

**BERRYBANK WIND FARM  
AMENDMENT APPLICATION**

**EXPERT WITNESS STATEMENT  
OF BRETT LANE**

**Berrybank Developments Pty Ltd**



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## 1. WITNESS INFORMATION

### 1.1. Expert witness information

#### 1.1.1. Name and address

Brett Lane  
Brett Lane & Associates Pty Ltd  
Suite 5, 61-63 Camberwell Road  
Hawthorn East, Vic. 3123

#### 1.1.2. Area of expertise

Brett has had 40 years' experience in wildlife research and management, including development impact assessment. He has worked in consulting for over 25 years and has also been involved in work with non-government environment groups (e.g. Birds Australia, Asian Wetland Bureau/Wetlands international).

Brett has undertaken flora and fauna impact assessments and/or monitoring for over 70 planned or operating wind energy developments. His company is a leading wind farm flora and fauna impact assessment group with experience throughout Australia.

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 and implementation of post- construction bird and bat impact monitoring programs, native vegetation and threatened species management plans, and pest plant and animal plans;
- Strategic advice to wind energy development companies on regulatory, technical and community issues related to wildlife impacts of wind farms;
- Participation in regulatory processes, including the preparation of Referrals and Assessments under the EPBC Act and public forums and planning appeals and hearings within state planning jurisdictions.

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

His work has also included the preparation of a document for the Australian Wind Energy Association that outlined data set standards and data gathering protocols when assessing and monitoring wind farm risks to birds. In addition, he has developed the draft planning policy for the state of New South Wales on the impacts of wind farms on birds and bats.

His qualifications and experience are summarised in Appendix 1.

### 1.2. Information on 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 Brett Lane

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

- Project Director and internal peer reviewer for the flora and flora assessments of the proposed wind farm (2007 - ongoing);
- Internal peer reviewer for the 2015 -2017 re-assessment of vegetation and assessment of the impact on bird and bat of the revised turbine design that is the subject of the exhibited amendment application;
- Visited the site to confirm the findings and re-familiarise myself with the site; 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
Bernard O'Callaghan		Senior Ecologist and Project Manager, Wind farm ecological impact assessments	
Elinor Ebsworth		Ecological assessment, including native vegetation and flora.	

## **2. WORK UNDERTAKEN**

Brett Lane & Associates Pty Ltd (BL&A) have completed flora and fauna assessments of Berrybank Wind Farm since 2007. In addition, BL&A reviewed the impacts on biodiversity of modifications to the layout and turbine specifications of the Berrybank Wind Farm from 2015 to 2017.

These assessments were documented in the report *Biodiversity Impact Assessment on Proposed Modifications*, Report 14143 (5.5) (BL&A 2017) that accompanied the planning permit application for the amendment.

The work undertaken is summarised below.

### **2.1. Biodiversity assessment that accompanied the planning permit application**

The results of the assessments that accompanied the initial planning permit application are presented in the following report:

- BL&A 2009, 'Proposed Berrybank Wind Farm– Flora, Fauna and Targeted Brolga Assessment', Report 7152 (7.3), June 2009, report prepared for Union Fenosa Australia Wind Pty Ltd.

This report considered the following biodiversity attributes:

- Native vegetation;
- Birds (including Brolga); and
- Bats.

### **2.2. Endorsed Plans and assessments subsequent to the planning permit application**

BL&A prepared the Flora and Fauna Management Plan (Report 7152 (10.8)) dated August 2013 (BL&A 2013). The Flora and Fauna Management Plan has been endorsed by the Responsible Authority. The Fauna and Flora Management Plan incorporates the following Plans:

- Native Vegetation Management Plan;
- Pest Plant Management Plan;
- Terrestrial Fauna Management Plan; and
- Bat and Avifauna Management Plan.

The endorsed Native Vegetation Management Plan documents the proposed removal of native vegetation associated with the Berrybank Wind Farm. If there is additional vegetation to be removed from the Berrybank Wind Farm as a result of the modification this will need to be incorporated into a revised native vegetation management plan.

### **2.3. Investigations associated with the assessment of the proposed modification**

The findings of biodiversity studies to assess the impacts of the proposed modification are included in the report that accompanied the modification:

- BL&A 2017, 'Biodiversity Impact Assessment of Proposed Modifications', Report 14143 (5.5), May 2017, Report to Berrybank Development Pty Ltd.

### **2.3.1. Native vegetation assessment**

Information was provided by Berrybank Development Pty Ltd summarising the proposed changes in layout to the wind farm. Based on the modified layout, a series of surveys of native vegetation was undertaken in 2015 and 2016 to assess areas identified as potential native vegetation where infrastructure, including access points from road reserves, may impact on native vegetation. Recommendations were provided to avoid and minimise the impact of the project on native vegetation. The findings of these studies are included in BL&A (2017), the biodiversity report that accompanied the modification application.

### **2.3.2. Bird and bat impact assessment**

Information on the proposed changes in turbine specifications, number of turbines and layout was provided by Berrybank Development Pty Ltd. Potential changes in the impacts on birds and bats were then assessed. The findings of these studies are included in BL&A (2017), the biodiversity report that accompanied the modification application.

## **2.4. Additional investigations as part of this Expert Witness Statement**

In the preparation of this expert witness statement, additional investigations have been undertaken as described below.

### **2.4.1. Native vegetation assessment**

The revised layout as proposed in the May 2017 modification of the proposed Berrybank Wind Farm has been assessed to determine changes in native vegetation removal. This assessment included:

- Reviewing the final modified layout to identify any changes in impacts on native vegetation; and
- A site visit on 31 October 2017 to check current native vegetation and bird and bat habitat conditions at the Berrybank Wind farm site and to review the feasibility of any alterations required to avoid native vegetation removal.

### **2.4.1. Bat and bat impact assessment**

An assessment of birds and bats of the change in impacts from the modified wind farm design was undertaken based on a combination of raising the RSA for turbines and a reduction in the number of turbines. This assessment included:

- Reviewing the modified turbine specifications to determine change in impacts on birds and bats;
- Further assessment of aviation safety lighting impacts on bats;
- Review of listed species in the surrounding area;
- Interrogation of DELWP database (Nature Print) to determine change in species distribution; and
- Site visit on 31 October 2017 to confirm if any habitat features of the site had changed and to verify if previous findings were still valid.

## 2.5. Sources of information

The sources of information for this expert witness statement are:

- BL&A 2009, 'Proposed Berrybank Wind Farm– Flora, Fauna and Targeted Brolga Assessment', Report 7152 (7.3), June 2009, report prepared for Union Fenosa Australia Wind Pty Ltd.
- BL&A 2013, 'Flora and Fauna Management Plan', Report 7152 (10.8), August 2013, report prepared for Berrybank Development Pty Ltd.
- BL&A 2017, 'Biodiversity Impact Assessment on Proposed Modifications', Report 14143 (5.5), May 2017, report prepared for Berrybank Development Pty Ltd.
- Nature Print (DELWP, 2017).

### Site visit

In addition to the above listed sources of information, I undertook a site visit on 31 October 2017 to confirm site conditions and to understand the findings of the native vegetation assessment and site condition to interpret the earlier bird utilisation data.

### Submissions

Submissions made on the modification application provided by the proponent were reviewed and, where required, additional information provide in response to issues raised.

### 3. FINDINGS

The findings from this work are summarised below.

#### 3.1. Native vegetation

BL&A was engaged by Berrybank Development Pty Ltd to conduct a native vegetation impact assessment of the proposed layout change. The report ‘Biodiversity Impact Assessment on Proposed Modifications’, Report 14143 (5.5) (BL&A 2017) reviewed the following:

- Native Vegetation Information Management system (NVIM) (DELWP 2015a);
- Biodiversity Interactive Map 2.0. (DELWP 2015b);
- Flora and Fauna Guarantee Act 1988 - Threatened List (DELWP 2015c);
- Proposed Berrybank Wind Farm – Flora, Fauna and Targeted Brolga Assessment’, Report 7152 (7.3) (BL&A 2009);
- Berrybank Wind Farm Project – Flora and Fauna Management Plan, Report 7152 (10.8) (BL&A 2013).
- Comparison of initial and modified layout for Berrybank Wind Farm; and
- Assessment of the potential impacts of the proposed layout change on flora and native vegetation.

The sources of information listed above were reviewed to determine the current ecological values within the Berrybank Wind Farm site. The impacts of the modified proposal on these ecological values was then determined.

The native vegetation clearing controls (CI 52.17 of the planning scheme) have changed in Victoria since the initial permit was issued. The initial permit was issued under the Native Vegetation Management Framework. The new regulatory regime for native vegetation removal is the Biodiversity Assessment Guidelines.

##### 3.1.1. Legislation and policy

#### Planning and Environment Act 1987

Destruction, lopping or removal of native vegetation on land which, together with all contiguous land in one ownership, has an area of 0.4 hectares or more requires a planning permit under Clause 52.17 of all Victorian Planning Schemes. This includes the removal of dead trees with a DBH (diameter at breast height or at 1.3 metres above the ground) of 40 centimetres or more and any individual scattered native plants.

#### FFG Act

The Victorian *Flora and Fauna Guarantee Act 1988* (FFG Act) lists threatened and protected species and ecological communities. Any removal of threatened flora species or communities (or protected flora) listed under the FFG Act from public land requires a Licence or Permit under the Act, obtained from DELWP. The FFG Act does not apply to development on private land.

### 3.1.2. Results

#### *Existing information*

Pre-European Ecological Vegetation Class (EVC) mapping (DELWP 2015b) indicated that the study area and surrounds would have supported Plains Grassland – Plains Grassy Woodland mosaic (EVC 897) prior to European settlement based on modelling of factors including rainfall, aspect, soils and remaining vegetation.

BL&A (2009) recorded patches of the following EVCs during surveys:

- Plains Grassland/Plains Grassy Woodland mosaic (EVC 897);
- *Heavier-soils* Plains Grassland (EVC 132\_63);
- Plains Grassy Wetland (EVC 125); and
- Aquatic Herbland (EVC 653).

These patches are shown and described in BL&A 2017.

Net Gain assessments and targeted threatened species surveys for small areas of potential impact under the currently approved layout were conducted by BL&A in 2008 and 2009, and are documented in the 'Berrybank Wind Farm Flora and Fauna Management Plan' (BL&A 2013).

No remnant native vegetation was mapped within the areas of proposed impact during these initial surveys. Two rare or threatened flora species were confirmed during these investigations, but were not expected to be impacted (BL&A 2009).

#### **3.1.2.1. Impacts of the revised layout**

The Berrybank Wind Farm, as currently approved, does not involve the removal of any remnant patch native vegetation, scattered trees or impacts to threatened flora species (BL&A 2009).

The proposed layout changes involve a reduction in the number of turbines, amending the location of access tracks and the placement of site access/exits, crossings and emergency break barriers. It also allows for the micro-siting of turbines post-approval.

The amendment assessment (BL&A 2017) identified a number of areas of native vegetation potentially impacted by the modification, all of which occurred in road reserves where access tracks to the wind farm are located. This report also provided recommendations for avoidance of native vegetation removal, where possible.

The proponent has committed to implementing these recommendations to avoid and minimise impacts to native vegetation; however, this has not yet been fully incorporated in the modified layout.

The recommendations provided in BL&A 2017 are summarised below. Further detail is provided in Table 2.

- Impacts on areas of native vegetation could be avoided at four of the five sites;
- At one site on Berrybank-Werneth Road impacts on native vegetation could not be avoided. The estimated removal will be around 20 metres x 10 metres – approximately 197m<sup>2</sup>.; and

- It is recognised that additional adjustments to the proposed layout may be necessary to enable suitable access for large vehicles transporting turbines when the final development plan is presented to the Responsible Authority for endorsement.

**Table 2: Impact of proposed modification on native vegetation (from BL&A 2017)**

Site name	Native vegetation impacts arising from modified layout (May 2017)	Recommendation for avoidance of native vegetation	EPBC listed NTGVVP?	FFG Act listed WBPG?	Targeted surveys completed	Avoided in current modified layout?
Doyle’s Road	Yes	Move site access point 30-50 metres to the north	Yes	No	Clover Glycine Hairy Tails Small Milkwort White Sunray	No – but can be achieved by implementing recommendations
Private land adjacent to the Hamilton Highway	Yes	Move track east by 50 metres	No	No	Button Wrinklewort Clover Glycine White Sunray	No – but can be achieved by implementing recommendations
Berrybank-Werneth Road	Yes	Cannot be avoided	Yes	No	Button Wrinklewort Clover Glycine Curly Sedge Hairy Tails Small Milkwort White Sunray Swamp Fireweed Large-fruit Fireweed Fragrant Leek-Orchid Spiny Rice-flower Trailing Hop-bush	No – unavoidable removal around 20metres x 10 metres – approximately 197m2
Bennett’s Road	Yes	Locate crossing south of the centreline of Padgett’s lane by 30-70 metres	Possibly	Possibly		No – but can be achieved by implementing recommendations
Padgett’s Lane	Yes	Move crossing east to bend in Padgett’s Lane	Yes	No	None required	No – but can be achieved by implementing recommendations

**Figure 1: Berrybank Wind Farm proposed layout and native vegetation**

### 3.1.3. Implications

Implications of the revised layout are as follows.

Condition 13 f) of the two permits require a Native Vegetation Management Plan (which has been endorsed), which includes:

- (i) *‘A report by a suitably qualified person after the completion of a target spring survey of native vegetation in the vicinity of access points where a Vegetation Protection Overlay exists. The report should set out the findings of the targeted spring survey and, if vegetation listed under the Flora and Fauna Guarantee Act 1988 or the Environment Protection and Biodiversity Conservation Act 1999 is identified, set out how impacts on that vegetation is to be avoided or minimised;*
- (ii) *Requirements for consultation with the Department of Sustainability and Environment the Corangamite Shire Council and Golden Plains Shire Council in the preparation of any offset plan;*
- (iii) *Identification of offsets prior to native vegetation removal;*
- (iv) *Explanation of how vegetation removal has been minimised by project design;*
- (v) *A detailed and thorough description of how the native vegetation management framework’s three-step approach has been applied;*
- (vi) *Protocols so that net gains will be undertaken if native vegetation disturbance and removal cannot be avoided for the construction, operation and decommissioning stages of the project; and*
- (vii) *A protocol for the protection of native vegetation on the wind farm site during the construction phase; procedures for the rehabilitation of construction zones with appropriate pasture species.’*

The Native Vegetation Management Plan is included in the Flora and Fauna Management Plan (BL&A Report 7152 (10.8)) dated August 2013, which has been endorsed by the Responsible Authorities. Thus, any amendments to the quantum of vegetation removal will need to be identified and incorporated into a revised native vegetation management plan.

This revised plan should assess vegetation removal and determine required offsets in accordance with the current native vegetation clearing controls, namely the Biodiversity Assessment Guidelines. In anticipation of this, the information to be included in the Native Vegetation Management Plan has been included in the report ‘Biodiversity Impact Assessment on Proposed Modifications’, Report 14143 (5.5) (BL&A, 2017). The vegetation removal would be assessed under the Biodiversity Assessment Guidelines to follow the “low-risk” assessment pathway as outlined in BL&A (2017).

It is noted that the Handbook issued by DELWP to inform decision-making under the Guidelines states for the low risk pathway (DELWP 2015d – pg 18): **Decision-point - Biodiversity considerations** - “do not object to (or refuse to grant) a permit based on biodiversity considerations in Clause 52.17“. This indicates that the extent of native vegetation removal proposed is not of conservation consequence and the requirements of the state’s native vegetation clearance controls will readily be achieved through the provision of an offset.

#### FFG Act

Under the FFG Act, a permit will be required to remove the Plains Grassland vegetation on the Berrybank – Werneth Road as it is a listed threatened community on public land.

### 3.1.4. Conclusion

- Most impacts on native vegetation can be avoided if the proponent proceeds with the proposed access track relocations outlined above to avoid impacts on native vegetation, where possible.
- One site on the Berrybank – Werneth Road will require the removal of 197m<sup>2</sup> of native vegetation. This proposed removal will need to be incorporated into an amended Native Vegetation Management Plan for endorsement by the Responsible Authorities. A permit will be required under the FFG Act to remove this area of listed grassland community as it is on public land. This removal will not significantly reduce the extent or compromise the quality of the roadside remnant native grassland that occurs along this road.
- It is recognised there may be additional adjustments to the proposed layout to ensure suitable access for large vehicles transporting turbines for the construction of the Berrybank Wind Farm.
- An updated Native Vegetation Management Plan will need to be prepared recording all planned vegetation removal.
- The revised Native Vegetation Management Plan needs to consider removal of this vegetation under the Biodiversity Assessment Guidelines.
- The required offset for removal of this native vegetation will need to be secured before removal commences.

### 3.2. Bird and bat impacts from the modification

The planning approval for Berrybank Wind Farm was issued on 24th August 2010. It details the specifications of the wind farm, including the number and scale of the turbines. The permit originally specified the tower height of the wind turbines at 80 metres, with an overall height of 131 metres above natural ground level.

The proposed changes in turbine specifications are set out in Table 3.

**Table 3: Proposed changes to turbine specifications**

Turbine specification	Currently permitted turbines	Modified turbines	Total extent of change
Maximum RSA height (tip height)	131	180m	Increase in blade tip height of 49 m
Minimum RSA height (above ground)	29.5 m	40 m	10.5 increase in height of minimum RSA
Rotor radius	50.5	65 m	14.5 m rotor diameter increase
Total RSA m <sup>2</sup> / turbine	8,012 m <sup>2</sup>	13,273 m <sup>2</sup>	66% increase
Number of turbines	99 approved and 95 endorsed	79	17% reduction

In this report, **rotor swept area (RSA)** is the zone encompassing the area of an operating wind turbine within which the blades rotate. It has upper “maximum” and lower “minimum” RSA heights, and a total circular swept area.

The 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 the micro-siting requirements of the current permit.

This assessment compares the change in risk to birds as a result of the turbine changes in Table 3. It is based on the information below:

- BL&A 2009 report *Proposed Berrybank Wind Farm, Flora and Fauna assessment, Report No. 7152 (7.3)* on the results of bird and bat utilisation surveys of the Berrybank wind farm site (BL&A, 2009);
- BL&A 2017, *Biodiversity Impact Assessment on Proposed Modifications*, Report No. 14143(5.5); and
- Information from Berrybank Development Pty Ltd summarizing the proposed changes in height and layout of the wind turbines at the wind farm.

The original bird utilisation survey for the wind farm was based on a model being considered at the time of the surveys, i.e. turbines not exceeding 120 metres in height (i.e. from the ground to the top of the highest point reached by the rotating turbine blades) and a lower minimum RSA height of 35 metres above the ground. These two heights were used in the original flora and fauna impact assessment (BL&A 2009) as a basis for understanding the bird and bat risks from operating turbines. However, these were not the heights that were approved through the approval process.

The proposed modified turbine envelope will encompass the measurements listed in Table 3 and impacts on birds and bats is assessed using these maximum measurements.

A calculation of the changes in the RSA at various height bands is outlined in Table 4 below.

**Table 4: Changes in Rotor Swept Area at various heights for two different turbines**

Height range (m)	Area of 101 m diam. turbine	Area of 130 m diam. Turbine <sup>^</sup>	Change in total RSA	% Change in total RSA
0-10				
10-20		-		
20-30	5		-5	
30-40	437		-437	-100%
40-50	724	469	-254	-35%
50-60	875	826	-49	-6%
60-70	963	1,022	60	6%
70-80	1,003	1,151	148	15%
80-90	1,003	1,235	232	23%
90-100	963	1,283	321	33%
100-119	1,599	2,582	983	62%
120-139	441	2,387	1,945	441%
140-160	-	1,848	1,848	
160+		469	469	
<b>Total</b>	<b>8,012</b>	<b>13,273</b>	<b>5,261</b>	<b>66%</b>

The impacts of the changes are outlined below:

- The increase in the rotor diameter from 101 metres to 130 metres will bring changes to the total extent of the RSA for each turbine from 8,012 m<sup>2</sup> to 13,273 m<sup>2</sup>, which will increase the total RSA area by approximately 66%;
- The total area of RSA between 20 to 60 metres will decrease the RSA in height bands (20-30m, 30-40m, 40-50m and 50-60m) up to 60 metres;
- The majority of the change in RSA will be at heights above 100 metres above the ground.

Based on the original bird utilisation surveys and the overall flora and fauna assessment at the Berrybank Wind Farm (BL&A 2009), none of the species of birds found to regularly fly over the wind farm were rare or threatened and the site was found to be dominated by common farmland birds. The most commonly observed bird species at rotor swept area height at the Berrybank Wind Farm were:

- Australian Magpie;
- Australasian Pipit;
- House Sparrow;
- Yellow-rumped Thornbill;
- Willie Wagtail; and
- Common Starling.

These species are common and widespread in southeastern Australia in agricultural landscapes and any additional 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.

During the bird utilisation study for the Berrybank Wind Farm, the height of flying birds was recorded and documented in BL&A (2009) in the height zones outlined in the table below:

- Below rotor swept area height: <35 m above the ground;
- At rotor swept area height (35 to 120 m above the ground); and
- Above rotor swept area height (>120 m).

The assignment of birds to height classes from the data collected was:

- Below rotor swept area height: 95.7 percent;
- Within rotor swept area height: 4.1 percent; and
- Above rotor swept area height: 0.2 percent.

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 40 metres to 120 metres. The data has been analysed and is presented in Table 6. Information from the bird utilisation surveys at the Ryan Corner Development Pty Ltd proposed Hawkesdale Wind Farm is also presented to indicate the observed height distribution of birds in a similar agricultural setting.

The table shows that bird height distribution was similar between the two wind farms with very small differences between the proportions of birds seen at the different heights.

Table 5: Bird flight heights at Berrybank and Hawkesdale Wind Farms.

Height class (m)	Berrybank (%)	Hawkesdale (%)
Ground	71.0	74.0
1 - 10	17.2	3.5
11 - 20	5.3	6.6
21 - 30	2.8	6.2
31 - 40	0.8	3.8
41 - 60	1.2	2.3
61 - 80	0.3	1.2
81 - 100	0.5	1.5
101 - 120	0.7	0.2
121 - 140	0.0	0.0
>140	0.2	0.8
<b>Total birds counted</b>	<b>559</b>	<b>2,773</b>

The proposed modified turbine increases the lower minimum RSA height for turbines by 10.5 metres (i.e. from 29.5 to 40 metres). This is a change will lift the lower minimum RSA by 10.5 metres will result in less risk to the 0.8% of all bird flights between 30 and 40 metres.

As a result of the proposed modifications:

- The total area of RSA per turbine between 20-30m, 30-40m, 40-50m and 50-60m actually decreases. This will have a corresponding decrease in risk to the over 98% of birds recorded flying below 60 metres in the proposed modification;
- The incremental RSA area change for the height range from 60 to 70m and 70-80m is 6% and 15% respectively. This is a relatively small increase in risk to the 0.3 % of birds recorded flying between 60 and 80 meters; and
- Above 80 metres there is an increase in the total area of RSA in bands up to 170 metres. However, 1.4 % of birds were recorded flying at this height. This would present an increased risk to high flying species such as raptors and the needletail.

The proposed increase in the maximum height to 180 metres will have a small incremental effect on birds at the Berrybank Wind Farm as few birds (0.2%) were recorded flying above 120 metres. 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 the Wedge-tailed Eagle, other high-flying raptor species and the White-throated Needletail *Hirundapus caudacutus*. None of these species are listed as threatened species although the White-throated Needletail is listed as migratory under the EPBC Act. Therefore, the impacts on these species are not of concern at a population level.

In addition, the decrease in the number of turbines from the approved and endorsed 95 turbines to 79 turbines will result in a decrease of 17% in the number of turbines, which will contribute to reducing overall risks.

### 3.2.1.1. *Potential impacts of modification on Brolgas*

An updated search of the Victorian VBA for Brolgas was completed to 10 km beyond the proposed boundaries of the Berrybank Wind Farm (September 2017). There have been no major changes in Brolga distribution within 10 km of the wind farm. There were two records of Brolgas within the 10 km of the Berrybank Wind Farm, one a 2017 breeding record by BL&A at near Woody Yaloak River about 6.6 km from the eastern extremity of the wind farm. This new information does not change any conclusions in relation to how the broga uses the landscape within 10-20 kilometres of the Berrybank Wind Farm and the findings from our work for the original assessment of the project (BL&A 2010, Report 7152[7.3]) still hold.

As Figure 4 in the original Brolga assessment for the project showed (BL&A 2010, Report 7152[7.3], p.46), the site lies in an area of comparatively elevated country with a limited number of natural wetlands in it. Beyond about 10 kilometres, to the south-east and the west, the country is lower-lying and supports many more wetlands with Brolga records. Although there are a small number of breeding records closer than 10 kilometres, the level of Brolga activity across the site is expected to be lower than for other regions of the species' range.

It is noted that Brolga fly more frequently below 30 metres (BL&A unpublished data) than above 30 metres. Based on this, increasing the height of the lower level of the RSA from 29.5 to 40 metres above the ground would further decrease collision risk for this species.

The Planning Panel has requested that the *Interim guidelines for the assessment avoidance, mitigation and offsetting of Potential Wind Farm Impacts on the Victorian Brolga Population 2011 (DSE 2012)* be addressed in relation to the amendment application. The Bat and Avifauna Management Plan (BAM Plan) for the Berrybank Wind Farm (BL&A 2013 Report 7152 [10.8]) was approved by DELWP's predecessor in 2013. It was prepared after these guidelines were published and took them into account (see below). It included a requirement to consult with the local community in relation to Brolga activity on and around the wind farm site, as well as a requirement to monitor monthly for Brolga presence within 3 kilometres of the wind farm in the breeding season (July to December) and within five kilometres of the wind farm in the flocking season (January – June). These distances are based on the default breeding and flocking site buffers in the guidelines.

In the BAM Plan, Brolga breeding and flocking within these distances from the wind farm triggers a requirement to monitor more closely their movements and behaviour to ascertain if there is a risk to individuals from the wind farm. The approved BAM Plan therefore takes account of the buffers in the more recent guidelines and provides for intensive monitoring of any activity within the default buffer distances.

### 3.2.2. *Modification of impacts on Bats*

Greg Richards & Associates Pty Ltd in association with BL&A studied the bat avifauna of the proposed Berrybank Wind Farm. Nine species of bats were considered likely to utilise the wind farm site. These species are common and secure species. It was considered that the Southern Bent-wing Bat (*Miniopterus schreibersii bassiana*), which is a threatened species in Victoria and nationally, was unlikely to occur regularly at the Berrybank wind farm site as the site is too far from the usual range of this species. None were recorded during bat surveys of the wind farm site (BL&A 2009).

Records of bat calls above ground are achieved by lifting the call receiver of the detector to heights of up to 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 Berrybank did not involve recording bats at height. Notwithstanding this, 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 than at ground level. 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. Based on this, increasing the RSA ground clearance from 29.5 metres to 40 metres would likely to decrease the number of bats exposed to potential collision risk. It can also be assumed that any increase in the extent of the RSA might lead to a proportionate increase in number of bats exposed to a risk of fatal collision with the rotating turbines.

The proposed RSA envelope will maintain the lower RSA at a minimum of 40 metres compared to the original permitted minimum RSA of 29.5 metres. Overall the level of risk of collision to most bat species that fly low to the ground will be reduced by this modification.

At the proposed Berrybank wind farm site, bat activity involved common, widespread bat species only, thus the effect of the changed RSA height range and extent are not considered to be significant as most bat activity is likely to remain below the increased lower RSA height. Collisions, when they occur, are almost certain to involve common, widespread species. These impacts would not lead to any significant decline in their populations.

### **3.2.3. Aviation Night Lighting**

I understand that CASA has recommended that steady, low-intensity red lights be placed on 35 of the turbines at the Berrybank Wind Farm.

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). Gehring *et al.* (2009) found that communication towers lit at night with only flashing red or flashing white lights had significantly fewer bird fatalities than towers lit with a combination of steady-burning red and flashing lights. Most of the birds affected in North America are night-migrating songbirds, of which there are very few in southern Australia.

Several reviews of bat mortality at wind farms in the USA have 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).

The comparative level of bird and bat utilisation for the Berrybank Wind Farm is low, and there were no species of threatened birds or bats at risk on the site. The CASA recommendation for red lights is unlikely to increase significantly the risk of attracting bats

to turbines given the lack of correlation between red lighting and bat collisions at wind farms where this has been investigated (see above). As most bird mortality at red (and other colour) lit structures in the USA involve night-migrating songbirds, of which there are very few in Australia, bird fatality rates at the wind farm are not expected to be affected by the CASA-required lighting scheme.

#### 3.2.4. Summary of findings

Based on the foregoing review of relevant information, the conclusions below have been made.

In relation to birds:

- The proposed modified turbine increases the lower minimum RSA height for turbines by 10.5 metres will lift the lower minimum RSA by 10.5 metres which moves the RSA higher and out of the heights of most bird activity. This will result in less risk to the 0.8% of all bird flights between 31 and 40 metres.
- The decrease in RSA per height increment up to 60 meters between will have a corresponding decrease in risk to the 98% of birds recorded flying below 60 metres in the proposed modification;
- The incremental RSA area change at for the height range from 60 to 70 and 70-80 metres is 6% and 15% respectively. This is a relatively small increase in risk to the 0.3 % of birds recorded flying between 60 and 80 meters; and
- Above 80 metres there is an increase in the total area of RSA in bands to 170 metres and an increase in tip height has the potential to impact on higher flying species. These include raptors as a group, and specifically the Wedge-tailed Eagle, the White-throated Needletail *Hirundapus caudacutus* and other high-flying raptor species.
- Overall there is a substantial decrease in risk to most bird species by this modification. However, there is an increased risk to high flying species including the Wedge-tailed Eagle, the White-throated Needletail *Hirundapus caudacutus* and other high-flying raptor species. None of these species are listed as threatened species although the White-throated Needletail is listed as migratory under the EPBC Act.
- In addition, the decrease in the number of turbines from approved and endorsed 95 turbines to 79 turbines will result in a decrease of 17% in the number of turbines and will contribute to reducing overall risks.
- Brolgas may be occasionally visit the wind farm site. It is noted that Brolga fly more frequently below 30 metres (BL&A unpublished data) than above 30 metres. Based on this, increasing the height of the lower level of the RSA from 29.5 to 40 metres above the ground would further decrease any low collision risk.
- The CASA-required aviation safety lighting for the wind turbines is not expected to lead to significantly elevated levels of bird collision at the wind farm.

In relation to bats:

- The increased rotor swept area and height of turbines at the wind farm is highly unlikely to lead to a significant impact on bat species inhabiting the site, as no threatened species have been recorded on the site and any impacts are likely to affect common, widespread bat species.

- In addition, the decrease in the number of turbines from approved and endorsed 95 turbines to 79 turbines will result in a decrease of 17% of the number of turbines and will contribute to reducing overall risks.
- The CASA-required aviation safety lighting for the wind turbines is not expected to lead to elevated levels of bat collision at the wind farm

### **Bird and Avifauna Management Plan (BAM Plan)**

The Golden Plains Council and Corangamite Shire Council Planning Permits (Number 20092820 and 20092821) for the construction of a Wind Farm states that a Bat and Avifauna Management (BAM) Plan must be prepared, in consultation with the DEPI. Condition 16 states:

*“A Bat and Avifauna Management (BAM) Plan must be prepared, in consultation with the DEPI. The plan must include:*

- a) *A statement of the objectives and overall strategy for managing and mitigating any significant bird and bat strike arising from the wind energy facility.*
- b) *A monitoring program of at least 2 years duration, either commencing upon the commissioning of the last turbine of the first stage of the approved development and use (if any) or alternatively, such other time of commencement as it to the satisfaction of the Minister for Planning.*

*The monitoring program must include surveys during breeding and migratory seasons to ascertain:*

- *The species, number, age and sex (if possible) and date of any bird or bat strike*
- *The number and species of birds and bats struck at lit versus unlit turbines*
- *Any seasonal and yearly variation in the number of bird and bat strikes*
- *Whether further detailed investigations of any potential impacts on birds and bats are warranted.*

*Any such required further detailed investigations are to be undertaken in consultation with the Department of Sustainability and Environment and to the satisfaction of the Minister for Planning.*

- c) *Procedures for the reporting of any bird and bat strikes to the Department of Sustainability and Environment within 7 days of becoming aware of any strike identifying where possible whether the strike was by lit or unlit turbine<sup>1</sup>.*
- d) *Information on the efficacy of searches for carcasses of birds and bats, and, where practicable, information on the rate of removal of carcasses by scavengers, so that corrections factors can be determined to enable calculations of the total number of mortalities.*
- e) *Procedures for the regular removal or carcasses likely to attract raptors to areas near turbines.*

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<sup>1</sup> Union Fenosa has advised that no turbines will be lit.

- f) *Procedures for periodic reporting, within agreed timeframes, of the findings of the monitoring to the Department of Sustainability and Environment and the local community.*
- g) *Recommendations in relation to a mortality rate for specified species which would trigger the requirement for responsive mitigation measures to be undertaken by the operator of the wind energy facility to the satisfaction of the Minister for Planning.*
- h) *Implementation measures development in consultation with the Department of Sustainability and Environment to offset any impacts detected during them monitoring including turbine operation management and on-site or off-site habitat enhancement (including management or improvement of habitat or breeding sites).*
- i) *In relation to Brolga the plan must also include:*
  - (i) *A thorough assessment developed in consultation with the Department of Sustainability and Environment of the two identified Brolga sites and their significance to the wind farm layout with reference to the draft Guidelines for Assessment of Potential Wind Farm Impacts on Brolga (DSE 2009). (The first site is approximately 1km east of the project near Wilgul – Werneth Road and between Urches Road and Boundary Road. The second site is at the intersection of the Hamilton highway and Foxhow – Rokewood Road). Fieldwork is to be undertaken during flocking and/or breeding season as agreed with the Department of Sustainability and Environment.*
  - (ii) *Implementation of measures to increase power line visibility through marking to mitigate bird collisions.*
  - (iii) *If further sites are found, these must be reported to the Department of Sustainability and Environment.*
  - (iv) *Based on the above, if additional Brolga sites are found within 5 km of the site, development a mitigation program in consultation with the Department of Sustainability and Environment and to the satisfaction of the Minister for Planning.*

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 or any additional monitoring or mitigation contingencies. 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, apart from the project description.

### 3.3. 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.

Submitter and Issue	Response
Submission no 2: <ul style="list-style-type: none"> <li>▪ Ploughing bushfire breaks along Padgetts Lane roadside</li> </ul>	<ul style="list-style-type: none"> <li>▪ A very limited area of native vegetation will be removed.</li> <li>▪ Native vegetation removal will be in line with the approved vegetation management plan</li> </ul>
Submission 3 <ul style="list-style-type: none"> <li>▪ Concerns that bigger turbines will have an effect on the environment and wildlife</li> </ul>	<ul style="list-style-type: none"> <li>▪ The assessment on birds and bats is included in this witness statement</li> </ul>
Submission no 5: <ul style="list-style-type: none"> <li>▪ Brolgas and Wedge-tailed Eagles nest and live within Berrybank Area and have done for many decades</li> </ul>	<ul style="list-style-type: none"> <li>▪ The assessment of birds and bats is included in this witness statement</li> <li>▪ The use of Wedge-tailed Eagle of the site was relatively low</li> <li>▪ Brolga records in the Victorian Biodiversity Atlas have been reviewed in the development of this statement</li> </ul>
Submission no 6: <ul style="list-style-type: none"> <li>▪ A lot of frogs breeding in area, what damage to wildlife and environment</li> </ul>	<ul style="list-style-type: none"> <li>▪ Frogs and wetlands were assessed in the original flora and fauna assessment (2009).</li> <li>▪ Wetlands were revisited in response to submissions on the property south-west of the intersection of the Hamilton Highway and the Foxhow – Berrybank Road. No habitat suitable for this species was found, apart from a dispersal corridor along the waterway to the west. The farm dams in this area lack habitat features suitable for the species, such as dense fringing and floating aquatic vegetation. Turbines and associated infrastructure will be located more than 100 metres from this waterway, the usual maximum dispersal distance of this species from waterways and wetlands, so impacts on it from the wind farm are not anticipated.</li> </ul>

<p>Submission no 8:</p> <ul style="list-style-type: none"> <li>▪ Questions facts in Flora and Fauna Report 2009 in relation to native grasslands, Growling Grass Frog and Legless Lizards and the wetlands of the Chain of Ponds</li> <li>▪ Native grasslands in areas and links to chain of ponds</li> <li>▪ Growling Grass Frog living the Chain of Ponds – 400 metres from turbines</li> <li>▪ T48 and three other wetlands near dams with Growling Grass Frog living and breeding</li> <li>▪ Request for an independent investigation report on Growling Grass Frog</li> <li>▪ Birds feed on grains at Berrybank Grain Corp</li> <li>▪ Many Eagles and Brolgas</li> </ul>	<ul style="list-style-type: none"> <li>▪ The Growling Grass Frog was considered to have the potential to occur within the wind farm site. However, wetland habitats on the site are limited in extent, lack suitable fringing and floating vegetation and are not linked to nearby areas where the species occurs. The probability that it occurs on the wind farm site is considered to be low. (See site-specific consideration in the preceding response to submission 6.</li> <li>▪ The site surveyed in 2007 incorporated properties to the west that include the Chain of Ponds wetlands and the findings of the fauna assessment at the time reflected potential for the nationally threatened Growling Grass Frog to occur in this wetland. Subsequent changes to the wind farm boundary have meant that this wetland is no longer included in the proposed development area.</li> <li>▪ Anecdotal reports suggest there are Wedge-tailed Eagle nests within the proposed wind farm site. The Wedge-tailed Eagle is not a threatened species and no evidence of a Wedge-tailed Eagle nest was found during the earlier series of surveys.</li> <li>▪ Low quality native vegetation was documented in the BL&amp;A amendment application native vegetation assessment (Letter report of September 2015, Figure 1) at the intersection of the Hamilton Highway and the Berrybank - Foxhow Road. Inspection of this area on 31<sup>st</sup> October 2017 revealed that annual grass and weed invasion had resulted in this vegetation no longer supporting indigenous plants at the cover threshold required to be mapped as patch vegetation under the native vegetation clearing controls (the Biodiversity Assessment Guidelines).</li> </ul>
<p>Submission no 9:</p> <ul style="list-style-type: none"> <li>▪ Micro siting should not give rise to adverse change to vegetation</li> </ul>	<ul style="list-style-type: none"> <li>▪ The revised locations for turbines as a result of micro siting will be surveyed for native vegetation prior to finalisation of siting to minimise impact to native vegetation.</li> <li>▪ Any vegetation to be impacted will be managed under the Native Vegetation Management Plan.</li> </ul>

#### **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



**Brett Lane**

**Brett Lane & Associates Pty Ltd  
Suite 5, 61–63 Camberwell Road  
Hawthorn East, VIC 3123**

**3rd November 2017**

## 5. REFERENCES

- BL&A 2009, 'Proposed Berrybank Wind Farm– Flora, Fauna and Targeted Brolga Assessment', Report 7152 (7.3), June 2009, report prepared for Union Fenosa Australia Wind Pty Ltd.
- BL&A 2013, 'Flora and Fauna Management Plan', Report 7152 (10.8), August 2013, report prepared for Berrybank Development Pty Ltd – Endorsed by DSE.
- BL&A 2017, 'Biodiversity Impact Assessment on Proposed Modifications', Report 14143 (5.5), May 2017, report prepared for Berrybank Development Pty Ltd.
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- DELWP 2015d, *Biodiversity Assessment handbook – permitted clearing of native vegetation*, Department of Land, Water and Planning, East Melbourne, Victoria,
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**Appendix 1: Qualifications and experience of Brett Lane**



# 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)

**Appendix 2: Qualifications and experience of significant 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.

# Bernard O'Callaghan

## Senior Ecologist and Project Manager



## Profile

Bernard O'Callaghan has significant expertise in environment, biodiversity, and coastal management and development with the private sector, development agencies and environmental organisations in Australia and over 25 Asia-Pacific countries. Bernard has extensive experience in the design and implementation of environmental management plans to manage the impacts of development, conservation and renewable energy projects on threatened flora and fauna. He has prepared and reviewed environmental assessment reports for surveys carried out in Victoria, New South Wales, Vietnam, Fiji, Vanuatu and Tonga. Bernard has been responsible for the project management for large-scale ecological surveys in urbanised and highly remote locations. Since joining BL&A, Bernard has advised on a range of wind farm and housing developments and has provided strong technical and regulatory QA for these and other development impact assessments for the company.

## Biography

### Qualifications

Master of Environmental Management, University of New England  
Grad certificate in Applied Science (Environment and Heritage Interpretation)  
Bachelor of Science (hons), Melbourne University

### Employment History

2015 – present  
Senior Ecologist and Project Manager, *BL&A, Melbourne, Australia*

2013-2015  
Independent international consultant Asia– Pacific, Vanuatu

2008 - 2013  
Regional Program Coordinator, IUCN Regional Program, Suva, Fiji

2007 – 2008  
Regional Program Coordinator, IUCN Vietnam Country Program, Vietnam

2001 – 2005  
Chief Technical Advisor, *Vietnam, World Bank—IUCN*

1993-2001  
International environmental management assignments, including IUCN, Wetlands International, Asian Development Bank and Mekong River Commission

## Key Skills

- Project Manager including programming, staffing, client liaison, production of high quality technical reports
- Bat and avifauna management plans for wind farms preparation and implementation
- Biodiversity and Climate Change policy advice
- Protected Area Management Planning processes
- Flora and Fauna Assessments
- Targeted surveys for listed flora and fauna species
- Constraints analysis
- Scoping assessment
- Management plan preparation for listed fauna and flora values and offset sites
- Salvage protocol preparation and implementation
- Project design recommendation
- EPBC Act and EES Referrals
- Offset site selection
- Preparation of assessment reports (preliminary documentation, public environmental report and environmental impact statement)

# Project Examples

## Property Development

St. Andrews Golf Course, Fingal, Flora and fauna assessment and bushfire assessment (2016-2017)

Maroondah Hwy, Lilydale, Biodiversity Assessment Guidelines (2016)

True North, Somerton, Kangaroo Management Plans (2016-2017)

## Renewable Energy

Mt Gellibrand Wind Farm, Mt Gellibrand, Victoria: Rotor Swept Area proposed modification assessment (2015).

Coonooer Wind Farm, Coonooer Bridge, Victoria: Bird and Bat Management Plan (2015)

Kiata Wind Farm, Victoria: Environment Protection and Biodiversity Conservation Act 1999 referral for flora and fauna matters; (2015)

Capital II Wind Farm, New South Wales: Bird and Bat Adaptive Management Program, Bird Utilisation Surveys (2015)

Capital Wind Farm, New South Wales: Implementation of Bird & Bat Management Program  
– Monthly Mortality Monitoring (2015)

Cullerin Range Wind Farm, New South Wales: Implementation of Bird & Bat Adaptive Management Program  
– Specialist surveys (2015 –2016 )

Taralga Wind Farm, New South Wales: Implementation of Bird and Bat Adaptive Management Plan (2015- )

White Rock Wind Farm , Northern New South Wales: - Pre-construction bat utilisation surveys; Development of Draft Bird & Bat Adaptive Management Program (2015- )

White Rock Wind Farm, Northern New South Wales: - Development of Draft Bird & Bat Adaptive Management Program (2015-2016)

Bodangora Wind farm, NSW - Development of Draft Bird & Bat Adaptive Management Program (2015-2017)

## Road and coastal infrastructure

Vanuatu Coastal Adaptation Project, United Nations Development Program (UNDP) - Assessment of coastal infrastructure and the needs for “climate proofing” - 2013-2015.

Pilot Program for Climate Resilience—Asian Development Bank— Initial Environmental Examination coastal road construction and rehabilitation, Kingdom of Tonga (2013)

Portsea Surf Life Saving Club— Flora and fauna assessment for new access road (2017)

## Ecosystem Monitoring and Management

Nha Trang Bay, Vietnam—completion of baseline marine and coastal surveys; development of Plan of Management; Regulation development and enforcement; and Monitoring (2001-2005)



## Elinor Ebsworth

### Senior Ecologist



## Profile

Elinor is a DELWP accredited ecologist with over five years' experience in ecological consultancy. She holds a Bachelor's degree in Science (Honours) from the University of Tasmania and has worked for BL&A since 2015. During her time as a consultant, Elinor has worked on numerous projects involving ecological assessments, management and monitoring. Her reporting experience includes assessments under the Biodiversity Assessment Guidelines, formulation of environmental management plans and preparation of ecological monitoring reports. Elinor is accredited to undertake habitat hectare assessments and access safely both rail corridors and construction sites. While with BL&A, Elinor has undertaken a three month placement with V/Line as a Natural Resource Specialist.

## Biography

### Working in industry since 2012

#### Qualifications

BSc Geography and Environmental Studies, University of Tasmania, Hobart

DELWP Vegetation Quality Assessment Certification

Accreditation to Access Rail Corridors Safely

Accreditation to Access construction Sites (White Card)

#### Employment History

2015 - present

Senior Ecologist, Brett Lane and Associates Pty Ltd, Victoria

2014 - 2015

Research Associate, Environmental Change Biology (Bowman) Lab, University of Tasmania

2012—2014

Botanist, GHD Pty Ltd, Victoria

2006—2009 (casual)

Environmental Management Officer, Hobart Water, Tasmania

## Key Skills

- Native vegetation assessments
- Vegetation monitoring
- Habitat hectare assessments
- Listed Flora assessments
- Fauna habitat assessments
- Targeted surveys for listed species
- Ecological monitoring
- Offset site selection
- Knowledge of environmental policy and legislation



# Project Examples

## Property Development

- Bacchus Marsh Grammar School, Staughton Vale, Victoria: Flora and Bushfire Assessment, including habitat hectare assessment (2015)
- Bellarine Highway, Point Lonsdale, Victoria: Flora and Fauna Assessment, including habitat hectare assessment (2015)
- 15 Bowmans Lane, Keysborough, Victoria: Flora and Fauna Assessment, including habitat hectare assessment (2015)
- Braemar College road widening for access, Woodend: Flora and Fauna Assessment, including habitat hectare assessment (2016)
- Cave Hill Quarry, Lilydale, Victoria: Updated Flora and Fauna Assessment, including habitat hectare assessment (2015)
- Centre Road, Berwick, Victoria: Flora and Fauna Assessment, including habitat hectare assessment (2015)
- Citation Reserve, Mount Martha, Victoria: Flora and Fauna Assessment, including habitat hectare assessment (2015)
- Donnybrook Road, Donnybrook, Victoria: Determination of Matters of National Significance within the Melbourne Strategic Assessment Area (2015)
- Honda MPE Hume Highway, Somerton, Victoria: Flora and Fauna Assessment, including habitat hectare assessment (2015)
- Inverloch RACV Resort, Inverloch, Victoria: Offset Monitoring including flora quadrats, photo point and pest animal monitoring (2015)
- Modeina, Burnside, Victoria: tagging of Spiny Rice-flower (2016)
- Mullane Road, Pakenham, Victoria: Flora and Fauna Assessment, including habitat hectare assessment (2016)
- Stamford Park, Rowville, Victoria: Flora and Fauna Assessment, including habitat hectare assessment (2015-2016)
- St Andrews Beach Golf Course: Flora and Fauna and Bushfire Assessment, including habitat hectare assessment (2016)
- Victorian Volcanic Plain, Western Victoria: Searches for Matters of National Significance (including NTGVVP and Spiny Rice-flower) within potential offset sites (2015)
- Waverley Golf Club, Rowville, Victoria: Flora and Fauna Assessment, including habitat hectare assessment (2015-2016)

## Renewable Energy

- Ararat Wind Farm, Ararat, Victoria: Revised vegetation assessment and Pest Animal Monitoring (2015)
- Berrybank Wind Farm, Berrybank, Victoria: Desktop native vegetation assessment for revised layout (2015)
- Dundonnell Wind Farm, Dundonnell, Victoria: Transmission line Native Vegetation Assessment, including habitat hectare assessment and targeted surveys (2015)
- Kiata Wind Farm, Kiata, Victoria: Desktop native vegetation assessment for revised layout (2015)
- Ryan Corner and Hawkesdale Wind Farms, Victoria: Desktop native vegetation assessment for revised layout (2015)
- Salt Creek Wind Farm, Hexham, Victoria: Access track overview assessment (2015)

## Road and Rail Infrastructure

- V/Line Natural Resource Specialist placement (2017)
- Murray River Crossing - Echuca, Victoria and Moama, New South Wales: Masked Owl Habitat assessment (2016)
- Murray River Crossing - Echuca, Victoria and Moama, New South Wales: Squirrel Glider Habitat Linkage Strategy (2015)

## Telecommunications Infrastructure

- NBN Tower, Goughs Bay, Victoria: Flora and Fauna Assessment, including habitat hectare assessment (2015)
- NBN Tower, Lovely Banks, Victoria: Flora and Fauna Assessment, including habitat hectare assessment (2016)