



Offset Monitoring Program – Mount Emerald Wind
Farm.

BIOCONDITION SURVEY RESULTS

RATCH Australia Corporation Limited



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Revision History

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Contents

1.0 Introduction	1
1.1 Background.....	1
1.2 Objectives and Outcomes	3
1.2.1 Regional Ecosystems:.....	3
2.0 Methods	10
2.1 Targeted Weed Surveys	10
2.2 Photo-Monitoring Points	12
3.0 Results	13
3.1.1 Fire Impacts on the MEWF Offset Site	13
3.2 Weed Monitoring & Control.....	14
3.3 Photo Monitoring Points	16
4.0 Discussion	21
4.1 Biodiversity Management Issues	21
4.1.1 Weeds	21
5.0 Summary	22
6.0 References	23

Tables

Table 1: Regional Ecosystems Present Within the Proposed Offset Site	3
Table 4: Photo Monitoring Points.....	17

Figures

Figure 1	MEWF Offset Location	2
Figure 2	MEWF Offset Site Regional Ecosystems.....	9
Figure 3	Monitoring Points on Offset Lot	11

Plates

Plate 1	North East Facing Boundary Displaying Epicormic Sprouting in Regenerating Canopy	13
Plate 2	Lemontree Drive Turnaround Grader Grass Incursion Post Treatment (-17.21175, 145.39055).....	15
Plate 3	<i>Melinis minutiflora</i> Growing Near to Of Concern RE 7.12.65k (-17.20127, 145.40718).....	15
Plate 4	Grader Grass Incursion Post Treatment (-17.19771, 145.40668)	16

Appendices

Appendix A	Fauna List	
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1.0 Introduction

1.1 Background

The Mount Emerald Wind Farm (MEWF) Offset Site (study site) is located within land described as Lot 22 SP210202 and comprises approximately 434.9 ha (**Figure 1**). It is located immediately to the southeast of the MEWF site at Mutchilba, within the Mareeba Shire Council Area, with vehicle access through Lemontree Drive. The lot tenure is freehold and the primary land use is vacant. The area fringes the Baldy Mountain Forest Reserve and the Herberton Range National Park, via the Herberton Range (Queensland Government 2016).

On 26 November 2016, approval under the provisions of the *Environmental Protection and Biodiversity Conservation (EPBC) Act*, was granted to RATCH Australia Corporation Limited (RACL). As a requirement of the EPBC Act approval 2011/6228, as issued by the Federal Department of the Agriculture Water and the Environment (DAWE), a Biodiversity Offset Area was developed to compensate for the clearing of ~73 ha of habitat on the MEWF Project Site. The MEWF Offset site has been designated as a Nature Reserve under the *Nature Conservation Act 1992* by the Queensland Department of Environment and Science (DES).

The MEWF Offset site is located entirely within the Wet Tropics bioregion. It is mountainous with narrow ridges and rocky terrain that are steeply dissected along three dominant ridge lines. The offsets site lies adjacent to the MEWF project site. The majority of the site consists of remnant vegetation with ~192.89 ha consisting of Least Concern vegetation listed under the *Vegetation Management Act 1999* and the remaining ~242 ha listed as Of Concern vegetation.

4 Elements Consulting was commissioned by RACL to conduct annual photo monitoring point (this years survey) and biennial full site biocondition surveys on the MEWF Offset Site. This current report details the results of the fifth biocondition survey since 2017. This report has been prepared to comply with the requirements outlined in the Mount Emerald Wind Farm Offset Area Management Plan (RPS 2016), which details monitoring management actions. The data collected in 2016 provided baseline data for future monitoring to be compared against and enables targeted and adaptive management procedures to be implemented to ensure the biological integrity of the biodiversity area is maintained or improved and conserved into the future.

The actions required include:

- ▶ Photo-monitoring points to determine variation over time; and
- ▶ Targeted weed surveys.

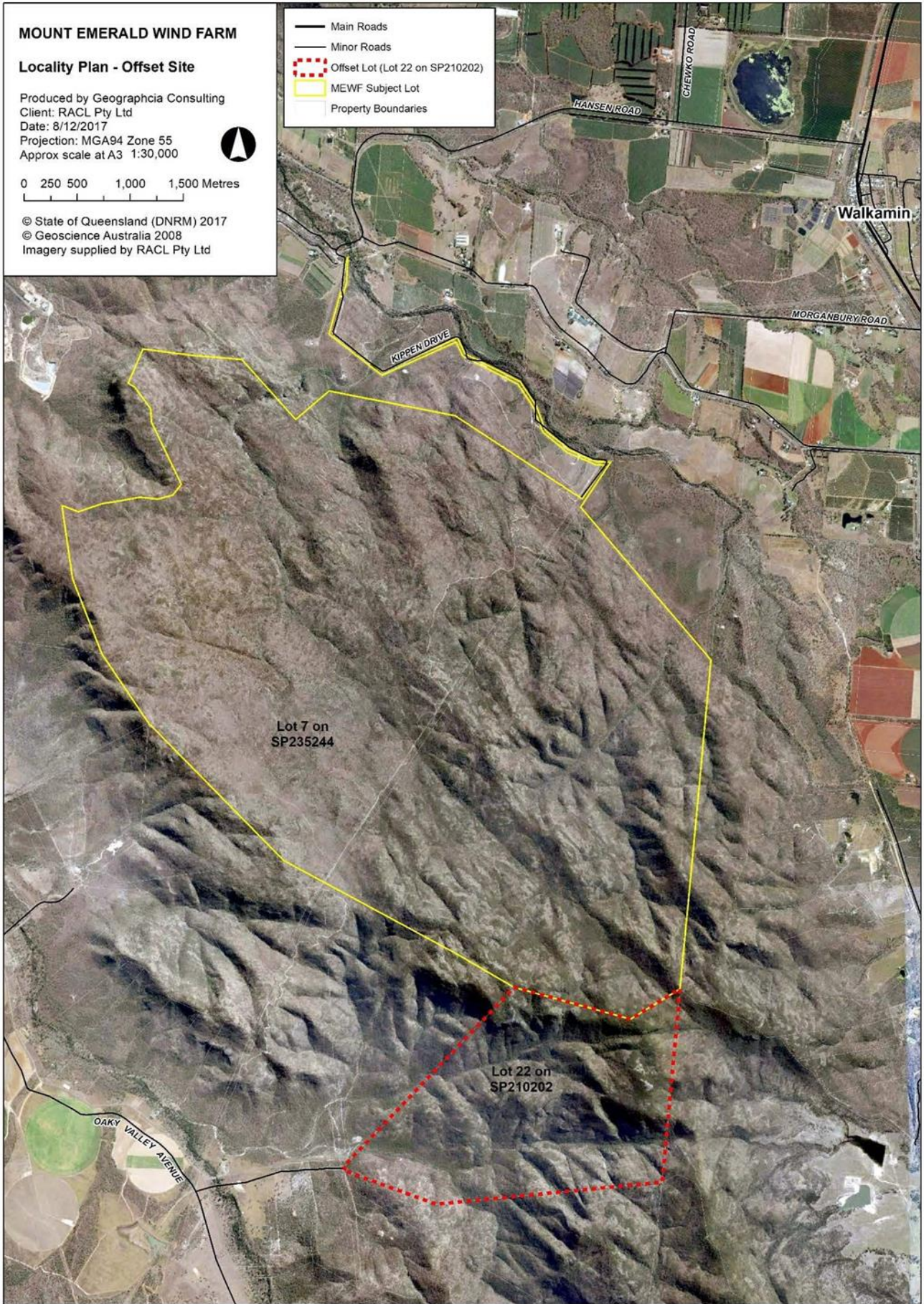


Figure 1 MEWF Offset Location

1.2 Objectives and Outcomes

As identified in the Offset Area Management Plan (RPS 2016), the offset area provides for the long-term protection of habitat for seven threatened species and, through the implementation of adaptive management practices, the quality of the habitat will be improved and maintained over time. The offset area is to be protected in perpetuity as a Nature Refuge. The management plan objectives and outcomes are to:

- ▶ Protect remnant vegetation communities within the offset area from degradation;
- ▶ Protect native fauna within the offset area from introduced weeds and pest fauna;
- ▶ Protect the site vegetation and fauna from wildfires;
- ▶ Maintain the ecological condition of remnant vegetation listed as Of Concern and Least Concern under the *Vegetation Management Act 1999* within the Offset area, where the BioCondition Class of 1, for each assessment unit does not change.

This report presents the methods and results of the 2023 biocondition monitoring program at the MEWF Biodiversity Offset Area, including a discussion of the findings and comparisons with the results of the baseline data conducted in 2016. Management recommendations that relate to the current monitoring phase are documented in **Section 4.0**.

1.2.1 Regional Ecosystems:

The Regional Ecosystems (REs) mapped for the offset site are described in **0** and shown on the mapping in **Figure 2**. Baseline surveys in 2016 identified that RE mapping was consistent with ground truthed vegetation assessments.

Table 1: Regional Ecosystems Present Within the Proposed Offset Site

RE	RE Description	VMA ¹	Bio. ²	Area ³
7.3.26a	Riverine wetland or fringing riverine wetland. <i>Casuarina cunninghamiana</i> , <i>Eucalyptus tereticornis</i> , <i>Lophostemon suaveolens</i> , <i>Melaleuca leucadendra</i> , <i>M. fluviatilis</i> , <i>Buckinghamia celsissima</i> , <i>Mallotus philippensis</i> woodland and forest with an understorey of <i>Melaleuca viminalis</i> and <i>Bursaria tenuifolia</i> . Fringing forests of larger streams. (BVG1M: 16a).	OC	E	2.63
7.12.7c	Simple notophyll semi-evergreen vine forest. Uplands of the dry rainfall zone. Rhyolite. (BVG1M: 5c).	LC	NCP	1.24
7.12.9	<i>Acacia celsa</i> (brown salwood) open forest to closed forest. Foothills, uplands and highlands on granites and rhyolites, of the very wet and wet rainfall zone. (BVG1M: 5d).	OC	OC	1.16

RE	RE Description	VMA ¹	Bio. ²	Area ³
7.12.16a	Simple to complex notophyll vine forest, including small areas of <i>Araucaria bidwillii</i> (Bunya pine). Uplands and highlands on granites and rhyolites, of the cloudy wet to moist rainfall zones. (BVG1M: 6b).	LC	NCP	9.34
7.12.26a	<i>Syncarpia glomulifera</i> , <i>Allocasuarina torulosa</i> and/or <i>A. littoralis</i> open-forest and woodland. Uplands and highlands, often on steep slopes, of the wet rainfall zone. Granite and rhyolite. (BVG1M: 28e).	LC	NCP	4.41
7.12.26e	<i>Syncarpia glomulifera</i> low open forest and low woodland. Uplands on steep rocky slopes, of the moist and dry rainfall zone. Granite and rhyolite. (BVG1M: 28e).	LC	NCP	8.99
7.12.29a	<i>Corymbia intermedia</i> , <i>Eucalyptus tereticornis</i> , <i>E. drepanophylla</i> open forest to low open forest and woodland with <i>Allocasuarina torulosa</i> , <i>A. littoralis</i> , <i>Lophostemon suaveolens</i> , <i>Acacia cincinnata</i> , <i>A. flavescens</i> , <i>Banksia aquilonia</i> and <i>Xanthorrhoea johnsonii</i> . Uplands, on granite and rhyolite. (BVG1M: 9c).	LC	NCP	4.60
7.12.30d	Open woodland to open forest (10-20 m tall) mosaic with variable dominance, often including <i>Eucalyptus cloeziana</i> , <i>C. citriodora</i> , <i>E. portuensis</i> , <i>E. lockyeri</i> , <i>C. leichhardtii</i> , <i>E. atrata</i> , <i>E. pachycalyx</i> , <i>E. reducta</i> , <i>C. intermedia</i> and <i>E. shirleyi</i> . There is often a very sparse to mid-dense secondary tree layer of <i>C. abergiana</i> and/or <i>C. stockeri</i> . A very sparse to sparse tall shrub layer may be present and can include <i>Acacia flavescens</i> , <i>Persoonia falcata</i> , <i>Bursaria spinosa</i> subsp. <i>spinosa</i> , <i>Allocasuarina inophloia</i> , <i>Petalostigma pubescens</i> and <i>Grevillea glauca</i> . A sparse to dense lower shrub layer may include <i>Jacksonia thesioides</i> , <i>Acacia calyculata</i> , <i>Xanthorrhoea johnsonii</i> and <i>Grevillea glossadenia</i> . The ground layer may be dominated by species such as <i>Themeda triandra</i> , <i>Heteropogon triticeus</i> , <i>Mnesithea rottboellioides</i> , <i>Arundinella setosa</i> , <i>Cleistochloa subjuncea</i> , <i>Eriachne pallescens</i> var. <i>pallescens</i> , <i>Lepidosperma laterale</i> and <i>Xanthorrhoea johnsonii</i> . Rocky slopes on granite and rhyolite. (BVG1M: 9d).	LC	NCP	133.42
7.12.34	<i>Eucalyptus portuensis</i> (white mahogany) and/or <i>E. drepanophylla</i> (ironbark), +/- <i>C. intermedia</i> (pink bloodwood), +/- <i>C. citriodora</i> (lemon-scented gum), +/- <i>E. granitica</i> (granite ironbark) open woodland to open forest. Uplands on granite, of the dry rainfall zone. (BVG1M: 9d).	LC	NCP	23.76

RE	RE Description	VMA ¹	Bio. ²	Area ³
7.12.57a	Shrubland and low woodland mosaic with <i>Syncarpia glomulifera</i> (turpentine), <i>Corymbia abergiana</i> (range bloodwood), <i>Eucalyptus portuensis</i> (white mahogany), <i>Allocasuarina littoralis</i> (black sheoak) and <i>Xanthorrhoea johnsonii</i> (grasstree). Uplands and highlands on granite and rhyolite, of the moist and dry rainfall zones. (BVG1M: 9d). Vegetation communities in this regional ecosystem include: 7.12.57a: Shrubland and low woodland mosaic with <i>Syncarpia glomulifera</i> , <i>Corymbia abergiana</i> , <i>Eucalyptus portuensis</i> , <i>Allocasuarina littoralis</i> and <i>Xanthorrhoea johnsonii</i> . Uplands and highlands on granite and rhyolite, of the moist and dry rainfall zones. (BVG1M: 9d).	OC	OC	58.60
7.12.57c	Shrubland/low woodland (1.5-9 m tall) mosaic with variable dominance, often including <i>Eucalyptus cloeziana</i> , <i>Corymbia abergiana</i> , <i>E. portuensis</i> , <i>E. reducta</i> , <i>E. lockyeri</i> , <i>C. leichhardtii</i> , <i>Callitris intratropica</i> , <i>E. atrata</i> , <i>E. pachycalyx</i> , <i>E. shirleyi</i> , <i>E. drepanophylla</i> and <i>Homoranthus porteri</i> , on rhyolite and granite. There is occasionally a very sparse to sparse secondary tree layer of <i>C. abergiana</i> and/or <i>C. stockeri</i> . A very sparse to sparse tall shrub layer may be present and can include <i>Persoonia falcata</i> , <i>Exocarpos cupressiformis</i> and <i>Melaleuca viridiflora</i> var. <i>viridiflora</i> . A sparse to dense lower shrub layer may include <i>Jacksonia thesioides</i> , <i>Acacia calyculata</i> , <i>Coelospermum reticulatum</i> , <i>Xanthorrhoea johnsonii</i> , <i>Acacia humifusa</i> , <i>Dodonaea lanceolata</i> var. <i>subsessilifolia</i> , <i>Grevillea dryandri</i> subsp. <i>dryandri</i> , <i>Grevillea glossadenia</i> , <i>Acacia umbellata</i> and Ericaceae spp. The ground layer may be dominated by species such as <i>Themeda triandra</i> , <i>Xanthorrhoea johnsonii</i> , <i>Eriachne pallescens</i> var. <i>pallescens</i> , <i>Cleistochloa subjuncea</i> , <i>Borya septentrionalis</i> , and <i>Eriachne</i> spp. Includes open rocky dominated by herbs and grasses. This RE includes areas of 7.12.65k (rocky areas with shrubby/herbaceous cover) which are too small to map. Rocky slopes on granite and rhyolite. (BVG1M: 9d).	OC	OC	107.32

RE	RE Description	VMA ¹	Bio. ²	Area ³
7.12.58	<i>Eucalyptus reducta</i> woodland to open forest (6-18 m tall). Common associated species include <i>E. granitica</i> , <i>Corymbia dimorpha</i> , <i>C. citriodora</i> , <i>E. cloeziana</i> and occasionally <i>C. intermedia</i> . There is often a sparse secondary tree layer of <i>C. abergiana</i> and/or <i>E. lockyeri</i> . There may be a very sparse tall shrub layer of species such as <i>Acacia flavescens</i> , <i>Persoonia falcata</i> , <i>Allocasuarina littoralis</i> and <i>Acacia simsii</i> , and a very sparse to dense lower shrub layer of <i>Acacia calyculata</i> , <i>Pultenaea millarii</i> , <i>Jacksonia thesioides</i> , <i>Grevillea glossadenia</i> , <i>Grevillea dryandri</i> subsp. <i>dryandri</i> , <i>Homoranthus porteri</i> and <i>Dodonaea lanceolata</i> var. <i>subsessilifolia</i> . The ground layer is often dominated by species such as <i>Themeda triandra</i> , <i>Eriachne</i> spp., <i>Cleistochloa subjuncea</i> , <i>Lomandra longifolia</i> , <i>Mnesithea rottboellioides</i> , <i>Xanthorrhoea johnsonii</i> , <i>Heteropogon triticeus</i> and <i>Coronidium newcastlianum</i> . Granite and rhyolite. (BVG1M: 9d).	OC	OC	72.45
7.12.65k	Granite and rhyolite rock outcrop, of dry western areas, associated with shrublands to closed forests of <i>Acacia</i> spp. and/or <i>Lophostemon</i> spp. and/or <i>Allocasuarina</i> spp. In the Mount Emerald area, shrubs may include <i>Acacia umbellata</i> , <i>Melaleuca borealis</i> , <i>Homoranthus porteri</i> , <i>Leptospermum neglectum</i> , <i>Melaleuca recurva</i> , <i>Melaleuca uxorum</i> , <i>Grevillea glossadenia</i> , <i>Corymbia abergiana</i> , <i>Eucalyptus lockyeri</i> , <i>Sannantha angusta</i> , <i>Pseudanthus ligulatus</i> subsp. <i>ligulatus</i> , <i>Acacia aulacocarpa</i> , <i>Leptospermum amboinense</i> , <i>Xanthorrhoea johnsonii</i> and <i>Jacksonia thesioides</i> . Ground-cover species may include <i>Borya septentrionalis</i> , <i>Lepidosperma laterale</i> , <i>Eriachne</i> spp., <i>Cleistochloa subjuncea</i> , <i>Boronia occidentalis</i> , <i>Cheilanthes</i> spp., <i>Coronidium newcastlianum</i> , <i>Schizachyrium</i> spp., <i>Tripogon loliiformis</i> , <i>Gonocarpus acanthocarpus</i> and <i>Eragrostis</i> spp. Dry western areas. Granite and rhyolite. (BVG1M: 29b).	LC	OC	7.03

RE	RE Description	VMA ¹	Bio. ²	Area ³
9.5.8	Woodland to open-woodland of <i>Eucalyptus cullenii</i> (Cullen's ironbark) and/or <i>E. leptophleba</i> (Molloy red box) +/- <i>Corymbia erythrophloia</i> (red bloodwood) +/- <i>Erythrophleum chlorostachys</i> (Cooktown ironwood). <i>Eucalyptus tardecidens</i> (box) may also occur as a subdominant in northern extent of this regional ecosystem. A sparse shrub layer includes <i>Petalostigma</i> spp., <i>Melaleuca</i> spp., <i>Grevillea</i> spp., <i>Alphitonia pomaderroides</i> and <i>Maytenus cunninghamii</i> (yellowberry bush). The sparse to dense ground layer is dominated by <i>Heteropogon contortus</i> (black speargrass) and <i>Sarga plumosum</i> (plume sorghum). Occurs on undulating plains in valleys in ranges on Tertiary/Quaternary soils overlying granite and metamorphic geologies. (BVG1M: 13a)	LC	NCP	0.01
9.5.9a	Woodland to open-woodland of <i>Corymbia clarksoniana</i> (Clarkson's bloodwood) +/- <i>Eucalyptus platyphylla</i> (poplar gum) +/- <i>E. leptophleba</i> (Molloy red box) +/- <i>C. tessellaris</i> (Moreton Bay ash) with a distinct to sparse sub-canopy layer often including <i>Melaleuca viridiflora</i> (broad-leaved paperbark), <i>Grevillea glauca</i> (bushman's clothes peg), <i>Petalostigma pubescens</i> (quinine) and <i>Alphitonia pomaderroides</i> (soapbush). An open to sparse shrub layer includes <i>Melaleuca</i> spp., <i>Personia falcata</i> , <i>Grevillea</i> spp. and <i>Petalostigma pubescens</i> (quinine). The sparse to mid-dense ground layer is dominated by <i>Themeda triandra</i> (kangaroo grass), <i>Aristida</i> spp., <i>Heteropogon contortus</i> (black speargrass), <i>H. triticeus</i> (giant speargrass), and <i>Sarga plumosum</i> (plume sorghum). Occurs on undulating plains. (BVG1M: 9e).	LC	NCP	
9.12.7a	Woodland to open-woodland of <i>Eucalyptus cullenii</i> (Cullen's ironbark) +/- <i>Corymbia erythrophloia</i> (red bloodwood) +/- <i>Erythrophleum chlorostachys</i> (Cooktown ironwood) +/- <i>C. dallachiana</i> (Dallachy's gum). An open to mid-dense subcanopy can occur and includes a variety of species. The shrub layer is absent to open and dominated by <i>Maytenus cunninghamii</i> (yellowberry bush), <i>Alphitonia pomaderroides</i> (soapbush), <i>Petalostigma</i> spp., and <i>Acacia</i> spp. The ground layer is sparse to dense and dominated by <i>Heteropogon contortus</i> (black speargrass), <i>H. triticeus</i> (giant speargrass), <i>Themeda triandra</i> (kangaroo grass) and <i>Sarga plumosum</i> (plume sorghum) with a <i>Xanthorrhoea</i> sp. (grasstree) occurring in some areas. Occurs on rhyolite hills. (BVG1M: 13a).	LC	NCP	0.01

RE	RE Description	VMA ¹	Bio. ²	Area ³
9.12.40	Low open-woodland to low woodland of <i>Melaleuca citrolens</i> (scrub teatree) +/- <i>Terminalia platyptera</i> (yellow-wood) +/- <i>Corymbia dallachiana</i> (Dallachy's gum) +/- <i>Erythrophleum chlorostachys</i> (Cooktown ironwood). The sparse shrub layer consists of <i>Petalostigma banksii</i> (smooth-leaved quinine), <i>M. citrolens</i> and <i>Gardenia vilhelmii</i> (breadfruit). The ground layer is frequently bare, with patches of short grasses including <i>Eriachne</i> spp., <i>Aristida</i> spp. and <i>Schizachyrium</i> spp. (firegrass). This community also occurs as short open-tussock grassland wooded with low trees and shrubs of <i>Melaleuca citrolens</i> +/- <i>Terminalia</i> spp. Occurs on gentle slopes, footslopes, rolling hills and colluvial low slopes. (BVG1M: 21b).	LC	NCP	
Non-rem	Non-remnant: modified land, roads, clearings and tracks.			0.08
<p>¹ Status under Vegetation Management Act 1999: OC - Of Concern; LC - Least Concern.</p> <p>² Biodiversity management status: E - Endangered; OC - Of Concern, NCP - No Concern at Present.</p> <p>³ Area - total area in hectares of RE type within offset site.</p>				

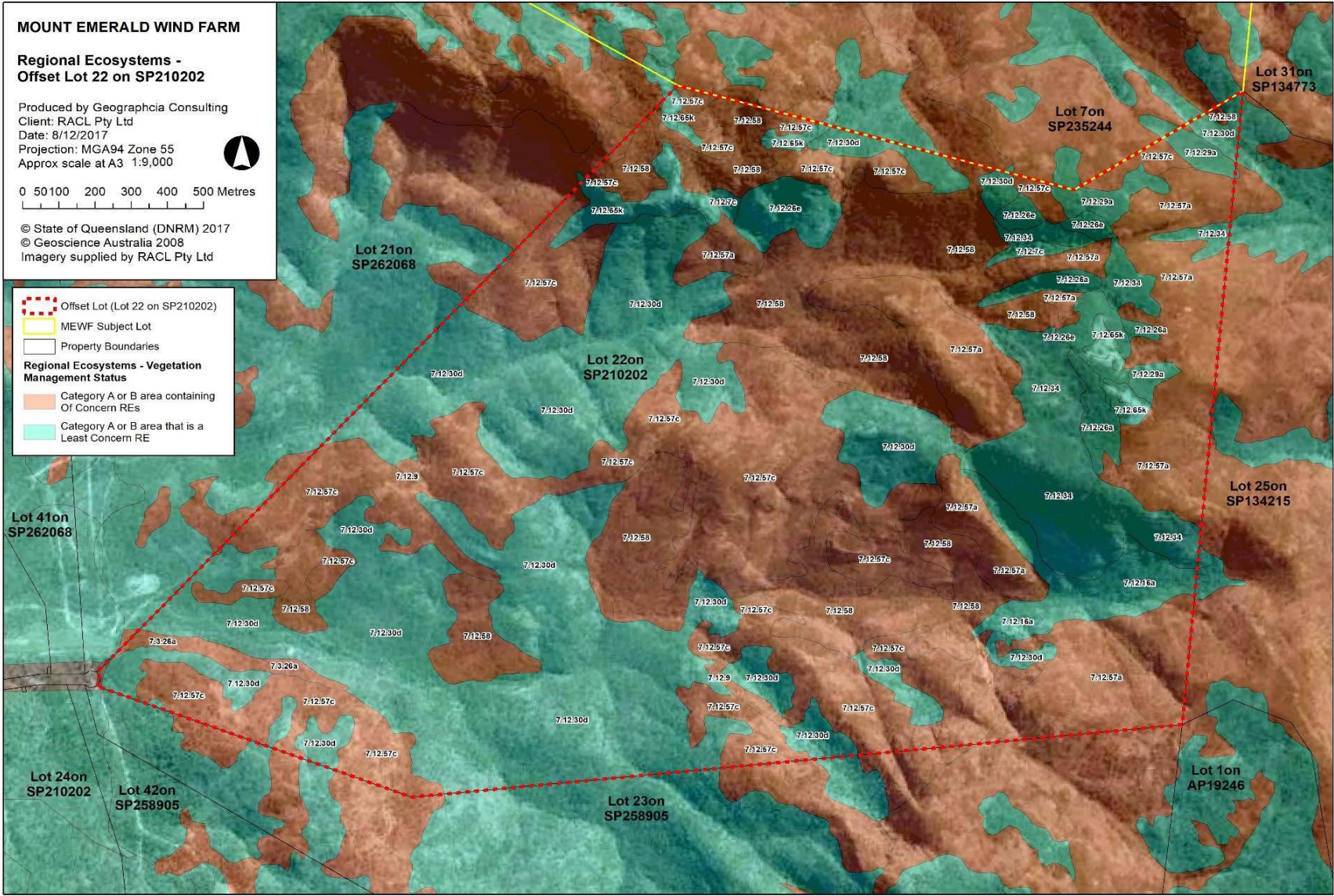


Figure 2 MEWF Offset Site Regional Ecosystems

2.0 Methods

The following sections detail the methods employed for the 2023 ecological offset area monitoring program. The methods employed as part of this monitoring program are consistent with those outlined in the MEWF Offset Area Management Plan (RPS 2016).

Field surveys were conducted on site over 5 days, from the 03-04 May and 14-16 May, 2023. Monitoring points are provided in **Figure 3** below.

Total rainfall during the month of May was 30 mm. Mean minimum and maximum temperatures were 22.0°C and 29.5°C respectively (BOM 2023).

2.1 Targeted Weed Surveys

A weed assessment was undertaken within the MEWF Offset site which concentrated on the access track from Lemon Tree Drive and the Mount Emerald Walking Track that leads to the summit of Mount Emerald. The entire length of these tracks was traversed on foot by a field botanist. Additional spot observations of weed presence in remnant, undisturbed vegetation was undertaken previously in 2016, 2017, 2019 and during the current survey effort.

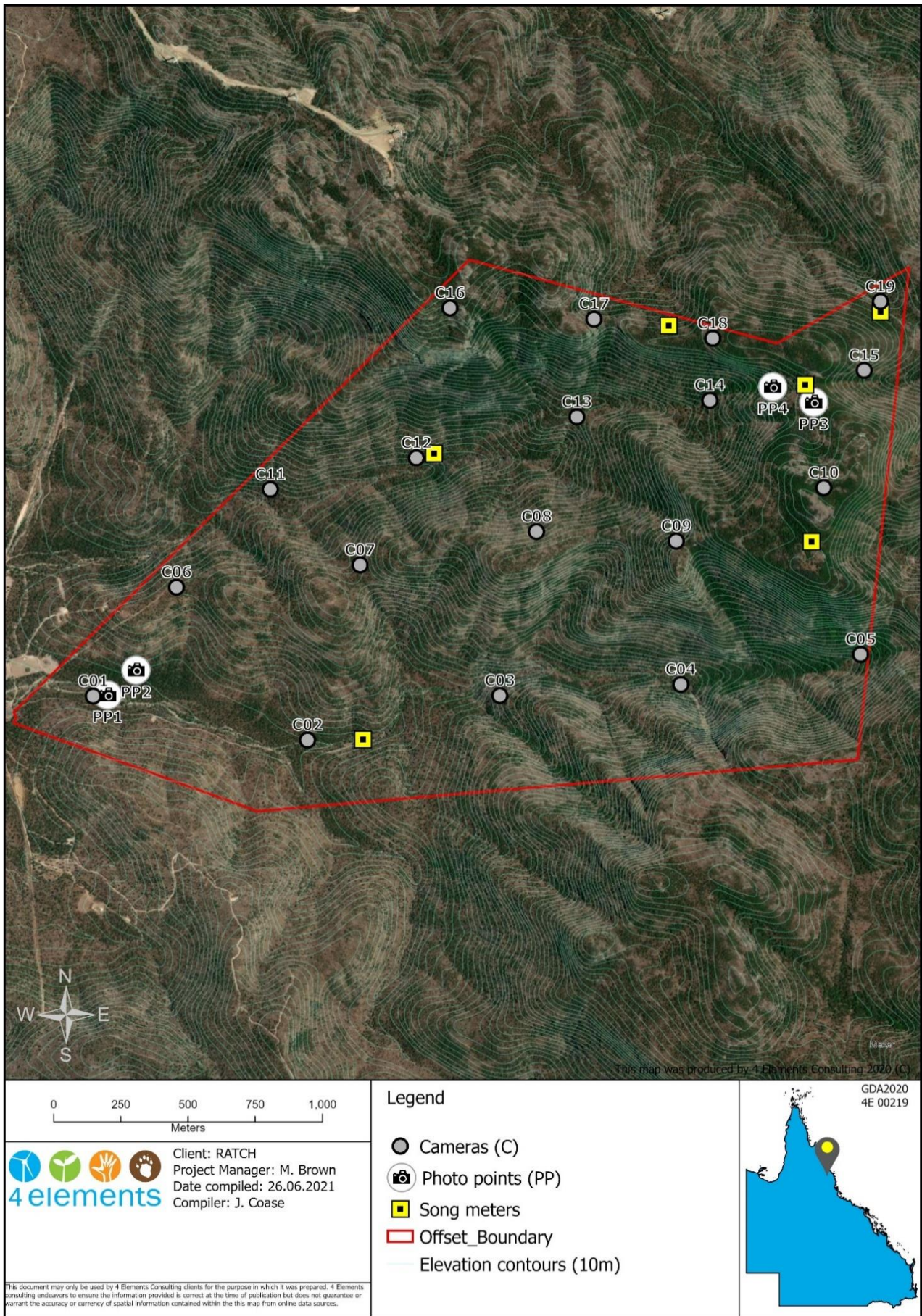


Figure 3 Monitoring Points on Offset Lot

2.2 Photo-Monitoring Points

Four photo monitoring points were established in 2016 within the offset area to enable a visual assessment of changes over time within distinct vegetation types (**Figure 3**). Each point was:

- ▶ Marked with a 1 m star picket which was flagged with yellow tape and the GPS points recorded;
- ▶ Each point had photographs taken in all cardinal directions; and
- ▶ Metadata which included GPS co-ordinates, data and time were recorded.
- ▶ Photographic and metadata records are taken at these photo monitoring points annually.

3.0 Results

3.1.1 Fire Impacts on the MEWF Offset Site

A high intensity fire moved through parts of the MEWF Offset site in late September 2020 with three (3) of the four (4) photo monitoring points burning during the fire event (see **Figure 3** and Section 4.1 **Table 4**). The only photo monitoring point that did not burn was point 4 which is located in a deep boulder lined gully supporting dry rainforest vegetation. All other monitoring sites are within sclerophyll open woodland communities. All very high intensity canopy fires were recorded on the eastern boundary (**Plate 1**). At the time of survey, these areas were in recovery with nearly all canopy trees displaying epicormic budding. As a result of this fire event, no canopy tree flowering was observed in these areas (near to photo monitoring point 3). The same fire has travelled through to the western boundary of the property to impact a high proportion of the western slopes. At this section of the property visual assessment appeared to indicate a less intense fire. Although, much of the understory was burned in this section.

Plate 1 North East Facing Boundary Displaying Epicormic Sprouting in Regenerating Canopy



3.2 Weed Monitoring & Control

Since it was first recorded in a weed survey conducted in January 2018, a population of Grader Grass (*Themeda quadrivalvis*) has established a seed bank along the main access track from Lemontree Drive. This species is readily detectable, had not been previously recorded on site prior to this January 2018 survey. In 2018, Grader Grass extended from the access track entry gate to the vehicle turnaround at the end of the track. The extent was similar in 2020, with the population distributed along the length of the access track with most individuals occurring at the vehicle turnaround (**Plate 3**). In 2020, the Grader Grass infestation was hand-pulled twice per wet season and placed into garbage bags and removed from site. This control method was continued in 2021 with a noticeable reduction in the size of the infestation at this location.

The Mount Emerald walking track, which provides pedestrian access to the summit of Mount Emerald, is another source of weeds for the study site. Close to the walking track, a number of weed populations have been recorded. These include Molasses Grass (*Melinis minutiflora*) which occurs in exposed situations at high elevations (**Plate 4**) and occasionally in rocky gullies. This species is potentially problematic and will be monitored to determine if it is likely to spread further and present a threat to high elevation rock pavement communities on the offset site. At this stage the site population of this species, as shown in **Plate 4**, is restricted and has no vehicular access to support herbicide application. The rock pavement communities have shallow soil lenses which may be eroded during the wet season if the current stabilising *Melinis* population is killed/removed. If the population is not invading the site further no action is recommended except to monitor the population for spread.

Three (3) discrete Grader Grass incursions have been recorded near the summit of Mount Emerald since 2018. These have been actively managed by hand pulling and covering in thick black builder's plastic as a method of killing the plants (solarisation). This control method has continued in the current weed treatment. No expansion of these three (3) populations has been recorded. Results of the treatment are shown in **Plate 5**.

Plate 2 Lemontree Drive Turnaround Grader Grass Incursion Post Treatment (-17.21175, 145.39055)



Plate 3 *Melinis minutiflora* Growing Near to Of Concern RE 7.12.65k (-17.20127, 145.40718)



Plate 4 Grader Grass Incursion Post Treatment (-17.19771, 145.40668)







3.3 Photo Monitoring Points





A visual assessment was undertaken at four photo monitoring points. These locations were selected based on habitat quality, Regional Ecosystem attributes and location. **04** below summarises the characteristics of these sites where photographs are orientated towards the North, South, East and West facing directions. Whilst the photo will aid in the broad comparisons over time, they are best used in combination with floristic data (Gleed 2017) as they are unlikely to show fine scale changes on their own.

Table 4: Photo Monitoring Points

Site ID	Description	Photograph from North, South, East, West	
<p>Photo Point 1</p> <p>Location: UTM 55K 0327999, 8096486</p>	<p>Mapped as RE 7.3.26a</p> <p>Site only partially conforms to mapped RE absence of <i>Allocasuarina cunninghamii</i>.</p> <p>Alluvial sandy loam on riverine wetland.</p> <p>Canopy of <i>Eucalyptus tereticornis</i>, <i>Corymbia leichardtii</i> with a sparse shrub layer containing <i>Lophostemon grandiflorus</i>, <i>Bursaria tenuifolia</i>, <i>Exocarpus cupressiformis</i>, <i>Callitris intratropica</i>, <i>Acacia spp.</i> with a ground layer containing <i>Heteropogon triticeus</i>, <i>Sarga spp.</i> and <i>Themeda triandra</i>.</p>	 <p>North</p>	 <p>South</p>
		 <p>East</p>	 <p>West</p>

Site ID	Description	Photograph from North, South, East, West	
<p>Photo Point 2 Location: UTM 55K 0328099, 8096579</p>	<p>Mapped 7.12.30d Site conforms to RE containing dominant canopy and shrub and ground layer associates.</p> <p>Rocky slopes on granite and rhyolite. Canopy <i>Eucalyptus cloeziana</i>, <i>Corymbia leichardtii</i> and <i>Eucalyptus crebra</i> with a very sparse shrub layer containing <i>Petalostigma pubescens</i>, <i>Coelospermum reticulatum</i>, <i>Persoonia falcata</i>, <i>Grevillea parrallela</i> and a ground layer containing <i>Heteropogon triticeus</i>, <i>Sarga spp.</i> and <i>Themeda triandra</i>.</p>	 <p data-bbox="938 738 1016 767">North</p>	 <p data-bbox="1731 738 1809 767">South</p>
		 <p data-bbox="949 1294 1005 1323">East</p>	 <p data-bbox="1731 1294 1809 1323">West</p>

Site ID	Description	Photograph from North, South, East, West	
<p>Photo Point 3</p> <p>Location: UTM 55K 0330501, 8097591</p>	<p>Site conforms to RE 7.12.57a containing low open woodland to shrubland containing key canopy and lower level associates.</p> <p>High uplands slopes on granite and rhyolite. Tall shrub/ low tree layer</p> <p><i>Syncarpia glomulifera</i>, <i>Corymbia abergiana</i>, <i>Eucalyptus portuensis</i>, <i>Eucalyptus crebra</i>, <i>Allocasuarina littoralis</i>, <i>Banksia aquilonia</i>. Ground layer <i>Xanthorrea johnsoni</i>, <i>Themeda triandra</i>, <i>Imperata cylindrica</i>, <i>Pteridium esculentum</i>,</p>	 <p data-bbox="938 746 1016 770">North</p>	 <p data-bbox="1733 746 1812 770">South</p>
		 <p data-bbox="949 1350 1005 1374">East</p>	 <p data-bbox="1733 1350 1812 1374">West</p>

Site ID	Description	Photograph from North, South, East, West	
<p>Photo Point 4</p> <p>Location: UTM 55K 0330355, 8097647</p>	<p>Mapped as RE 7.12.16a</p> <p>Site conforms to mapped RE containing simple to complex notophyll vine forest with emergent <i>Agathis microstachya</i> on granite and rhyolite in the uplands of the moist rainfall zone.</p> <p><i>Agathis microstachya</i> emergent layer absent. All other vegetation layers conform to RE 7.12.16a.</p>	 <p data-bbox="936 743 1016 772">North</p>	 <p data-bbox="1729 743 1809 772">South</p>
		 <p data-bbox="949 1311 1003 1340">East</p>	 <p data-bbox="1733 1311 1805 1340">West</p>

4.0 Discussion

4.1 Biodiversity Management Issues

4.1.1 Weeds

The most prominent biodiversity management issue for the offset site is the control of invasive weeds. Whilst several weed species occur across the offset site, a major weed of concern is Grader Grass (*Themeda quadrivalvis*). Incursion of this invasive grass has occurred along areas of the access track off Lemontree Drive, as well as three (3) small patches on the northern slopes of the offset site. These populations have been effectively managed in the current weed treatment; however, ongoing monitoring and management will be required at the commencement of the next wet season to prevent populations from re-establishing. Other weeds, such as *Mesosphaerum suaveolens* (syn: *Hyptis suaveolens*) have been recorded on the access track and will require further control and monitoring prior to the next wet season. No expansion of weeds has been recorded in the last seven (7) years of monitoring. This would indicate that although eradication of these weeds has not been achieved, management to prevent spread has been effective. With continued management it is expected that the weed seed bank will be further reduced in subsequent years.

5.0 Summary

This report presents results of the 7th photopoint biocondition survey for the Mount Emerald Windfarm Offset Site.

The ground cover layer has remained relatively consistent on the site since surveys began in 2016, despite the recent fire which occurred in October 2020. Recent good rains have promoted a dense ground layer across the site. Suitable amounts of coarse woody debris remain across the site, which provides excellent habitat for small mammals and reptiles.

Weed surveys indicate there are currently no priority listed weed species on site, however, vigilance will be required along the walking track and road entry to ensure there are no access points for these threats. Continued management measures to remove weeds from tracks and external site boundaries will reduce the risks significantly.

Fauna habitat resources remain abundant within the MEWF Offset Site, and the habitat is of high quality. The offset site has a high density of the large hollows that several nocturnal birds of prey, bat and small to medium sized mammal species require for breeding. In addition, small mammals (terrestrial and arboreal), which are the respective prey of a number of predatory species, were identified throughout the site. Canopy tree species and understorey shrubs within the site provide abundant foraging resources such as foliage, seeds, pollen, nectar and invertebrates for variety of species on a seasonal basis and may potentially influence the occurrence and abundance of arboreal mammal species and birds.

The ecological condition of the MEWF Offset Site has been maintained since baselines surveys were conducted in 2016.

6.0 References

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- 4 Elements Consulting (2018) Mount Emerald Offset Area Monitoring Program Report. Prepared for RATCH Australia Corporation, Brisbane.
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