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Annual Monitoring Report 2022

Gullen Range Wind Farm Offset

Report prepared for New Gullen Range Wind Farm Pty Ltd

March 2023



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Prepared for:	New Gullen Range Wind Farm Pty Ltd
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1. Introduction

1.1 Overview

Narla Environmental Pty Ltd (Narla) was commissioned by New Gullen Range Wind Farm Pty Ltd to conduct annual ecological monitoring at Gullen Range Wind Farm (GRWF) within the GRWF Offset Area (**Figure 1**). The GRWF project involves the operation of 73 wind turbines at Gullen Range in the Southern Tablelands region of NSW. A Compensatory Habitat Package (CHP), prepared by NGH Environmental Pty Ltd (NGH Environmental 2016a) as a condition of consent for the project, identifies a number of management zones within the GRWF Offset Area (**Figure 1**), and recommends specific management actions that are to be implemented within the site to improve its biodiversity values.

These management actions have been incorporated into a Conservation Property Vegetation Plan (CPVP) for the site. The CPVP details the required management actions for each management zone, and includes monitoring and reporting requirements. The ongoing approval of the GRWF project requires compliance with the CHP and CPVP, which sets a goal of improving the site towards or to benchmark levels within 5 years and 20 years, respectively.

1.2 Scope of works

The purpose of this report was to outline the monitoring of native vegetation, pest species, weed species and nestboxes that have been conducted within the GRWF Offset Area in 2022, and to assess compliance with the CHP and CPVP. The report will detail the following:

- A compilation and analysis of monitoring results from 2016-2022;
- Presentation of photographic evidence (photo points) to illustrate progress of weed management and native regeneration;
- Details of pest fauna species found to be within the Offset Area;
- Management actions undertaken within the site;
- Overall compliance with the CHP and CPVP; and
- Recommendations to improve biodiversity values within the site.



Figure 1. Management zones within the GRWF Offset Area (based on NGH Environmental 2019).

2. Methodology

2.1 Vegetation Monitoring

Baseline vegetation condition monitoring was undertaken by NGH Environmental within the GRWF Offset Area in November 2016 to meet the requirements of management actions 3 and 4 of Schedule 2 of the CPVP. The monitoring plots have been permanently marked in the field using high visibility star posts at the beginning and end of the transects to facilitate replication. Management Action 38 of the CPVP specifies the following requirement for ongoing monitoring of vegetation condition data:

“38. The Landholder must conduct annual monitoring at the monitoring points shown on Map 1. Monitoring involves collecting plot data according with the Biobanking methodology and taking photographs from fixed photographic points at these monitoring sites.”

Vegetation monitoring was conducted within the GRWF Offset Area on the 23rd and 24th November 2022 to satisfy this requirement. Monitoring was conducted at eleven (11) previously established 20m x 50m Biometric Plots. The locations of the monitoring points are shown in **Figure 3** and **Table 1**.

The layout of each plot is presented in **Figure 2**. The starting post was used as a photo-point with images taken along the transect and at 90-degree intervals around the starting post. The exception is plot GRMP1 where the monitoring point was established at the transect end and this has been maintained for consistency.

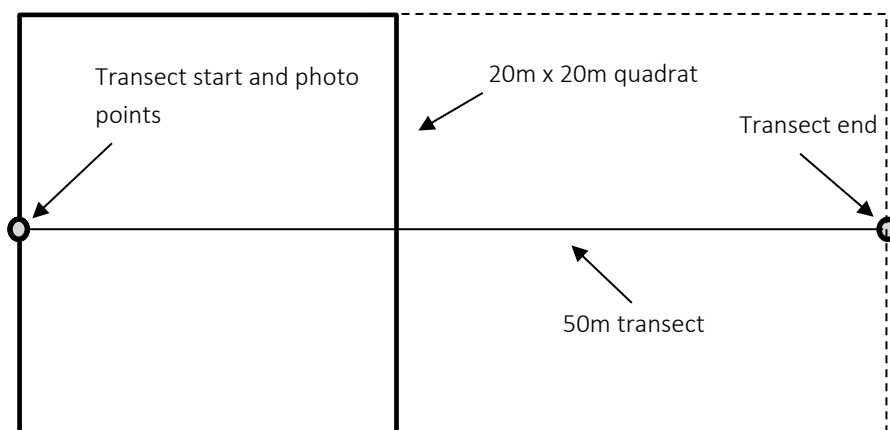


Figure 2. 20m x 50m vegetation plots established within the GRWF Offset Area.

The following data were collected within each plot:

- At each 1m interval along the 50m transect:
 - Percentage native and exotic cover in the overstorey (woody plants with >10m height) and midstorey (woody plants with 1-10m height); and
 - Counts of ground cover (<1m height) including native shrubs, native grasses, native other and exotic using the point intersect method.
- Within a 400m² area (20m x 20m quadrat):
 - A list of native and exotic species.
 - Native species abundance as per the modified Braun-Blanquet Scale (NGH 2019):
 - R = Rare (<4) individuals present
 - + = Few (4-15) individuals present

- 1 = A number of individuals present, less than 5% cover
 - 2 = 5 - <20% cover
 - 3 = 20 - <50% cover
 - 4 = 50 - <75% cover
 - 5 = 75-100% cover
- Within a 1000m² area (20m x 50m plot):
 - Number of individual trees with hollows (only hollows ≥5cm diameter);
 - Total length of fallen logs in meters (only logs >10cm width).

The data recorded from each monitoring plot were then compared with the benchmark data, baseline data, and data from subsequent monitoring years (2017, 2018, 2019, 2020 and 2021; **Section 3.1**).

Table 1. Location of vegetation monitoring plots within the GRWF Offset Area.

Plot Name	Zone	Vegetation type/condition	Transect Start		Transect End	
			Easting	Northing	Easting	Northing
GRMP1	2	Apple Box – Yellow Box Woodland with a predominately exotic understorey	726922.2	6165757.2	726936.4	6165819
GRMP2	3	Broad-leaved Peppermint – Brittle Gum Dry Forest with a diverse native understorey	726630.4	6165990.9	726605.3	6165949.5
GRMP3	1	Apple Box – Yellow Box Woodland with a predominately low diversity native understorey	726545.7	6166159.3	726573	6166197
GRMP4	3	Broad-leaved Peppermint – Brittle Gum Dry Forest with a diverse native understorey	726138.9	6166164.7	726127.3	6166208
GRMP5	1	Apple Box – Yellow Box Woodland with a predominately low diversity native understorey	725866.5	6166183.9	725810	6166177.8
GRMP6	3	Mountain Gum – Broad-leaved Peppermint Forest/Apple Box – Broad-leaved Peppermint Forest with a diverse native understorey	725671.1	6165777.9	725654.5	6165828.8
GRMP6a	5	Localised Apple Box dominated area where a more open canopy has facilitated the invasion of Serrated Tussock	725671.1	6165777.9	725697.6	6165370.9
GRMP7	4	Ribbon Gum Forest with a mixed native and exotic understorey	725620.6	6165753.6	725612.4	6165798.7

Plot Name	Zone	Vegetation type/condition	Transect Start		Transect End	
			Easting	Northing	Easting	Northing
GRMP8	3	Broad-leaved Peppermint – Brittle Gum Dry Forest with a diverse native understorey	725623.2	6165528.1	725624.8	6165569.8
GRMP9	2	Apple Box – Yellow Box Woodland with a predominately exotic understorey (no overstorey)	726861	6165991	726863	6165941
GRMP10	1	Apple Box – Yellow Box Woodland with a predominately low diversity native understorey (derived grassland)	726533	6166243	726567	6166282

2.2 Weed Monitoring

Baseline weed mapping was undertaken by NGH Environmental within the GRWF Offset Area in November 2016, and focussed on mapping the extent and density of noxious weeds (now referred to as priority weeds under the Biosecurity Act 2015). Subsequent monitoring events were undertaken in 2017, 2018, 2019, 2020 and 2021. Annual weed monitoring has been conducted to ensure compliance with the CPVP management action: “*Weed control – Noxious Weed Management*”. At the time of establishment of the CPVP, landowners and managers had legal obligations to control noxious weeds under the NSW Noxious Weeds Act 1993. The Biosecurity Act 2015 has now superseded the Noxious Weeds Act 1993, which lists ‘Priority Weeds’ in lieu of ‘Noxious Weeds’. Section 32 of the Biosecurity Act 2015 (NSW) states “A priority weed is any weed identified in a local strategic plan, for a region that includes that land or area, as a weed that is or should be prevented, managed, controlled or eradicated in the region.”

Weed monitoring was conducted within the GRWF Offset Area on the 23rd and 24th November, 2022. Various weed points and polygons (areas) have been mapped and annotated with details of weed species, locations and abundance (Narla Environmental 2020). All of these areas were visited during the November 2022 monitoring and inspected for any change. Weed extent and density were recorded at these locations. Additional weed points were also mapped during this monitoring period. Further to this, eleven (11) existing photo-points (**Table 2; Figure 3**) were visited on the 23rd and 24th November, 2022. Photos were captured to the north, east, south and west, as per previous monitoring events.

Table 2. Location of weed photo monitoring points within the Offset Area.

Monitoring Photo-point ID	Coordinates	
	Easting	Northing
GRWPP1	727211	6165533
GRWPP2	727133	6165473
GRWPP3	726879	6165745
GRWPP4	726888	6166017
GRWPP5	726734	6166346
GRWPP6	726466	6166285
GRWPP7	726268	6166198
GRWPP8	725573	6165828
GRWPP9	725727	6165567

Monitoring Photo-point ID	Coordinates	
	Easting	Northing
GRWPP10	725696	6165735
GRWPP11	725915	6166233

2.3 Pest species monitoring

Pest animal control within the GRWF Offset Area is a requirement of the approved CHP (NGH Environmental 2016). The following auditable measures are listed in the CHP:

- Feral Animal Control Plan prepared and implemented.
- Correspondence with adjacent landowners documented.
- Control measures and their location recorded.

An Integrated Pest Management Plan (IOPMP, NGH 2016c) has also been implemented within the GRWF Offset Area. Section 5.1 of the IPMP 'Subsequent years – implementation of control methods (if required) and monitoring', specifies the following:

- Undertake monitoring.
- The landholder, with the aid of LLS, will determine if pest management is required after results are received from monitoring each year. Action thresholds and control objectives should be developed at this time.
- The type and extent of pest control implemented will be determined and developed in accordance with the South East LLS pest management practices and regional strategies, if applicable.

To undertake the 2022 annual pest species monitoring, a total of 12 remote motion activated cameras were deployed between 14th September and the 23rd November, 2022 (67 nights). These were positioned in the same locations and orientation as the previous years of monitoring (**Table 3; Figure 3**). Motion sensing camera traps were set to record still images for the entire monitoring period (i.e. day and night with a 30s delay between triggers). The activity of pest species within the zone was determined by their presence or absence per camera, per trap night. Overall, there were a total of 803 trap nights for the 2022 monitoring period.

Table 3. Location of camera traps within the Offset Area.

Camera Trap	Coordinates	
	Easting	Northing
Camera 1	727126.11	6165450.89
Camera 2	726724.64	6166271.06
Camera 3	726812.49	6165814.59
Camera 4	726229.58	6166221.80
Camera 5	726168.83	6165655.31
Camera 6	726340.42	6165844.96
Camera 7	726470.96	6165773.54
Camera 8	726383.11	6166118.35
Camera 9	725893.80	6166020.66
Camera 10	725738.63	6165899.15
Camera 11	725567.86	6165662.29
Camera 12	725802.67	6165491.52

2.4 Weather Conditions

Weather conditions taken from the nearest weather station (Goulburn TAFE; Station No. 070263) in the months and years leading up to and during monitoring surveys are outlined in **Table 4**. The amount of rainfall in the year leading up to and during the surveys was noticeably higher than the first four years of monitoring (2016-2019), although similar to the previous monitoring years of 2020 and 2021. Both 2021 and 2022 have had annual rainfall that has exceeded the annual mean. This has provided ideal conditions for the germination and growth of both native and exotic species, included seeded and installed native plants.

Table 4. Weather conditions taken from the nearest weather station (Station number 070263) in the lead up and during the field survey (BOM 2021a; BOM 2021b).

Month	Year	Mean Temperature		Monthly Total Rainfall (mm)	Annual Total Rainfall (mm)
		Min	Max		
-	2016	-	-	-	721.4
	2017				497.2
	2018				485.2
	2019				481.4
	2020				825.0
	2021				972.8
January	2022	15.5	25.6	186.6	952.2 (to date)
February		12.9	24.0	31.8	
March		13.1	21.5	172.8	
April		9.6	18.6	63.8	
May		6.0	15.0	64.2	
June		2.5	10.5	21.0	
July		2.9	10.9	52.4	
August		4.4	13.3	75.2	
September		5.9	14.9	63.8	
October		9.0	17.8	109.2	
November (first 24 days)		8.1	19.5	111.4	

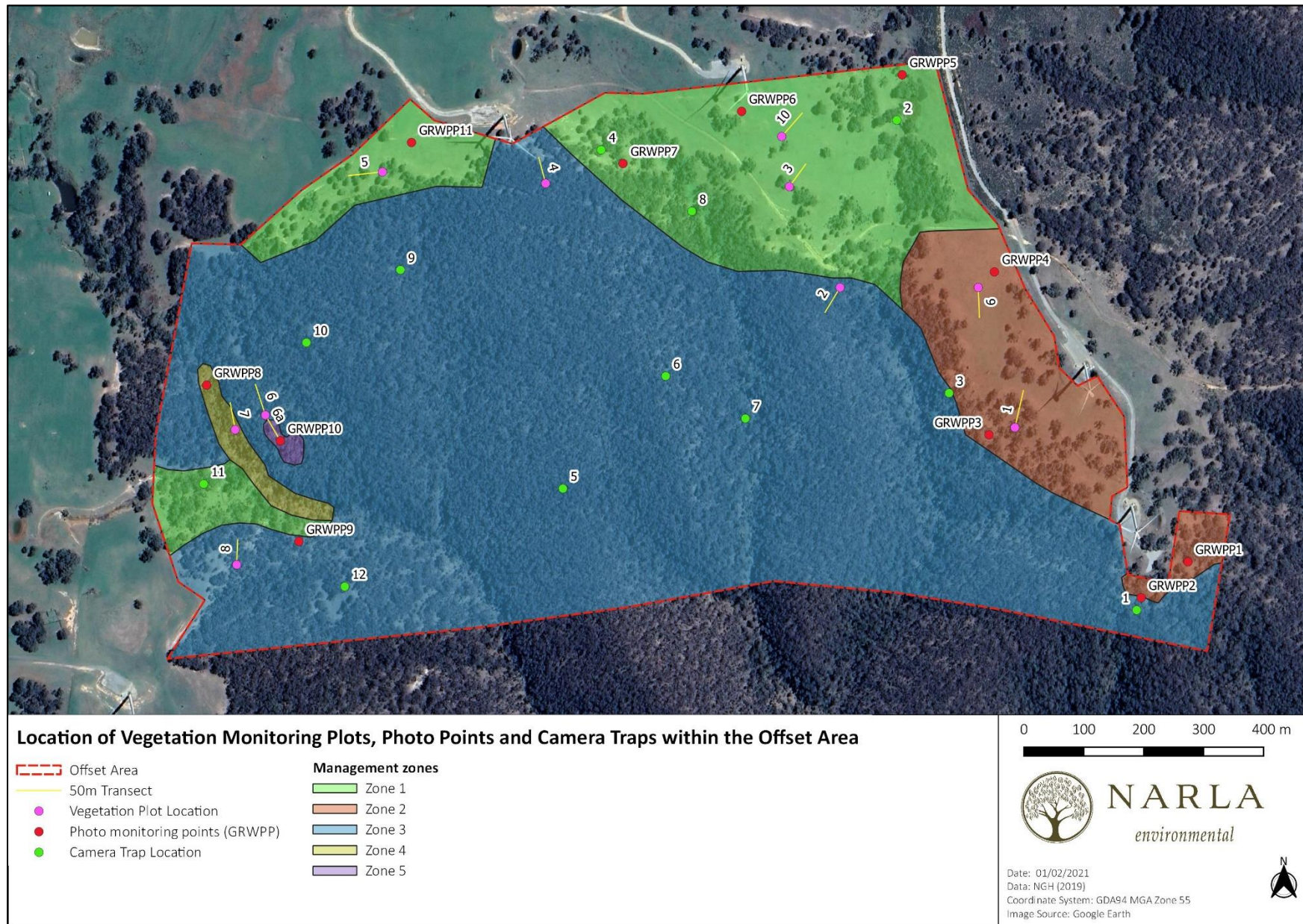


Figure 3. Location of vegetation monitoring plots, photo points and camera traps within the offset area.

3. Results & Discussion

3.1 Vegetation Monitoring

The data from the 2022 vegetation monitoring (see **Appendix B** for raw data) was compared against previous years and benchmark data to provide an indication of overall vegetation condition and the vegetation trajectory (**Figure 4; Figure 5; Figure 6; Figure 7; Figure 8**). Noticeably across the GRWF Offset Area was a marked increase in vegetation growth, a result of favourable weather conditions within the previous two years. This is also evident in photo-monitoring points (**Appendix A**) when compared to previous years.

All management zones displayed an increase in groundcover vegetation (grasses, shrubs and other), with exotic cover (mostly perennial and annual grasses) also increasing in Zones 3, 4 and 5. Increases in exotic cover often results in a decrease in native species richness, which was evident in both Zone 4 and 5. Conversely, native species richness increased in Zone 1 and 2, which also saw a slight decrease in exotic cover.

3.1.1 Management Zone Benchmarks

Table 5 provides a summary of how each vegetation attribute is performing against benchmark data, and whether any future actions are required to improve current values to comply with the CHP and CPVP.

Although benchmark values for native overstorey and midstorey cover within Zone 2 have not been achieved (**Table 5**; as required by the CHP and CPVP), a number of plantings have been installed over a 5-year period since 2017 within the existing cleared areas, totalling 380 overstorey and midstorey species (152 plants per ha). This is more than the 25 plants per ha required as per item no. 30 of the CPVP. It is anticipated that with continued maintenance of these plantings (including replacement of dead plantings), overstorey and midstorey cover will continue to increase (as the plants mature), gradually approaching benchmark values.

Similarly, benchmark values have not been achieved for overstorey and midstorey cover in Zone 1, and midstorey cover in Zone 3 and Zone 5 (**Table 5**). However, it is not a requirement as per the CHP and CPVP to achieve benchmark for such attributes within these zones. Nonetheless, a planting program has been implemented within these zones to further improve biodiversity values. Overstorey and midstorey species have been planted over a 5-year period since 2017 in Zone 1 (287 plants), Zone 3 (93 plants) and Zone 5 (40 plants). It is anticipated that continued maintenance of these plantings (including replacement of dead plantings) will allow the vegetation within these zones to approach benchmark over the coming years.

A requirement of the CHP and CPVP is to improve native groundcover and species diversity within Zone 1, 2 and 5. While there has not been an increase in native groundcover growth since 2021, both Zones 2 and 5 exceeds the benchmark range and Zone 1 is nearing the benchmark range (**Table 5**). In addition, groundcover vegetation (shrubs and other) in Zone 2 is within or exceeding benchmark range, although an increase in groundcover vegetation (grasses) is required to achieve benchmark. While there has not been an increase in species richness since 2021, continued weed management and revegetation efforts can assist in achieving benchmarks in Zone 1 and Zone 2 (**Table 5**).

3.1.2 Revegetation Efforts

Revegetation efforts have been previously conducted in Zone 1 and 2, including the broadcast of seed and installation of hiko grasses. A number of native grasses have emerged across these two zones over the past year, with large clumps of *Poa labillardierei* particularly evident. Revegetation was also conducted in 2022, with 6kg of native seed broadcast in Zones 1 and 2. Such efforts will be required over a number of years to gradually increase the groundcover and diversity within these zones. These future actions will be discussed in **Section 4.3**

Table 5. Performance summary of vegetation attributes against benchmark data. Data compiled from November 2022 monitoring.

Zone	Vegetation attribute	Average value across plots	Benchmark range	Within benchmark range? *	Action required? (See Section 4.3)
1	Native species richness	8	20	↑ required	Yes
	Native cover (overstorey)	7%	17-27%	↑ required	No
	Native cover (midstorey)	0%	7.5-12.5%	↑ required	No
	Native groundcover (grasses)	10%	24-30%	↑ required	No
	Native groundcover (shrubs)	0%	0-5%	↑ required	No
	Native groundcover (other)	10.7%	12.75-18.75%	→ Benchmark range	No
	Exotic cover	83.3%	0%	↓ required	Yes
	Hollow-bearing Trees	0	1	-	-
	Logs	0.7m	35m	-	-
2	Native species richness	5	20	↑ required	Yes
	Native cover (overstorey)	0.8%	17-27%	↑ required	No
	Native cover (midstorey)	0%	7.5-12.5%	↑ required	No
	Native groundcover (grasses)	3%	24-30%	↑ required	Yes
	Native groundcover (shrubs)	0%	0-5%	Within benchmark range	No
	Native groundcover (other)	34%	12.75-18.75%	Exceeds benchmark range	No
	Exotic cover	99%	0%	↓ required	Yes
	Hollow-bearing Trees	0.5	1	-	-
	Logs	5m	35m	-	-
3	Native species richness	16.5	20	↑ required	Yes
	Native cover (overstorey)	13%	20.5-22.5%	↑ required	No
	Native cover (midstorey)	2%	8.5-13.5%	↑ required	No
	Native groundcover (grasses)	11%	1-10%	Exceeds benchmark range	No
	Native groundcover (shrubs)	5%	4.7-8.7%	Within benchmark range	No

Zone	Vegetation attribute	Average value across plots	Benchmark range	Within benchmark range? *	Action required? (See Section 4.3)
	Native groundcover (other)	39%	8.5-12.5%	Exceeds benchmark range	No
	Exotic cover	38%	0%	↓ required	No
	Hollow-bearing Trees	0.5	1	-	-
	Logs	33.5m	30m	-	-
4	Native species richness	16	13	↑ required	Yes
	Native cover (overstorey)	16.5%	26-44%	↑ required	No
	Native cover (midstorey)	23%	0-20%	Exceeds benchmark range	No
	Native groundcover (grasses)	8%	16-38%	↑ required	No
	Native groundcover (shrubs)	26%	0-5%	Exceeds benchmark range	No
	Native groundcover (other)	32%	9-21%	Exceeds benchmark range	No
	Exotic cover	72%	0%	↓ required	No
	Hollow-bearing Trees	1	-	-	-
	Logs	70m	-	-	-
5 (including Zone 3)	Native species richness	16.8	20	↑ required	Yes
	Native cover (overstorey)	12%	17-27%	→ Benchmark range	No
	Native cover (midstorey)	1.8%	7.5-12.5%	↑ required	No
	Native groundcover (grasses)	17%	24-30%	→ Benchmark range	No
	Native groundcover (shrubs)	10%	0-5%	Exceeds benchmark range	No
	Native groundcover (other)	29.5%	12.75-18.75%	Exceeds benchmark range	No
	Exotic cover	27.5%	0%	↓ required	Yes
	Hollow-bearing Trees	0.5	2	-	-
	Logs	61.8m	25m	-	-

* ↑ = increase; ↓ = decrease; → = approaching

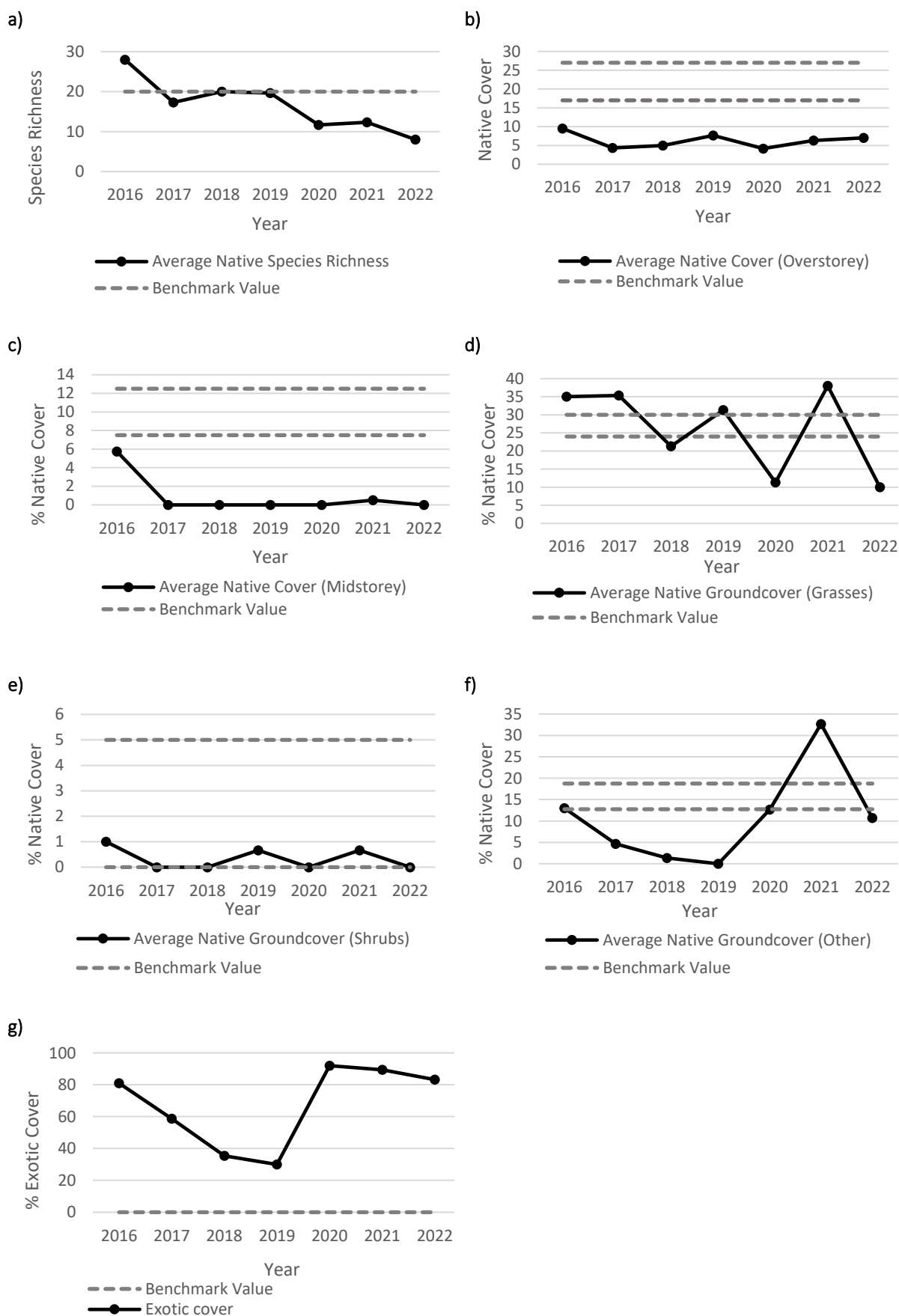


Figure 4. Comparison of yearly plot data to benchmark data within Management Zone 1 for a) Native species richness, b) Native cover (overstorey), c) Native cover (midstorey), d) Native groundcover (grasses), e) Native groundcover (shrubs), f) Native groundcover (other), and g) Exotic cover.

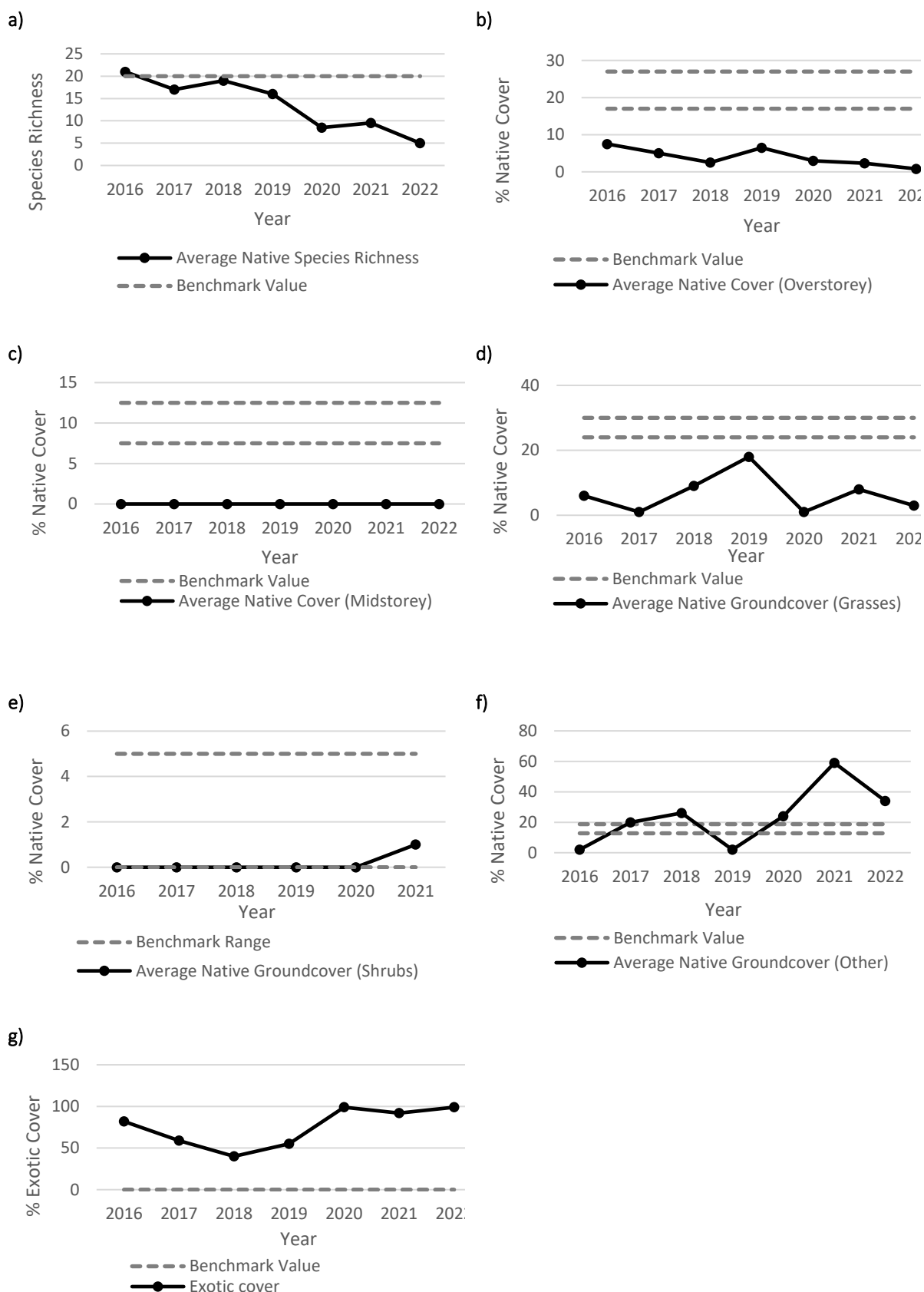


Figure 5. Comparison of yearly plot data to benchmark data within Management Zone 2 for a) Native species richness, b) Native cover (overstorey), c) Native cover (midstorey), d) Native groundcover (grasses), e) Native groundcover (shrubs), f) Native groundcover (other), and g) Exotic cover.

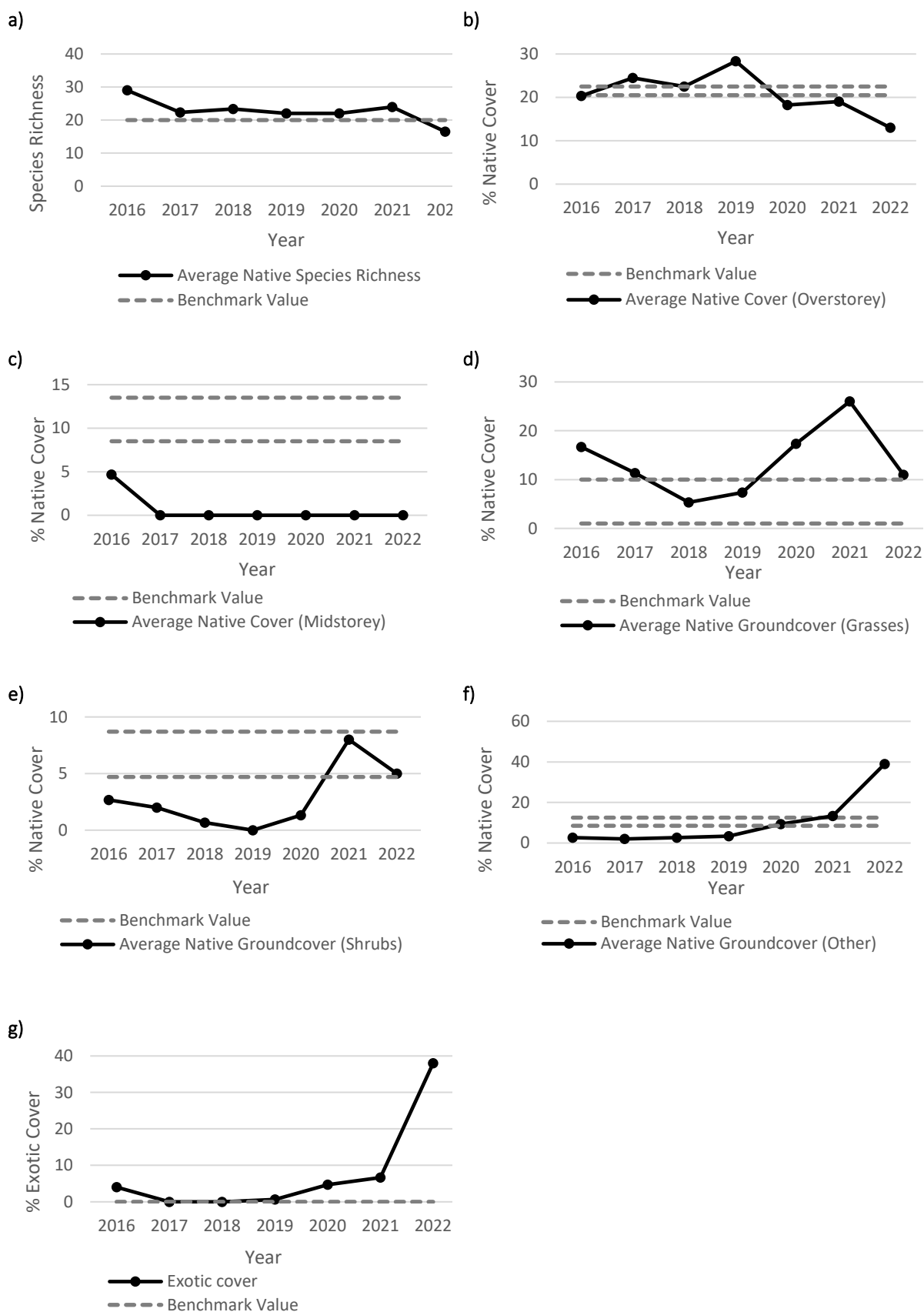


Figure 6. Comparison of yearly plot data to benchmark data within Management Zone 3 for a) Native species richness, b) Native cover (overstorey), c) Native cover (midstorey), d) Native groundcover (grasses), e) Native groundcover (shrubs), f) Native groundcover (other), and g) Exotic cover.

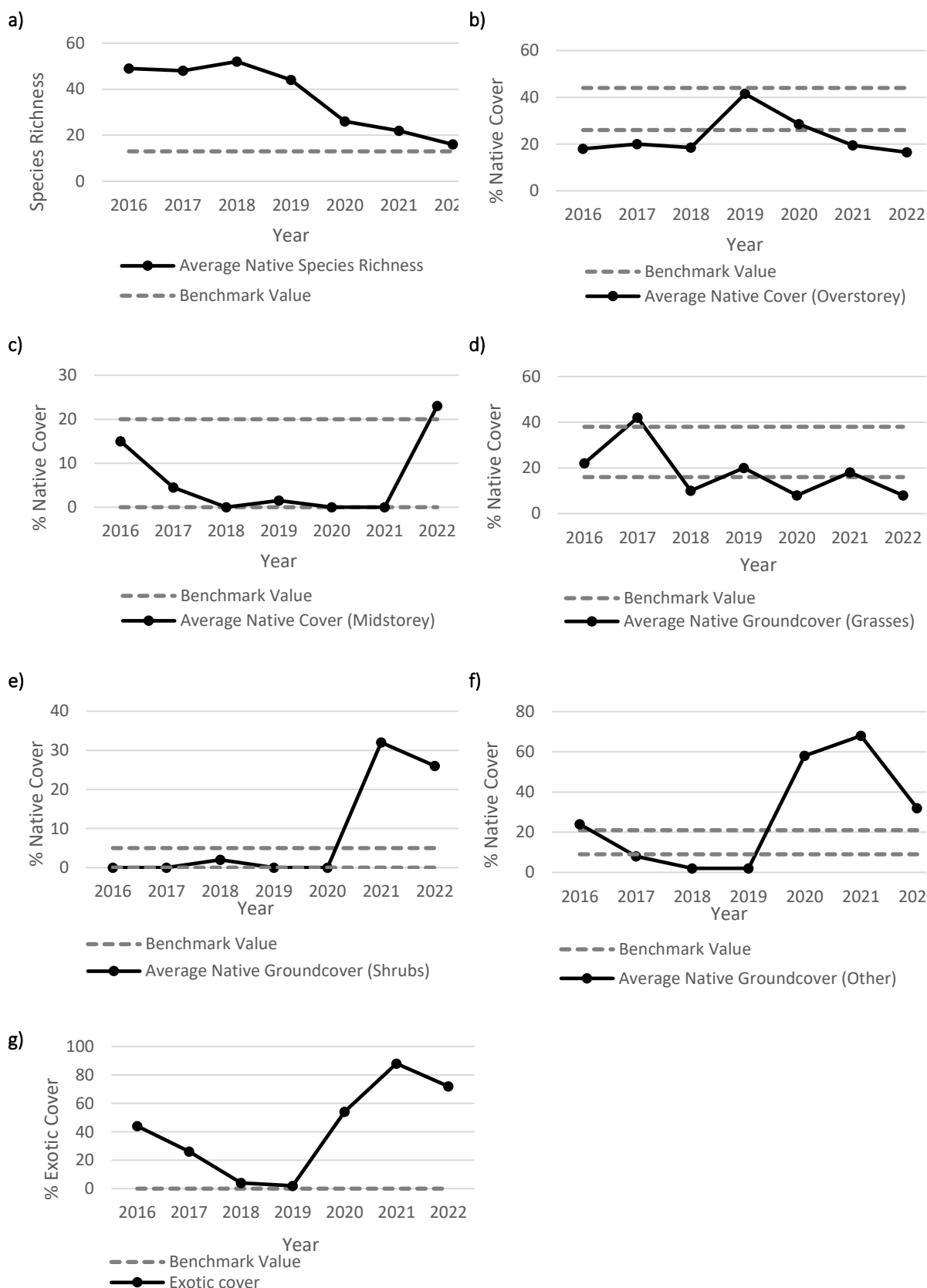


Figure 7. Comparison of yearly plot data to benchmark data within Management Zone 4 for a) Native species richness, b) Native cover (overstorey), c) Native cover (midstorey), d) Native groundcover (grasses), e) Native groundcover (shrubs), f) Native groundcover (other), and g) Exotic cover.

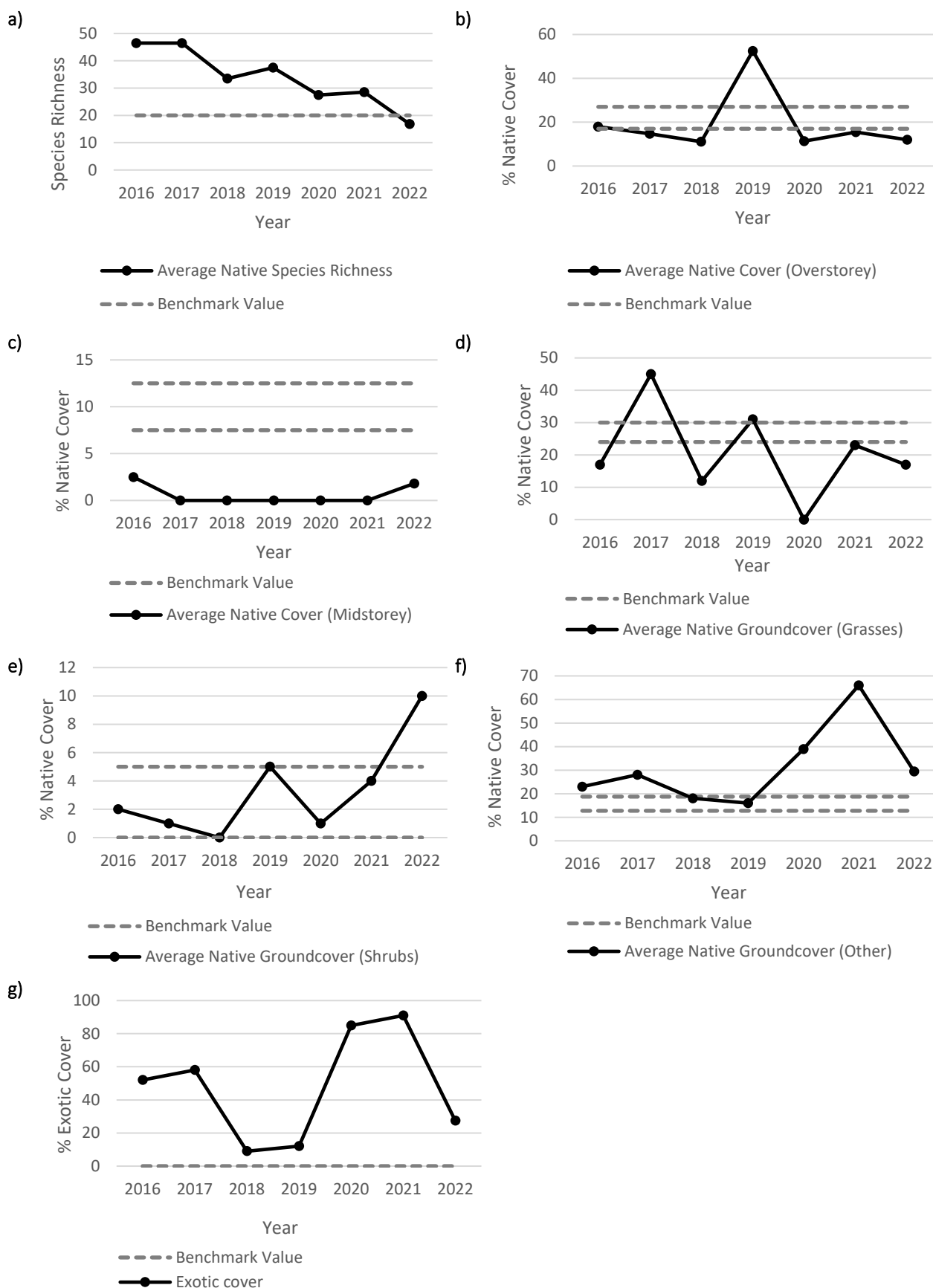


Figure 8. Comparison of yearly plot data to benchmark data within Management Zone 5 (and including Zone 3) for a) Native species richness, b) Native cover (overstorey), c) Native cover (midstorey), d) Native groundcover (grasses), e) Native groundcover (shrubs), f) Native groundcover (other), and g) Exotic cover.

3.2 Weed Monitoring

Weed monitoring was conducted with a focus on the following weed infestations that have been previously recorded within the Offset Area:

- Blackberry (*Rubus fruticosus* species aggregate)
- Hawthorn (*Crataegus monogyna*)
- Paterson's Curse (*Echium plantagineum*)
- Serrated Tussock (*Nassella trichotoma*)
- Sifton Bush (*Cassinia sifton*)
- Sweet Briar (*Rosa rubiginosa*)

The weed density of each weed polygon within the Offset Area is displayed in **Figure 9**. As with the previous years, the occurrence of the target weeds appears to be concentrated along the edges of the Offset Area. However, there has been a significant increase in Blackberry found along creek lines and a high prevalence of Serrated Tussock found throughout the Offset Area.

Similar to the 2021 monitoring, the majority of weed polygons appear to have low to very low weed densities, although an increase in weed density was noted in some weed polygons. The majority of moderate and high infestations are a result of Sifton Bush and Serrated Tussock, which have both increased in cover since the 2021 monitoring. There seems to be a slight decrease in Blackberry occurrences, however there were numerous high-density patches found along creek lines.

Weed control activities were carried out in October 2022. Weed control activities were hampered in 2022 by Contractor availability and wet weather causing access issues to the site. The repeated higher-than-average rainfall in 2022 provided ideal growing conditions for exotic species, which would be expected to markedly increase without any management actions (i.e. spraying). Weed control activities will begin in early 2023 and continue throughout 2023. This will remain an ongoing requirement within the Offset Area, particularly due to the invasive nature of such weeds. In addition, large infestations of Serrated Tussock directly outside of the Offset Area allows for the blow in of seed, making control much more difficult. **Section 4.3** details specific management actions that should continue to be implemented to control the target weeds within the Offset Area.

3.2.1 Photo Monitoring

Photo monitoring points are presented in **Appendix C**. These photos used alongside photos from previous monitoring events provide a visual detail of changes in weed cover within the Offset Area over successive years.

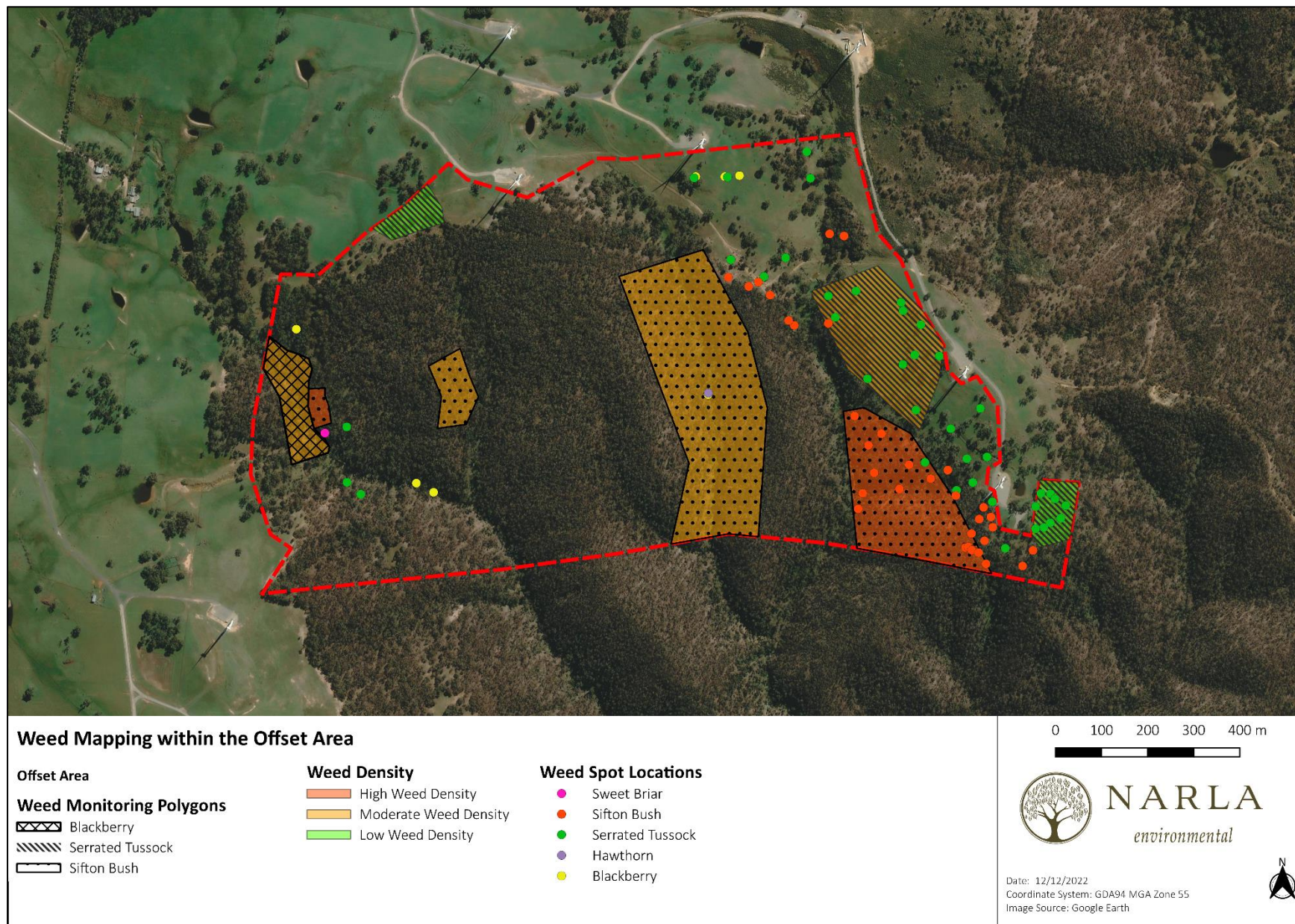


Figure 9. Weed mapping within the Offset Area during November 2022.

3.3 Pest Species Monitoring

The following six (6) pest species were recorded within the Subject Site during the monitoring period:

- *Dama dama* (Fallow Deer; **Plate 1**)
- *Lepus capensis* (Cape Hare; **Plate 2**)
- *Sus scrofa* (Feral Pig; **Plate 3**)
- *Vulpes vulpes* (Red Fox; **Plate 4**)
- *Oryctolagus cuniculus* (European Rabbit; **Plate 5**);
- *Bos taurus* (Domestic Cow; **Plate 6**).

Pest species recorded within the Offset Area are presented in **Table 6**. The most commonly detected pest species was Feral Pig, which was recorded on 59 trap nights; Fallow Deer, recorded on 38 trap nights; and Cape Hare, recorded on 21 trap nights. These pest species detected were relatively widespread within the Offset Area (**Table 6**), with Feral Pig being the most widespread (recorded on 10 cameras).

A number of native species were also detected including *Macropus giganteus* (Eastern Grey Kangaroo), *Macropus rufogriseus* (Red-necked Wallaby), Australian raven (*Corvus coronoides*), Swamp Wallaby (*Wallabia bicolor*), Common Wombat (*Vombatus ursinus*), Crimson Rosella (*Platycercus elegans*), Common Brushtail Possum (*Trichosurus vulpecula*), Common Ringtail Possum (*Pseudocheirus peregrinus*), Pied Currawong (*Strepera graculina*), White-winged Chough (*Corcorax melanorhamphos*), Australian Magpie (*Gymnorhina tibicen*) and Short-beaked Echidna (*Tachyglossus aculeatus*).

Overall, the 2022 pest monitoring saw a slight decrease in pest species from the previous year. Slight decreases in occurrences were observed in Fallow Deer and Cape Hare. Feral Goats remained absent from the Offset Area, and no Feral Cats were observed in this monitoring period. Occurrences of only three (3) feral pest species increased from the previous year: European Rabbit, Feral Pig and Red Fox. An increase in the Feral Pig population was also physically evident within the Offset Area, with areas of Feral Pig diggings observed during monitoring efforts. One camera trap photo (**Plate 3**) revealed there are at least nine (9) Feral Pigs within the Offset Area. Ongoing control efforts should be maintained to minimise (and potentially eradicate) feral pests from the area, particularly as they are impacting on the regeneration and growth of native vegetation.

Table 6. Pest species recorded within the Offset Area and the number of records per trap night (Spring 2022).

Species	Number of cameras pest species recorded on	Frequency of occurrence (number of trap days/nights presences / total number of trap days/nights)	
		2021	2022 (and change from previous year)
<i>Capra hircus</i> (Feral Goat)	0	0%	0% (0%)
<i>Dama dama</i> (Fallow Deer)	8	8.6%	4.7% (-3.9%)
<i>Felis catus</i> (Feral Cat)	0	0%	0% (-0%)
<i>Lepus capensis</i> (Cape Hare)	5	6.5%	2.6% (-3.9%)
<i>Oryctolagus cuniculus</i> (European Rabbit)	3	0.4%	1.1% (+0.7%)
<i>Sus scrofa</i> (Feral Pig)	10	4.5%	7.3% (+2.8%)
<i>Vulpes vulpes</i> (Red Fox)	7	0.8%	2.0% (+1.2%)



Plate 1. Fallow Deer (*Dama dama*) observed on a camera trap within the Offset Area.



Plate 2. Cape Hare (*Lepus capensis*) observed on a camera trap within the Offset Area.



Plate 3. Feral Pigs (*Sus scrofa*) observed on a camera trap within the Offset Area.



Plate 4. Red Fox (*Vulpes vulpes*) observed on a camera trap within the Offset Area.



Plate 5. *Oryctolagus cuniculus* (European Rabbit) observed on a camera trap within the Offset Area.



Plate 5. Domestic Cow (*Bos taurus*) observed on a camera trap within the Offset Area.

4. Performance Review and Recommendations

4.1 Management Actions Undertaken in 2022

The following management actions were conducted within the Offset Area during 2022 and are discussed below:

- Pest Animal Control
- Targeted Weed Control
- Nestbox monitoring
- Revegetation
- Monitoring (Quarterly & Annual).

4.1.1 Pest Animal Control

Pest animal control (i.e. baiting, trapping and shooting) efforts were undertaken throughout the year in 2022 (**Appendix D**). Four (4) Feral Pigs were removed during this period. In addition, regular checks for pest species were undertaken throughout 2022 by the local farmer.

4.1.2 Targeted Weed Control

Weed control activities were carried out in October 2022. Weed control activities were hampered in 2022 by Contractor availability and wet weather causing access issues to the site.

4.1.3 Nestbox Monitoring

The annual nestbox condition monitoring was undertaken by Spatial Footprints on the 19th May 2022. An accompanying monitoring report (**Appendix E**) was also prepared. The monitoring report revealed a total of thirty (30) nestboxes were inspected, with twenty-seven (27) appearing in good condition (following in-field maintenance and repairs). Further results and recommendations of the nestbox monitoring are outlined in the report (**Appendix E**).

4.1.4 Revegetation

Revegetation was conducted in 2022 with 6kg of native seed (4kg of *Themeda triandra* and 2kg of *Poa labillardierei*) broadcast in Zones 1 and 2.

4.1.5 Monitoring (Quarterly and Annual)

Quarterly inspections were conducted in 2022 on the 17th March, 11th May, 31st August and 8th November by Leo Pearce and Michael McNally (**Appendix G**). All inspections noted damage to plantings, likely from deer or pigs. The removal of pest animals from the Offset Area was recorded in May inspection.

The annual monitoring review for 2022 was conducted on the 15th December by Leo Pearce (**Appendix H**). An increase in weed species was evident due to wet weather conditions and staffing shortages. The wet weather has however contributed to an increase in the growth and health of plantings. It was also noted that current management actions may be adapted following the recommendations outlined in this report.

4.2 Compliance with the CHP and CPVP

Table 7 and **Table 8** detail the management actions recommended in the CHP and required by the CPVP. Narla have undertaken an assessment to determine whether the recommendations and requirements have been met for the Offset Area during 2022.

Table 7. Compliance with recommended management measures from the CHP.

Aim	Rationale	Applicable management zones	Auditable measure	Compliant as of Dec 2022	Evidence of compliance / reason for non-compliance
Ongoing General Management Measures					
Target identified threats to biodiversity: Invasion by exotic perennial grass	The aim is to reduce weed abundance on the offset site and protect it from invasion from adjacent sites. Actions to be done in accordance with the Integrated Weed Management Plan (NGH 2016b).	Zone 1, 2, 3, 4 and 5	Weed monitoring completed seasonally. Quantity of chemical and location of action to be recorded. Annual report to provide map of extent of current and past weed infestation, details of control undertaken and an assessment of the success of current management.	Yes	- Quarterly inspections for weed control undertaken. - Weed control carried out in October 2022 (See Section 4.1.2). - Annual report (this report) completed.
Pest animal control	Feral animals are detrimental to biodiversity values. Management actions to be done as prescribed in the Integrated Pest Management Plan (NGH Environmental 2016c).	Zone 1, 2, 3, 4 and 5	Feral Animal Control Plan implemented. Correspondence with adjacent landowners documented. Control measures and their location recorded.	Yes	- Regular pest animal checks undertaken by local farmer. - Evidence of feral animal controls recorded.
Removal of fallen timber	Fallen timber would be left in place within the offset site.	Zone 1, 2, 3, 4 and 5	Annual audit of performance.	Yes	Quarterly checklists completed.
Installations to offset removed hollow-bearing trees	Nest boxes may provide suitable habitat in lieu of hollow-bearing trees.	Zone 1, 2, 3, 4 and 5	Annual audit to confirm still in place.	Yes	Annual inspection conducted in May 2022.

Aim	Rationale	Applicable management zones	Auditable measure	Compliant as of Dec 2022	Evidence of compliance / reason for non-compliance
Rapid control of Serrated Tussock	Serrated Tussock threatens the integrity of the native dominated groundcover. Actions to be done in accordance with the Integrated Weed Management Plan (NGH Environmental 2016b).	Zone 1, 2 and 5. Follow up works in Zone 2 and 5.	Weed management plan implemented. Reduced extent of Serrated Tussock.	Yes	- Weed control carried out in October 2022 (See Section 4.1.2). - Moderate increase in Serrated Tussock noted from previous year.
Rapid control of Blackberry	Blackberry is an invasive weed. Actions to be done in accordance with the Integrated Weed Management Plan (NGH Environmental 2016b).	Zone 4	Weed management plan implemented. Reduced extent of Blackberry.	Yes	- Weed control carried out in October 2022 (See Section 4.1.2). - Slight decrease in Blackberry in known locations.
Assisted regeneration of overstorey and midstorey vegetation	Native vegetation is below benchmark figures, and where natural seed sources are not present, require assisted regeneration. Aims are to: improve overstorey and midstorey vegetation cover to benchmark levels for Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands in the Hawkesbury Nepean CMA within 5 years after CPVP is registered and active management has commenced.	Zone 2	Plantings established and maintained. Planting density at least 25 plants per hectare (or at other predetermined benchmark). Proportion of planted vegetation >2m high. Overstorey and midstorey vegetation cover within or approaching benchmark within 5 years after CPVP is registered and active management has commenced.	Yes	- Since 2017, Greening Australia have installed a total of 380 overstorey and midstorey species within this zone (152 trees/ha). With continued maintenance of these plantings (including replacement of dead plantings), overstorey and midstorey cover will continue to increase (as the plants mature), gradually approaching benchmark values. - Quarterly checklists conducted to monitor the

Aim	Rationale	Applicable management zones	Auditable measure	Compliant as of Dec 2022	Evidence of compliance / reason for non-compliance
	monitor, maintain and replace plants if necessary for the first 3 years after planting or until plants are at least 2 metres in height.				success of revegetation efforts.
Enrichment of native ground cover and species diversity	Increasing the percent cover and diversity of native groundcovers would assist in restoring ecosystem function within these zones. The seeding program would aim to have the native ground cover vegetation cover within benchmark for Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands in the Hawkesbury Nepean CMA within 5 years after the CPVP is registered and active management has commenced.	Zone 1, 2 & 5	Groundcover vegetation within or approaching benchmark within 5 years after the CPVP is registered and active management has commenced.	Partial	- Groundcover vegetation in Zone 1 and Zone 5 is either approaching, within or exceeding benchmark range. - Groundcover vegetation (shrubs and other) in Zone 2 is within or exceeding benchmark range (Table 5). - Increases in native groundcover (grasses) is required to achieve benchmark in Zone 2 (Table 5). - Increases in species diversity are required to achieve benchmark in Zone 1 and Zone 2 (Table 5). - Since 2017, the following revegetation efforts have been conducted: - Zone 1 – 22kg of seed broadcast and 80 hiko grasses planted.

Aim	Rationale	Applicable management zones	Auditable measure	Compliant as of Dec 2022	Evidence of compliance / reason for non-compliance
					- Zone 1 and 2 – 4kg of <i>Themeda triandra</i> and 2kg of <i>Poa labillardierei</i>. ▪ Continued efforts will be required over a number of years to gradually increase the groundcover and diversity within these zones.
Exclusion of grazing	Stock provide a vector for the spread of weeds such as Serrated Tussock.	Zone 1, 2, 3, 4 and 5	No evidence of grazing within the offset area.	No	▪ Fence damage in several locations due to fallen trees were identified during the November quarterly inspection. Stock likely entered the Offset Area through the damaged fencing.
Monitoring and Reporting					
To undertake surveys to assess performance against baseline data and management objectives.	Monitoring plot data is required annually (up to a maximum of 20 years) as management actions are implemented. Comparing the data to the baseline, to other years, and to the bench mark data allows improvements in condition to be demonstrated. The data would also be utilised to inform the adaptive management of the site.	Zone 1, 2, 3, 4 and 5	Ongoing monitoring completed annually (up to a maximum of 20 years). Quarterly site inspections and annual management performance review completed.	Yes	▪ Annual vegetation monitoring conducted in November 2022. ▪ Quarterly site inspections and annual review undertaken.

Aim	Rationale	Applicable management zones	Auditable measure	Compliant as of Dec 2022	Evidence of compliance / reason for non-compliance
	In addition to the monitoring plot data, quarterly site inspections and an annual review of management performance would be undertaken as outlined in Appendix B of the CHP.				
Review and Adaptive Management					
Be adaptive to the results obtained during monitoring.	Changes in site conditions may require changes to the management strategies.	Zone 1, 2, 3, 4 and 5	Annual report, provided to Dept. Planning and Wind Farm Developer. Management adapted as recommended in the annual report.	Yes	- Annual vegetation monitoring conducted in November 2022. - Management will be adapted to conform with recommendations as outlined in this report.

Table 8. Compliance with measures specified in the CPVP.

Map Unit(s)	Management Action	Duration of Management Action	Management Action Details	Compliance	Evidence of compliance / reason for non-compliance
Zone 1, 2, 3, 4 and 5	Measures to confirm that the objective of “maintain or improve” has been achieved	In Perpetuity	1. The Landholder shall implement the measures set out in this Schedule 2 to enable the objective of "maintain or improve" to be measured, quantified and verified.	Yes	This table.
Zone 1, 2, 3, 4 and 5	Protect and enhance remnant vegetation for biodiversity conservation	In Perpetuity	2. The Landholder must maintain an area of 122.93 ha represented in Map 1 as Map units, Zone 1, 2, 3, 4 and 5 to protect and enhance remnant and regrowth native vegetation for biodiversity conservation purposes.	Yes	The Offset Area is managed as outlined in this report.
Zone 1, 2, 3, 4 and 5	Routine Agricultural Management Activities (RAMAS)	In Perpetuity	5. The Landholder is permitted to undertake the following Routine Agricultural Management Activities (RAMAs) under Section 11 and 22 of the Native Vegetation Act 2003: - the maintenance of existing rural infrastructure marked on Map 3 (for example fence lines and tracks); - the removal of noxious weeds under the Noxious Weeds Act 1993; - the control of pest animals under the Local Land Services Act 2013, including the immediate removal of animal carcasses to discourage scavenging raptors; - the maintenance of public utilities (such as those associated with the transmission of electricity, the supply of water, the supply of gas and electronic communication); and - any activity reasonably considered necessary to remove or reduce an imminent risk of serious personal injury or damage to property.	Yes	No evidence of any activity that would contravene this management action was observed during monitoring.

Map Unit(s)	Management Action	Duration of Management Action	Management Action Details	Compliance	Evidence of compliance / reason for non-compliance
			All other RAMA's are not permitted within the offset area represented in Map 1.		
Zone 1, 2, 3, 4 and 5	Retain native vegetation regrowth	In Perpetuity	6. The Landholder must not clear native vegetation, whether remnant or regrowth, other than in accordance with the RAMAs specified in Management Action 5.	Yes	Quarterly site inspections undertaken. No clearing of native vegetation observed.
Zone 1, 2, 3, 4 and 5	Retention of standing and fallen dead timber (excluding within 100 metres of turbines)	In Perpetuity	7. The Landholder must not remove any standing or fallen, live or dead timber other than in accordance with the RAMAs specified in Management Action 5. 8. The Landholder is permitted to remove standing or fallen dead timber within 100 metres of an installed wind turbine.	Yes	Quarterly site inspections undertaken. No removal of timber observed.
Zone 1, 2, 3, 4 and 5	Retention of rocks	In Perpetuity	9. The Landholder must not remove rocks except for in accordance with the following sections of the Native Vegetation Act: 11(1)(a) – the maintenance of rural infrastructure. 11(1)(b) – any activity reasonably considered necessary to remove or reduce and imminent risk of serious personal injury or damage to property.	Yes	Quarterly site inspections undertaken. No removal of rocks observed.
Zone 1, 2, 3, 4 and 5	No exotic plantings	In Perpetuity	10. The Landholder must not plant any non-local (exotic or non-indigenous) trees, shrubs, grass, or groundcover species in Zones 1, 2, 3, 4 and 5 of Map 1.	Yes	- Revegetation activities undertaken by Greening Australia involved installation of native species. - No evidence of exotic plantings observed during monitoring.

Map Unit(s)	Management Action	Duration of Management Action	Management Action Details	Compliance	Evidence of compliance / reason for non-compliance
Zone 1, 2, 3, 4 and 5	Exclusion of recreational use and access	In Perpetuity	11. The Landholder shall exclude all recreational movement of vehicles, motor bikes, bicycles and horses in Zones 1, 2, 3, 4 and 5 of Map 1.	Yes	Quarterly site inspections undertaken. No recreational vehicles, motorbikes, bicycles and/or horses observed.
Zone 1, 2, 3, 4 and 5	Exclusion of honey bee apiaries	In Perpetuity	12. The Landholder must exclude all commercial and non-commercial Honey Bee (<i>Apis mellifera</i>) apiaries in Zones 1, 2, 3, 4 and 5 of Map 1.	Yes	No commercial or non-commercial Honey Bee apiaries observed during monitoring.
Zone 1, 2, 3, 4 and 5	Fire exclusion	In Perpetuity	13. The Landholder is not to set fire to Zones 1, 2, 3, 4 and 5 of Map 1 at any time unless specified otherwise in accordance with the Rural Fires Act 1997 or for the purpose of ecological burning with the intention of achieving a "maintain or improve outcome" for biodiversity conservation purposes. The Landholder must seek consultation with the OEH and LLS prior to undertaking ecological burning. The Landholder must seek any necessary fire permits required by the local fire authority prior to undertaking burning.	Yes	Quarterly site inspections undertaken. No evidence of fire reported.
Zone 1, 2, 3, 4 and 5	Exclude fertilisers	In Perpetuity	14. The landholder must not apply any fertilisers to Zones 1, 2, 3, 4 and 5 of Map 1 at any time.	Yes	Quarterly site inspections undertaken. No evidence of fertiliser application recorded.
Zone 1, 2, 3, 4 and 5	Exclusion of grazing	In Perpetuity	15. Grazing is to be excluded from Zones 1, 2, 3, 4 and 5 of Map 1 unless agreed upon in consultation with OEH.	Yes	- Quarterly site inspections undertaken. No evidence of grazing recorded. - Fence damage in several locations due to fallen trees were identified during the November quarterly inspection.

Map Unit(s)	Management Action	Duration of Management Action	Management Action Details	Compliance	Evidence of compliance / reason for non-compliance
					Stock likely entered the Offset Area through the damaged fencing.
Zone 1, 2, 3, 4 and 5	Removal of rubbish and dead domestic animals. No rubbish disposal.	In Perpetuity	16. The Landholder must remove all rubbish from Zones 1, 2, 3, 4 and 5 in Map 1. The landholder must not dispose of further rubbish or domestic animal remains in Zones 1, 2, 3, 4 and 5 of Map 1 for the duration of this agreement.	Partial	- Quarterly site inspections undertaken. - Animal remains (Crimson Rosella) found within the offset area (Plate 6). - No evidence of disposal of domestic animal remains.
Zone 1, 2, 3, 4 and 5	Control of pest animals	In Perpetuity	17. The Landholder must implement an Integrated Pest Management Plan to control pest animals. 18. When undertaking activities to control pest animals the Landholder must: - Contact Local Land Services (LLS) Goulburn on 02 4824 1900 for advice regarding best management practices; - Act in accordance with any advice received from LLS; and - Obtain all relevant permits and approvals from State and local government agencies. 19. The Landholder must not undertake baiting for rabbits. Alternatives for rabbit control must be sought. 20. Dead animal carcasses must be removed to discourage scavenging raptors.	Yes	- Regular pest animal checks undertaken by local farmer. - Evidence of feral animal controls recorded.
Zone 1, 2, 3, 4 and 5	Weed control – Noxious Weed Management	In Perpetuity	21. The Landholder must not apply herbicide by boom spraying or aerial spraying. 22. Spraying for noxious weeds must only be undertaken using a hand-held spray device on target species only. Woody weeds must be removed by hand. 23. When undertaking activities to control noxious weeds the Landholder must:	Yes	Weed control carried out in October 2022 (See Section 4.1.2).

Map Unit(s)	Management Action	Duration of Management Action	Management Action Details	Compliance	Evidence of compliance / reason for non-compliance
			- Contact the noxious plants authority (Upper Lachlan Shire Council) for advice regarding best management practices and; - Act in accordance with any advice received from Upper Lachlan Shire Council.		
Zone 1, 2, 3, 4 and 5	Provide artificial hollows at locations that are at least 200m from installed turbine locations.	Within 12 months from the commencement of this agreement	24. The Landholder must install 30 artificial hollows within Zones 1, 2, 3 and 4 of Map 1 to preserve the overall abundance of hollows in the area. 25. Hollows must not be installed within 200m of a turbine. 26. Artificial hollows must be kept in working condition and free of pests including rats and bees. 27. A one-off audit is to be completed once fitted (in accordance with Appendix B of the CHP). Annual inspections are to be undertaken to ensure the nesting boxes are still in place and in a good state of repair. 28. Construction and placement of the artificial hollows must reflect the Local Land Services guidelines "Build your own wildlife nest box" in Attachment 2, Annexure 1. 29. Artificial hollows must be constructed of hardwood and represent suitable hollows for a variety of bats, birds and other arboreal mammals.	Yes	Nestbox monitoring undertaken as outlined in Appendix E.
Zone 2	Assisted regeneration of overstorey and midstorey vegetation.	Within 12 months from the commencement of this agreement	30. Planting of trees and shrubs must be undertaken to increase the tree density to at least 25 (or an on-site determined benchmark tree/shrub density) trees and shrubs per hectare and consist of the species present within the surrounding vegetation. Plants must be obtained from locally collected provenances where available. 31. Plantings must be monitored, maintained and replaced if necessary, for the first 3 years after planting or until trees are at least 2 metres in height. 32. The planting program must aim to have the overstorey and midstorey vegetation cover within benchmark for Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands, within 20 years following approval of this PVP.	Yes	Since 2017, Greening Australia have installed a total of 380 overstorey and midstorey species within this zone (152 trees/ha). With continued maintenance of these plantings (including replacement of dead plantings), overstorey and midstorey cover will continue to increase (as

Map Unit(s)	Management Action	Duration of Management Action	Management Action Details	Compliance	Evidence of compliance / reason for non-compliance
			33. Planting of overstorey trees must not be undertaken within 100m of turbines to discourage roosting/nesting of bird and bat species in close proximity to turbines.		the plants mature), gradually approaching benchmark values. Quarterly checklists conducted to monitor the success of revegetation efforts.
Zone 1, 2 and 5	Enrichment of native ground cover and species diversity	Within 12 months from the commencement of this agreement	34. Native seed containing local province grass, forb and shrub species must be broadcast in late winter/early spring for the first three years or until monitoring indicates that native groundcover and diversity has sufficiently increased. 35. Seed must be broadcast at a rate of between 2 - 6kg/ha depending on the weed load (higher in weedier areas) or as determined in consultation with an expert in revegetation. 36. The seeding program would aim to have the native ground cover vegetation cover within benchmark for Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands, within 20yrs following approval of the PVP. See Management Action 32 for benchmark data.	Yes	- Groundcover vegetation in Zone 1 and Zone 5 is either approaching, within or exceeding benchmark range (Figure 5). - Groundcover vegetation (shrubs and other) in Zone 2 is within or exceeding benchmark range (Figure 5). - Increases in native groundcover (grasses) is required to achieve benchmark in Zone 2 (Figure 5). - Increases in species diversity are required to achieve benchmark in Zone 1, Zone 2 and Zone 5 (Figure 5).

Map Unit(s)	Management Action	Duration of Management Action	Management Action Details	Compliance	Evidence of compliance / reason for non-compliance
					- Since 2017, the following revegetation efforts have been conducted: - Zone 1 and 2 – 6kg of native seeds broadcast (4kg of <i>Themeda triandra</i> and 2kg of <i>Poa labillardierei</i>) in 2022. - Continued efforts will be required over a number of years to gradually increase the groundcover and diversity within these zones.
Zone 1, 2, 3, 4 and 5	Quarterly monitoring	5 years from the commencement of this agreement	37. The Landholder must undertake quarterly (or as otherwise agreed with OEH/LLS) site inspections using Appendix B: checklist form from the 'Compensatory Habitat Package'.	Yes	Quarterly site inspections undertaken.
Zone 1, 2, 3, 4 and 5	Annual reporting	20 years or for the life of the windfarm (whichever comes first)	38. The Landholder must conduct annual monitoring at the monitoring points shown on Map 1. Monitoring involves collecting plot data in accordance with the BioBanking methodology and taking photographs from fixed photographic points at these monitoring sites. 39. The Landholder must also complete an annual review of checklists in the CHP.	Yes	- Annual vegetation monitoring conducted in November 2022. - Annual review undertaken.

Map Unit(s)	Management Action	Duration of Management Action	Management Action Details	Compliance	Evidence of compliance / reason for non-compliance
Zone 1, 2, 3, 4 and 5	On-going reporting	20 years or for the life of the windfarm (whichever comes first)	40. The Landholder must provide details of the quarterly inspections and annual review and monitoring in an annual report which will be made available to officers of South East Local Land Services, Office of Environment and Heritage and the Department of Planning and Environment. 41. Reporting is to be provided by the landholder within 60 days of the anniversary of PVP approval.	Yes	This report.

4.3 Recommendations

The following recommendations are based on the results of the 2022 monitoring, as well as the quarterly monitoring inspections.

Management zone	Management Action Required	Management Action Details
Vegetation Management		
Zone 1, 2, 3 & 5	Monitor previously installed plantings	Continued maintenance of current plantings (including replacing dead plantings).
Zone 1 & 2	Increase the percent cover of native grasses in Zone 2. Increase species richness. Reduce exotic cover.	- High exotic cover (perennial and annual grasses) was present in both of these zones, which suppresses the regeneration of native species, including regeneration of native seed that has been broadcast. - Continued revegetation and weed control efforts are to be undertaken within these zones (see Figure 10), with a focus on reducing perennial and annual grasses in Zone 1 and 2; increasing native grass cover in Zone 2; and increasing native species richness in Zone 1 and 2. Ideally, the zone should be treated over a number of years, with a focus on expanding areas containing good native resilience. Consultation with Greening Australia may be necessary.
Zone 5	Reduce exotic cover.	- High exotic cover was present within this zone, which should be gradually reduced to ensure it does not suppress the regeneration of native groundcover species. - Spot spraying of exotic species should be conducted within this zone (see Figure 10), with a focus on increasing areas showing the most native resilience. Spot spraying is to be conducted once every 3 months to allow for native regeneration to occur post-spraying.
Weed management		
All zones	Reduce cover of Blackberry	- Small infestations of Blackberry (moderate density) and spot locations should be sprayed once during the appropriate time of year to prevent seeding and eliminate from the polygon. - Any large infestations observed on site (including high density polygons) should be sprayed on the peripheries only (during the appropriate time of year) to prevent mass habitat loss and slowly decrease the extent. - Yearly follow up treatments will be required (to be reviewed in next monitoring report).
All zones	Reduce cover of Serrated Tussock	- Moderate infestations of Serrated Tussock occur across the site and can be readily managed. - All areas of Serrated Tussock (polygons and weed spot locations) are to be visited and sprayed twice per year. - If possible, a spray regime should be conducted for Serrated Tussock within a 10-50m perimeter outside of

Management zone	Management Action Required	Management Action Details
		the Offset Area. The blow in of seed from large areas of Serrated Tussock makes the management of this weed within the Offset Area difficult.
All zones	Reduce cover of Sifton Bush and Hawthorn.	- Moderate infestations of Sifton Bush occur across the site and can be readily managed. - All polygons and weed spot locations are to be attended twice per year to treat any remaining infestations.
Pest Management		
All zones	Conduct pest species control	Pest animal control (i.e. shooting) is to be undertaken 4 times per year (once every season) during 2023.
Monitoring		
All zones	Annual review	Annual review to continue to ensure compliance with the CPVP.
All zones	Vegetation monitoring	Annual vegetation monitoring to continue to ensure compliance with the CPVP. Monitoring involves collecting plot data in accordance with the BioBanking methodology and taking photographs from fixed photographic points at these monitoring sites
All zones	Weed monitoring	Weed monitoring to continue on an annual basis to guide the management of priority weeds within the Offset Area.
All zones	Pest monitoring	- Annual pest monitoring to be conducted within 2023 over a 3-week period. - Frequency of pest monitoring to be revised each year in annual monitoring report, pending yearly pest activity results.
All zones	Nestbox monitoring	Nestbox monitoring to continue to be conducted annually to ensure they are kept in working condition and free of pests.
Other		
All zones	Rubbish and fence removal	No rubbish or damaged fencing was observed within the Offset Area.

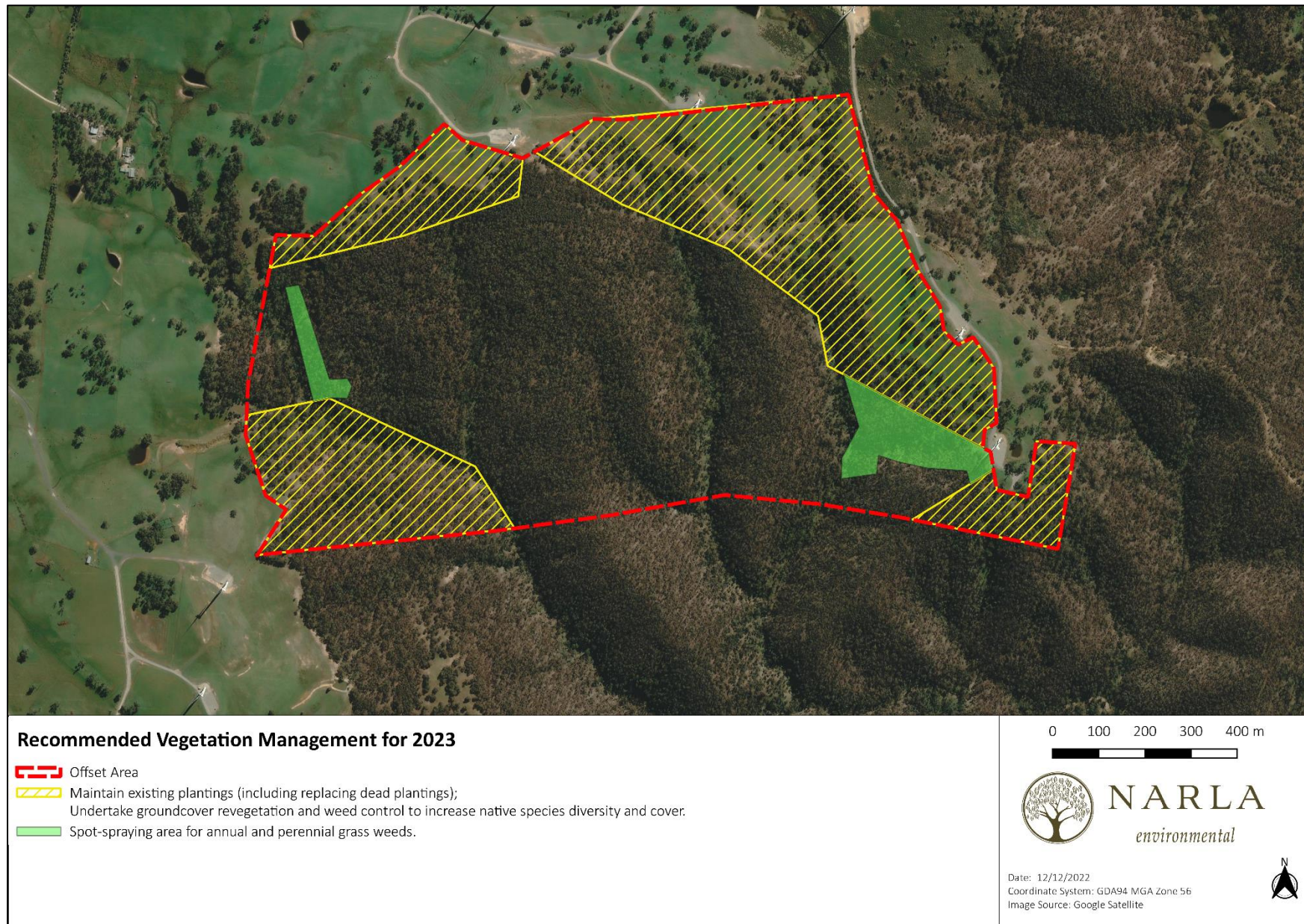


Figure 10. Recommended vegetation management to be conducted within the Offset Area during 2023.



Plate 6. Crimson Rosella remains (possibly Fox attack) within the Offset Area.

5. References

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6. Appendices

Appendix A. Vegetation Photo Monitoring Points.

Appendix B. Vegetation Monitoring Plot Data.

Appendix C Weed Photo Monitoring Points.

Appendix D. Pest Control Records for 2022

Appendix E. Annual Nestbox Condition Monitoring Report for 2022.

Appendix F. Revegetation Records for 2022

Appendix G. Quarterly Monitoring Checklists

Appendix H. Annual Monitoring Review for 2022.

Appendix A. Vegetation Photo Monitoring Points.

Monitoring Point: GRMP1		
North		
		
2017	2018	2019
		
2020	2021	2022

Monitoring Point: GRMP1

East



2017



2018



2019



2020



2021



2022

Monitoring Point: GRMP1

South



2017



2018



2019



2020



2021



2022

Monitoring Point: GRMP1

West



2017



2018



2019



2020



2021



2022

Monitoring Point: GRMP2

North-west



2017



2018



2019



2020



2021



2022

Monitoring Point: GRMP2

North-east



2017



2018



2019



2020



2021



2022

Monitoring Point: GRMP2

South-east



2017



2018



2019



2020



2021



2022

Monitoring Point: GRMP2

South-west



2017



2018



2019



2020



2021



2022

Monitoring Point: GRMP3

North-west



2017



2018



2019



2020



2021



2022

Monitoring Point: GRMP3

North-east



2017



2018



2019



2020



2021



2022

Monitoring Point: GRMP3

South-east



2017



2018



2019



2020



2021



2022

Monitoring Point: GRMP3

South-west



2017



2018



2019



2020



2021



2022

Monitoring Point: GRMP4

North



2017



2018



2019



2020



2021



2022

Monitoring Point: GRMP4

East



2017



2018



2019



2020



2021



2022

Monitoring Point: GRMP4

South



2017



2018



2019



2020



2021



2022

Monitoring Point: GRMP4

West



2017



2018



2019



2020



2021



2022

Monitoring Point: GRMP5

North



2017



2018



2019



2020



2021



2022

Monitoring Point: GRMP5

East



2017



2018



2019



2020



2021



2022

Monitoring Point: GRMP5

South



2017



2018



2019



2020



2021



2022

Monitoring Point: GRMP5

West



2017



2018



2019



2020



2021



2022

Monitoring Point: GRMP6

North



2017



2018



2019



2020



2021



2022

Monitoring Point: GRMP6

East



2017



2018



2019



2020



2021



2022

Monitoring Point: GRMP6

South



2017



2018



2019



2020



2021



2022

Monitoring Point: GRMP6

West



2017



2018



2019



2020



2021



2022

Monitoring Point: GRMP7

North



2017



2018



2019



2020



2021



2022

Monitoring Point: GRMP7

East



2017



2018



2019



2020



2021



2022

Monitoring Point: GRMP7

South



2017



2018



2019



2020



2021



2022

Monitoring Point: GRMP7

West



2017



2018



2019



2020



2021



2022

Monitoring Point: GRMP8

North



2017



2018



2019



2020



2021

No data

2022

Monitoring Point: GRMP8

East



2017



2018



2019



2020



2021



2022

Monitoring Point: GRMP8

South



2017



2018



2019



2020



2021



2022

Monitoring Point: GRMP8

West



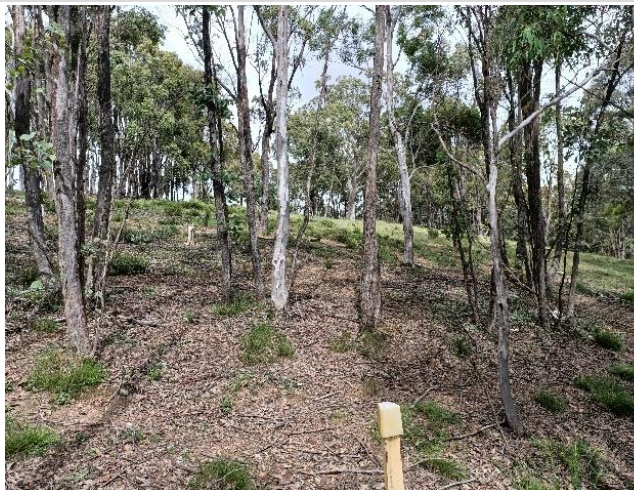
2017



2018



2019



2020



2021



2022

Monitoring Point: GRMP9

North



2017



2018



2019



2020



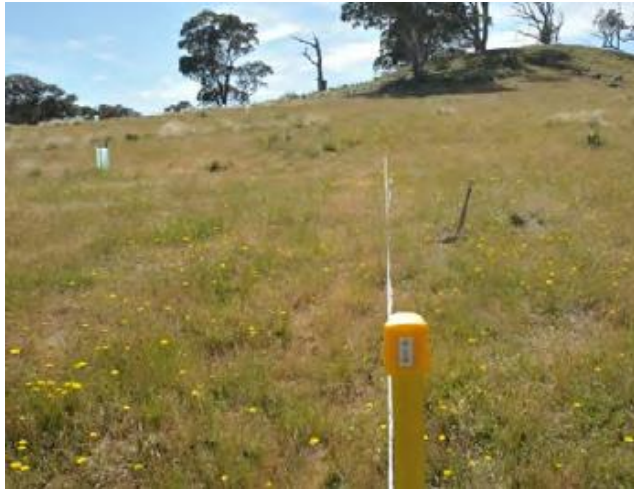
2021



2022

Monitoring Point: GRMP9

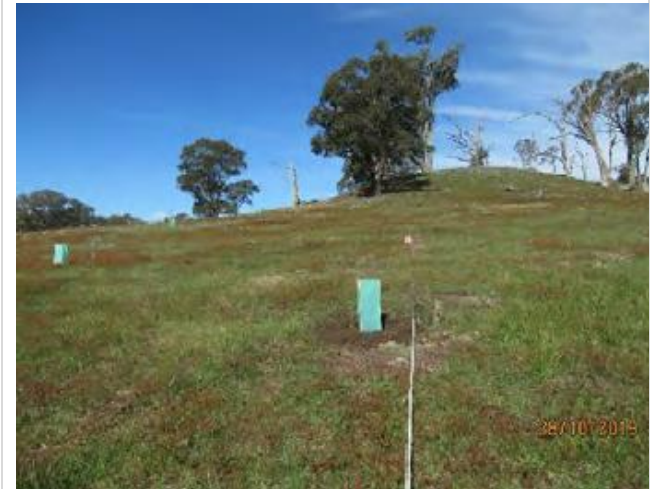
East



2017



2018



2019



2020



2021



2022

Monitoring Point: GRMP9

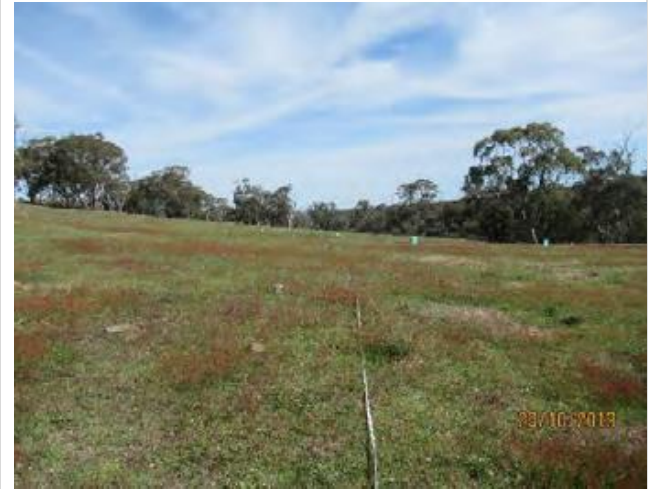
South



2017



2018



2019



2020



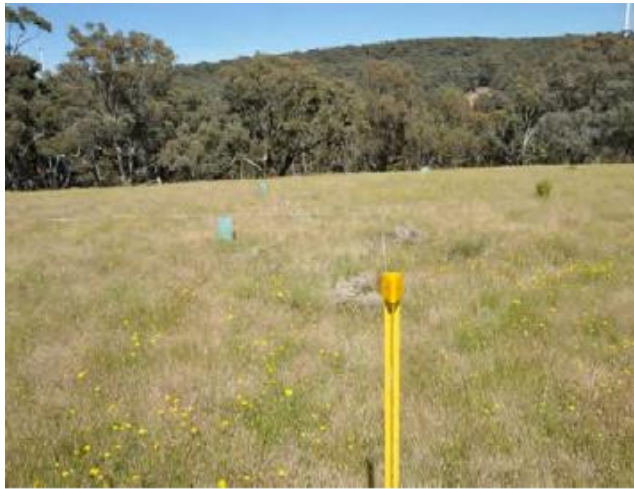
2021



2022

Monitoring Point: GRMP9

West



2017



2018



2019



2020



2021



2022

Monitoring Point: GRMP10

North-east



2017



2018



2019



2020



2021



2022

Monitoring Point: GRMP10

North-west



2017



2018



2019



2020



2021



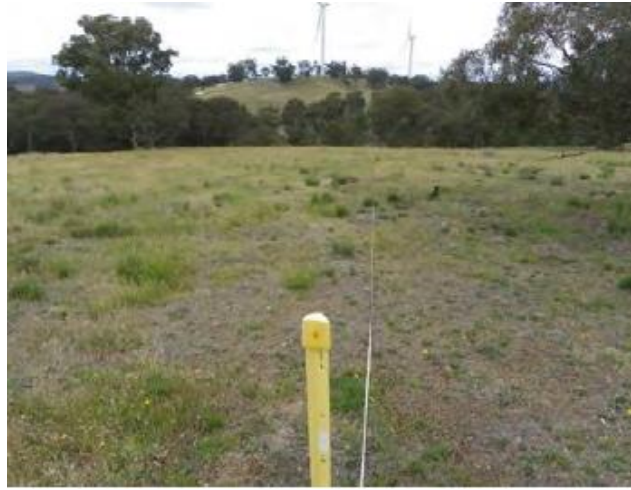
2022

Monitoring Point: GRMP10

South-east



2017



2018



2019



2020



2021



2022

Monitoring Point: GRMP10

South-west



2017



2018



2019



2020



2021



2022

Appendix B. Vegetation Monitoring Plot Data.

Monitoring Plot Data Sheet (Biometric)					
Plot Information		Recorders	Hannah Martin	Date	23/11/2022
Site Name/Code	Gullen Range Wind Farm Offset Area				
Plot Name	GRMP1				
Start Easting	726922.2	End Easting	726936.4		
Start Northing	6165757.2	End Northing	6165819		
Zone	Management Zone 1				
Vegetation type/condition	Apple Box – Yellow Box Woodland with a predominately exotic understorey				

Average Canopy Cover (Specht)	5m		10m		15m		20m		25m		30m		35m		40m		45m		50m						
Native overstorey cover (%)	3		0		0		0		0		0		3		7		3		0						
Native mid-cover (%)	0		0		0		0		0		0		0		0		0		0						
Exotic overstorey cover (%)	0		0		0		0		0		0		0		0		0		0						
Exotic mid-cover (%)	0		0		0		0		0		0		0		0		0		0						
Point Intersect (m)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Native Shrub																									
Native Grass																									
Native Other	1							1			1	1		1	1	1	1	1	1	1	1		1	1	
Exotic	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Point Intersect (m)	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Native Shrubs																									
Native Grasses																									
Native Other	1	1	1	1	1	1	1	1			1	1	1	1	1	1	1	1		1	1	1	1		
Exotic	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1
20m x 50m Quadrat	Number of individual trees with hollows (only hollow ≥5cm diameter): 1												Total length fallen logs in metres (only logs >10cm width): 10m												

Species Native	CA	Species Exotic	CA
<i>Acaena echinata</i>	+	<i>Aira elegantissima</i>	R
<i>Acaena novae-zelandiae</i>	R	<i>Anthoxanthum odoratum</i>	5
<i>Eucalyptus bridgesiana</i>	+	<i>Bromus hordeaceus</i>	1
<i>Geranium gardneri</i>	+	<i>Carduus tenuiflorus</i>	+
<i>Oxalis perennans</i>	+	<i>Holcus lanatus</i>	1
<i>Schoenus apogon</i>	1	<i>Nasella trichotoma</i>	1
<i>Carex canescens</i>	1	<i>Rubus fruticosus species aggregate</i>	R
<i>Cassinia arcuata</i>	R	<i>Rumex acetosella</i>	+
<i>Acaena echinata</i>	+	<i>Sherardia arvensis</i>	+
		<i>Sonchus asper</i>	+
		<i>Stellaria media</i>	R
CA (Cover Abundance modified Braun-Blanquet scale): R = Rare (<4) individuals present; + = Few (4-15) individuals present; 1 = A number of individuals present, less than 5% cover; 2 = 5 - <20% cover; 3 = 20 - <50% cover; 4 = 50 - <75% cover; 5 = 75-100% cover			

Monitoring Plot Data Sheet (Biometric)

Plot Information		Recorders	Hannah Martin		Date	24/11/2022
Site Name/Code	Gullen Range Wind Farm Offset Area					
Plot Name	GRMP2					
Start Easting	726630.4	End Easting	726605.3			
Start Northing	6165990.9	End Northing	6165949.5			
Zone	Management Zone 3					
Vegetation type/condition	Broad-leaved Peppermint – Brittle Gum Dry Forest with a diverse native understorey					

Average Canopy Cover (Specht)	5m		10m		15m		20m		25m		30m		35m		40m		45m		50m						
Native overstorey cover (%)	0		0		0		0		0		0		0		0		15		20						
Native mid-cover (%)	0		0		0		0		0		0		0		0		0		0						
Exotic overstorey cover (%)	0		0		0		0		0		0		0		0		0		0						
Exotic mid-cover (%)	0		0		0		0		0		0		0		0		0		0						
Point Intersect (m)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Native Shrub		1	1	1	1	1	1	1	1	1	1	1					1						1	1	
Native Grass	1																								1
Native Other		1			1	1	1	1	1	1	1					1		1	1						
Exotic			1	1												1			1				1	1	
Point Intersect (m)	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Native Shrubs																									
Native Grasses	1				1																				
Native Other	1	1		1		1	1				1														
Exotic																									
20m x 50m Quadrat	Number of individual trees with hollows (only hollow ≥5cm diameter): 0												Total length fallen logs in metres (only logs >10cm width): 200												

Species Native	CA	Species Exotic	CA
<i>Carex canescens</i>	R	<i>Ageratina adenophora</i>	R
<i>Cassinia aculeata</i>	5	<i>Aira elegantissima</i>	R
<i>Cymbonotus lawsonianus</i>	R	<i>Cirsium vulgare</i>	R
<i>Daucus glochidiatus</i>	R	<i>Holcus lanatus</i>	R
<i>Echinopogon ovatus</i>	+	<i>Hypochaeris radicata</i>	R
<i>Eucalyptus mannifera</i>	1	<i>Rubus fruticosus species aggregate</i>	R
<i>Eucalyptus melliodora</i>	3	<i>Rumex acetosella</i>	1
<i>Eucalyptus rossii</i>	2		
<i>Euchiton involucratus</i>	R		
<i>Gonocarpus tetragynus</i>	1		
<i>Goodenia hederacea</i>	R		
<i>Hydrocotyle laxiflora</i>	R		
<i>Lachnagrostis sp.</i>	+		
<i>Luzula sp.</i>	+		
<i>Microlaena stipoides</i>	R		
<i>Oxalis perennans</i>	+		

Species Native	CA	Species Exotic	CA
<i>Senecio quadridentatus</i>	R		
CA (Cover Abundance modified Braun-Blanquet scale): R = Rare (<4) individuals present; + = Few (4-15) individuals present; 1 = A number of individuals present, less than 5% cover; 2 = 5 - <20% cover; 3 = 20 - <50% cover; 4 = 50 - <75% cover; 5 = 75-100% cover			

Monitoring Plot Data Sheet (Biometric)

Plot Information		Recorders	Hannah Martin		Date	23/11/2022
Site Name/Code	Gullen Range Wind Farm Offset Area					
Plot Name	GRMP3					
Start Easting	726545.7		End Easting	726573		
Start Northing	6166159.3		End Northing	6166197		
Zone	Management Zone 1					
Vegetation type/condition	Apple Box – Yellow Box Woodland with a predominately low diversity native understorey					

Average Canopy Cover (Specht)	5m		10m		15m		20m		25m		30m		35m		40m		45m		50m							
Native overstorey cover (%)	0		0		0		0		0		0		0		0		0		0							
Native mid-cover (%)	0		0		0		0		0		0		0		0		0		0							
Exotic overstorey cover (%)	0		0		0		0		0		0		0		0		0		0							
Exotic mid-cover (%)	0		0		0		0		0		0		0		0		0		0							
Point Intersect (m)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
Native Shrub																										
Native Grass																										
Native Other																						1				
Exotic	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Point Intersect (m)	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	
Native Shrubs																										
Native Grasses																										
Native Other										1		1			1	1					1	1				
Exotic	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
20m x 50m Quadrat	Number of individual trees with hollows (only hollow ≥5cm diameter): 0													Total length fallen logs in metres (only logs >10cm width): 0												

Species Native	CA	Species Exotic	CA
<i>Bulbine bulbosa</i>	R	<i>Holcus lanatus</i>	4
<i>Cassinia aculeata</i>	R	<i>Bromus hordeaceus</i>	3
<i>Cassinia sifton</i>	1	<i>Hypochaeris radicata</i>	1
<i>Eucalyptus melliodora</i>	2	<i>Juncus acutus subsp. acutus</i>	1
<i>Geranium gardneri</i>	+	<i>Sporobolus fertilis</i>	2
<i>Microlaena stipoides</i>	R	<i>Petrorhagia nanteuillii</i>	+
<i>Oxalis perennans</i>	R	<i>Nassella trichotoma</i>	+
<i>Schoenus apogon</i>	2	<i>Anthoxanthum odoratum</i>	1
		<i>Lysimachia arvensis</i>	R
		<i>Plantago lanceolata</i>	R
		<i>Rubus fruticosus species aggregate</i>	R
		<i>Rumex acetosella</i>	R
CA (Cover Abundance modified Braun-Blanquet scale): R = Rare (<4) individuals present; + = Few (4-15) individuals present; 1 = A number of individuals present, less than 5% cover; 2 = 5 - <20% cover; 3 = 20 - <50% cover; 4 = 50 - <75% cover; 5 = 75-100% cover			

Monitoring Plot Data Sheet (Biometric)

Plot Information		Recorders	Hannah Martin		Date	23/11/2022
Site Name/Code	Gullen Range Wind Farm Offset Area					
Plot Name	GRMP4					
Start Easting	726138.9		End Easting	726127.3		
Start Northing	6166164.7		End Northing	6166208		
Zone	Management Zone 3					
Vegetation type/condition	Broad-leaved Peppermint – Brittle Gum Dry Forest with a diverse native understorey					

Average Canopy Cover (Specht)	5m		10m		15m		20m		25m		30m		35m		40m		45m		50m						
Native overstorey cover (%)	3		25		35		30		20		40		50		20		5		0						
Native mid-cover (%)	0		0		0		0		0		0		0		0		0		0						
Exotic overstorey cover (%)	0		0		0		0		0		0		0		0		0		0						
Exotic mid-cover (%)	0		0		0		0		0		0		0		0		0		0						
Point Intersect (m)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Native Shrub																						1	1		
Native Grass							1	1	1		1		1				1								
Native Other	1			1		1									1			1			1				
Exotic				1		1																			
Point Intersect (m)	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Native Shrubs																									
Native Grasses	1			1	1	1																			1
Native Other										1					1					1		1	1		
Exotic																									
20m x 50m Quadrat	Number of individual trees with hollows (only hollow ≥5cm diameter): 0												Total length fallen logs in metres (only logs >10cm width): 7												

Species Native	CA	Species Exotic	CA
<i>Gonocarpus tetragynus</i>	1	<i>Aira elegantissima</i>	+
<i>Melichrus urceolatus</i>	1	<i>Vulpia bromoides</i>	1
<i>Goodenia hederacea</i>	1	<i>Hypochaeris radicata</i>	+
<i>Cymbonotus lawsonianus</i>	1	<i>Anthoxanthum odoratum</i>	1
<i>Lomandra filiformis</i> subsp. <i>Filiformis</i>	1	<i>Sporobolus fertilis</i>	R
<i>Acacia dealbata</i>	R		
<i>Cassinia aculeata</i>	1		
<i>Poranthera microphylla</i>	R		
<i>Hydrocotyle laxiflora</i>	1		
<i>Astroloma humifusum</i>	R		
<i>Hovea heterophylla</i>	R		
<i>Eucalyptus mannifera</i>	2		
<i>Acacia dealbata</i>	3		
<i>Poa sieberiana</i>	2		

Species Native	CA	Species Exotic	CA
CA (Cover Abundance modified Braun-Blanquet scale): R = Rare (<4) individuals present; + = Few (4-15) individuals present; 1 = A number of individuals present, less than 5% cover; 2 = 5 - <20% cover; 3 = 20 - <50% cover; 4 = 50 - <75% cover; 5 = 75-100% cover			

Monitoring Plot Data Sheet (Biometric)

Plot Information		Recorders	Hannah Martin		Date	24/11/2022
Site Name/Code	Gullen Range Wind Farm Offset Area					
Plot Name	GRMP5					
Start Easting	725866.5		End Easting	725810		
Start Northing	6166183.9		End Northing	6166177.8		
Zone	Management Zone 1					
Vegetation type/condition	Apple Box – Yellow Box Woodland with a predominately low diversity native understorey					

Average Canopy Cover (Specht)	5m		10m		15m		20m		25m		30m		35m		40m		45m		50m						
Native overstorey cover (%)	20		0		40		50		30		0		0		0		0		0						
Native mid-cover (%)	0		0		0		0		0		0		0		0		0		0						
Exotic overstorey cover (%)	0		0		0		0		0		0		0		0		0		0						
Exotic mid-cover (%)	0		0		0		0		0		0		0		0		0		0						
Point Intersect (m)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Native Shrub																									
Native Grass																									
Native Other																									
Exotic	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Point Intersect (m)	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Native Shrubs																									
Native Grasses																									
Native Other						1	1	1	1	1	1										1			1	
Exotic	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
20m x 50m Quadrat	Number of individual trees with hollows (only hollow ≥5cm diameter): 0												Total length fallen logs in metres (only logs >10cm width): 8												

Species Native	CA	Species Exotic	CA
<i>Melichrus urceolatus</i>	1	<i>Briza minor</i>	2
<i>Gonocarpus tetragynus</i>	1	<i>Hypochaeris radicata</i>	1
<i>Schoenus apogon</i>	2	<i>Anthoxanthum odoratum</i>	2
<i>Eucalyptus mannifera</i>	2	<i>Holcus lanatus</i>	3
<i>Geranium pink flower</i>	1	<i>Bromus hordeaceus</i>	3
<i>Carex canescens</i>	1	<i>Aira elegantissima</i>	+
<i>Eucalyptus dives</i>	2	<i>Trifolium dubium</i>	2
<i>Cassinia aculeata</i>	R	<i>Sporobolus fertilis</i>	1
<i>Juncus subsecundus</i>	+		
<i>Euchiton involucratus</i>	+		
<i>Luzula sp.</i>	+		
<i>Melichrus urceolatus</i>	1		
<i>Gonocarpus tetragynus</i>	1		
<i>Schoenus apogon</i>	2		

Species Native	CA	Species Exotic	CA
CA (Cover Abundance modified Braun-Blanquet scale): R = Rare (<4) individuals present; + = Few (4-15) individuals present; 1 = A number of individuals present, less than 5% cover; 2 = 5 - <20% cover; 3 = 20 - <50% cover; 4 = 50 - <75% cover; 5 = 75-100% cover			

Monitoring Plot Data Sheet (Biometric)

Plot Information		Recorders	Hannah Martin		Date	24/11/2022
Site Name/Code	Gullen Range Wind Farm Offset Area					
Plot Name	GRMP6					
Start Easting	725671.1	End Easting	725654.5			
Start Northing	6165777.9	End Northing	6165828.8			
Zone	Management Zone 3					
Vegetation type/condition	Mountain Gum – Broad-leaved Peppermint Forest/Apple Box – Broad-leaved Peppermint Forest with a diverse native understorey					

Average Canopy Cover (Specht)	5m		10m		15m		20m		25m		30m		35m		40m		45m		50m						
Native overstorey cover (%)	20		10		1		1		0		0		0		0		0		0						
Native mid-cover (%)	0		0		2		0		1		0		1		1		15		20						
Exotic overstorey cover (%)	0		0		0		0		0		0		0		0		0		0						
Exotic mid-cover (%)	0		0		0		0		0		0		0		0		0		0						
Point Intersect (m)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Native Shrub																									
Native Grass																									
Native Other		1	1		1	1	1	1	1	1	1	1		1	1	1				1					1
Exotic		1	1	1			1	1	1	1		1	1				1	1	1	1	1	1	1	1	1
Point Intersect (m)	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Native Shrubs																		1					1	1	
Native Grasses																									
Native Other				1		1		1			1	1	1		1	1			1	1		1			1
Exotic	1	1	1		1	1	1		1	1	1	1	1	1	1	1	1			1	1				1
20m x 50m Quadrat	Number of individual trees with hollows (only hollow ≥5cm diameter): 1												Total length fallen logs in metres (only logs >10cm width): 60												

Species Native	CA	Species Exotic	CA
<i>Euchiton involucratus</i>	1	<i>Aira elegantissima</i>	1
<i>Acaena echinata</i>	1	<i>Anthoxanthum odoratum</i>	3
<i>Daucus glochidiatus</i>	1	<i>Cirsium vulgare</i>	R
<i>Hydrocotyle laxiflora</i>	1	<i>Holcus lanatus</i>	3
<i>Geranium gardneri</i>	3	<i>Hypochaeris radicata</i>	1
<i>Pteridium esculentum</i>	R	<i>Lysimachia arvensis</i>	1
<i>Cymbonotus lawsonianus</i>	1	<i>Nassella trichotoma</i>	2
<i>Ajuga australis</i>	1	<i>Plantago lanceolata</i>	1
<i>Galium sp.</i>	R	<i>Rubus fruticosus species aggregate</i>	R
<i>Microlaena stipoides</i>	2	<i>Trifolium dubium</i>	1
<i>Dichondra repens</i>	1	<i>Vulpia bromoides</i>	1
<i>Cassinia aculeata</i>	2		
<i>Eucalyptus bridgesiana</i>	2		
<i>Eucalyptus dives</i>	R		
<i>Glycine clandestina</i>	R		
<i>Melichrus urceolatus</i>	1		

Species Native	CA	Species Exotic	CA
<i>Plantago varia</i>	R		
<i>Ranunculus lappaceus</i>	+		
<i>Schoenus apogon</i>	1		
CA (Cover Abundance modified Braun-Blanquet scale): R = Rare (<4) individuals present; + = Few (4-15) individuals present; 1 = A number of individuals present, less than 5% cover; 2 = 5 - <20% cover; 3 = 20 - <50% cover; 4 = 50 - <75% cover; 5 = 75-100% cover			

Monitoring Plot Data Sheet (Biometric)

Plot Information		Recorders	Hannah Martin		Date	24/11/2022
Site Name/Code	Gullen Range Wind Farm Offset Area					
Plot Name	GRMP6a					
Start Easting	725671.1		End Easting	725697.6		
Start Northing	6165777.9		End Northing	6165370.9		
Zone	Management Zone 5					
Vegetation type/condition	Localised Apple Box dominated area where a more open canopy has facilitated the invasion of Serrated Tussock					

Average Canopy Cover (Specht)	5m		10m		15m		20m		25m		30m		35m		40m		45m		50m						
Native overstorey cover (%)	10		10		0		0		0		0		0		1		10		20						
Native mid-cover (%)	10		1		1		2		10		5		5		1		0		0						
Exotic overstorey cover (%)	0		0		0		0		0		0		0		0		0		0						
Exotic mid-cover (%)	0		0		0		0		0		0		0		0		0		0						
Point Intersect (m)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Native Shrub									1					1											
Native Grass		1			1	1	1					1			1			1							
Native Other								1			1					1		1		1	1	1	1		
Exotic	1	1	1	1	1	1	1		1	1	1	1	1	1	1		1		1		1		1	1	1
Point Intersect (m)	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Native Shrubs										1															
Native Grasses	1			1	1												1								
Native Other	1	1		1	1				1		1		1				1		1	1				1	1
Exotic	1		1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1
20m x 50m Quadrat	Number of individual trees with hollows (only hollow ≥5cm diameter): 1												Total length fallen logs in metres (only logs >10cm width): 10												

Species Native	CA	Species Exotic	CA
<i>Acacia mearnsii</i>	1	<i>Aira elegantissima</i>	2
<i>Acaena echinata</i>	1	<i>Anthoxanthum odoratum</i>	2
<i>Acaena novae-zelandiae</i>	1	<i>Briza maxima</i>	R
<i>Ajuga australis</i>	1	<i>Cirsium vulgare</i>	+
<i>Cassinia aculeata</i>	3	<i>Holcus lanatus</i>	2
<i>Cymbonotus lawsonianus</i>	R	<i>Hypochaeris radicata</i>	1
<i>Dichondra repens</i>	1	<i>Nassella trichotoma</i>	3
<i>Echinopogon ovatus</i>	R	<i>Rubus fruticosus species aggregate</i>	R
<i>Eucalyptus bridgesiana</i>	2	<i>Rumex acetosella</i>	+
<i>Eucalyptus dives</i>	R	<i>Trifolium dubium</i>	+
<i>Geranium gardneri</i>	1	<i>Verbena bonariensis</i>	R
<i>Gonocarpus tetragynus</i>	+	<i>Vulpia bromoides</i>	1
<i>Goodenia hederacea</i>	1		
<i>Hydrocotyle laxiflora</i>	1		
<i>Lomandra longifolia</i>	1		
<i>Melichrus urceolatus</i>	2		

Species Native	CA	Species Exotic	CA
<i>Microlaena stipoides</i>	1		
<i>Plantago varia</i>	1		
<i>Poranthera microphylla</i>	R		
<i>Schoenus apogon</i>	1		
CA (Cover Abundance modified Braun-Blanquet scale): R = Rare (<4) individuals present; + = Few (4-15) individuals present; 1 = A number of individuals present, less than 5% cover; 2 = 5 - <20% cover; 3 = 20 - <50% cover; 4 = 50 - <75% cover; 5 = 75-100% cover			

Monitoring Plot Data Sheet (Biometric)

Plot Information		Recorders	Hannah Martin		Date	24/11/2022
Site Name/Code	Gullen Range Wind Farm Offset Area					
Plot Name	GRMP7					
Start Easting	725620.6		End Easting	725612.4		
Start Northing	6165753.6		End Northing	6165798.7		
Zone	Management Zone 4					
Vegetation type/condition	Ribbon Gum Forest with a mixed native and exotic understorey					

Average Canopy Cover (Specht)	5m		10m		15m		20m		25m		30m		35m		40m		45m		50m						
Native overstorey cover (%)	15		10		5		20		20		30		15		30		5		15						
Native mid-cover (%)	0		0		0		0		0		5		5		70		70		80						
Exotic overstorey cover (%)	0		0		0		0		0		0		0		0		0		0						
Exotic mid-cover (%)	0		0		0		0		0		0		0		0		0		0						
Point Intersect (m)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Native Shrub								1	1							1			1						
Native Grass																									
Native Other	1	1	1									1		1						1	1	1		1	1
Exotic	1		1	1	1	1		1		1	1	1	1	1		1	1			1		1	1	1	1
Point Intersect (m)	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Native Shrubs									1			1	1	1	1	1	1								1
Native Grasses																									
Native Other						1	1												1	1	1			1	
Exotic	1	1	1	1	1		1	1	1	1	1	1	1				1		1		1	1	1		1
20m x 50m Quadrat	Number of individual trees with hollows (only hollow ≥5cm diameter): 0												Total length fallen logs in metres (only logs >10cm width): 70												

Species Native	CA	Species Exotic	CA
<i>Acaena novae-zelandiae</i>	1	<i>Holcus lanatus</i>	5
<i>Acacia dealbata</i>	R	<i>Ageratina adenophora</i>	+
<i>Amyema sp.</i>	R	<i>Aira elegantissima</i>	+
<i>Asplenium flabellifolium</i>	R	<i>Anthoxanthum odoratum</i>	1
<i>Cassinia aculeata</i>	2	<i>Bromus diandrus</i>	1
<i>Dichondra repens</i>	1	<i>Bromus hordeaceus</i>	1
<i>Eucalyptus bridgesiana</i>	R	<i>Cirsium vulgare</i>	+
<i>Eucalyptus dalrympleana</i>	3	<i>Hypochaeris radicata</i>	+
<i>Euchiton involucrat</i>	+	<i>Rubus fruticosus species aggregate</i>	+
<i>Geranium gardneri</i>	1	<i>Rumex acetosella</i>	+
<i>Hydrocotyle laxiflora</i>	1	<i>Sporobolus fertilis</i>	r
<i>Lomandra longifolia</i>	R	<i>Stellaria media</i>	+
<i>Plantago varia</i>	R		
<i>Plantago varia</i>	R		
<i>Pteridium esculentum</i>	+		
<i>Stellaria pungens</i>	R		

Species Native	CA	Species Exotic	CA
CA (Cover Abundance modified Braun-Blanquet scale): R = Rare (<4) individuals present; + = Few (4-15) individuals present; 1 = A number of individuals present, less than 5% cover; 2 = 5 - <20% cover; 3 = 20 - <50% cover; 4 = 50 - <75% cover; 5 = 75-100% cover			

Monitoring Plot Data Sheet (Biometric)

Plot Information		Recorders	Hannah Martin		Date	24/11/2022
Site Name/Code	Gullen Range Wind Farm Offset Area					
Plot Name	GRMP8					
Start Easting	725623.2		End Easting	725624.8		
Start Northing	6165528.1		End Northing	6165569.8		
Zone	Management Zone 3					
Vegetation type/condition	Broad-leaved Peppermint – Brittle Gum Dry Forest with a diverse native understorey					

Average Canopy Cover (Specht)	5m		10m		15m		20m		25m		30m		35m		40m		45m		50m						
Native overstorey cover (%)	20		5		10		2		20		15		15		25		15		30						
Native mid-cover (%)	0		0		0		0		0		0		0		0		0		0						
Exotic overstorey cover (%)	0		0		0		0		0		0		0		0		0		0						
Exotic mid-cover (%)	0		0		0		0		0		0		0		0		0		0						
Point Intersect (m)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Native Shrub																		1							
Native Grass	1																							1	1
Native Other		1	1		1		1		1							1									
Exotic																1			1				1		
Point Intersect (m)	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Native Shrubs																									
Native Grasses			1	1		1					1						1	1							
Native Other			1	1		1													1						
Exotic																				1	1		1		1
20m x 50m Quadrat	Number of individual trees with hollows (only hollow ≥5cm diameter): 0												Total length fallen logs in metres (only logs >10cm width): 30												

Species Native	CA	Species Exotic	CA
<i>Acacia mearnsii</i>	R	<i>Aira elegantissima</i>	1
<i>Cassinia aculeata</i>	1	<i>Anthoxanthum odoratum</i>	1
<i>Digitaria ciliaris</i>	R	<i>Bromus diandrus</i>	+
<i>Eucalyptus dives</i>	3	<i>Holcus lanatus</i>	+
<i>Eucalyptus mannifera</i>	3	<i>Hypochaeris radicata</i>	+
<i>Gonocarpus tetragynus</i>	2	<i>Rubus fruticosus</i> species aggregate	R
<i>Goodenia hederacea</i>	1		
<i>Hydrocotyle laxiflora</i>	+		
<i>Lomandra filiformis</i> subsp. <i>filiformis</i>	1		
<i>Melichrus urceolatus</i>	+		
<i>Microlaena stipoides</i>	2		
<i>Microlaena stipoides</i>	1		
<i>Poa sieberiana</i>	R		
<i>Poranthera microphylla</i>	1		
<i>Schoenus apogon</i>	+		

Species Native	CA	Species Exotic	CA
<i>Wahlenbergia luteola</i>	R		
CA (Cover Abundance modified Braun-Blanquet scale): R = Rare (<4) individuals present; + = Few (4-15) individuals present; 1 = A number of individuals present, less than 5% cover; 2 = 5 - <20% cover; 3 = 20 - <50% cover; 4 = 50 - <75% cover; 5 = 75-100% cover			

Monitoring Plot Data Sheet (Biometric)

Plot Information		Recorders	Hannah Martin		Date	23/11/2022
Site Name/Code	Gullen Range Wind Farm Offset Area					
Plot Name	GRMP9					
Start Easting	726861		End Easting	726863		
Start Northing	6165991		End Northing	6165941		
Zone	Management Zone 2					
Vegetation type/condition	Apple Box – Yellow Box Woodland with a predominately exotic understorey (no overstorey)					

Average Canopy Cover (Specht)	5m		10m		15m		20m		25m		30m		35m		40m		45m		50m						
Native overstorey cover (%)	0		0		0		0		0		0		0		0		0		0						
Native mid-cover (%)	0		0		0		0		0		0		0		0		0		0						
Exotic overstorey cover (%)	0		0		0		0		0		0		0		0		0		0						
Exotic mid-cover (%)	0		0		0		0		0		0		0		0		0		0						
Point Intersect (m)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Native Shrub																									
Native Grass																									
Native Other	0	1	1						1	1	1	1	1		1	1	1	1	1		1		1	1	
Exotic	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Point Intersect (m)	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
Native Shrubs																									
Native Grasses																									
Native Other									1																
Exotic	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
20m x 50m Quadrat	Number of individual trees with hollows (only hollow ≥5cm diameter): 0													Total length fallen logs in metres (only logs >10cm width): 0											

Species Native	CA	Species Exotic	CA
<i>Geranium gardneri</i>	1	<i>Anthoxanthum odoratum</i>	3
<i>Rumex brownii</i>	1	<i>Bromus hordeaceus</i>	3
		<i>Cirsium vulgare</i>	R
		<i>Holcus lanatus</i>	1
		<i>Hypochaeris glabra</i>	1
		<i>Nassella trichotoma</i>	1
		<i>Sporobolus fertilis</i>	2
		<i>Taraxacum officinale</i>	1
		<i>Trifolium dubium</i>	1

CA (Cover Abundance modified Braun-Blanquet scale): R = Rare (<4) individuals present; + = Few (4-15) individuals present; 1 = A number of individuals present, less than 5% cover; 2 = 5 - <20% cover; 3 = 20 - <50% cover; 4 = 50 - <75% cover; 5 = 75-100% cover

Monitoring Plot Data Sheet (Biometric)

Plot Information		Recorders	Hannah Martin	Date	23/11/2022
Site Name/Code	Gullen Range Wind Farm Offset Area				
Plot Name	GRMP10				
Start Easting	726533	End Easting	726567		
Start Northing	6166243	End Northing	6166282		
Zone	Management Zone 1				
Vegetation type/condition	Apple Box – Yellow Box Woodland with a predominately low diversity native understorey (derived grassland)				

Average Canopy Cover (Specht)	5m		10m		15m		20m		25m		30m		35m		40m		45m		50m							
Native overstorey cover (%)	0		0		0		0		0		0		0		0		0		0							
Native mid-cover (%)	0		0		0		0		0		0		0		0		0		0							
Exotic overstorey cover (%)	0		0		0		0		0		0		0		0		0		0							
Exotic mid-cover (%)	0		0		0		0		0		0		0		0		0		0							
Point Intersect (m)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
Native Shrub																										
Native Grass																										
Native Other																										
Exotic	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Point Intersect (m)	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	
Native Shrubs																										
Native Grasses																										
Native Other							1									1				1						
Exotic	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
20m x 50m Quadrat	Number of individual trees with hollows (only hollow ≥5cm diameter): 0													Total length fallen logs in metres (only logs >10cm width): 0												

Species Native	CA	Species Exotic	CA
<i>Acacia mearnsii</i>	R	<i>Anthoxanthum odoratum</i>	3
<i>Acaena echinata</i>	R	<i>Bromus hordeaceus</i>	3
<i>Eucalyptus bridgesiana</i>	R	<i>Carex canescens</i>	+
<i>Geranium gardneri</i>	1	<i>Holcus lanatus</i>	5
<i>Rumex brownii</i>	1	<i>Hypochaeris radicata</i>	1
		<i>Lysimachia arvensis</i>	R
		<i>Sporobolus fertilis</i>	2
		<i>Vulpia bromoides</i>	1

CA (Cover Abundance modified Braun-Blanquet scale): R = Rare (<4) individuals present; + = Few (4-15) individuals present; 1 = A number of individuals present, less than 5% cover; 2 = 5 - <20% cover; 3 = 20 - <50% cover; 4 = 50 - <75% cover; 5 = 75-100% cover

Appendix C Weed Photo Monitoring Points.

Monitoring Point: GRWPP1		
North		
 2017	 2018	 2019
 2020	 2021	 2022

Monitoring Point: GRWPP1

East



2017



2018



2019



2020



2021



2022

Monitoring Point: GRWPP1

South



2017



2018



2019



2020



2021



2022

Monitoring Point: GRWPP1

West



2017



2018



2019



2020



2021



2022

Monitoring Point: GRWPP2

North-west



2017



2018



2019



2020

No data

2021



2022

Monitoring Point: GRWPP2

North-east



2017



2018



2019



2020



2021



2022

Monitoring Point: GRWPP2

South-east



2017



2018



2019



2020



2021



2022

Monitoring Point: GRWPP2

South-west



2017



2018



2019



2020



2021



2022

Monitoring Point: GRWPP3

North-west



2017



2018



2019



2020



2021



2022

Monitoring Point: GRWPP3

North-east



2017



2018



2019



2020



2021



2022

Monitoring Point: GRWPP3

South-east



2017



2018



2019



2020



2021



2022

Monitoring Point: GRWPP3

South-west



2017



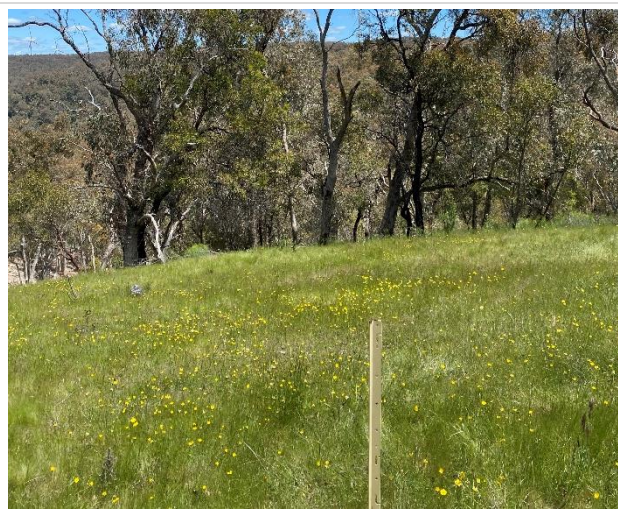
2018



2019



2020



2021



2022

Monitoring Point: GRWPP4

North



2017



2018



2019



2020



2021



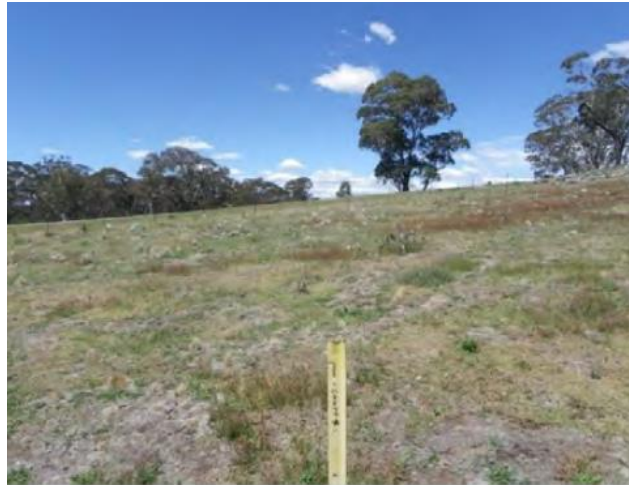
2022

Monitoring Point: GRWPP4

East



2017



2018



2019



2020



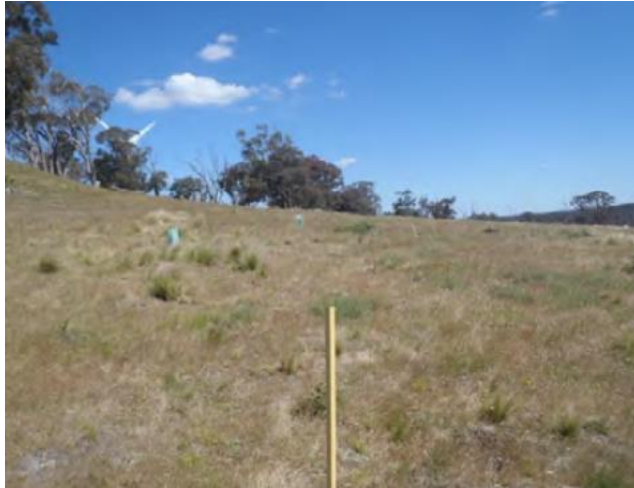
2021



2022

Monitoring Point: GRWPP4

South



2017



2018



2019



2020



2021



2022

Monitoring Point: GRWPP4

West



2017



2018



2019



2020



2021



2022

Monitoring Point: GRWPP5

North



2017



2018



2019



2020



2021



2022

Monitoring Point: GRWPP5

East



2017



2018



2019



2020



2021



2022

Monitoring Point: GRWPP5

South



2017



2018



2019



2020



2021



2022

Monitoring Point: GRWPP5

West



2017



2018



2019



2020



2021



2022

Monitoring Point: GRWPP6

North



2017



2018



2019



2020



2021



2022

Monitoring Point: GRWPP6

East



2017



2018



2019



2020



2021



2022

Monitoring Point: GRWPP6

South



2017



2018



2019



2020



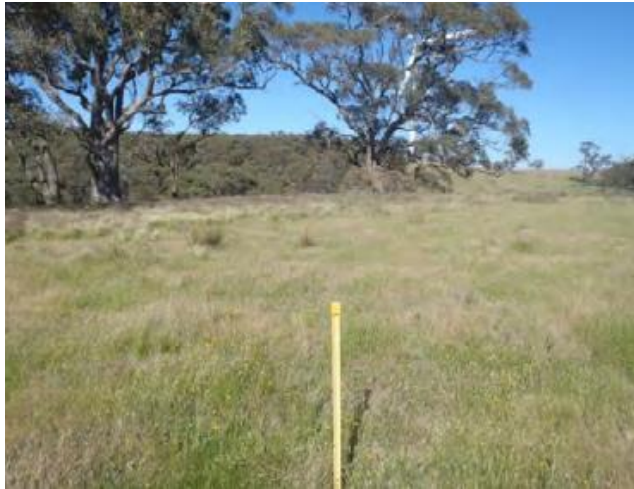
2021



2021

Monitoring Point: GRWPP6

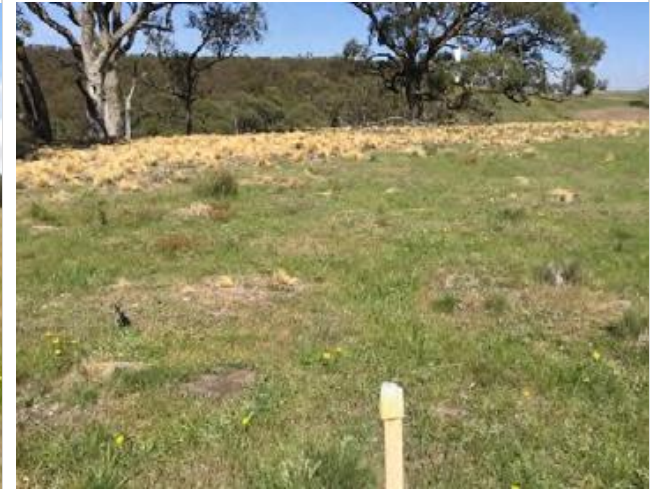
West



2017



2018



2019



2020



2021



2022

Monitoring Point: GRWPP7

North



2017



2018



2019



2020



2021



2022

Monitoring Point: GRWPP7

East



2017



2018



2019



2020



2021



2022

Monitoring Point: GRWPP7

South



2017



2018



2019



2020



2021



2022

Monitoring Point: GRWPP7

West



2017



2018



2019



2020



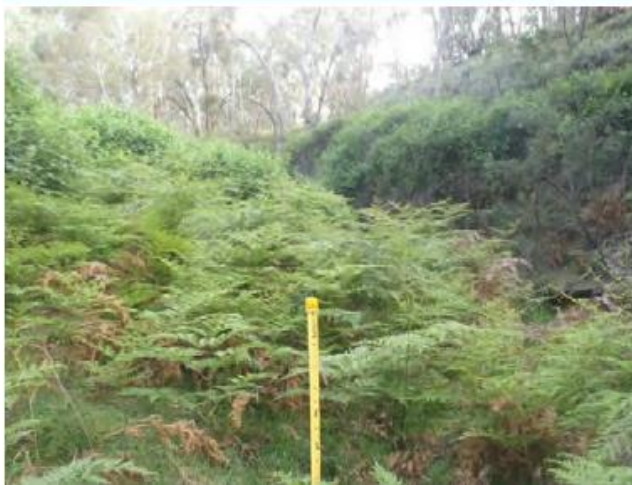
2021



2022

Monitoring Point: GRWPP8

North



2017



2018



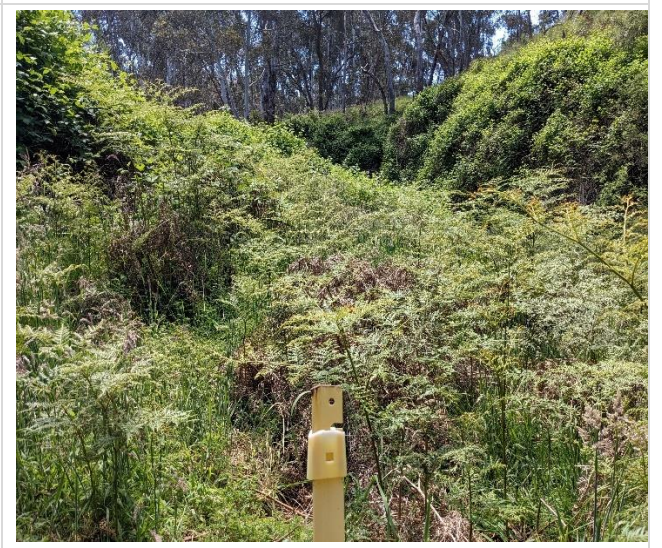
2019



2020



2021



2022

Monitoring Point: GRWPP8

East



2017



2018



2019



2020



2021



2022

Monitoring Point: GRWPP8

South



2017



2018



2019



2020



2021



2022

Monitoring Point: GRWPP8

West



2017



2018



2019



2020



2021



2022

Monitoring Point: GRWPP9

North



2017



2018



2019



2020



2021



2022

Monitoring Point: GRWPP9

East



2017



2018



2019



2020



2021



2022

Monitoring Point: GRWPP9

South



2017



2018



2019



2020



2021



2022

Monitoring Point: GRWPP9

West



2017



2018



2019



2020



2021



2022

Monitoring Point: GRWPP10

North



2017



2018



2019



2020



2021



2022

Monitoring Point: GRWPP10

East



2017



2018



2019



2020



2021



2022

Monitoring Point: GRWPP10

South



2017



2018



2019



2020



2021



2022

Monitoring Point: GRWPP10

West



2017



2018



2019



2020



2021



2022

Monitoring Point: GRWPP11

North



2017



2018



2019



2020



2021



2022

Monitoring Point: GRWPP11

East



2017



2018



2019



2020



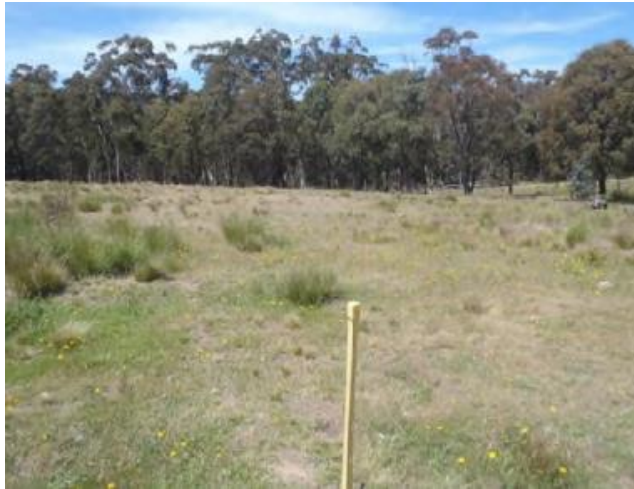
2021



2022

Monitoring Point: GRWPP11

South



2017



2018



2019



2020



2021



2022

Monitoring Point: GRWPP11

West



2017



2018



2019



2020



2021



2022

Appendix D. Pest Control Records for 2022

GULLEN RANGE WIND FARM OFFSET AREA - FERAL ANIMAL CONTROL RECORDS

[illegible]

Appendix E. Annual Nestbox Condition Monitoring Report for 2022.

Annual Nest Box Condition Monitoring Report: Gullen Range Wind Farm - PVP Offset Area

Prepared by Spatial Footprints

ABN: 56 805 462 327

Report produced by Alexandra Ullrich, 29th June 2022

Document Reference: SF_R004_20220629



All photographs in this report were taken during the inspection on 19th May 2022.

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1.0 Introduction

This report outlines the 2022 findings of the annual nest box inspection program at the Gullen Range Wind Farm (GRWF). Thirty nest boxes within Zones 1, 2, 3, 4, and 5 of the GRWF PVP Offset Area were inspected on the 19th May 2022. Nest boxes were inspected to ensure they remain in good working condition; remain securely in place and are free of unwanted pest species as specified by Management Action 26 of the PVP.

2.0 Monitoring and Maintenance Methods

The nest box condition monitoring was carried out by Alexandra Ullrich (Spatial Footprints) who has been trained in ecological surveying techniques and is accredited to Work at Heights. Alexandra was accompanied by a NGRWF staff member for safety and guidance around the Site. Condition monitoring involved carrying out a visual inspection focusing on the following areas:

- a) The overall condition of the boxes including damaged, rotting or splitting timber and clear openings;
- b) The securing mechanisms of the box to the host tree (i.e., the *Habisure* system); the position of the nest box on the tree and checking that the box is securely fastened whilst allowing for tree growth; and,
- c) Checking for pest species or evidence of pest species such as rats, bees or Indian Mynas.

To minimise nest box disturbance, nest boxes and their contents were carefully inspected using a ground-based technique. Using a camera mounted on a telescopic pole, nest boxes located up to 7m above ground were able to be easily inspected. An iPad device was used to remotely view the condition of the boxes from the ground and wirelessly control the capture of video and images.

During the field inspection, findings were recorded using a pro-forma field data sheet noting the condition of each individual nest box and its contents. Photographs and videos were taken of any nest boxes that were found damaged or deteriorated or had evidence of internal signs of box use, i.e., nest materials or live fauna. The images and recordings were later processed on the ground and animals encountered within the boxes identified. Findings are presented in Tables 1 & 2 and representative images of the box's contents are included at Appendix A.

Once the nest boxes were checked to be clear of nesting fauna (as described above), maintenance and repairs were carried out using an extendable ladder and appropriate safety equipment. Using a cordless drill to predrill the screw holes, additional screws were installed to secure external plywood layers that were separating due to weathering. To protect the external surfaces of the weathered nest boxes, Lanotec Timber Seal was applied to external surfaces of the boxes using an 8L pressure spray bottle and a nozzle.

3.0 Results

3.1 Nest Box Condition

Most of the nest boxes inspected, i.e., 27 out of the 30 (or 90%) were found to be in good overall condition and showed only minor signs of weathering such as discolouration of the plywood, or minor delamination of their plywood panels (refer Table 1.). The remaining three nest boxes (C3-5, C5-1 & C5-2), all kookaburra boxes, had moderately delaminated plywood lids (i.e., with multiple layers delaminating). As the plywood layers on the lids of these boxes were very warped (see Figure 1.), these boxes were not repaired in the field. These nest boxes are still functional but will require repair in the future. To assist with any future repair or replacement, kookaburra nest box C3-5 lid was measured during this inspection. The lid of this nest box measured 34cm wide and 37cm long.



Figure 1. (a) Kookaburra nest box C3-5 and (b) Kookaburra nest boxes C5-1 and C5-2 with delaminating plywood lids.

During this inspection there was evidence of a severe windstorm, mainly within zones C4 and C5 of the GRWF PVP Offset area. Within this area, many large trees were observed to be uprooted and large branches snapped off (see Figure 2). Fortunately, the nest boxes in these zones and trees supporting them did not appear to be damaged by this severe weather event.



Figure 2. Fallen trees and broken branches, evidence of a severe weather event within zones C4 and C5 of the PVP Offset area.

Table 1. Inspection results of 30 Nest Boxes within GRWF Offset Area on 19th May 2022.

Maintenance & Repair Key: **AS** = Additional Screws; **CE** = Cleared Entrance; **CP** = Carpet Fitted; **LAB** = Relabelled, and **TO** = Timber Oil

Box No.	Nest Box Type	Nest Box Secured	Pest Species	Initial Condition & Maintenance/Repairs	Overall Condition Post Maintenance
C1-1	Small Parrot	Yes	No	Good (TO)	Good
C1-2	Medium Parrot	Yes	No	Good (TO)	Good
C1-3	Small Parrot	Yes	No	Good	Good
C1-4	Rear-Entry Squirrel Glider	Yes	No	Good (LAB & TO)	Good
C1-5	Rear-Entry Micro- Bat	Yes	No	Good (TO)	Good
C1-6	Rear-Entry Micro- Bat	Yes	No	Good (CE & TO)	Good
C2-1	Medium Parrot	Yes	No	Good	Good
C2-2	Rear-Entry Squirrel Glider	Yes	No	Minor delamination (AS, CP, LAB & TO)	Good
C2-3	Owlet Nightjar	Yes	No	Good	Good
C2-4	Rear-Entry Micro- Bat	Yes	No	Good (LAB & TO)	Good
C2-5	Medium Parrot	Yes	No	Minor delamination (AS & TO)	Good
C2-6	Rear-Entry Micro- Bat	Yes	No	Good	Good
C2-7	Kookaburra	Yes	No	Good (TO)	Good
C2-8	Medium Parrot	Yes	No	Good (TO)	Good
C3-1	Owlet Nightjar	Yes	No	Good (TO)	Good
C3-2	Rear-Entry Micro- Bat	Yes	No	Good (TO)	Good
C3-3	Rear-Entry Micro- Bat	Yes	No	Good (LAB, CE & TO)	Good
C3-4	Rear-Entry Micro- Bat	Yes	No	Good (LAB & TO)	Good
C3-5	Kookaburra	Yes	No	Moderate delamination of lid (TO)	Fair
C3-6	Rear-Entry Micro- Bat	Yes	No	Good (TO)	Good
C3-7	Owlet nightjar	Yes	No	Good (TO)	Good
C3-8	Feathertail Glider	Yes	No	Good (TO)	Good
C3-9	Small Parrot	Yes	No	Good (TO)	Good
C3-10	Medium Parrot	Yes	No	Good (LAB & TO)	Good
C4-1	Small Parrot	Yes	No	Good (LAB & TO)	Good
C4-2	Medium Parrot	Yes	No	Good (LAB & TO)	Good
C4-3	Medium Parrot	Yes	No	Good (TO)	Good
C4-4	Feathertail Glider	Yes	No	Good (TO)	Good
C5-1	Kookaburra	Yes	No	Moderate delamination of lid (TO)	Fair
C5-2	Kookaburra	Yes	No	Moderate delamination of lid (TO)	Fair

Table 2. Contents and occupants of 30 Nest Boxes recorded during condition monitoring inspection on 19th May 2022. Previous monitoring results from 8th March 2021 are included for comparison.

Box No.	Box Type	Contents (May 2022)	Contents (Mar. 2021)
C1-1	Small Parrot	bark strips and twigs	bark and twigs
C1-2	Medium Parrot	bark strips	bark strips
C1-3	Small Parrot	2 Ringtail Possums	bark strips and twigs
C1-4	Rear-Entry Squirrel Glider	green leaf nest	green leaf nest
C1-5	Rear-Entry Micro-Bat	-	-
C1-6	Rear-Entry Micro-Bat	-	-
C2-1	Medium Parrot	2 Ringtail Possums	glider leaf nest
C2-2	Rear-Entry Squirrel Glider	brown leaf nest (and remnant honeycomb)	Beehive (European honey bee)
C2-3	Owlet nightjar	1 Ringtail Possum	green leaves and twigs
C2-4	Rear-Entry Micro-Bat	-	-
C2-5	Medium Parrot	brown leaves and bark strips	brown leaves and bark strips
C2-6	Rear-Entry Micro-Bat	-	-
C2-7	Kookaburra	bark strips and twigs	bark strips and twigs
C2-8	Medium Parrot	green and brown leaves	green leaves and twigs
C3-1	Owlet nightjar	-	-
C3-2	Rear-Entry Micro-Bat	-	-
C3-3	Rear-Entry Micro-Bat	-	-
C3-4	Rear-Entry Micro-Bat	-	-
C3-5	Kookaburra	green leaves, bark and twigs	brown leaves, bark and twigs
C3-6	Rear-Entry Micro-Bat	-	-
C3-7	Owlet nightjar	brown leaves	green leaves
C3-8	Feather tail glider	-	-
C3-9	Small Parrot	brown leaves	1 Ringtail Possum
C3-10	Medium Parrot	brown leaf nest	4 Sugar Gliders
C4-1	Small Parrot	green leaf nest	green leaf nest
C4-2	Medium Parrot	-	-
C4-3	Medium Parrot	-	-
C4-4	Feathertail glider	brown leaf nest	green leaf nest
C5-1	Kookaburra	green leaves	green leaves and twigs
C5-2	Kookaburra	-	-

3.2 Maintenance and Repairs

General in-field maintenance and repair work included securing separating plywood panels with additional countersunk screws, relabelling faded labels and applying Lanotec Timber Seal to protect the external plywood surfaces from weathering (see Figures 3. & 4.). For a breakdown of the in-field work carried out on each nest box, refer to Table 1. and the Maintenance and Repair Key.



Figure 3. (a) Plywood panels on nest box C2-5 were beginning to separate. (b) Additional screws were installed to secure the front plywood panels (see highlighted area).



Figure 4. Nest boxes were coated with Lanotec Timber Seal to protect the plywood layers from weathering.



Figure 5. Photographs of repair and modification to nest box C2-2: (a) old honeycomb was cleaned out from inside the nest box, and (b) separating plywood panels were secured by installing additional screws (see yellow arrow) and a piece of shag-pile carpet was fitted to the underside of the lid as a future bee deterrent.

Nest box C2-2 was found to be free of the feral bee infestation reported during the previous inspection (in 2021). The following maintenance and repairs were carried out to return this nest box to a fully functional state: the old honeycomb was cleaned out; the separating front plywood panels resecured with additional screws and a piece of shag-pile carpet was fitted to the underside of the lid to deter future bee occupation,⁽¹⁾ (see photographs at Figure 5). Note timber seal was applied after photographs were taken.

3.3 Nest Box Security

The *Habisure* system, (a kinked wire design to allow for future growth of the host tree) was inspected on each nest box to ensure the hose around the wire remained intact and the wire, whilst securely supporting the nest box, was not damaging the host tree and still had room for future growth. All nest boxes and attachment wire were in good repair and were securely fastened to their host trees.

3.4 Pest Status

There were no pest species such as rats, bees, wasps or common (Indian) Mynas recorded in or around any of the nest boxes during this current inspection. Squirrel glider nest box C2-2, that was previously reported as infested by a feral bee colony (in 2021 inspection report) was observed to be free of any pest species during this inspection event. The reason for the failure/abandonment of this hive is unclear, however small nest box volume and variable food resources are two known limiting factors.

3.5 Nest Box Contents

Similar to the previous (2021) inspection period, 17 of the 30 nest boxes (i.e., approximately 57%) were found to contain either an animal or had signs of use, i.e., fresh or old nesting material (see Table 2, and Appendix A for representative photographs). Obvious evidence of recent use (i.e., green leaves and green leaf nests) was recorded in 5 nest boxes (refer to Table 2), which is down slightly from the 8 boxes recorded in 2021. Consistent with the 2021 inspection, 13 nest boxes showed no sign of occupation at the time of inspection, with the majority of these (i.e., 8 boxes) being microbat nest boxes. Evidence such as scats and/or hair left by microbats or other fauna is not well retained by bat boxes, as they have no floor and have an opening on the underside of the box. As such the total usage rate may be underestimated due to limited evidence of use being retained by these bat boxes.

The total number of animals observed occupying the nest boxes has remained stable during the 2021 and 2022 monitoring periods, with a total of 5 animals recorded during both years. In 2021, 4 sugar gliders and 1 ringtail possum were recorded, whilst during this current inspection, a total of five ringtail possums were recorded (refer Table 2). Whilst only one arboreal mammal species, (i.e., ringtail possum (*Pseudocheirus peregrinus*)) was confirmed using the nest boxes during this inspection, typical glider's bowl-shaped green leaf nests were also observed in two nest boxes: C1-4 (rear-entry squirrel glider) and C4-1 (small parrot). These two nest boxes were noted to have green leaf nests during the previous inspecting period also. It should be noted that arboreal mammals like gliders and possums often use multiple hollows (natural and artificial) and change nesting sites on a regular basis. Refer to Table 2. and representative photographs at Appendix A.

Similar to the previous (2021) inspection, the three nest boxes that were used by ringtail possums during this inspection (C1-2: medium parrot; C2-3: owlet-nightjar, and C1-3: small parrot) were observed to contain nesting material such as green leaf nests or drey material (e.g., bark strips and leaves), refer Table 2. Like the previous inspection, no bird or reptile species were recorded occupying the nest boxes.

4.0 Summary and Recommendations

The 2022 nest box monitoring inspection at the Gullen Range Wind Farm PVP Offset Area found that the nest boxes are securely attached to their host trees and are continuing to offer hollow dependent fauna with a functional den resource. Following in-field maintenance and repairs, 27 of the 30 nest boxes were recorded to be in good overall condition. The remaining three nest boxes (all large kookaburra boxes) were found to be in a fair condition as their plywood lids were delaminating and were warped beyond in-field repair. These nest boxes are still weatherproof and functional; however they should be considered for repair or replacement at the next monitoring event. See Appendix B for the location of the three weather-affected kookaburra nest boxes.

Common ringtail possums (*Pseudocheirus peregrinus*) were the only species found to be using the nest boxes during this inspection, with 5 ringtail possums observed in 3 nest boxes. Typical glider's bowl-shaped green leaf nests were also recorded in two of the smaller nest boxes. No bird species were recorded using the nest boxes however as the majority of the nest boxes are in good overall condition, they will be available when environmental conditions are favourable and requirement of these nesting resources arise.

The level of pest activity remains very low with no evidence of pest species including rats or bees in or around any of the nest boxes during this current inspection. Ongoing annual inspections and basic in-field maintenance ensures that the nest boxes remain secure, weatherproof and pest free and remain a functional resource for the target faunal wildlife species whilst also maximizing the useful life of the nest boxes.

The following recommendations are provided in response to the findings of this inspection:

- Kookaburra nest boxes: C3-5, C5-1 and C5-2, which have moderately delaminated and warped plywood lids, should be considered for repair or replacement (if deemed beyond maintenance repair) at the next monitoring event;
- Nest box modifications that deter beehive establishment, such as the attachment of shag-pile carpet to the underside lid⁽¹⁾ should be considered prior to the fitment of replacement nest boxes;
- Replacement nest boxes should be modified with a hinged lid to enable ease of inspection. It is also recommended that replacement boxes have sealed side joints and holes in the base panel to ensure adequate drainage;⁽²⁾
- Annual reapplication of a non-toxic, organic timber sealant such as Lanotec's Timber Seal or Tung Oil should be considered to help protect and waterproof the plywood nest boxes.⁽²⁾
- ❖ Note: Minimising animal disturbance should be considered before undertaking any maintenance or repair of the nest boxes.

References:

1. Tweed-Byron Bush Futures Project, Nest Box Manual - Bush Futures, Sustainable management of Significant Urban and Peri-Urban Bushland Areas. Retrieved from <https://www.tweed.nsw.gov.au/files/assets/public/documents/environment/nest-box-manual.pdf> [Verified 19 June 2022].
2. Local Land Services Greater Sydney, Build your own Wildlife Nest Box (2017). Retrieved from https://www.lls.nsw.gov.au/_data/assets/pdf_file/0006/656610/GS-LLS-Wildlife-Nest-Box-10-2017-Accessible.pdf [Verified 19 June 2022].

APPENDIX A. 2022 FIELD PHOTOGRAPHS



Figure 1. Two ringtail possums in medium parrot nest box C2-1.



Figure 2. Two ringtail possums denning in small parrot nest box C1-3. Note long prehensile tail with white tip.



Figure 3. A solitary ringtail possum denning in owllet nightjar nest box C2-3.



Figure 4. Green leaves and bark strips in nest box C3-5, (i.e., common possum drey material).



Figure 5. A typical glider's bowl-shaped nest made from eucalypt leaves in nest box C1-4.



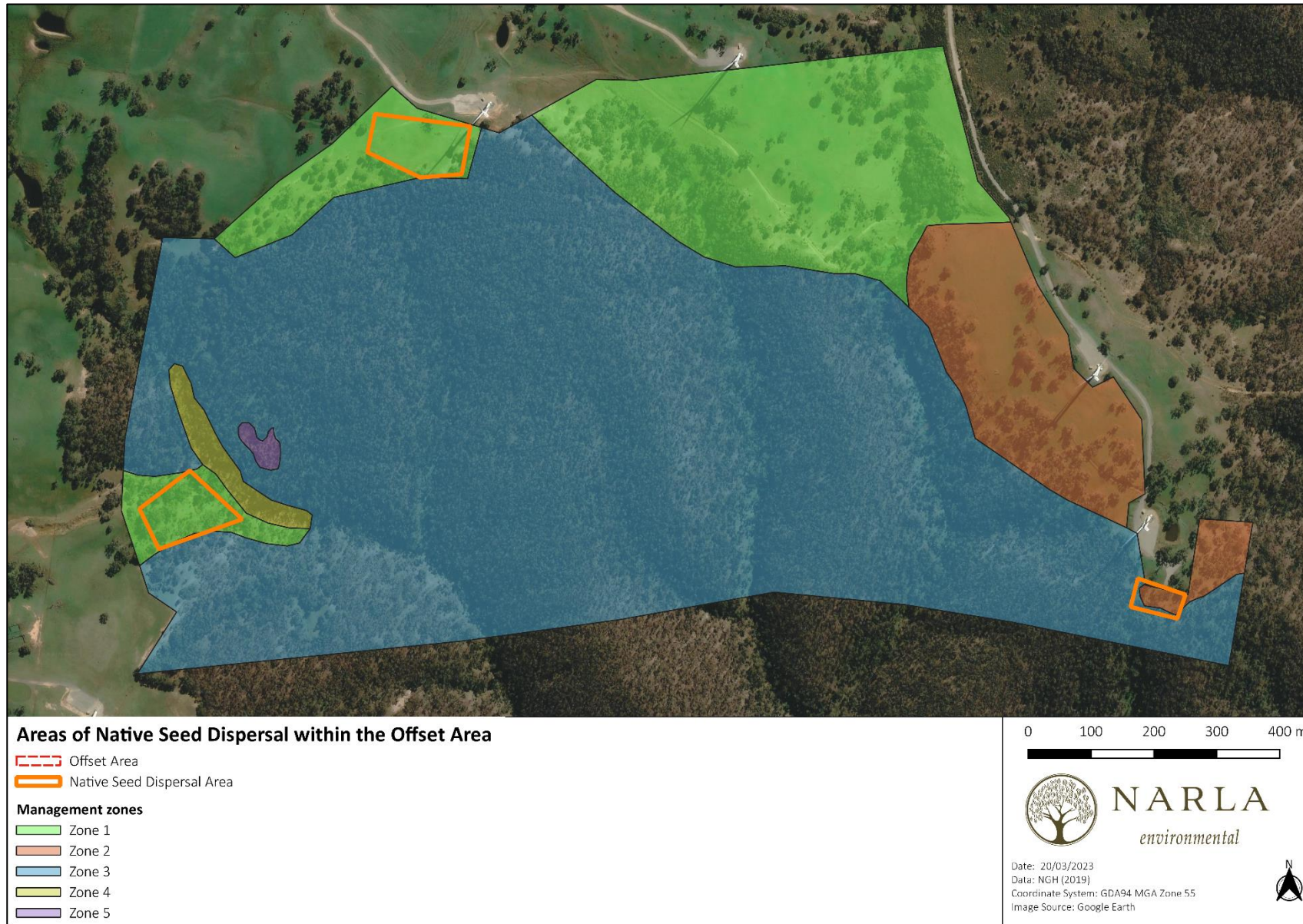
Figure 6. Evidence of use, a green leaf nest in nest box C4-1.

APPENDIX B.



Legend ○ Nest Boxes — PVP Boundary ▲ Nest Boxes with Delaminating Lids	NEST BOX CONDITION MONITORING RESULTS - 2022			Project Ref: SF_R004_20220629	Data Sources: Imagery: NSW DFSI WMS Imagery © Spatial Services 2021 (Captured: 02/03/2015; WGS84) Base Data: Supplied by Client Note: Whilst every care is taken, Spatial Footprints does not take any responsibility for the accuracy of data provided by third parties.
				Date Drawn: 29/06/2022	
				Prepared By: 	

Appendix F. Revegetation Records for 2022.



Appendix G. Quarterly Monitoring Checklists.

APPENDIX B REVISED CHP CHECKLISTS

Quarterly management checklist

Date of site inspection 17-03-2022 Person undertaking inspection: Leo Pearce

Issue	Action	Comments
Routine agricultural management activities (RAMAs)	Aside from weed and pest animal control, list any maintenance or addition of infrastructure that has occurred in the offset area	Nil
Habitat values	Is native vegetation being retained?	Yes
	Is timber being left where it falls?	Yes
	Are rocks being retained?	Yes
	Are the nest boxes still intact	Yes
Exclusions	Are stock being excluded from the offset site?	Yes
	Are recreational vehicles being excluded?	Yes
	Is fire being excluded?	Yes
	Are fertilisers being excluded	Yes
	Is rubbish disposal being excluded?	Yes
Weed control	List weed control actions taken: List any related documentation	Nil this quarter
Pest animal control	List any pest animal control activities List any related documentation	Nil this quarter
Maintenance of plantings	Have plants had sufficient water?	Yes
	Is there any evidence of death, damage or disease?	There is damage from animals, likely deer and pigs.
	Are tree guards or other methods of protection intact and adequate?	Yes
	List areas where follow-up maintenance of plantings is required below	Monitor for watering.
Additional information	Do any actions need to be undertaken in the next quarter?	Weed spraying
	Do any changes need to be made to this checklist or to management actions?	No

APPENDIX B REVISED CHP CHECKLISTS

Quarterly management checklist

Date of site inspection 11-05-2022 Person undertaking inspection: Michael McNally

Issue	Action	Comments
Routine agricultural management activities (RAMAs)	Aside from weed and pest animal control, list any maintenance or addition of infrastructure that has occurred in the offset area	Nil
Habitat values	Is native vegetation being retained?	Yes
	Is timber being left where it falls?	Yes
	Are rocks being retained?	Yes
	Are the nest boxes still intact	Yes
Exclusions	Are stock being excluded from the offset site?	Yes- Trees across fenceline. Stock still excluded but repairs being organized.
	Are recreational vehicles being excluded?	Yes- Unconfirmed Reports of motorbike riders. Boundary gate being installed with minor fencing
	Is fire being excluded?	Yes
	Are fertilisers being excluded	Yes
	Is rubbish disposal being excluded?	Yes
Weed control	List weed control actions taken: List any related documentation	Nil this quarter
Pest animal control	List any pest animal control activities List any related documentation	1080 pig baiting being conducted on the NW corner and SE neighbouring farmland by Landowners and NGRWF. Application records with landowners
Maintenance of plantings	Have plants had sufficient water?	Yes
	Is there any evidence of death, damage or disease?	There is damage from animals, likely deer and pigs.
	Are tree guards or other methods of protection intact and adequate?	Yes
	List areas where follow-up maintenance of plantings is required below	Plenty of rain fall received this quarter.
Additional information	Do any actions need to be undertaken in the next quarter?	Weed spraying, fence repair, Gate installation
	Do any changes need to be made to this checklist or to management actions?	No

APPENDIX B REVISED CHP CHECKLISTS

Quarterly management checklist

Date of site inspection 31-08-2022 Person undertaking inspection: Jochen Rasmussen and Simon Zhao

Issue	Action	Comments
Routine agricultural management activities (RAMAs)	Aside from weed and pest animal control, list any maintenance or addition of infrastructure that has occurred in the offset area	Nil
Habitat values	Is native vegetation being retained?	Yes
	Is timber being left where it falls?	Yes
	Are rocks being retained?	Yes
	Are the nest boxes still intact	Yes
Exclusions	Are stock being excluded from the offset site?	Yes
	Are recreational vehicles being excluded?	Yes
	Is fire being excluded?	Yes
	Are fertilisers being excluded	Yes
	Is rubbish disposal being excluded?	Yes
Weed control	List weed control actions taken: List any related documentation	Nil this quarter
Pest animal control	List any pest animal control activities List any related documentation	Nil this quarter
Maintenance of plantings	Have plants had sufficient water?	Yes
	Is there any evidence of death, damage or disease?	There is damage from animals, likely deer and pigs.
	Are tree guards or other methods of protection intact and adequate?	Yes
	List areas where follow-up maintenance of plantings is required below	Nil this quarter
Additional information	Do any actions need to be undertaken in the next quarter?	Weed spraying
	Do any changes need to be made to this checklist or to management actions?	No

APPENDIX B REVISED CHP CHECKLISTS

Quarterly management checklist

Date of site inspection 8-11-2022 Person undertaking inspection: Simon Zhao

Issue	Action	Comments
Routine agricultural management activities (RAMAs)	Aside from weed and pest animal control, list any maintenance or addition of infrastructure that has occurred in the offset area	Nil
Habitat values	Is native vegetation being retained?	Yes
	Is timber being left where it falls?	Yes
	Are rocks being retained?	Yes
	Are the nest boxes still intact	Yes
Exclusions	Are stock being excluded from the offset site?	Yes
	Are recreational vehicles being excluded?	Yes
	Is fire being excluded?	Yes
	Are fertilisers being excluded	Yes
	Is rubbish disposal being excluded?	Yes
Weed control	List weed control actions taken: List any related documentation	Weed spraying activities underway – see weed control records.
Pest animal control	List any pest animal control activities List any related documentation	Nil this quarter
Maintenance of plantings	Have plants had sufficient water?	Yes
	Is there any evidence of death, damage or disease?	There is damage from animals, likely deer and pigs.
	Are tree guards or other methods of protection intact and adequate?	Yes
	List areas where follow-up maintenance of plantings is required below	Monitor for watering.
Additional information	Do any actions need to be undertaken in the next quarter?	Weed spraying. Fence damaged in a few locations due to falling trees. Fence repair required.
	Do any changes need to be made to this checklist or to management actions?	No

Appendix H. Annual Monitoring Review for 2022.

Annual review

Date of inspection: 15/12/2022 Person undertaking inspection: Leo Pearce

Review question	Comment
Were all quarterly inspections undertaken?	Yes
Should the frequency be altered?	No
Has annual monitoring at established BioMetric plots been completed?	Yes
Have all nest boxes been installed. Are they in need of repair?	Yes No
Is there any evidence of bushfire?	No
What positive trends are evident? <i>For example, is habitat complexity increasing (timber on ground, good understorey cover, good regeneration, hollows and canopy vegetation retained)</i>	Wet weather this year has increased ground cover and the health/growth of plantings.
What negative trends are evident? <i>For example, are weeds and pest animal activity increasing? Is there any evidence of erosion or sedimentation requiring action?</i>	increased weeds due to wet weather and not being able to carry out weed control activities due to access issues caused by the wet weather conditions.
What changes will be made to the management actions to improve biodiversity outcomes?	Incorporate any recommendations from the CHP Annual Report provided by NARLA.



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