



**Centre for  
Environmental  
Management**

**Report Commissioned by Future Energy**

# **Leonards Hill Wind Park – Fauna Assessment**

**July 2006**



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Report to Future Energy

by:

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## BACKGROUND

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The development of the wind energy industry in Australia is progressing rapidly and is widely considered to be an environment-friendly alternative to the production of energy using fossil fuels. Wind turbines, however, pose a risk to fauna, particularly flying forms such as birds and bats. Risks include collisions with operating wind turbines and disturbance and resulting avoidance of habitats in and near wind farms (Brett Lane & Associates 2005). Some species may be particularly vulnerable including birds of prey and owls (Brett Lane & Associates 2005).

Potential impacts on fauna form an important part of the planning, assessment and approval process for wind energy developments. In recognition of the importance of a thorough risk assessment of potential fauna impacts during development and operation of wind energy facilities, protocols have been developed to provide guidance to the most appropriate siting, design and management of wind energy facilities. For example, Wind Farms and Birds: Interim Standards for Risk Assessment (Brett Lane & Associates 2005) provides key information for both companies operating wind farms and agencies involved in the approval process on a standard approach to assessing bird impacts pre-development and post-development.

### Leonards Hill Wind Park

Future Energy Pty. Ltd. is investigating the possible establishment of a small community wind park at Leonards Hill, south of Daylesford. The proposed community wind park will comprise two modern turbines and be expected to provide enough energy to power over 2,000 homes. The turbines will be situated on cleared farmland.

As an initial step in assessing the feasibility of the Leonards Hill Wind Park project, Future Energy has commissioned the Centre for Environmental Management, University of Ballarat to provide an overview of the fauna recorded from the site and surrounding areas. The overview of the site and its surrounds involved two components:

- A review of existing, available information on fauna at the site and within the surrounding region.
- An inspection of the site and the surrounding region to assess the nature of fauna habitats present and potential fauna usage of the site and its surrounds.

The objective of this overview is to provide an assessment of the fauna of the proposed wind park site and the surrounding region. In particular the overview aims to:

- Identify the potential occurrence of any significant species at the site.
- Identify fauna habitats on or near the proposed wind park site.
- Identify species that may be adversely impacted during the establishment and functioning of the wind turbines based on the results of the desktop assessment and field inspection of fauna habitats present.

This overview will provide an estimate of the potential for significant fauna impacts and identify issues requiring further investigation.

## Study Area

The proposed Leonards Hill Wind Park site is located on cleared farmland at Leonards Hill, approximately 10 km south of Daylesford, on the east side of the Ballan-Daylesford Road. The farmland on which the proposed wind park occurs abuts the Wombat State Forest to the east. The extensive Wombat State Forest also occurs approximately 1-2 km west of the proposed wind park. These forests mostly support Herb-rich Foothill Forest EVC and Shrubby Foothill Forest EVC. The site occurs within the Central Victorian Uplands bioregion.

The proposed wind park site is mostly cleared farmland, presently used for cattle grazing, potato crops and hay production. Some remnant Blackwood *Acacia melanoxylon* persist along fencelines. There are two prominent vegetation corridors, running north-south, approximately 200 m to the east and 300 m west of the proposed locations of the two wind turbines. The eastern corridor is approximately 15 m in width and occurs on an unused road reserve. This corridor supports native vegetation including many large, old eucalypts. To the west, the vegetated roadside adjoining the Ballan-Daylesford Road also provides a corridor for faunal movement in the landscape. This corridor is approximately 50 m wide.

There are two small farm dams located approximately 200-300 m from the site of the proposed wind turbines.



**Figure 1** View of Leonards Hill from its south-west base.

## METHODS

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### Investigation area

The investigation area included three distinct zones:

- Zone 1 - the site of the proposed wind turbines (includes 100 m radius around wind turbines) (Figure 2).
- Zone 2 - the site of the proposed wind park (the farm land surrounding the site of the proposed wind turbines; approximately 300 m radius around proposed wind turbines) (Figure 3).
- Zone 3 - the area surrounding the proposed wind park (5 km radius around proposed wind turbines) (Figure 4).

These zones align with the guidelines identified by Brett Lane & Associates (2005) for determining the potential impact of wind farms and reflect the potential mobility of birds, and bats, within landscapes.

### Existing information

Existing fauna records for the wind park site and its surrounds were sourced from the Atlas of Victorian Wildlife (AVW) (DSE 2004a). A five kilometre buffer area around the wind turbines was used and all records within this area were compiled. Records were filtered to a locational accuracy of  $\leq 2'$  longitude/latitude.

The AVW contains the most complete readily accessible Victorian data on fauna location records, including Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) and Flora and Fauna Guarantee Act 1988 (FFG Act) listed species, as well as threatened species within Victoria.

In addition, the EPBC Act – Database of Significant Locations (DEH – [www.deh.gov.au](http://www.deh.gov.au); Accessed 1 March 2006) was searched for matters protected by the EPBC Act that may occur in the Leonards Hill area. The report generated from this search provides general guidance on matters of National Environmental Significance (NES) and other matters protected by the EPBC Act in the search area. The NES and other matters protected by the EPBC Act that are listed from a search (e.g. threatened species or ecological communities, or migratory species) are those that are predicted to occur within the area, and a general indication is provided of the likelihood of their presence. Species or communities highlighted by the search therefore have not necessarily been recorded from the search site, but may occur there if suitable habitat is present.

The Wombat State Forest Explorer was also searched for information on biodiversity values in the study area (DSE 2004b).

## Field inspection

A field inspection of the proposed Leonards Hill Wind Park was undertaken on 20 February 2006. This included searches of the site of the proposed wind turbines and the proposed wind park.

The field inspection included a complete traverse of the proposed wind park site, inspecting potential fauna habitat and recording any observations of fauna. Observations of tracks, scratchings, burrows and scats were also recorded. The field inspection did not include systematic fauna surveys (e.g. trapping, spotlighting and Anabat) of the proposed wind park site.

All remnant trees within the cleared farmland (Zones 1 and 2) surrounding the proposed turbine sites (approximately 300 m radius) were inspected for potential fauna habitats and signs of fauna use.



**Figure 2** Typical Zone 1 habitat

## Limitations

The field inspection was conducted on a single day in February 2006 and focused predominantly on the presence of potential fauna habitat. The fauna observations recorded therefore represent only a brief snapshot of the fauna likely to use the site. The small amount of time spent at the site may not have been adequate to detect rare, cryptic, migratory or wide-ranging species. The observations, while not exhaustive, do provide a representative account of the fauna present at the site, and complement those records contained within the AVW (DSE 2004a).

Observations of fauna during the field inspection were largely limited to opportunistic sightings of species while traversing the site and its surrounds by foot. More intensive survey methods, such as bat trapping, use of Anabat detectors and call playback, could result in additional species being recorded. However, based on the fauna habitat present at the site and previous records of species observed in the district, more intensive survey is unlikely to add significantly to the current knowledge of threatened or sensitive species that may utilise the site.



**Figure 3** Typical Zone 2 habitat abutting vegetated roadside corridor



**Figure 4** View of landscape (Zone 3) surrounding proposed wind park site

# FAUNA OVERVIEW OF LEONARDS HILL WIND PARK

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## Existing information

There were no existing fauna records within Zones 1 and 2 of the proposed Leonards Hill Wind Park (DSE 2004a). The AVW contained records of 71 vertebrate fauna species occurring within five kilometres of the proposed Leonards Hill Wind Park site (Zone 3). This includes 38 birds (37 native species and one introduced species), 22 mammals (18 native species and four introduced species), six reptiles, four frogs and one fish (Appendix 1).

There were no species listed as threatened in Australia under the EPBC Act recorded within five kilometres of the proposed wind park site (DSE 2004a). Two species listed as threatened in Victoria under the FFG Act have been recorded within five kilometres of the proposed wind park; Powerful Owl (also considered vulnerable in Victoria) and Mountain Galaxias (DSE 2004a). One species listed on the Advisory List of Threatened Vertebrate Fauna in Victoria (DSE 2003), the endangered Brown Toadlet, has also been recorded within five kilometres of the proposed wind park site.

The predicted species report generated from the EPBC Act – Database of Significant Locations (DEH – [www.deh.gov.au](http://www.deh.gov.au); Accessed 1 March 2006) included several species not listed in the AVW search. Of these predicted occurrences, seven bird species were identified as potentially occurring in the Leonards Hill area (Appendix 2). These included the threatened Swift Parrot and Regent Honeyeater (both considered endangered under the EPBC Act), migratory species White-throated Needletail, Satin Flycatcher and Rufous Fantail and other protected species under the EPBC Act including Fork-tailed Swift and Rainbow Bee-eater. The AVW did not contain records of any of these species within 5 km of the proposed wind park (DSE 2004a).

## Field inspection

A total of 29 fauna species were recorded at the proposed Leonards Hill Wind Park site and the surrounding area during the field inspection (Zones 1 and 2) (Appendix 3). This included 27 bird species and two mammal species (one native species and one introduced species) (Appendix 3).

None of the fauna species recorded during the survey are listed as threatened in Australia or Victoria.

Three bird species were recorded during the field inspection at the site of the proposed wind turbines (Zone 1): Australian Magpie, Little Raven and Welcome Swallow. These species are all common and widespread and are typical of open farmland habitats.

All species listed in Appendix 3 were observed in Zone 2. These species are common and widespread in southeast Australia (Emission *et al.* 1987). The majority of these species were observed in the patches and corridors of native vegetation located away from the site of the proposed wind turbines.

The assessment of potential fauna habitats close to the proposed wind park site (Zones 1) identified isolated trees and associated hollows as providing potential habitat for fauna (Figure 5). The value of these trees and their associated hollows to fauna at the site is likely to be reduced due to their isolation in the landscape.

A medium-sized nest was observed in a remnant eucalypt within Zone 2 which would have been constructed by an Australian Magpie or raven species.



**Figure 5** Isolated remnant Blackwood *Acacia melanoxylon* within Zone 1

Two small to medium-sized farm dams are present in Zone 2. These supported little emergent vegetation or submerged coarse woody debris and therefore had limited habitat value for fauna and would not support large waterbird populations.

## POTENTIAL FAUNA USE OF STUDY AREA

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Wind turbines do present a collision risk to birds and bats during flight. The flight behaviour of some species may put them at particular risk. Groups of species that may be exposed to greater risk based on their flight behaviour includes birds of prey (e.g. Wedge-tailed Eagle) and waterbirds that fly in dense concentrations. The relative risk of collisions with wind turbines is lowered by the size of the proposed wind park, which comprises just two wind turbines. Landscape structure also influences the risk level associated with wind turbines. The occurrence of geographical features such as waterways, ridgelines and vegetation corridors influence the pattern of fauna movements through the landscape. The presence of landscape features, such as large wetlands and grain crops, that attract large concentrations of birds can also influence risk levels.

### **Fauna movement through the landscape**

The geographical layout of the proposed Leonards Hill Wind Park site is unlikely to concentrate or funnel bird or bat movements towards the proposed turbine sites. Leonards Hill is 717 m a.s.l. and forms a medium-sized rise in an undulating landscape. The mound-shaped hill is isolated from surrounding rises and does not form a distinct ridge-line that are often preferred flight areas for birds of prey, such as the Wedge-tailed Eagle. There were no major drainage lines that could function as important corridors for faunal movement in close proximity to the proposed wind park site.

Potential linear corridors for fauna movement are located to the east and west of the proposed turbine sites and there are large patches of native vegetation east and west of the site. Species moving through the landscape are likely to use these corridors and surrounding forest rather than the cleared area in which the proposed wind park would be situated. Most species observed during the field inspection were within the corridors, which form part of Zone 2. The species recorded here were typical of forest and woodland habitats and would not be expected to regularly use the open farmland habitats that surround the proposed wind turbines.

The review of existing information and the field inspection identified few significant fauna habitats (i.e. those that attract high numbers of potentially susceptible species) within the area (Zones 1, 2 and 3) that could potentially increase the fauna impacts of the wind park. There are no significant wetland habitats (Ramsar wetlands and protected areas) or other wetlands within five kilometres that are likely to support significant concentrations of listed migratory species that would have a flight path affected by the proposed wind park. There is unlikely to be large concentrations of waterbirds, including communal roosts, in the area at any time.

There is some potential for large bird concentrations to occur within the site if any grain or other seed crops are planted nearby in the future. Such crops within the area surrounding the proposed wind park have the potential to attract large flocks of Sulphur-crested Cockatoos, Long-billed Corellas and Galahs, which are all common and widespread in Victoria. The susceptibility of these species to collision with wind turbines when in large flocks is unknown, but it is likely to be greater than when present in small flocks.

### **Fauna habitat within the study site**

The land within the immediate vicinity of the proposed wind park site is farmland. At the time of survey the land within 200 m of the proposed turbines was variously used for cattle grazing, hay production and potato cropping. This land use favours open country species such as Australian Magpie and Little Raven and various other species that are common and widespread in southeast Australia.

There are a small number of remnant trees present, mostly mature Blackwood *Acacia melanoxylon* located along existing fencelines. A small proportion of these trees contained hollows which may provide shelter and breeding sites for birds, bats and arboreal mammals. These trees are isolated from the large patches and corridors of intact vegetation. Research into the use of trees by bats in rural landscapes found bat activity and bat abundance decreased as tree density decreased (Lumsden & Bennett 2005). It was found that bat activity and bat abundance was highest in areas of dense scattered trees and woodland blocks, but the ability of bats to commute across open areas enabled them to access sparsely scattered trees (Lumsden and Bennett 2005).

## POTENTIAL THREATS TO SPECIES

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The proposed Leonards Hill Wind Park, comprising two wind turbines, presents a low risk to fauna based on its small size and the limited habitat value that the proposed site has for fauna. The fauna habitats at the proposed wind park site are unlikely to provide suitable habitat for any significant fauna species identified in this report or species known to be at particular risk of adverse impacts associated with the development and operation of the wind park.

The Swift Parrot is considered endangered under the EPBC Act. This species mainly occurs in the Box-Ironbark forests and woodland in central and northern Victoria (DSE 2003). Gullies provide key habitats for these species in such forests. This species is known to be vulnerable to collisions with building windows in Tasmania (DSE 2003). The proposed wind park site does not provide suitable habitat for this species, but based on its nomadic nature, the Swift Parrot may move through the Leonards Hill area from time to time. The AVW did not contain any records of this species in the Leonards Hill area (DSE 2004a). The likelihood of any impact to this species associated with the proposed wind park is low.

The Regent Honeyeater is also considered endangered under the EPBC Act. This species has similar habitat preferences to the Swift Parrot, but significant declines in Victoria mean that it is now unlikely to occur in the region. The AVW did not contain any records of this species in the Leonards Hill area. The impact of the proposed wind park on Regent Honeyeater would be low.

The proposed wind park would also have an insignificant impact on other bird species protected under the EPBC Act that are predicted to occur in the Leonards Hill area (Appendix 2). Rufous Fantail and Satin Flycatcher inhabit forests, particularly dense gully habitats. The proposed wind park site does not provide suitable habitat for these species. White-throated Needletail and Fork-tailed Swift are aerial species that are rarely observed to alight and sometimes congregate in large numbers (Emison *et al.* 1987). Both species often forage very high in the air, but may also forage at lower levels feeding on insects (Emison *et al.* 1987). Therefore, based on their flight behaviour, wind turbines may present some risk to these species, however the small scale of the proposed development means any impact to these species is likely to be low even if they do fly over the area. The Rainbow Bee-eater occurs in wooded habitats in central and northern Victoria. The proposed wind park does not support suitable habitat for this species.

The Powerful Owl is considered to be vulnerable in Victoria (DSE 2003) and is listed as threatened in Victoria under the FFG Act. This species has been recorded at several locations within 5 km of the proposed wind park site. The Powerful Owl occurs in forest habitats where they favour gullies (Emison *et al.* 1987). This species hunts at night, flying through the forest canopy and preying upon arboreal mammals (Emison *et al.* 1987). The cleared farmland surrounding the proposed wind farm (Zones 1 and 2) is unlikely to provide habitat value for this species. Whilst the Powerful Owl may hunt in open farmland adjacent to forests, based on the configuration of the landscape surrounding the proposed wind farm site (Zones 2 and 3), with large patches of forest and vegetated corridors connecting major patches, the necessity for Powerful Owls to cross the site would be limited and therefore any effect would be small.

The Mountain Galaxias is listed as threatened in Victoria under the FFG Act. The Mountain Galaxias is a fish that occurs in small, flowing streams and would not be affected by the proposed wind park.

The Brown Toadlet is considered to be endangered in Victoria (DSE 2003). This species occurs in the litter layer of forests and would not be affected by the proposed wind park.

Based on their flight behaviour, birds of prey may be at increased risk of collision with wind turbines. Bird of prey species recorded within 5 km of the proposed wind park site were Brown Goshawk and Wedge-tailed Eagle. Brown Goshawks typically inhabit forests and woodlands and are rare in open farmland (Emison *et al.* 1987). This species generally catch prey on the ground or in flight among trees (Emison *et al.* 1987). The Brown Goshawk is widespread in Victoria. The Wedge-tailed Eagle occurs in a wide variety of habitats, including woodlands and open farmland. This species is often observed soaring at various heights, using updrafts associated with variable topography such as ridgelines. An individual Wedge-tailed Eagle was reported to collide with a wind turbine in Tasmania (AusWEA Fact Sheet 8: Wind Farms and Bird and Bat Impacts – [www.auswea.com.au](http://www.auswea.com.au); Accessed 21 February 2006). The topography of the proposed Leonards Hill Wind Park site would present a lower likelihood of attraction to soaring Wedge-tailed Eagles as it is not a major rise in the landscape (in height or slope) and does not form a continuous ridgeline. As a result there would be less generation of the strong updraft winds that Wedge-tailed Eagles frequently use. There were four records of the Wedge-tailed Eagles within 5 km of the proposed wind park in the AVW (2004a), all greater than 2 km from the site. It is therefore unlikely that the Leonards Hill area is important to this species, or other bird of prey species, and the impacts associated with the proposed wind park would be low.

There are records of three waterbird species within 5 km of the proposed wind park. The Straw-necked Ibis has been recorded in the AVW (DSE 2004a). A small mixed-flock of Pacific Black Duck and Australian Wood Duck were observed on a farm dam within Zone 2 during the field inspection. There are no large wetland habitats within five kilometres that are likely to regularly support significant concentrations of birds that would have a flight path affected by the proposed wind park. As there are unlikely to be large concentrations of waterbirds, including communal roosts, in the area at any time, the potential impact to these species will be low.

Based on the findings of Lumsden & Bennett's (2005) investigation into the use of trees in rural landscapes by bats in northern Victoria, it is likely that some bats make use of the isolated trees present in Zones 1 and 2. Bat activity and abundance, however, is likely to be significantly less than that in surrounding areas supporting more native vegetation such as that occurring in the vegetated corridors and surrounding forests. Small numbers of bats have been reported to collide with wind turbines in Australia (AusWEA Fact Sheet 8: Wind Farms and Bird and Bat Impacts – [www.auswea.com.au](http://www.auswea.com.au); Accessed 21 February 2006). Assuming that bat activity and bat abundance is significantly reduced in the open farmland area (Zones 1 and 2) for the species identified in this report as occurring in this district, the proposed wind park will have a low impact on bats.

## SUMMARY OF IMPACTS

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The fauna assessment conducted at the proposed Leonards Hill Wind Park provides an initial assessment of the known fauna information for the site and its surrounds that should enable further assessment of the projects feasibility. There are no indications within the existing AVW records, or from the site assessment, that significant species utilise the proposed wind park site. The habitat present at the proposed wind park site does not provide suitable habitat for significant species recorded from the area. There are no indications that the proposed wind park would have a significant impact on any species or species group. The construction and operation of the proposed wind farm will potentially impact on some fauna, including potential impacts to birds and bats, however this impact has been assessed as low in this report.

Based on this assessment of potential threats to species associated with the proposed Leonards Hill Wind Park, the development presents a low risk to fauna. This assessment is based on the qualitative risk analysis approach presented in Brett Lane & Associates (2005) that uses estimates of the level of consequence and its likelihood to assess risk. The level of consequence represents mortality of or disturbance to fauna and ranges from insignificant to significant with the likelihood of risk ranging from very rare to probable. The consequence of the proposed wind park on fauna is minor and the likelihood that these consequences or impacts could occur is rare. Therefore the risk associated with the proposed wind park is low for threatened and listed species, birds that flock or occur in low numbers and species or groups of species that are prone to collision with turbines or to indirect effects from wind farms.

### Further investigations

If the proposed development proceeds and Future Energy is required to conduct operational phase fauna monitoring (in which impacts of the operation of the wind park are monitored), it will be necessary to conduct more detailed pre-operational fauna monitoring for comparative purposes (Brett Lane & Associates 2005).

## REFERENCES

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# APPENDIX 1 ATLAS OF VICTORIAN WILDLIFE RECORDS OF FAUNA FROM THE LEONARDS HILL REGION

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## Existing database records

The table below lists vertebrate fauna species recorded in the Atlas of Victorian Wildlife (DSE 2004a) from sites within five kilometres of the proposed Leonards Hill Wind Park site.

## Key to codes:

\* = introduced species

## Conservation status:

FFG - Flora and Fauna Guarantee Act 1988

L = listed as threatened under the Act

Advisory List of Threatened Vertebrate Fauna in Victoria (DSE 2003)

e = endangered v = vulnerable

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Species name	Common name
<b>Birds</b>	
<i>Threskiornis spinicollis</i>	Straw-necked Ibis
<i>Accipiter fasciatus</i>	Brown Goshawk
<i>Aquila audax</i>	Wedge-tailed Eagle
<i>Vanellus miles</i>	Masked Lapwing
<i>Calyptorhynchus funereus</i>	Yellow-tailed Black-Cockatoo
<i>Cacatua galerita</i>	Sulphur-crested Cockatoo
<i>Glossopsitta concinna</i>	Musk Lorikeet
<i>Glossopsitta porphyrocephala</i>	Purple-crowned Lorikeet
<i>Neophema chrysostoma</i>	Blue-winged Parrot
<i>Cuculus pallidus</i>	Pallid Cuckoo
<i>Cacomantis variolosus</i>	Brush Cuckoo
<i>Chrysococcyx lucidus</i>	Shining Bronze-Cuckoo
<b>Lv</b> <i>Ninox strenua</i>	Powerful Owl
<i>Dacelo novaeguineae</i>	Laughing Kookaburra
<i>Cormobates leucophaeus</i>	White-throated Treecreeper

Species name	Common name
<i>Acanthiza pusilla</i>	Brown Thornbill
<i>Acanthiza chrysorrhoa</i>	Yellow-rumped Thornbill
<i>Acanthiza lineata</i>	Striated Thornbill
<i>Anthochaera carunculata</i>	Red Wattlebird
<i>Lichenostomus chrysops</i>	Yellow-faced Honeyeater
<i>Lichenostomus melanops</i>	Yellow-tufted Honeyeater
<i>Melithreptus brevirostris</i>	Brown-headed Honeyeater
<i>Phylidonyris pyrrhoptera</i>	Crescent Honeyeater
<i>Petroica multicolor</i>	Scarlet Robin
<i>Petroica rosea</i>	Rose Robin
<i>Pachycephala pectoralis</i>	Golden Whistler
<i>Rhipidura fuliginosa</i>	Grey Fantail
<i>Rhipidura leucophrys</i>	Willie Wagtail
<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike
<i>Artamus cyanopterus</i>	Dusky Woodswallow
<i>Gymnorhina tibicen</i>	Australian Magpie
<i>Strepera versicolor</i>	Grey Currawong
<i>Corvus coronoides</i>	Australian Raven
<i>Corcorax melanorhamphos</i>	White-winged Chough
<i>Neochmia temporalis</i>	Red-browed Finch
* <i>Carduelis carduelis</i>	European Goldfinch
<i>Dicaeum hirundinaceum</i>	Mistletoebird
<i>Zosterops lateralis</i>	Silvereye
<b>Mammals</b>	
<i>Antechinus agilis</i>	Agile Antechinus
<i>Antechinus swainsonii</i>	Dusky Antechinus
<i>Trichosurus vulpecula</i>	Common Brushtail Possum
<i>Pseudocheirus peregrinus</i>	Common Ringtail Possum

	Species name	Common name
	<i>Petauroides volans</i>	Greater Glider
	<i>Petaurus breviceps</i>	Sugar Glider
	<i>Phascolarctos cinereus</i>	Koala
	<i>Vombatus ursinus</i>	Common Wombat
	<i>Wallabia bicolor</i>	Black Wallaby
	<i>Macropus giganteus</i>	Eastern Grey Kangaroo
	<i>Tadarida australis</i>	White-striped Freetail Bat
	<i>Nyctophilus geoffroyi</i>	Lesser Long-eared Bat
	<i>Chalinolobus gouldii</i>	Gould's Wattled Bat
	<i>Chalinolobus morio</i>	Chocolate Wattled Bat
	<i>Falsistrellus tasmaniensis</i>	Eastern False Pipistrelle
	<i>Vespadelus regulus</i>	Southern Forest Bat
	<i>Eptesicus sp.</i>	Unidentified Eptesicus
	<i>Rattus fuscipes</i>	Bush Rat
	* <i>Rattus rattus</i>	Black Rat
	* <i>Mus musculus</i>	House Mouse
	* <i>Ovis aries</i>	Sheep (feral)
	* <i>Canis vulpes</i>	Red Fox
<b>Reptiles</b>		
	<i>Egernia whitii</i>	White's Skink
	<i>Lampropholis guichenoti</i>	Garden Skink
	<i>Saproscincus mustelinus</i>	Weasel Skink
	<i>Niveoscincus coventryi</i>	Coventry's Skink
	<i>Eulamprus tympanum tympanum</i>	Southern Water Skink
	<i>Pseudemoia entrecasteauxii</i>	Southern Grass Skink
<b>Frogs</b>		
	<i>Geocrinia victoriana</i>	Victorian Smooth Froglet
e	<i>Pseudophryne bibronii</i>	Brown Toadlet
	<i>Crinia signifera</i>	Common Froglet

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	<b>Species name</b>	<b>Common name</b>
<b>Fish</b>	<i>Litoria ewingii</i>	Southern Brown Tree Frog
	L <i>Galaxias olidus</i>	Mountain Galaxias

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## APPENDIX 2 EPBC ACT – DATABASE OF SIGNIFICANT LOCATIONS RECORDS OF TERRESTRIAL FAUNA FROM THE LEONARDS HILL AREA

### Database records

The table lists those terrestrial fauna species predicted to occur in the Leonards Hill area based on the report generated from the EPBC Act – Database of Significant Locations (DEH – www.deh.gov.au; Accessed 1 March 2006) from the Leonards Hill area. Species that potentially occur in the area based on habitat preferences, movements or current distribution are identified.

	Species name	Common name	Potential occurrence
<b>Threatened</b>			
<b>sp.</b>			
	<i>Lathamus discolor</i>	Swift Parrot	✓
	<i>Rostratula australis</i>	Painted Snipe	
	<i>Xanthomyza phrygia</i>	Regent Honeyeater	✓
	<i>Litoria raniformis</i>	Growling Grass Frog	
	<i>Dasyurus maculatus maculatus</i>	Spot-tailed Quoll	
	<i>Pseudomys fumeus</i>	Smoky Mouse	
	<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	
	<i>Delma impar</i>	Striped Legless Lizard	
<b>Migratory</b>			
<b>sp.</b>			
	<i>Haliaeetus leucogaster</i>	White-bellied Sea-eagle	
	<i>Hirundapus caudacutus</i>	White-throated Needletail	✓
	<i>Myiagra cyanoleuca</i>	Satin Flycatcher	✓
	<i>Rhipidura rufifrons</i>	Rufous Fantail	✓
	<i>Gallinago hardwickii</i>	Latham's Snipe	
<b>Overfly</b>			
<b>marine area</b>			
<b>sp.</b>			
	<i>Apus pacificus</i>	Fork-tailed Swift	✓
	<i>Ardea alba</i>	Great Egret	

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<b>Species name</b>	<b>Common name</b>	<b>Potential occurrence</b>
<i>Ardea ibis</i>	Cattle Egret	
<i>Merops ornatus</i>	Rainbow Bee-eater	✓

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## APPENDIX 3 FAUNA RECORDED FROM THE PROPOSED LEONARDS HILL WIND PARK SITE AND ITS SURROUNDS

### Site inspection records

The table below lists vertebrate fauna species recorded opportunistically during a site inspection of the proposed Leonards Hill Wind Park site and its surrounds conducted on the 20 February 2006.

### Key to codes:

\* = introduced species

Species name	Common name
<b>Birds</b>	
<i>Chenonetta jubata</i>	Australian Wood Duck
<i>Anas superciliosa</i>	Pacific Black Duck
<i>Glossopsitta concinna</i>	Musk Lorikeet
<i>Cacatua galerita</i>	Sulphur-crested Cockatoo
<i>Cacatua tenuirostris</i>	Long-billed Corella
<i>Cacatua roseicapilla</i>	Galah
<i>Platycercus elegans</i>	Crimson Rosella
<i>Hirundo neoxena</i>	Welcome Swallow
<i>Hirundo ariel</i>	Fairy Martin
<i>Rhipidura fuliginosa</i>	Grey Fantail
<i>Colluricincla harmonica</i>	Grey Shrike-thrush
<i>Acanthiza lineata</i>	Striated Thornbill
<i>Acanthiza pusilla</i>	Brown Thornbill
<i>Acanthiza chrysorrhoa</i>	Yellow-rumped Thornbill
<i>Sericornis frontalis</i>	White-browed Scrubwren
<i>Malurus cyaneus</i>	Superb Fairy-wren
<i>Cormobates leucophaeus</i>	White-throated Treecreeper
<i>Dicaeum hirundinaceum</i>	Mistletoebird
<i>Pardalotus punctatus</i>	Spotted Pardalote
<i>Zosterops lateralis</i>	Silvereye
<i>Melithreptus lunatus</i>	White-naped Honeyeater
<i>Lichenostomus chrysops</i>	Yellow-faced Honeyeater

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<b>Species name</b>	<b>Common name</b>
<i>Anthochaera carunculata</i>	Red Wattlebird
<i>Strepera versicolor</i>	Grey Currawong
<i>Gymnorhina tibicen</i>	Australian Magpie
<i>Corvus mellori</i>	Little Raven
<i>Pardalotus striatus</i>	Striated Pardalote
 <b>Mammals</b>	
<i>Macropus giganteus</i>	Eastern Grey Kangaroo
* <i>Oryctolagus cuniculus</i>	Rabbit

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