ASSESSMENT | PLANNING | MANAGEMENT

Wagga Wagga Planning Study

Environmental / Biodiversity report for Eastern Industrial - Hammond Avenue North

(Project No. 069-052)

Report prepared for:
Willana Associates
on behalf of Wagga Wagga City Council

March 2008

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Executive Summary

Wagga Wagga City Council (WWCC) is in the process of preparing a draft Local Environment Plan (LEP) for the Wagga Wagga Local Government Area (WWLGA). The draft plan is intended to implement the strategic planning undertaken in the Wagga Wagga Spatial Plan 2007 (WWCC 2006) and will be prepared in accordance with the *Standard Instrument (Local Environmental Plans) Order 2006*.

Eco Logical Australia Pty Ltd was commissioned by Wagga Wagga City Council to prepare a study of the biodiversity values of a site at Hammond Street, Wagga Wagga, along with seven other sites (each subject to an individual report). The biodiversity studies will feed into the broader environmental study for each proposed development site. Each biodiversity report presents the ecological values of the subject lands and whether development of the site will "maintain or improve" biodiversity.

This biodiversity report seeks to present the ecological values of the Hammond Street development site and to discuss the potential impacts on ecological values, including threatened species, endangered populations and endangered ecological communities, arising from development of the site. Moreover the report seeks to provide a framework for maintaining and improving biodiversity at the Hammond Street site.

The specific objectives of the project are to:

- Describe the ecological values of the site
- Describe potential impacts of proposed development
- Recommend ways to minimise impacts on ecological values of the site
- Where impacts are unavoidable, to recommend offsets which ensure larger, viable areas of native vegetation and habitat are retained in such a way as to enhance landscape connectivity.

The report aims to provide a structure plan for the Hammoand Street development site which will allow development of the site while avoiding impacts to native vegetation and threatened species habitats

The site has a history of agricultural use which has reduced the floral diversity to exotic species. There was also evidence of cropping on site. Remnant trees or other remnant native vegetation was largely absent from the site with only a few native or cosmopolitan groundlayer species.

No threatened species were recorded during the survey and the site is not considered to provide habitat for any threatened species, endangered populations or ecological communities known to occur within the Wagga Wagga LGA.

Consequently, the development potential of the site is extensive, however, the precise extent of development will need to be determined in the context of other constraints (*i.e.* geotechnical, flooding, bushfire, etc).

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1. Introduction

1.1 Project Background

Wagga Wagga City Council (WWCC) is in the process of preparing a draft Local Environment Plan (LEP) for the Wagga Wagga Local Government Area (WWLGA). The draft plan is intended to implement the strategic planning undertaken in the Wagga Wagga Spatial Plan 2007 (WWCC 2006) and will be prepared in accordance with the *Standard Instrument (Local Environmental Plans) Order 2006*.

Preparation of the draft LEP requires that 8 environmental studies be undertaken at sites within the WWLGA that are proposed to be subject to significant zoning changes. These sites are:

- Boorooma East
- Estella West
- Lloyd
- Bomen
- Eastern Industrial – Copland Street South
- Eastern Industrial – Hammond Avenue North
- Edison Road
- Moorong Street

Eco Logical Australia Pty Ltd has been commissioned by Wagga Wagga City Council to prepare a study of the biodiversity values of each of the above sites. The biodiversity studies will feed into the broader environmental study for each proposed development site. Each biodiversity report will present the ecological values of the subject lands and whether development of the site will "maintain or improve" biodiversity.

The current document presents the biodiversity report for the proposed development site known as Eastern Industrial - Hammond Avenue North. Biodiversity reports for each of the 7 additional development sites are presented as separate documents.

1.2 Project Objectives

This biodiversity report seeks to present the ecological values of the Eastern Industrial - Hammond Avenue North development site and to discuss the potential impacts on ecological values, including threatened species, endangered populations and endangered ecological communities, arising from development of the site. Moreover the report seeks to provide a framework for maintaining and improving biodiversity at the Eastern Industrial - Hammond Avenue North site.

The specific objectives of the project are to:

- Describe the ecological values of the site
- Describe potential impacts of proposed development
- Recommend ways to minimise impacts on ecological values of the site
- Where impacts are unavoidable, to recommend offsets which ensure larger, viable areas of native vegetation and habitat are retained in such a way as to enhance landscape connectivity.

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The report aims to provide a structure plan for the Eastern Industrial - Hammond Avenue North development site which will allow development of the site while avoiding impacts to native vegetation and threatened species habitats

1.3 Study Area

The Eastern Industrial - Hammond Avenue North site occurs east of the Wagga Wagga city centre. The site occupies an area of approximately 8.2 ha and is bounded by Hammond Ave (Also known as the Sturt Highway) to the south, Kooringal Rd to the west, Gillard Rd to the east and parts of Tarcoola Rd to the north.

Current land use at the site is predominately industrial with some lots currently vacant. Warehouses, office space and a service station are some of the existing land uses. Vacant site are covered in exotic species.

Land use north of the site is primarily agricultural on the floodplain of the Murrumbidgee River. South and west of the site are other commercial and industrial enterprises.

The site is flat with an elevation of 180 AHD. Soils on the site are Kurrajong Plain soils described by Chen and McKane (1997). These soils are silty clays, quite fertile and have low erosion hazard.

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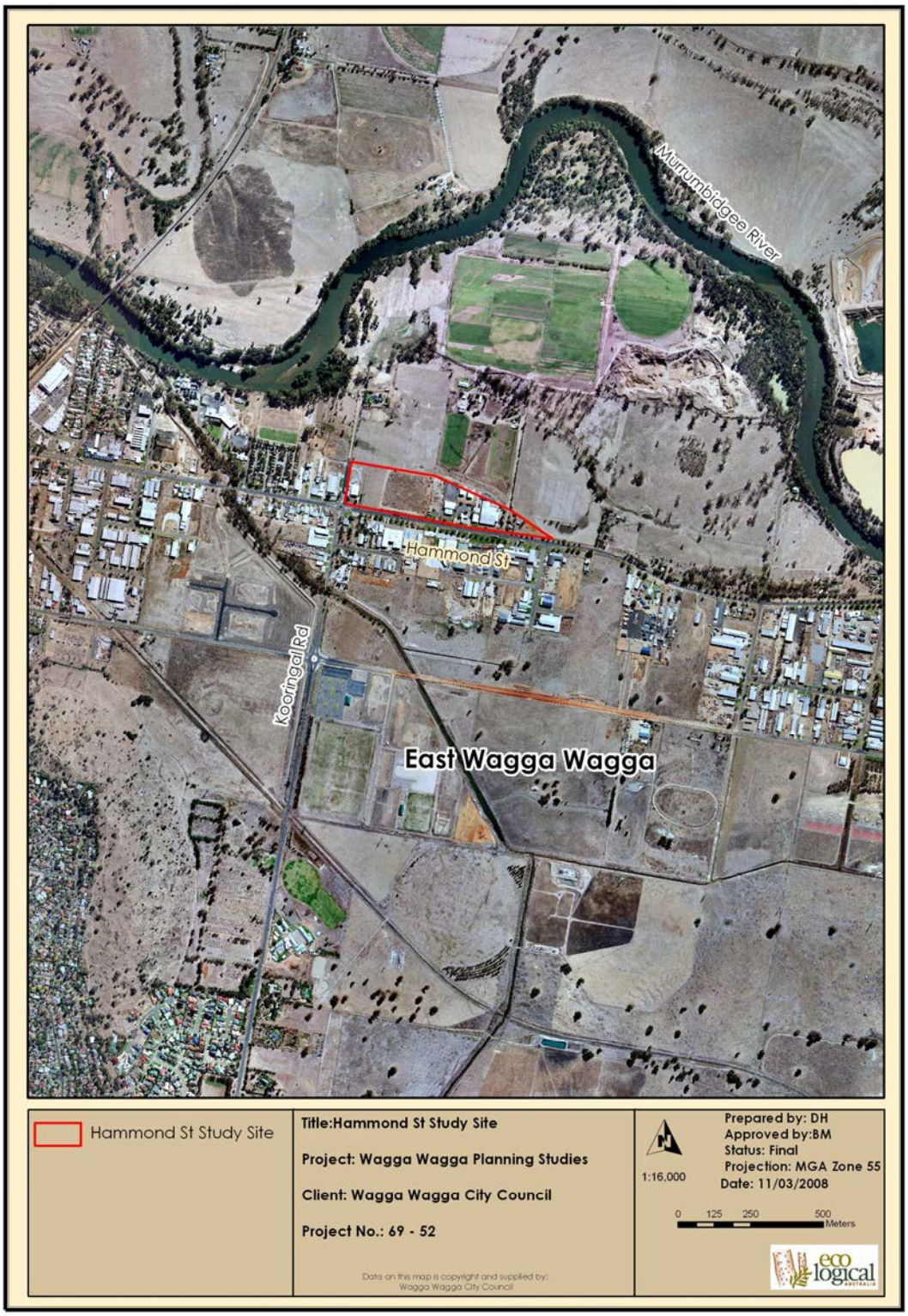

Map 1 – Location of proposed Eastern Industrial – Hammond Street development site.

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1.4 Legislative Summary

The following provides a brief summary of the main pieces of legislation relevant to biodiversity conservation within the study area.

NSW Native Vegetation Act, 2003 (NV Act)
The objects of the *Native Vegetation Act, 2003* (NV Act) are to manage native vegetation on a regional basis through bringing an end to broadscale clearing and seeking to protect and improve areas of existing native vegetation, particularly those areas of high conservation value. The NV Act also seeks to encourage the revegetation and rehabilitation of land in accordance with the principles of ecologically sustainable development.

Under the NV Act, clearing of native vegetation is not permitted unless the clearing is in accordance with a development consent granted in accordance with the NV Act or unless the clearing is in accordance with a property vegetation plan (PVP). Clearing of unprotected regrowth, of certain groundcover and clearing associated with routine agricultural management activities (RAMAs) does not constitute clearing of native vegetation under the Act and therefore does not require a consent approval or PVP.

Under the NV Act, clearing of native vegetation cannot be undertaken unless it **improves or maintains environment outcomes**. Mitigating actions or offsets which provide gains equal to, or exceeding, losses from clearing, may be required in order for clearing of native vegetation to improve or maintain biodiversity values under the Act. Under the Act, native vegetation which is in **'moderate to good' condition** and is of a type, or within a landscape that is highly cleared (>70%), can not be offset and is not permitted to be cleared.

Environmental Planning and Assessment Act 1979 (EP&A Act)
The NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) is the principal planning legislation for the state, providing a framework for the overall environmental planning and assessment of development proposals. Various legislation and instruments, such as the NSW *Threatened Species Conservation Act 1995* (TSC Act), are integrated with the EP&A Act.

The LES is being prepared in accordance with section 57 of the EP&A Act. Issues to be addressed in the LES were raised during consultation with agencies (conducted in accordance with sections 34A and 62 of the EP&A Act).

NSW Threatened Species Conservation Act, 1995 (TSC Act)
The TSC Act aims to protect and encourage the recovery of threatened species, populations and ecological communities listed under the Act. The integration of the TSC Act with the NSW Environmental Planning and Assessment Act (EP&A Act) requires consideration of the likelihood of a development (Part 4 of the EP&A Act) or an activity (Part 5 of the EP&A Act) significantly affecting threatened species, populations and ecological communities or their habitat. This is undertaken through the preparation of a '7-part test' (Section 5A).

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Schedule 1 of the TSC Act lists threatened species, populations and ecological communities and species that are endangered or presumed extinct. Schedule 2 lists vulnerable species and Schedule 3 lists key threatening processes.

The TSC Act defines 'endangered' as a species, population or ecological community that is likely to become extinct or is in immediate danger of extinction. A species that is 'presumed extinct' has not been located in nature during the preceding fifty years despite the searching of known and likely habitats. A 'vulnerable' species is likely to become endangered unless the circumstances and factors threatening its survival or evolutionary development cease to operate.

The site is known or potential habitat for a number of threatened species, ecological communities and/or migratory species listed under the Act.

The TSC Act provides for the preparation of recovery plans and threat abatement plans, some of which apply to the site. Biodiversity certification of Local Environment Plans (LEPs) is also facilitated through this Act.

Commonwealth Environment Protection & Biodiversity Conservation Act, 1999 (EPBC Act)

Approval from the Commonwealth Environment Minister is required under the EPBC Act if an action (can include a project, development, undertaking or activity) will, or is likely to, have a significant impact on matters considered to be of national environmental significance (NES matters). NES matters relevant to this study include threatened species, ecological communities and migratory (JAMBA/CAMBA) species that are listed under the Act.

The EPBC Act does not define significant impact but identifies matters that are necessary to take into consideration. If the matter is referred to the Minister a decision is generally required within 20 days in relation to whether an action requires Commonwealth approval.

The site is known or potential habitat for a number of threatened species, ecological communities and/or migratory species listed under the Act.

NSW Noxious Weeds Act, 1993 (NW Act)

The objectives of the Noxious Weeds Act are to identify which noxious weeds require control measures, identify control measures suitable to those species and to specify the responsibilities of both public and private landholders for noxious weed control.

The Noxious Weeds Act allows for the declaration of weeds as noxious within a Local Control Area (LCA) and assigns a weed control class to each declared noxious weeds. The Eastern Industrial – Hammond Street site is located within the Wagga Wagga City Council LCA. Currently 106 species or groups of species are listed as noxious weeds within the Wagga Wagga City Council LCA. 3 noxious weeds are known to occur on the site.

Water Management Act 2000 (WM Act)

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The Water Management *Act 2000* and *Water Act 1912* control the extraction of water, the use of water, the construction of works such as dams and weirs and the carrying out of activities in or near water sources in New South Wales. 'Water sources' include any river, lake, estuary, place where water occurs naturally on or below the surface of the ground and New South Wales coastal waters.

Approval is required under the *Water Management Act* for carrying out of a 'controlled activity' on 'waterfront land' (s91). Controlled activities' include:

- the construction of buildings or carrying out of works;
- the removal of material or vegetation from land by excavation or any other means;
- the deposition of material on land by landfill or otherwise; or
- any activity that affects the quantity or flow of water in a water source.

'Waterfront land' is defined as the bed of any river or lake, and any land lying between any permanent or intermittent waterbody or lake and a line drawn parallel to and forty metres inland from either the highest bank or shore (in relation to non-tidal waters) or the mean high water mark (in relation to tidal waters). The distance of forty metres can be reduced by the regulations. Depending upon the regulations, land adjoining coastal waters may also be waterfront land.

It is an offence to carry out a controlled activity on waterfront land except in accordance with an approval.

No part of the study site occurs on waterfront land as defined under the WM Act.

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2. Description of Methods

2.1 Review of existing information

A review of the Atlas of NSW Wildlife was undertaken for the site and determined that while there are many records of threatened species in the Wagga LGA, most of these are associated with patches of remnant vegetation.

Aerial photography was supplied by Wagga Wagga City Council and reviewed prior to field survey.

2.2 Desktop Assessment

The NSW National Parks and Wildlife Atlas of NSW Wildlife and Commonwealth Environmental Protection and Biodiversity Conservation Act (1999) Protected Matters Search Tool were used to supplement surveys undertaken in this site in order to compile a comprehensive list of flora and fauna likely or with the potential to occur at the site. The searches were performed on 4/09/2007 for the Wagga Wagga LGA. Likelihood of occurrences for threatened species, populations and communities for the Hammond Avenue site were then made based on the habitat characteristics of the site, results of the field survey and professional judgement (Appendix 1). Five terms for the likelihood of occurrence of species were used and are defined below:

- "yes" = the species was or has been observed on the site
- "likely" = a medium to high probability that a species uses the site
- "potential" = suitable habitat for a species occurs on the site, but there is insufficient information to categorise the species as likely to occur, or unlikely to occur
- "unlikely" = a very low to low probability that a species uses the site
- "no" = habitat on site and in the vicinity is unsuitable for the species.

2.3 Field Survey

The proposal site was inspected on 15th August 2007 by Sam Luccitti and Bruce Mullins of Eco Logical Australia. Limited access to the site at the time of survey meant that only the unoccupied land was inspected, with other sites viewed from the road reserve.

The vacant land in the west half of the site was traversed as part of the field survey (Map 2). The traverse extended for more that 100 m and all visible vascular flora were recorded. Incidental sightings of fauna were also noted. The survey extended for 1 person hours.

Tree counts were undertaken from the road reserve with estimations of each tree's diameter at breast height noted.

2.4 Desktop review results

A review of The NSW National Parks and Wildlife Atlas of NSW Wildlife and Commonwealth Environmental Protection and Biodiversity Conservation Act (1999) Protected Matters Search Tool showed numerous threatened species have been

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recorded within the Wagga Wagga LGA. Consideration of the range and habitat requirements of each species found that none of the species were likely or had the potential to occur at the site.

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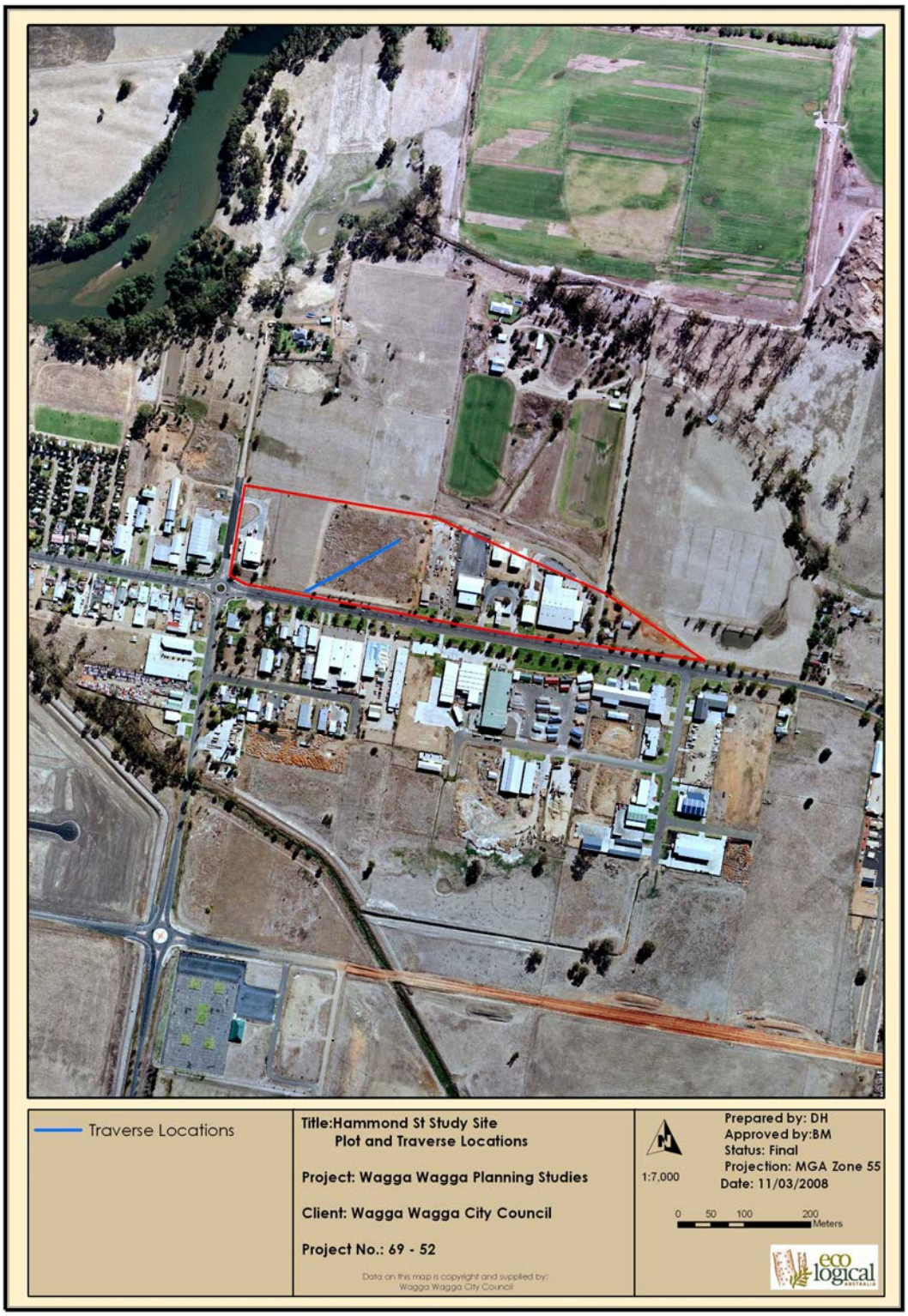

Map 2 – Location of vegetation traverse.

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2.5 Field Survey Results

2.5.1 Flora

The survey identified only 24 species, five of which were native (Appendix 2). There were some planted eucalypts in the east, but no remnant native trees were present.

Common species recorded on the site during the current survey included kikuyu (*Pennisetum clandestina*), ryegrass (*Lolium rigidum*) and Paterson's curse (*Echium plantagineum*).

No remnant trees were recorded on the site.

Two noxious weeds were recorded on site; Paterson's curse (*Echium plantagineum*) and horehound (*Marrubium vulgare*). Both species are categorised as Class 4 noxious weeds within the Wagga Wagga LGA.

2.5.2 Fauna

No fauna were observed on the site during the brief survey. The location of the site, existing landuse and lack of native vegetation suggests that only fauna found in urban and semi rural environments would occur on the site.

Fauna habitat only consisted of grassland and urbanised lands. These habitats are of limited value with similar habitat widely available in the greater city area.

2.6 Special Considerations

While access to the entire site was limited, it is unlikely to affect the outcomes of this assessment. Only a small portion of the site in the west was directly accessible during the survey. However, due to the size of the site and high resolution aerial photography provided by council, the results and recommendations made within the report have a high degree of confidence.

2.7 Consultation

Eco Logical Australia discussed their approached to the project, and in particular field survey, with Mark Sheahan (DECC), Dr David Read, and David Walker (Wagga Wagga City Council), Darren Wallett (DWE), and Rachel Short, Vicki Shirlaw and Stuart Harding (Willana Associates).

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3. Assessment of Vegetation

3.1 Areas of Native Vegetation

The site is devoid of native vegetation communities and has a very high proportion of exotic species (Map 3).

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Map 3 – Areas of vegetation at the site.

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3.2 Regional Scale Assessment

3.2.1 Mitchell Landscapes

A review of the Mitchell Landscapes mapping within the Wagga Wagga area found that one Mitchell Landscape occurs within the Hammond Avenue site. This landscape is the Murrumbidgee – Tarcutta Channels and Floodplains Ecosystem in the NSW South West Slopes Bioregion (Mitchell 2002) (Map 4). The landscape is characterised by channels, floodplain and terraces of Murrumbidgee tributaries on Quaternary alluvium, generally lies at an elevation of between 200 to 400m, and has undifferentiated organic sand and loam on the floodplain, brown gradational loam and yellow texture-contrast soils on higher terraces. River red gum gallery woodland generally occurs on banks in this landscape, and yellow box and grey box open woodland occur on floodplain and terraces (Mitchell 2002). This landscape has been heavily cleared for agricultural production (Table 1).

Table 1 –Mitchell landscapes within the study area

Mitchell Landscape	Degree of Clearance	Area within Study Area	% of Study Area
Murrumbidgee – Tarcutta Channels and Floodplains Ecosystem	91 %	8.2 ha	100 %

3.2.2 Vegetation Types

The site contains no native vegetation communities or paddock trees.

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Map 4 – Mitchell landscapes on the site.

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Landscape Scale Assessment

3.2.3 Landscape Value

The landscape value of the site is defined by Ayers *et al.* (2005) as the extent of vegetation cover, the connectivity of vegetation within the site to patches of native vegetation outside the site and the overall size of remnant vegetation patches connected to the site. In determining the landscape value of the site, the extent of vegetation cover is estimated for three scales (within 10, 100 and 1000 ha areas) to recognise the different ranges of various biota and scale of impacts of activities on biota in the area.

The study site is located within an industrial environment, with some industrial, urban and rural development to the south, east and west. Native vegetation cover in and outside the site is sparse and no remnant trees are present in the site. The site does not provide connectivity between patches of native vegetation (Table 2).

A summary of the outcomes of the landscape scale assessment as descried in Ayers *et al.* (2005) is provided in Table 2 below.

Table 2 – Landscape Value of Vegetation.

Landscape Attribute	Current Score
% Cover within 1.75 km radius (1000 ha)	< 10 %
% Cover within 0.55 km radius (100 ha)	< 10 %
% Cover within 0.2 km radius (10 ha)	< 10 %
Connectivity value	Nil
Total adjacent remnant area	Small
Calculated Landscape Value	**0**

3.3 Site Scale Assessment

The survey determined that the site was devoid of native vegetation (Map 5).

3.3.1 Assessment Zone Delineation

No assessment zones were attributed to the site (Map 5) as it lacked any native vegetation able to be assessed using the BioMetric methodology (Ayers et al. 2005).

3.3.2 Condition and Quality of Vegetation

Vegetation at the site was entirely non-native and as such no condition, as described in Ayers *et al.* (2005) was assigned to the site (Map 6).

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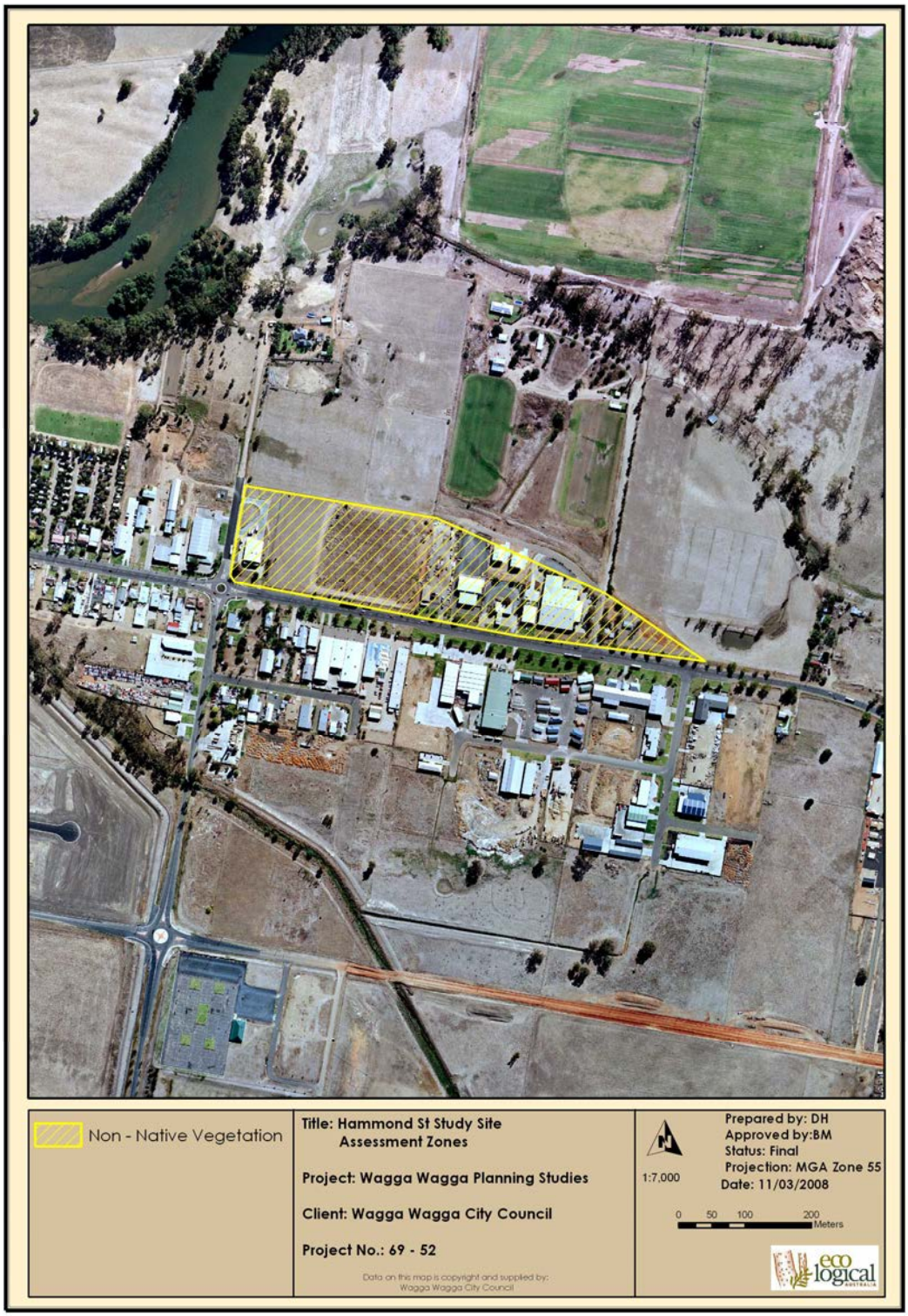

Map 5 – Assessment Zones at the site. No assessment zones were delineated on the sit e as it is devoid of native vegetation.

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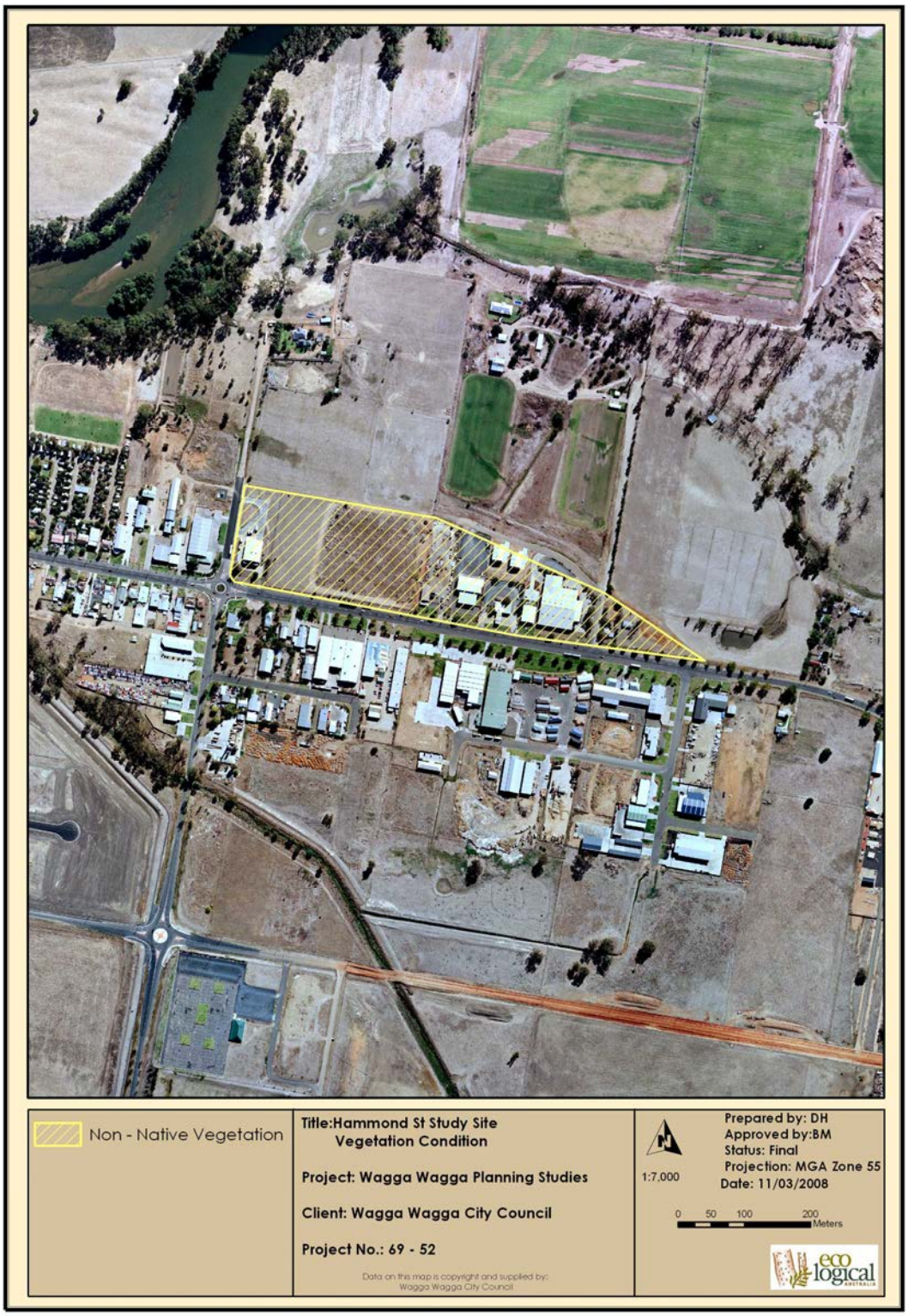

Map 6 – Vegetation condition at the site.

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4. Threatened Species

4.1 Threatened Species

There is not suitable habitat for threatened species on the site.

4.2 Threatened Populations

There are no threatened populations of flora or fauna, or their habitat, on site.

4.3 Endangered Ecological Communities

There are no endangered ecological communities on site.

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5. Structure Plan

The study site contains no native vegetation or threatened species habitat and is therefore potentially suitable for residential/industrial development.

The precise extent of retained areas relative to potentially developable areas will need to be determined in the context of other constraints to development (*i.e.* geotechnical, flooding, bushfire, etc).

The areas proposed for development, as determined on the basis of current investigation at the site, are presented in Map 7 below.

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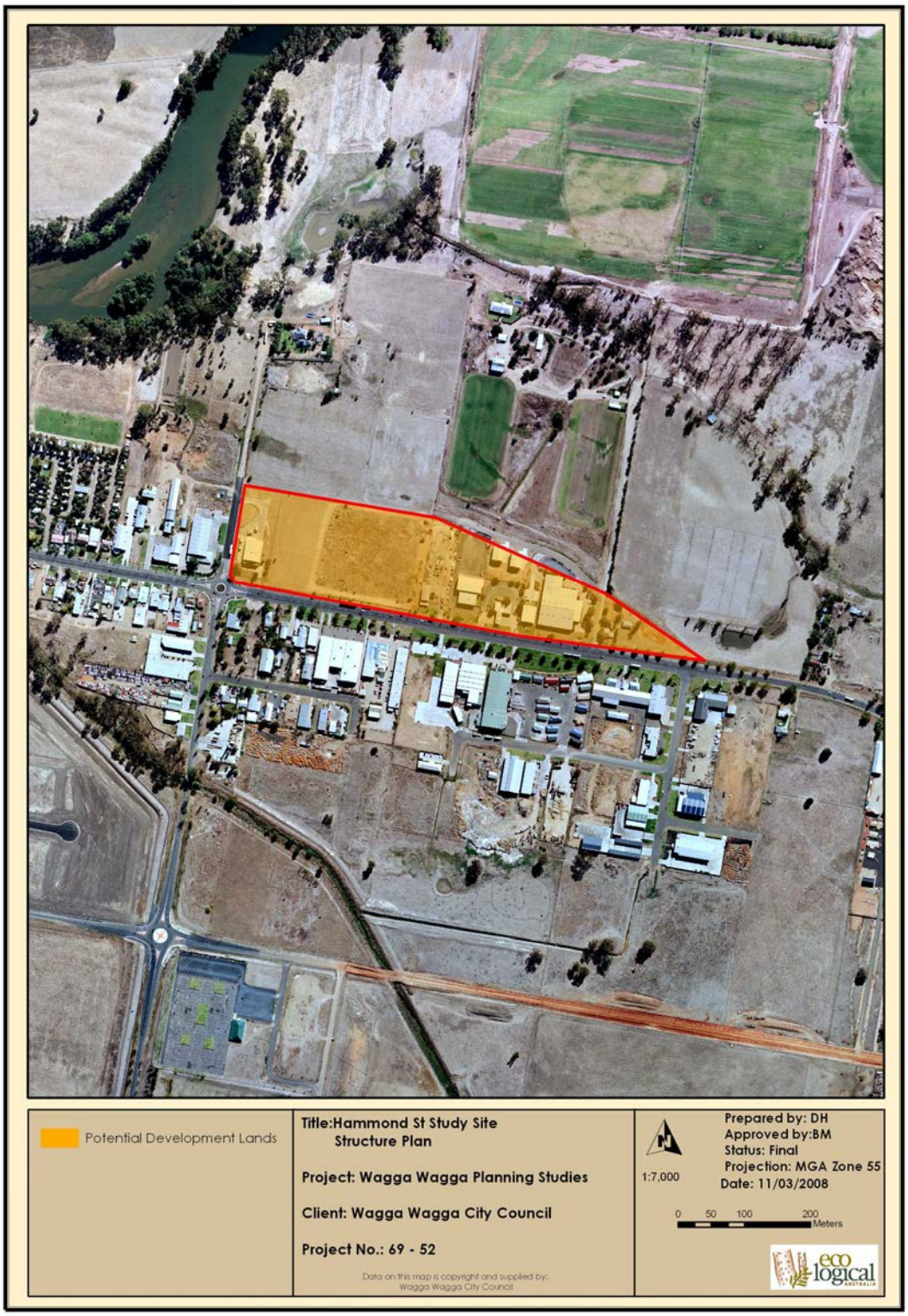

Map 7: Structure Plan for the site

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6. References

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7. Appendices

Appendix 1: Likelihood of occurrence for threatened species, populations and communities on the Hammond Avenue North site.

Scientific Name	Common Name	Status		Likelihood	Habitat
		TSC Act	EPBC Act		
Threatened species - Fish					
Maccullochella peelii peelii	Murray Cod		V	No	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.
Macquarie australasica	Macquarie Perch		E	No	Occurs widely in riverine and lake habitats. In Sydney basin only known from Cataract and Cordeaux River catchments. Upland streams and migrates upstream to gravel beds to spawn.
Threatened species - Frogs					
Litoria booroolongensis	Booroolong Frog	E		No	Restricted to NSW and north-eastern Victoria, predominantly along the western-flowing streams of the Great Dividing Range. Live along permanent streams with some fringing vegetation cover such as ferns, sedges or grasses
Litoria raniformis	Southern Bell Frog	E	V	No	Usually found in or around permanent or ephemeral Black Box/Lignum/Nitre Goosefoot swamps, Lignum/Typha swamps and River Red Gum swamps or billabongs along floodplains and

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Scientific Name	Common Name	Status		Likelihood	Habitat
		TSC Act	EPBC Act		
					river valleys. They are also found in irrigated rice crops, particularly where there is no available natural habitat
Threatened species - Snakes					
Aprasia parapulchella	Pink-tailed Worm-lizard	V	V	No	In general, lizards occur in open grassland habitats that have a substantial cover of small rocks
Delma impar	Striped Legless Lizard	V	V	No	Lowland native grasslands
Threatened species - Birds					
Ardea alba	Great Egret, White Egret		M	No	Shallows of rivers, estuaries, tidal mudflats, freshwater wetlands, larger dams
Ardea ibis	Cattle Egret		M	Unlikely	Stock paddocks, pastures, croplands, garbage tips, wetlands, tidal mudflats
Burhinus grallarius	Bush Stone-curlew	E		No	Well wooded floodplain forests, amongst fallen timber
Cacatua leadbeateri	Major Mitchell's Cockatoo	V		No	Near water on timbered watercourses
Callocephalon fimbriatum	Gang-gang Cockatoo	V		No	Wetter forests, and woodlands, from sea level to 2000m on divide. From timbered foothills and valleys to suburban gardens.
Climacteris picumnus victoriae	Eastern subspecies of Brown Treecreeper	V		No	Drier forests / woodlands / scrubs with fallen branches.
Gallinago hardwickii	Latham's Snipe, Japanese Snipe		M	No	Soft wet ground or shallow water with tussocks and other green and dead growth. Wet drainage areas
Grus rubicundis	Brolga	V		No	Though Brolgas often feed in dry grassland or ploughed paddocks or even desert claypans, they are dependent on wetlands too, especially

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Scientific Name	Common Name	Status		Likelihood	Habitat
		TSC Act	EPBC Act		
					shallow swamps, where they will forage with their head entirely submerged
Haliaeetus leucogaster	White-bellied Sea-Eagle		M	No	Rivers, large dams. Roost and nest on large platforms built in large Eucalypts
Hirundapus caudacutus	White-throated Needletail		M	Unlikely	Open space above canopy. Forages over large areas
Lathamus discolor	Swift Parrot	E	E, M	Unlikely	Forests, woodlands, plantations, banksias, street trees and gardens on the mainland
Leipoa ocellata	Malleefowl	E	V, M	No	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
Melanodryas cucullata	Hooded Robin	V		No	Prefers lightly wooded country, usually open eucalypt woodland, acacia scrub and mallee, often in or near clearings or open areas
Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	V		No	Ironbark woodlands, extensively wooded areas
Merops ornatus	Rainbow Bee-eater		M	Unlikely	Open woodlands with sandy, loamy soils, dunes, cliffs, mangroves golf courses
Myiagra cyanoleuca	Satin Flycatcher		M	Unlikely	Heavily vegetated gullies in forests, and taller woodlands of coastal south-east Australia. Also occurs in various sites during migration including farms and parks
Neophema pulchella	Turquoise Parrot	V		Unlikely	Open grassy woodland, with dead trees, near permanent water and forested hills.
Ninox connivens	Barking Owl	V		Unlikely	Open forests,

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Scientific Name	Common Name	Status		Likelihood	Habitat
		TSC Act	EPBC Act		
					woodlands, dense scrubs, other large trees near watercourses. Nest in tree hollow.
Pachycephala inornata	Gilbert's Whistler	V		No	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.
Pedionomus torquatus	Plains Wanderer	E	V	No	Most of the vegetation is <5 cm high but some vegetation up to a maximum of 30 cm is important for concealment, grass tussocks are spaced 10-20 cm apart
Polytelis swainsonii	Superb Parrot	V	V	Unlikely	Breeds along inland rivers in river red gum, feeding in box woodland with 10km of nest tree. West of dividing range.
Pomatostomus temporalis temporalis	Grey-crowned Babbler (eastern subspecies)	V		Unlikely	Inhabits open Box-gum Woodlands on the slopes, and Box-Cypress-pine and open Box Woodlands on alluvial plains
Pyrrholaemus sagittatus	Speckled Warbler	V		Unlikely	Well vegetated woodlands, diverse structure
Rostratula australis	Australian Painted Snipe		V	Unlikely	Well vegetated margins of wetlands
Rostratula benghalensis australis	Painted Snipe (Australian subspecies)	E	V, M	Unlikely	Well vegetated margins of wetlands
Stagonopleura guttata	Diamond Firetail	V		Unlikely	Open eucalypt forests, woodlands.
Stictonetta naevosa	Freckled Duck	V		No	Prefer permanent freshwater swamps and creeks with heavy growth of Cumbungi, Lignum or Tea-tree. During drier times they move from ephemeral

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		TSC Act	EPBC Act		
					breeding swamps to more permanent waters such as lakes, reservoirs, farm dams and sewage ponds
Grantiella picta	Painted Honeyeater	V	-	Unlikely	Boree, Brigalow and Box-gum woodlands and box –ironbark forests. Inhabits vegetation with 5 or more mistletoe per hectare.
Xanthomyza phrygia	Regent Honeyeater	E	E, M	Unlikely	Dry open forests, woodlands, especially red ironbark, yellow box, yellow gum
Threatened species - Mammals					
Dasyurus maculatus	Spotted-tailed Quoll	V	E	No	Occurs in wide variety of habitats in large remnants. Dens in tree hollows, hollow log or rock crevice
Macrotis lagotis	Bilby	Ex	V	No	Sandy desert areas in spinifex (*Triodia* species) grasslands
Myotis adversus	Large-footed Myotis	V		No	Known from a range of habitats close to water from lakes, small creeks to large lakes and mangrove lined estuaries
Saccolaimus flaviventris	Yellow-bellied Sheathtail Bat	V	-	Unlikely	Forages in most habitats across its very wide range, with and without trees. Roosts and breeds in living or dead hollow bearing trees.
Chalinolobus picatus	Little Pied bat	V	-	Unlikely	Dry open forest, open woodland, mulga woodlands, chenopod shrublands, cypress pine forest, malle and bramble box. Roosts and breeds in tree hollows, fissures or cracks, buildings, power poles, fence posts, caves, cliff crevices, mineshafts and tunnels.
Nyctophilus timoriensis (south	Eastern Long-eared Bat	V	V	Unlikely	Inhabits a variety of vegetation types,

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Scientific Name	Common Name	Status		Likelihood	Habitat
		TSC Act	EPBC Act		
eastern form)					including mallee, bulloak Allocasuarina luehmannii and box eucalypt dominated communities, but it is distinctly more common in box/ironbark/cypress-pine vegetation that occurs in a north-south belt along the western slopes and plains of NSW and southern Queensland
Petaurus norfolcensis	Squirrel Glider	V		Unlikely	In the region occurs in Box-gum woodlands, box-ironbark woodlands and river red gum woodland.
Phascolarctos cinereus	Koala	V		No	Inhabit eucalypt woodlands and forests
Phascogale tapoatafa	Brush-tailed Phascogale	V	-	No	Prefer dry sclerophyll open forest with sparse groundcover of herbs, grasses, shrubs or leaf litter. Also inhabit heath, swamps, rainforest and wet sclerophyll forest.
Threatened species - Plants					
Ammobium craspedioides	Yass Daisy	V	V	No	Known from natural temperate grassland sites.
Amphibromus fluitans	River Swamp Wallaby-grass	V	V	No	Swamps or low-lying areas which become periodically water-logged, usually on clayey soils.
Austrostipa wakoolica		E	E	No	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

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Scientific Name	Common Name	Status		Likelihood	Habitat
		TSC Act	EPBC Act		
					rise
Brachycome muelleroides	Claypan Daisy	V	V	No	Grows in damp areas on the margins of claypans in moist grassland with *Pycnosorus globosus*, *Agrostis avenacea* and *Austrodanthonia duttoniana*
Brachycome papillosa	Mossigiel Daisy	V	V	No	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
Diuris sheaffiana	Tricolour Diuris	V	V	No	Sporadically distributed on the western slopes of NSW. 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
Senecio garlandii	Wooly Ragwort	V	V	No	Woolly Ragwort occurs on sheltered slopes of rocky outcrops
Swainsona murrayana	Slender Darling-pea	V	V	No	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.
Swainsona recta	Small Purple-pea	E	E	No	Before European settlement Mountain Swainson-pea occurred

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Scientific Name	Common Name	Status		Likelihood	Habitat
		TSC Act	EPBC Act		
					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*
Thesium australe	Austral Toadflax	V	V	No	Often found in damp sites in association with Kangaroo Grass (*Themeda australis*)
Threatened Ecological Populations					
Petaurus norfolcensis – endangered population Wagga Wagga	Squirrel Glider population in the Wagga Wagga LGA	E		No	Inhabits a wide range of open forest, woodland and riverine forest habitats. Utilise remnants of various sizes, including small remnants and even small stands of trees within Travelling Stock Reserves, roadside reserves or private land. Often utilise linear remnant vegetation along roadsides or rivers and streams
Threatened Ecological Communities					
	White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	E	CE	No	Western slopes and plains

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Appendix 2: Flora species recorded on the Hammond Avenue North site.

Species Name	Common Name
Arctotheca calendula#	Capeweed
Avena fatua#	Wild Oats
Bromus spp. #	
Chenopodium album#	Fat Hen
Cirsium vulgare#	Spear Thistle
Conyza spp.#	
Cynodon dactylon	Common Couch
Echium plantagineum#	Patterson's Curse
Erodium cicutarium#	Common Crowfoot
Fumaria spp. #	
Galium aparine#	Goosegrass
Lactuca serriola#	Prickly Lettuce
Lepidium pseudohyssopifolium#	Peppercress
Lolium rigidum#	Wimmera Ryegrass
Malva parviflora#	Small-flowered Mallow
Marrubium vulgare#	Horehound
Medicago polymorpha#	Burr Medic
Panicum effusum	Poison or Hairy Panic
Pennisetum clandestinum#	Kikuyu Grass
Polygonum aviculare#	Wireweed
Rapistrum rugosum#	Turnip Weed
Taraxacum spp. #	
Trifolium spp. #	
Vinca spp. #	

#Exotic species

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