

**GULLEN RANGE WIND FARM**  
**WEDGE-TAILED EAGLE BREEDING SURVEY**  
**2017 & 2018**

**New Gullen Range Wind Farm Pty Ltd**



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**February 2019**

**Report No. 14182 (34.4)**

## **CONTENTS**

1. INTRODUCTION.....	1
2. METHODS .....	2
2.1. Existing Information .....	2
2.2. Field Methodology.....	2
2.3. Training Session.....	2
2.4. Limitations of field assessment.....	2
3. RESULTS.....	4
3.1. Background information.....	4
3.2. Survey Results.....	4
3.2.1. Breeding season 2017.....	4
3.2.2. Breeding season 2018.....	5
3.3. Summary of results.....	6
4. Conclusion.....	8

## **TABLES**

Table 1: Description of each nest site and related evidence of activity - 2017 breeding season .....	5
Table 2: Description of each nest site and related evidence of activity - 2018 breeding season .....	6
Table 3: Summary of Wedge-tailed Eagle nest use .....	7

## **FIGURES**

Figure 1: Location of WTE nests at Gullen Range Wind Farm. ....	3
Figure 2: Wedge-tailed Eagle chick observed in nest 4 .....	4
Figure 3: Wedge-tailed Eagle chicks observed in nest 5.....	4
Figure 4: Wedge-tailed Eagle chick in nest 4.....	5

## 1. INTRODUCTION

New Gullen Range Wind Farm Pty Ltd engaged Brett Lane and Associates Pty Ltd (BL&A) to monitor the breeding activity of Wedge-tailed Eagle (WTE) in 2017 and 2018 twice per year (September and October/November) for an initial two-year period at the Gullen Range Wind Farm (GRWF).

Based on concerns raised by the Office of Environment and Heritage (OEH) about potential impacts on breeding Wedge-tailed Eagle (WTE) at Gullen Range Wind Farm, New Gullen Range Wind Farm Pty Ltd agreed to further monitor the breeding activity of WTE. This investigation was commissioned to monitor the nestlings that are still dependent on their parents in September and check on the grown birds in October/November before they disperse. This additional monitoring of the WTE will add to the existing knowledge of WTE breeding success at GRWF and will enable the potential impact the Wind Farm has on the WTE to be assessed.

At the NGRWF site nine WTE nests have been discovered in varying conditions. WTE pairs will usually have more than one nest in their territory and can alternate which nests they use from year to year.

This report presents the findings of the WTE breeding season during 2017 and 2018.

Specifically, the scope of the investigation included the following.

- Checks for breeding activity at the nine WTE nests known in the area in September and October/November 2017 and 2018;
- Additional searches for any additional Wedge-tailed Eagle nesting sites on the wind farm site and its vicinity; and
- A training session to train windfarm staff in carcass searches while driving across the wind farm site, carcass handling and reporting.

This report presents the findings of the assessment, identifies issues and provides recommendations and mitigation options. It is divided into the sections described below:

**Section 2** presents the methodology of the surveys;

**Section 3** summarises the results of the monitoring; and

**Section 4** details the conclusions and recommendations from the results of these surveys.

This investigation was undertaken by a team from Brett Lane & Associates Pty Ltd, comprising Curtis Doughty (Senior Zoologist), Inga Kulik (Senior Ecologist & Project Manager) and Brett Lane (Principal Consultant).

## 2. METHODS

### 2.1. Existing Information

During the first two years of the operation of GRWF, monitoring of the local Wedge-tailed Eagle (WTE) population was undertaken at the wind farm site and its vicinity. During this time, nine WTE nesting sites were located and found to be used by four resident breeding pairs.

### 2.2. Field Methodology

The WTE monitoring was undertaken on the 3<sup>rd</sup> and 4<sup>th</sup> October and the 28<sup>th</sup> and 29<sup>th</sup> November 2017 in the first year and on the 17<sup>th</sup> and 18<sup>th</sup> September and 29<sup>th</sup> and 30<sup>th</sup> October 2018 in the second year, with all WTE nest sites monitored for recent use. The location of the WTE nesting sites is presented in Figure 1.

Monitoring included the following.

- Looking into nests from vantage points where possible and recording if any nestlings or adults were at the nest
- Making notes on the general condition of the nest and
- If nests were empty, looking under the nests for signs of recent use including prey, feathers, white wash and/or pellets.

While traversing the GRWF, notes were made on the presence, location and observed behaviour of any WTE recorded on the property.

In addition, every turbine was scanned for WTE carcasses, with any found carcasses collected and reported to the wind farm management.

### 2.3. Training Session

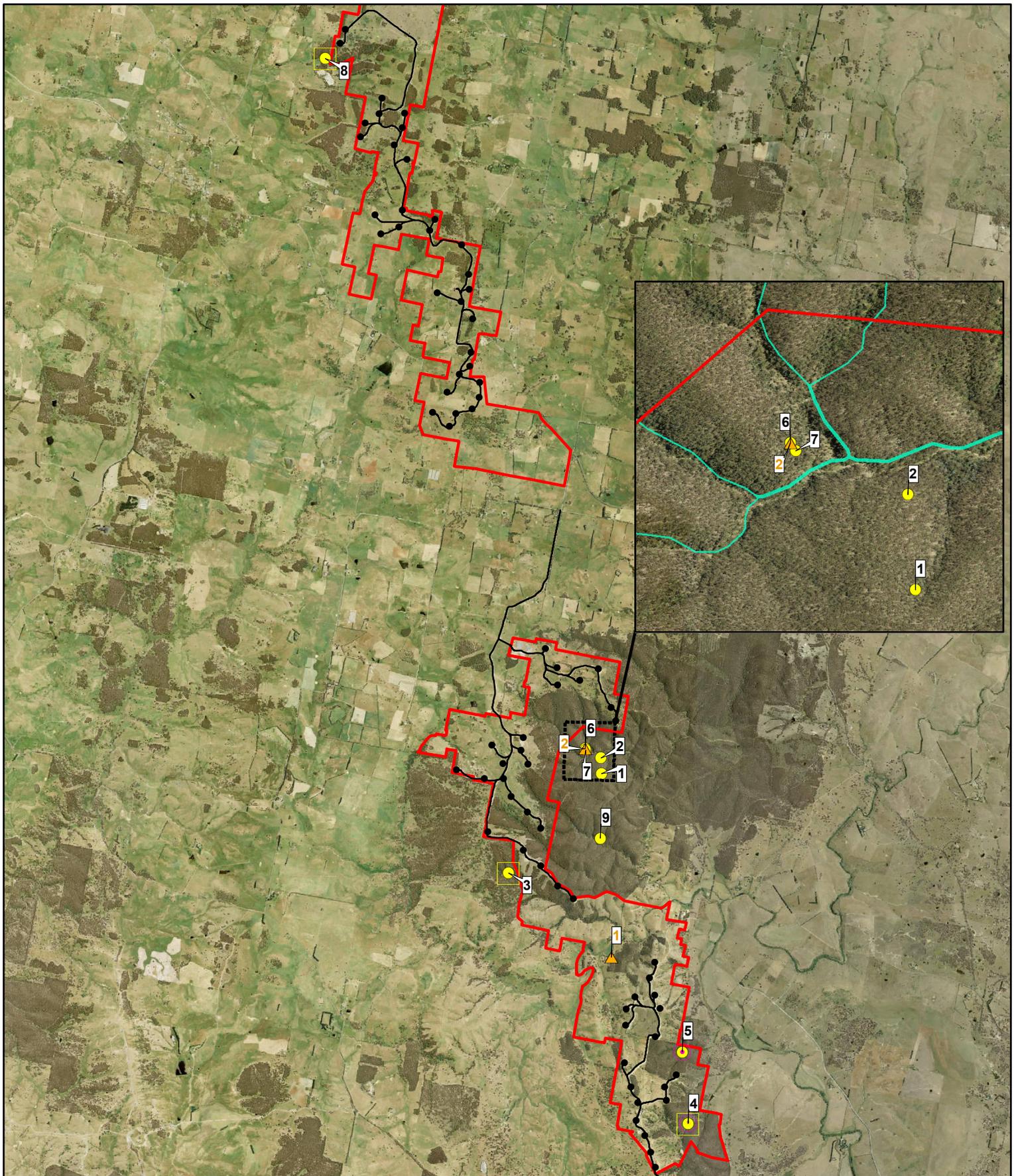
BL&A undertook a training session on the morning of the 4<sup>th</sup> October 2017. The wind farm personnel were asked to look out for WTE carcasses when traversing about the site. They were instructed to collect the carcass and fill out a casualty report if they came across any eagle remains. The casualty report will be prepared and forwarded to OEH within seven working days. The eagle carcass will be stored in the freezer on-site for up to three weeks before its disposal.

### 2.4. Limitations of field assessment

The timing and duration of WTE surveys, and the weather conditions under which surveying was undertaken, was considered suitable for detecting the species.

The field survey undertaken at the end of November 2017 failed to record any eagle chicks within nests. However, this does not necessarily indicate a failed breeding attempt, as the young birds observed earlier in October may have already fledged and left the nest.

Similarly, during the field survey undertaken at the end of October 2018 failed to record activity at two of the nests indicating either a failed nesting attempt or the chick had already fledged.



### Legend

- Wind farm boundary
- Tracks
- Turbines
- ▲ Peregrine Falcon nests (2)
- Wedge-tailed eagle nests (9)
- WTE active nest 2017 (2)
- WTE active nest 2018 (3)



<b>Figure 1: Raptor nests</b>		
<b>Project: Gullen Range Wind Farm</b>		
<b>Client: New Gullen Range Wind Farm Pty Ltd</b>		
Project No.: 14182	Date: 24/01/2019	Created By: N. May / C. Doughty
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### 3. RESULTS

#### 3.1. Background information

During the post construction carcass monitoring during 2015 and 2016 WTE nests were searched for and monitored during the breeding season for use. During 2015 four WTE nests were active with three successful fledglings raised from three of the nests and during 2016 two WTE nests were active with one fledgling successfully raised from one of the nests. Due to the decreases in fledgling success at the GRWF site BL&A recommended further monitoring of the breeding activity of WTE twice per year for the 2017/2018 to determine where birds are nesting and the breeding success.

#### 3.2. Survey Results

Out of the nine nests located within GRWF, two nesting sites were used by WTE during the 2017 breeding season and three nests were used during the 2018 breeding season.

##### 3.2.1. Breeding season 2017

During the survey in early October 2017, WTE nest 4 contained one chick. The chick had downy white feathers which would suggest it was less than one month old (Figure 2). The chick was not observed during the November survey.



Figure 2: Wedge-tailed Eagle chick observed in nest 4

During the survey in October 2017, WTE nest 5 contained two eagle chicks. They both had downy white feathers suggesting they were less than one month old (Figure 3).



Figure 3: Wedge-tailed Eagle chicks observed in nest 5

Out of the nine WTE nests inspected, two nests were used by WTE for breeding during 2017 (nests 4 and 5 on Figure 1). A description of nest condition and evidence of recent activity for all nine nest sites is given in Table 1.

WTE nest 6 was used for breeding by Peregrine Falcon in 2016 and 2017 after it was used by WTE in 2015. Nevertheless, this nest would still be suitable for WTE to use in the future.

**Table 1: Description of each nest site and related evidence of activity - 2017 breeding season**

Nest	Oct-17	Nov-17
WTE nest 1	Nest has completely fallen out of tree.	No recent activity.
WTE nest 2	Old nest, falling out of tree, no recent activity.	No recent activity.
WTE nest 3	Large nest still in good condition, no recent activity.	No recent activity.
WTE nest 4	<b>Large nest with one young chick with downy feathers.</b>	No chick in nest, signs of recent use.
WTE nest 5	<b>Nest with two young chicks with downy feathers.</b>	No chick in nest, signs of recent use.
WTE nest 6/ Peregrine Falcon nest 2	This nest was used by WTE in 2015. It has been occupied by Peregrine Falcon in 2016 and 2017.	Nest empty, no recent use by WTE.
WTE nest 7	Old nest, falling out of tree, no recent activity.	No recent activity.
WTE nest 8	Nest still in good condition, no recent activity.	No recent activity.
WTE nest 9	Old nest, falling out of tree, no recent activity.	No recent activity.
Peregrine Falcon nest 1	Nest still in good condition, no recent activity.	No recent activity.

During the 2017/2018 breeding surveys, Wedge-tailed Eagles were still seen flying over all three sections of the wind farm site (Bannister, Pomeroy and Gurrundah). This confirms that most of the wind farm site is still used by this species for foraging.

### 3.2.2. Breeding season 2018

During the survey in mid-September 2018, three WTE nests were in use (see Table 2). At WTE nests 3 and 8 (Figure 1) a lot of white wash was observed under the nests suggesting these were actively being used. WTE nest 4 contained at least one chick possibly two with downy feathers. During the survey in late October only WTE nest 4 was still in use with a large chick almost ready to fledge (Figure 3).



Figure 4: Wedge-tailed Eagle chick in nest 4

It is unclear what happened to young birds at WTE nests 3 and 8 as these nests were inactive at the end of October 2018 with no recent use. It is most likely that these nesting attempts failed. The WTE chick at WTE nest 4 was almost at fledgling age and was not far from leaving the nest. In general, this pair were very successful breeders in the past raising chicks every year since monitoring commenced in 2015.

**Table 2: Description of each nest site and related evidence of activity - 2018 breeding season**

Nest	Sep-18	Oct-18
WTE nest 1	Nest has completely fallen out of tree.	Nest has completely fallen out of tree.
WTE nest 2	Old nest, falling out of tree, no recent activity.	Old nest, falling out of tree, no recent activity.
WTE nest 3	<b>Large nest, active this year, assume the pair that nested in WTE nest 5 the previous year are using this nest this year.</b>	No recent activity, nest empty.
WTE nest 4	<b>Nest is active, one possibly two chicks with white downy feathers.</b>	<b>Nest is active and has one chick in it almost ready to fledge.</b>
WTE nest 5	Nest inactive this year, suggest the pair that used it this nest last year are nesting at WTE nest 3 this year.	Nest inactive.
WTE nest 6 /Peregrine Falcon nest 2	Nest empty, no recent use by WTE.	Nest empty, no recent use by WTE.
WTE nest 7	Old nest, falling out of tree, no recent activity.	Old nest, falling out of tree, no recent activity.
WTE nest 8	<b>Active nest, a lot of white wash under nest, did not see any eagles near nest though. Can not see in nest.</b>	No recent activity, nest is empty.
WTE nest 9	Old nest, falling out of tree, no recent activity.	Old nest, falling out of tree, no recent activity.
Peregrine Falcon nest 1	Nest still in good condition, no recent activity.	Nest still in good condition, no recent activity.

### 3.3. Summary of results

Since monitoring commenced in 2015 the nesting attempts at GRWF have been variable. During the 2015 WTE breeding season four pairs of WTE occupied nests, during 2016 two pairs occupied nests, in 2017 the same two pairs occupied nests and in 2018 three pairs occupies nests (see Table 3).

The two pairs of eagles that originally occupied WTE nests 6 and 8 were not observed nesting during 2016 and 2017. It was unclear if these pairs had moved to other nesting sites outside the GRWF site or if the birds were affected by the wind turbines. Nest 8 was situated outside the GRWF site boundary and the pair may have moved to another nest in their territory that was unknown. Alternatively, one or both of the eagles may have been affected by wind turbines.

During the 2018 breeding season three nests were occupied. It is likely that the pair of eagles that usually nested at nest 5 had moved to nest 3. These birds were successful breeders producing young most years.

The WTE pair using nest 8 in 2018 could either be a new pair to the wind farm site or the original pair returning that used this nest in 2015.

Nest 4 was continuously used by the same pair of eagles who were successful breeders producing fledglings each year throughout the monitoring period.

**Table 3: Summary of Wedge-tailed Eagle nest use**

Nest	Description	2015	2016	2017	2018
1	Nest has completely fallen out of tree.				
2	Old nest, falling out of tree, no recent activity.				
3	Large nest in good condition.				X
4	Large nest in good condition.	X	X	X	X
5	Nest in good condition, used most years.	X	X	X	
6	Nest in good condition used by both WTE and Peregrine Falcon in different years	X			
7	Old nest, falling out of tree, no recent activity.				
8	Nest in good condition	X			X
9	Old nest falling out of tree, no recent activity.				

**Notes:** X = nest was active.

#### 4. CONCLUSION AND RECOMMENDATIONS

Throughout the four-year monitoring period from 2015 to 2018 WTE breeding attempts varied from two to four pairs at the GRWF. The first year of operating turbines in 2015 coincided with the first year of WTE nest monitoring and had the highest count of breeding attempts.

Overall breeding attempts by WTE changed from four breeding pairs in 2015 to two breeding pairs in 2016 and 2017 and increased again to three breeding pairs in 2018.

Wedge-tailed Eagles are known to change their nesting sites from time to time and use several nests within their territory in different years. As mentioned in Section 3.3 the reduction from four breeding pairs to two pairs in 2016 could have either been caused by WTE using different nests outside the wind farm site or the birds could have been affected by wind turbines. The fact that in 2018 the number of breeding pairs increased again to three pairs shows that either a pair that used the site previously returned to the site or an existing nest was used by a pair new to the area.

Overall breeding attempts average to be three pairs per year at the GRWF site. This is an acceptable level for breeding given the area covered for this investigation.

In light of the previous studies into WTE at GRWF and this study into WTE breeding pairs, given that an acceptable number of WTE pairs are continuing to use the wind farm site for breeding during the operation of the wind farm, it is concluded that the GRWF does not adversely affect the local WTE population and it is recommended that no further monitoring is necessary.