

**HAWKESDALE WIND FARM
AMENDMENT APPLICATION**

**EXPERT WITNESS STATEMENT
OF BERNARD O'CALLAGHAN**

Ryan Corner Development Pty Ltd



Brett Lane & Associates Pty. Ltd.
Ecological Research & Management

Suite 5 61–63 Camberwell Road, Hawthorn, VIC 3123

P.O. Box 337, Camberwell, VIC 3124

Ph. (03) 9815 2111

Fax. (03) 9815 2685

August 2017

Report No. 14144A (12.2)

CONTENTS

1. WITNESS INFORMATION 1

 1.1. Expert witness information..... 1

 1.1.1. Name and address 1

 1.1.2. Area of expertise 1

2. WORK UNDERTAKEN 3

 2.5. Sources of information 5

3. FINDINGS..... 7

 3.1. Native vegetation 7

 3.2. Assessment of birds and bats..... 8

 3.3. Birds..... 9

 3.3.1. Species recorded 9

 3.3.2. Birds and flight heights..... 10

 3.3.3. Change in risk to birds from change in RSA..... 10

 3.3.4. Potential impacts of modification on Brolgas 12

 3.3.5. Summary of impacts on birds 13

 3.4.1. Southern Bentwing Bat..... 14

 3.4.2. Summary of impacts of modification on bats 14

 3.6. Bird and Avifauna Management Plan (BAM Plan) 15

 3.7. Response to submissions 16

4. DECLARATION..... 17

5. REFERENCES..... 18

TABLES

Table 1: Details of other significant contributors 2

Table 2: The measurements of new turbine models proposed for Hawkesdale Wind Farm.
..... 4

Table 3: Proposed modifications to turbine specifications..... 8

Table 4: Change in RSA at height and bird flight heights at Hawkesdale Wind Farms..... 11

Table 5: Response to submissions 16

APPENDICES

Appendix 1: Qualifications and experience of Bernard O’Callaghan..... 20

Appendix 2: Qualifications of other contributors 21

1. WITNESS INFORMATION

1.1. Expert witness information

1.1.1. Name and address

Bernard Thomas O'Callaghan
Brett Lane & Associates Pty Ltd
Suite 5, 61-63 Camberwell Road
Hawthorn East, Vic. 3123

1.1.2. Area of expertise

Bernard has extensive expertise in ecology and related legislation and policies. He has particular expertise and experience in assessing and monitoring the impacts of wind farms on birds and bats. This has included:

- Bird and bat risk assessments to inform pre-feasibility studies for wind farm developments;
- Detailed bird and bat impact assessments, including on a range of bird and bat species of concern, for wind farm feasibility studies and development applications under both Commonwealth and state laws and regulations;
- Assessments of the effects of changes in turbine technology on birds and bats;
- Development and auditing of construction environmental management measures for wind farm projects
- Design and execution of bird and bat impact monitoring programs at seven operating wind farms around Australia, including five in Victoria;
- Recognised as the expert technical advisor to five wind farms in NSW by the Government of NSW; and
- Biodiversity compliance monitoring for operating wind farms.

His qualifications and experience are summarised in Appendix 1.

1.2. Information of other significant contributors

The names, addresses and areas of expertise of other significant contributors to this report, and associated background reports, are presented in Table 1.

1.3. Role of Bernard O’Callaghan

I confirm that my role in the assessment of the Hawkesdale Wind Farm has been:

- Project Manager and internal peer reviewer for the flora assessments of the proposed wind farm (2015 - onwards);
- Project Manager and internal peer reviewer for the 2015 -2017 re-assessment of bird and bat impacts of the revised turbine design that is the subject of the exhibited amendment application;
- Visited the site to confirm the findings and familiarise myself with the site in July 2017; and
- Preparation of this witness statement.

Table 1: Details of other significant contributors

Name of contributor	Address	Area of Relevant Expertise	Location of summary of qualifications and expertise
Alan Brennan	Brett Lane & Associates Pty Ltd Suite 5, 61-63 Camberwell Road, Hawthorn East, Vic. 3123	Ecological assessment, including native vegetation and flora.	Appendix 2
Justin Sullivan		Ecological assessment, including native vegetation and flora.	
Khalid Al-Dabbagh		Bird and bat utilisation surveys and data analysis	
Brett Lane		Principal Ecologist, Wind farm ecological impact assessments	

2. WORK UNDERTAKEN

Brett Lane & Associates Pty Ltd (BL&A) has completed a number of assessments of the impacts of the proposed modifications to the layout and turbine specifications of the Hawkesdale Wind Farm on biodiversity from 2015 to 2017.

These assessments have been documented in a report (BL&A 2017a) which accompanied the planning permit application for the amendment. However, subsequent additional assessments have been undertaken. These more recent native vegetation impact studies are documented in a new report (BL&A 2017b) that supplements and replaces the native vegetation elements of the report that accompanied the planning permit application.

The work undertaken and detailed in this witness statement is summarised below.

2.1. Biodiversity assessment that accompanied the planning permit application

The results of the assessment that accompanied the planning permit application for the amendment are outlined in the following report:

- BL&A (2017a) ‘Hawkesdale Wind Farm – Biodiversity impact assessment on proposed modification.’ Report 14144 (9.5) to Ryan Corner Development Pty Ltd. April 2017.

This report considered the following biodiversity attributes:

- Native vegetation;
- Birds (including the Brolga); and
- Bats (including the Southern Bentwing Bat).

This report compared impacts of the original permitted layout and turbine design on the biodiversity attributes listed above with the impacts of the proposed amended layout and turbine design.

However, the native vegetation assessment ‘Hawkesdale Wind Farm – Biodiversity impact assessment on proposed modification’ is now superseded as outline in Section 2.2 and 2.3 below.

2.2. Bird and Avifauna assessment subsequent to the planning permit application

The bird impact assessments undertaken are summarised below. These assessments are based on the information listed below.

- BL&A, 2010, ‘Hawkesdale Wind Farm, Pre-construction Bird and Bat Surveys’, Report No. 9067 [3.2], Consultants Report to Union Fenosa Wind Australia Pty Ltd
- Information from Union Fenosa Wind Australia Pty Ltd summarising the proposed changes in height of the wind turbines at the wind farm

The turbine dimensions used in the original flora and fauna impact assessment (BL&A 2010) as a basis for understanding the bird and bat risks from operating turbines were as follows:

- Maximum 120 m height above the ground (i.e. to the top of the highest point reached by the rotating turbine blades); and
- Minimum 35 m height above the ground (i.e. to the bottom of the lowest point reached by the rotating turbine blades)

The original proposal also involved the construction of 31 turbines.

The proposed amended turbine envelope will encompass the measurements listed in Table 2. – Impacts on birds and bats have been assessed using these measurements. The number of turbines has been reduced from 31 to 26.

Table 2: The measurements of new turbine models proposed for Hawkesdale Wind Farm.

	Max Upper RSA Height (m)	Min Lower RSA Height (m)
Generic Turbine (relating to 23 turbines)	180	40
Modified specifications (relating to only three turbines – A10, A13 & A17)	160	30

During 2009, bird utilisation surveys at Hawkesdale Wind Farm detailed records of bird flight heights were recorded by BL&A for future use. For each bird observed flying during the formal bird count, a record was made of its flight height at intervals of 10 metres up to 40 metres and at intervals of 20 metres above that height. This enables a detailed assessment of the impacts of the proposed modification to be undertaken using the original data.

A search of the Victorian Biodiversity Atlas (VBA) for Brolgas was completed to 10 km beyond the proposed boundaries of the Hawkesdale Wind Farm (November 2015) to determine this species’ likelihood of occurrence.

A qualitative assessment of bat impacts from the amended wind farm design has been undertaken based on a combination of raising the RSA for all but three turbines and a reduction in the total number of turbines from 31 to 26. Consideration was also given to the species of bats recorded during the 2009 bat utilisation surveys and whether threatened species would be affected. It was useful that bat recordings obtained during the 2009 surveys were taken both at ground level and at height from a wind monitoring mast.

During the native vegetation assessment in July 2017, it was obvious that there had been no significant changes in land use, farming activities or revegetation works. For this reason, the original 2009 bird utilisation surveys and bat surveys results were still considered representative of the bats on the site and, therefore, a valid basis for assessing the impacts on birds and bats of the amended turbine layout and specifications.

2.3. Native vegetation assessment subsequent to the planning permit application

Subsequent to planning permit application, BL&A were instructed to prepare a new assessment of the impacts of the proposed modification on native vegetation. The findings of this work are included in this witness statement.

The new assessment of the impacts of the proposed modification on native vegetation involved a survey of the full footprint of the Hawkesdale Wind Farm in July 2017 to record the presence of native vegetation. The impact of the proposed amendment was calculated and recommendations developed to avoid, minimize and offset any impacts on native vegetation.

This assessment was completed and the results are summarised in Section 3 below. The report detailing this information is provided in Attachment 2.

2.4. Further Bird and bat impact assessments subsequent to the planning permit application

The impacts on bird and bats of the original and proposed amended turbine designs have been further assessed in this witness statement using a more refined quantitative approach (see below). The turbine layouts and designs assessed in this statement are described below:

The original turbine specifications permitted for Hawkesdale Wind Farm were:

- Tower height of 78 metres;
- Rotor Swept Area (RSA) maximum height of 121.5 metres above the ground; and
- RSA minimum height of 34.5 metres above the ground.

On 12th August 2010, the Minister for Planning approved a minor amendment to the specifications of the wind turbines as outlined below:

- Tower height of 80 metres;
- Blade length of 46.25 metres;
- Rotor Swept Area (RSA) maximum height of 126.25 metres above the ground; and
- RSA minimum height of 33.75 metres above the ground.

The current proposed modification assessment is based on:

- Blade length up to 70 meters;
- Rotor Swept Area (RSA) maximum height of 180 metres above the ground; and
- RSA minimum height of 40 metres above the ground;

These specifications will be used for all except for 23 of 26 turbines. For three turbines (namely A10, A13 and A17) the specifications will be a proposed upper RSA of 160 metres and a lower RSA height of 30m above the ground

In addition, it is proposed to microsite a number of turbines and realign access tracks and ultimately reduce the number of turbines on the Hawkesdale Wind Farm site from the approved 31 to 26.

2.5. Sources of information

The sources of information for this expert witness statement are:

Native vegetation

- BL&A, 2017b, ‘Hawkesdale Wind Farm, Native Vegetation Assessment.’, Report No. 14144 [11.0], July, Consultants Report to Ryan Corner Development Pty Ltd. This involved a field assessment by a Senior Botanist of the entire footprint of Hawkesdale Wind Farm.

Bird and bat assessment

Each of the above assessments involved reviewing the bird and bat utilisation survey data for the Hawkesdale Wind Farm as outlined in the report below.

- BL&A, 2010, ‘Hawkesdale Wind Farm, Pre-construction Bird and Bat Surveys’, Report No. 9067 [3.2], Consultants Report to Union Fenosa Wind Australia Pty Ltd

The data collected in 2009 (BL&A 2009) is still considered valid as there have been no significant changes in agricultural practices in the area to indicate bird or bat species composition and activity would be substantially different. This was confirmed during the native vegetation assessment of the site in July 2017.

A comparison was made of the area of the RSA at different heights relative to bird activity at different heights to determine the percentage increase in number of bird flights potentially at risk of colliding with the turbines from the modified turbine design.

Site visit

In addition, a site visit by Bernard O’Callaghan was undertaken in July 2017 to confirm the finding that site conditions had not changed to the extent that the earlier bird utilization data would no longer represent the bird species and their relative abundance on the site.

Other submissions

A summary of submissions on the amendment application provided by the proponent was reviewed and a response provided to issues listed in the summary of submissions.

3. FINDINGS

The findings from this work are summarised below.

3.1. Native vegetation

The original approved layout of the Hawkesdale Wind Farm involved removing native vegetation. Under Clause 52.17 of the Moyne Planning Scheme a planning permit (Permit No. PL06/319) to remove native vegetation was issued. The proposed modification assessment report (BL&A 2017a) detailed a range of measures to minimise impacts on native vegetation.

Subsequent to the proposed modification assessment report (BL&A 2017a) BL&A were instructed to prepare a new application for native vegetation under the Biodiversity Assessment Guidelines (DEPI 2013). This assessment was complete in July 2017 by a Senior Botanist from BL&A and the results are summarised in the report below:

- BL&A, 2017b, ‘Hawkesdale Wind Farm, Native Vegetation Assessment.’, Report No. 14144 [11.0], July, Consultants Report to Ryan Corner Development Pty Ltd.

In summary, the wind farm consists of a grid comprising a total of 26 turbines, including 23 turbines to the north and three turbines to the south of Woolsthorpe-Heywood Road. The site largely comprises farming land used for grazing by sheep and cattle, commonly separated by rows of planted trees used as windbreaks. Native vegetation in the study area was largely limited to road reserves, with native grassland vegetation being recorded either side of Woolsthorpe-Heywood Road and native woodland recorded either side of Peshurst-Warrnambool Road and Woolsthorpe-Heywood Road. A natural drainage line meanders its way through the study area and supports some native swampy vegetation in the central part of the study area.

In total, 13 remnant patches of native vegetation were recorded in the study area comprising the following vegetation types:

- Swamp Scrub (EVC 53);
- *Heavier soils* Plains Grassland (EVC 132_61); and
- Basalt Shrubby Woodland (EVC 642).

One ecological community listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) was recorded in study area being:

- Natural Temperate Grassland of the Victorian Volcanic Plain (NTGVVP).

While the final development footprint for the Hawkesdale wind farm may still be adjusted and micro-sited, all infrastructure will be restricted to the area surveyed for this investigation (the study area). As such, at this stage impacts to native vegetation have been calculated on the basis of removal of all native vegetation that occurred within the study area. This is a worst-case scenario. It is anticipated that much of the native vegetation present in the study area can be avoided.

Thus, based on the above approach, the upper limit of native vegetation removal was calculated as:

- A total of 0.872 hectares of native vegetation (including 0.371 hectares of NTGVVP).

A planning permit under Clause 52.17 of the Moyne Planning Scheme is required for the removal of native vegetation. Given the upper limit of native vegetation to be removed, and

the mapping of the site as Location Risk A, the application will be assessed under the Low Risk Pathway. The application would, therefore, not trigger a referral to DELWP.

Offsets required to compensate for the proposed removal of native vegetation from the study area have been determined as follows:

- 0.056 *general* biodiversity equivalence units with a minimum strategic biodiversity score of 0.146 within the Glenelg Hopkins CMA area or the Moyne Council Area.

A referral under the EPBC Act may also be required for the impacts to NTGVVP along Woolsthorpe – Heywood Road, if impacts to this vegetation cannot be avoided.

However, the actual impact to native vegetation is likely to be significantly lower than this. This can be achieved by:

- Refining the layout;
- Micro-siting of particular infrastructure (i.e. access tracks, power poles); and
- Relocation of road crossings to avoid impacts of native vegetation and the EPBC Act listed community.

3.2. Assessment of birds and bats

The proposed change in turbine specifications used in this assessment are set out in Table 3.

Table 3: Proposed modifications to turbine specifications

Turbine specification	Currently permitted turbines	Modified Turbines	Total extent of change
Maximum RSA height (tip height)	126.25	180m	Overall 53.75 m blade tip height
Minimum RSA height (above ground)	33.75 m	40 m	6.25m increase in minimum RSA
Rotor radius	46.25 m	70 m	23.75 m rotor diameter increase
Total RSA m ² / turbine	6,720 m ²	15,394 m ²	129% increase
Number of turbines	31	26	16% decrease

Note: These specifications will be used for all except for 23 of 26 turbines. For three turbines (namely A10, A13 and A17) the specifications will be a proposed upper RSA) of 160 metres and a lower RSA height of 30m above the ground

In this report, RSA or the zone encompassing the area of an operating wind turbine within which the blades rotate, is defined in terms of an upper “maximum” and lower “minimum” RSA height, and a total circular swept area of the RSA.

Thus, this assessment compares the change in risk to birds and bats as a result of the changes in turbine parameters as indicated in Table 3 above. It considers the original bird utilisation surveys (BUS), conducted in 2009. The earlier assessment was based on turbines not exceeding 150 metres in height.

In summary, the proposed revised turbine dimensions are:

- The proposed minimum lower RSA height is:
 - 40 meters above ground, which is 6.25 metres higher than the height in the amended approval for 23 of the 26 turbines; and

- 30 meters above ground, which is 3.75 metres lower than the height in the amended approval for 3 of the 26 turbines;
- The increase in the rotor diameter from amended modification from 92.5 metres to 140 metres would also bring changes to the total extent of each RSA from 6,720 m² to 15,394 m², which will increase the total RSA area by approximately 129%. Most of this change (over 89%) is in the zone from 80 metres above the ground.
- An increase in the upper maximum RSA height (tip height) from 126.25 metres to 180 metres.

These larger turbines will be installed at the same locations as the turbines in the approved wind farm layout, although some will be micro-sited in accordance with provisions of the permit. Impacts on birds and bats of the proposed changes are discussed separately below.

It is now proposed that the number of turbines be reduced from the approved 31 turbines to 26 turbines. Impacts on birds and bats from the proposed changes are discussed separately below.

3.3. Birds

During the bird utilisation survey for the Hawkesdale Wind Farm, the height of flying birds was documented in BL&A (2010) as follows:

- Below rotor swept area height: 91.4 percent of observed birds;
- Within rotor swept area height: 7.8 percent of observed birds; and
- Above rotor swept area height: 0.8 percent of observed birds.

3.3.1. Species recorded

The original bird utilisation surveys at the Hawkesdale Wind Farm did not record any rare or threatened species of birds over the wind farm. Birds recorded on the site were predominantly common farmland birds.

The most abundant species at the impact sites were:

- Raven species (mainly Little Raven);
- Australian Magpie;
- Eurasian Skylark;
- Long-billed Corella; and
- Straw-necked Ibis.

The most abundant species observed flying at RSA height were:

- Long-billed Corella;
- Raven spp. (mainly Little Raven);
- Red Wattlebird;
- Eurasian Skylark; and
- Australian Magpie.

These five-species accounted for over 75 percent of the birds counted at RSA height, with corellas comprising the highest proportion of these flights (27.7%). All bird species flying at RSA height were common farmland birds.

The most abundant species recorded at the site are common and widespread in southeastern Australia in agricultural landscapes and any collisions as a consequence of the increased rotor swept area from the larger wind turbines is unlikely to have a significant effect on their populations. None of the species recorded were *Flora and Fauna Guarantee Act 1988* (FFG Act) or *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) listed species or otherwise listed as rare or threatened.

Few birds of prey were observed on the site during the bird utilisation surveys. Three rector species were recorded in the survey area with the Brown Falcon was the most abundant species and no Wedge-tailed Eagles were observed during the survey of the Hawkesdale wind farm site.

The number of raptors was low in relation to the total number of birds recorded during the survey. Raptors formed 0.38 percent of all individuals surveyed on the wind farm site and 2.3 percent of birds seen at RSA height

3.3.2. Birds and flight heights

During bird utilisation surveys at Hawkesdale Wind Farm bird flight heights were recorded. For each bird observed flying during the formal bird count a record was made of its flight height at intervals of 10 metres up to 40 metres and at intervals of 20 metres above that height. The data have been analysed and presented in Table 4, which compares the change in RSA at each of the flight height bands in which the birds were recorded.

These data are aligned with data collected during bird utilisation surveys for a range of wind farms in southern Australia (n = 11), BL&A (unpubl. data). This aggregated data indicates that, on average, 5.5% of birds were recorded usually between 40 and 120 metres above the ground, typically considered as rotor swept area (RSA) height. On average, 0.3% percent of birds were observed flying above RSA height.

3.3.3. Change in risk to birds from change in RSA

The changes in the Rotor Swept Areas (RSA) at different height levels is outlined in Table 4 below. The data in the table indicates that for 23 of the 26 turbines there will be a decrease in RSA at height up to 60 metres, and an increase in RSA at heights above 60 metres. The impact of these changes is discussed below.

Table 4: Change in RSA at height and bird flight heights at Hawkesdale Wind Farms

Height range (m)	% flights (previous data)	RSA of 46.25 m blade (33.75 - 126.25 metres) (m ²)	RSA of 70 m blade (40 - 180 metres) (m ²)	Change in total RSA (m ²)	% Change in total RSA
Ground	74.0				
0-9	3.5				
10-20	6.6		-		
20-30	6.2	-	-	-	
30-40	3.8	196	-	-196	-100
40-60	2.3	1,373	1,349	-24	-2
60-80	1.2	1,791	2,280	490	27
80-100	1.5	1,791	2,672	882	49
100-120	0.2	1,373	2,790	1,417	103
120-140	0	196	2,672	2,476	1262
140-160	0.8	-	2,280	2,280	large
160-180		-	1,349	1,349	large
Total	100%	6,720	15,394	8,674	129

The implications of these proposed changes are discussed below.

Increase in lower minimum RSA height

The proposed modification increases the lower minimum RSA height from modified turbines by 6.25 metres (i.e. from 33.75 to 40 metres) for 23 of the 26 turbines. This increase in the lower minimum RSA will lift the turbine from the area of 30-40 metres where 3.8 % of the birds were recorded. This will reduce potential collision risk at these 23 turbines.

The proposed modification decreased the lower minimum RSA height for three of the modified turbines by 3.75 metres (i.e. from 33.75 to 30 metres). This increase will result in a small amount of extra RSA between 33.75 and 30 metres where 3.8 % of the birds were recorded. This will slightly increase the potential collision risk at these 3 turbines.

As most turbines will have a higher minimum RSA height and the total number of turbines will be reduced from the approved 31 turbines to 26 turbines the risk to birds from all changes to the wind farm is considered to be less than for the approved wind farm.

Change in extent of RSA at various heights

As a result of the proposed modifications:

- The total area of RSA per turbine between 20-40 metres and 40-60 metres actually decreases. This will lead to a corresponding decrease in risk to the 6.1 % of birds flying between 20-60 metres;
- The RSA area increased in the bands between 60-80 metres and above. This will present an increase in risk to the 3.7 % of birds recorded above 60 metres;
- Above 120 metres is the height range where the fewest bird flights were recorded. The studies from 11 other wind farm sites indicates that less than 2% of bird flights were recorded above 80 metres and no bird flights were recorded above 140 metres

(although 0.8% of flights were recorded at Hawkesdale Wind Farm above this height). This would present an increased risk to high flying species such as raptors and the White-throated Needletail.

It is noteworthy that this potential increased collision risk affects common farmland birds, including a significant proportion of the observed movements that involved introduced, pest species. No threatened or endangered species were recorded during surveys and none is considered to occur regularly or in significant numbers due to a lack of suitable habitat on the wind farm site.

This analysis demonstrates the increase in RSA area at heights above 80 metres is more likely to impact on higher flying species. These include raptors as a group, and specifically species such as the Wedge-tailed Eagle (although not recorded on site).

Change in maximum tip height from 140 meters to 180 meters

The change in tip height from 140 meters to 180 meters occurs at the height where the fewest bird flights were recorded (0.8% of flights). The studies from 11 other wind farm sites recorded no flights above 140 metres. Based on the foregoing results, the proposed increase in the maximum height to 180 metres will increase the risk to the small number of birds flying above 140 metres.

3.3.4. Potential impacts of modification on Brolgas

The Minister for Planning has issued a planning permit for the construction of a wind farm at Hawkesdale (Moyn Planning Scheme, Permit Number: 20060221). Under Condition 17 of this permit, a targeted assessment must be undertaken, to the satisfaction of the Minister for Planning, of listed threatened bird and bat species likely to utilise the site

Assessments were completed in October 2009 consistent with guidance from DELWP (then DSE). A roaming field survey of wetlands within ten kilometres from the edge of the proposed wind farm site was undertaken. The wetlands were surveyed during the Brolga breeding season (July to December) Many wetlands that were marked on the 1:50,000 topographic map sheets were dry during the survey and supported no wetland bird species. Many wetlands had been permanently drained and were unlikely to support any wetland birds in the future. There were no wetlands within 5 km that were considered suitable for Brolga breeding.

A search of the Victorian VBA for Brolgas was completed in July 2017 to 10 km beyond the proposed boundaries of the Hawkesdale Wind Farm. There are no major changes in Brolga distribution in the 10 Km range. There are no new records of solitary or pairs of Brolgas within 10 km of the Hawkesdale Wind Farm.

It is noted that Brolgas fly most frequently below 30 metres (BL&A unpublished data). Based on this, increasing the height of the lower level of the RSA from 33.75 metres to 40 metres above ground level for most of the turbines and setting a minimum 30 metres ground clearance for the three turbines A10, A13, and A17, while reducing the number of turbines from 31 to 26 is likely to reduce the overall collision risk to Brolgas.

3.3.5. Summary of impacts on birds

This analysis indicates that the revised turbine design will result in a decrease in the risk to low flying bird species (i.e. most species), while increasing the risk to higher flying birds (e.g. raptors and White-throated Needletails) across the Hawkesdale Wind Farm site.

The results of the bird utilisation surveys together with the original and updated habitat assessment indicate that this increase in impact will affect common, widespread farmland-adapted bird species. The likelihood of the change in turbine design significantly increasing risks to threatened bird species is considered negligible. For this reason, for high flying birds, the proposed change will have additional impacts that are not of any conservation concern.

3.4. Impacts on Bats

As part of the pre-construction surveys of Hawkesdale Wind Farm in 2009-2010, Greg Richards and Associates Pty Ltd, in association with BL&A, studied the bat fauna of the Hawkesdale Wind Farm and found eleven species of bats on the wind farm site. These species were mostly common and secure species, except for the Southern Bent-wing Bat (*Miniopterus schreibersii bassiana*), which is a threatened species in Victoria and Critically Endangered nationally. This species was recorded at Hawkesdale Wind Farm and was recorded much less often compared with other species.

Records of bat calls above ground at Hawkesdale Wind Farm were achieved by lifting the microphone of the detector to a height of 50 metres on a wind monitoring mast. In this way, the maximum height of bat calls recorded by the detector is approximately 75 metres above ground. The bat surveys at Hawkesdale involved recording bats at height. The number of bat calls recorded 50 metres above the ground was limited (less than 20 calls recorded and involved mostly White-striped Free-tail Bats, a species known to fly higher than most). The results of the surveys showed that of the eleven species utilising the wind farm site, the White-striped Freetail Bat was almost the only species flying at heights over 50 metres above ground-level. Experience from other wind farms confirm this (BL&A; unpubl. data).

Recording at height elsewhere in south eastern Australia (BL&A, unpubl. records) shows that fewer species and many fewer calls are recorded 50 metres above the ground. At 50 metres, the number of bat calls falls to less than 15% of the number recorded from the ground (i.e. up to a height of c. 25 metres). Between 25 and 50 metres above the ground, call numbers represent about 25% of those recorded at ground level.

The proposed modification increases the lower minimum RSA height from modified turbines by 6.25 metres (i.e. from 33.75 to 40 metres) for 23 of the 26 turbines. This will lift the lower minimum RSA and will reduce potential collision risk at these 23 turbines for the majority of bat species. The proposed modification decreases the lower minimum RSA height for three of the modified turbines 3.75 metres (i.e. from 33.75 to 30 metres) will slightly increase the potential collision risk at these 3 turbines. The decrease in the number of turbines from 31 turbines to 26 turbines is a 16% decrease in the number of turbines.

The decrease in heights of the three turbines 10,13,17 to 30 metres is unlikely to impact on bats. These three turbines are not located with 200 metres of tree native forests. They are within 100 metres of Cyprus pines and other exotic wind break vegetation; however, this type of vegetation has not been shown to support locally high bat numbers.

However, the increase in area of RSA above 40 metres may have an impact on high-flying bat species such as White-striped Freetail Bat and Gould’s Wattled Bat. However, these species are not listed as threatened and impacts will not be of conservation concern.

3.4.1. Southern Bentwing Bat

The status of the Southern Bentwing Bat has been changed under the Commonwealth EPBC Act from ‘conservation concern’ to ‘critically endangered’ since the original wind farm planning application. A number of bat calls of the Southern Bentwing Bat were recorded. To clarify the flight height profile of the Southern Bentwing Bat calls at various heights up to 50 metres above the ground were recorded and analysed.

In summary, in relation to the various survey periods at the Hawkesdale Wind Farm, the Southern Bent-winged bat height distribution was:

- Above 50 metres in height it was not recorded;
- Between over 20 metres but lower than 50 metres a single Southern Bentwing Bat call was recorded (out of several hundred Southern Bentwing Bat calls recorded); and
- Recorders at Ground level detected all but one of the Southern Bent-winged bat calls.

Bent-wing bats usually fly at tree canopy heights in treed areas and within six metres of ground in more open grassland areas (Churchill 2008). These data indicates that in the cleared agricultural land that makes up the Hawkesdale Wind Farm, the Southern Bentwing Bat is a low-flying species and is rarely recorded at height. The proposed amendment to the lower minimum RSA height of 23 of the 26 turbines will decrease the collision risk to the Southern Bentwing Bat. However, for three of the proposed turbines (namely A10, A13 and A17), a lower RSA height of 30m above the ground will slightly increase the risk to this bat species. However, overall the proposed amendment will result in a reduction in the collision risk to the Southern Bentwing Bat.

3.4.2. Summary of impacts of modification on bats

At Hawkesdale Wind Farm, bat activity was moderate and included several hundred records of the state and nationally threatened Southern Bent-wing Bat. All except for one call were below the proposed lower height of the RSA.

The incremental impact of the overall increase in area of RSA will not increase impacts on most species as a higher proportion of the bats and bat activity is likely to remain below the lower RSA height of 40 metres. Collisions, when they occur, will almost certainly involve common and widespread high-flying species, such as White-striped Freetail Bat and Gould’s Wattled Bat. However, these impacts would not lead to any significant decline in their populations.

3.5. Aviation Night Lighting

Due to the increase in turbine tip height, the requirement for this wind farm for night lighting for aviation safety has been detailed in the letter of 30th June 2016 from CASA to DELWP. This referral response from CASA for Hawkesdale Wind Farm dated 30th June 2016 recommends that the ‘*the wind farm is lit with steady red medium intensity lighting at night as per Section 9.4 of the CASA Manual of Standards Part 139.*’

Several studies have shown a high-level of foraging activity by bats around artificial lights. Lights on turbines may attract moths and other nocturnal insects, thus increasing the probability of bat collisions since bats feed on insects at night. Based on experience with lighting of wind farms and communication towers in the United States (Shire *et al.* 2000;

Kerlinger and Kerns 2003) to minimize impacts on birds and bats, the shortest possible flash of light is preferable to a longer duration flash or constant illumination. For example, strobe (i.e. those that flash for a very short time) and LED red lights are more preferable than yellow or white lights that are illuminated constantly or for short periods of up to three seconds (Kerlinger *et al.* 2010). Similarly, Gehring *et al.* (2009) found that communication towers lit at night with only flashing red or flashing white lights had significantly fewer avian fatalities than towers lit with a combination of steady-burning and flashing lights.

However, several reviews of bat mortality at wind farms in the USA has not been able to identify a correlation between lighting of turbines for aviation with red lights and collisions with bats (Johnson *et al.*, 2004; Jain *et al.* 2010; Baerwald & Barclay 2011, and Berthinussen *et al.* 2017).

Although the comparative level of bird and bat utilisation for the Hawkesdale Wind Farm is relatively low, and there were no species of listed birds and only one record of an endangered bat at height, the preference remains for red lights in line with CASA recommendations. However, given the evidence from other sources, flashing red lights would minimize the risk to bird species.

3.6. Bird and Avifauna Management Plan (BAM Plan)

The Minister for Planning has issued a planning permit for the construction of a Wind Farm (Moyné Planning Scheme, Permit No.: 20060222). Under condition 16 of this permit, a BAM Plan must be prepared. This condition states that:

“16. Before the development starts, a Bat and Avifauna Management Plan (“BAM Plan”) must be prepared, to the satisfaction of the Minister for Planning, in consultation with the Department of Sustainability and Environment, and must be submitted to and approved by the Minister for Planning. When approved, the Plan will be endorsed and will then form part of the permit.

The use must be carried out in accordance with the endorsed plan. A BAM Plan has been developed in conjunction with DSE and has been agreed between the proponent and DELWP (formerly DSE). It is proposed that this BAM Plan be updated to reflect the proposed modification. The proposed modification does not lead to a significant change in the risk of the wind farm to birds and bats. The monitoring protocols, impacts triggers and investigation and reporting requirements in that BAM Plan are still considered valid and it does not need to be amended.

3.7. Response to submissions

The proponent has provided me with a summary of the issues raised in submissions on the amendment application (to July 2017). The table below lists the issues in submissions relevant to bird and bat impacts (based on the advice of the proponent) and includes my response.

Table 5: Response to submissions

Submitter and Issue	Response
Moyne Shire Council	
<ul style="list-style-type: none"> ▪ Southern Bent-wing Bat seeks additional data 	The surveys from the Hawkesdale Wind Farm pre-construction surveys in 2009-2010 are included in this witness statement and impacts analysed.
<ul style="list-style-type: none"> ▪ Seeks condition relating to BAM plans updated/reworded to improve clarity 	A summary of the status of the Bird and Avifauna Management Plan is provided above. It is considered as satisfactory for addressing the change in impacts as a result of this modification. .
Other submissions	
<ul style="list-style-type: none"> ▪ Submission 2: Related to about a pair of Wedge-tailed Eagles 	Wedge-tailed Eagles are likely to frequent the Hawkesdale Wind Farm site although this species was not recorded during the previous surveys. The increasing height may increase susceptibility of raptor species including Wedge-tailed Eagles to impacts. However, measures in the BAM Plan are likely to partially mitigate this risk which are likely to make the wind farm site less attractive to raptors.

4. DECLARATION

I have made all the inquiries that I believe are desirable and appropriate and no matters of significance which I regard as relevant have to my knowledge been withheld from the Panel.

Signed



Bernard O'Callaghan
Brett Lane & Associates Pty Ltd
Suite 5, 61–63 Camberwell Road
Hawthorn East, VIC 3123

1 August 2017

5. REFERENCES

- BL&A, 2010, ‘Hawkesdale Wind Farm, Pre-construction Bird and Bat Surveys’, Report No. 9067 [3.2], Consultants Report to Union Fenosa Wind Australia Pty Ltd);
- BL&A 2017a ‘Hawkesdale Wind Farm – Biodiversity impact assessment on proposed modification.’ Report 14144 (9.5) to Ryan Corner Development Pty Ltd. April 2017.
- BL&A 2017b ‘Hawkesdale Wind Farm – Native Vegetation Assessment’ Report 14144 (11.0) to Ryan Corner Development Pty Ltd. July 2017.
- Curry & Kerlinger, LCC. 2004, A study of Bird and Bat Collision Fatalities at the Mountaineer Wind Energy Centre, Tucker country, West Virginia: Annual Report for 2003, Mountaineer Wind Energy Centre, West Virginia.
- DELWP 2015a, *Native Vegetation Information Management system*, Department of Environment, Land, Water and Planning, East Melbourne, Victoria, viewed 25th August 2015, <http://www.delwp.vic.gov.au>
- DELWP 2015b, *Biodiversity Interactive Map 2.0*. Department of Environment, Land, Water and Planning, East Melbourne, Victoria, viewed 25th August 2015, <http://www.delwp.vic.gov.au>
- DELWP 2015c, *Flora and Fauna Guarantee Act 1988 - Threatened List*, Department of Environment, Land, Water and Planning, East Melbourne, Victoria, viewed 25th August 2015, <http://www.delwp.vic.gov.au>
- DELWP 2015d, *Victorian Biodiversity Atlas 2015*, Department of Land, Water and Planning, East Melbourne, Victoria, viewed 25th August 2015, <http://www.delwp.vic.gov.au>
- DEPI 2013, *Biodiversity assessment guidelines*, Department of Environment and Primary Industries, East Melbourne, Victoria
- DoE 2015, *Environmental Protection and Biodiversity Conservation Act 1999, Protected Matters Search Tool*. Department of Environment, Canberra, viewed 25th August 2015, <http://www.environment.gov.au>
- Department of Sustainability and Environment (DSE) 2012. Interim Guidelines for the Assessment, Avoidance, Mitigation and Offsetting of Potential Wind Farm Impacts on the Victorian Brolga Population 2011, Revision 1 February 2012.
- ERM 2006, *Hawkesdale Wind Farm Ecological Assessment*, Environmental Resources Management Australia.
- Department of Sustainability and Environment (DSE) 2012. Interim Guidelines for the Assessment, Avoidance, Mitigation and Offsetting of Potential Wind Farm Impacts on the Victorian Brolga Population 2011, Revision 1 February 2012.
- Johnson, G.D., Erickson, W.P., Strickland, M.D., Shepard, M.F., Shepard, D.A. and Sarappo, S.A. 2003. Mortality of bats at a large-scale wind power development at Buffalo Ridge, Minnesota, *The American Midland Naturalist* 150: 332-342.
- Kerlinger P & Kerns J 2003, ‘FAA Lighting of wind turbines and bird collisions’, Paper presented to National Wind Coordinating Committee, Wildlife Work Group Meeting, November 2003, Washington, USA.
- Kerlinger P, Gehring J.L., Erickson W.P., Curry R., Jain A., and Guarnaccia J. 2010, ‘Night migrant fatalities and obstruction lighting at wind turbines in North America’, *The Wilson Journal of Ornithology* 122 (4): 744-754.

Shire GG, Brown K & Winegard G 2000, ‘Communication Towers: A deadly hazard to birds’, American Bird Conservancy.

TME 2007, *Hawkesdale Wind Farm Net Gain Assessment Supplementary Report*, Environmental Resources Management Australia.

Appendix 1: Qualifications and experience of Bernard O’Callaghan



BERNARD O'CALLAGHAN

SENIOR ECOLOGIST AND PROJECT MANAGER

Qualifications:

Bachelor of Science (Hons) – Zoology, Melbourne University
Graduate Diploma in Applied Sciences, (Envir. & Heritage Interpretation), Deakin University
Masters of Environmental Management – University of New England, Armidale

EXPERIENCE

Bernard has over 25 years experience in environmental and wildlife science and management, including a range of development and environment related initiatives. He has worked in the delivery of environmental management projects and consulting for over 20 years, including over 15 years involvement with non-government environment organisations such as the International Union for Conservation of Nature – IUCN. He has also advised development agencies including the Asian Development Bank and the World Bank.

Bernard has undertaken a range of impact assessments and review of potential impacts for over 10 planned or operating wind energy developments. He has also developed, reviewed and implemented Bird and Bat management plans for over 10 wind farms in Australia.

Bernard's project experience has included:

- Flora and fauna impact assessments, with particular emphasis on impacts of wind energy development on native vegetation, threatened flora and fauna species, birds and bats;
- Design, implementation and review of various post- construction bird and bat impact monitoring programs in over 10 wind farms;
- Development of 5 draft and final Bird and Bat Adaptive Management Programs (BBAMPs) in NSW;
- Currently overseeing implementation of 4 active BBAMPs;
- Strategic advice to wind energy development companies on regulatory, technical and community issues related to wildlife impacts of wind farms; and
- Supported regulatory processes, including the preparation of Referrals and Assessments under the EPBC Act and public forms and planning appeals within state planning regimes.

This experience has given him a well developed overview of overseas and local wind energy impacts on flora and fauna, as well as strategies for addressing related regulatory requirements.

EMPLOYMENT HISTORY

1993-1998	Senior Program Officer and Program Coordinator - Asian Wetland Bureau/ Wetlands International (Malaysia / Cambodia/ Mekong)
1998-2001:	International Independent Environmental Consultant – Asia
2001-2005:	Chief Technical Advisor - World Bank / IUCN (Vietnam)
2005- 2013:	Technical Program Director - IUCN (Vietnam and Oceania)
2013- 2015:	International Independent Environmental Consultant – Asia- Pacific
2015- present:	Brett Lane & Associates Pty Ltd. (Melbourne, Australia)

Appendix 2: Qualifications of other contributors



Alan Brennan

Senior Ecologist and Project Manager

Profile

Alan Brennan joined Brett Lane and Associates Pty Ltd, Melbourne in 2007. Alan's role involves developing solutions for projects experiencing issues with ecological matters. During his career in the biological sciences Alan has developed specialised skills and abilities in vegetation and land management along with a sound knowledge of relevant policies and legislation. Since 1997, he has worked to ensure sustainable development outcomes are achieved across a range of industry sectors. Prior to this, Alan worked in medical and agricultural research .

Biography

Employed in the biological sciences since 1986

Qualifications

Graduate Diploma in Land Rehabilitation *University of Ballarat*

Bachelor Applied Science (Applied Biology) *RMIT University*

Certificates and Licenses

Management Authorisation – Salvage and Translocation
DELWP Certificate of Competency in Vegetation Quality
Assessments Registration No. HH168

Victorian Animal Ethics Approval

Employment History

2007 – Present

Senior Ecologist / Project Manager, *BL&A*

2005 – 2007

Manager City Environment, *Hume City Council*

2000 – 2005

Environmental Services Manager,
Melton Shire Council

2000 – 2000

Catchment Management Project Co-ordinator,
Melton Shire Council

1998 – 2000

Grassland Project Officer, *DNRE (now DELWP)*

1997 – 1998

Catchment Management Officer, *DNRE (now DELWP)*

1992 – 1995

Cell Physiologist, *Monash University & Monash IVF*

1988 – 1992

Plant Pathologist, *Department of Agriculture ,*

Key Skills

- Project Manager including budgeting, staffing, client liaison & production of high quality technical reports
- Flora and Fauna Assessments
- Biodiversity (habitat hectare) assessments
- Environmental impact assessments
- Expert witness for VCAT, Planning Panels, Magistrates Court, County Court & Supreme Court
- Ecological constraints analysis
- Scoping assessments
- Management plan preparation
- Offset Plan preparation
- Project design recommendation
- Preparation of mitigation measures
- EPBC Act and EES Referrals
- Preparation of assessment reports (preliminary documentation, public environmental report and environmental impact statement)
- Offset site selection
- Management of native vegetation management on-ground works

Project Examples

Property Development

Precinct Structure Plan 92 Westbrook, Wyndham Vale, Victoria — 550 hectares of land adjacent to the Werribee River: Initial and multiple targeted flora and fauna assessments, Submission to DSE Time Stamping review, liaison with DSE and GAA (2010 – 2012)

Brompton Lodge, Cranbourne West, Victoria — preparation of Expert Witness Statement of Evidence, flora and fauna assessment, preparation of Expert Witness Statement for Logical Inclusion Assessment Panel, net gain analysis and preparation of Native Vegetation Precinct Plan, preparation of Expert Witness Statement for rezoning Panel (2007 to 2016).

River Valley Estate, Sunshine North — 100+ hectare site adjacent to the Maribyrnong River, flora and fauna assessments, multiple targeted flora surveys, impact assessments and offset searches (2008 to 2016)

Harpley Estate, Werribee West, Victoria — biodiversity assessment, development of a conservation management plan, review of a landscape plan

Hodgkins Road, Hastings, Victoria, Initial and targeted flora and fauna assessments, net gain assessments, preparation of Expert Witness Statement of Evidence for VCAT, provision of evidence at VCAT, development of an offset management plan and a conservation management plan, assessment of and assistance with Planning Scheme infringements

Renewable Energy

Portland Wind Energy Project Stage V, Portland, Victoria — flora and habitat hectare assessment and net gain analysis of development footprint (2008 – 2010).

Crookwell Wind Farm, Crookwell, New South Wales — flora and fauna assessment along with community consultation (2009)

Bulgana Wind Farm, Victoria — Detailed flora and fauna impact assessment, EPBC Referral (2015)

Road and Rail Infrastructure

Second Crossing of the Murray at Echuca, Victoria — detailed biodiversity assessment of multiple alignments, targeted flora and fauna surveys, detailed habitat mapping, preparation of expert witness statement for EES and EPBC Referral. Preparation of reporting to enable assessment under NSW legislation (2008-2016)

Dingley Bypass, Victoria: flora and fauna assessments for multiple stages, impact assessments, threatened flora and fauna species targeted surveys, preparation of EES Referral, preparation of a response to letter of community concern, sourcing of offsets, preparation of offset management plan, client & regulator liaison and development of mitigation measures, construction phase advice and assessments (2008 - 2012)

Avalon Airport Rail Link, Victoria, Spiny Rice-flower and Striped Legless Lizard surveys, net gain assessments of three potential alignments and Department of Transport liaison (2012)

Bulla Bypass and Melbourne Airport Link to OMR, Victoria, overview flora and fauna assessments for multiple routes, impact assessment, threatened flora and fauna species targeted surveys, advice on preparation of EES Referral, development of mitigation measures and managing sub-contracting of aquatic surveys (2011- 2012)

Nagambie Northern Bypass, Victoria, flora and fauna assessments, net gain impact assessment and construction phase assessment and advice (2010 – 2011).

Ecosystem Monitoring and Management

DSE Bushfire Vegetation Assessments, Victoria, undertook rapid field assessments of public and private land across large areas at a high risk from bushfire.

Deep Lead, Victoria, provision of advice on EPBC Act, assessment of impacts from rail rehabilitation project, preparation of weed management plan, implementation of weed management plan, search for offsets (2010 – 2013)

Maidstone Street Altona, Victoria, Spiny Rice-flower salvage and translocation plan preparation and development of an offset and conservation management plan

Northern Highway, Wallan to Kilmore, Victoria, Preparation and implementation of a fauna management plan

City of Greater Geelong Review of environmental programs, Victoria, Review of land and waterway programs involving review of existing information, staff interviews and benchmarking with other Councils.

Dr. Khalid Al Dabbagh

Senior Zoologist



Profile

Khalid has over 35 years' experience in Zoology, specialising in ornithology and animal ecology. Khalid has extensive experience in identifying fauna species and their habitat as well as undertaking impacts assessments for a wide range of other projects types. Khalid is particularly experienced in assessing development impacts on birds and bats. He has helped to prepare environmental management plans and mitigation recommendations for numerous projects. Khalid has worked on over 50 wind farm projects, undertaking bird utilisation studies, bat surveys and bird and bat mortality estimates.

Biography

Working in industry since 1980

Qualifications

PhD (Animal Population Ecology), *University of Leicester, England*

MSc (Ornithology), *University of Baghdad*

BSc (Biology), *University of Baghdad*

Certificates and Licenses

Management Authorisation – Salvage and Translocation
Construction Induction 'White Card'

Employment History

2002 – Present

Zoologist & Ecologist, *BL&A, Melbourne.*

1994– 2002

Section Editor, *Handbook of Australian, New Zealand and Antarctic Birds, Birds Australia, Melbourne*

1993 – 1994

Research assistant, *Arthur Rylah Institute for Environmental Research, Heidelberg, Victoria*

1980 – 1992

Senior lecturer, *University of Baghdad, Iraq.*

1983 – 1989

Senior research Scientist, *Iraqi Biological Research Centre*

1976 – 1983

Lecturer, *University of Basrah, Iraq*

Key Skills

- Ornithologist
- Implementation of bird and bat management plans at wind farms
- Mortality assessment at wind farms
- Terrestrial Fauna Assessments
- Targeted surveys for listed flora and fauna species
- Bird and Bat Utilisation Surveys
- Scoping assessments
- Management plan preparation for listed fauna values and offset sites
- Striped Legless Lizard salvage protocol implementation
- Project design recommendation
- EPBC Act and EES Referrals
- Offset site selection

Project Examples

Property Development

Manor Lakes, Wyndham Vale, Victoria: Flora and fauna assessment and targeted fauna surveys (2010–2011).

Eynesbury, Victoria: Flora and fauna assessment and targeted fauna surveys (2008, 2011).

Somerfield Estate, Keysborough, Victoria: Flora, Fauna and Growling Grass Frog surveys (2008 – 2009)

Renewable Energy

Wonthaggi Wind Farm, Vic. 2005–2007, bird and bat utilization studies; mortality studies.

Bald Hills Wind Farm 2004–2011, Bird and bat utilization surveys; Bird, Bat and Animal Pest Management Plans.

Stockyard Hill Wind farm 2008; bird and bat utilisation survey; Brolga Surveys.

Lal Lal Wind Farm, Vic. 2006-2007; bird and bat utilisation survey; Powerful and Barking Owls Surveys.

Ryan Corner Wind Farm, 2006-2007; bird and bat utilisation survey; Brolga and Southern Bentwing Bat Surveys.

Dundonnell Wind Farm, 2009; bird and bat utilisation survey; Brolga Surveys.

Ararat Wind Farm, 2008, 2012; bird and bat utilisation survey; Bird, Bat and Animal Pest Management Plans.

Rugby Wind Farm 2011; bird and bat utilization survey.

Taralga Wind Farm 2012; bird and bat utilization survey.

Woodlawn Wind Farm , NSW (20011–2012), Bird utilisation surveys; mortality studies.

Capital Wind Farm, NSW, (2010–2011), Bird utilisation surveys; mortality studies.

Granville Wind Farm, Tasmania 2012 – 2013, bat and threatened species surveys.

Road and Rail Infrastructure

Second Murray River Crossing at Echuca – Moama –Flora, fauna and native vegetation assessment, Threatened flora and fauna surveys and Bat survey (2011–2012).

Dingley Bypass: Flora and fauna assessment and targeted fauna surveys (2010–2011).

Avalon Airport Rail Link: Flora and fauna assessment and targeted fauna surveys (2011–2012).

Ecosystem Monitoring and Management

Warrambeen Monitoring, Victoria: Ecological Monitoring of threatened fauna species (2010).



Justin Sullivan

Senior Ecologist



Profile

Justin first joined BL&A in 2008 and currently is working in the role of Senior Ecologist. Since being at BL&A Justin has been highly involved in a broad range of work including impact assessments for residential development, environmental monitoring projects including River Red-gum monitoring on the Murray River, and impact assessments for major infrastructure projects including roads, powerlines and wind farms.

Between 2011 and 2014 Justin worked in the role of Project Manager at BL&A and demonstrated his knowledge of the environmental planning process in Victoria, as well as working towards positive environmental outcomes. Between 2015 and 2016 Justin worked as Biodiversity Officer at Yarra Ranges Council, where he was responsible for reviewing and assessing planning applications and oversaw the management of a number of Council bushland reserves in the Yarra Ranges Shire. Since early 2017, Justin has been working in the role of Senior Ecologist at BL&A. He has an excellent knowledge of Victoria's flora and fauna and provides high level reports for a broad range of assessment types.

Biography

Working in industry since 2008

Qualifications

BSC (Honours in Botany), *La Trobe University*

Certificates and Licenses

DELWP Certificate of Competency in Vegetation Quality

Assessments Registration No.HH061

Construction Induction 'White Card'

First Aid Certificate HLTAID001-3

Employment History

2017 - current

Senior Ecologist, *BL&A, Melbourne*

2015 - 2016

Biodiversity Offsets Officer & Environmental Planner,
Yarra Ranges Shire Council

2011 - 2014

Botanist and Project Manager, *BL&A, Melbourne*

2008 - 2011

Field Botanist, *BL&A, Melbourne*

2001

Assistant Ranger, *Point Cook Coastal Park, Point Cook, Vic.*

Key Skills

- Specialist botanical knowledge of Victoria's flora
- Working knowledge of Victoria's Planning Scheme, namely particular provisions (i.e. Clause 52.17)
- Working knowledge of environmental regulations relevant Victoria (i.e. EPBC Act, FFG Act)
- Demonstrated ability in Habitat hectare and tree assessment
- Working fauna survey skills
- Experienced in undertaking targeted surveys for listed flora and fauna species
- Provided environmental planning advice to applicants, Council Officers and other regulators
- Regularly provides project design recommendations to applicants
- Experienced in preparation of a variety of reports, including Flora and Fauna Assessments, Native Vegetation Assessments, EPBC Act Referrals, Offset Management Plans, and Targeted survey Reports, always to a high standard
- Project Management including budgeting, staffing and client liaison

Project Examples

Property Development

Modeina Estate, Burnside, Victoria: Flora and Fauna Assessment, EPBC Act referral (2009 – present)

Somerfield Estate, Keysborough, Victoria: Flora, Fauna and Growling Grass Frog Survey and Offset Plan Preparation (2008 – 2014)

Harpley Estate, Black Forest Road, Werribee, Victoria: Striped Legless Lizard Salvage Plan, Eastern Kangaroo Management Plan and Environmental Management Plan (2012—present)

South Dudley Road, Wonthaggi Residential Development, Wonthaggi, Victoria: Flora, Fauna and Growling Grass Frog Survey (2011).

Renewable Energy

Moorabool Wind Farm, Moorabool, Victoria: Native Vegetation Assessment of the Wind Farm and Transmission Line (present)

Ararat Wind Farm, Ararat, Victoria: Flora and Fauna Assessment of the Wind Farm and Transmission Line, Offset Plan, Native Vegetation and Pest Plans (2007 – 2014)

Bald Hills Wind Farm, South East Gippsland, Victoria: Native Vegetation Management Plan and preparation of Offset Plan (2008 – 2014)

Stockyard Hill Wind Farm, Beaufort, Victoria: Native Vegetation Assessment (2007 – 2011)

Road and Rail Infrastructure

Second Murray River Bridge Crossing at Echuca-Moama: Detailed Flora and Fauna Assessment, Targeted Flora and Fauna Surveys, Bat Survey and Net Gain Assessment (2008 – 2014)

Burke Road, Glen Iris and North Road, Ormond Level Crossing Removal Project, Victoria: Flora and Fauna Assessment (2012)

Cardinia Road Upgrade, Pakenham, Victoria: Flora and Fauna Assessment (2012)

Ecosystem Monitoring and Management

River Red Gum Monitoring Project, Murray River, Mildura Region, Victoria: Monitoring of River Red-gum health at various reaches along the Murray River system (2008 – 2013).

Wimmera River Monitoring Project, Wimmera River, Horsham Region, Victoria: Monitoring of River Red-gum and River health (2008 – 2009).

Water and Pipeline Infrastructure

Altona Recycled Water Project Stage 2, Werribee to Altona, Victoria: Flora and Fauna Assessment (2011 – 2014)

Kurrak Rd to Browns Lane Outfall Sewer Development, Plenty, Victoria: Flora and Fauna Assessment (2008 –2014)

Bellbird Ridge Estate, Sewer Alignment Development, Diamond Creek, Victoria: Flora, Fauna and Native Vegetation Assessment (2010)

Point Cook Sustainable Alternative Water Scheme Project, Point Cook, Victoria: Native Vegetation Impact Assessment (2011)

Telstra Tower, Tinderbox Hills, Tasmania: Flora and Fauna Assessment (2012)



Brett Lane

Principal Consultant and Director

Profile

Brett has over 35 years' experience in ecological research and management. He has worked in a range of positions with environmental consultancies in Melbourne and Brisbane and with non-government environmental groups in Australia and East Asia. He has specialist knowledge in birds and wetlands, and extensive experience in ecological impact assessment, including in the infrastructure, renewable energy, property development and mining industries. Brett has undertaken and managed many hundreds of ecological assessments and prepared and reviewed documents that have accompanied development applications on behalf of private companies, government infrastructure agencies and private individuals. His extensive experience has given him an excellent knowledge of the regulatory environment relevant to native vegetation, flora and fauna and he can advise on the scope of scientific information needed to inform the development assessment and decision-making process. He has also defended his scientific work as an expert witness in courts and tribunals. Brett founded BL&A in 2001.

Biography

Working in industry since 1979

Qualifications

BA (Zoology & Physical Geography) *Monash University*

Certificates and Licenses

Management Authorisation – Salvage and Translocation
Victorian Animal Ethics Approval

Employment History

2001 – present

Director, *Brett Lane & Associates Pty Ltd, Melbourne*

1999 – 2000

Natural Resource Specialist, *PPK Environment & Infrastructure Pty Ltd, Melbourne*

1996 – 1998

Senior Ecologist, *Ecology Australia Pty Ltd, Melbourne*

1993 – 1996

Principal Terrestrial Ecologist, *WBM Oceanics Australia, Brisbane*

1991 – 1993

Assistant Director (East Asia), *Asian Wetland Bureau, Kuala Lumpur, Malaysia*

1987 – 1991

Director, *Brett A Lane Pty Ltd (Melbourne)*

1980 – 1986

Wader Studies Co-ordinator, *Royal Australasian Ornithologists' Union (now Birdlife Australia, Melbourne)*

1979

Research Assistant, *Kinhill Planners Pty Ltd., Melbourne*

Key Skills

- Experienced advisor on state and federal biodiversity legislation and policy
- EPBC Act and EES Referrals
- Preparation of environmental assessment reports (preliminary documentation, public environmental report and environmental impact statement)
- Preparation of native vegetation planning permit applications
- Design of developments to comply with biodiversity legislation and policies
- Expert witness for VCAT, planning panels and courts
- Ecological risk assessment
- Native vegetation assessment
- Terrestrial fauna assessment and wetland ecology
- Ornithologist specialising in wetland and migratory shorebirds
- Wind energy development specialist and minimizing impacts on wildlife including collision risk modelling

Project Examples

Property Development

Eynesbury Township, Eynesbury, Victoria: Flora, Fauna and Habitat Hectare Assessment, Targeted Flora Surveys, Growling Grass Frog Survey, Plains-wanderer Survey and Development of an Offset Tracking Tool. Net Gain Analysis for Planning Permit Applications of subsequent stages and advice on offset management (2003 – present)

Taylor's Rd, Sydenham, Victoria (Broadcast Australia): EPBC Act Referral, preparation of EPBC Act Public Environment Report (PER), Offset Site Search and Offset Management Plan, Spiny Rice-flower Propagation and Translocation Plans, Seed Collection (2006 – present)

Somerfield Estate, Keysborough, Victoria: Flora, Fauna and Growling Grass Frog Survey and Offset Plan Preparation, preparation of offset tracking reports for each stage of development (2008 – present)

Modena Estate, Burnside, Victoria: Flora and Fauna Assessment, targeted threatened species surveys, EPBC Act referrals and assessment approvals, development of offset and mitigation plans (2002 – present)

Renewable Energy

Dundonnell Wind Farm, Dundonnell, Victoria: Overview and Targeted Assessments including Brolga, bat, migratory bird, Striped Legless Lizard, Flora Surveys, assessment of powerline route and road access options, EPBC Act Referral, Input to EES Referral, preparation of EES technical appendix on flora and fauna, Brolga impact assessment, collision risk modelling (2009 – present)

Granville Wind Farm, Granville Harbour, Tasmania: Overview Assessment, targeted surveys including Orange-bellied Parrot and bat surveys, EPBC Act Referral and advice for regulator negotiations (2011 – present)

MacArthur Wind Farm, MacArthur, Victoria: Overview assessment, detailed flora and fauna surveys, impact assessment, input to EPBC Act Referral and state EES, assessment of powerline and road route options, appearance at state Planning Panel hearings as expert witness, preparation of pre-construction and operational flora and fauna management plans, net gain analysis and identification of suitable offsets (2004 – 2012)

Cherry Tree Wind Farm, Victoria: Overview assessment, native vegetation and threatened flora surveys, targeted threatened fauna surveys, assessment of powerline and road route options, offset site sourcing and assessment, preparation of expert witness statement and appearance at VCAT (2010 - 2015)

Mt Gellibrand Wind Farm, Mt Gellibrand, Victoria: Overview assessment, detailed flora and fauna surveys, including targeted Brolga and migratory bird surveys, and Striped Legless Lizard tile grid surveys, input to state planning permit application, preparation of witness statement and appearance at state Planning Panel hearing, preparation and early implementation of pre-construction flora and fauna management plans, including bat and avifauna management plan, native vegetation mapping, offset mapping, development of Brolga monitoring and mitigation strategies (2004 – present).

Road and Rail Infrastructure

Avalon Airport Rail Link, Little River, Victoria: Flora and Fauna Mapping, Constraint Analysis and Net Gain Analysis (2011 – 2013)

Dingley Bypass, Keysborough, Victoria: Flora and Fauna Assessment, including targeted flora surveys, habitat hectare assessment and Net Gain analysis, expert witness at VCAT case (approved) (2008 – 2014)

Nagambie bypass, Nagambie Victoria: Flora and Fauna Assessment, including habitat hectare assessment and Net Gain analysis (2008)

Second Murray River Bridge Crossing at Echuca-Moama: Detailed Flora Assessment, Targeted Flora Survey (2008 – present)

Ecosystem Monitoring and Management

Scientific Review Panel, Kerang Lakes Bypass project (North Central Catchment Management Authority, Goulburn Murray Water): Scientific review of detailed technical reports to inform decisions of water savings plans and associated watering plans for five wetlands that form part of the Ramsar-listed Kerang Lakes wetlands system. (2013)

Northern Victoria Irrigation Renewal Program (NVIRP): Assessed the impact of a major federal water industry investment project on Matters of National Environmental Significance, including threatened flora, threatened fauna and listed migratory birds using wetlands located in the potential impact area. (2009-2011)