

## 7. Flora and Fauna Assessment

This chapter provides an assessment of the potential impacts resulting from the proposed construction of an additional three turbines (turbines 21, 22, 23) and associated infrastructure (cabling and access routes).

### 7.1 Introduction

The potential ecological impacts of any wind farm development relate to:

- construction activities associated with clearing native vegetation and habitat disturbance
- operational impacts which are predominantly associated with potential for avifauna to strike the rotating turbine blades.

The assessment of the potential for these impacts on the entire project was undertaken by URS (flora and fauna) and Greg Richards and Associates (avifauna) at the time of the original EIS in 2004 and by Kevin Mills and Associates (KMA) for the first project modification in early 2010.

KMA assessed the flora and fauna at the additional proposed turbine sites and along the proposed access and cabling route. The full report of this investigation is provided as Appendix F and summarised in the following sections.

### 7.2 Flora

#### 7.2.1 Site flora survey

A comprehensive field survey was conducted by KMA on 30 April 2010. In conjunction with the site survey, KMA related the findings to relevant databases and the observed ecological features of the site. The aim of the survey was to:

- classify and describe the vegetation in the locality of the proposed additional turbines sites and associated infrastructure
- map the distribution of the vegetation communities
- record as many as possible of the plant species present
- search for threatened plant species

The vegetation survey technique combined traverses of the site area, which were undertaken on foot, with vegetation sampling on the actual development sites. The traverses were targeted to cover the full topographic variation of the site, the full range of vegetation communities and potential habitat for threatened plant species.

#### 7.2.2 Results of the flora survey

The locality of the areas to be disturbed by the construction of the three proposed wind turbine sites are generally treeless with heavily grazed exotic grassland, and some native species. Diversity is low and no rare or threatened species were considered likely to occur. The species identified included:

- Phalaris (*Phalaris aquatica*) (exotic)
- Subterranean Clover (*Trifolium subterranean*) (exotic)
- Clammy Goosefoot (*Chenopodium pumilio*)
- Corkscrew Spear-grass (*Austrostipa scabra*)
- Wattle Mat-rush (*Lomandra filiformis*)
- Wallaby Grass (*Austrodanthonia racemosa*)

A full list of the native plant species recorded by KMA in the project area during the recent survey is provided in Appendix F.

## 7.3 Fauna

### 7.3.1 Site fauna survey

Fauna surveys were conducted on 30 April 2010. The purpose of the fauna survey was to:

- detect as many as possible of the fauna species present
- describe the fauna habitat in the site area
- assess the potential for the habitat in the site area to support threatened fauna

The field survey concentrated on habitats likely to be used by fauna and all animals directly observed or identified by call recognition were recorded. A ground search was also undertaken for animal scats, tracks and diggings.

### 7.3.2 Results of the fauna survey

The fauna habitat identified in the vicinity of the proposed additional turbine sites is typical of the rural environment of the region. The site consists of heavily grazed paddocks with little native fauna, though some species, mainly birds, forage in the grassland.

It was observed that there are very few trees on site. The trees in the locality of the three proposed wind turbines were found to be small and not hollow bearing.

A full list of the fauna species recorded by KMA in the project area during the recent survey is provided in Appendix F.

## 7.4 Conservation values

### 7.4.1 Threatened species

Threatened species in NSW are listed on schedules under the NSW *Threatened Species Conservation Act 1995* (TSC Act), where they are classified "endangered" (Schedule 1, Part 1), "vulnerable" (Schedule 2) or "presumed extinct" (Schedule 1, Part 4).

Nationally threatened species are listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) as "extinct", "critically endangered", "endangered", "vulnerable" or "conservation dependent".

Habitat assessment is important for predicting the likelihood of species occurring in a particular area. The type of vegetation, the presence/absence of rock outcrops, tree hollows, watercourses etc are taken into account in this assessment. Using this method, several species of threatened fauna would occur in the site area from time to time but would be incidental given the type of habitats present. Threatened species with the potential to occur in the locality of the Woodlawn site were discussed in the report by URS (2004) for the original EIS and reviewed in the subsequent SEE (Aurecon, 2010). The sites associated with proposed additional turbines have been inspected and similarly assessed.

Table 7.1 provides a list of these species along with an indication of their potential to occur in the project area based on the habitat assessment and their conservation status.

**Table 7.1 – Threatened species previously recorded in the local area (adapted from KMA, June 2010))**

| Species                                    | Common name               | TSC Act | EPBC Act | Potential to occur                                                                                                      |
|--------------------------------------------|---------------------------|---------|----------|-------------------------------------------------------------------------------------------------------------------------|
| <b>Plants</b>                              |                           |         |          |                                                                                                                         |
| <i>Diurus aequalis</i>                     | Buttercup double tail     | E       | V        | Occurs in woodland and forest with a grassy understorey. <b>No suitable habitat – unlikely to occur on site.</b>        |
| <i>Dodonaea procumbens</i>                 | Creeping Hop Bush         | V       | V        | Grows in woodland on sandy soils. <b>No suitable habitat – unlikely to occur on site.</b>                               |
| <i>Swainsona sericea</i>                   | Silky Swainson-pea        | V       | -        | Occurs in native grassland. <b>No suitable habitat – unlikely to occur on site.</b>                                     |
| <b>Mammals</b>                             |                           |         |          |                                                                                                                         |
| <i>Miniopterus schreibersii oceanensis</i> | Eastern Bentwing Bat      | V       | -        | There are no roosting sites in the area. Though, this species of bat is likely to forage in the area.                   |
| <i>Falsistrellus tasmaniensis</i>          | Eastern False Pipistrelle | V       | -        | This species of bat may forage in the area. <b>No hollow-bearing trees will be removed.</b>                             |
| <i>Phascolarctos cinereus</i>              | Koala                     | V       | -        | No woodland or forest in the vicinity of the site. <b>Unlikely to occur on site.</b>                                    |
| <b>Birds</b>                               |                           |         |          |                                                                                                                         |
| <i>Stagonopleura guttatai</i>              | Diamond Firetail          | V       | -        | Some potential to occur in grassland without trees, including exotic grassland.                                         |
| <i>Petroica phoenicea</i>                  | Flame Robin               | V       | -        | Woodland bird species. Have been recorded in the general area. May frequent the locality in winter.                     |
| <i>Stictonetta naevosa</i>                 | Freckled Duck             | V       | -        | Occurs occasionally on Lake George and Lake Bathurst. Lake George is immediately west of the subject land.              |
| <i>Callocephalon fimbriatum</i>            | Gang-gang Cockatoo        | V       | -        | Have been recorded in the general area. May frequent the locality in winter.                                            |
| <i>Hieraaetus morphnoides</i>              | Little Eagle              | V       | -        | Woodland bird species, which forages on both woodland and farmland. May occur on site from time to time.                |
| <i>Petroica boodang</i>                    | Scarlet Robin             | V       | -        | Woodland bird species. May occur on site from time to time.                                                             |
| <i>Climacteris picumnus</i>                | Brown Treecreeper         | V       |          | Woodland bird species No woodland/forest habitat on the sites to attract the species. <b>Unlikely to occur on site.</b> |
| <i>Calyptorhynchus lathami</i>             | Glossy Black-Cockatoo     | V       | -        | Occurs in mature eucalypt forest and woodland. <b>No suitable habitat – Unlikely to occur on site.</b>                  |
| <i>Melanodryas cucullata</i>               | Hooded Robin              | V       |          | Woodland bird species No woodland/forest habitat on the sites to attract the species. <b>Unlikely to occur on site.</b> |

| Species                          | Common name                | TSC Act | EPBC Act | Potential to occur                                                                                                                                                                        |
|----------------------------------|----------------------------|---------|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Anseranas semipalmate</i>     | Magpie Goose               | V       | -        | <b>Unlikely to occur on site</b> , although the species has been recorded at Lake Bathurst.                                                                                               |
| <i>Xanthomyza phrygia</i>        | Regent Honeyeater          | E       | E        | No preferred food trees, such as the Yellow Box, in the area. <b>Unlikely to occur on site.</b>                                                                                           |
| <i>Chthonicola sagittata</i>     | Speckled Warbler           | V       | -        | Woodland bird species, with shrubby understory. May occur in the general area. <b>Unlikely to occur on site.</b>                                                                          |
| <i>Daphoenositta chrysoptera</i> | Varied Sittella            | V       | -        | Woodland bird species. May occur in the general area. <b>Unlikely to occur on site.</b>                                                                                                   |
| <i>Artamus leucorhynchus</i>     | White-browed Woodswallow   | V       | -        | Woodland bird species. May occur in the general area. <b>Unlikely to occur on site.</b>                                                                                                   |
| <b>Reptiles</b>                  |                            |         |          |                                                                                                                                                                                           |
| <i>Tympanocryptus lineatus</i>   | Grassland Earless Dragon   | E       | E        | Occurs in natural temperate grassland. <b>No suitable habitat – Unlikely to occur on site.</b>                                                                                            |
| <i>Suta flagellum</i>            | Little Whip Snake          | V       | -        | Occurs in woodland with ground cover. <b>No suitable habitat</b> present, on or near the development sites. <b>Unlikely to occur on site.</b>                                             |
| <i>Aprasia parapuchella</i>      | Pink-tailed Legless Lizard | V       | V        | Occurs in native grassland amongst rocky outcrops. <b>No suitable habitat</b> present, on or near the development sites. <b>Unlikely to occur on site.</b>                                |
| <i>Varanus rosenbergi</i>        | Rosenberg's Goanna         | V       | -        | Occurs in woodland with native ground cover. <b>No suitable habitat</b> present, on or near the development sites. <b>Unlikely to occur on site.</b>                                      |
| <i>Delmar impar</i>              | Striped Legless Lizard     | V       | V        | Occurs in natural temperate grassland. <b>No suitable habitat – Unlikely to occur on site.</b>                                                                                            |
| <b>Frogs</b>                     |                            |         |          |                                                                                                                                                                                           |
| <i>Litoria aurea</i>             | Green and Golden Bell Frog | E       | V        | Occurs in wetlands. <b>No suitable habitat</b> present, on or near the development sites. <b>Unlikely to occur on site.</b>                                                               |
| <b>Invertebrates</b>             |                            |         |          |                                                                                                                                                                                           |
| <i>Synemon plana</i>             | Golden Sun Moth            | E       | CE       | Occur in natural temperate grassland, not exotic grassland. <b>Unlikely to occur on site</b> due to poor quality grassland and general absence of tussocks of <i>Austrodanthonia</i> Spp. |

NOTE: V = vulnerable; E = endangered; CE = critically endangered; - = not listed

KMA noted that no threatened plant species were recorded in the site area and none are expected to occur given the highly modified character of the development area.

### 7.4.2 Migratory species

The EPBC Act allows for the listing of internationally protected migratory species, ie species listed under the Japan – Australia Migratory Bird Agreement (JAMBA), the China – Australia Migratory Bird Agreement (CAMBA) and the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention).

Various internationally protected migratory species have been recorded in the vicinity of both Woodlawn and Capital Wind Farm, species such as the Australian Wood Duck, Australian Shelduck, Pacific Black Duck, Nankeen Kestrel, Brown Falcon and Wedge-tailed Eagle. KMA concluded that there is no important habitat on the wind farm properties for such species and the habitat on the site is not likely to support an ecologically important proportion of a population of migratory species.

### 7.4.3 Endangered populations

Endangered populations in NSW are listed under the TSC Act (Schedule 1, Part 2). There are no provisions under the EPBC Act for the listing of endangered populations.

No endangered populations have been declared in or near the area.

### 7.4.4 Endangered Ecological Communities

Endangered populations in NSW are listed under the TSC Act (Schedule 1, Part 3). Nationally threatened ecological communities are listed under the EPBC Act.

No endangered or nationally threatened ecological communities occur in the area of the proposed additional three turbine sites.

Figure 7.1 shows the locations of the Endangered Ecological Communities for the project site.

## 7.5 Assessment of potential impacts on flora and fauna

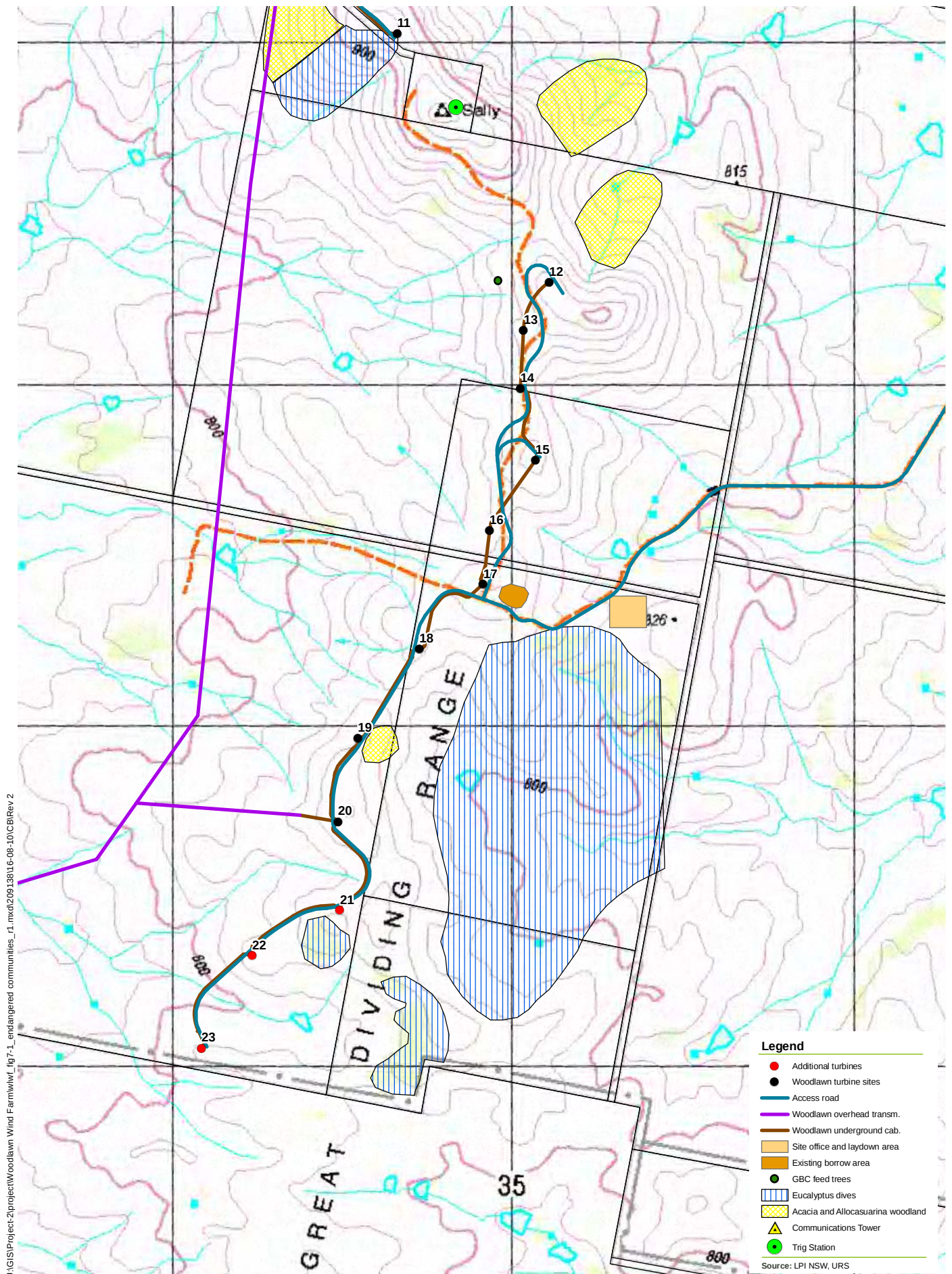
### 7.5.1 Summary of potential impacts

KMA has concluded that the proposed construction of the three additional wind turbines, and their associated track and cable routes, are unlikely to have a significant impact on native flora and fauna.

### 7.5.2 Threatened Species Conservation Act

The TSC Act requires that specific matters be taken into account when considering whether a proposal is likely to have a significant effect on threatened species, populations or ecological communities, and whether a Species Impact Statement (SIS) is required.

This process, commonly referred to as the "seven part test" or "test of significance", has been applied to relevant species for the proposed additional wind turbines and their associated tracks and cable routes.



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Woodlawn Wind Farm **Supplementary Statement of Environmental Effects**  
Projection: MGA

**FIGURE 7.1: Location of Endangered Communities**

## Assessment under the TSC Act

- (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*

The surveys of the site area did not find any threatened plant species and none are expected to be found in these areas. The heavily grazed habitats there are very unlikely to support such species.

The only occurrence of threatened animals in the site area is likely to be occasional visits by listed woodland bird species. Their occurrence there is not unique to the site area; these species range widely across the landscape but do not find high value habitat in the areas involved in the development. KMA has ascertained that threatened fauna is not a significant issue on the development area.

KMA concluded that the proposal will not have an adverse effect on the life cycle of threatened plant or animal species, such that a viable local population is likely to be placed at risk of extinction.

- (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 proposed development is not likely to have an adverse effect on the life cycle of any endangered population. No endangered populations were found to occur within the site area.

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

The patches of native grassland and remnant woodland are not part of the *White Box - Yellow Box - Red Gum Woodland* listed endangered ecological community; this community does occur on some of the lowlands in the locality. The site area did not and does not support this type of woodland, as it is located on land where the remnant vegetation indicates a different type of woodland is and was originally present.

The proposed development is not likely to have an adverse effect on endangered ecological communities to the extent that it is likely to place a community at risk of extinction.

- (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*
- (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*
- (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 is not likely to remove or impact in any way on habitat that is important for any listed threatened species, population or community. There are no listed plant species,



populations or communities within the development areas and threatened fauna are only ever likely to be incidental visitors to the area.

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

Critical habitat refers only to those areas of land listed in the Registers of Critical Habitat. No critical habitat has been declared in the site area.

- (f) *whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan*

This is not applicable. Recovery plans have not been prepared for any relevant threatened species, endangered ecological community or population, and no relevant threat abatement plans have been prepared.

- (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 small amount of native vegetation in the site area will be cleared as a few ground cover plants grow in the grazing paddocks. This amount of clearing is negligible.

#### **Conclusion of KMA assessment under TSC Act**

KMA concluded that the construction of the three additional turbines and associated infrastructure at the Woodlawn Wind Farm is not likely to have a significant effect on any threatened species, populations or communities listed under the *Threatened Species Conservation Act 1995*, or their habitats and that the preparation of a Species Impact Statement (SIS) is not warranted.

#### **7.5.3 Environment Protection and Biodiversity Conservation Act**

The EPBC Act specifies that approval is required from the Commonwealth Minister for the Environment for actions that have, will have or are likely to have a significant impact on matters of National Environmental Significance (NES). The Act identifies seven matters of NES.

KMA has considered the *Significant Impact Guidelines: Matters of National Environmental Significance* (DEWHA, 2006) when deciding whether or not to refer the proposed action to the Commonwealth Minister for the Environment for assessment and approval.

#### **Assessment under the EPBC Act**

KMA's assessment concluded that the site does not contain any threatened species. Remnants of native grassland and woodland on and near the development areas are not part of either of the listed communities (*Natural Temperate Grassland* or *White Box – Yellow Box – Blakely's Red Gum Woodland* and *Derived Grasslands*). Further assessment of listed threatened species and communities is not required.

Migratory species do occur in the general area as all species of native duck and all native diurnal birds of prey are listed. The impact of the proposed wind turbines and associated tracks on internationally protected migratory species was also assessed by KMA. Many internationally protected migratory species occur in the general area, as many common and widespread species have been listed. Some of these species occur on the site from time to time, but there is no important habitat on the site for such species and the habitat on the site does not support an ecologically important proportion of a population of such species. No nationally endangered communities occur on the site and no nationally threatened species are likely to occur there.



### *Significant Impact Criteria for Critically Endangered and Endangered Ecological Communities*

There are no endangered ecological communities at any of the additional wind turbine sites or along the proposed access track and cabling routes.

### *Significant Impact Criteria for Listed Migratory Species*

The construction of the proposed wind turbines and associated track and cable routes is not likely to have a significant impact on listed migratory species. There is no "important habitat" in the area for such species and the habitats there are not likely to support an "ecologically important proportion" of a population of a migratory species.

### **Conclusion of assessment under the EPBC Act**

KMA has concluded that:

- The proposed expansion of Woodlawn Wind Farm is not likely to have a significant impact on matters of NES listed under the EPBC Act.
- Referral to the Commonwealth Minister for the Environment for assessment and approval is therefore not warranted.

## **7.5.4 Waterbirds and Shore Birds**

The initial EIS for the project (URS, 2004) examined the movement of waterbirds and shorebirds between Lake George and Lake Bathurst. No data was collected at the time of the EIS as both the lakes were dry, however a preliminary strike risk assessment of the impact of the wind farm on the populations of particular species was undertaken and potential low level routes taken by these birds was presented (Figure 7.2). The EIS indicated that the potential impact on the waterbirds and shore birds is assumed to be low.

The proposed locations of the three additional turbines has been included in Figure 7.2 and indicates that these additional turbines are not within the identified low-level flight routes.

## **7.6 Mitigation measures**

KMA have made the following recommendations to minimise and avoid impacts of flora and fauna.

- Avoid removing or disturbing the remnant woodland patches near the development sites; these are the only habitats that could be important for threatened woodland birds in the locality.
- Develop a soil and water management plan to ensure that adequate controls over soil movement is minimised and that there is appropriate rehabilitation of the disturbed areas.

These measures are in addition to the measures proposed in the original 2004 EIS and the measures updated in the 2010 SEE. Full lists of measures are provided in Chapter 10.



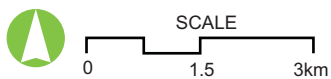
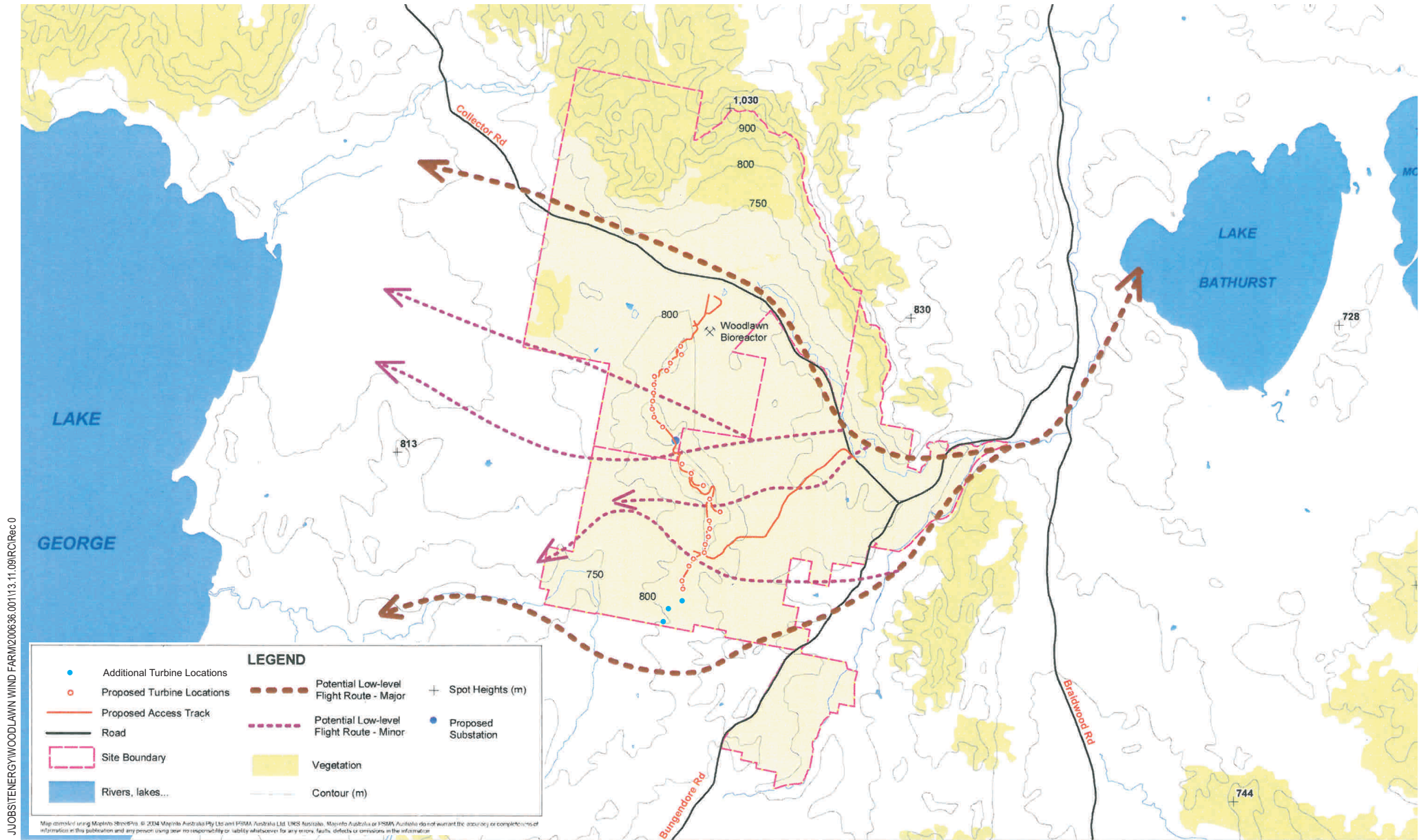
## 7.7 Conclusion

This chapter summarises the finding of the KMA report located in Appendix F and provides a summary of the flora and fauna applicable to the proposed modification to the Woodlawn Wind Farm.

KMA has concluded that proposed locations of the three additional wind turbines and their associated track and cable routes are heavily grazed sheep paddocks and are also highly modified environments.

Some areas of native grassland and remnant woodland occur in the general area, but these communities are not part of any listed threatened ecological community.

Threatened bird species occur in the general area from time to time, but the developments do not significantly impact upon any habitat likely to be important for such species.



Source: URS, 2004

Woodlawn Wind Farm **Supplementary Statement of Environmental Effects**

**FIGURE 7.2: Potential Water bird Low-level Flight Routes**