hollows present in other areas along the study locality providing suitable roosting and breeding habitat for the Superb Parrot, Turquoise Parrot, Brown Treecreeper, Gang Gang Cockatoo, Major Mitchell Cockatoo, Squirrel Glider and inland Forest Bat;

- Larger, better quality stands of vegetation providing nesting and roosting habitats near the study area (to the west at Lighthouse Hill and south along the Murrumbidgee River) would be unaffected by the proposal; and

- All of the above species are highly flight mobile and would be able to access other areas of vegetation during and after project completion.

There is therefore unlikely to be a significant impact on any threatened species from the proposal. The 7-Part Tests have further concluded that the proposed subdivision will not:

- Reduce the long-term viability of a local population of threatened species, populations or ecological communities;

- Accelerate the extinction of a species, population or ecological community or place it at risk of extinction; or

- Adversely affect critical habitat.

A Species Impact Statement or Referral to the Commonwealth Minister is not required for the proposal.

5.2.2 Endangered Ecological Communities

Box Gum Woodland as defined under the TSC Act and EPBC Act is present along the majority of the road reserve area, except in the northern section of the proposal area (refer to Figure 4-2). No other endangered ecological communities were found to occur within the study area. Although it is intended that an impact zone of approximately 5 m will be undertaken for the widening of this section of road, most of which comprises bare earth, some vegetation will be removed to allow for this widening, subsequently a 7-Part Test under the TSC Act and an Assessment of Significance under the EPBC Act were undertaken. These assessments concluded that:

- The removal of some vegetation from the western road verge would not significantly impact upon the extent of this EEC within the study area;

- The removal of vegetation would not fragment the community in any way; and

- A number of mature remnant old growth trees are present along both sides of the road, it is expected that one or two hollow bearing trees may be impacted upon as a result of the activity, however measures should be undertaken to minimise this impact.

Therefore, no significant impact would occur to the Box Gum Woodland EEC within the study area as a result of the proposal and a Species Impact Statement is not required.

6 ENVIRONMENTAL MANAGEMENT MEASURES

A number of direct and indirect impacts are expected from the proposal however, these are considered to be minor based upon discussions with WWCC and the surveyors plans (Figure 1-2). The proposed activity will impact on the western side of the road reserve area where a 5 m impact zone is estimated. This is small in scale and will not reduce the potential for foraging, breeding or roosting habitat within the study locality. The following outlines some management measures that should be incorporated into the proposed development to ensure any biodiversity impacts are minimised.

6.1 PROPOSAL DESIGN

- It is recommended that the majority of works be undertaken on the western road verge, to reduce the impact zone to one side of the road reserve.
- Wherever possible, batters should be steepened to minimise intrusion into existing vegetation and reduce the footprint of the project.
- A qualified ecologist should be on site to assist in fauna relocation if any hollow bearing trees are to be affected.

6.2 CONSTRUCTION

- The limit of works should be clearly marked using earth bunding, pegs, exclusion fencing or similar to protect non-development areas along the road reserve area.
- Vehicles, machinery, or equipment should be parked/stored in areas already previously disturbed.
- Construction works should be limited to one side of the road reserve to limit impacts on vegetation within the area.
- Where possible hollow bearing trees should be retained as these provide habitat for threatened species such as the superb parrot.
- Limb lopping should be done by chainsaw and not through the use of an excavator or similar machinery. The 2-cut method should be adopted, whereby the first incision is done on the underside of the limb, followed by a cut from the top, to prevent tearing.
- All noxious weeds at the site should be controlled in accordance with their class under the Noxious Weeds Act 1993 and suitable measures should be put in place to ensure they are not spread through the site.

7 CONCLUSION

This Flora and Fauna Assessment has been undertaken to determine the likely impacts from widening approximately 750 m of Pine Gully Road to upgrade the existing safety of this section of the road. Key findings include:

- The study area supports an area of remnant woodland that is consistent with the definition of Box Gum Woodland EEC under the TSC Act. No significant impact to this community would occur as a result of the proposal;
- The study area supports some grassland habitats with scattered mature trees;
- A number of hollow bearing trees are present within the study area which provide habitat for a number of fauna species, including threatened species. it is predicted that several hollowing bearing trees may be impacted upon as a result of the activity however this is small in scale and it is recommended that an ecologist be present if any hollow bearing trees are to be removed;
- The study area contains vegetation that acts as an important movement corridor within the landscape as the majority of land surrounding the study area comprises of cleared agricultural lands; and
- No Matters of National Environmental Significance listed under the EPBC Act were recorded on site or are expected to occur on site.

An assessment of the likely impacts on threatened species has concluded that a significant impact pursuant to the *EP&A* and *EPBC Acts* is not likely from the proposal. A Species Impact Statement or Referral to the Commonwealth Minster for the Environment is not required.

8 DECLARATION

This flora and fauna assessment provides a true and fair review of the proposal in relation to its potential effects on the biodiversity. It addresses to the fullest extent possible, all of the requirements of the TSC Act and the EPBC Act.

Signed:

Erwin Budde

nghenvironmental Manager

Wagga Wagga Office

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Appendix A **SITE PHOTOS**

Photo 1: Looking south along western edge of road.

Photo 2: Facing north on western edge of road.

Photo 3: Tree on eastern side of road that may require possible lopping.

Photo 4: Just north of Estella intersection along western edge of road.

Photo 5: facing south near intersection on eastern side.

Photo 6: Drainage line on east side may require works.

Appendix B **DATABASE SEARCH RESULTS**

Table B-1. **Results of database searches**. Numbers in parentheses indicate number of species records within search area from relevant database.

Bionet Search tool: Lists records of threatened species on the schedules of the *TSC Act* or *FM Act* within a defined search area

Wildlife Atlas: Lists records of threatened species on the schedule of the *TSC Act* within a defined search area

EPBC Protected Matters Search tool: Lists items/species on the Schedules of the *EPBC Act* with the potential to occur within a defined search area

ACRONYMS

EPBC: Environment Protection and Biodiversity Conservation Act

FM: Fisheries Management Act

TSC: Threatened Species Conservation Act

E: Endangered

V: Vulnerable

CE: Critically Endangered

RoTAP Rare or Threatened Australian Plant (Briggs & Leigh 2006)

Conservation code

2 - geographic range <100km

3 - geographic range >100km

Conservation status

E - endangered to point of extinction if current land use and other threats continue to operate

V - vulnerable, at risk of depletion over 20-50- years if land use that threatens survival is maintained

C - at least one population conserved in a national park or proclaimed conservation area

K – seldom collected, conservation status not reliably determined until more field survey information is available

Size class of reserved populations

a - >1000 plants in conservation reserve

i - < 1000 plants in conservation reserve

- reserved population size not accurately known

Table B-1. Results of database searches.

Item/Species	Bionet (Wagga Wagga LGA) 22/01/09	Wildlife Atlas (Wagga Wagga LGA) 22/01/09	EPBC Act Protected Matters (Wagga Wagga LGA) 22/01/09	RoTAP Database (Wagga Wagga LGA) 22/01/09
FAUNA				
Frogs				
Crinia sloanei Sloane's Froglet		V-TSC (2)		
Litoria raniformis Southern Bell Frog	E-TSC (2)	E-TSC (2)	V-EPBC	
Litoria booroolongensis Booroolong Frog	E-TSC (1)		E-EPBC	
Birds				
Oxyura australis Blue-billed Duck		V-TSC (1)		
Stictonetta naevosa Freckled Duck	V-TSC (2)	V-TSC (1)		
Grus rubicunda	V-TSC (7)	V-TSC (6)		

Item/Species	Bionet (Wagga Wagga LGA) 22/01/09	Wildlife Atlas (Wagga Wagga LGA) 22/01/09	EPBC Act Protected Matters (Wagga Wagga LGA) 22/01/09	RoTAP Database (Wagga Wagga LGA) 22/01/09
Brolga				
Xanthomyza phrygia Regent Honeyeater	E-TSC (2)	E-TSC (1)	E-EPBC	
Calyptorhynchus lathami Glossy Black-Cockatoo	V-TSC (1)	V-TSC (5)		
Neophema pulchella Turquoise Parrot	V-TSC (20)	V-TSC (37)		
Ninox connivens Barking Owl	V-TSC (7)	V-TSC (7)		
Burhinus grallarius Bush Stone-curlew	V-TSC (5)	V-TSC (4)		
Lathamus discolor Swift Parrot	E-TSC (40)	E-TSC (21)	E-EPBC	
Cacatua leadbeateri Major Mitchell's Cockatoo	V-TSC (2)	V-TSC (2)		

Item/Species	Bionet (Wagga Wagga LGA) 22/01/09	Wildlife Atlas (Wagga Wagga LGA) 22/01/09	EPBC Act Protected Matters (Wagga Wagga LGA) 22/01/09	RoTAP Database (Wagga Wagga LGA) 22/01/09
Callocephalon fimbriatum Gang-gang cockatoo	V-TSC (12)	V-TSC (8)		
Polytelis swainsonii Superb Parrot	V-TSC (65)	V-TSC (59)	V-EPBC	
Climacteris picumnus Brown Treecreeper	V-TSC (455)	V-TSC (490)		
Climacteris picumnus victoriae Brown Treecreeper (eastern subspecies)		V-TSC (2)		
Pyrrholaemus saggitatus Speckled Warbler	V-TSC (28)	V-TSC (63)		
Melithreptus gularis gularis Black-chinned Honeyeater (eastern subspecies)	V-TSC (17)	V-TSC (13)		
Melanodryas cucullata Hooded Robin	V-TSC (12)	V-TSC (19)		
Pomatostomus temporalis temporalis	V-TSC (7)	V-TSC (4)		

Item/Species	Bionet (Wagga Wagga LGA) 22/01/09	Wildlife Atlas (Wagga Wagga LGA) 22/01/09	EPBC Act Protected Matters (Wagga Wagga LGA) 22/01/09	RoTAP Database (Wagga Wagga LGA) 22/01/09
Grey-crowned Babbler (eastern subspecies)				
Pachycephala inornata Gilbert's Whistler	V-TSC (5)	V-TSC (5)		
Stagonopleura guttata Diamond Firetail	V-TSC (22)	V-TSC (31)		
Leipoa ocellata Malleefowl			V-EPBC	
Pedionomus torquatus Plains-wanderer			V-EPBC	
Rostratula australis Australian Painted Snipe			V-EPBC	
Fish				
Macquaria australasica Macquarie Perch			E-EPBC	
Maccullochella macquariensis	E-FM (11)			

Item/Species	**Bionet (Wagga Wagga LGA) 22/01/09**	**Wildlife Atlas (Wagga Wagga LGA) 22/01/09**	**EPBC Act Protected Matters (Wagga Wagga LGA) 22/01/09**	**RoTAP Database (Wagga Wagga LGA) 22/01/09**
Trout Cod				
Bidyanus bidyanus Silver Perch	V-FM (3)			
Maccullochella peelii peelii Murray Cod			V-EPBC	
Mammals				
Petaurus norfolcensis Squirrel Glider Squirrel Glider population in Wagg Wagga LGA	V-TSC (67)	V-TSC (21) E-TSC (19)		
Miniopterus schreibersii oceanensis Eastern Bentwing-bat		V-TSC (1)		
Falsistrellus tasmaniensis Eastern False Pipistrelle		V-TSC (1)		
Nyctophilus timoriensis		V-TSC (1)	V-EPBC	

Item/Species	Bionet (Wagga Wagga LGA) 22/01/09	Wildlife Atlas (Wagga Wagga LGA) 22/01/09	EPBC Act Protected Matters (Wagga Wagga LGA) 22/01/09	RoTAP Database (Wagga Wagga LGA) 22/01/09
Eastern Long-eared Bat				
Dasyurus maculatus Spotted-tailed Quoll	V-TSC (6)	V-TSC (3)	E-EPBC	
Macrotis lagotis Bilby	E-TSC (2)	E-TSC (3)		
Vespadelus baverstocki Inland Forest Bat		V-TSC (1)		
Myotis adversus Large-footed Myotis	V-TSC (1)	V-TSC (1)		
Phascolarctos cinereus Koala	V-TSC (12)	V-TSC (10)		
Onychogalea fraenata Bridled Nail-tail Wallaby	E-TSC (1)			
Reptiles				
Delma impar	V-TSC (1)		V-EPBC	

Item/Species	Bionet (Wagga Wagga LGA) 22/01/09	Wildlife Atlas (Wagga Wagga LGA) 22/01/09	EPBC Act Protected Matters (Wagga Wagga LGA) 22/01/09	RoTAP Database (Wagga Wagga LGA) 22/01/09
Striped Legless Lizard				
Aprasia parapulchella Pink-tailed Worm-lizard			V-EPBC	
FLORA				
Ammobium craspedioides Yass Daisy	V-TSC (3)	V-TSC (3)	V-EPBC	2V
Brachycome muelleroides Claypan Daisy	V-TSC (1)	V-TSC (1)	V-EPBC	
Brachyscome papillosa Mossgiel Daisy			V-EPBC	
Senecio garlandii Woolly Ragwort	V-TSC (10)	V-TSC (27)	V-EPBC	3VC-
Swainsona recta Mountain Swainson-pea	E-TSC (2)	E-TSC (2)		3ECi
Pilularia novae-hollandiae		E-TSC (5)		

Item/Species	Bionet (Wagga Wagga LGA) 22/01/09	Wildlife Atlas (Wagga Wagga LGA) 22/01/09	EPBC Act Protected Matters (Wagga Wagga LGA) 22/01/09	RoTAP Database (Wagga Wagga LGA) 22/01/09
Austral Pillwort				
Amphibromus fluitans River Swamp Wallaby-grass			V-EPBC	
Austrostipa wakoolica A spear grass			E-EPBC	
Diuris sheaffiana Tricolour Diuris			V-EPBC	
Swainsona murrayanum Slender Darling-pea			V-EPBC	
Pultenaea campbellii New England Bush Pea				3K
Kunzea baxteri Scarlet Kunzea				3KC- (Species is not listed on NSW PlantNET and is only known from coastal areas of WA.)
Prasophyllum campestre				3RC-

Item/Species	Bionet (Wagga Wagga LGA) 22/01/09	Wildlife Atlas (Wagga Wagga LGA) 22/01/09	EPBC Act Protected Matters (Wagga Wagga LGA) 22/01/09	RoTAP Database (Wagga Wagga LGA) 22/01/09
Pomaderris pauciflora				3RC-
Endangered Ecological Communities				
Weeping Myall Woodlands			E-EPBC	
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland			CE-EPBC	
Ramsar Wetlands				
Fivebough and Tuckerbil Swamps			Within same catchment as Ramsar site.	
***OTHER LISTED SPECIES**				
Migratory Terrestrial Species Birds				
Haliaeetus leucogaster White-bellied Sea-Eagle			Migratory	
Hirundapus caudacutus White-throated Needletail			Migratory	

Item/Species	Bionet (Wagga Wagga LGA) 22/01/09	Wildlife Atlas (Wagga Wagga LGA) 22/01/09	EPBC Act Protected Matters (Wagga Wagga LGA) 22/01/09	RoTAP Database (Wagga Wagga LGA) 22/01/09
Leipoa ocellata Malleefowl			Migratory	
Merops ornatus Rainbow Bee-eater			Migratory	
Myiagra cyanoleuca Satin Flycatcher			Migratory	
Xanthomyza phrygia Regent Honeyeater			Migratory	
Migratory Wetland Species **Birds**				
Ardea alba Great Egret, White Egret			Migratory	
Ardea ibis Cattle Egret			Migratory	
Gallinago hardwickii			Migratory	

Item/Species	Bionet (Wagga Wagga LGA) 22/01/09	Wildlife Atlas (Wagga Wagga LGA) 22/01/09	EPBC Act Protected Matters (Wagga Wagga LGA) 22/01/09	RoTAP Database (Wagga Wagga LGA) 22/01/09
Latham's Snipe, Japanese Snipe				
Rostratula benghalensis s. lat. Painted Snipe			Migratory	
Migratory Marine Birds				
Apus pacificus Fork-tailed Swift			Migratory	
Ardea alba Great Egret, White Egret			Migratory	
Ardea ibis Cattle Egret			Migratory	

*Note: Species restricted to marine habitats have not been included.

Appendix C **THREATENED SPECIES TABLE**

Table 1. Flora. An evaluation of the likelihood and extent of impact to threatened flora recorded from within Wagga Wagga LGA. Records are from a search of the Department of Environment and Climate Change (DECC) Wildlife Atlas, BioNet and the EPBC Environmental Reporting Tool available from the Department of Environment, Water, Heritage and the Arts website. Ecology information has been obtained from the Threatened Species Profiles on the NSW DECC website (www.threatenedspecies.environment.nsw.gov.au).

Codes:

Presence of Habitat:

Yes: Potential or known suitable abiotic factors such as soil type, geology, moisture content, topography, aspect and/or altitude are present within the Proposal Site. Associated species/vegetation type is present within the Proposal Site.

No: No suitable resources/landscape/vegetation type is present within the Proposal Site.

Likelihood of Occurrence

None: Species would not occur.

Unlikely: Species is not likely to occur.

Possible: Species could occur and proposal site may provide suitable conditions.

Present: Species was recorded during the field investigations.

Possible Impact

No: The proposal would not impact this species or its habitats. No 7-Part Test is necessary for this species.

Yes: The proposal could impact this species or its habitats. A 7-Part Test has been completed for this species.

Species & Listing*	Ecology	Presence of Habitat	Nearest Records	Likelihood of Occurrence	Possible Impact?
FLORA					
Ammobium craspedioides Yass Daisy	The Yass Daisy is a rosette-forming perennial. Leaves are spoon-shaped, to 12 cm long and 17 mm wide, hairy on top and white and woolly underneath. Found from near Crookwell on the Southern Tablelands to near Wagga Wagga on the South Western Slopes. Most populations are in the Yass region. Found in dry forest, Box-Gum Woodland and secondary grassland derived from clearing of these communities. Grows in association with a large range of eucalypts	**Yes** – Species is known to occur in Box Gum Woodland in association with *Eucalyptus blakelyi.*	This species is confined to the Yass district with only two outlying records from Livingstone National Park, approximately	**Unlikely**. Species would have been found in flower at the time of the field investigations and all areas of the study area were traversed. Thus due	**No.**

Species & Listing*	Ecology	Presence of Habitat	Nearest Records	Likelihood of Occurrence	Possible Impact?
TSC-V *EPBC-V*	(*Eucalyptus blakelyi*, *E. bridgesiana*, *E. dives*, *E. goniocalyx*, *E. macrorhyncha*, *E. mannifera*, *E. melliodora*, *E. polyanthemos*, *E. rubida*). Apparently unaffected by light grazing, as populations persist in some grazed sites. Found in a number of cemeteries in the region.		16kms south of the study area.	to the small study area and the summer timing of the survey it is considered likely that this species would have been recorded during the site survey should it have been present.	
Amphibromus fluitans River Swamp Wallaby-grass *TSC-V* *EPBC-V*	A perennial grass to 0.8 m tall that spreads by both underground and above-ground stems. The species is virtually aquatic, often with only the flower heads above the water. Recorded recently in lagoons beside the Murray River near Cooks Lagoon (Shire of Greater Hume), Mungabarina Reserve, East Albury, at Ettamogah, Thurgoona (Charles Sturt University Campus), near Narranderra, and also further west along the Murray River (near Mathoura). Habitats in south-western NSW include swamp margins in mud, dam and tank beds in hard clay and in semi-dry mud of lagoons with *Potamogeton* and *Chamaeraphis* species. Flowering time is from November to March. Disturbance regimes are not known, although the species requires periodic flooding of its habitat to maintain wet conditions. *Amphibromus fluitans* grows mostly in permanent swamps. The species needs wetlands which are at least moderately fertile and which have some bare ground, conditions which are produced by seasonally-fluctuating water levels.	**No** – The study area does not contain any permanent swamps or wetlands.	Unknown. Species was predicted to occur from the EPBC search. Species has not been recorded within the Wagga Wagga LGA.	**Unlikely**. Species has not been recorded within the Wagga Wagga LGA and no potential habitat is present at the site.	**No.**
Austrostipa wakoolica A spear-grass *TSC-E* *EPBC-E*	A densely-tufted, perennial spear-grass that grows to 1 m tall. The species is 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. The species 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. Associated species include *Callitris glaucophylla, Eucalyptus microcarpa, E. populnea, Austrostipa eremophila, A. drummondii, Austrodanthonia eriantha* and *Einadia nutans*. Flowering is from October to December, mainly in response	**No** – Associated habitats and vegetation communities are not present within the study area. The dominant Eucalyptus spp at the site have not been found in association with this	Unknown. Species was predicted to occur from the EPBC search. Species has not been recorded within the Wagga Wagga LGA.	**None**. Species has not been recorded within the Wagga Wagga LGA previously and suitable habitat is not present within the proposal site.	**No.**

Species & Listing*	Ecology	Presence of Habitat	Nearest Records	Likelihood of Occurrence	Possible Impact?
	to rain.	species.			
Brachycome muelleroides Claypan Daisy *TSC-V* *EPBC-V*	The Claypan Daisy is an annual herb that grows to 14 cm tall. Its single white flowers, only 4 mm across, are produced from September to November, at the ends of thread-like stems to 3 cm long. Grows in damp areas on the margins of claypans in moist grassland with *Pycnosorus globosus, Agrostis avenacea* and *Austrodanthonia duttoniana*. Also recorded from the margins of lagoons in mud or water, and in association with *Calotis anthemoides*. Victorian collections have generally come from open positions on the Murray River floodplain, swampy River Red Gum (*Eucalyptus camaldulensis*) Forest and damp depressions.	**No** – Species is found to occur in damp areas adjacent to claypans and lagoons. Proposal site is located along a road edge and does not contain suitable habitat.	Species was recorded within Wagga Wagga town centre in 1889.	**None**. Species was last recorded over 100 years ago within Wagga Wagga LGA and no suitable habitat is present within the study area.	**No**.
Brachycome papillosa Mossgiel Daisy *EPBC-V*	The Mossgiel Daisy is a multi-stemmed, perennial herb that grows to 40 centimetres tall. It occurs chiefly from Mossgiel to Urana, in south-western NSW, with sites in the Jerilderie area, the Hay Plain, Willandra Lakes district and north to Ivanhoe. The only known site on South Western Slopes is Ganmain Reserve. The species is recorded primarily in clay soils on Bladder Saltbush (*Atriplex vesicaria*) and *Maireana aphylla* plains, but also in grassland and in Grey Box (*Eucalyptus microcarpa*) - Cypress Pine (*Callitris* spp.) woodland. Species flowers from June to December and has been recorded as locally occasional to common in populations.	**No –** Species is found to occur on *Atriplex vesicaria* and *Maireana aphylla* plains. These species are not present within the study area. Vegetation at the site is not consistent with Grey Box-Callitris Pine woodland.	Unknown. Species was predicted to occur from the EPBC search. Species has not been recorded within the Wagga Wagga LGA.	**None**. Species has not been recorded within the Wagga Wagga LGA previously and associated species/vegetation types are not present within the proposal site.	**No.**
Diuris Tricolor Pine Donkey Orchid *TSC-V* *EPBC-V*	The Pine Donkey Orchid (formerly known as *Diuris sheaffiana*) is a terrestrial species (it grows from the ground rather than from rocks or vegetation). It has between one and three leaves, to 30 centimetres long and 4mm wide. Sporadically distributed on the western slopes of NSW, extending from south of Narrandera all the way to the far north of NSW. The Pine Donkey Orchid grows in sclerophyll forest among grass, often with native Cypress Pine (*Callitris spp.*). It is found in sandy soils, either on flats or small rises. Also recorded from a red earth soil in a Bimble Box community in western NSW. Usually recorded as	**Marginal** – Within the Murrumbidgee CMA the species is found within floodplain woodlands and riverine sandhill woodlands. One	Unknown. Species was predicted to occur from the EPBC search. Species has not been recorded within the Wagga Wagga LGA.	**None**. Species has not been recorded within the Wagga Wagga LGA previously and the diversity of groundcover species at the site is low.	**No.**

Species & Listing*	Ecology	Presence of Habitat	Nearest Records	Likelihood of Occurrence	Possible Impact?
	common and locally frequent in populations, however only one or two plants have also been observed at sites. The species has been noted as growing in large colonies. 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. Flowers from September to November or generally spring. The species is a tuberous, deciduous terrestrial orchid and the flowers have a pleasant, light sweet scent.	associated species *Callitris glaucophylla* is present at the site however this species is widespread throughout the area. With the exception of grasses the species diversity of the road verge is low and no *Bulbine* species were recorded. Thus this species is considered unlikely to occur at the site.			
Pilularia novae-hollandiae Austral Pillwort *TSC-E*	Austral Pillwort is at first appearance a very unfern-like, semi-aquatic fern, resembling more a small fine grass. In NSW, Austral Pilwort has been recorded from suburban Sydney, Khancoban, the Riverina between Albury and Urana (including Henty, Walbundrie, Balldale and Howlong) and at Lake Cowal near West Wyalong. The population at Lake Cowal is the only known extant population in NSW. Austral Pillwort grows in shallow swamps and waterways, often among grasses and sedges. It is most often recorded in drying mud as this is when it is most conspicuous. Most of the records in the Albury-Urana area were from table drains on the sides of roads. This species is probably ephemeral (especially in the drier parts of its range), appearing when soils are moistened by rain.	**No –** The proposal site is located along a road edge and does not contain any swamps or waterways.	Species was recorded from Dudal Comer Swamp near Henty, approximately 50km SW of the study area in 1951-1952.	**None**. Suitable habitat is not present within the study area for this species.	**No.**
Senecio garlandii Woolly Ragwort *TSC-V*	Woolly Ragwort is a much-branched perennial herb or shrub growing to 1.2 m tall. It has woolly stems, and large leaves, also woolly below, to 15 cm long and 8 cm wide, with toothed edges. This daisy is found between Temora, Bethungra and Albury and possibly Burrinjuck near Yass. The largest populations are at The Rock and Mt Tabletop (and surrounds). Woolly Ragwort occurs on sheltered	**No** – Species is known from rocky outcrops which are not present in the	Species was recently recorded in The Rock Nature Reserve in 2007, approximately 24kms west of the	**None**. Suitable habitat is not present within the study area.	**No.**

Species & Listing*	Ecology	Presence of Habitat	Nearest Records	Likelihood of Occurrence	Possible Impact?
EPBC-V	slopes of rocky outcrops. Flowering occurs in spring.	study area.	study area.		
Swainsona murrayana Slender Darling-pea *EPBC-V*	A sparsely-downy forb with greyish, thin or tapered, stiffly leathery pods. 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. The species has been collected from clay-based soils, ranging from grey, red and brown cracking clays to red-brown earths and loams. It grows in a variety of vegetation types including bladder saltbush, black box and grassland communities on level plains, floodplains and depressions and is often found with *Maireana* species. Plants have been found in remnant native grasslands or grassy woodlands that have been intermittently grazed or cultivated. Plants produce winter-spring growth, flower in spring to early summer and then die back after flowering. They re-shoot readily and often carpet the landscape after good cool-season rains. The species may require some disturbance and has been known to occur in paddocks that have been moderately grazed or occasionally cultivated.	No – Species is typically found with *Maireana* species, which were not recorded within the study area. Associated vegetation communities are not present within the study area.	Unknown. Species was predicted to occur from the EPBC search. Species has not been recorded within the Wagga Wagga LGA.	**None**. Species has not been recorded within the Wagga Wagga LGA previously and associated species/vegetation types are not present within the proposal site.	**No.**
Swainsona recta Mountain Swainsona Pea *TSC-E* *EPBC-E*	Mountain Swainson-pea is a slender, erect perennial herb growing to 30 cm tall. The leaves are divided into up to six pairs of 10 mm long, very narrow leaflets, each with a pointed tip. Mountain Swainson-pea was recorded historically from places such as Carcoar, Culcairn and Wagga Wagga where it is probably now extinct. Populations still exist in the Queanbeyan and Wellington-Mudgee areas. Before European settlement Mountain Swainson-pea occurred in the grassy understorey of woodlands and open-forests dominated by Blakely's Red Gum *Eucalyptus blakelyi*, Yellow Box *E. melliodora*, Candlebark Gum *E. rubida* and Long-leaf Box *E. goniocalyx*. Grows in association with understorey dominants that include Kangaroo Grass *Themeda australis*, poa tussocks *Poa* spp. and spear-grasses *Austrostipa* spp. Plants die back in summer, surviving as rootstocks until they shoot again in autumn. Flowers throughout spring, with a peak in October. Seeds ripen at the end of the year. Individual plants have been known to live for up to 20 years. Generally tolerant of fire, which also enhances germination by breaking the seed coat and reduces	**Yes** – Species occurs in grassy woodland and associated *Eucalyptus* spp. were recorded within the study area.	Species was recorded within Wagga Wagga township in 1900 but has not been recorded within the area since.	**Unlikely**. Species was recorded within study locality over 100 years ago. Given the lack of diversity in the groundcover, it is unlikely that this species would occur here.	**No.**

Species & Listing*	Ecology	Presence of Habitat	Nearest Records	Likelihood of Occurrence	Possible Impact?
	competition from other species.				
EEC					
Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South western Slopes bioregions. *TSC-EEC*	This ecological community is scattered across the eastern parts of the alluvial plains of the Murray-Darling river system. The structure of the community varies from low woodland and low open woodland to low sparse woodland or open shrubland, depending on site quality and disturbance history. The tree layer grows up to a height of about 10 metres and invariably includes *Acacia pendula* (Weeping Myall or Boree) as one of the dominant species or the only tree species present. The understorey includes an open layer of chenopod shrubs and other woody plant species and an open to continuous groundcover of grasses and herbs. The structure and composition of the community varies, particularly with latitude, as chenopod shrubs are more prominent south of the Lachlan River district, while other woody species and summer grasses are more common further north. In some areas the shrub stratum may have been reduced or eliminated by clearing or heavy grazing. This EEC is known from parts of the Local Government Areas of Berrigan, Bland, Bogan, Carrathool, Conargo, Coolamon, Coonamble, Corowa, Forbes, Gilgandra, Griffith, Gwydir, Inverell, Jerilderee, Lachlan, Leeton, Lockhart, Moree Plains, Murray, Murrumbidgee, Narrabri, Narranderra, Narromine, Parkes, Urana, Wagga Wagga and Warren, and but may occur elsewhere in these bioregions.	**No –** The dominant species *Acacia pendula* was not recorded within the study area and is not predicted to occur.	Unknown. EEC was predicted to occur from the EPBC search. EEC has been recorded within the Wagga Wagga area.	**None –** EEC is not present within the study area.	**No.**
White Box Yellow Box Blakely's Red Gum Woodland *TSC-EEC* *EPBC-CEEC*	White Box Yellow Box Blakely's Red Gum Woodland (commonly referred to as Box-Gum Woodland) is an open woodland community (sometimes occurring as a forest formation) , in which the most obvious species are one or more of the following: White Box *Eucalyptus albens*, Yellow Box *E. melliodora* and Blakely's Red Gum *E. blakelyi*. Intact sites contain a high diversity of plant species, including the main tree species, additional tree species, some shrub species, several climbing plant species, many grasses and a very high diversity of herbs. Characterised by the presence or prior occurrence of White Box, Yellow Box	**Yes** –Mature trees at the site include Yellow Box (*Eucalyptus melliodora)* and Blakely's Red Gum (*E. blakelyi).* Understorey	This EEC is present within the Wagga Wagga LGA.	**Present –** Vegetation within the study area complies with the definition of Box Gum Woodland under the TSC Act but does not meet the requirements of Box Gum Woodland EEC	**Yes**. 7 Part Test applied.

Species & Listing*	Ecology	Presence of Habitat	Nearest Records	Likelihood of Occurrence	Possible Impact?
	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 Apple Box (*E. bridgesiana*), Red Box (*E. polyanthemos*), Candlebark (*E. rubida*), Snow Gum (*E. pauciflora*), Argyle Apple (*E. cinerea*), Brittle Gum (*E. mannifera*), Red Stringybark (*E. macrorhyncha*), Grey Box (*E. microcarpa*), Cabbage Gum (*E. amplifolia*) and others. The understorey in intact sites is characterised by native grasses and a high diversity of herbs; the most commonly encountered include Kangaroo Grass (*Themeda australis*) Poa Tussock (*Poa sieberiana*), wallaby grasses (*Austrodanthonia spp.*), spear-grasses (*Austrostipa spp.*), Common Everlasting (*Chrysocephalum apiculatum*), Scrambled Eggs (*Goodenia pinnatifida*), Small St John's Wort (*Hypericum gramineum*), Narrow-leafed New Holland Daisy (*Vittadinia muelleri*) and blue-bells (*Wahlenbergia spp.*).	vegetation at the site is predominately grassy with a number of native perennial grass species recorded.		under the EPBC Act. Refer to Section 4.2.4.	

*Note:

TSC-V	Listed as Vulnerable under the Threatened Species Conservation Act
TSC-E	Listed as Endangered under the Threatened Species Conservation Act
TSC-EEC	Listed as an Endangered Ecological Community under the Threatened Species Conservation Act
EPBC-V	Listed as Vulnerable under the Environment Protection and Biodiversity Conservation Act
EPBC-E	Listed as Endangered under the Environment Protection and Biodiversity Conservation Act
EPBC-CEEC	Listed as a Critically Endangered Ecological Community under the Environment Protection and Biodiversity Conservation Act

Table 2. Fauna. An evaluation of the likelihood and extent of impact to threatened and migratory fauna recorded from within Wagga Wagga LGA. Records are from a search of the DECC, Wildlife Atlas, BioNet and the (EPBC) Environmental Reporting Tool for the Department of Environment & Water Resources. Fauna species restricted to marine habitats (eg. Dugongs, Southern right whale etc) have been excluded. Ecology information has been obtained from the Threatened Species Profiles on the NSW DECC website (www.threatenedspecies.environment.nsw.gov.au).

Codes:

Presence of Habitat:

Yes: Potential or known foraging, roosting, nesting, refuge, movement corridor (including movement of genetic material) or other habitat is present within the Proposal Site.

No: No potential foraging, roosting, nesting or other habitat is present within the Proposal Site.

Likelihood of Occurrence

None: Species would not occur

Unlikely: Species is not likely to occur

Vagrant: Species could occur on occasion as a vagrant or passing over/across the Proposal Site (usually applies to more mobile species)

Possible: Species could occur and utilise resources in the Proposal Site.

Present: Species was recorded during the field investigations

Possible Impact

No: The proposal would not impact this species or its habitats. No 7-Part Test is necessary for this species.

Yes: The proposal could impact this species or its habitats. A 7-Part Test has been completed for this species.

Species & Listing*	Ecology	Presence of Habitat	Nearest Records	Likelihood of Occurrence	Possible Impact?
FAUNA					
Southern Bell Frog *Litoria raniformis*	One of the largest frog species in Australia, these animals may reach up to 104 mm in length, with females usually larger than males. 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. Usually found in or around permanent or ephemeral Black Box/Lignum/Nitre Goosefoot swamps,	**No –** This species prefers permanent swamp areas. The study area does not support this habitat	Species recorded near Ladysmith in 1999.	**None**. Study area does not support suitable habitat for this species.	**No**.

Species & Listing*	Ecology	Presence of Habitat	Nearest Records	Likelihood of Occurrence	Possible Impact?
TSC-E *EPBC-V*	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. Breeding occurs during the warmer months and is triggered by flooding or a significant rise in water levels. The species has been known to breed anytime from early spring through to late summer/early autumn (Sept to April) following a rise in water levels. During the breeding season animals are found floating amongst aquatic vegetation (especially cumbungi or Common Reeds) within or at the edge of slow-moving streams, marshes, lagoons, lakes, farm dams and rice crops. Tadpoles require standing water for at least 4 months for development and metamorphosis to occur but can take up to 12 months to develop. Outside the breeding season animals disperse away from the water and take shelter beneath ground debris such as fallen timber and bark, rocks, grass clumps and in deep soil cracks. Prey includes a variety of invertebrates as well as other small frogs, including young of their own species.	type.			
Sloane's Froglet *Crinia sloanei* TSC-V	Crinia sloanei has been recorded from widely scattered sites in the floodplains of the Murray-Darling Basin, with the majority of records in the Darling Riverine Plains, NSW South Western Slopes and Riverina bioregions in New South Wales. It is typically associated with periodically inundated areas in grassland, woodland and disturbed habitats. Habitats it is found in include woodlands, grasslands and disturbed areas.	**No –** Species is found to inhabit areas inundated with water. The study area did not have any permanent water courses present.	Species recorded near Livingstone National Park in 2001 just north of Burrandana.	**None**. Study area does not support suitable habitat for this species.	**No.**
Booroolong Frog *Litoria booroolongensis* (Bionet search only)	The Booroolong Frog is a medium sized tree frog, with adults growing to about 5 cm. Their body-colour may be grey, olive or brown with indistinct black markings. This species is restricted to NSW and north-eastern Victoria, predominantly along the western-flowing streams of the Great Dividing Range. It inhabits permanent streams with some fringing vegetation cover such as ferns, sedges or grasses. Adults occur on or near cobble banks and other rock structures within stream margins. Shelter under rocks or amongst vegetation near the ground on the stream edge. Breeding occurs in spring and early summer and tadpoles metamorphose in late summer to early autumn. Eggs are laid in submerged rock crevices and tadpoles grow in slow-flowing connected or	**No –** Study area does not support suitable habitat for this species as it inhabits permanent water bodies.	Species recorded over 55kms south east of study area in 1999 near Humula.	**None.** The study area is located along Pine Gully Road where although there is a small drainage line present, there is no permanent water evident within the study area.	**No.**

Species & Listing*	Ecology	Presence of Habitat	Nearest Records	Likelihood of Occurrence	Possible Impact?
	isolated pools.				
Speckled Warbler *Pyrrholaemus sagittatus* *TSC-V*	The Speckled Warbler is a small well-camouflaged very heavily streaked ground-dwelling bird related to the scrubwrens, reaching a length of 13cm. 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 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. The diet consists of seeds and insects, with most foraging taking place on the ground around tussocks and under bushes and trees. Pairs are sedentary and occupy a breeding territory of about ten hectares, with a slightly larger home-range when not breeding. The rounded, domed, roughly built nest of dry grass and strips of bark is located in a slight hollow in the ground or the base of a low dense plant, often among fallen branches and other litter. A side entrance allows the bird to walk directly inside. A clutch of 3-4 eggs is laid, between August and January, and both parents feed the nestlings. The eggs are a glossy red-brown, giving rise to the unusual folk names 'Blood Tit' and 'Chocolatebird'.	**Yes** – Species is known to occupy eucalypt dominated communities with a grassy understory.	Species was recently recorded by **ngh**environmental ecologists in August 2008 approximately 2kms west of the site	**Possible**. The study area supports a grassy understorey and sparse shrub layer. This species was observed along a road approximately 2kms from the site with similar vegetation.	**Yes. 7 part test required.**
Freckled Duck *Stictonetta naevosa* TSC-V	The Freckled Duck is a dark, greyish-brown bird with a large head that is peaked at the rear, and a distinctive narrow, slightly up-turned bill. The Freckled Duck is found primarily in south-eastern and south-western Australia, occurring as a vagrant elsewhere. It breeds in large temporary swamps created by floods in the Bulloo and Lake Eyre basins and the Murray-Darling system, particularly along the Paroo and Lachlan Rivers, and other rivers within the Riverina. Prefer permanent freshwater swamps and creeks with heavy growth of Cumbungi, Lignum or Tea-tree. During drier times they move from ephemeral breeding swamps to more permanent waters such as lakes, reservoirs, farm dams and sewage ponds. Generally rest in dense cover during the day, usually in deep	**No –** there are no water resources available within the study area that is suitable habitat for this species.	Last recorded in 2003 within Wagga Wagga town centre.	**Unlikely.** Study area does not support suitable habitat for this species	**No**.

Species & Listing*	Ecology	Presence of Habitat	Nearest Records	Likelihood of Occurrence	Possible Impact?
	water. Feed at dawn and dusk and at night on algae, seeds and vegetative parts of aquatic grasses and sedges and small invertebrates. Nesting usually occurs between October and December but can take place at other times when conditions are favourable. Nests are usually located in dense vegetation at or near water level.				
Blue Billed Duck *Oxyura australis* *TSC-V*	The Blue-billed Duck is one of only two Australian species of stiff-tailed ducks - diving ducks with spine-like tail-feathers. The Blue-billed Duck is endemic to south-eastern and south-western Australia. It is widespread in NSW, but most common in the southern Murray-Darling Basin area. The Blue-billed Duck prefers deep water in large permanent wetlands and swamps with dense aquatic vegetation. The species is completely aquatic, swimming low in the water along the edge of dense cover. It will fly if disturbed, but prefers to dive if approached. Blue-billed Ducks will feed by day far from the shore, particularly if dense cover is available in the central parts of the wetland. They feed on the bottom of swamps eating seeds, buds, stems, leaves, fruit and small aquatic insects such as the larvae of midges, caddisflies and dragonflies. Blue-billed Ducks are partly migratory, with short-distance movements between breeding swamps and overwintering lakes with some long-distance dispersal to breed during spring and early summer. Blue-billed Ducks usually nest solitarily in Cumbungi over deep water between September and February. They will also nest in trampled vegetation in Lignum, sedges or Spike-rushes, where a bowl-shaped nest is constructed. The most common clutch size is five or six. Males take no part in nest-building or incubation. Young birds disperse in April-May from their breeding swamps in inland NSW to non-breeding areas on the Murray River system and coastal lakes.	**No** - Species prefers areas of permanent water with dense vegetation. The study area does not support this type of habitat.	Closest record is near the Rock Nature Reserve roughly 35kms west of the study area in 1978	**Unlikely**. The study area does not comprise of any dam areas, therefore providing no suitable habitat for this species.	**No**.
Bush Stone Curlew *Burhinus grallarius*	The Bush Stone-curlew stands about 55 cm tall. It has a grey to light brown back, marked with black blotches, and a streaked rump. Inhabits open forests and woodlands with a sparse grassy groundlayer and fallen timber. Largely nocturnal, being especially active on moonlit nights. Feed on insects and small vertebrates, such as frogs, lizards and snakes. Nest on the ground in a scrape or small bare patch. Two eggs are laid in spring and early summer.	**No** – Species inhabits areas with fallen timber and sparse grassy areas.	Last recorded near Lake Albert in 1979, roughly 15kms south of the study area.	**Unlikely**. The study area supports very minimal fallen timber with the western road verge approximately 10 – 20 m in width. The study area	**No**.

Species & Listing*	Ecology	Presence of Habitat	Nearest Records	Likelihood of Occurrence	Possible Impact?
TSC-E				is adjoined by open cleared farming land and Pine Gully Road providing minimal if at all any habitat for this species.	
Gang Gang cockatoo *Callocephalon fimbriatum* TSC-V	The Gang-gang Cockatoo is distributed from southern Victoria through south- and central-eastern New South Wales. In New South Wales, the Gang-gang Cockatoo is distributed from the south-east coast to the Hunter region, and inland to the Central Tablelands and south-west slopes. It occurs regularly in the Australian Capital Territory. It is rare at the extremities of its range, with isolated records known from as far north as Coffs Harbour and as far west as Mudgee. In summer, generally found in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. In winter, may occur at lower altitudes in drier more open eucalypt forests and woodlands, and often found in urban areas. May also occur in sub-alpine Snow Gum *Eucalyptus pauciflora* woodland and occasionally in temperate rainforests. Move to lower altitudes in winter, preferring more open eucalypt forests and woodlands, particularly in box-ironbark assemblages, or in dry forest in coastal areas. Favours old growth attributes for nesting and roosting.	**Yes** – Species may occur at lower altitudes in drier more open eucalypt forests and woodlands, and often found in urban areas.	Recorded approximately 30kms south of the study area in Livingstone National Park in 1979 and also at The Rock Nature Reserve in 1985	**Possible**. Species may utilise study area as a flyover and as roosting and breeding habitat as there are a number of hollow bearing trees along the road verge	**Yes. 7 Part test required.**
Major Mitchell Cockatoo *Cacatua leadbeateri* *TSC-V*	An unmistakable cockatoo of the dry inland, the Pink Cockatoo is the only Australian cockatoo that is salmon-pink below and white above. 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. Normally found in pairs or small groups, though flocks of hundreds may be found where food is abundant. Nesting, in tree hollows, occurs throughout the second half of the year; nests are at least 1 km apart, with no more than one pair every 30 square kilometres.	**Yes** – Species inhabits a variety of habitats with or without tree species present.	Previously recorded in 1999 near Estella just east of the study area.	**Possible**. Species may utilise study area as a flyover and as roosting and breeding habitat as there are a number of hollow bearing trees along the road verge	**Yes. 7 Part test required.**
Glossy black cockatoo	The species is uncommon although widespread throughout suitable forest and woodland habitats, from the central Queensland coast to East Gippsland in	**No** – species relies on allocasuarina and	Last recorded in 2007 at the Rock nature	**None**. Study area does not provide suitable	**No.**

Species & Listing*	Ecology	Presence of Habitat	Nearest Records	Likelihood of Occurrence	Possible Impact?
Calyptorhynchus lathami TSC-V	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 up to 1000 m in which stands of she-oak species, particularly Black She-oak (*Allocasuarina littoralis*), Forest She-oak (*A. torulosa*) or Drooping She-oak (*A. verticillata*) occur. In the Riverina area, inhabits open woodlands dominated by Belah (*Casuarina cristata*). Feeds almost exclusively on the seeds of several species of she-oak (*Casuarina* and *Allocasuarina* species), shredding the cones with the massive bill. Dependent on large hollow-bearing eucalypts for nest sites. One or two eggs are laid between March and August.	casuarinas for foraging and roosting. Neither of these species is present within the study area.	Reserve and again near the wagga wagga town centre also in 2007.	foraging habitat for this species.	
Brown treecreeper *Climacteris picumnus* *TSC-V*	The Brown Treecreeper is endemic to eastern Australia and occurs in eucalypt forests and woodlands of inland plains and slopes of the Great Dividing Range. It is less commonly found on coastal plains and ranges. Found in eucalypt woodlands (including Box-Gum Woodland) and dry open forest of the inland slopes and plains inland of the Great Dividing Range; mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey, sometimes with one or more shrub species; also found in mallee and River Red Gum (*Eucalyptus camaldulensis*) Forest bordering wetlands with an open understorey of acacias, saltbush, lignum, cumbungi and grasses; usually not found in woodlands with a dense shrub layer; fallen timber is an important habitat component for foraging; also recorded, though less commonly, in similar woodland habitats on the coastal ranges and plains. Sedentary, considered to be resident in many locations throughout its range; present in all seasons or year-round at many sites; territorial year-round, though some birds may disperse locally after breeding. Hollows in standing dead or live trees and tree stumps are essential for nesting.	**Yes –** Although the study area may provide some foraging habitat this species prefers areas of stringybarks in open grassy areas.	Recently recorded in 2001 just 15kms south of the study area.	**Possible**. The study area supports a number of hollow bearing trees along the road verges, some of which may be impacted upon as a result of the proposal. There is very minimal fallen timber evident and as such the study area may be used as foraging habitat or as a movement corridor.	**Yes. 7 Part test required.**
Diamond Firetail *Stagonopleura*	Found in grassy eucalypt woodlands, including Box-Gum Woodlands and Snow Gum *Eucalyptus pauciflora* Woodlands. Also occurs in open forest, mallee, Natural Temperate Grassland, and in secondary grassland derived from other communities. Often found in riparian areas (rivers and creeks), and sometimes	**No –** Species is usually found near riparian areas and within lightly wooded	Recorded within the township of Wagga Wagga in 1997.	**Unlikely.** The study area comprises remnant eucalypt trees with some regeneration and cypress	**No.**

Species & Listing*	Ecology	Presence of Habitat	Nearest Records	Likelihood of Occurrence	Possible Impact?
guttata TSC-V	in lightly wooded farmland. Feeds exclusively on the ground, on ripe and partly-ripe grass and herb seeds and green leaves, and on insects (especially in the breeding season). Usually encountered in flocks of between five to 40 birds, occasionally more. Groups separate into small colonies to breed, between August and January. Nests are globular structures built either in the shrubby understorey, or higher up, especially under hawk's or raven's nests. Birds roost in dense shrubs or in smaller nests built especially for roosting. Appears to be sedentary, though some populations move locally, especially those in the south. Has been recorded in some towns and near farm houses.	farmland.		pine. Ground cover species are mostly exotic providing minimal suitable habitat for this species.	
Malleefowl *Leipoa ocellata* EPBC only EPBC-MT	Large, distinctive, ground-dwelling bird. Robust, powerful legs, a short bill and a flattish head. Recorded mainly from the southern half of the western NSW, from the Pilliga forest, south-west to the Griffith and Wentworth districts, excluding the southern Riverina. Predominantly inhabit mallee communities, preferring the tall, dense and floristically-rich mallee found in higher rainfall (300-450 mm mean annual rainfall) areas. Less frequently found in other eucalypt woodlands (e.g., mixed Western Grey Box and Yellow Gum or Bimble Box, Ironbark-Callitris Pine, Callitris Pine, Mulga (*Acacia aneura*), and Gidgee(*A. cambagei*). Prefers areas of light sandy to sandy loam soils and habitats with a dense but discontinuous canopy, dense and variable shrub and herb layers. Malleefowl will occupy areas within five years of fire, however they prefer older age classes. A pair may occupy a range of between 50 and 500 ha, overlapping with those of their neighbours. Mainly forage in open areas on seeds of acacias and other native shrubs (*Cassia, Beyeria, Bossiaea*), buds, flowers and fruits of herbs and various shrubs, insects (cockroaches, ants, soil invertebrates), and cereals if available. Incubate eggs in large mounds that contain considerable volumes of sandy soil. The litter within the mounds must be dampened for it to decompose and provide heat for incubation of eggs.	**No –** Species predominately inhabits mallee communities, none of which were present within the study area.	N/A	**None.** Study area does not support any mallee eucalypt communities nor are there dense shrub and herb layers present. No malleefowl nests were seen within or near the study area.	**No.**
Plains-wanderer *Pedionomus torquatus* EPBC only	The Plains-wanderer (*Pedionomus torquatus*) is a small quail-like bird standing about 12-15 cm tall. They occur in semi-arid, lowland native grasslands that typically occur on hard red-brown soils. These grasslands support a high diversity of plant species, including a number of state and nationally threatened species. Grassland habitat structure is more important than species composition. Preferred habitat typically has 50% bare ground, 10% fallen litter, and the remaining 40% comprised of herbs, forbs and grasses. Most of the vegetation is <5 cm high but some vegetation up to a maximum of 30 cm is	**No –** The study area does not support ground cover species less 5cm high.	N/A	**None.** Species is mainly found in the western Riverina areas.	**No.**

Species & Listing*	Ecology	Presence of Habitat	Nearest Records	Likelihood of Occurrence	Possible Impact?
	important for concealment, grass tussocks are spaced 10-20 cm apart. During prolonged drought, the denudation of preferred habitats may force birds into more marginal habitats that become temporarily suitable. Individual birds range over about 12 ha but share around half this area with a mate, meaning that pairs require about 18 ha of suitable habitat. A ground-dwelling species which is very difficult to observe during the day. Graziers have seen Plains-wanderers when mustering sheep. The species can only be properly surveyed at night using spotlighting techniques.				
Australian Painted Snipe *Rostratula australis* *EPBC only* *EPBC-MT*	The Painted Snipe has a scattered distribution in Australia, primarily occuring along the east coast from north Queensland to the Eyre Peninsula in South Australia, and including the majority of New South Wales and Victoria. Scattered records indicate that it may also occur in western Queensland, throughout Western Australia and the Northern Territory. A single record is known from Tasmania. The Painted Snipe inhabits inland and coastal shallow freshwater wetlands, occuring in both ephemeral and permanent wetlands, particularly where there is grass. Individuals have been spotted in artificial dams, sewage ponds and waterlogged grasslands. The movements of the Painted Snipe are poorly known and it may be a migratory species. Sightings of individuals are erratic, and it is thought the species is likely to be nomadic in response to suitable conditions, such as floods. The Painted Snipe forages at night on mud flats and in shallow water. It feeds on invertebrates such as worms, snails and water beetles, and plant material such as seeds. The Painted Snipe nests on the ground amongst tall vegetation such as grass tussocks and reeds. Nests, which consist of a scrape in the ground lined with grass and leaves, are often located on small islands. The female is polyandrous, meaning that she leaves the male to look after the young while she moves on to mate with as many other males as she can attract. Incubation of the eggs and brooding of the young is therefore done by the male alone.	**No** - Species prefers inland and coastal shallow freshwater wetlands, particularly where there is grass present. Forages at night on mud flats and feeds in certain invertebrates.	**N/A**	**None**. Potential suitable habitat does not exist within study area.	**No.**
Brolga *Grus rubicundus*	Though Brolgas often feed in dry grassland or ploughed paddocks or even desert claypans, they are dependent on wetlands, especially shallow swamps, where they will forage with their head entirely submerged. They feed using their heavy straight bill as a 'crowbar' to probe the ground or turn it over, primarily on sedge roots and tubers. They will also take large insects, crustaceans, molluscs	**No** – Species is dependent on wetlands.	Last recorded in Wagga Wagga LGA in 1979 just west of Uranquinty.	**None**. There are no permanent wetlands located within the study area.	**No.**

Species & Listing*	Ecology	Presence of Habitat	Nearest Records	Likelihood of Occurrence	Possible Impact?
TSC-V	and frogs. The famous Brolga 'dance' is apparently at least in part a courtship or bonding display where a pair or many pairs face each other, crouch down and stretch upwards, trumpet, leap and toss grass and sticks into the air. The nest comprises a platform of grasses and sticks, augmented with mud, on an island or in the water. Two eggs are laid from winter to autumn.				
Black Chinned Honeyeater *Melithreptus gularis gularis* TSC-V	The Black-chinned Honeyeater is the largest of its genus, reaching 17 cm in length. The cap is black, with a white crescent around the nape, and there is a diagnostic black centre line down the white throat. There is a small crescent of blue skin above the eye. The back and wings are a dull olive-green and the tail is greyish-brown. The underparts are white, with a greyish-buff tint on the breast. The bill is short, black and slightly downcurved. Occupies mostly upper levels of drier open forests or woodlands dominated by box and ironbark eucalypts, especially Mugga Ironbark (*Eucalyptus sideroxylon*), White Box (*Eucalyptus albens*), Grey Box (*Eucalyptus microcarpa*), Yellow Box (*Eucalyptus melliodora*) and Forest Red Gum (*Eucalyptus tereticornis*). Also inhabits open forests of smooth-barked gums, stringybarks, ironbarks and tea-trees. A gregarious species usually seen in pairs and small groups of up to 12 birds.	**Yes –** Species is known to inhabit areas of White box and Yellow box species.	Recently recorded in 2001 10kms south of the study area.	**Possible**. Study area comprises both box eucalypt species. There may be some removal of old growth trees along the western road verge.	**Yes. 7 Part test required.**
Regent Honeyeater *Xanthomyza Phrygia* TSC-E EPBC-E EPBC-MT	The Regent Honeyeater mainly inhabits temperate woodlands and open forests of the inland slopes of south-east Australia. Birds are also found in drier coastal woodlands and forests in some years. There are only three known key breeding regions remaining: north-east Victoria (Chiltern-Albury), and in NSW at Capertee Valley and the Bundarra-Barraba region although breeding has been observed outside these areas. In NSW the distribution is very patchy and mainly confined to the two main breeding areas and surrounding fragmented woodlands. In some years non-breeding flocks converge on flowering coastal woodlands and forests. 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. Every few years non-breeding flocks are seen foraging in flowering coastal Swamp Mahogany	**No** – Species mainly inhabits temperate woodlands, open forests and drier coastal woodlands with large numbers of mature trees and high canopy cover with a high abundance and species richness of bird species. Is only known to breed at three key areas in	Last recorded within Wagga Wagga town centre in 1977.	**Unlikely**. The species has not been seen in the locality for 30 years, and the study area does not contain appropriate habitat.	**No.**

Species & Listing*	Ecology	Presence of Habitat	Nearest Records	Likelihood of Occurrence	Possible Impact?
	and Spotted Gum forests, particularly on the central coast and occasionally on the upper north coast. Birds are occasionally seen on the south coast. The Regent Honeyeater is a generalist forager, which mainly feeds on the nectar from a wide range of eucalypts and mistletoes. Key eucalypt species include Mugga Ironbark, Yellow Box, Blakely's Red Gum, White Box and Swamp Mahogany. Also utilises : *E. microcarpa, E. punctata, E. polyanthemos, E. mollucana, Corymbia robusta, E. crebra, E. caleyi, Corymbia maculata, E.mckieana, E. macrorhyncha, E. laevopinea,* and *Angophora floribunda*. Nectar and fruit from the mistletoes *A. miquelii, A. pendula, A. cambagei* are also eaten during the breeding season. When nectar is scarce lerp and honeydew comprise a large proportion of the diet. Insects make up about 15% of the total diet and are important components of the diet of nestlings. A shrubby understorey is an important source of insects and nesting material. The species breeds between July and January in Box-Ironbark and other temperate woodlands and riparian gallery forest dominated by River Sheoak. Regent Honeyeaters usually nest in horizontal branches or forks in tall mature eucalypts and Sheoaks. Also nest in mistletoe haustoria.	NSW.			
Gilbert's Whistler *Pachycephala inornata* *TSC-V*	Gilbert's Whistler is one of the less colourful of the Australian whistler species. The Gilbert's Whistler occurs in ranges, plains and foothills in arid and semi-arid timbered habitats. In NSW it occurs mostly in mallee shrubland, but also in box-ironbark woodlands, Cypress Pine and Belah woodlands and River Red Gum forests. Within the mallee the species is often found in association with an understorey of spinifex and low shrubs including acacias, hakeas, sennas and grevilleas. In woodland habitats, the understorey comprises dense patches of shrubs. The Gilbert's Whistler forages on or near the ground in shrub thickets and in tops of small trees. Its food consists mainly of spiders and insects such as caterpillars, beetles and ants. Occasionally, seeds and fruits are eaten. The young are fed insects. Breeding takes place from August to November. Patches of dense understorey shrubs associated with mallee or woodland are essential for territorial pairs to breed. Aggregations of nesting pairs are sometimes recorded. At Cowra three pairs nested in a 25 ha area. Nests are built 2 m above the ground in the fork of dense foliage of prickly plants such as acacias. The nest	**No –** Species occupies areas of woodland with dense shrub layer.	Located just west of Wagga Wagga town centre in 1979.	**Unlikely.** Species prefers areas of dense shrubland. Although the study area has some areas of vegetation it is unlikely to support suitable breeding or roosting habitat for this species.	**No.**

Species & Listing*	Ecology	Presence of Habitat	Nearest Records	Likelihood of Occurrence	Possible Impact?
	is either a lined cup or sometimes birds use the old nests of other species, particularly disused babblers' nests. Two or three eggs, occasionally four, are laid. The pair holds and defends the territory all year round. Whistlers do not make any regular large-scale movements, though young disperse after fledging.				
Hooded Robin *Melanodryas cucullate* TSC-V	The Hooded Robin is considered a sedentary species, but local seasonal movements are possible. The south-eastern form is found from Brisbane to Adelaide throughout much of inland NSW, with the exception of the north-west. The species is widespread, found across Australia, except for the driest deserts and the wetter coastal areas - northern and eastern coastal Queensland and Tasmania. 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. Often perches on low dead stumps and fallen timber or on low-hanging branches, using a perch-and-pounce method of hunting insect prey. Territories range from around 10 ha during the breeding season, to 30 ha in the non-breeding season. May breed any time between July and November, often rearing several broods. The nest is a small, neat cup of bark and grasses bound with webs, in a tree fork or crevice, from less than 1 m to 5 m above the ground.	**Yes –** Species does inhabit open cleared areas, however requires structurally diverse habitats including mature eucalyptus, saplings and some shrubs.	Species has been recorded within Wagga Wagga LGA at a number of locations including Livingstone National Park and just west of Wagga Wagga town centre. Most recent sighting was recorded in 2007.	**Possible**. Species may use the study area as foraging habitat; however it does not support a structural diverse range of habitats as no shrub layers are evident.	**Yes. 7 Part test applied.**
Grey Crowned Babbler *Pomatostomus temporalis temporalis* TSC-V	Inhabits open Box-Gum Woodlands on the slopes, and Box-Cypress-pine and open Box Woodlands on alluvial plains. Flight is laborious so birds prefer to hop to the top of a tree and glide down to the next one. Birds are generally unable to cross large open areas. Live in family groups that consist of a breeding pair and young from previous breeding seasons. A group may consist of up to fifteen birds. All members of the family group remain close to each other when foraging. A soft 'chuck' call is made by all birds as a way of keeping in contact with other group members. Feed on invertebrates, either by foraging on the trunks and branches of eucalypts and other woodland trees or on the ground, digging and probing amongst litter and tussock grasses Build and maintain several conspicuous, dome-shaped stick nests about the size of a football. A nest	**Yes –** This species is known to inhabit areas of Box-Cypress areas on slopes. However will not cross large areas of country.	Species recorded by **ngh**environmental ecologists in August 2008 within 2kms of the study area.	**Possible.** Although the study area is surrounded by cleared areas and that this species isn't known to cross open cleared areas, there is suitable habitat present within the study area, however there will be minimal removal of vegetation, as such this will not impact	**No.**

Species & Listing*	Ecology	Presence of Habitat	Nearest Records	Likelihood of Occurrence	Possible Impact?
	is used as a dormitory for roosting each night. Nests are usually located in shrubs or sapling eucalypts, although they may be built in the outermost leaves of low branches of large eucalypts. Nests are maintained year round, and old nests are often dismantled to build new ones. Breed between July and February. Usually two to three eggs are laid and incubated by the female. During incubation, the adult male and several helpers in the group may feed the female as she sits on the nest. Young birds are fed by all other members of the group. Territories range from one to fifty hectares (usually around ten hectares) and are defended all year. Territorial disputes with neighbouring groups are frequent and may last up to several hours, with much calling, chasing and occasional fighting.			on this species.	
Swift Parrot *Lathamus discolour* *EPBC-E* *TSC-E* *EPBC-MM*	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 Grey Box *E. microcarpa*, Grey Box *E. moluccana* and Blackbutt *E. pilularis*. Return to home foraging sites on a cyclic basis depending on food availability.2	**Yes** – There is a number of white box trees present which may provide foraging habitat for this species.	Species last recorded in 2002 near Pomingalarna Reserve, just south of Wagga Wagga.	**Unlikely**. Study area does not support many trees favoured by the species for feeding, with the exception of White box. Species breeds in Tasmania, therefore the proposal is unlikely to impact on this species.	**No.**
Turquoise Parrot *Neophema pulchella* *TSC-V*	The Turquoise Parrot's range extends from southern Queensland through to northern Victoria, from the coastal plains to the western slopes of the Great Dividing Range. Lives on the edges of eucalypt woodland adjoining clearings, timbered ridges and creeks in farmland. Usually seen in pairs or small, possibly family, groups and have also been reported in flocks of up to thirty individuals. Prefers to feed in the shade of a tree and spends most of the day on the ground searching for the seeds or grasses and herbaceous plants, or browsing on vegetable matter. Forages quietly and may be quite tolerant of disturbance.	**Yes** – Lives on the edges of eucalypt woodlands near clearings.	Previously recorded roughly 30kms from study area near Livingstone National Park in 2001.	**Possible**. Study area contains potential habitat, including a variety of grasses and herbaceous plants with a number of hollow bearing trees present along the	**Yes. 7 Part Test applied.**

Species & Listing*	Ecology	Presence of Habitat	Nearest Records	Likelihood of Occurrence	Possible Impact?
	However, if flushed it will fly to a nearby tree and then return to the ground to browse as soon as the danger has passed. Nests in tree hollows, logs or posts, from August to December.			road verges.	
Superb Parrot *Polytelis swainsonii* *TSC-V* *EPBC-V*	Inhabit Box-Gum, Box-Cypress-pine and Boree Woodlands and River Red Gum Forest. In the Riverina the birds nest in the hollows of large trees (dead or alive) mainly in tall riparian River Red Gum Forest or Woodland. On the South West Slopes nest trees can be in open Box-Gum Woodland or isolated paddock trees. Species known to be used are Blakely's Red Gum, Yellow Box, Apple Box and Red Box. Nest in small colonies, often with more than one nest in a single tree. Breed between September and January. May forage up to 10 km from nesting sites, primarily in grassy box woodland. Feed in trees and understorey shrubs and on the ground and their diet consists mainly of grass seeds and herbaceous plants. Also eaten are fruits, berries, nectar, buds, flowers, insects and grain.	**Yes –** Study area provides some hollow bearing trees for roosting and foraging habitat is present.	**ngh**environmental staff have recorded this species within 2kms of the study area in August 2008	**Possible.** Study area supports a number of hollow bearing trees which could provide suitable roosting and breeding habitat for this species.	**Yes. 7 Part test applied.**
Barking Owl *Ninox connivens* *TSC-V*	The Barking Owl is a typical hawk-owl, with staring, yellow eyes and no facial-disc. It is grey to greyish-brown above, with white spots on the wings and almost white underneath with greyish-brown vertical streaks. Is found throughout Australia except for the central arid regions and Tasmania. It is quite common in parts of northern Australia, but is generally considered uncommon in southern Australia. It has declined across much of its distribution across NSW and now occurs only sparsely. Inhabits eucalypt woodland, open forest, swamp woodlands and, especially in inland areas, timber along watercourses. Denser vegetation is used occasionally for roosting. During the day they roost along creek lines, usually in tall understorey trees with dense foliage such as *Acacia* and *Casuarina* species, or the dense clumps of canopy leaves in large *Eucalypts*. Feeds on a variety of prey, with invertebrates predominant for most of the year, and birds and mammals such as smaller gliders, possums, rodents and rabbits becoming important during breeding. Live alone or in pairs. Territories range from 30 to 200 hectares and birds are present all year. Three eggs are laid in nests in hollows of large, old eucalypts including River Red Gum (*Eucalyptus camaldulensis*), White Box (*Eucalyptus albens*), (Red Box) *Eucalyptus polyanthemos* and Blakely's Red Gum (*Eucalyptus blakelyi*). Breeding occurs	**No** – The eucalypt woodland in the study area is not as dense as typical habitat for the species. Species roosts in dense vegetation and forages along watercourses.	Recorded in Livingstone National Park in 2001.	**Unlikely**. Habitat is not present in the study area. Species may use area as a flyover.	**No.**

Species & Listing*	Ecology	Presence of Habitat	Nearest Records	Likelihood of Occurrence	Possible Impact?
	during late winter and early spring				
Spotted Tailed Quoll *Dasyurus maculatus* TSC – V EPBC – E	The Spotted-tailed Quoll is about the size of a domestic cat, from which it differs most obviously in its shorter legs and pointed face. The range of the Spotted-tailed Quoll has contracted considerably since European settlement. It is now found on the east coast of NSW, Tasmania, eastern Victoria and north-eastern Queensland. Only in Tasmania is it still considered common. Recorded across a range of habitat types, including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline. Individual animals use hollow-bearing trees, fallen logs, small caves, rock crevices, boulder fields and rocky-cliff faces as den sites. Mostly nocturnal, although will hunt during the day; spends most of the time on the ground, although also an excellent climber and may raid possum and glider dens and prey on roosting birds. Use 'latrine sites', often on flat rocks among boulder fields and rocky cliff-faces; these may be visited by a number of individuals; latrine sites can be recognised by the accumulation of the sometimes characteristic 'twisty-shaped' faeces deposited by animals. Females occupy home ranges up to about 750 hectares and males up to 3500 hectares; usually traverse their ranges along densely vegetated creek lines.	**No –** Although the study area supports some hollow bearing there are no rock crevices present.	Last recorded near Mangoplah in 2006.	**Unlikely**. The study area does not contain dense woodland habitat that would support the species in this region.	**No.**
Bilby *Macrotis lagotis* TSC-E4	Bilbies have the characteristic long bandicoot muzzle and very long ears. As compared with other bandicoots, they have a longer tail, bigger ears, and softer, silky fur. They are nocturnal omnivores that do not need to drink water, as they get all the moisture they need from their food, which includes insects and their larvae, seeds, spiders, bulbs, fruit, fungi and very small animals. Most food is found by digging or scratching in the soil, and using their very long tongues. Once widespread in arid, semi-arid and relatively fertile areas, the Greater Bilby is now restricted to arid wastelands and remains endangered.	**No** - This species is extinct in most parts of Australia including NSW; however successful reintroduction programs have been implemented in Queensland and South Australia.	Last recorded within the Wagga Wagga LGA over 100 years ago.	**None**. The species does not occur in NSW. There are no suitable foraging habitats within the proposed activity areas. This species was last recorded within Wagga Wagga LGA in 1912.	No.
Bridled Nailtail Wallaby	The Bridled Nail-tail Wallaby previously occupied *Acacia* shrubland and grassy woodland in semi-arid regions of eastern Australia. Its known distribution is now restricted to two relatively small areas in Queensland. During the day, the	**No** – Species prefers acacia shrubland	N/A	**None**. The study area does not support suitable	**No**.

Species & Listing*	Ecology	Presence of Habitat	Nearest Records	Likelihood of Occurrence	Possible Impact?
Onychogalea fraenata EPBC-V	Bridled Nailtail Wallaby rests in a slightly dished patch of bare ground scratched out beside a bush or tree. Around dusk it commences to feed.	areas in semi arid regions.		habitat for this species.	
Squirrel Glider *Petaurus norfolcensis* TSC-V	Adult Squirrel Gliders have a head and body length of about 20 cm. They have blue-grey to brown-grey fur above, white on the belly and the end third of the tail is black. There is a dark stripe from between the eyes to the mid-back and the tail is soft and bushy averaging about 27 cm in length. Inhabits mature or old growth Box, Box-Ironbark woodlands and River Red Gum forest west of the Great Dividing Range and Blackbutt-Bloodwood forest with heath understorey in coastal areas. Prefers mixed species stands with a shrub or Acacia midstorey. Live in family groups of a single adult male one or more adult females and offspring. Require abundant tree hollows for refuge and nest sites. Diet varies seasonally and consists of Acacia gum, eucalypt sap, nectar, honeydew and manna, with invertebrates and pollen providing protein.	**Yes –** Study area supports some remnant tree hollows for this species.	A number of records found within Livingstone National Park, just south of the study area in 2005.	**Possible –** Although the study area supports some suitable habitat for this species, the majority of the site is surrounded by cleared farming areas. The proposal may remove a hollow bearing tree.	**Yes. 7 Part test required.**
Koala *Phascolarctos cinereus* TSC-V	In NSW it mainly occurs on the central and north coasts with some populations in the western region. It was historically abundant on the south coast of NSW, but now occurs in sparse and possibly disjunct populations. Koalas are also known from several sites on the southern tablelands. Inhabit eucalypt woodlands and forests. 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. Inactive for most of the day, feeding and moving mostly at night. Spend most of their time in trees, but will descend and traverse open ground to move between trees. Home range size varies with quality of habitat, ranging from less than two ha to several hundred hectares in size. Generally solitary, but have complex social hierarchies based on a dominant male with a territory overlapping several females and sub-ordinate males on the periphery.	**No** – Feeds on a variety of eucalypt species. The study area has only a few scattered eucalypts. There is no woodland that would support the species.	Recorded in 2006 along the Holbrook Road, roughly 20kms south of the study area.	**None**. There is no suitable habitat present in the study area.	**No.**
Large Footed Myotis	The Large-footed Myotis is found in the coastal band from the north-west of Australia, across the top-end and south to western Victoria. It is rarely found more than 100 km inland, except along major rivers. Generally roost in groups of	**No** – Species is rarely found 100kms inland,	Recorded along the Murrumbidgee River	**None**. The study area is not located along any	**No.**

Species & Listing*	Ecology	Presence of Habitat	Nearest Records	Likelihood of Occurrence	Possible Impact?
Myotis adversus TSC-V	10 - 15 close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings, under bridges and in dense foliage. Forage over streams and pools catching insects and small fish by raking their feet across the water surface. In NSW females have one young each year usually in November or December.	except along major rivers.	near Wagga Wagga in 2000.	major river systems	
Inland Forest Bat *Vespadelus baverstocki* TSC-V	Recorded from scattered localities in western NSW, but may be more widespread. Roosts in tree hollows and abandoned buildings. It has been recorded from a variety of woodland formations, including mallee, mulga and River Red Gum. Colony size ranges from a few individuals to more than fifty. Females congregate to raise young. The single young is carried by its mother until its weight affects her flight, and is then left in the roost at night. These bats fly rapidly and cover an extensive foraging area.	**Yes** – Species roosts in tree hollows and was recorded in locality	Species was last recorded within Wagga Wagga LGA just north-west of the town centre in 2007.	**Possible**. Study area supports a number of hollow bearing tress, especially along the western road verge, some of which may require removal	**Yes. 7 Part test required.**
Eastern False Pipistrelle *Falsistrellus tasmaniensis* TSC-V	The Eastern False Pipistrelle is found on the south-east coast and ranges of Australia, from southern Queensland to Victoria and Tasmania. Prefers moist habitats, with trees taller than 20 m. Generally roosts in eucalypt hollows, but has also been found under loose bark on trees or in buildings. Hunts beetles, moths, weevils and other flying insects above or just below the tree canopy. Hibernates in winter. Females are pregnant in late spring to early summer.	**No** – The species prefers moist habitats with trees taller than 20m.	Recorded just west of the Rock Nature Reserve.	**None**. Although the study area does support some hollow bearing trees, most are under 20 m in height and the site is not located neat any wet/moist habitats	**No.**
Striped Legless Lizard Delma impar Bionet and EPBC search	The Striped Legless Lizard occurs in the Southern Tablelands, the South Western Slopes and possibly on the Riverina. Populations are known in the Goulburn, Yass, Queanbeyan, Cooma and Tumut areas. Found mainly in Natural Temperate Grassland but has also been captured in grasslands that have a high exotic component. Also found in secondary grassland near Natural Temperate Grassland and occasionally in open	**Yes -** Study area supports modified grassland areas and open Box- Gum woodland.	Species was last recorded in 2006 near Tarcutta.	**Unlikely.** Although the study area supports some suitable habitat for this species, there are neither surface rocks that support suitable habitat for this species nor	**No.**

Species & Listing*	Ecology	Presence of Habitat	Nearest Records	Likelihood of Occurrence	Possible Impact?
	Box-Gum Woodland. Habitat is where grassland is dominated by perennial, tussock-forming grasses such as Kangaroo Grass *Themeda australis*, spear-grasses *Austrostipa* spp. and poa tussocks *Poa* spp., and occasionally wallaby grasses *Austrodanthonia* spp. Sometimes present in modified grasslands with a significant content of exotic grasses. Sometimes found in grasslands with significant amounts of surface rocks, which are used for shelter.			*themada australis* evident.	
Pink Tailed Worm Lizard *Aprasia parapulchella* *TSC-V* *EPBC-V*	The Pink-tailed Worm-lizard is worm-like, with a dark-brown head and nape, gradually merging with the pale grey or grey-brown body. The tail, nearly as long as its body, is pink or reddish-brown towards the tip. The Pink-tailed Worm Lizard is only known from the Central and Southern Tablelands, and the South Western Slopes. There is a concentration of populations in the Canberra/Queanbeyan Region. Other populations have been recorded near Cooma, Yass, Bathurst, Albury and West Wyalong. This species is also found in the Australian Capital Territory. Inhabits sloping, open woodland areas with predominantly native grassy groundlayers, particularly those dominated by Kangaroo Grass (*Themeda australis*). Sites are typically well-drained, with rocky outcrops or scattered, partially-buried rocks. Commonly found beneath small, partially-embedded rocks and appear to spend considerable time in burrows below these rocks; the burrows have been constructed by and are often still inhabited by small black ants and termites. Feeds on the larvae and eggs of the ants with which it shares its burrows. It is thought that this species lays 2 eggs inside the ant nests during summer; the young first appear in March.	**No –** Species prefers rocky outcrop areas. The study area did not support any rocky outcrop areas.	**N/A**	**None.** Study area does not support suitable habitat for this species.	**No.**
Trout Cod *Maccullochella macquariensis* *TSC-E*	The trout cod is a large, elongated, deep-bodied fish which is very similar in appearance to the Murray cod. Features which distinguish it from the Murray cod include an overhanging upper jaw, a long, broad, rounded snout, a straight head profile, and relatively large eyes. Trout cod are often found close to cover and in relatively fast currents, especially in fairly deep water close to the bank, and often congregate around snags. They tend to remain at the one site and to have small home ranges. They are carnivores, preying mainly on other fishes as well as crustaceans and aquatic insects.	**No** – Species prefers fast flowing water. The study area does not support any rivers or streams.	**N/A**	**None**. Study area does not support suitable habitat for this species	**No.**

Species & Listing*	Ecology	Presence of Habitat	Nearest Records	Likelihood of Occurrence	Possible Impact?
EPBC-E					
Murray Cod *Maccullochella peelii peelii* EPBC-V	The Murray Cod is the largest freshwater fish found in Australia. It is a long lived predator species that is highly territorial and aggressive. It occurs naturally in the waterways of the Murray–Darling Basin in a wide range of warm water habitats that range from clear, rocky streams to slow flowing turbid rivers and billabongs. The upper reaches of the Murray and Murrumbidgee Rivers are considered too cold to contain suitable habitat.	**No** – Species occurs in a range of warm water habitats from clear rocky streams to slow flowing turbid rivers. Study area does not support any rivers or streams.	**N/A**	**None**. Study area does not support suitable habitat for this species	**No.**
Macquarie Perch *Macquaria australasica* EPBC-E TSC-V	Macquarie perch are found in both river and lake habitats, especially the upper reaches of rivers and their tributaries. They are quiet, furtive fish that feed on aquatic insects, crustaceans and molluscs. Sexual maturity occurs at two years for males and three years for females. Macquarie perch spawn in spring or summer in shallow upland streams or flowing parts of rivers. Females produce around 50,000-100,000 eggs which settle among stones and gravel of the stream or river bed.	**No** – Study area does not support any rivers or streams. Species inhabits the upper reaches of rivers and their tributaries.	**N/A**	**None**. Study area does not support suitable habitat for this species	**No.**
Silver Perch *Bidyanus bidyanus* *TSC-V*	Silver perch are a moderate to large freshwater fish native to the Murray-Darling river system. Silver perch are oval shaped with a small head that can become beak-like in larger fish. Silver perch were once widespread and abundant throughout most of the Murray-Darling river system. They have now declined to low numbers or disappeared from most of their former range. Silver perch seem to prefer fast-flowing, open waters, especially where there are rapids and races, however they will also inhabit warm, sluggish water with cover provided by large woody debris and reeds. They are omnivorous, feeding on	**No** – Study area does not contain any freshwater streams or rivers. Species prefers fast flowing, open waters where rapids occur.	**N/A**	**None**. Study area does not support suitable habitat for this species	**No.**

Species & Listing*	Ecology	Presence of Habitat	Nearest Records	Likelihood of Occurrence	Possible Impact?
	small aquatic insects, molluscs, earthworms and green algae. Males reach sexual maturity at three years of age, when around 25 cm in length, and females at five years, when around 29 cm. Adults migrate upstream in spring and summer to spawn. Juveniles also sometimes move upstream in response to rising water temperatures and levels. Females can shed 300,000 or more semi-buoyant eggs of about 2.75 mm in diameter. The eggs develop in a few days to become feeding larvae that drift downstream.				

*Listing

TSC-V	Listed as Vulnerable under the Threatened Species Conservation Act
TSC-E	Listed as Endangered under the Threatened Species Conservation Act
TSC-EEC	Listed as an Endangered Ecological Community under the Threatened Species Conservation Act
EPBC-V	Listed as Vulnerable under the Environment Protection and Biodiversity Conservation Act
EPBC-E	Listed as Endangered under the Environment Protection and Biodiversity Conservation Act
EPBC-CE	Listed as Critically Endangered under the Environment Protection and Biodiversity Conservation Act
FM-V	Listed as Vulnerable under the Fisheries Management Act
FM-E	Listed as Endangered under the Fisheries Management Act

Table 3. EPBC Act listed migratory and overfly species, ecology, likelihood of presence and likelihood of impact due to Proposal. Unless otherwise indicated, information on ecology is sourced from the NSW Department of Environment and Climate Change and the Australian Museum websites. Due to the location of the Proposal site exclusively marine species were not considered in the assessment.

Species & Listing*	Ecology	Presence of Habitat	Nearest Records	Likelihood of Occurrence	Possible Impact?
EPBC Act Listed Species					
White Bellied Sea Eagle *Haliaeetus leucogaster* EPBC-MT	White-bellied Sea-Eagles are a common sight in coastal and near coastal areas of Australia. In addition to Australia, the species is found in New Guinea, Indonesia, China, south-east Asia and India. White-bellied Sea-Eagles are normally seen perched high in a tree, or soaring over waterways and adjacent land. Birds form permanent pairs that inhabit territories throughout the year.The White-bellied Sea-Eagle feeds mainly off aquatic animals, such as fish, turtles and sea snakes, but it takes birds and mammals as well. It is a skilled hunter, and will attack prey up to the size of a swan. Sea-Eagles also feed on carrion (dead prey) such as sheep and fish along the waterline. They harass smaller birds, forcing them to drop any food that they are carrying. Sea-Eagles feed alone, in pairs or in family groups.White-bellied Sea-Eagles build a large stick nest, which is used for many seasons in succession. The nest can be located in a tree up to 30m above the ground, but may also be placed on the ground or on rocks, where there are no suitable trees. At the start of the breeding season, the nest is lined with fresh green leaves and twigs. The female carries out most of the incubation of the white eggs, but the male performs this duty from time to time.	**No** - Study area outside species distribution.	**N/A**	**None.** No habitat would be affected.	**No.**
White Throated Needletail *Hirundapus*	White-throated Needletails often occur in large numbers over eastern and northern Australia. They arrive in Australia from their breeding grounds in the northern hemisphere in about October each year and leave somewhere between May and August. They are aerial birds and for a time it was commonly believed that they did not land while in Australia. It has now been observed that birds will roost in trees, and radio-tracking has since confirmed that this is a	**No -** Possible vagrant or occasional visitor to the area but unlikely to use habitats in the study area.	**N/A**	**None.** Highly mobile migratory species which would not be reliant upon any of the habitats to be impacted by the	**No.**

caudacutus EPBC-MT	regular activity. The White-throated Needletail feeds on flying insects, such as termites, ants beetles and flies. They catch the insects in flight in their wide gaping beaks. Birds usually feed in rising thermal currents associated with storm fronts and bushfires and they are commonly seen moving with wind fronts. White-throated Needletails are non-breeding migrants in Australia.			proposal.	
Rainbow Bee-eater *Meropus ornatus* EPBC-MT	The Rainbow Bee-eater is found throughout mainland Australia, as well as eastern Indonesia, New Guinea and, rarely, the Solomon Islands. In Australia it is widespread, except in desert areas, and breeds throughout most of its range, although southern birds move north to breed. The Rainbow Bee-eater is most often found in open forests, woodlands and shrublands, and cleared areas, usually near water. It will be found on farmland with remnant vegetation and in orchards and vineyards. It will use disturbed sites such as quarries, cuttings and mines to build its nesting tunnels. Southern populations move north, often in huge flocks, during winter; northern populations are present year round. Rainbow Bee-eaters eat insects, mainly catching bees and wasps, as well as dragonflies, beetles, butterflies and moths. They catch flying insects on the wing and carry them back to a perch to beat them against it before swallowing them. Bees and wasps are rubbed against the perch to remove the stings and venom glands.	**Yes** – Species may utilise study area for foraging habitat as it occurs in farmland areas with remnant vegetation.	**N/A**	**None.** Highly mobile migratory species which would not be reliant upon any of the habitats to be impacted by the proposal.	**No.**
Satin Flycatcher *Myiagra cyanoleuca* EPBC-MT	The Satin Flycatcher is found along the east coast of Australia from far northern Queensland to Tasmania, including south-eastern South Australia. It is also found in New Guinea. The Satin Flycatcher is not a commonly seen species, especially in the far south of its range, where it is a summer breeding migrant. The Satin Flycatcher is found in tall forests, preferring wetter habitats such as heavily forested gullies, but not rainforests. The Satin Flycatcher is a migratory species, moving northwards in winter to northern Queensland and Papua New Guinea, returning south to breed in spring. The Satin Flycatcher takes insects on the wing, foraging actively from perches in the mid to upper canopy.	**No** - Species prefers wetter habitats such as heavily forested gullies. Is a migratory species. Proposal site does not provide suitable habitat for this species.	**N/A**	**None.** Proposal site does not support suitable habitat.	**No.**
Great Egret *Ardea alba*	Great Egrets occur throughout most of the world. They are common throughout Australia, with the exception of the most arid areas. Great Egrets prefer shallow water, particularly when flowing, but may be seen on any watered area, including damp grasslands. Great Egrets can be seen alone or in small flocks, often with other egret species, and roost at night in groups. The Great Egret usually feeds alone. It feeds on molluscs, amphibians, aquatic insects, small reptiles, crustaceans and occasionally other small animals, but fish make up the	**No** - Foraging habitat is not present in the study area.	**N/A**	**None.** No suitable habitats would be impacted by the proposal.	**No.**

EPBC-MW EPBC-MM	bulk of its diet. The Great Egret usually hunts in water, wading through the shallows, or standing motionless before stabbing at prey. Birds have also been seen taking prey while in flight.The Great Egret breeds in colonies, and often in association with cormorants, ibises and other egrets. Both sexes construct the nest, which is a large platform of sticks, placed in a tree over the water. The previous years' nest may often be re-used. Both sexes also incubate the eggs and care for the young (usually two or three).				
Cattle Egret *Ardea ibis* EPBC-MW EPBC-MM	Originally found in Africa, Europe and Asia, the Cattle Egret is now found on nearly every continent, with birds in Australia originating from Asia. In Australia it is most widespread and common in north-eastern Western Australia across the Top End, Northern Territory, and in south-eastern Australia from Bundaberg, Queensland to Port Augusta, South Australia, including Tasmania. The Cattle Egret is found in grasslands, woodlands and wetlands, and is not common in arid areas. It also uses pastures and croplands, especially where drainage is poor. Will also forage at garbage dumps, and is often seen with cattle and other stock. The Cattle Egret is partially migratory, moving during winter. The Cattle Egret prefers grasshoppers, especially during breeding season, but eats many other invertebrates. It also eats frogs, cane toads, lizards and some small mammals. Its sharp bill is used in a lunging and stabbing manner. It often feeds by following large animals such as cattle, grabbing insects and worms that they disturb with their feet. They also will sit on cattle to look out for insects.Cattle Egret pairs are monogamous for the breeding season, and they breed in colonies, usually with other waterbirds. Their shallow platform nests are made in wetland areas in trees and bushes, usually as high up as possible. Both parents build the nest and incubate the eggs, with one brood per season being raised.	**No** - Foraging habitat is not present in the study area.	**N/A**	**None.** No suitable habitats would be impacted by the proposal.	**No.**
Latham's Snipe *Gallinago hardwickii* EPBC-MW	Latham's Snipe is a non-breeding migrant to the south east of Australia including Tasmania, passing through the north and New Guinea on passage. Latham's Snipe breed in Japan and on the east Asian mainland. Latham's Snipe are seen in small groups or singly in freshwater wetlands on or near the coast, generally among dense cover. They are found in any vegetation around wetlands, in sedges, grasses, lignum, reeds and rushes and also in saltmarsh and creek edges on migration. They also use crops and pasture. Latham's Snipe is a migratory wader, moving to Australia in our warmer months. Birds may fly directly between Japan and Australia, stopping at a few staging areas. They leave their breeding areas from August to November, arriving in Australia mainly in	**No** - wetlands, saltmarshes or creeks are not present in the study area.	**N/A**	**None.** No habitats would be affected by the proposal.	**No.**

	September. They leave the south-east by the end of February, moving northwards along the coast. Most have left Queensland by mid-April.Latham's Snipe feed by thrusting their long bill into mud with an up and down 'sewing machine' action in soft mudflats or shallow water. They roost in the day and feed at night, early morning or evening. They are omnivorous, eating seeds and plant material, worms, spiders and insects, some molluscs, isopods and centipedes. Latham's Snipe breeds in Japan and on the East Asian mainland, on dry ground such as grassy hillsides and forest clearings. The males have spectacular display flights, rising in the air and then diving to the ground, in courtship or to defend territory. The female incubates in a shallow depression lined with grasses and leaves.				
Painted Snipe *Rostratula benghalensis s. lat.* EPBC-MW	The Painted Snipe is small freshwater wader, with a long bill that droops slightly at the tip. The female has a chestnut-black hood with a bold white eye-patch and a cream stripe along the middle of the crown. In NSW, this species has been recorded at the Paroo wetlands, Lake Cowell, Macquarie Marshes and Hexham Swamp. Most common in the Murray-Darling Basin. 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 amongst tall vegetation, such as grasses, tussocks or reeds. Forages nocturnally on mud-flats and in shallow water. Feeds on worms, molluscs, insects and some plant-matter.	**No –** This species prefers fringes of swamps and marshes.	**N/A**	**None.** The proposal site does not support any suitable habitat for this species.	**No.**
Fork-tailed Swift *Apus pacificus* EPBC-MM	Low to very high airspace over varied habitat, rainforest to semi-arid desert. Most active just ahead of summer storm fronts. Stays on the wing day and night, sleeping in high, circling flocks.	**No** - This species may fly overhead or occasionally land on or near the study area.	**N/A**	**None.** A highly mobile species which would not be affected by the proposal.	**No.**

* Listing:

EPBC-MT: Environmental Protection and Biodiversity Conservation Act-Migratory terrestrial species

EPBC-MM: Environmental Protection and Biodiversity Conservation Act-Migratory marine species

EPBC-MW: Environmental Protection and Biodiversity Conservation Act-Migratory wetland species

Appendix D **FLORA AND FAUNA RESULTS**

Flora Results

A list of all flora species identified within the study area is provided in Table D-1. The flora survey was undertaken along Pine Gully Road on the 23rd January 2009.

Notes:

* Introduced species or planted Australian natives (whether native to the Wagga area or not) are preceded by an asterisk.

? Species identification not possible due to the immature stage of the plant and a lack of plant reproductive material.

C4 Denotes noxious weed as listed on the *NSW Noxious Weeds Act (1993)* for the Wagga Wagga City Council area. Class 4 specifies that the growth and spread of the plant must be controlled according to the measures specified in a management plan published by the local control authority.

\# Denotes a species designated as "important" in the list provided by DEWHA (2006)

Relative ranked frequency of occurrence:

C common - abundant

O occasional – moderately frequent

U uncommon – sparse

Table D-1: List of flora species recorded during the survey.

Scientific name	Common name	Family	Abundance
TREES			
Acacia implexa	lightwood or hickory	Fabaceae	O
Brachychiton populneus	kurrajong	Sterculiaceae	U
Callitris glaucophylla	white cypress pine	Cupressaceae	U
Eucalyptus blakelyi	Blakely's red gum	Myrtaceae	O
Eucalyptus melliodora	yellow box	Myrtaceae	C
**Melia azedarach*	white cedar	Meliaceae	U
**Olea europaea* ssp. *cuspidata*	African olive	Oleaceae	C
**Schinus areira*	pepper tree	Anacardiaceae	O
SHRUBS			
Bursaria spinosa ssp *spinosa*	blackthorn	Pittosporaceae	U
*(C4)*Lycium ferocissimum*	African boxthorn	Solanaceae	U
VINES AND TWINERS			
#*Glycine clandestina*		Fabaceae	U
#*Glycine tabacina*		Fabaceae	U
FORBS			
**Conyza* sp.	fleabane	Asteraceae	U
*(C4)*Echium plantagineum*	Paterson's curse	Boraginaceae	U
**Hypochaeris radicata*	cat's ear, flatweed	Asteraceae	U
**Lactuca serriola*	Prickly Lettuce	Asteraceae	U
**Romulea rosea* var. *australis*	onion grass	Iridaceae	C
#*Sida corrugata*		Malvaceae	U

**Trifolium arvense*	hare's foot clover	Fabaceae	U
Wahlenbergia sp.	Native Blue bell	Campanulaceae	U
GRASSES			
Aristida ramosa var. *ramosa*	wiregrass	Poaceae	C
Austrodanthonia sp.	wallaby grass	Poaceae	C
Austrostipa sp	corkscrew grass	Poaceae	C
**Avena fatua*	wild oats	Poaceae	O
Bothriochloa macra	red-stem grass	Poaceae	U
Panicum effusum	hairy panic	Poaceae	U
Paspalidium aversum		Poaceae	U
**Paspalum dilatatum*	Paspalum	Poaceae	U
GRAMINOIDS			
Lomandra filiformis ssp *coriacea*		Lomandraceae	C
Lomandra filiformis ssp *filiformis*		Lomandraceae	O
Lomandra multiflora ssp *multiflora*		Lomandraceae	O
PARASITIC PLANTS			
Amyema miquelii	box mistletoe	Loranthaceae	U

Fauna Results

Table D-2: List of fauna species identified during field investigations undertaken on the 7th and 8th of January 2009 for a Flora and Fauna Assessment for the proposed subdivision along Featherwood Drive, Wagga Wagga NSW.

Notes:

I Denotes introduced/exotic species (non-native).

N Denotes native species

TSC-V: Threatened Species Conservation Act - Vulnerable species

Observation Type:

O = Observed (sighted) F = Tracks / scratchings

W = Heard

X = Scat

Species	Sighting	Status
BIRDS		
ARTAMIDAE		
Australian Magpie *Gymnorhina tibicen*	O, W	N
Pied Butcherbird *Cracticus nigroguiaris*	O	N
Grey Butcherbird *Cracticus torquatus*	O	N
CACATUIDAE		
Galah *Cacatua roseicapilla*	O, W	N
Sulphur Crested Cockatoo *Cacatua roseicapilla*	W	N
CAMPEPHAGIDAE		

Species	Sighting	Status
Black Faced Cuckoo Shrike *Coracina novaehollandiae*	O	N
COLUMBIDAE		
Crested Pigeon *Ocyphaps lophotes*	O, W	N
Peaceful Dove *Geopelia striata*	W	N
CORVIDAE		
Australian Raven *Corvus coronoides*	W	N
DICRURIDAE		
Willie Wagtail *Rhipidura leucophrys*	O, W	N
Magpie Lark *Grallina cyanoleuca*	O	N
FALCONIDAE		
Brown Falcon *Falco berigora*	O	N
HIRUNDINIDAE		
Tree Martin *Petrochelidon nigricans*	O	N
MALURIDAE		
Superb Fairy wren *Malurus cyaneus*	O, W	N
MELIPHAGIDAE		
Noisy Miner *Manorina melanocephala*	O	N

Species	Sighting	Status
White Plumed Honeyeater *Lichenostomus penicillatus*	O	N
MUSCICAPIDAE		
Common Blackbird *Turdus merula*	O	I
PARDALOTIDAE		
Yellow Rumped Thornbill *Acanthiza chrysorrhoa*	O	N
PLATYCERCIDAE		
Eastern Rosella *Platycerus eximius*	O	N
PSITTACIDAE		
Yellow Rosella *Platycercus elegans*	O	N
STURNIDAE		
Common Starling *Sturnus vulgaris*	O	I
MAMMALS		
LEPORIDAE		
Hare *Lepus timidus*	X, F	I
REPTILES		
SCINCIDAE		
Boulenger's Skink *Morethia boulengeri*	O	N

Appendix E SEVEN PART TEST AND EPBC ACT ASSESSMENT

TSC ACT: 7-PART TEST

Section 5A of the *Environmental Planning and Assessment Act 1979* (EP&A Act) specifies seven factors to be taken into account in deciding whether a development is likely to significantly affect threatened species, populations or ecological communities, or their habitats listed on the TSC Act.

The following Assessments of Significance assess the level of likely impact associated with the proposed road widening of a section of Pine Gully Road near Estella, Wagga Wagga on one Endangered Ecological Community and ten threatened fauna species identified as being potentially impacted by the proposal.

No.	Species	Listing
Endangered Ecological Community		
1	*Box Gum Woodland*	EEC
BIRDS		
2	*Pyrrholaemus sagittatus* – Speckled Warbler	Vulnerable
3	*Climacteris picumnus victoriae* – Brown Treecreeper	Vulnerable
4	*Melanodryas cucullata* – Hooded Robin	Vulnerable
5	*Melithreptus gularis gularis* - Black Chinned Honeyeater	Vulnerable
6	*Neophema pulchella* - Turquoise Parrot	Vulnerable
7	*Polytelis swainsonii* – Superb Parrot	Vulnerable
8	*Callocephalon fimbriatum* - Gang Gang Cockatoo	Vulnerable
9	*Cacatua leadbeateri* - Major Mitchell Cockatoo	Vulnerable
MAMMALS		
10	*Petaurus norfolcensis* - Squirrel Glider	Vulnerable
11	*Vespadelus baverstocki* – Inland Forest Bat	Vulnerable

Endangered Ecological Community: BOX GUM WOODLAND

a) In the case of a threatened species, whether the action proposed 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.

N/A

b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

N/A

c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(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

(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.

Box Gum Woodland EEC is present along both sides of Pine Gully Road within the road reserve. This vegetation is consistent with Yellow Box Woodland and contains a number of native grass species in the understorey. Blakely's Red Gum (*Eucalyptus blakelyi*) is also scattered through the site. This vegetation type is prevalent within the majority of road reserves within the immediate area and the surrounding study locality. The proposal would require the removal of less than 0.4ha of vegetation assuming the clearing is from within a five metre wide band along the western road edge only. The road reserve is approximately 11 metres wide along the western side of Pine Gully Road. Some limbs would also require removal from the eastern road edge where these overhang the roadway and have a risk of falling. In total the proposal would affect approximately 24% of the area containing vegetation in the study area. Taking into account that the majority of this area is road verge and table drains, and that the majority of vegetation in the study area is contained within the land further from the road edge, the quantity of vegetation to be removed is very small (less than 0.1ha). This impact is considered insignificant considering the extent of the community within the study area and the surrounding locality.

At the site the understorey of the community is dominated by the exotic species, African olive, which has most likely been brought into the area by birds as they are concentrated around the base of large trees. A number of exotic groundcover species, particularly forbs, are also prevalent through the site. While the proposal is likely to result in some soil disturbance which could lead to the spread or introduction of additional exotic species, it is considered unlikely that this would change the composition of the community to the point where its local occurrence would be placed at risk of extinction. Soil disturbance to areas outside of work zones should be avoided in order to reduce any associated impacts to these areas.

d) In relation to the habitat of a threatened species, population or ecological community:

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

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

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

The proposed works would require the removal of approximately only a small amount of vegetation from within the study area. This vegetation is located along the western edge of Pine Gully Road and is thus already fragmented and edge effects such as weed invasion are evident. The proposal would not increase fragmentation or isolate this vegetation in any way and would not increase the length of edge affected vegetation. The vegetation along Pine Gully Road is already isolated by cleared paddock areas to the east and west. The removal of this vegetation would not significantly decrease the extent of Box Gum Woodland EEC within the study locality and would not endanger the long-term survival of this EEC.

e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).

No areas of critical habitat have been declared for the study area.

f) Whether the action proposed is consistent with the objectives or actions of a Recovery Plan or Threat Abatement Plan.

No current Recovery Plans or Threat Abatement Plans are relevant to the proposal.

g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Key threatening processes relevant to the proposal include:

- Clearing of native vegetation.

The clearing of native vegetation is considered a major contributor to the loss of biodiversity. In its determination, the NSW Scientific Committee found that 'clearing of any area of native vegetation, including areas less than two hectares in extent, may have significant impacts on biological diversity'. Clearing can lead to direct habitat loss, habitat fragmentation and associated genetic impacts, habitat degradation and off-site impacts such as downstream sedimentation.

Box Gum woodland is present along both side of Pine Gully Road. Less than 0.1ha of vegetation would require removal and thus the proposal can be considered to result in the operation of this key threatening process. However, the vegetation to be removed as part of this proposal is small and of low habitat value due to its proximity to a busy road. As such the proposal is not likely to contribute significantly to the operation of clearing as a threatening process.

BIRDS

a) In the case of a threatened species, whether the action proposed 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.

SPECKLED WARBLER

The Speckled Warbler is a small well-camouflaged very heavily streaked ground-dwelling bird reaching a length of 13 cm. This species 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 with typical habitat including 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. The rounded, domed, roughly built nest of dry grass and strips of bark is located in a slight hollow in the ground or the base of a low dense plant, often among fallen branches and other litter. A side entrance allows the bird to walk directly inside (DECC, 2005).

No Speckled Warblers were observed during field investigations; however the species has been recorded by nghenvironmental along a road reserve approximately 2ks from the study area. The study area supports at best marginal habitat for this species with little structural diversity evident along both the eastern and western road verges. An area of less than 0.4 ha will be impacted upon, assuming the impact zone is less than 5 m along the western side of the road verge. Most of this area comprises bare earth with some ground cover species and some trees present within 5 m from the road verge. This is small in scale and it is considered highly unlikely that the Speckled Warbler would be dependent on the area impacted by the proposed development. The proposed development would not have an adverse effect on the life cycle of the species such that a viable local population of the species would be placed at risk of extinction by the proposal.

BROWN TREECREEPER (EASTERN SUB SPECIES)

The Brown Treecreeper occurs in eucalypt forests and woodlands of inland plains and slopes of the Great Dividing Range. The western boundary of the range of eastern subspecies runs approximately through Wagga Wagga, Temora, Forbes, Dubbo and Inverell and along this line the subspecies intergrades with the arid zone subspecies of Brown Treecreeper.

The eastern subspecies lives in eucalypt woodlands through central NSW and in coastal areas with drier open woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey (DECC 2008). Brown Treecreepers are bark feeders which feed predominantly on ants. The species spends considerable time on the ground feeding, and will retreat to nearby trees and stumps if startled. The species appears to prefer open groundcover of grasses with limited shrubs, possibly due to the predation risks of spending considerable time on the ground feeding (Doerr 2006). They breed and roost in tree hollows and stumps.

Brown Treecreepers are sedentary cooperative breeders, meaning that offspring from past breeding seasons stay to help raise new offspring. These retained individuals are mostly males. A breeding pair occupies an area of 3-10ha year round, with supergroups formed in areas

supporting large amounts of habitat. In good quality habitats, territories can be as small as 3 ha, however in poor habitats a single territory may be as large as 10ha.

Given the small amount of habitat to be removed, and the retention of all hollow bearing trees present along the road verge with the exception of one or two trees it is considered that the proposal would not reduce the capacity of the study area to continue to support the presence of this species if they were present. The resources necessary for breeding will not be substantially reduced by the proposal as the majority of hollow bearing trees will be retained and foraging resources will not be reduced. The proposed development would not have an adverse effect on the life cycle of the species such that a viable local population of the species would be placed at risk of extinction by the proposal.

It is possible that one or two trees, with possible hollows present may need to be removed as a result of the activity however this is small in scale as there are a number of hollow bearing trees present within the vicinity. It is recommended however, that an ecologist be present if any hollow bearing trees are to be removed.

HOODED ROBIN

The Hooded Robin is considered a sedentary species although local seasonal movements are possible. The south-eastern form is found from Brisbane to Adelaide throughout much of inland NSW, with the exception of the north-west. It prefers lightly wooded country, usually open eucalypt woodland, acacia scrub and mallee, often in or near clearings or open areas. The species requires structurally diverse habitats featuring mature eucalypts, saplings, some small shrubs and a ground layer of moderately tall native grasses. They often perch on low dead stumps and fallen timber or on low-hanging branches, using a perch-and-pounce method of hunting insect prey. Territories range from around 10 ha during the breeding season, to 30 ha in the non-breeding season. It may breed any time between July and November, often rearing several broods. The nest is a small, neat cup of bark and grasses bound with webs, in a tree fork or crevice, from less than 1 m to 5 m above the ground (DECC, 2005).

No Hooded Robins were recorded in the study area during the field investigations. The nearest record for this species was located at Sandy creek. The study area supports at best marginal habitat for this species as there is little structural diversity in the stands of vegetation located along the road verges. An area of 0.4 ha will be impacted upon, most of which comprises bare earth with some ground cover species and possible trees, which is small in scale.

It is considered highly unlikely that the Hooded Robin would be dependent on the area impacted by the proposed development. The proposed development would not have an adverse effect on the life cycle of the species such that a viable local population of the species would be placed at risk of extinction by the proposal.

BLACK CHINNED HONEYEATER (EASTERN SUB SPECIES)

The Black Chinned Honeyeater is the largest of its genus, reaching 17 cm in length. The subspecies is widespread, from the tablelands and western slopes of the Great Dividing Range to the north-west and central-west plains and the Riverina. It is rarely recorded east of the Great Dividing Rang and has also been recorded at a few scattered sites in the Hunter, Central Coast and Illawarra regions.

This species occupies mostly upper levels of drier open forests or woodlands dominated by box and ironbark eucalypts, especially Mugga Ironbark (*Eucalyptus sideroxylon*), White Box (*Eucalyptus albens*), Grey Box (*Eucalyptus microcarpa*), Yellow Box (*Eucalyptus melliodora*) and

Forest Red Gum (*Eucalyptus tereticornis*). This species is a gregarious species usually seen in pairs and small groups of up to 12 birds.

Feeding territories are large making the species locally nomadic. Recent studies have found that the Black-chinned Honeyeater tends to occur in the largest woodland patches in the landscape as birds forage over large home ranges of at least 5 hectares. The nest is placed high in the crown of a tree, in the uppermost lateral branches, hidden by foliage. It is a compact, suspended, cup-shaped nest (DECC, 2005).

No Black Chinned Honeyeaters were recorded in the study area during the field investigations. The nearest record for this species was approximately 3kms south of the study area in 2007. The study area supports at best marginal habitat for this species as the site is small in scale with vegetation only located within the road reserve areas. An area of approximately 0.4 ha will be impacted upon, most of which comprises bare earth with some ground cover species and possible trees, which is small in scale.

It is considered highly unlikely that the Black Chinned Honeyeater would be dependent on the area impacted by the proposed development. The proposed development would not have an adverse effect on the life cycle of the species such that a viable local population of the species would be placed at risk of extinction by the proposal.

TURQUOISE PARROT

The Turquoise Parrot's range extends from southern Queensland through to northern Victoria, from the coastal plains to the western slopes of the Great Dividing Range. The species lives on the edges of eucalypt woodland adjoining clearings, timbered ridges and creeks in farmland. They prefer to feed in the shade of a tree and forage mostly on the ground for the seeds or grasses and herbaceous plants, or browsing on vegetable matter. The species nests in tree hollows, logs or posts, from August to December (DECC, 2005).

No Turquoise Parrots were recorded in the study area during the field investigations. The nearest record of the species is located near Uranquinty approximately 15 kms away from the study area to the south. Potential foraging habitat for the species is present in the study area. The area of impact is quite small in scale with approximately 0.4 ha to be affected as a result of the proposed activity. This species is reliant upon hollow bearing trees for roosting and breeding habitat, with the study area providing a number of hollow bearing trees along the road reserve areas. It is possible that one or two trees, with possible hollows present may need to be removed as a result of the activity however this is small in scale as there are a number of hollow bearing trees present within the vicinity. It is recommended however, that an ecologist be present if any hollow bearing trees are to be removed.

SUPERB PARROT

The Superb Parrot's range extends throughout eastern inland NSW along the south west slopes, the northern parts of the ACT and north central Victoria. The species retreats each spring towards the southwest of NSW to breed, mainly in River and Blakely's Red Gums. 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.

The Superb Parrot prefers to inhabit Box-Gum, Box-Cypress-pine and Boree Woodlands and River Red Gum Forests, while in the Riverina the species nests in the hollows of large trees (dead or alive) mainly in tall riparian River Red Gum Forest or Woodland. As one of the many Australian bird species that uses tree hollows for breeding, clearing of woodland areas has had a large

impact on the parrot and, with minimal replacement of old trees, its numbers may continue to decline in the future.

The species breeds between September and January and nests in small colonies while foraging up to 10kms from their nesting sites. The species feeds in trees and understorey shrubs and on the ground and their diet consists mainly of grass seeds and herbaceous plants. Also eaten are fruits, berries, nectar, buds, flowers, insects and grain (DECC, 2005).

No Superb Parrots were observed within the study area during field investigations; however **ngh**environmental ecologists have recently recorded this species less than 2 kms from the site. There are a number of hollow bearing trees within the study locality, mainly located along road reserve areas, providing suitable roosting and breeding habitat for this species. The species is known to forage up to 10 kms from known roosting sites so is highly flight mobile.

The area of impact is quite small in scale with approximately 0.4 ha to be affected as a result of the proposed activity. It is possible that one or two trees, with possible hollows present may need to be removed as a result of the activity however this is small in scale as there are a number of hollow bearing trees present within the vicinity. It is recommended however, that an ecologist be present if any hollow bearing trees are to be removed.

The proposal is not considered to have an adverse impact on this species as the activity is quite small in scale, with suitable foraging and roosting habitat present across the entire study locality. This species is highly flight mobile and will not be impacted upon as a result of the proposed activity.

GANG GANG COCKATOO

The Gang Gang Cockatoo are one of the more distinctive and charismatic members of Australia's avifauna. These birds are primarily slate-grey, with the males easily identified by their scarlet head and wispy crest, while females have a grey head and crest and feathers edged with salmon pink on the underbelly. In New South Wales, the Gang-gang Cockatoo is distributed from the south-east coast to the Hunter region, and inland to the Central Tablelands and south-west slopes. It occurs regularly in the Australian Capital Territory. It is rare at the extremities of its range, with isolated records known from as far north as Coffs Harbour and as far west as Mudgee.

In summer, it is generally found in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. In winter, may occur at lower altitudes in drier more open eucalypt forests and woodlands, and often found in urban areas. The species will move to lower altitudes in winter, preferring more open eucalypt forests and woodlands, particularly in box-ironbark assemblages, or in dry forest in coastal areas.

No Gang Gang Cockatoos were recorded in the study area during the field investigations. The nearest record of the species is located 8kms south of the study area in 1979. Potential foraging and roosting habitat for the species is present in the study area. The area of impact is quite small in scale with approximately 0.4 ha to be affected as a result of the proposed activity. This species is reliant upon hollow bearing trees for roosting and breeding habitat, with the study area providing a number of hollow bearing trees along the road reserve areas. It is possible that one or two trees, with possible hollows present may need to be removed as a result of the activity however this is small in scale as there are a number of hollow bearing trees present within the vicinity. It is recommended however, that an ecologist be present if any hollow bearing trees are to be removed.

MAJOR MITCHELL COCKATOO

The Major Mitchell Cockatoo, also known as the Pink Cockatoo is the only Australian cockatoo that is salmon-pink below and white above. It is smaller than the Sulphur-crested Cockatoo *C. galerita*, but slightly larger than a Galah *C. roseicapilla*.. In NSW it is found regularly as far east as about Bourke and Griffith, and sporadically further east than that.

The Pink Cockatoo inhabits a wide range of treed and treeless inland habitats, always within easy reach of water and 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. Nesting, in tree hollows, occurs throughout the second half of the year; nests are at least 1 km apart, with no more than one pair every 30 square kilometres.

No Pink Cockatoos were recorded in the study area during the field investigations. The nearest record of the species is less than 1 km east of the study area in 1998. Potential foraging and roosting habitat for the species is present in the study area. The area of impact is quite small in scale with approximately 0.4 ha to be affected as a result of the proposed activity. This species is reliant upon hollow bearing trees for roosting and breeding habitat, with the study area providing a number of hollow bearing trees along the road reserve areas. It is possible that one or two trees, with possible hollows present may need to be removed as a result of the activity however this is small in scale as there are a number of hollow bearing trees present within the vicinity. It is recommended however, that an ecologist be present if any hollow bearing trees are to be removed.

b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

The Gang Gang Cockatoo population in the Hornsby and Ku-ring-gai Local government areas is listed as an endangered population; however this is not relevant to the proposed activity.

No populations of any of the above other avifauna species have been listed as endangered under Part 2 of Schedule 1 of the TSC Act.

c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(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

(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.

Not relevant.

d) In relation to the habitat of a threatened species, population or ecological community:

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

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

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

The proposal involves widening a section of Pine Gully Road near the intersection of Estella Road as it has been recognised as a national black spot. The proposed activity will involve widening approximately 750 m of the existing road by widening the western shoulder of the road to reduce the amount of crashes on this particular stretch of road. The majority of works will be undertaken on the western road verge where it is assumed that no more than 5 m will be impacted upon from the road edge. As such, some vegetation will be removed as a result of the activity, however this will mostly comprise of ground cover species. Some tree lopping and constructions works will also be undertaken on the eastern side of the road verge to accommodate the upgrade, however this will be minor.

The study area contains habitat value for a large range of fauna species as it provides an ideal movement corridor in this area as the majority of land surrounding the study area is predominately cleared farming land. There are a number of hollow bearing trees present along both the eastern and western road verges and vegetation structure is good with ground cover species, remnant trees and some regeneration and shrubs species present.

The proposed activity will remove approximately 0.4 ha of vegetation, assuming that a 5 m impact zone on the western edge is adhered to. It is possible that one or two hollow bearing trees may need to be removed as a result of the proposed activity; however there are numerous hollow bearing trees present within the vicinity and it is recommended that an ecologist be present if any hollow bearing trees need to be removed.

In regards to the distribution of potential foraging, breeding and roosting habitat within the study locality for these above avifauna species, extensive stands of vegetation are present to the west at Lighthouse Hill, to the south along the Murrumbidgee River and to the east within Charles Sturt University.

The area to be impacted upon within the study area is of limited importance in maintaining a viable local population of the above avifauna species within the locality. The proposed activity will not affect the long term survival of any of the threatened avifauna species listed above within the study locality.

e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).

No areas of critical habitat have been declared for the study area.

f) Whether the action proposed is consistent with the objectives or actions of a Recovery Plan or Threat Abatement Plan.

There are no recovery plans in place for any of the above-listed threatened avifauna species.

g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

A number of key threatening processes are relevant to the proposal including:

- Clearing of native vegetation.

The clearing of native vegetation is considered a major contributor to the loss of biodiversity. In its determination, the NSW Scientific Committee found that 'clearing of any area of native vegetation, including areas less than two hectares in extent, may have significant impacts on biological diversity'. Clearing can lead to direct habitat loss, habitat fragmentation and associated genetic impacts, habitat degradation and off-site impacts such as downstream sedimentation.

The area of impact is approximately 0.4 ha assuming that the impact zone is less than 5 m in width and vegetation removal works are only undertaken on the western side road verge. The majority of the road verge comprises of bare earth with some ground cover species, remnant eucalypt trees and a number of mid-storey and shrub species providing an ideal movement corridor for a variety of fauna species. As a result of the proposed activity, this results in this key threatening process. Vegetation to be removed will mostly comprise of ground cover species and some leaf litter, however one or two trees comprising hollows may also need to be removed as a result of widening the existing road. It is recommended that an ecologist be on site if the removal of any hollow bearing trees is impacted upon.

As such the proposal is not likely to contribute significantly to the operation of clearing as a threatening process. Notwithstanding this, it is considered that this impact would be unlikely to place any local population of any of the above-listed threatened avifauna species at risk of extinction.

MAMMALS

a) In the case of a threatened species, whether the action proposed 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.

SQUIRREL GLIDER

The Squirrel Glider has a head and body length of about 20 cm and is sparsely distributed in eastern Australia, from northern QLD to western Victoria. It inhabits mature or old Growth Box-Ironbark woodlands and River Red Gum forest west of the Great Dividing Range. It prefers mixed species stands with a shrub or acacia midstorey. The Squirrel Glider requires abundant hollows for refuge and nest sites and lives in family groups of a single adult male or more adult females and offspring.

The Squirrel Glider's diet varies seasonally and consists of Acacia gum, eucalypt sap, nectar, honeydew and manna, with invertebrates and pollen providing protein.

No Squirrel Gliders were recorded within the study area during field investigations. The nearest record for this species is near Pomingalarna Reserve in 2000, however this species has also been observed near Kapooka, approximately 15 kms from the study area. The study area supports at best marginal habitat for this species, although there are a number of hollow bearing trees present along the road reserve, the area is surrounded by cleared farming paddocks. The area of vegetation to be removed is approximately 0.4 ha in size, assuming a 5 m impact zone is adhered to on the western side of the road where the majority of works will be undertaken. This is quite small in scale and the majority of vegetation present along the road is at least 2 – 3 m from the road edge.

Although this species forages on eucalypt sap and acacia gum, the amount of vegetation to be removed is small in scale, with abundant food resources available in adjacent stands of vegetation within the road reserves and remnant old growth trees.

It is considered highly unlikely that the Squirrel Glider would be dependent on the area impacted by the proposed development. The proposed development would not have an adverse effect on the life cycle of the species such that a viable local population of the species would be placed at risk of extinction by the proposal.

(DECC, 2005)

b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

A population of Squirrel Gliders in the Wagga Wagga LGA has been listed as endangered under Part 2 of Schedule 1 of the TSC Act. No Squirrel Gliders were observed within the study area during field investigations; however suitable foraging and roosting habitat is present for this species as there is an abundance of acacia and eucalypt saplings present and hollow bearing trees.

The proposed activity is quite small in scale, affecting less than 0.4 ha of vegetation, most of which would constitute foraging and some roosting habitat for this species as it is uncertain if one or two hollow bearing trees will need to be removed as a result of the proposed activity. As such this will not place the Squirrel Glider population of Wagga Wagga at risk of extinction.

c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

(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

(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.

Not relevant.

d) In relation to the habitat of a threatened species, population or ecological community:

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

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

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

The proposal involves widening a section of Pine Gully Road near the intersection of Estella Road as it has been recognised as a national black spot. The proposed activity will involve widening approximately 750 m of the existing road by widening the western shoulder of the road to reduce the amount of crashes on this particular stretch of road. The majority of works will be undertaken on the western road verge where it is assumed that no more than 5 m will be impacted upon from the road edge. As such, some vegetation will be removed as a result of the activity, however this will mostly comprise of ground cover species. Some tree lopping and constructions works will also be undertaken on the eastern side of the road verge to accommodate the upgrade, however this will be minor.

The study area contains habitat value for a large range of fauna species as it provides an ideal movement corridor in this area as the majority of land surrounding the study area is predominately cleared farming land. There are a number of hollow bearing trees present along both the eastern and western road verges and vegetation structure is good with ground cover species, remnant trees and some regeneration and shrubs species present.

The proposed activity will remove approximately 0.4 ha of vegetation, assuming that a 5 m impact zone on the western edge is adhered to. It is possible that one or two hollow bearing trees may need to be removed as a result of the proposed activity; however there are numerous hollow bearing trees present within the vicinity and it is recommended that an ecologist be present if any hollow bearing trees need to be removed.

In regards to the distribution of potential foraging, breeding and roosting habitat within the study locality for the Squirrel Glider extensive stands of vegetation are present to the west at Lighthouse Hill, to the south along the Murrumbidgee River where this species has mostly been recorded and to the east within Charles Sturt University.

The area to be impacted upon within the study area is of limited importance in maintaining a viable local population of the Squirrel Glider within the locality. The proposed activity will not affect the long term survival of this species within the study locality.

e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).

No areas of critical habitat have been declared for the study area.

f) Whether the action proposed is consistent with the objectives or actions of a Recovery Plan or Threat Abatement Plan.

There are no recovery plans in place for the Squirrel Glider or the endangered Squirrel Glider population at Wagga Wagga.

g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

A number of key threatening processes are relevant to the proposal including:

- Clearing of native vegetation.

The clearing of native vegetation is considered a major contributor to the loss of biodiversity. In its determination, the NSW Scientific Committee found that 'clearing of any area of native vegetation, including areas less than two hectares in extent, may have significant impacts on biological diversity'. Clearing can lead to direct habitat loss, habitat fragmentation and associated genetic impacts, habitat degradation and off-site impacts such as downstream sedimentation.

The area of impact is approximately 0.4 ha assuming that the impact zone is less than 5 m in width and vegetation removal works are only undertaken on the western side road verge. The majority of the road verge comprises of bare earth with some ground cover species, remnant eucalypt trees and a number of mid-storey and shrub species providing an ideal movement corridor for a variety of fauna species. As a result of the proposed activity, this results in this key threatening process. Vegetation to be removed will mostly comprise of ground cover species and some leaf litter, however one or two trees comprising hollows may also need to be removed as a result of widening the existing road. It is recommended that an ecologist be on site if the removal of any hollow bearing trees is impacted upon.

As such the proposal is not likely to contribute significantly to the operation of clearing as a threatening process. Notwithstanding this, it is considered that this impact would be unlikely to place any local population of any of the Squirrel Glider at risk of extinction.

MAMMALS

a) In the case of a threatened species, whether the action proposed 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.

INLAND FOREST BAT

The Inland Forest Bat is a small pare brown microbat with a rounded face and small ears. It has been recorded from scattered localities in western NSW, but may be more widespread. The Inland Forest Bat is known to roost in tree hollows and abandoned buildings and has been recorded from a variety of woodland formations, including mallee, mulga and river red gum.

The species colony size ranges from a few individuals to more than fifty. Females congregate to raise young with a single young being carried by its mother until its weight affects her flight, and is then left in the roost at night. This species of bat is known to fly rapidly and covers an extensive area for foraging.

The nearest record for this species is located approximately 2kms south of the study area along the Murrumbidgee River. The study area supports suitable roosting and foraging habitat for this species as there are a number of hollow bearing trees present along both road verges. The area of vegetation to be removed is approximately 0.4 ha in size, assuming a 5 m impact zone is adhered to on the western side of the road where the majority of works will be undertaken. This is quite small in scale and the majority of vegetation present along the road is at least 2 – 3 m from the road edge.

It is considered highly unlikely that the Inland Forest Bat would be dependent on the area impacted by the proposed development. The proposed development would not have an adverse effect on the life cycle of the species such that a viable local population of the species would be placed at risk of extinction by the proposal.

(DECC, 2005)

b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

No populations of the Inland Forest Bat have been listed as endangered under Part 2 of Schedule 1 of the TSC Act.

c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

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

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

Not relevant.

d) In relation to the habitat of a threatened species, population or ecological community:

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

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

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

The proposal involves widening a section of Pine Gully Road near the intersection of Estella Road as it has been recognised as a national black spot. The proposed activity will involve widening

approximately 750 m of the existing road by widening the western shoulder of the road to reduce the amount of crashes on this particular stretch of road. The majority of works will be undertaken on the western road verge where it is assumed that no more than 5 m will be impacted upon from the road edge. As such, some vegetation will be removed as a result of the activity, however this will mostly comprise of ground cover species. Some tree lopping and constructions works will also be undertaken on the eastern side of the road verge to accommodate the upgrade, however this will be minor.

The study area contains habitat value for a large range of fauna species as it provides an ideal movement corridor in this area as the majority of land surrounding the study area is predominately cleared farming land. There are a number of hollow bearing trees present along both the eastern and western road verges and vegetation structure is good with ground cover species, remnant trees and some regeneration and shrubs species present.

The proposed activity will remove approximately 0.4 ha of vegetation, assuming that a 5 m impact zone on the western edge is adhered to. It is possible that one or two hollow bearing trees may need to be removed as a result of the proposed activity; however there are numerous hollow bearing trees present within the vicinity and it is recommended that an ecologist be present if any hollow bearing trees need to be removed.

In regards to the distribution of potential foraging, breeding and roosting habitat within the study locality for the Inland Forest Bat extensive stands of vegetation are present to the west at Lighthouse Hill, to the south along the Murrumbidgee River where this species has been recorded and to the east within Charles Sturt University.

The area to be impacted upon within the study area is of limited importance in maintaining a viable local population of the Inland Forest bat within the locality. The proposed activity will not affect the long term survival of any of the threatened avifauna species listed above within the study locality.

e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).

No areas of critical habitat have been declared for the study area.

f) Whether the action proposed is consistent with the objectives or actions of a Recovery Plan or Threat Abatement Plan.

There are no recovery plans in place for the Inland Forest Bat.

g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

A number of key threatening processes are relevant to the proposal including:

- Clearing of native vegetation.

The clearing of native vegetation is considered a major contributor to the loss of biodiversity. In its determination, the NSW Scientific Committee found that 'clearing of any area of native vegetation, including areas less than two hectares in extent, may have significant impacts on biological diversity'. Clearing can lead to direct habitat loss, habitat fragmentation and associated genetic impacts, habitat degradation and off-site impacts such as downstream sedimentation.

The area of impact is approximately 0.4 ha assuming that the impact zone is less than 5 m in width and vegetation removal works are only undertaken on the western side road verge. The majority of the road verge comprises of bare earth with some ground cover species, remnant eucalypt trees and a number of mid-storey and shrub species providing an ideal movement corridor for a variety of fauna species. As a result of the proposed activity, this results in this key threatening process. Vegetation to be removed will mostly comprise of ground cover species and some leaf litter, however one or two trees comprising hollows may also need to be removed as a result of widening the existing road. It is recommended that an ecologist be on site if the removal of any hollow bearing trees is impacted upon.

As such the proposal is not likely to contribute significantly to the operation of clearing as a threatening process. Notwithstanding this, it is considered that this impact would be unlikely to place any local population of any of the Squirrel Glider at risk of extinction.

Conclusion

The Assessment of Significance has concluded that the proposal is not likely to significantly affect any of the above threatened fauna species that were recorded, or predicted to occur, within the study area either directly or indirectly. Specifically, the proposal would be unlikely to:

- Reduce the long-term viability of any local population of threatened species, populations or ecological communities;
- Accelerate the extinction of a species, population or ecological community or place it at risk of extinction; or
- Adversely affect critical habitat.

It is concluded that a Species Impact Statement is not required for the proposal.

EPBC ACT – ASSESSMENT OF SIGNIFICANCE

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) protects the environment, particularly Matters of National Environmental Significance (Protected matters). It streamlines the national environmental assessment and approvals process, protects Australian biodiversity and integrates management of important natural and cultural places. The Matters of National Environmental Significance are:

- Listed threatened species and ecological communities;
- Migratory species protected under international agreements;
- Ramsar wetlands of international importance;
- The Commonwealth marine environment;
- World Heritage properties;
- National Heritage places; and
- Nuclear actions.

An action will require approval if the action has, will have, or is likely to have a significant impact on a species listed in any of the following categories:

- Extinct in the wild;
- Critically endangered;
- Endangered; or
- Vulnerable.

An action will also require approval if the action has, will have, or is likely to have a significant impact on an ecological community listed in any of the following categories:

1. Critically endangered; or
2. Endangered.

Box Gum Woodland is listed as a critically endangered ecological community under the EPBC Act and the Superb Parrot (*Polytelis swainsonii*) is listed as vulnerable under the EPBC Act. As such an assessment of significance has been undertaken for each.

Significant impact criteria – Box Gum Woodland EEC

An action is likely to have a significant impact on a critically endangered or endangered ecological community if there is a real chance or possibility that it will:

a) reduce the extent of an ecological community;

Box Gum Woodland EEC is present along both sides of Pine Gully Road within the road reserve. The vegetation at the site complies with the EPBC Act definition of Box Gum Woodland EEC in that the patch is approximately 2.6ha in size and there is natural regeneration of the dominant overstorey eucalypts. This patch size includes surrounding areas of vegetation outside of the study area (approx 1ha) that is a continuation of the vegetation community. The proposal site

does not contain 12 native understorey species (excluding grasses) but does contain three "important" species as listed by DEWHA (2006). The proposal would affect less than 0.4ha (5m x 750m) of land, most of which is cleared and disturbed, but some of which (likely 0.1ha) contains Box Gum Woodland, from along the western edge of Pine Gully Road. Vegetation along this edge is sparse as a result of past soil disturbance, compaction and clearing when the road was constructed. Thus the proposed works would remove less than a quarter of edge affected Box Gum Woodland. This amount of vegetation removal is considered insignificant with regards to the regional and local extent of Box Gum Woodland and its removal would not jeopardise the long-term survival of the community within the area.

b) fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines;

The proposed works would require the removal of a small area of vegetation (Box Gum Woodland) from within the study area. This vegetation is located along the western edge of Pine Gully Road and is thus already fragmented and edge effects such as weed invasion are evident. The proposal would not increase fragmentation or isolate this vegetation in any way and would not increase the length of edge affected vegetation. The vegetation along Pine Gully Road is already isolated by cleared paddock areas to the east and west. The removal of this vegetation would not significantly decrease the extent of Box Gum Woodland EEC within the study locality and would not endanger the long-term survival of this EEC.

c) adversely affect habitat critical to the survival of an ecological community;

No areas of critical habitat listed on any statutory registers have been declared for the study area. The proposal would not affect any habitat critical to the survival of the community within the local area.

d) modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns;

The proposed works are for the widening of an existing road and thus would not modify or destroy the current abiotic factors at the site that are necessary for the survival of the EEC. Soil disturbance would be restricted to the work zone (5m strip along the western edge of the road) and appropriate controls would be put in place to designate this area. Drainage and nutrient conditions at the site would not be altered by the works.

e) cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting;

At the site the understorey of the community is dominated by the exotic species, African olive, which has most likely been brought into the area by birds as they are concentrated around the base of large trees. A number of exotic groundcover species, particularly forbs, are also prevalent through the site. While the proposal is likely to result in some soil disturbance which could lead to the spread or introduction of additional exotic species, it is considered unlikely that this would change the composition of the community to the point where its local occurrence would be placed at risk of extinction. Soil disturbance to areas outside of work zones should be avoided in order to reduce any associated impacts to these areas.

f) cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to:

i. assisting invasive species, that are harmful to the listed ecological community, to become established; or

ii. causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community; or

The proposal site already contains a number of exotic species (refer to point above and Appendix D for list of all flora species recorded). While the proposal is likely to result in some soil disturbance which could lead to the spread or introduction of additional exotic species, it is considered unlikely that this would change the composition of the community to the point where its local occurrence would be placed at risk of extinction and the quality and integrity of the community would be substantially reduced. Soil disturbance to areas outside of work zones would be avoided in order to reduce any associated impacts to these areas.

g) interfere with the recovery of an ecological community.

The vegetation within the study area is not in a state of recovery and the proposal would not interfere with natural regeneration at the site.

Significant impact criteria – Superb Parrot

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

a) lead to a long-term decrease in the size of an important population of a species;

The Superb Parrot has been observed within 2 kms from the study area by **ngh**environmental ecologists in August 2008. There are a number of hollow baring trees present along the road reserve that could provide ideal roosting and breeding habitat for this species.

Notwithstanding this the Superb Parrot is known to forage up to 10kms from its nesting sites, suggesting that suitable higher quality stands of foraging and roosting habitat are present within the study locality for this species. As such the proposed activity will not lead to the long term decrease of this species given the proposed activity will mainly impact on approximately 0.4 ha along the road reserve.

b) reduce the area of occupancy of an important population;

No. The proposed activity will impact on approximately 0.4 ha of vegetation, if a 5 m impact zone on the western road verge is adhered to. The immediate impact area comprises mostly bare earth with some ground cover species and possible shrub and tree species. it is possible that one or two hollow bearing trees may be impacted upon as a result of the proposed activity, however there are numerous hollow bearing trees present within the study area and it is recommended that an ecologist be present if any hollow bearing trees are to be removed. Therefore the reduction in the area of occupancy will be minimal and not significantly affect this species as it is highly mobile and will travel up to 10kms to forage from nesting sites.

c) fragment an existing important population into two or more populations;

No. The proposed activity is located along a road verge that provides an important movement corridor for many species and acts as ideal foraging habitat. The site is already surrounded by cleared farming land and as such is ideal habitat for many flight mobile species. As this species is highly flight mobile and can easily traverse to other areas for foraging it is unlikely to fragment this population.

d) adversely affect habitat critical to the survival of a species;

This species relies heavily of hollow bearing trees for breeding and nesting habitat. There are a number of hollow bearing trees present within the study area and it is possible that on or two trees may need to be removed as a result of the activity. It is recommended that an ecologist be present if the removal of such trees is to occur. Suitable stands of higher quality habitat are present to the west at Lighthouse Hill and to the south along the Murrumbidgee River. As a result the proposed activity will not adversely affect critical habitat for the survival of this species.

e) disrupt the breeding cycle of an important population;

The study area supports ideal breeding habitat for this species as there area number of hollow bearing trees present within the study area. It is possible that on or two trees may need to be removed as a result of the activity. It is recommended that an ecologist be present if the removal of such trees is to occur. Suitable stands of higher quality habitat are present to the west at Lighthouse Hill and to the south along the Murrumbidgee River therefore the proposal will not disrupt the breeding cycle of an important population, if one was present.

f) modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline;

It is possible that one or two hollow bearing trees will be impacted upon as a result of the proposal. This species is highly mobile and is known to forage up to 10kms from nesting sites. The proposal will not result in modifying or destroying the quality of habitat for this species. Higher quality stands of vegetation are present to the west at Lighthouse Hill and to the south along the Murrumbidgee River.

g) result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat;

The proposed development has the potential to introduce invasive weeds that reduce the quality of habitat for the Superb Parrot. However the study area already comprises a variety of exotic species, mostly ground cover species. Suitable foraging habitat is present in other adjacent areas for this species as it is highly flight mobile.

h) introduce disease that may cause the species to decline; or

The proposed development should not introduce disease that may cause the Superb Parrot, if present in the study area, to decline.

i) interfere substantially with the recovery of the species.

The development of widening a small section of Pine Gully Road is of low intensity. Given the small area of habitat that will be impacted by the proposed activity (approx 0.4 ha), it is unlikely that the proposal would have an impact on the recovery of the Superb Parrot if present. There is no recovery plan in place for this species.

Conclusion

It is unlikely that the works would result in a significant impact on the Superb Parrot, or their habitat. The implementation of the safeguards described in this report would minimise the possibility of any impact occurring on these species.

Based on this assessment a referral under the *Environment Protection and Biodiversity Conservation Act 1999* is not required.