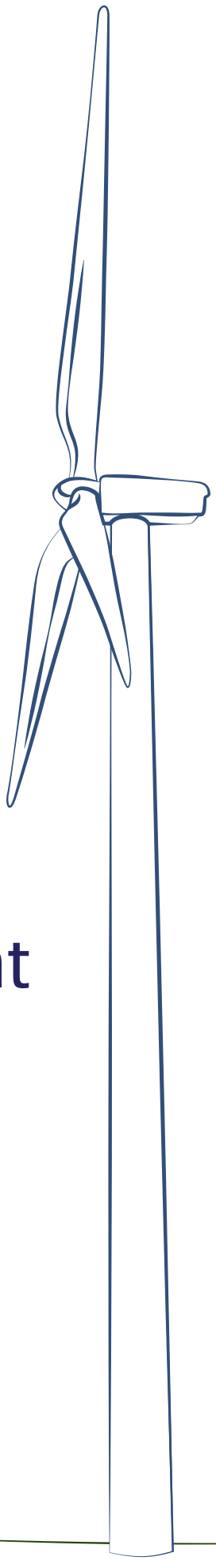

Attachment G

Flora & Fauna Assessment

KEVIN MILLS & ASSOCIATES

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FLORA AND FAUNA ASSESSMENT

BODANGORA WIND FARM
SHIRE OF WELLINGTON
NEW SOUTH WALES

prepared by

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Cover Photograph: Typical landscape within the wind farm project area; looking west from the summit of Mount Bodangora.

Contents

1. INTRODUCTION

Infigen Energy Pty Limited is applying to the Department of Planning under Part 3A of the *Environment Planning & Assessment Act 1979* (NSW) for the development of a wind farm east of Wellington in New South Wales. Kevin Mills & Associates Pty Limited was commissioned to undertake flora and fauna studies for the project. The purpose of this report is to document the results of the field studies undertaken and to provide an assessment of the flora and fauna conservation issues associated with the wind farm site. The report will be an appendix to the Environmental Assessment (EA) for the project.

The study and this report have been guided by the Director-General's Requirements contained in the letter from the Department of Planning and dated 12 November 2010. The relevant flora and fauna requirements are set out below.

"Flora and Fauna
The EA must:

- Include an assessment of all project components on flora and fauna (both terrestrial and aquatic, as relevant) and their habitat consistent with the *Draft Guidelines for Threatened Species Assessment* (DEC 2005); including details on the existing site conditions and likelihood of disturbance (including quantifying the worst case extent of impact of the basis of vegetation type and total native vegetation disturbed (hectares of clearing));
- The EA must specifically consider impacts on threatened species and communities listed under both State and Commonwealth legislation that have been recorded on the site and surrounding land, impacts to riparian and/or instream habitat in the case of disturbance of waterways, and to biodiversity corridors. In addition, impact of the project on birds and bats from blade strikes, low air pressure zones at the blade tips (barotraumas, including the potential nature/extent of impacts, significance of such impacts on threatened species and mitigation measures), and alteration to movement patterns/flight paths resulting from the turbines must be assessed, including demonstration of how the project has been sited to avoid and/or minimise such impacts. The EA must also consider flight paths, roosting and nesting sites for aerial species. If any of the bat and bird species likely to be impacted by the wind turbines are also listed species under State or Commonwealth legislation, then the significance assessment for each of these species must consider impacts from the wind turbines as well as impacts from habitat loss;
- Details of how flora and fauna impacts would be managed during construction and operation including adaptive management and maintenance protocols (including the mitigation and/or management of weeds); and
- Measures to avoid, mitigate or offset impacts consistent with "improve or maintain" principles. Sufficient details must be provided to demonstrate the availability of viable and achievable options to offset the impacts of the project (including in relation to water quality, salinity, soils and biodiversity)."

The Department notes that consultation must be undertaken with the following relevant authorities:

- Wellington Shire Council
- Department of Environment, Climate Change & Water (now Office of Environment & Heritage)
- Central West CMA.

The key information contained in this report is:

i. a description of the plant communities, remnant vegetation and fauna habitats on the wind farm site;
ii. lists of the flora and fauna species observed during this study together with relevant previous information;
iii. an assessment of the potential impact on flora and fauna, including species, populations and ecological communities listed under the New South Wales *Threatened Species Conservation Act 1995* (TSC Act) and New South Wales *Fisheries Management Act 1994* (FM Act);
iv an assessment of matters of national environmental significance listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act); and
v. preliminary recommendations for impact avoidance and mitigation.

Kevin Mills & Associates undertook field surveys in the study area in early October 2010 (Spring) and July 2011 (winter); during the later period, the detailed layout of the wind farm had been determined. Note that bats are being assessed by another consultant.

2. THE STUDY AREA

2.1 Location

The study area is located on the Central West Slopes of New South Wales, about 12 kilometres to the northeast of the township of Wellington. The study area, which is a broad area covering all ridges likely to be incorporated into the wind farm, is about 10 kilometres north to south and about 17 kilometres east to west. The extent of the study area is shown in **Figure 1.**

The study area is located between the Twelve Mile Road to the south, Spicers Creek to the east, Bodandora to the west and Driel Creek Road to the north. The Mudgee Road traverses east-west across the centre of the study area. The properties involved are Awahnee, Glen Oak, Landsgrove and Panorama; the Gunnegalderie property was removed from the project as this report was being finalised.

Site Profile

Region:	Western Slopes
Bio-Region:	South Western Slopes Biogeographic Region (far northern corner)
Botanical Subdivision:	Central Western Slopes
Geological Provence:	Eastern part of Lachlan Fold Belt; minor occurrences of Sydney Basin rocks.
Catchment:	Macquarie River
CMA:	Central West Catchment Management Authority

2.2 Topography, Geology and Soil

The study area is located on undulating to gently sloping country at an altitude of from around 460 metres along the western edge of the area to 743 metres atop Mount Bodangora. The major watercourses in the area are Spicers Creek, Mullion Creek and Drill Creek, all of which drain to the Talbragar River then the Macquarie River north of Wellington. In the far south-eastern corner of the area, minor creeks drain to the nearby Cudgegong River.

The district in which the wind farm is located is on the eastern edge of the Lachlan Fold Belt, just outside the north-western extremity of the Sydney Basin geological province. Although the area is largely underlain by older rocks, both sedimentary and granite, there are areas of Permian sedimentary rocks associated with the Sydney Basin here and there. The major ridges on Glen Oak and the Gunnegalderie area are composed of granite and are characterised by large outcrops of rock, often with large boulders sitting on bedrock. Soils are often stony and/or sandy; most of the deeper and more productive soils have been extensively cleared of their natural vegetation.

2.3 Past and Present Land Use

Most of the land within the study area has been extensively used for cropping and stock grazing for many decades. Much of the area is completely cleared of tree cover, although stands of woodland and paddock trees are typical of many places; see cover photograph. Most paddocks have been pasture improved and much of the more level country is used for crops such as wheat and canola.

3. SURVEY METHODS

3.1 Guidelines for Threatened Species Surveys and Assessment

In 2004, the former Department of Environment and Conservation (now the Office of Environment and Heritage) published guidelines for threatened species surveys and assessments. Published as a working draft, the guidelines are known as the Threatened Species Survey and Assessment: Guidelines for Developments and Activities (Working Draft) (DEC 2004). Chapter 5, Field Surveys, provides guidance on field survey techniques for detecting threatened species and the level of effort required.

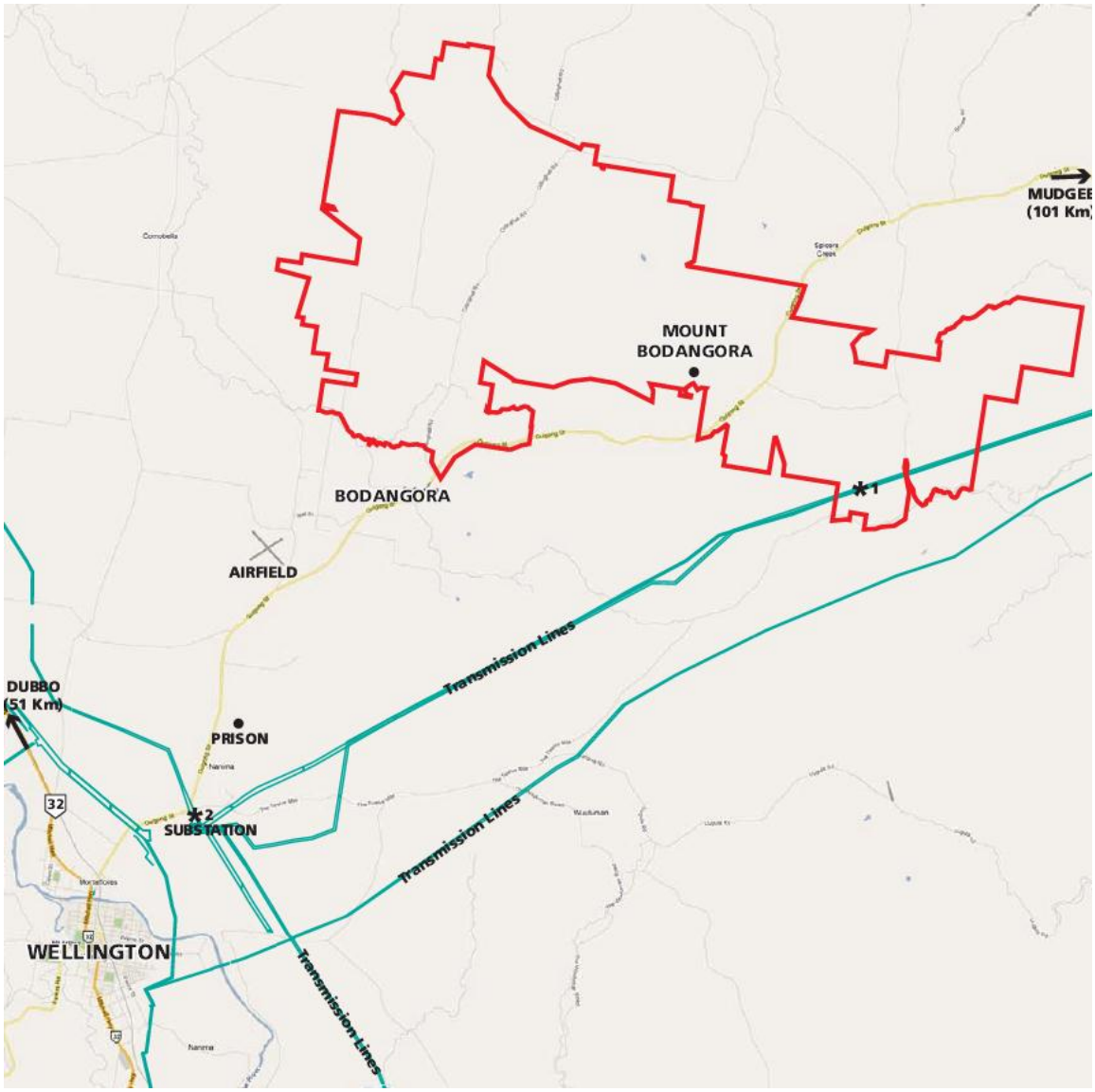

Figure 1. The Study Area.

The Guidelines promote "a consistent and systematic approach to the survey and assessment of threatened biodiversity" (p.2-11), but concede that they are not always appropriate or necessary. For example, the document states "Not all the survey methods . . . will be appropriate or necessary in all situations." (*Guidelines*, p.8-72). The guidelines also states: "Ideally, surveys would be undertaken during optimal climatic and seasonal conditions and would also consider issues such as migratory species movements, availability of shelter and food resources, and the statistical issues associated with minimising sampling error. In many cases this will not be possible." (*Guidelines*, p.8-72) Where appropriate, the survey and assessment methods outlined in the *Guidelines* are used in the investigation.

Bird surveys on proposed wind farm sites are particularly important, so that special attention was given to identifying and recording this fauna group. The considerations and procedures set out in the documents titled *Wind Farm and Birds. Interim Standard for Risk Assessment* (AWEA 2005) and *EPBC Policy Statement 2.3. Wind Farm Industry* (DEWHA 2008) were especially noted.

3.2 Flora Survey Method

Dates of Survey: The flora surveys were undertaken between in the study area from 9 to 11 October 2010 (spring) and 11 to 14 July 2011 (winter).

Objectives: The objectives were to classify and describe the vegetation, to record as many as possible of the plant species present, to search for threatened plant species and to assess the potential for threatened plant species and communities to occur in the study area.

Vegetation Classification: The vegetation in the study area was classified on the basis of its structure and the name(s) of the dominant plant species in the area, often based upon the tallest stratum (e.g. trees,) using the structural classification system devised by Walker and Hopkins (1990). The vegetation classes within the system include closed forest (rainforest), open forest, woodland, open woodland, isolated trees, shrubland, heathland, grassland, sedgeland, etc. If well-accepted plant community names were available, these were used to identify the communities; e.g. listed endangered ecological communities.

Survey Design and Technique: In keeping with the requirements of the *Threatened Species Survey and Assessment: Guidelines for Developments and Activities (Working Draft)* (DEC 2004), the survey technique combined multiple traverses of the study area with vegetation sampling. The random meander method was also used. The traverses were undertaken on foot and covered the full topographic variation of the study area, the full range of vegetation communities present and areas of potential habitat for threatened plant species.

Each of the proposed wind turbine tower locations was visited as were the most logical access routes and notes were specifically made on the vegetation and habitat at each site; see **Appendix 4**.

In the study area generally, the characteristic plant species were recorded, and notes were made on the structure and condition of the vegetation. All plant species observed were recorded. The survey was fairly thorough and one survey period was at a good time of the year (spring after good local rain), so most of the species present would have been detected; however, additional species can almost always be found during longer surveys and in different seasons.

Nomenclature: The plant species names in this report are the current names published by the National Herbarium of New South Wales in the *Flora of New South Wales* (Harden 1992-2002). Most of the common names are from the *Flora of New South Wales* (op. cit.), *Australian Plant Genera* by Baines (1981) and *Weeds of the South-east* by Richardson, Richardson and Shepherd (2006).

The following definitions are used in this report, these are generally widely accepted in the botanical literature.

Forest: a community of relatively closely spaced trees (projective foliage cover >30%) growing taller than 10 metres.

Woodland: a community of well spaced trees (projective foliage cover 10-30%) growing to a height of 4 to 30 metres.

Open Woodland: a community of scattered trees (projective foliage cover <10% growing to a height of 4 to 30 metres.

Grassland: vegetation dominated by grasses and forbs, with <10% tree and/or shrub cover.

Native Grassland: grassland with >50% of vegetation cover composed of indigenous species, >50% of all species are native, and the minimum vegetation cover, alive or dead, is >10%.

Natural Grassland: native grassland considered to have had <10% tree and/or shrub cover at the time of European settlement.

Secondary Grassland: a native grassland remaining after the removal or dieback of previously occurring trees and/or shrubs, where these occupied >10% cover.

Native Pasture: containing native and introduced species, where introduced species occupy >50%, but <75% of both cover and species present, where pasture species have often been mechanically sown.

Exotic Grassland: where >75% of species and cover are composed of introduced plants.

Sown Pasture: where the dominant plants are sown exotic species (>75% cover), usually fertilised land used for grazing (e.g. ryegrass and clover).

Cropland: a species that is sown, usually following ploughing, for commercial harvest (e.g. wheat) or stock feed.

3.3 Fauna Survey Method

Dates of Survey: Fauna surveys were undertaken in October 2010 (spring) and July 2011 (winter), at the same time as the flora surveys. Spring is an ideal for surveying for fauna. The weather conditions at the time of the surveys were good, with warm to hot temperatures and little wind in 2010 and relatively mild weather conditions in 2011. Prior to the October 2010 surveys, the region had experienced good rain and the whole country was green with a fresh cover of herbaceous vegetation. Crops were well advanced in many paddocks.

Objectives: The objectives were to describe fauna habitats, to detect as many as possible of the animal species present and to survey for and assess the potential for threatened fauna species to occur in the study area. Note that others are undertaking bat surveys on the proposed wind farm site.

Survey Design and Technique: The *Threatened Species Survey and Assessment: Guidelines for Developments and Activities (Working Draft)* (DEC 2004) were taken into account when determining what fauna survey techniques and survey effort were appropriate for this study. As mentioned earlier, the Guidelines state that "not all the survey methods detailed [in the Guidelines are] appropriate or necessary in all situations" (*Guidelines*, p.8-72).

All fauna species observed, heard or detected by other means (e.g. signs of presence) during the surveys were identified and recorded. Species were identified by direct observation and call-recognition, and a ground search was conducted for animal scats, tracks, and diggings. The survey results indicate which species were observed during the survey, but should not be regarded as a complete inventory of the species that would occur in the study area; this could be obtained only by a long study spanning all seasons. For this reason, the survey results are supplemented with data from previous surveys nearby and the NSW Wildlife Atlas.

The bird surveys included the general recording of species noted above, along with some targeted surveys throughout the study area. In those areas, transects were walked and/or driven, and all birds, their numbers and their flight heights were recorded during all targeted surveys. The resulting survey sheets are provided later in the report.

In this study, the primary aim was to survey for threatened birds as the character of the majority of the country within the study area precluded the presence of other threatened animals known or likely to occur in the locality, other than bats. The Superb Parrot was especially targeted as were the threatened passerine woodland birds. In July 2011, the observation of a Spotted-tailed Quoll was reported by the owner of Gunnegalderie. This was about three years ago near the homestead; the species is discussed later in this report. This property is not now within the wind farm project area.

Given the importance of tree hollows to native animals, tree hollow surveys were undertaken at several locations throughout the project area. The survey involved walking a transect or searching an area recording the number of all trees over 30 cm dch (trunk diameter at chest height); at least 50 trees per site were surveyed. Trees containing hollows were recorded as to their species, dch and the number of hollows present. Hollows were divided into three size classes, i.e. <10 cm, 10-20 cm and >20 cm diameter.

Nomenclature: The fauna species names in this report are based on the Australian Museum's *The Mammals of Australia* (Strahan 1995), *Australian Bats* (Churchill 1998), *The Taxonomy and Species of Birds of Australia and its Territories* (Christidis & Boles 2008) and *Reptiles and Amphibians of Australia* (Cogger 1992).

4. FLORA

4.1 Vegetation Patterns and Plant Communities

The district in which the wind farm is located is on the Central Western Slopes, just outside the north-western extremity of the Sydney Basin geological province. The area is primarily underlain by old sedimentary and granite rocks. As expected, the geology greatly influences the natural vegetation patterns of the district. The references consulted as part of the study include the work of Althofer & Harden (1980), Dubbo Field Naturalists Society (1984) and Cumberland Ecology (2005). Contact was also made with the Central West Catchment Management Authority in Wellington for information.

The study area supports some stands of modified woodland and scattered paddock trees and patches of trees; much of the area is treeless. Within the grazing land, there is often very little native ground cover and native shrubs, in particular, are quite rare.

The understorey in most places is exotic grassland or a mix of native and exotic plants; i.e. native pasture. The majority of the study area is exotic pasture with few if any trees. The understorey to most of the stands of woodland is composed almost entirely of exotic species. The exceptions are roadside remnants, such as along Gillinghall Road, and on the poorer soils in the far east where pasture improvement has not occurred. The general extent of the woodland and remnant trees can be appreciated on **Figure 2**.

Almost all of the remnant trees, patches of trees and occasional patch of native grassland in the lower areas are part of the one plant community, the White Box - Yellow Box - Blakely's Red Gum Woodland. This is part of a community complex found extensively across central western New South Wales. On some of the higher land, on old sedimentary rocks and granite, the woodland contains other species and is not a part of the Box-Gum Woodland community.

Forest/Woodland of the Granite Country
The granite country in the central and southern parts of the project area, mainly on Glen Oak and Gunnegalderie, supported woodland with a high proportion of White Cypress Pine *Callitris glaucophylla*. The associated trees, depending upon topography, are White Box *Eucalyptus albens*, Blakely's Red Gum *Eucalyptus blakelyi*, Red Stringybark *Eucalyptus macrorhyncha*, Red Box *Eucalyptus polyanthemos,* Kurrajong *Brachychiton populneus* and Hickory Wattle *Acacia implexa*. In the south, Rough-barked Apple *Angophora floribunda* is common in nearby gullies and slopes. Much of this country supports a mix of native and exotic plants; many of the natives are surviving amongst the large outcrops of granite. Typical native shrubs include Spearwood *Acacia doratoxylon*, Weeping Boree *Acacia vestita,* Drooping Sheoak *Allocasuarina verticillata* and Sticky Daisy Bush *Olearia elliptica*. The small species amongst the rocks include Mulga Fern *Cheilanthes sieberi,* Rock Isotoma *Isoltoma axillaris*, Nodding Blue Lily *Stypandra glauca* and Stinking Pennywort *Hydrocotyle laxiflora.*

White Box Woodland
The White Box Woodland community occurred on most low-lying sites independent of geology, extending onto the ridges in most places except the poorest soils. The main tree is White Box *Eucalyptus albens*, which is still abundant in the district today, along with Blakely's Red Gum *Eucalyptus blakelyi,* Yellow Box *Eucalyptus melliodora* and, to a lesser extent, Kurrajong *Brachychiton populneus*. Fuzzy Box *Eucalyptus conica* occurs as individual trees here and there on the lowest flats. The White Box - Yellow Box Woodland also occurred on the small area of basalt on the summit of Mount Bodangora.

On the ridges, White Box was also dominant, in addition to Blakely's Red Gum, Mugga Ironbark *Eucalyptus sideroxylon* and Kurrajong. Today, there is almost no native grassland understorey remaining. At most, tussocky native pasture is found in a few paddocks, sometimes dominated by species of Spear-grass *Austrostipa* spp. and/or Redleg Grass *Bothriochloa macra*.

Woodland on poor soils
The poor, stony soils on the sedimentary rocks support woodland to forest containing the species Red Stringybark *Eucalyptus macrorhyncha*, Tumbledown Gum *Eucalyptus dealbata*, Long-leaved Box *Eucalyptus nortonii* and Red Box *Eucalyptus polyanthemos.* The extensive woodland north of Mount Bodangora is of this type. Typical understorey species in that area include Silvertop Wallaby Grass *Joycea pallida*, Grey Guinea Flower *Hibbertia obtusifolia*, Nodding Blue Lily *Stypandra glauca* and Urn Heath *Melichrus urceolatus*.

4.2 Plant Species Recorded

A complete list of the plant species recorded in the study area is provided in **Appendix 1**. In all, 122 indigenous and 102 exotic (introduced) plant species were recorded. Most of the native species observed are grasses and forbs; the number of tree and shrub species is very low, reflecting the intensive nature of farming and grazing in the study area.

Several introduced plant species declared noxious under the *Noxious Weeds Act 1993* (NSW) in the Wellington Council local government area (Wellington Council 2009) occur in the study area; these are listed in **Table 1**.

Table 1
Noxious weeds recorded in the study area

Name	Habit	Control Class[1]
African Box Thorn *Lycium ferrocissimum*	Spiky shrub; fleshy seeds spread by birds.	4
Bathurst Burr *Xanthium spinosum*	Spiny herb, annual.	4
Blackberry *Rubus fruticosa* sp. agg.	Prickly, scrambling shrub; fleshy seeds spread by birds.	4
Noogoora Burr *Xanthium occidentale*	Tall herb, annual.	4
Prickly Pear *Opuntia stricta*	Fleshy herb; pads readily root if broken off.	4
Sweet Briar *Rosa rubiginosa*	Thorny shrub; seeds spread by birds.	4
Tree-of-Heaven *Ailanthes altissima*	Tree, suckers readily forming thickets.	4

1. Control Class as defined by the *Noxious Weeds Act 1993* (NSW).

4.3 Threatened Plant Species

No threatened plants have apparently been recorded within 20 kilometres of the study area (NSW Wildlife Atlas). No threatened plant species were recorded within the study area in this study. Given the highly modified character on the whole area, particularly the ground cover, it seems unlikely that any such species occurs on the wind farm site.

5. FAUNA

5.1 Habitat for Native Animals

The Bodangora study area is generally typical of the rural landscape associated with the tablelands and western slopes of New South Wales. The area is largely cleared and used for cropping, such as wheat, and stock grazing, primarily sheep. Remnant trees and stands of woodland characterise much of the area, although the understorey and groundcover is seldom dominated by native plants. Trees are therefore the most important habitat feature across most of the study area. Trees provide foraging, roosting and breeding resources for native birds and other animals. Tree hollows are particularly important as they are used by many species and take a long time to be created.

The occurrence of tree hollows was sampled at several locations in the study area to determine the abundance of hollows; see **Table 2** and **Appendix 5.** Living and dead trees were surveyed for hollows; in total, 361 trees were surveyed at five locations.

Table 2
Summary of Tree Hollow Surveys

Transect/trees	*Surveyed trees*	*No. trees with hollows*	*No. of hollows*	*No. hollows per surveyed tree*	*Average dch of hollow trees*
Transect 1	53			0.5	
Live trees		10	17		94.4 cm
Dead tree					
Transect 2	67			0.6	
Live trees		13	37		83.7 cm
Dead tree		1	2		36.0 cm
Transect 3	103			0.2	
Live trees		8	20		85.4 cm
Dead tree		1	6		120.0 cm
Transect 4	73			0.3	
Live trees		6	14		90.7 cm
Dead tree		2	7		71.0 cm
Transect 5	65			0.4	
Live trees		17	23		53.8 cm
Dead tree		0	0		-
All transects					
Live trees		54	101		77.3 cm
Dead tree		7	22		65.5 cm
All trees	361	61 (17%)	123	0.3	75.9 cm

The conclusions that can be drawn from the tree hollow surveys are:

- hollow-bearing trees are not common in the landscape (17% of trees had at least one hollow);
- tree hollows are not very common (average of 0.3 hollows per surveyed tree);
- large hollows are very rare;
- large old trees are rare;
- physical damage to trees on exposed ridges produces many small hollows;

Another important habitat element are the extensive rock outcrops associated with the granite country in the central and southern parts of the study area, particularly on Glen Oak; see **Photograph 2.** These areas, which are often well covered in trees and large shrubs, contain much of the fauna diversity within the study area. The shelter provided by rocky outcrops is important for reptiles and other animal groups, such as bats and possums. The importance of rocky areas in supporting native animals in rural environments should not be underestimated.

Wetlands are rare in the area and all are ephemeral in character. Low-lying flats and riparian zones along watercourses provide some wetland habitat, but their value depends upon the season. Farm dams provide relatively small areas of open water with little fringing wetland vegetation, only useful for low numbers of a few species. Large concentrations of waterfowl are not expected to occur in the study area. Except for the dam on Glen Oak, all farm dams are small and dry up regularly.

5.2 Fauna Species recorded in the Study Area

Species recorded

The fauna species recorded in the study area have been listed in **Appendix 2**. Also listed in **Appendix 2** are those species recorded in the locality and documented in the NSW Wildlife Atlas. In total, 11 native mammals, 104 birds, 16 reptiles and 3 frogs have previously been recorded in the locality, with 87 of these species (76 native, 11 introduced) being recorded during this investigation.

Bird Surveys

Targeted bird counts along transects spread throughout the study area recorded 2,281 individual bird observations of 60 species in 33.6 hours of observation during the two survey periods. A summary of the results of these surveys is provided in **Table 3.** The results of the bird surveys indicate that 97 percent of

all observations were of birds active below 20 metres. This is not surprising as local tree height is between eight and 20 metres. Only 0.4 percent of observations were of birds flying above 50 metres from the ground.

Table 3
Summary of bird survey data

Transect No.	No. species[1]	Survey Time	Height Class (No. of birds) Ground	<10m	10-20m	20-50m	>50m
October 2010							
1	18	125 mins	35	39	9	4	1
2	19	60 mins	41	36	11	3	1
3	22	43 mins	49	26	4	4	2
4	10	25 mins	8	12	5	0	0
5	15	27 mins	20	11	4	3	0
6	30	270 mins	233	42	11	4	2
7	13	110 mins	79	55	15	6	0
8	12	30 mins	7	8	7	0	0
9	20	140 mins	51	31	15	6	1
10	17	110 mins	21	12	3	2	1
Total	44	940 mins(15.7 hrs)	544	272	84	32	8
Percentage		-	58%	29%	9%	3%	1%
July 2011							
11	20	100 mins	102	66	26	3	0
12	16	189 mins	59	59	21	0	0
13	27	184 mins	109	55	7	1	2
14	14	37 mins	12	16	0	0	0
15	17	60 mins	51	75	25	3	0
16	25	300 mins	119	78	2	6	0
17	17	65 mins	26	33	1	22	0
18	21	105 mins	73	148	6	2	
19	17	35 mins	49	81	0	3	
Total	48	1075 mins (17.9 hrs)	600	611	88	40	2
Percentage		-	45%	46%	7%	3%	0.2%
Total	60	2015 mins (33.6 hrs)	1144	883	172	72	10
Percentage		-	50%	39%	8%	3%	0.4%

1. Native species only included.

6. THREATENED SPECIES, POPULATIONS AND COMMUNITIES

6.1 Classification and Assessment

Threatened species, populations and communities in New South Wales are listed on schedules attached to the NSW *Threatened Species Conservation Act 1995* (TSC Act) and NSW *Fisheries Management Act 1994* (FM Act) and Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Under the TSC and FM Acts they are classified "endangered", "vulnerable", "critically endangered" or "presumed extinct". Under the EPBC Act, threatened species and communities are classified "extinct", "critically endangered", "endangered", "vulnerable" or "conservation dependent". The EPBC Act also lists "protected migratory species".

The "Threatened Species Assessment Guidelines; the Assessment of Significance", published by the Department of Environment and Climate Change (DECC 2007), state that the applicant/proponent should develop a list of threatened species, populations and ecological communities which may be affected directly or indirectly by the proposed action, development or activity" [and that] "adequate reasons must be provided to show how the list was derived" (p.2, para.6).

Photograph 1. Stand of Yellow Box in the western part of the study area.
Almost all areas of remnant woodland have an exotic understorey. (July 2011)

Photograph 2. Large granite outcrops are common in the area; these provide high value habitat for native animals. (July 2011)

Photograph 3. Most of the turbines are located on cleared ridge country such as this (October 2010)

Photograph 4. Woodland with a native shrub and ground cover; such sites are rare in the area. (Gillinghall Road, October 2010)

In order to develop such a list, the NSW Wildlife Atlas was searched for threatened species previously recorded in the local area, i.e. within about 10 kilometres of the study area. Searches were also made of records of threatened species in other reports and publications. A few additional species were added to the list for consideration, as these occur widely on the tablelands and may have simply been missed during previous studies. These species have been listed below, in **Table 4**.

The *Guidelines* state that "a species does not have to be considered as part of the assessment of significance if adequate surveys or studies have been carried out that clearly show that the species does not occur in the study area, or will not use on-site habitats on occasion, or will not be influenced by off-site impacts of the proposal. Otherwise, all species likely to occur in the study area (based on general species distribution information), and known to use that type of habitat, should be considered in the rationale that determines the list of threatened species, populations and ecological communities for the assessment of significance" (DECC 2007; pp.2-3, para.7). The following questions were therefore posed with regard to each threatened species:

Does the species occur in the study area?
Is the species likely to use the on-site habitats on occasion?
Is the species likely to be influenced by off-site impacts of the proposal?
Is the Assessment of Significance required?

6.2 Presence of Threatened Species, etc.

In order to assess whether each threatened species is likely to occur in or utilise the on-site habitats on occasion, consideration was given to determining the extent to which the study area satisfies the habitat requirements and habitat preferences of the threatened species in **Table 4**. The frequency of previous records in the NSW Wildlife Atlas were also taken into account in assessing whether the threatened species was likely to use the on-site habitats. The assessment has been undertaken below, in **Table 4**; species in bold have been recorded in the study area and are discussed below the table.

White Box Yellow Box Blakely's Red Gum Woodland
Remnants of this community occur extensively across the tablelands and western slopes. Most of the study area was originally covered in this woodland. The remnants that still occur are mainly paddock trees, although in a some locations there are stands of tree and along some local road reserves there are relatively intact woodland (i.e. with a native understorey). The stands of paddock trees nearly always have an exotic understorey, free of shrubs; occasionally native pasture occurs below these stands.

Spotted-tailed Quoll *Dasyurus maculatus*
This species was recorded twice near the Gunnegalderie homestead in about 2008 (B. Taylor, owner, pers. comm., July 2011). One animal was trapped near a chicken coop and not long after another animal was observed running across the entry road to the north of the homestead. This species is likely to be very thinly distributed throughout the study area and the region. The granite outcrops, not far from the above sighting, may well provide the shelter sites needed for the quoll to survive in this rural landscape.

Superb Parrot *Polytelis swainsonii*
The Superb Parrot is distributed from central Victoria to north-central New South Wales. Core breeding areas occur in the south, between Cowra and Yass and along the Murray River valley (Webster & Ahern 1992). Birds move northwards in winter, when the majority of sightings are made in the north of its range (Webster & Ahern 1992). This is consistent with the sightings of the species in the study area in winter 2011, but not in spring 2010. The NSW Wildlife Atlas contains two records of the Superb Parrot from the area to the south of Mount Bodangora.

The following observations were made in the western parts of the study area in July 2011:

Location (GPS)	No. Birds	Date
55 0689464 6412038	3	12 July 2011
55 0691522 6416277	18	12 July 2011
55 0689156 6410602	3	13 July 2011
55 0691324 6409575	4	13 July 2011
55 0691481 6418043	3	14 July 2011
55 0689558 6411987	1	14 July 2011

Table 4
List of Threatened Species for the Locality

Species	TSC Act[1]	EPBC Act[1]	Habitat Requirements/Preferences, etc.	Potential presence in the study area (Recorded/High / Medium / Low)
Populations				
No endangered populations occur in the locality.				
Critical Habitat				
No critical habitat occurs in the locality.				
Ecological communities				
White Box Yellow Box Blakely's Red Gum Woodland	E	E	Remnants of this community occur extensively across the Central Tablelands and further afield.	Recorded. The trees and woodland stands in the area are mostly part of this community complex.
Fuzzy Box Woodland	E	-	This community was not found in the area; *Eucalyptus conica* is very rare in the area and does not form a distinct community.	Not recorded, occurs further to the west.
Threatened Plants				
None recorded within 20 km of the study area.				No threatened plant species were located in the study area.
Threatened Mammals				
Koala *Phascolarctos cinereus*	V	-	Koalas occur in eucalypt forest and woodland containing their preferred feed tree species, i.e. *Eucalyptus tereticornis*, *E. microcorys*, *E. punctata*, *E. viminalis*, *E. camaldulensis*, *E. albens, E. haemastoma*, *E. signata*, *E. populnea* and *E. robusta*. Where Koalas occur, one or more of these species is often dominant or prominent. Because so much native vegetation in NSW has been cleared, Koalas now occur in marginal habitat.	NSW Wildlife Atlas records to the northwest of study area. Food trees do occur in the area. Lack of local records suggests species is not present.
Spotted-tailed Quoll *Dasyurus maculatus*	V	V	Quolls live in a wide variety of habitats, e.g. rainforest, eucalypt forest, woodland and coastal heath. Their diet consists of medium sized mammals, birds, small mammals and carrion. They have a large home range, 1287-1452 ha for males and 614-1067 ha for females (Edgar & Belcher 1995). Dens are in hollow logs, tree hollows, caves and crevices. Usually terrestrial.	Recorded. Observed twice about 2008 on Gunnegalderie property (vicinity of farm house).
Squirrel Glider *Petaurus norfolcensis*	V	-	Squirrel Gliders inhabit open, dry eucalypt forest and woodland, and are generally absent from closed and/or moist forest. They need tree hollows for use as refuges and nest sites. Banksias and wattles provide important food resources. The species has a home range of 20-30 ha.	Low. Wildlife Atlas record well to the southwest of Orange, and well away from the study area. Suitable habitat probably not present in majority of area.

Table 4 cont...
List of Threatened Species for the Locality

Species	TSC Act[1]	EPBC Act[1]	Habitat Requirements/Preferences, etc.	Potential presence in the study area (Recorded/High / Medium / Low)
Threatened Birds				
Brown Treecreeper *Climacteris picumnus*	V	-	The Brown Treecreeper is an inland species that occurs in eucalypt woodland, preferably open woodland, without dense shrubs. They forage on tree trunks and on the ground among fallen and leaf litter. They nest in tree hollows.	Not recorded. Degraded remnant woodland not likely to support the species. One record to west of study area.
Diamond Firetail *Stagonopleura guttata*	V	-	The Diamond Firetail occurs throughout south-eastern Australia mostly in inland areas. The species generally inhabits eucalypt woodlands forest and mallee where there is a grassy understorey and also occurs in grassland.	Not recorded but likely to occur as it is a widespread bird in rural area.
Flame Robin *Petroica phoenicea*	V	-	The robin is widespread on the tablelands and nearby, moving to lower altitudes in winter. Birds inhabit woodland and more open country in winter.	Not recorded but likely to occur as it is a widespread bird in rural areas.
Gang-gang Cockatoo *Callocephalon fimbriatum*	V	-	Gang-gang Cockatoos mainly occur in eucalypt forest, where they feed on eucalypt fruit and wattle seed. They nest in large old trees with hollows. The species is nomadic, with some seasonal movements, as well, as the cockatoos wander over wide areas in response to the seasonal availability of food.	Probably not present or only a rare visitor as suitable forest is not present in the study area; more likely t to the east.
Grey-crowned Babbler *Pomatostomus temporalis*	V	-	Grey-crowned Babblers usually occupy open woodlands with mature eucalypts, tall shrubs, and a ground cover of native grass and forbs. Threatened by loss and degradation of woodland habitat.	Recorded. Observed in woodland along Gillinghall Road.
Hooded Robin *Melanodryas cucullata*	V	-	The Hooded Robin occurs throughout Australia mainly in inland areas. This bird inhabits a wide range of woodlands, shrublands and forest, in particular open woodland with some shrubs and dead timber.	Moderate. A woodland bird that probably occurs in the locality.
Little Eagle *Hieraaetus morphnoides*	V	-	The Little Eagle occupies habitats rich in prey within open eucalypt forest, woodland or open woodland. Sheoak or acacia woodlands and riparian woodlands of interior NSW are also used	Not recorded. Very widespread and likely in the area from time to time.
Little Lorikeet *Glossopsitta pusilla*	V	-	Little Lorikeets mostly occur in dry, open eucalypt forests and woodlands. They have been recorded from both old-growth and logged forests in the eastern part of their range, and in remnant woodland patches and roadside vegetation on the western slopes.	Not recorded. One record from Wellington. Could occur occasionally, but no special habitat present.
Regent Honeyeater *Xanthomyza phrygia*	E	E	Regent Honeyeaters occur in temperate eucalypt woodland and open forest, in wooded farm-land and in urban areas with mature trees. They prefer areas with large trees, many flowering trees and a tall shrub layer. They are wide ranging and highly nomadic.	If present, only likely to be a very rare visitor.

Table 4 cont...
List of Threatened Species for the Locality

Species	TSC Act[1]	EPBC Act[1]	Habitat Requirements/Preferences, etc.	Potential presence in the study area (Recorded/High / Medium / Low)
Scarlet Robin *Petroica boodang*	V	-	The Scarlet Robin breeds in drier eucalypt forests and temperate woodlands, often on ridges and slopes, within an open understorey of shrubs and grasses and sometimes in open areas. Abundant logs and coarse woody debris are important structural components of its habitat.	Not recorded but likely to occur as it is a widespread bird in rural areas.
Speckled Warbler *Chthonicola sagittata*	V	-	The Speckled Warbler is found in south-eastern Australia and is mainly an inland bird. This species inhabits woodlands with a grassy understorey, often where there is a sparse shrub cover. Nests are made on the ground.	Not recorded but likely to occur as it is a widespread bird in rural areas.
Superb Parrot *Polytelis swainsonii*	V	V	This parrot occurs throughout the western slopes of NSW, onto the edges of the tablelands of NSW, and into central Victoria. The breeding areas are in the central to southern part of its range. The orange area is on the eastern edge of a core breeding area. Birds disperse widely from the breeding areas outside the breeding season (September to January). Hollows in trees are essential for breeding.	Recorded in the western part of the study area in July 2011; a winter visitor to this area.
Turquoise Parrot *Neophema pulchella*	V	-	Turquoise Parrots inhabit "woodlands, open forest and timbered grasslands on mountain slopes, ridges and along watercourses", favouring "the edges of woodland adjoining open grassland, or timbered ridges and tree-lined creeks that traverse farmland" (Forshaw 1981). They forage on the ground for seed, usually in pairs or small groups. After breeding, they disperse from the woodlands into more open country.	Could occur, but would be very rare in this district; recorded once to the north of Wellington.
Varied Sittella *Daphoenositta chrysoptera*	V	-	The Varied Sittella is sedentary and inhabits most of mainland Australia except the treeless deserts and open grasslands, with a nearly continuous distribution in NSW from the coast to the far west. It inhabits eucalypt forests and woodlands, especially rough-barked species and mature smooth-barked gums with dead branches.	Probably occurs in the area; a widespread on the tablelands and slopes of NSW.
White-fronted Chat *Epthianura albifrons*	V	-	The White-fronted Chat inhabits damp open habitats, particularly wetlands with saltmarsh areas bordered by open grasslands or lightly timbered land. The species is also observed in open grasslands and sometimes in low shrubs bordering wetlands. Inland, the White-fronted Chat is often observed in open grassy plains, saltlakes and saltpans that are along the margins of rivers and waterways.	Not recorded. Habitat very marginal in the study area, as there are no wetlands.

1. V = vulnerable, E = endangered, - = not listed. Species in **bold** were recorded in this study.

Grey-crowned Babbler *Pomatostomus temporalis*
The Grey-crowned Babbler "formerly ranged throughout eastern Australia from South Australia, through Victoria and broadly through NSW and central Queensland up into New Guinea."(NSW Scientific Committee 2001). "In NSW, the Grey-crowned Babbler occurs on the western slopes and plains". The NSW Scientific Committee (2001) notes that "Grey-crowned Babblers occupy open woodlands dominated by mature eucalypts, with regenerating trees, tall shrubs, and an intact ground cover of grass and forbs." The main threat to the species is loss and degradation of woodland habitat. During the winter surveys, a group of five birds was observed on 14 July 2011 in remnant woodland in the Gillinghall Road reserve (map ref. 55 0692200 6412400).

6.3 Migratory Species

The EPBC Act allows for the listing of internationally protected migratory species, i.e. 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).

Many listed internationally protected migratory species occur in the locality of the wind farm. Such species include all diurnal birds of prey (e.g. Nankeen Kestrel) and waterfowl (i.e. native ducks), species that are not threatened in Australia and are in some cases very abundant. The important sites for migratory species in Australia are large areas of habitat where these species congregate, such as extensive wetlands. 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.

7. IMPACT ON FLORA AND FAUNA

The assessment of the potential impact of the proposed wind farm must be considered having regard to those matters set out in the Director-General's Requirements, as provided in **Section 1**. The relevant matters for flora and fauna are discussed below. The layout of the wind farm is shown on **Figure 2**.

7.1 General Impact

The development footprint of wind farms is usually quite small given the size of the projects. Each turbine tower requires about 40 m x 30 m, or 1,200 square metres of ground for construction and operation. Access tracks are formed gravel roads, while cable laying and transmission lines connect the wind farm internally and externally. Given the character of the country around Bodangora, this wind farm requires very little clearing of native vegetation. The vast majority of tower locations and access routes are across cleared and heavily modified grazing land. Some clearing of vegetation is required at a few tower sites, as summarised in **Appendix 4.** It is estimated that the wind farm can be constructed without the need for tree removal, as the country is largely cleared.

The overall impact of the wind farm at Bodangora on native flora and fauna is small. With a small overall footprint and the ability to locate infrastructure to avoid local habitats, the wind farm is not likely to have a significant impact on woodland, rocky outcrops or any other feature that could be important to native biota. The recommendations in **Section 8** are aimed at ensuring that the impact is minimal.

<u>Blade-strike and Birds</u>
The impact on birds is often cited as a potential impact of wind farms. Various bird species and groups of birds are commonly thought to collide with wind turbines, a phenomenon referred to as "blade-strike". Birds of prey and species that form large flocks and fly well above the tree canopy are thought to be most at risk. Overseas studies have found that the magnitude of the impact is strongly influenced by the physical characteristics of the site, particularly the type of habitat on the site and in the surrounding area (Jacobs 1994; Curry 1994; Still, Little, Lawrence & Carver 1994; Harrison 1996).

The greatest impacts seem to occur near large wetlands and at sites on important migration routes, i.e. where large flocks of birds are regularly present. One such location was in California, where birds of prey

were affected where they congregated in a mountain pass. An early study also found that an impact on birds of prey was at least partly due to the lattice framework construction of the towers, which provided perching sites for the birds. Modern towers, however, are enclosed and have no perching sites.

So far, the data suggest that wind farms in Australian have little impact on native birds. No dead or injured birds were found during surveys at selected turbine sites (e.g. Crookwell Wind Farm, PPI Environmental Services 1999). Similarly, no bats were killed at Crookwell by blade-strike (Richards 1999). No carcasses were found below the turbines during a monitoring study between August 1998 and January 1999. However, 20 birds were killed by blade-strike during the first 14 months of operation at the Woolnorth Wind Farm in Tasmania (quoted in URS 2004). AusWEA (2002) report on several studies in the early 2000s that found very few bird deaths on wind farms in Victoria and Tasmania. All studies in Australia found bird mortality associated with wind farms to be very low.

The Policy Statement by DEWHA (2009) notes that some bird and bat species are prone to collide with turbines or above-ground transmission lines than others. The document cites large souring raptors and large waterbirds as more likely to collide with turbines than agile or lower flying species. In assessing potential impacts, local topography, large wetlands and seasonal factors should also be considered. Species that travel in flocks are also more likely to be impacted. Flight corridors are identified as potentially important locations for impact. Such corridors may be associated with:

- "prominent headlands or peninsulas where migrating species depart or landfall;
- near approaches to wetlands or bat caves;
- along ridges, rivers and vegetated corridors; and
- through gaps between habitat patches."

The Australian Wind Energy Association Report entitled '*Wind Farms and Birds – Interim Standards for Risk Assessment*' provides a framework for determining the levels of investigation of bird impacts at wind farm sites and a set of systematic and structured protocols for the different levels of investigation that guide the choice and application of bird collection data and analysis methods. We have undertaken bird surveys on wind farm sites on several occasions since 2005, and have a good understanding of the species present and the habits they are using. As noted earlier in this report, we have also recorded the heights at which birds were flying. The results indicate that the vast majority of birds fly below the local tree height; i.e. well below the lower tip of the blade.

After a review of the threatened bird species known and potentially present in the study area, the relevant species are either ground species or are unlikely to occur in the area because of a lack of suitable habitat. This being the case, the potential risk to threatened species from blade-strike is very low to negligible.

7.2 Assessment under Part 3A

Guidelines for Threatened Species Assessment
Guidelines that identify matters relevant to the assessment of potential impact on threatened species, populations or ecological communities of proposed development under Part 3A of the *Environmental Planning and Assessment Act 1979* (NSW) have been prepared by the Department of Environment and Conservation (now Office of Environment and Heritage) and the Department of Primary Industries (DEC July 2005).

The *Guidelines for Threatened Species Assessment* identify the following objectives in regard to conserving threatened species, etc.:

- "Maintain or improve biodiversity values (i.e. there is no net impact on threatened species or native vegetation).
- Conserve biological diversity and promote ecologically sustainable development.
- Protect areas of high conservation value (including areas of critical habitat).
- Prevent the extinction of threatened species.
- Protect the long-term viability of local populations of a species, population nor ecological community.
- Protect aspects of the environment that are matters of national environmental significance."

The *Guidelines* outline a broad five-step process for assessing impacts on threatened species. Note that 'threatened species' refers here to species, populations and communities listed as threatened under the *Threatened Species Conservation Act 1995* (NSW) or the *Fisheries Management Act 1994* (NSW). As

this project is being assessed under Part 3A of the *EP&A* Act, this investigation and report follow the *Guidelines* where relevant.
Note that matters of national environmental significance (NES) are those matters listed under the *Environment Protection & Biodiversity Conversation Act 1999* (Commonwealth); these matters are not listed under state legislation, although there is considerable overlap in the species and communities that area listed. An assessment under the Commonwealth Act is provided in the next section of the report.

Step 1 – Preliminary Assessment
"The main purpose of a preliminary assessment is to determine the likelihood of the study area and subject site supporting threatened species" (*Guidelines*, page 2). As noted in the *Guidelines*, this step is primarily a 'desktop' study, using existing information, literature and data bases to identify relevant threatened species. The *Guidelines* state that the following matters should be included in the preliminary assessment:

a description of the location and nature of the proposed development;
a description of dominant vegetation types;'
a description of habitat features;
a list of threatened species that are known or likely to occur within the study area;
an assessment of which of the threatened species that are known or likely to occur are likely to be directly or indirectly affected by the proposal provides a list of factors for consideration in identifying adverse impacts. This list is not necessarily exhaustive and is not development-specific." (*Guidelines*, page 3)

Step 2 – Field Survey and Assessment
As noted in the *Guidelines*, "the required intensity and extent of survey will vary greatly depending upon the species likely to be present, size of the development area, the level of biological and habitat diversity on the site, and the type and complexity of vegetation on the site." (*Guidelines*, page 3)

The *Guidelines* point out the need "to ensure that a reliable assessment of the presence or absence of threatened species can be made" (*Guidelines*, page 3). It is also noted that consideration needs to be given to the relevance of climatic or seasonal conditions for the target species.

Where relevant, the survey methods set out in the document titled *Threatened Biodiversity Survey & Assessment: Guidelines for Developments and Activities* (DECC 2004) should be followed. As noted above, the level of the survey will very much depend upon site conditions.

The outcome of Step 2 should be that adequate field surveys are undertaken for all target species identified in Step 1 such that confident statements can be made regarding the potential for the presence of the species on the subject site. In some instances, the precautionary principle should be adopted and the presence of a species assumed for the purposes of impact assessment.

Step 3 – Evaluation of Impact
This step involves identifying the potential magnitude and extent of the impact, if any, the development will have on each of the target species.

The *Guidelines* suggest that "impacts will be more significant if:

- areas of high conservation value are affected;
- individual animals and/or plants and/or subpopulations that are likely to be affected by the proposal play an important role in maintaining the long-term viability of the species, population or ecological community;
- habitat features that are likely to be affected by the proposal play an important role in maintaining the long-term viability of the species, population or ecological community;
- the duration of impacts are long-term;
- the impacts are permanent and irreversible." (*Guidelines* page 4)

Step 4 – Avoid, mitigate and then offset
Where there is a potential to impact on threatened species, this should be addressed through, firstly, avoiding the impact; this may mean making some changes to the proposed development. If avoidance is not possible, then some form of mitigation may be required. Finally, if neither avoidance nor mitigation are possible, then some form of offset or compensation will be required. This could entail the rehabilitation of similar habitat nearby.

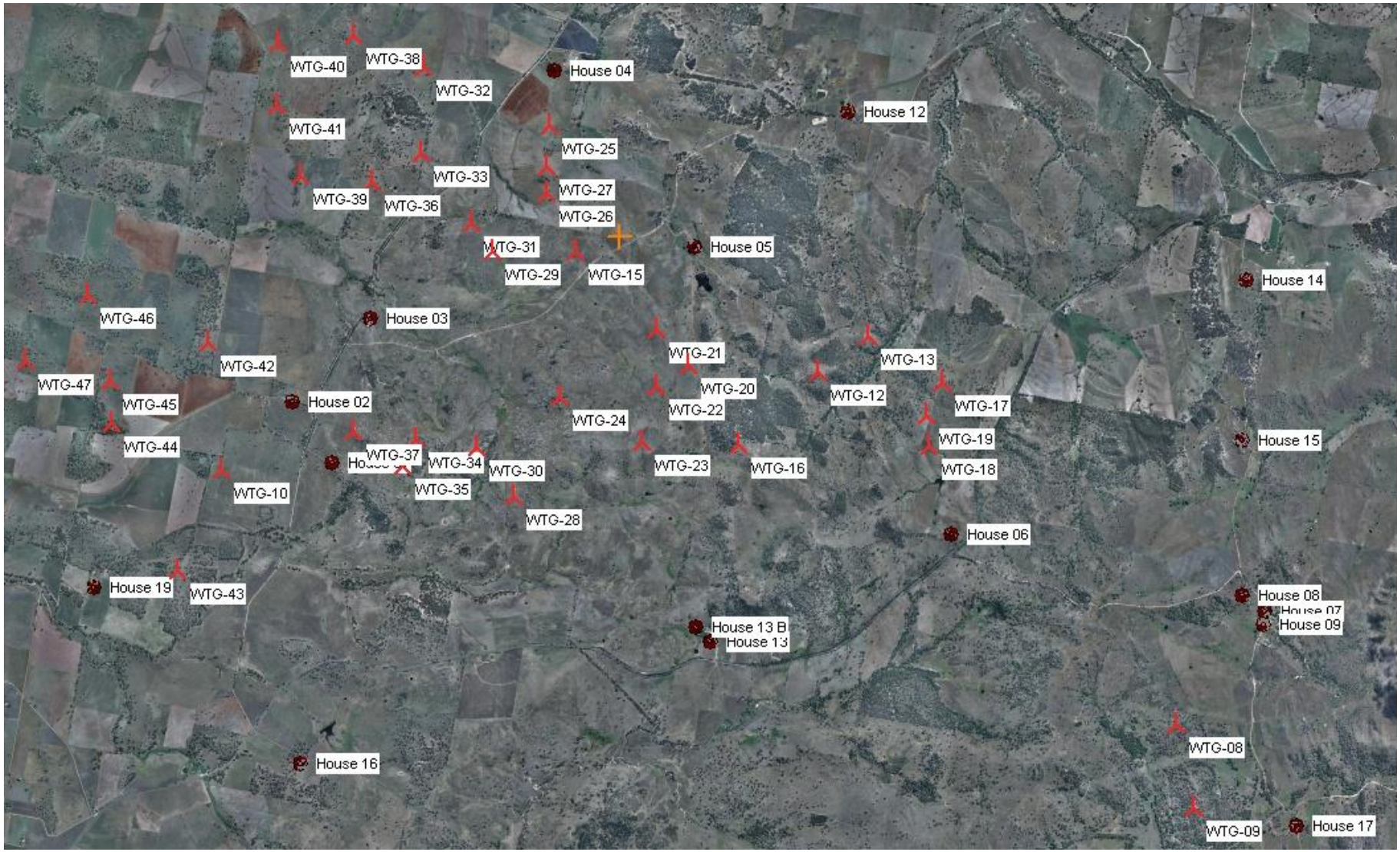

Figure 2. Layout of the Bodangora Wind Farm.

Step 5 – Key thresholds
The *Guidelines* state that "the development application needs to contain a justification of the preferred option based on:

- whether or not the proposal, including actions to avoid or mitigate impacts or compensate to prevent unavoidable impacts will maintain or improve biodiversity values.
- whether or not the proposal is likely to reduce the long-term viability of a local population of the species, population or ecological community.
- whether or not the proposal is likely to accelerate the extinction of the species, population or ecological community or place it at risk of extinction.
- whether or not the proposal will adversely affect critical habitat." (*Guidelines* page 4)

Appendix 3 to the *Guidelines* contains more detail for identifying potential impacts on threatened species.

The assessment process under the *TSC Act 1995* commonly known as the 'seven part test' is not used for Part 3A matters. The matters to be considered in the assessment of a Part 3A development are determined by the Minister for Planning for each development. The following discussion addresses the five steps from the Part 3A *Guidelines*, as set out above.

Step 1 – Preliminary Assessment
The *Guidelines* state that certain matters should be included in the preliminary assessment. These are primarily concerned with descriptions of the development, the vegetation types, habitats, the threatened species known and likely to occur in the area and those threatened species that may be impacted by the proposed development. Descriptions of the Project Site and its environment are provided in this report at **Sections 2** and **4**. For detailed descriptions of the proposed development, reference should be made to the other documents accompanying this application. **Section 3** describes the survey methods employed in the study.

Step 2 – Field Survey and Assessment
Field surveys were undertaken in the study area in October 2010 and July 1011. These surveys included general flora and fauna surveys of the entire study area, where all species were identified and documented, including plant communities and habitats. The surveys targeted each turbine tower site and the logical access routes to those sites; each was surveyed for important habitats for threatened plants and animals. The results of these surveys are presented in **Sections 4 and 5** of this report. An analysis of the likelihood of threatened species, etc. being present is undertaken in **Section 6**. All known or potential threatened species and communities are discussed in that section.

Step 3 – Evaluation of Impact
The impact of the proposed development is assessed below under several key headings**.**

Threatened Plant Species
The surveys of the study area did not find any threatened plant species and none are expected to occur there. The highly modified character of the majority of the land, much of which supports exotic grassland cover and is cropped or pasture improved, precludes the likelihood of threatened plants occurring in the study area. Those sites that support native plants, such as road reserves and the granite country, were targeted but no threatened plant species were located.

Threatened Animal Species
Three threatened animal species are known from the locality and several others no doubt occur there; these species are identified and assessed in **Section 6**. The species recorded are the Spotted-tailed Quoll, Superb Parrot and Grey-crowned Babbler. The wind farm proposal will not interfere with any important habitat for these species as long as care is taken in positioning the infrastructure. The following assessments have been made for each of these species.

The Spotted-tailed Quoll is not likely to be widespread in the area; the location where the species was observed a few years ago is in the vicinity of the granite country and where there are quite large areas of woodland. One or both habitats may be important for the quoll. There are now no turbines in that area.

The Superb Parrot depends upon tree hollows for breeding. Although no breeding is likely in the study area where the bird is a winter visitor, the removal of trees with hollows, which are rare in the area, can readily be avoided by micro-siting the infrastructure. The parrot is primarily a ground feeder and would seldom fly above the tree canopy. Blade-strike is unlikely to be a threat to this species.

The Grey-crowned Babbler requires natural woodland with a native understorey. Such woodland is rare in most parts of the wind farm site. The wind farm does no impact on any natural woodland, so the impact on the habitat of this species is very unlikely to be significant. The species is a ground bird and could not be impacted by blade-strike.

Other species that are occasional visitors are not likely to be significantly impacted by the wind farm, as the impact on habitat features such as woodland and rocky outcrops can be avoided; see recommendations in **Section 8**. Blade-strike is also not likely to be significant; no species is likely to occur in large flocks min this area and most are ground birds and unlikely to fly above the tree canopy.

Threatened Communities
The patches of woodland are part of the White Box Yellow Box Blakely's Red Gum Woodland community. The quality of the native understorey in most areas is low to very low, although stands of these trees are common in the district. The wind farm will result in some loss of native vegetation that, at least originally, is part of the listed community. This loss is small and high value sites are not involved. We have made recommendations to address this issue in **Section 8**.

Step 4 – Avoid, mitigate and then offset
The Bodangora wind farm avoids all high value vegetation or habitats; components of the wind farm are located to avoid all important native habitats. The development will be mitigated in those areas where there could be some native habitat loss by minimising the footprint of the development and micro-siting components to avoid local habitat features, such as rock outcrops.

There will some minor impact on tree cover in a few areas; a proposal for an offset is therefore discussed in **Section 8**.

Step 5 – Key thresholds
The *Guidelines* require justification of the preferred option based on:

whether or not the proposal, including actions to avoid or mitigate impacts or compensate to prevent unavoidable impacts will maintain or improve biodiversity values
The proposed wind farm is unlikely to diminish biodiversity values in the area in any significant way. The land affected is almost entirely highly modified farming land. Recommendations attached to this report at Section 8 aim to avoid and minimise the impact of the wind farm on biodiversity.

whether or not the proposal is likely to reduce the long-term viability of a local population of the species, population or ecological community
Some trees to be removed are part of the White Box – Yellow Box – Blakely's Red Gum in the broadest sense and some of the study area is utilised by threatened animals (e.g. Superb Parrot). However, the impact of the wind farm infrastructure is not likely to reduce the long-term viability of any local population of a listed species, population or community. The impact can be avoided and minimised by micto-siting the components of the wind farm to avoid treed areas and rocky outcrops, and to retain hollow-bearing trees.

whether or not the proposal is likely to accelerate the extinction of the species, population or ecological community or place it at risk of extinction
The wind farm is largely located in paddocks that have been cleared of their original natural woodland and habitats. Most of the land involved supports native pasture or exotic grassland, with very little native grassland anywhere in the study area. The wind farm is very unlikely to accelerate the extinction of any species, population or ecological community or place any such species, population or community at risk of extinction.

whether or not the proposal will adversely affect critical habitat.
There is no declared critical habitat in or in the vicinity of the development areas.

7.3 Assessment under the EPBC Act

The impact of a proposed action on matters of national environmental significance is assessed under the provisions of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Matters of national environmental significance are:

- World Heritage properties,
- National Heritage places,
- wetlands of international importance (RAMSAR wetlands),
- listed threatened species and ecological communities
- migratory species;
- Commonwealth marine areas;
- Great Barrier Reef Marine Park;
- nuclear actions (including uranium mining).

An action must be referred to the Commonwealth Minister if the action has, will have, or is likely to have a significant impact on matters of national environmental significance. In addition to setting out "significant impact criteria" for the various matters of national environmental significance, e.g. endangered species, vulnerable species, endangered ecological communities and listed migratory species, the *Guidelines* provide the following important definitions.

> "A *significant impact* is an impact which is important, notable, or of consequence, having regard to its context or intensity. Whether or not an action is likely to have a significant impact depends upon the sensitivity, value, and quality of the environment which is impacted, and upon the intensity, duration, magnitude and geographic extent of the impacts. You should consider all of these factors when determining whether an action is likely to have a significant impact on matters of national environmental significance."
>
> "To be *likely*, it is not necessary for a significant impact to have a greater then 50% chance of happening, it is sufficient if a significant impact on the environment is a real or not remote chance or possibility."
>
> "*Population*, in relation to critically endangered, endangered or vulnerable, threatened species, means:
> - a geographically distinct regional population, or collection of local populations; or
> - a regional population, or collection of local populations occurring within a particular bioregion."
>
> "An *important population* is a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are:
> - key source populations either for breeding or dispersal,
> - populations that are necessary for maintaining genetic diversity, and/or
> - populations that are near the limit of the species' range.
>
> "*Habitat critical to the survival of a species or ecological community*" refers to areas that are necessary:
> - for activities such as foraging, breeding, roosting, or dispersal;
> - for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators);
> - to maintain genetic diversity and long term evolutionary development, or
> - for the reintroduction of populations or recovery of the species or ecological community."

Such habitat may be, but is not limited to: habitat identified in a recovery plan for the species or ecological community as habitat critical for that species or ecological community; and/or habitat listed on the Register of Critical Habitat maintained by the Minister under the EPBC Act.

The Superb Parrot is the only nationally listed threatened species known to occur in the study area. The remnants of the White Box woodland in the study area are part of the White Box Yellow Box Blakely's Red Gum Woodland complex, listed as a threatened community. The impact of the proposed wind farm on this species and community is assessed below by applying the relevant significant impact criteria. The impact on listed migratory species has also been assessed below, by applying the significant impact criteria for migratory species.

Significant Impact Criteria for Vulnerable Species

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

- lead to a long-term decrease in the size of an important population of a species;
- reduce the area of occupancy of an important population;
- fragment an existing important population into two or more populations;
- adversely affect habitat critical to the survival of a species;
- disrupt the breeding cycle of an important population;
- modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline;

- result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat;
- introduce disease that may cause the species to decline; or
- interfere substantially with the recovery of the species.

Impact of the Proposed Wind Farm on the Superb Parrot
The development of the proposed wind farm, considering all of its components, is not likely to have a significant impact on the Superb Parrot. This conclusion is reached because:

- hollow-bearing trees are critical to the parrot, and the wind farm can be constructed without the loss of these trees;
- native grassland utilised for feeding by the parrots is largely absent from the area and very little would be impacted by the wind farm;
- the winter occurrence of the parrot in this area is outside the birds breeding period.

Significant Impact Criteria for Critically Endangered and Endangered Ecological Communities
An action is likely to have a significant impact on a critically endangered or endangered community if there is a real chance or possibility that it will:

- reduce the extent of an ecological community;
- fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines;
- adversely affect habitat critical to the survival of an ecological community;
- 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;
- 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;
- cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to:
  - assisting invasive species, that are harmful to the listed ecological community, to become established; or
  - 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
  interfere with the recovery of an ecological community.

Impact of the Proposed Wind Farm on White Box Yellow Box Blakely's Red Gum Woodland
The sites for the wind farm infrastructure do not support this community as defined in the guidelines from the Commonwealth. The Policy Statement document prepared by DEH (2006) titled 'White Box – Yellow Box – Blakely's Red Gum grassy woodlands and derived native grasslands' describes the procedure for identifying the community as listed under Commonwealth legislation. Those guidelines provide strict criteria that define this community as listed under the EPBC Act . Based on abundance of native understorey and presence of mature trees, almost none of the treed areas in the vicinity of the wind farm meet the minimum criteria for the community. Micro-siting of this infrastructure allows adjacent woodland to be avoided.

Significant Impact Criteria for Listed Migratory Species
An action is likely to have a significant impact on a migratory species if there is a real chance or possibility that it will:

- substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species;
- result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species; or
- seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.

An area of "important habitat" for a migratory species is:

- habitat utilised by a migratory species occasionally or periodically within a region that supports an ecologically significant proportion of the population of the species; and/or
- habitat that is of critical importance to the species at particular life-cycle stages; and/or
- habitat utilised by a migratory species which is at the limit of the species range; and/or
- habitat within an area where the species is declining.

Listed migratory species cover a broad range of species with different life cycles and population sizes. An "ecologically significant proportion" of a population therefore varies from species to species. In relation to migratory species, "population" means the entire population or any geographically separate part of the population of any species or lower taxon of wild animals, a significant proportion of whose members cyclically and predictably cross one or more national jurisdictional boundaries including Australia.

Impact of the Proposed Wind Farm on Listed Migratory Species
The proposed wind farm 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 habitat in the vicinity of the wind farm is not likely to support an ecologically important proportion of a population of such species. This conclusion is reached because the habitats affected by the wind farm could not support large or strategically important populations of listed migratory species, even though such species inhabit the area. Only small populations of listed waterfowl and diurnal birds of prey occur in the area.

Conclusion, EPBC Act
In our opinion, the proposed wind farm is not likely to have a significant impact on matters of national environmental significance listed under the *Environment Protection and Biodiversity Conservation Act*. Referral to the Commonwealth Minister for the Environment for assessment and approval is therefore not warranted. The proposed development is not likely to constitute a "controlled action" because is it not "likely to have a significant impact on a matter of national environmental significance".

8 CONCLUSION AND RECOMMENDATIONS

Summary of Findings
Although Part 3A has recently been revoked, this project is being assessed under Part 3A because the application is well advanced under that process; i.e. Director-General's Requirements from the Department of Planning have been issued.

This report provides a description of the flora and fauna occurring in study area surrounding the Bodangora wind farm proposal near Wellington. The wind farm, composed of turbine towers, access roads, buried cables and some transmission lines represents a small footprint on the landscape.

The area supports several threatened woodland animals and remnants of an endangered ecological community. The key habitats for these species are woodland, rocky outcrops and trees containing hollows. The wind farm can be constructed without removing stands of woodland, hollow-bearing trees (which are rare in the landscape) and interfering with large rocky areas; tree removal can be minimised by careful layout design. This investigation has determined that the Bodangora wind farm proposal is not likely to have a significant impact upon NSW listed threatened species, populations or communities.

The potential to impact upon matters of national environmental significance listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* has also been assessed by employing guidelines provided by the Commonwealth. Some of the woodland in the area is part of the listed White Box – Yellow Box – Blakely's Red Gum and Derived Grasslands community.

Woodland that meets the criteria established by the Commonwealth for that community is very patchy in its occurrence, covers only small areas and is of low floristic quality. An assessment concluded that the impact of wind farm is not likely to result in a significant impact on the listed woodland or any other matters of national environmental significance. In our view, referral to the Commonwealth Minister for the Environment for assessment and approval is not warranted.

Recommendations for Avoiding Impact and for Mitigation
The following recommendations are made to minimise and avoid impacts on biodiversity arising from the Bodangora wind farm proposal.

i) The most important means by which the impact of the wind farm can be minimised is by micro-siting the infrastructure (e.g. turbine towers, access tracks) to avoid removing woodland and trees and interfering with large rocky outcrops. It is therefore recommended that an ecologist be involved in determining the routing of access tracks and cable routes where tree removal may be involved. It is further recommended

that where turbine towers may involve tree removal that an ecologist also be involved in site selection to retain valuable habitat trees.

ii) It is recommended that priority be given to retaining hollow-bearing trees because of their high habitat value and inability to replace them in the short term.

iii) It is recommended that a register of all tree removal be maintained, including details of tree locations, type, size and numbers. This information is to be reviewed by an ecologist for assessing the adequacy of any offset relating to tree clearing.

iv) When constructing the access tracks, cable routes and the hardstands, care should be taken to ensure that the construction activities do not cause excessive erosion. Permanent tracks should be stabilised as soon as possible and temporary tracks and buried cable routes rehabilitated immediately to the satisfaction of the relevant government department.

v) As an offset for removing trees (the maximum number is estimated to be small) and disturbing rocky outcrops, it is recommended that a suitable stand or stands of woodland be fenced from grazing and allowed to regenerate. At least one of these sites should be in the granite country where there is a good cover of rock and native vegetation. The offset locations should be determined in consultation with an ecologist and the extent of any clearing should be related to the extent of the offset area adopted.

vi) Weed control on the properties is not the responsibility of the operator or contractors associated with the wind farm. However, measures should be implemented to ensure that the construction phase activities of the proposed wind farm do not exacerbate problems with invasive weeds. This is particularly important in relation to the spreading of invasive weeds to new locations. Advice from the relevant property owners would be worthwhile in this regard. A list of the important weeds is provided in this report.

vii) The construction phase should be monitored by a qualified environmental auditor in accordance with a Construction Environmental Management Plan. Issues to be monitored include:
- soil stabilisation works and their effectiveness;
- advice on micro-siting of wind farm components;
- creation of rocky habitat where rock is excavated.

viii) Large rock outcrops should be avoided, because they provide valuable habitat for reptiles and other native animals; particularly in a largely cleared landscape. Micro-siting of towers should be used to avoid rocky areas. If turbines are located among rock outcrops, the excavated rock should be deposited nearby in a 'natural' formation to re-create rocky habitat.

ix) Many kilometres of buried cable will be installed throughout the wind farm site to link turbines to the wind farm substation. The following recommendations relate to the installation of these cables.
- Disturbance should be minimised and rehabilitation undertaken as soon as possible after back-filling of the trench.
- Care should be taken on steep slopes to ensure that erosion does not occur. Any problems should be rectified immediately.
- The on-site maintenance crew should be responsible for regularly checking the cable routes for erosion until the routes have been stabilised and satisfactorily revegetated.
- The property owners and/or relevant government authority should be contacted to identify a suitable cover crop for sites requiring seeding to accelerate revegetation.

x) Steps can be taken to minimise the potential to impact on birds of prey, i.e. minimise the probability of blade-strike.
- the turbines should have no perching places;
- dead animals (e.g. sheep carcasses) within 200 metres of a turbine should be removed as soon as possible.
- lambing should not occur in paddocks with turbines;
- roadkills on site access tracks should be removed if they are within 200 metres of a turbine;
- the turbine and other facilities should not have lights, other than safety lights for aircraft navigation as required by government authorities, to minimise attracting nocturnal birds and bats.
- buildings, poles or other structures should not be constructed within 200 metres of turbines as they provide perching opportunities for birds of prey.

xi) Prior to the beginning of the construction phase of the wind farm, a field survey for the Superb Parrot should be undertaken by a qualified biologist. Among other things, this is to confirm whether the species is only a winter visitor to this area.
The following methods should be employed in this survey.

- The survey must be carried out in the breeding season of the parrot (i.e. September to December).
- Local land owners shall be interviewed to gain information about where the parrots have been seen, particularly in the current season.
- General observations in the areas where the parrots were seen on previous visits should be carried out to identify any areas where the parrots are present in that season.
- The targeted surveys will be carried out along those ridges and other places where trees may be removed by the wind farm infrastructure.
- Where Superb Parrots are observed in the target areas, they will be intensively studied to determine if they are nesting in the trees that may be removed. This will include watching parrot activity to determine if nesting is occurring (e.g. the sex of birds in flocks and attempting to follow parrots to nest trees).
- If nest trees are located in the target area, these trees will be documented, marked and discussions with the OEH undertaken as to the mitigation measures that should be undertaken.
- A report will be furnished to the DoP for forwarding to the OEH, outlining the studies undertaken and the results of those studies, including any consultation with OEH during the study period.

xii) Monitoring the impact of blade-strike on birds should be undertaken following completion of the wind farm. This can simply involve on-site staff recording birds found during their day-to-day work.

xiii) No large dams should be constructed within one kilometre of turbines.

xiv) If trees and other plants are planted around buildings and other facilities, then ideally these should be locally indigenous species.

xv) A Soil and Water Management Plan should be prepared for the construction phase of the project. This should be developed in conjunction with the relevant State government department. Weed management protocols should also be included in this plan.

9. REFERENCES

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Appendices

Appendix 1
Plant Species List for the Study Area

PTERIDOPHYTA (Ferns)

Azollaceae	
Azolla pinnata	Ferny Azolla
Sinopteridaceae	
Cheilanthes austrotenuifolia	Rock Fern
Cheilanthes sieberi	Mulga Fern
Cheilanthes distans	Bristly Cloak Fern

GYMNOSPERMAE (Conifers)

Cupressaceae	
Callitris endlicheri	Black Cypress Pine
Callitris glaucophylla	White Cypress Pine

ANGIOSPERMAE (Flowering Plants)

AGAVACEAE	
**Agave americana*	Century Plant
Anacardiaceae	
**Schinus molle*	Pepper Tree
Anthericaceae	
Arthropodium milleflorum	Vanilla Lily
Apiaceae	
Daucus glochidiatus	Native Carrot
Hydrocotyle laxiflora	Stinking Pennywort
**Foeniculum vulgare*	Fennell
Aquifoliaceae	
**Vinca major*	Blue Periwinkle
Asphodelaceae	
Bulbine bulbosa	Bulbine Lily
**Asphodelus fistulosus*	Asphodelus
Asteraceae	
Calotis lappulacea	Yellow Burr-daisy
Cassinia aculeata	Dolly Bush
Chrysocephalum apiculatum	Common Everlasting
Cotula australis	Common Cotula
Cymbonotus lawsonianus	Bear's Ear
Olearia elliptica	Sticky Daisy Bush
Senecio quadridentatus	Cotton Fireweed
Stuartina muelleri	Spoon Cudweed
Vittadinia cuneata	Fuzzweed
**Arctotheca calendula*	Capeweed
**Carthamus lanatus*	Saffron Thistle
**Centaurea calcitrapa*	Star Thistle
**Centaurea solstitialis*	St Barnaby's Thistle
**Chondrilla juncea*	Skeleton Weed
**Cirsium vulgare*	Spear Thistle
**Conzya sp.*	Fleabane
**Gamochaeta americana*	American Cudweed
**Hypochaeris radicata*	Flatweed
**Lactuca serriola*	Prickly Lettuce

**Picris hieracioides*	Hawkweed Picris
**Silybum marianum*	Variegated Thistle
**Sonchus asper* subsp. *glaucescens*	Prickly Sowthistle
**Sonchus oleraceus*	Common Sowthistle
**Tolpis barbata*	Yellow Hawkwed
**Tragopogon porrifolius*	Salsify
**Xanthium occidentale*	Noogoora Burr
**Xanthium spinosum*	Bathurst Burr
Bignoniaceae	
Pandorea pandorana	Wonga Vine
Boraginaceae	
**Echium plantagineum*	Paterson's Curse
**Echium vulgare*	Viper's Bugliss
Brassicaceae	
**Capsella bursa-pastoris*	Shepherd's Purse
**Hirschfeldia incana*	Hairy Brassica
**Lepidium* sp.	Peppercress
**Sisymbrium orientale*	Indian Hedge Mustard
Cactaceae	
**Opuntia stricta*	Prickly Pear
Campanulaceae	
Wahlenbergia luteola	Yellowish Bluebell
Wahlenbergia stricta	Tall Bluebell
Caryophyllaceae	
**Cerastium glomeratum*	Mouse-ear Chickweed
**Paronychia brasiliana*	Brazilian Whitlow
**Petrorhagia nanteuilii*	Proliferous Pink
**Polycarpon tetraphyllum*	Four-leaf Allseed
**Silene gallica*	Catchfly
**Spergularia rubra*	Sandspurry
**Stellaria media*	Chickweed
Casuarinaceae	
Allocasuarina verticillata	Drooping Sheoak
Chenopodiaceae	
Atriplex suberecta	Lagoon Saltbush
Einadia nutans	Nodding Saltbush
Maireana microphylla	Small-leafed Bluebush
Colchicaceae	
Wurmbea dioica	Early Nancy
Convolvulaceae	
Convolvulus erubescens	Australian Bindweed
Dichondra repens	Kidney Weed
Crassulaceae	
Crassula sieberiana	Stonecrop
Cyperaceae	
Carex appressa	Tall Sedge
Cyperus gracilis	Slender Flat-sedge
Isolepis hookeriana	Club-rush
Lepidosperma laterale	Variable Sword-sedge

Dilleniaceae	
Hibbertia obtusifolia	Grey Guinea Flower
Droseraceae	
Drosera peltata	Pale Sundew
Epacridaceae	
Lissanthe strigosa	Peach Heath
Melichrus urceolatus	Urn Heath
Euphorbiaceae	
Chamaesyce drummondii	Caustic Creeper
Phyllanthus hirtellus	Thyme Spurge
Poranthera microphylla	Small Poranthera
Fabaceae	
Caesalpinioideae (subfamily)	
Senna form taxon *'zygophylla'*	Senna
Faboideae (subfamily)	
Desmodium varians	Slender Tick-trefoil
Dillwynia sieberi	Prickly Parrot Pea
Glycine clandestine	Glycine
Glycine tabacina	Vanilla Glycine
Indigofera australis	Australian Indigo
Hardenbergia violacea	Native Sarsaparilla
**Astragalus hamosus*	Yellow Milk-vetch
**Medicago polymorpha*	Burr Medic
**Medicago sativa*	Lucerne
**Trifolium arvense*	Haresfoot Clover
**Trifolium augustifolium*	Narrow-leaf Clover
**Trifolium campestre*	Hop Clover
**Trifolium dubium*	Yellow Suckling Clover
**Trifolium glomeratum*	Cluster Clover
**Trifolium hirtum*	Hairy Clover
**Trifolium repens*	White Clover
**Trifolium subterraneum*	Subterranean Clover
**Vicia sativa*	Common Vetch
Mimosoideae (subfamily)	
Acacia decora	Western Silver Wattle
Acacia doratoxylon	Spearwood
Acacia implexa	Hickory Wattle
Acacia leucoclada	Silver Wattle
Acacia spectabilis	Mudgee Wattle
Acacia vestita	Weeping Boree
**Acacia baileyana*	Cootamundra Wattle
Geraniaceae	
Erodium crinitum	Blue Stork's-bill
Geranium potentilloides	Geranium
**Erodium cicutarium*	Common Storksbill
**Erodium butrys*	Long Storksbill
Goodeniaceae	
Velleia paradoxa	Spur Velleia
Haloragaceae	
Gonocarpus elatus	Hill Raspwort
Haloragis heterophylla	Swamp Raspwort
Hydrocharitaceae	
Ottelia ovalifolia	Swamp Lily

Hypericaceae	
Hypericum gramineum	Small St John's Wort
Iridaceae	
**Moraea setifolia*	Thread Iris
**Romulea rosea*	Onion Grass
**Sisyrinchium iridifolium*	Striped Rush-leaf
Juncaceae	
Juncus bufonius	Toad Rush
Lamiaceae	
**Marrubium vulgare*	Horehound
**Salvia verbenaca*	Wild Sage
**Scutellaria racemosa*	Skullcap
Lobeliaceae	
Isotoma axillaris	Rock Isotoma
Lomandraceae	
Lomandra filiformis	Wattle Mat-rush
Lomandra multiflora	Many-flowered Mat-rush
Loranthaceae	
Amyema pendulum	Drooping Mistletoe
Malaceae	
**Malus* x *domestica*	Apple Tree
Malvaceae	
Sida corrugata	Dwarf Sida
**Malva parviflora*	Small-flowered Mallow
**Modiola caroliniana*	Red-flowered Mallow
Meliaceae	
**Melia azedarach*	White Cedar
Myoporaceae	
Eremophila debilis	Winter Apple
Myrtaceae	
Angophora floribunda	Rough-barked Apple
Eucalyptus albens	White Box
Eucalyptus blakelyi	Blakely's Red Gum
Eucalyptus bridgesiana	Apple Box
Eucalyptus dealbata	Tumbledown Gum
Eucalyptus conica	Fuzzy Box
Eucalyptus goniocalyx	Bundy
Eucalyptus macrorhyncha	Red Stringybark
Eucalyptus melliodora	Yellow Box
Eucalyptus nortonii	Long-leaved Box
Eucalyptus polyanthemos	Red Box
Eucalyptus sideroxylon	Mugga Ironbark
Onagraceae	
**Oenothera stricta*	Evening Primrose
Orchidaceae	
Thelymitra pauciflora	Slender Sun-orchid

Oxalidaceae	
Oxalis perennans	Grassland Wood Sorrel
Oxalis radicosa	Oxalis
Papaveraceae	
**Argemone ochroleuca*	Mexican Poppy
**Papaver rhoeas*	*Field Poppy*
Phormiaceae	
Dianella longifolia	Blue Flax-lily
Stypandra glauca	Nodding Blue Lily
Phytolaccaceae	
**Phytolacca octandra*	Inkweed
Pittosporaceae	
Pittosporum phyllireoides	Weeping Pittosporum
Plantaginaceae	
**Plantago lanceolata*	Ribbed Plantain
Poaceae	
Aristida sp.	Three-awned Speargrass
Austrodanthonia carphoides	Short Wallaby Grass
Austrodanthonia linkii	Wallaby Grass
Austrostipa densiflora	Lion's Tail Grass
Austrostipa scabra	Corkscrew
Austrostipa verticillata	Slender Bamboo Grass
Bothriochloa macra	Red-leg Grass
Cymbopogon refractus	Barbed-wire Grass
Cynodon dactylon	Couch Grass
Elymus scaber	Wheatgrass
Joycea pallida	Silvertop Wallaby Grass
Microlaena stipoides	Weeping Grass
Paspalum distichum	Freshwater Couch
Phragmites australis	Common Reed
Sporobolus creber	Slender Rats-tail Grass
Themeda australis	Kangaroo Grass
**Avena* sp.	Oats
**Briza minor*	Lesser Quaking Grass
**Bromus cartharticus*	Prairie Grass
**Bromus diandrus*	Great Brome
**Bromus hordaceus*	Soft Brome
**Hordeum* sp.	Barley Grasses
**Lamarckia aurea*	Golden-top
**Lolium* sp.	Ryegrass
**Paspalum dilatatum*	Paspalum
**Pentaschistis airoides*	False Hairgrass
**Phalaris sp.*	Phalaris
**Poa bulbosa*	Bulbous Bluegrass
**Triticum aestivum*	Wheat
**Vulpia muralis*	Fescue
Polygonaceae	
Rumex brownii	Swamp Dock
**Acetosella vulgaris*	Sheep Sorrel
**Polygonum aviculare*	Wireweed
**Rumex crispus*	Curled Dock
Portulaceae	
Calandrinia eremaea	Small Purslane

Primulaceae	
**Anagallis arvensis*	Blue Pimpernel
Ranunculaceae	
Ranunculus lappaceus	Buttercup
Ranunculus sessiliflorus	Buttercup
Rosaceae	
Acaena ? ovina	Sheep's Burr
**Malus pumila*	Apple
**Prunus* sp.	Plum
**Rosa rubiginosa*	Sweet Briar
**Rubus* sp.	Blackberry
Rubiaceae	
Asperula conferta	Common Woodruff
Galium gaudichardiana	Rough Bedstraw
Opercularia hispida	Hairy Stinkweed
Salicaceae	
**Salix babylonica*	Weeping Willow
Santalaceae	
Exocarpos cupressiformis	Native Cherry
Sapindaceae	
Dodonaea viscosa ssp. *spatulata*	Hop-bush
Scrophulareaceae	
Gratiola peruviana	Brooklime
Veronica plebeia	Trailing Speedwell
**Misopates orontium*	Lesser Snapdragon
**Orobanche minor*	Lesser Broomrape
**Parentucellia latifolia*	Red Bartsia
**Verbascum virgatum*	Twiggy Mullein
**Veronica persica*	Creeping Speedwell
** Verbascum thapsus*	Great Mullein
Simaroubaceae	
**Ailanthus altissima*	Tree-of-Heaven
Solanaceae	
Solanum cinereum	Nightshade
**Datura stramonium*	Common Thornapple
**Solanum radicans*	Nightshade
**Lycium ferocissimum*	African Boxthorn
**Nicotiana glauca*	Tree Tobacco
**Solanum migrum*	Black Nightshade
Sterculiaceae	
Brachychiton populneus	Kurrajong
Stylidiaceae	
Levenhookia dubia	Hairy Stylewort
Typhaceae	
Typha domingensis	Narrow-leaf Cumbungi
Urticaceae	
Urtica incisa	Stinging Nettle
**Urtica urens*	Stinging Nettle

Verbenaceae	
**Verbena bonariensis*	Purpletop
Violaceae	
Hybanthus monopetalus	Slender Violet
Viscaceae	
Notothixos cornifolius	Kurrajong Mistletoe

Appendix 2
Animal Species List for the Study Area

a. Source of record.
   1. Recorded in the NSW Wildlife Atlas within the region.
   2. Recorded in the project area in October 2010.
   3. Recorded in the project area in July 2011.

b. Introduced bird species are indicated by an asterisk (*).

FAMILY Species		Wildlife Atlas[1]	This Study 2010/11[2]
MAMMALS			
ORNITHORHYNCHIDAE			
Platypus	*Ornithorhynchus anatinus*	1	
TACHYGLOSSIDAE			
Short-beaked Echidna	*Tachyglossus aculeatus*	1	2
DASYURIDAE			
Spotted-tailed Quoll	*Dasyurus maculatus*	1	
Common Dunnart	*Sminthopsis murina*	1	
VOMBATIDAE			
Common Wombat	*Vombatus ursinus*	1	3
PHASCOLARCTIDAE			
Koala	*Phascolarctos cinereus*	1	
PSEUDOCHEIRIDAE			
Common Ringtail Possum	*Pseudocheirus peregrinus*	1	
PHALANGERIDAE			
Common Brushtail Possum	*Trichosurus vulpecula*	1	
MACROPODIDAE			
Eastern Grey Kangaroo	*Macropus giganteus*	1	2.3
Common Wallaroo	*Macropus robustus*	1	2.3
Swamp Wallaby	*Wallabia bicolor*	1	2
MURIDAE			
House Mouse*	*Mus musculus*	1	3
CANIDAE			
Fox*	*Vulpes vulpes*	1	2.3
FELIDAE			
Cat*	*Felis catus*		2
LEPORIDAE			
Rabbit*	*Oryctolagus cuniculus*		2.3
Brown Hare*	*Lepus capensis*	1	2
BOVIDAE			
Domestic Cattle*	*Bos taurus*		2.3
Domestic Sheep*	*Ovis aries*		2.3
Cervidae			
Unidentified Deer	Cervus sp.*	1	

FAMILY Species		Wildlife Atlas	This Study 2010/11
BIRDS			
PHASIANIDAE			
Stubble Quail	*Coturnix pectoralis*	1	
ANATIDAE			
Black Swan	*Cygnus atratus*		
Australian Wood Duck	*Chenonetta jubata*	1	2.3
Pacific Black Duck	*Anas superciliosa*	1	2.3
Grey Teal	*Anas gracilis*		2.3
Pink-eared Duck	*Malacorhynchus membranaceus*		3
Hardhead	*Aythya australis*		3
PODICIPEDIDAE			
Australasian Grebe	*Tachybaptus novaehollandiae*		2.3
PHALACROCORACIDAE			
Little Pied Cormorant	*Microcarbo melanoleucos*	1	
Little Black Cormorant	*Phalacrocorax sulcirostris*	1	
ARDEIDAE			
White-faced Heron	*Egretta novaehollandiae*	1	2.3
THRESKIORNITHIDAE			
Australian White Ibis	*Threskiornis molucca*	1	
Straw-necked Ibis	*Threskiornis spinicollis*	1	2.3
ACCIPITRIDAE			
Black-shouldered Kite	*Elanus axillaris*	1	2.3
Collared Sparrowhawk	*Accipiter cirrocephalus*	1	
Brown Goshawk	*Accipiter fasciatus*	1	2
Wedge-tailed Eagle	*Aquila audax*	1	2.3
Little Eagle	*Hieraaetus morphnoides*	1	
FALCONIDAE			
Brown Falcon	*Falco berigora*	1	2.3
Black Falcon	*Falco subniger*	1	
Australian Hobby	*Falco longipennis*		2
Nankeen Kestrel	*Falco cenchroides*	1	2.3
RALLIDAE			
Buff-banded Rail	*Gallirallus philippensis*		2
Eurasian Coot	*Fulica atra*	1	
CHARADRIIDAE			
Masked Lapwing	*Vanellus miles*	1	2
Black-fronted Dotterel	*Elseyornis melanops*	1	3
LARIDAE			
Silver Gull	*Larus novaehollandiae*	1	
COLUMBIDAE			
Peaceful Dove	*Geopelia striata*	1	
Crested Pigeon	*Ocyphaps lophotes*	1	2.3
Common Bronzewing	*Phaps chalcoptera*	1	3
CACATUIDAE			
Galah	*Eolophus roseicapillus*	1	2.3
Long-billed Corella*	*Cacatua tenuirostris*		2

FAMILY Species		Wildlife Atlas	This Study 2010/11
Sulphur-crested Cockatoo	*Cacatua galerita*	1	2.3
Little Corella	*Cacatua sanguinea*	1	
Glossy Black-Cockatoo	*Calyptorhynchus lathami*	1	
Cockatiel	*Nymphicus hollandicus*	1	
PSITTACIDAE			
Australian King Parrot	*Alisterus scapularis*	1	2
Musk Lorikeet	*Glossopsitta concinna*		3
Little Lorikeet	*Glossopsitta pusilla*	1	
Crimson Rosella	*Platycercus elegans*	1	2
Eastern Rosella	*Platycercus eximius*	1	2.3
Blue Bonnet	*Northiella haematogaster*	1	2.3
Superb Parrot	*Polytelis swainsonii*	1	3
Red-rumped Parrot	*Psephotus haematonotus*	1	2.3
CUCULIDAE			
Common Koel	*Eudynamys scolopacea*		2
STRIGIDAE			
Barking Owl	*Ninox connivens*	1	
Southern Boobook	*Ninox novaeseelandiae*	1	2
AEGOTHELIDAE			
Australian Owlet-nightjar	*Aegotheles cristatus*	1	
PODARGIDAE			
Tawny Frogmouth	*Podargus strigoides*	1	
HALCYONIDAE			
Laughing Kookaburra	*Dacelo novaeguineae*	1	2.3
Sacred Kingfisher	*Todiramphus sanctus*	1	2
MEROPIDAE			
Rainbow Bee-eater	*Merops ornatus*	1	
CORACIIDAE			
Dollarbird	*Eurystomus orientalis*	1	
CLIMACTERIDAE			
White-throated Treecreeper	*Cormobates leucophaea*	1	
Brown Treecreeper	*Climacteris picumnus*	1	
MALURIDAE			
Superb Fairy-wren	*Malurus cyaneus*	1	2.3
PARDALOTIDAE			
Striated Pardalote	*Pardalotus striatus*	1	2.3
White-browed Scrubwren	*Sericornis frontalis*	1	
Western Gerygone	*Gerygone fusca*	1	
Brown Thornbill	*Acanthiza pusilla*	1	
Buff-rumped Thornbill	*Acanthiza reguloides*	1	
Yellow-rumped Thornbill	*Acanthiza chrysorrhoa*	1	2.3
Yellow Thornbill	*Acanthiza nana*	1	
Chestnut-rumped Thornbill	*Acanthiza uropygialis*	1	
Speckled Warbler	*Pyrrholaemus saggitatus*	1	
Weebill	*Smicromis brevirostris*	1	
MELIPHAGIDAE			
Red Wattlebird	*Anthochaera carunculata*	1	2.3
Noisy Friarbird	*Philemon corniculatus*	1	2.3

FAMILY Species		Wildlife Atlas	This Study 2010/11
Little Friarbird	*Philemon citreogularis*	1	
Noisy Miner	*Manorina melanocephala*	1	2.3
Striped Honeyeater	*Plectorhyncha lanceolata*	1	
Black Honeyeater	*Sugomel niger*	1	
Blue-faced Honeyeater	*Entomyzon cyanotis*	1	2
Yellow-faced Honeyeater	*Lichenostomus chrysops*	1	
White-eared Honeyeater	*Lichenostomus leucotis*	1	
White-plumed Honeyeater	*Lichenostomus penicillatus*	1	
Brown-headed Honeyeater	*Melithreptus brevirostris*	1	
White-naped Honeyeater	*Melithreptus lunatus*	1	
Black-chinned Honeyeater	*Melithreptus gularis*	1	
Eastern Spinebill	*Acanthorhynchus tenuirostris*	1	
Spiny-cheeked Honeyeater	*Acanthagenys rufogularis*	1	
Orange Chat	*Epthianura aurifrons*	1	
POMATOSTOMIDAE			
Grey-crowned Babbler	*Pomatostomus temporalis*		3
PETROICIDAE			
Jacky Winter	*Microeca fascinans*	1	
Hooded Robin	*Melanodryas cucullata*	1	
Red-capped Robin	*Petroica goodenovii*	1	
Rose Robin	*Petroica rosea*	1	
NEOSITTIDAE			
Varied Sittella	*Daphoenositta chrysoptera*	1	
PACHYCEPHALIDAE			
Grey Shrike-thrush	*Colluricincla harmonica*	1	
Eastern Shrike-tit	*Falcunculus frontatus*	1	
Golden Whistler	*Pachycephala pectoralis*	1	
Rufous Whistler	*Pachycephala rufiventris*	1	
DICRURIDAE			
Leaden Flycatcher	*Myiagra rubecula*	1	
Magpie-lark	*Grallina cyanoleuca*	1	2.3
RHIPIDURIDAE			
Grey Fantail	*Rhipidura albiscapa*	1	3
Willie Wagtail	*Rhipidura leucophrys*	1	2.3
CAMPEPHAGIDAE			
Black-faced Cuckoo-shrike	*Coracina novaehollandiae*	1	2.3
Ground Cuckoo-shrike	*Coracina maxima*		3
ARTAMIDAE			
Dusky Woodswallow	*Artamus cyanopterus*	1	
Grey Butcherbird	*Cracticus torquatus*		2.3
Pied Butcherbird	*Cracticus nigrogularis*	1	2.3
Australian Magpie	*Cracticus tibicen*	1	2.3
Pied Currawong	*Strepera graculina*	1	2.3
CORVIDAE			
Australian Raven	*Corvus coronoides*	1	2.3
Little Raven			2.3
CORCORACIDAE			
White-winged Chough	*Corcorax melanorhamphos*	1	2.3
Apostlebird	*Struthidea cinerea*	1	2.3

ORIOLIDAE			
Olive-backed Oriole	*Oriolus sagittatus*	1	
FAMILY Species		Wildlife Atlas	This Study 2010/11
MOTACILLIDAE			
Australasian Pipit	*Anthus novaeseelandiae*		2.3
ESTRILDIDAE			
Red-browed Finch	*Neochmia temporalis*	1	2.3
Diamond Firetail	*Stagonopleura guttata*	1	
Double-barred Finch	*Taeniopygia bichenovii*	1	
Zebra Finch	*Taeniopygia guttata*	1	
PASSERIDAE			
House Sparrow*	*Passer domesticus*	1	2.3
DICAEIDAE			
Mistletoebird	*Dicaeum hirundinaceum*	1	
HIRUNDINIDAE			
Welcome Swallow	*Hirundo neoxena*	1	2.3
Tree Martin	*Petrochelidon nigricans*	1	2
Fairy Martin	*Petrochelidon ariel*	1	2
SYLVIIDAE			
Clamorous Reed-Warbler	*Acrocephalus stentoreus*	1	2
ZOSTEROPIDAE			
Silvereye	*Zosterops lateralis*	1	2
MUSCICAPIDAE			
Common Blackbird*	*Turdus merula*	1	3
STURNIDAE			
Common Starling*	*Sturnus vulgaris*	1	2.3
FROGS			
MYOBATRACHIDAE			
Common Eastern Froglet	*Crinia signifera*	1	2
Giant Banjo Frog	*Limnodynastes interioris*	1	
Eastern Banjo Frog	*Limnodynastes dumerilii*	1	2
Spotted Grass Frog	*Limnodynastes tasmaniensis*		2
Smooth Toadlet	*Uperoleia laevigata*		2
HYLIDAE			
Peron's Tree Frog	*Litoria peronii*		2
REPTILES			
CHELIDAE			
Long-necked Tortoise	*Chelodina longicollis*	1	2
GEKKONIDAE			
Thick-tailed Gecko	*Underwoodisaurus milii*	1	
Tree Dtella	*Gehyra variegata*		3
AGAMIDAE			
Nobbi	*Amphibolurus nobbi*	1	
Bearded Dragon	*Pogona barbata*	1	2
SCINCIDAE			
Robust Skink	*Ctenotus robustus*	1	3

FAMILY Species		Wildlife Atlas	This Study 2010/11
Cunningham's Skink	*Egernia cunninghami*	1	
Tree Skink	*Egernia striolata*	1	3
White's Skink	*Egernia whitii*	1	
Barred-sided Skink	*Eulamprus tenuis*	1	
South-eastern Morethia Skink	*Morethia boulengeri*	1	
Eastern Blue-tongued Lizard	*Tiliqua scincoides*	1	2
ELAPIDAE			
Yellow-faced Whip Snake	*Demansia psammophis*	1	
Red-naped Snake	*Furina diadema*	1	
Bandy-Bandy	*Vermicella annulata*	1	
TYPHLOPIDAE			
Prong-snouted Blind Snake	*Ramphotyphlops bituberculatus*	1	
-	*Ramphotyphlops bicolor*	1	

Appendix 3
Bird Survey Sheets

Bird Survey Sheet				**Kevin Mills & Associates**	
Project: Bodangora Wind Farm				**Date:** 9 October 2010	
Location: Gillinghall Road					**No.:** Bod01
GPS (start) WGS84**:** 55 0691164 6408782			**(finish):** 064975 6416528		
Time: 10.10 am – 12.15 pm EDST – 125 mins					
Habitat: Paddocks and roadside trees and woodland.					
Species	**Ground**	**<10m**	**10-20m**	**20-50m**	**>50m**
Apostlebird	4				
Australian Magpie	4	9	1		
Australian Raven	2		1		
Australian Wood Duck	4				
Australasian Pipit	3				
Common Starling*			2		
Crested Pigeon	1	1			
Eastern Rosella	3	5	1		
Galah		4		4	1
Grey Butcherbird		1			
Magpie-lark	2	3			
Nankeen Kestrel			1		
Noisy Miner		6	1		
Pied Butcherbird		2	1		
Superb Fairy-wren	2				
Welcome Swallow		3	1		
White-winged Chough	9	1			
Willie Wagtail	1				
Yellow-rumped Thornbill		4			

Bird Survey Sheet				**Kevin Mills & Associates**	
Project: Bodangora Wind Farm				**Date:** 9 October 2010	
Location: Gillinghall Road, Spicers Road to Mudgee Road.					**No.:** Bod02
GPS (start) WGS84**:** 55 0694975 6416528			**(finish):** 0703179 6414571		
Time: 12.15 – 1.15 pm EDST – 60 mins					
Habitat: Paddocks and roadside trees and woodland.					
Species	**Ground**	**<10m**	**10-20m**	**20-50m**	**>50m**
Apostlebird	1				
Australian Magpie	12	3			
Australian Raven	4		1	3	1
Australian Wood Duck	2				
Common Starling*	30		4		
Crested Pigeon	1	2			
Eastern Rosella	3	17	5		
Galah		2	4		
Grey Butcherbird		1			
Laughing Kookaburra		2			
Magpie-lark	1				
Nankeen Kestrel		1			
Noisy Miner		3			
Pied Currawong		1			
Striated Pardalote			1		
Sulphur-crested Cockatoo	3				
Superb Fairy-wren	2				
Welcome Swallow		1			
White-faced Heron	2				
White-winged Chough (nest)	10	3			

Bird Survey Sheet				**Kevin Mills & Associates**	
Project: Bodangora Wind Farm				**Date:** 9 October 2010	
Location: Badalong Road to Gunnegalerie					**No.:** Bod03
GPS (start) WGS84**:** 55 0703473 6414644			**(finish):** 0703678 6409758		
Time: 1.17 – 2.00 pm EDST – 43 mins					
Habitat:					
Species	**Ground**	**<10m**	**10-20m**	**20-50m**	**>50m**
Australian Magpie	4	1			
Australian Raven			1	1	1
Australian Wood Duck	13				
Australasian Grebe	1				
Black-faced Cuckoo-shrike		1			
Blue-faced Honeyeater		1			
Common Starling*		1			
Crested Pigeon	1		1		
Eastern Rosella	11	2			
Galah				2	
Grey Goshawk					1
Grey Teal	1				
Magpie-lark	1	2			
Nankeen Kestrel				1	
Noisy Friarbird		1			
Noisy Miner	2	10			
Pacific Black Duck	1				
Pied Currawong		2			
Red-rumped Parrot	9				
Silvereye		1			
Striated Pardalote		2	2		
White-winged Chough	5	3			

Bird Survey Sheet				**Kevin Mills & Associates**	
Project: Bodangora Wind Farm				**Date:** 9 October 2010	
Location: Gunnegalerie gate along Mudgee Road to Bodangora					**No.:** Bod04
GPS (start) WGS84**:** 55 0699918 6410486			**(finish):** 0689487 6407266		
Time: 2.15 – 2.40 pm EDST – 25 mins					
Habitat:					
Species	**Ground**	**<10m**	**10-20m**	**20-50m**	**>50m**
Australian Magpie (nest)	3	4			
Australian Raven			2		
Common Starling*			2		
Galah			1		
Magpie-lark (nest)	4				
Noisy Miner		5			
Red-rumped Parrot		1			
Striated Pardalote			2		
Sulphur-crested Cockatoo		1			
Welcome Swallow	1	1			

Bird Survey Sheet				**Kevin Mills & Associates**	
Project: Bodangora Wind Farm				**Date:** 9 October 2010	
Location: Driel Creek Road – Bodangora Road to Dunedoo Road					**No.:** Bod05
GPS (start) WGS84**:** 55 0689487 6407266			**(finish):** 0684447 6413196		
Time: 2.45 – 3.12 pm EDST – 27 mins.					
Habitat: Typical rural landscape, no woodland patches.					
Species	**Ground**	**<10m**	**10-20m**	**20-50m**	**>50m**
Australian Magpie	10			2	
Australian Raven			2		
Australian Wood Duck	1				
Australasian Pipit	1				
Black-faced Cuckoo-shrike		1			
Brown Goshawk				1	
Clamorous Reed-warbler		1			
Common Starling*		106	3		
Eastern Rosella		1	1		
Magpie-lark	3				
Nankeen Kestrel			1		
Noisy Miner		4			
Pied Butcherbird	1	3			
Welcome Swallow		1			
White-winged Chough	4				

Bird Survey Sheet				**Kevin Mills & Associates**	
Project: Bodangora Wind Farm				**Date:** 10 October 2010	
Location: Glen Oak					**No.:** Bod06
GPS (start) WGS84**:** 55 0696794 6414048 – 0696951 6410895			**(finish):** 0692534 6413011		
Time: 8.45 am – 1.15 pm EDST – 270 mins					
Habitat: Farmland, scattered trees and some stands of woodland.					
Species	**Ground**	**<10m**	**10-20m**	**20-50m**	**>50m**
Apostlebird	7				
Australian Magpie	9	1			
Australian Raven	1	1			
Australian Wood Duck (dams)	10				
Australasian Grebe (dams)	5				
Australasian Pipit	2				
Black-faced Cuckoo-shrike		2			
Brown Falcon			2		
Common Starling*	5	7			
Crested Pigeon		12			
Eastern Rosella	2	4			
Fairy Martin		3			
Galah	121	4		4	2
Grey Butcherbird		1			
Grey Teal (dams)	5				
House Sparrow*	2				
Little Raven	35				
Magpie-lark	5	1			
Masked Lapwing	1				
Nankeen Kestrel		1	1	1	
Noisy Miner		6			
Pacific Black Duck (dam)	5				
Pied Butcherbird		1			
Pied Currawong		1			
Red-rumped Parrot	7		3		
Striated Pardalote		3			
Sulphur-crested Cockatoo	6	1			
Tree Martin			5		
White-winged Chough	9				
Yellow-rumped Thornbill	3				

Bird Survey Sheet				**Kevin Mills & Associates**	
Project: Bodangora Wind Farm				**Date:** 10 October 2010	
Location: Landsgrove Ridge – Driel Creek Road – Isali Street x Mudgee Road					**No.:** Bod07
GPS (start) WGS84**:** 55 0693634 6414809			**(finish):** 0689496 6407279		
Time: 2.30 – 4.20 pm EDST – 110 mins					
Habitat: Roadside woodland, paddocks.					
Species	**Ground**	**<10m**	**10-20m**	**20-50m**	**>50m**
Apostlebird	8				
Australian Magpie	20	15	7		
Australian Raven	3		1	6	
Australian Wood Duck (dams)	10				
Blue Bonnet		1			
Common Starling*	10	1	3		
Crested Pigeon		3			
Eastern Rosella	7	22			
Galah	1	2	7		
Magpie-lark	2	1			
Noisy Miner	4	10			
Pied Butcherbird	1	1			
White-winged Chough	23				

Bird Survey Sheet				**Kevin Mills & Associates**	
Project: Bodangora Wind Farm				**Date:** 11 October 2010	
Location: Gilinghall Road along Mudgee Road to Gunnegalderie gate					**No.:** Bod08
GPS (start) WGS84**:** 55 0691417 6408352			**(finish):** 0699913 6410487		
Time: 8.30 – 9.00 am EDST – 30 mins					
Habitat: Roadside trees, paddocks.					
Species	**Ground**	**<10m**	**10-20m**	**20-50m**	**>50m**
Australian Magpie	4				
Australian Raven		2			
Australian Wood Duck (dams)	1				
Australian Hobby			1		
Black-faced Cuckoo-shrike		1			
Common Starling*		1	2		
Eastern Rosella		1			
Galah		1	5		
Laughing Kookaburra		1			
Magpie-lark			1		
Noisy Miner		1			
Pied Butcherbird	2	1			

Bird Survey Sheet				**Kevin Mills & Associates**	
Project: Bodangora Wind Farm				**Date:** 11 October 2010	
Location: Gunnegalderie property					**No.:** Bod09
GPS (start) WGS84**:** 55 0699913 6140487			**(finish):** 0703505 6408419		
Time: 9.00 – 11.20 am EDST – 140 mins					
Habitat:					
Species	**Ground**	**<10m**	**10-20m**	**20-50m**	**>50m**
Australian Magpie	4	2	1		
Australian Raven	3	1		4	
Australian Wood Duck (dams)	7				
Australasian Grebe (dams)	1				
Australasian Pipit	1				
Common Starling*	2	6	4		
Crested Pigeon	7				
Eastern Rosella	10	7			
Galah	2		1	2	
Laughing Kookaburra		1			
Nankeen Kestrel			1		
Noisy Miner	1	8	7		
Red-rumped Parrot	12	2			
Striated Pardalote		2	1		

Sulphur-crested Cockatoo		1	1		
Welcome Swallow		5			
Wedge-tailed Eagle					1
White-winged Chough			3		
Willie Wagtail	1	1			
Yellow-rumped Thornbill	2	1			

Bird Survey Sheet			**Kevin Mills & Associates**		
Project: Bodangora Wind Farm			**Date:** 11 October 2010		
Location: Gunnegalderie to Mount Bodangora					**No.:** Bod10
GPS (start) WGS84**:** 55 0699913 6410489			**(finish):** 0697755 6410392		
Time: 11.20 am – 1.10 pm EDST – 110 mins					
Habitat: Woodland patches, scatted paddock trees and pasture.					
Species	**Ground**	**<10m**	**10-20m**	**20-50m**	**>50m**
Australian Magpie	2	2	1		
Australian Raven		1	2		
Australian Wood Duck (dams)	4				
Australasian Grebe (dams)	1				
Australasian Pipit	3				
Crested Pigeon	2	2			
Galah		1			
Grey Butcherbird		1			
Grey Teal (dams)	1				
Magpie-lark	2				
Musk Lorikeet		2			
Nankeen Kestrel				2	1
Noisy Miner		2			
Pacific Black Duck (dam)	1	1			
Straw-necked Ibis	1				
White-winged Chough	4				

Bird Survey Sheet			**Kevin Mills & Associates**		
Project: Bodandora Wind Farm			**Date:** 12 July 2011		
Location: Bodandora to Meadowlands					**No.:** Bod11
GPS (start) WGS84**:** 55 0689479 6407269			**(finish):** 0691085 640????		
Time: 08.00 – 09.40 : 100 mins					
Habitat: Rural, small stands of woodland.					
Species	**Ground**	**<10m**	**10-20m**	**20-50m**	**>50m**
Apostlebird	7				
Australian Magpie	11	2			
Australian Raven	3	2			
Australasian Pipit		1			
Brown Falcon		2			
Common Starling*		2	4		
Crested Pigeon	9	6			
Eastern Rosella	16	8			
Galah	14	10	3		
Grey Butcherbird		1			
Laughing Kookaburra		2			
Magpie-lark	2		2		
Musk Lorikeet		2	11		
Noisy Friarbird		1			
Noisy Miner	11	15	9		
Pied Butcherbird		1			
Red-rumped Parrot	9	2			
Superb Fairy-wren	1				
Superb Parriot	18	3			
Welcome Swallow		1	1		
White-winged Chough		6			

Bird Survey Sheet				**Kevin Mills & Associates**	
Project: Bodandora Wind Farm				**Date:** 12 July 2011	
Location: Gillinghall Road					**No.:** Bod12
GPS (start) WGS84**:** 55 0695100 6416723			**(finish):** 0691403 6408344		
Time: 09.50 – 12.00 + 15.04 – 15.23 : 189 mins					
Habitat: Rural, small stands of woodland.					
Species	**Ground**	**<10m**	**10-20m**	**20-50m**	**>50m**
Apostlebird	1				
Australian Magpie	4	1			
Australian Raven		5	5		
Blue Bonnet		2			
Common Bronzewing	2				
Common Starling*		5			
Eastern Rosella	9	25			
Galah	18	5			
Laughing Kookaburra		1			
Little Raven		6			
Magpie-lark	2	1			
Noisy Friarbird		1			
Noisy Miner		21	7		
Pied Butcherbird	1	3			
Striated Pardalote		2			
White-winged Chough	24				

Bird Survey Sheet				**Kevin Mills & Associates**	
Project: Bodandora Wind Farm				**Date:** 12 July 2011	
Location: Glen Oak property					**No.:** Bod13
GPS (start) WGS84**:** 55 0692519 6412977			**(finish):** 0696650 6412770		
Time: 12.00 – 15.04 : 184 mins					
Habitat: Rural, small stands of woodland.					
Species	**Ground**	**<10m**	**10-20m**	**20-50m**	**>50m**
Apostlebird	27				
Australian Magpie	15	7	3		
Australian Raven		2		1	
Australian Wood Duck (dams)	14				
Australasian Grebe (dams)	3				
Black-faced Cuckoo-shrike		1			
Brown Falcon		1			
Crested Pigeon	9				
Eastern Rosella		6			
Galah		20			
Grey Butcherbird		1			
Grey Teal (dams)	9				
Ground Cuckoo-shrike	3				
Hardhead	2				
House Sparrow*	22				
Magpie-lark	5				
Noisy Friarbird		4			
Noisy Miner	2	7	4		
Pacific Black Duck (dam)	9				
Pied Butcherbird		1			
Pink-eared Duck	5				
Red Wattlebird		1			
Red-rumped Parrot	4				
Striated Pardalote		2			
Superb Fairy-wren	3				
Wedge-tailed Eagle					2
Welcome Swallow		1			
Willie Wagtail		1			

Bird Survey Sheet				**Kevin Mills & Associates**	
Project: Bodandora Wind Farm				**Date:** 12 July 2011	
Location: Along highway and into Gunnegalderie property					**No.:** Bod14
GPS (start) WGS84**:** 55 0691403 6408344			**(finish):** 0701961 6409835		
Time: 15.23 – 16.00 : 37 mins					
Habitat: Rural, small stands of woodland.					
Species	**Ground**	**<10m**	**10-20m**	**20-50m**	**>50m**
Australian Magpie	1	5			
Australian Raven	1				
Australian Wood Duck (dams)	2				
Crested Pigeon	1				
Eastern Rosella	2				
Galah		2			
Magpie-lark	2				
Noisy Friarbird		2			
Pied Butcherbird		1			
Pied Currawong		1			
Red-rumped Parrot	2				
Striated Pardalote		3			
White-faced Heron (dam)	1				
Willie Wagtail		2			

Bird Survey Sheet				**Kevin Mills & Associates**	
Project: Bodandora Wind Farm				**Date:** 13 July 2011	
Location: North of Bodangora					**No.:** Bod15
GPS (start) WGS84**:** 55 0689479 6407269			**(finish):** 0689620 6412946		
Time: 08.00 – 09.00 : 60 mins					
Habitat: Rural, small stands of woodland.					
Species	**Ground**	**<10m**	**10-20m**	**20-50m**	**>50m**
Apostlebird	8				
Australian Magpie	9	3			
Australian Raven	4	3	1		
Common Starling*	1	5	1		
Crested Pigeon	1	26			
Eastern Rosella	6	19	5		
Galah		4	2		
Grey Butcherbird		1			
Magpie-lark	2				
Musk Lorikeet			11		
Noisy Friarbird		3			
Noisy Miner	2	10	1		
Pied Butcherbird		2	2		
Red-rumped Parrot	15				
Striated Pardalote		1			
Superb Parrot				3	
White-faced Heron	1				
White-winged Chough	2	1			

Bird Survey Sheet				**Kevin Mills & Associates**	
Project: Bodandora Wind Farm				**Date:** 13 July 2011	
Location: Gunnegalderie					**No.:** Bod16
GPS (start) WGS84**:** 55 0699924 6410500			**(finish):** 0702898 6407294		
Time: 09.05 – 14.05 : 300 mins					
Habitat: Rural, small stands of woodland.					
Species	**Ground**	**<10m**	**10-20m**	**20-50m**	**>50m**
Apostlebird	9				
Australian Magpie	5	7			
Australian Raven		5		6	
Australian Wood Duck (dams)	1				
Australasian Grebe (dams)	3				
Brown Falcon		2	2		
Common Starling*		30			
Crested Pigeon	27	4			
Eastern Rosella	12	9			
Galah		2			
Grey Butcherbird		1			
Grey Fantail		1			
Laughing Kookaburra		2			
Magpie-lark	2	1			
Nankeen Kestrel		2			
Noisy Miner	1	6			
Pacific Black Duck (dam)	2				
Pied Butcherbird	1	2			
Pied Currawong		1			
Red-browed Finch	35				
Striated Pardalote		2			
Sulphur-crested Cockatoo	7				
Superb Fairy-wren	1				
White-winged Chough	5				
Willie Wagtail	1	1			
Yellow-rumped Thornbill	7				

Bird Survey Sheet				**Kevin Mills & Associates**	
Project: Bodandora Wind Farm				**Date:** 13 July 2011	
Location: Gallinghall Road					**No.:** Bod17
GPS (start) WGS84**:** 55 0691392 6408352			**(finish):** 0693089 6414315		
Time: 14.25 – 15.30 : 65 mins					
Habitat: Rural, small stands of woodland.					
Species	**Ground**	**<10m**	**10-20m**	**20-50m**	**>50m**
Australian Magpie	5	1	1	1	
Australian Raven				3	
Australian Wood Duck (dams)	2				
Black-faced Cuckoo-shrike		1			
Black-shouldered Kite				1	
Blue Bonnet		4			
Brown Falcon		4			
Common Starling*		1			
Eastern Rosella	2	7		5	
Galah	14			8	
Grey Butcherbird		1			
Laughing Kookaburra		1			
Magpie-lark	2				
Noisy Friarbird		4			
Noisy Miner		8			
Pacific Black Duck (dam)	1				
Superb Parrot				4	
Willie Wagtail		1			

Bird Survey Sheet				**Kevin Mills & Associates**	
Project: Bodandora Wind Farm				**Date:** 14 July 2011	
Location: Bodangora to Meadowlands gate					**No.:** Bod18
GPS (start) WGS84**:** 55 0689485 6407265			**(finish):** 0691085 640????		
Time: 08.05 – 09.50 : 105 mins					
Habitat: Rural, small stands of woodland.					
Species	**Ground**	**<10m**	**10-20m**	**20-50m**	**>50m**
Apostlebird	7				
Australian Magpie	14	5			
Australian Raven	2	3	1	1	
Blue Bonnet		2			
Black-shouldered Kite				1	
Common Starling*		13			
Crested Pigeon	15	16			
Eastern Rosella	18	33			
Galah	2	5			
Grey Butcherbird		2			
Laughing Kookaburra		1			
Magpie-lark	4				
Musk Lorikeet		4	2		
Noisy Friarbird		2			
Noisy Miner		26	2		
Pacific Black Duck (dam)		7			
Pied Butcherbird		5			
Red-rumped Parrot		2			
Striated Pardalote		1			
Superb Parrot		3	1		
Welcome Swallow		6			
White-winged Chough	11	6			

Bird Survey Sheet				**Kevin Mills & Associates**	
Project: Bodandora Wind Farm				**Date:** 14 July 2011	
Location: Gallinghall Road					**No.:** Bod19
GPS (start) WGS84**:** 55 0694954 6416495			**(finish):** 0691405 6408344		
Time: 09.55 – 10.30 : 35 mins					
Habitat: Rural, small stands of woodland.					
Species	**Ground**	**<10m**	**10-20m**	**20-50m**	**>50m**
Apostlebird	10				
Australian Magpie	4	1			
Australian Raven	2	1		3	
Australian Wood Duck (dams)		1			
Australasian Pipit	1				
Brown Falcon		4			
Common Starling*		4			
Crested Pigeon	3	9			
Eastern Rosella		29			
Galah	8	15			
Grey-crowned Babbler	5				
Laughing Kookaburra		1			
Little Raven	12				
Magpie-lark	1				
Noisy Friarbird		6			
Noisy Miner	2	8			
Pied Butcherbird		1			
Pied Currawong		1			

Appendix 4
Summary of Wind Turbine Locations

No.	Location	Altitude	Notes
WTG01	705577 6410962	596m	Exotic grassland; mostly treeless; very scattered trees: *Eucalyptus albens, Acacia implexa, E. blakelyi* and *E. macrorhyncha.*
WTG02	705226 6409314	600m	Exotic grassland; mostly treeless; very scattered trees: *Eucalyptus albens, Acacia implexa, E. blakelyi* and *E. macrorhyncha.*
WTG03	705165 6410210	600m	Exotic grassland; mostly treeless; very scattered trees: *Eucalyptus albens, Acacia implexa, E. blakelyi* and *E. macrorhyncha.*
WTG04	704757 6409621	600m	Exotic grassland; mostly treeless; very scattered trees: *Eucalyptus albens, Acacia implexa, E. blakelyi* and *E. macrorhyncha.*
WTG05	704536 6410524	600m	Exotic grassland; mostly treeless; very scattered trees: *Eucalyptus albens, Acacia implexa, E. blakelyi* and *E. macrorhyncha.*
WTG06	703849 6410800	600m	Exotic grassland; mostly treeless; very scattered trees: *Eucalyptus albens, Acacia implexa, E. blakelyi* and *E. macrorhyncha.*
WTG07	702898 6407294	600m	Narrow ridge, granite outcrops; amongst trees: *Eucalyptus melliodora , E. blakelyi, Callitris glaucophylla, Allocasuarina verticillata, Brachychiton populneus; Acacia vestita* common.
*W*TG08	702536 6408434	640m	Granite knoll nearby; exotic grassland; scattered *Eucalyptus albens, Acacia implexa, Angophora floribunda; Acacia Vestita*
WTG09	-	-	Cleared paddock, not visited.
WTG10	-	-	Cleared paddock, not visited.
WTG12	-	-	Cleared paddock, not visited.
WTG13	-	-	Cleared paddock, not visited.
WTG15	-	-	Cleared paddock, not visited.
WTG16	-	-	Cleared paddock, not visited.
WTG09	701986 6410252	638m	Exotic grassland; very scattered *Eucalyptus albens.*
WTG10	701936 6409434	656m	Exotic grassland; scattered small trees of *Acacia implexa*, small rocky areas.
WTG11	701510 6410001	658m	Exotic grassland; knoll; little native ground cover; trees : *Eucalyptus albens, E. blakelyi.*
WTG12	701300 6409663	660m	Mostly exotic grassland; rock outcrop on knoll; *Eucalyptus albens* present.
WTG13	701106 6409224	660m	Mostly exotic ground cover; large granite outcrop; covered in trees and large shrubs: *Eucalyptus melliodora, Acacia vestita, Brachychiton populneus, Callitris glaucophylla.*
WTG14	701086 6408884	642m	Paddock sown with *Phalaris*; a few trees in vicinity: *Eucalyptus melliodora, E. blakelyi, Acacia implexa.*
WTG15	700886 6410634	640m	Exotic grassland; scattered trees around knoll - *Eucalyptus albens.*
WTG16	700836 6411084	620m	Exotic grassland; treeless knoll.
WTG17	699713 6412565	608m	Exotic grassland; almost treeless ridge.
WTG18	699560 6411787	640m	Exotic grassland; almost treeless ridge.
WTG19	699518 6412163	638m	Exotic grassland; almost treeless ridge.
WTG20	696649 6412773	596m	Exotic grassland; some sowing of pasture; almost treeless, some *Eucalyptus albens.*
WTG21	696262 6413204	580m	Exotic grassland; some sowing of pasture; almost treeless, some *Eucalyptus albens.*

WTG22	696260 6412508	595m	Exotic grassland; some sowing of pasture; almost treeless, some *Eucalyptus albens.*
WTG23	696086 6411834	600m	Exotic grassland; some sowing of pasture; almost treeless, some *Eucalyptus albens.*
WTG24	695086 6412384	575m	Granite knoll; very rocky, mostly mix of native and exotic plants; scattered trees: *E. blakeyli, Callitris glaucophylla*, mostly small.
WTG25	694977 6415650	520m	Exotic grassland; almost treeless.
WTG26	694944 6414839	535m	Exotic grassland; almost treeless.
WTG27	694935 6415159	529m	Exotic grassland; almost treeless.
WTG28	694526 6411184	560m	Scattered trees, mixed native-exotic understorey.
WTG29	694275 6414144	540m	Exotic grassland; almost treeless; some native grass patches (*Austrostipa* sp., *Bothriochloa macra*).
WTG30	694086 6411684	580m	Large granite knoll; rocky with many natives; trees *E. blakelyi, Acacia dorytoxylon*, etc.
WTG31	694025 6414477	538m	Exotic grassland; almost treeless; some native grass patches (*Austrostipa* sp., *Bothriochloa macra*).
WTG32	693448 6416362	500m	Exotic grassland; almost treeless.
WTG33	693423 6415324	520m	Exotic grassland; scattered *Eucalyptus albans*, *E.sideroxylon* and *E. blakelyi.*
WTG34	693367 6411876	556m	Granite; exotic grassland, natives amongst rocks; trees, mostly small, nearby: *E. blakelyi, E. bridgesiana, Acacia implexa*, *Allocasuarina verticillata*; *Bothriochloa macra* is common.
WTG35	693193 6411552	549m	Large outcrop of granite; surrounded by trees: *Eucalyptus albens*, *Callitris glaucophylla, Acacia dorytoxylon,* and *Brachychiton populneus;* mixed native-exotic ground cover; native perennial grasses common.
WTG36	692829 6414961	520m	Exotic grassland; scattered *Eucalyptus albens*; *Bothriochloa macra* common.
WTG37	692599 6411960	540m	Exotic grassland; treeless; no surface rock.
WTG38	692599 6416740	500m	Exotic grassland; occasional trees of *Eucalyptus albens* nearby.
WTG39	691963 6415040	500m	Exotic grassland.
WTG40	691692 6416642	500m	Exotic grassland; treeless; *Bothriochloa macra* is common.
WTG41	691672 6415899	500m	Exotic grassland; scattered *Eucalyptus albens* and *Brachychiton populneus*; *Bothriochloa macra* is common.
WTG42	690833 6413029	500m	Exotic grassland; scattered *Eucalyptus albens* and *Brachychiton populneus*.
WTG43	690466 6410294	500m	Exotic grassland; scattered *Eucalyptus albens;* woodland in vicinity.
WTG44	689673 6412056	500m	Native pasture/exotic grassland; located within stand of *Eucalyptus albens*; old mine site.
WTG45	689646 6412574	500m	Cropping paddock; exotic grassland; stand of *Eucalyptus albens* nearby.
WTG46	689348 6413614	480m	Native pasture/exotic grassland; scattered *Eucalyptus albens*.
WTG47	688553 6412837	480m	Exotic grassland; scattered *Eucalyptus albens*.

Note. Highlighted sites (15) were deleted from the project late in the preparation of this report, while six (6) sites were added.

Appendix 5
Tree Hollow Survey Results

Tree Hollow Survey Form				
Site Name: Bodangora				
Location: Gunnegalderie property		**Date:** 13 July 2011		
GPS (WGS84)**:** 55 0702536 6408434		**Site No**.: THoll.01		
Topography: Ridge crest and adjacent upper slope.		**No. of trees Surveyed**: 53		
Species	**Hollows <10cm diam.**	**10-20cm**	**>20cm**	**dch**
Angophora floribunda	1			86cm
Angophora floribunda	2		1	89cm
Eucalyptus albens	1			89cm
Eucalyptus albens	1			65cm
Eucalyptus albens	4			108cm
Eucalyptus albens			1	108cm
Eucalyptus albens	1			93cm
Eucalyptus macrorhyncha	2			71cm
Eucalyptus macrorhyncha		1		95cm
Eucalyptus macrorhyncha	1	1		140cm
Dead tree	1	3		60cm
Dead tree	1			59cm
Dead tree	2			42cm
10 live. 3 dead.	17	5	2	Av.: ? cm

Tree Hollow Survey Form				
Site Name: Bodangora				
Location: Gunnegalderie property		**Date:** 13 July 2011		
GPS (WGS84)**:** 55 071510 6410001		**Site No**.: THoll.02		
Topography: Ridge crest and adjacent upper slope.		**No. of trees Surveyed**: 67		
Species	**Hollows <10cm diam.**	**10-20cm**	**>20cm**	**dch**
Angophora floribunda	4			100cm
Angophora floribunda	1			110cm
Angophora floribunda	1			62cm
Eucalyptus macrorhyncha	1			96cm
Eucalyptus macrorhyncha	3		1	89cm
Eucalyptus macrorhyncha	4		1	65cm
Eucalyptus macrorhyncha	5	1	1	110cm
Eucalyptus albens	1	2		52cm
Eucalyptus albens	1			93cm
Eucalyptus bridgesiana	4			76cm
Eucalyptus melliodora	2	1		70cm
Eucalyptus polyanthemos	1			95cm
Eucalyptus polyanthemos	2	1		70cm
Dead tree	2			36cm
				cm
13 live. 1 dead.	29	4	3	Av.: ? cm

Tree Hollow Survey Form				
Site Name: Bodangora				
Location: Gallinghall Road (2 sections)		**Date:** 13 July 2011		
GPS (WGS84)**:** 55 0691392 6408352 to 0693091 6414317		**Site No**.: THoll.03		
Topography: Broad valley floor; roadside.		**No. of trees Surveyed**: 103		
Species	**Hollows <10cm diam.**	**10-20cm**	**>20cm**	**dch**
Eucalyptus melliodora	2			96cm
Eucalyptus melliodora	2			58cm
Eucalyptus melliodora	3			90cm
Eucalyptus albens		1		74cm
Eucalyptus albens	2			66cm
Eucalyptus albens	3			89cm
Eucalyptus albens		1		65cm
Eucalyptus conica	2	3	1	145cm
Dead tree	5		1	120cm
8 live. 1 dead.	19	5	2	Av.: ? cm

Tree Hollow Survey Form				
Site Name: Bodangora				
Location: Road northeast of Bodangora		**Date:** 14 July 2011		
GPS (WGS84)**:** 55 0688763 6409552 to 0689246 6410954		**Site No**.: THoll.04		
Topography: Undulating valley floor.		**No. of trees Surveyed**: 73		
Species	**Hollows <10cm diam.**	**10-20cm**	**>20cm**	**dch**
Eucalyptus albens			1	124cm
Eucalyptus albens			1	73cm
Eucalyptus albens	6			95cm
Eucalyptus albens	2			62cm
Eucalyptus albens	1			60cm
Eucalyptus albens	3			130cm
Dead tree	5			37cm
Dead tree	2			105cm
6 live. 2 dead.	19	0	2	Av.: ? cm

Tree Hollow Survey Form				
Site Name: Bodangora				
Location: Northwest of Bodangora (mine site)		**Date:** 14 July 2011		
GPS (WGS84)**:** 55 0689558 6411987		**Site No**.: THoll.05		
Topography: Ridge crest and adjacent upper slope.		**No. of trees Surveyed**: 65		
Species	**Hollows <10cm diam.**	**10-20cm**	**>20cm**	**dch**
Eucalyptus albens	1			69cm
Eucalyptus albens	2			56cm
Eucalyptus albens	1			55cm
Eucalyptus albens	1			34cm
Eucalyptus albens	1	1		43cm
Eucalyptus albens	1	1		62cm
Eucalyptus albens	2			44cm
Eucalyptus albens		1		50cm
Eucalyptus albens	1			64cm
Eucalyptus albens	1			64cm
Eucalyptus albens	2			48cm
Eucalyptus albens	1			62cm
Eucalyptus albens	2			107cm
Eucalyptus albens	1			36cm
Eucalyptus albens	1			43cm
Eucalyptus albens	1			41cm
Eucalyptus albens	1			37cm
17 live. 0 dead.	20	3	0	Av. ? cm

Appendix 6
Control Classes for Noxious Weed Species

Weed Control Classes

(1) The following weed control classes may be applied to a plant by a weed control order:
- (a) Class 1, State Prohibited Weeds,
- (b) Class 2, Regionally Prohibited Weeds,
- (c) Class 3, Regionally Controlled Weeds,
- (d) Class 4, Locally Controlled Weeds,
- (e) Class 5, Restricted Plants.

(2) The characteristics of each class are as follows:
- (a) Class 1 noxious weeds are plants that pose a potentially serious threat to primary production or the environment and are not present in the State or are present only to a limited extent.
- (b) Class 2 noxious weeds are plants that pose a potentially serious threat to primary production or the environment of a region to which the order applies and are not present in the region or are present only to a limited extent.
- (c) Class 3 noxious weeds are plants that pose a serious threat to primary production or the environment of an area to which the order applies, are not widely distributed in the area and are likely to spread in the area or to another area.
- (d) Class 4 noxious weeds are plants that pose a threat to primary production, the environment or human health, are widely distributed in an area to which the order applies and are likely to spread in the area or to another area.
- (e) Class 5 noxious weeds are plants that are likely, by their sale or the sale of their seeds or movement within the State or an area of the State, to spread in the State or outside the State.

(3) A noxious weed that is classified as a Class 1, 2 or 5 noxious weed is referred to in this Act as a *notifiable weed*.

(4) Legal Requirements

Class 1. The plant must be eradicated from the land and the land must be kept free of the plant.
Class 2. The plant must be eradicated from the land and the land must be kept free of the plant.
Class 3. The plant must be fully and continuously suppressed and destroyed.
Class 4. 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.
Class 4*. 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 an the plant may not be sold, propagated or knowingly distributed.
Class 5. The requirements in the *Noxious Weeds Act* for a notifiable weed must be complied with.

Appendix 7
List of Threatened Species recorded for the Locality

Source: NSW Wildlife Atlas, extracted October 2010.

Fauna, threatened species, Selected Area - 148.83333,-32.58333,149.33333,-32.25000 returned a total of 51 records of 14 species.

Report generated on 11/10/2010 - 21:32 (Data valid to 25/04/2010)

Aves	Map	Scientific Name	Common Name	Legal Status	Count
Acanthizidae					
	☐	Pyrrholaemus saggitatus	Speckled Warbler	V	8
Accipitridae					
	☐	Hieraaetus morphnoides	Little Eagle	V	1
Cacatuidae					
	☐	Calyptorhynchus lathami	Glossy Black-Cockatoo	V	7
Climacteridae					
	☐	Climacteris picumnus	Brown Treecreeper	V	4
Estrildidae					
	☐	Stagonopleura guttata	Diamond Firetail	V	2
Meliphagidae					
	☐	Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	V	1
Neosittidae					
	☐	Daphoenositta chrysoptera	Varied Sittella	V	1
Petroicidae					
	☐	Melanodryas cucullata	Hooded Robin	V	1
Psittacidae					
	☐	Glossopsitta pusilla	Little Lorikeet	V	4
	☐	Neophema pulchella	Turquoise Parrot	V	1
	☐	Polytelis swainsonii	Superb Parrot	V	7
Strigidae					
	☐	Ninox connivens	Barking Owl	V	7

Mammalia	Map	Scientific Name	Common Name	Legal Status	Count
Dasyuridae					
	☐	Dasyurus maculatus	Spotted-tailed Quoll	V	1
Phascolarctidae					
	☐	Phascolarctos cinereus	Koala	V	6

Flora, threatened species, Selected Area - 148.83333,-32.58333,149.33333,-32.25000 returned a total of 113 records of 5 species.
Report generated on 11/10/2010 - 21:45 (Data valid to 25/04/2010)

Plants	Map	Scientific Name	Common Name	Legal Status	Count
Fabaceae (Faboideae)					
	☐	*Swainsona recta*	Mountain Swainson-pea	E1	88
	☐	*Swainsona sericea*	Silky Swainson-pea	V	1
Fabaceae (Mimosoideae)					
	☐	*Acacia ausfeldii*	Ausfeld's Wattle	V	4
Orchidaceae					
	☐	*Caladenia arenaria*	Sand-hill Spider Orchid	E1	1
Rutaceae					
	☐	*Zieria obcordata*	-	E1	19