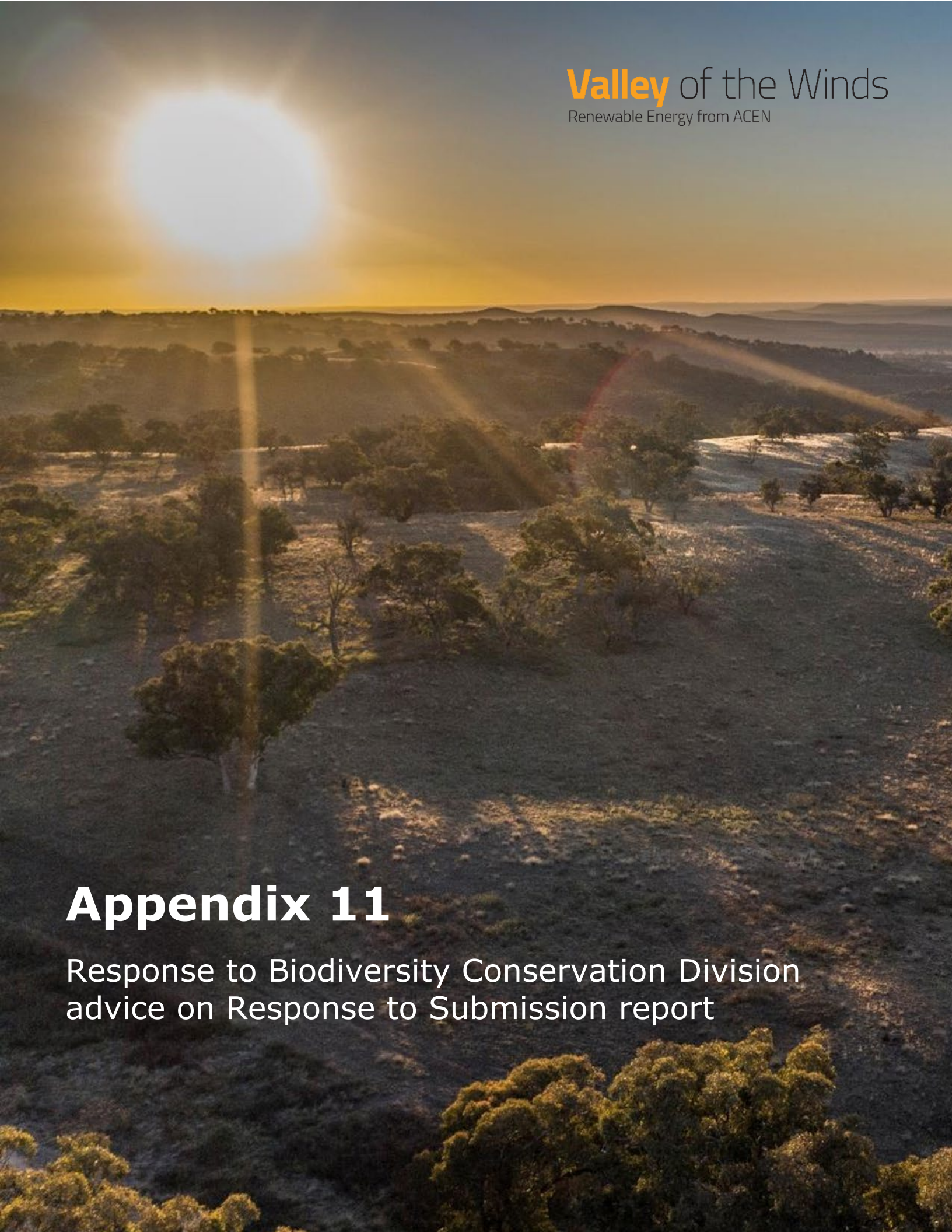

Appendix 11

Response to Biodiversity Conservation Division advice on Response to Submission report

Valley of the Winds – Response to BCS Advice on RtS

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Contents

List of Figures

List of Tables

Introduction

Eco Logical Australia (ELA) was engaged by ACEN Australia (ACEN) to undertake a biodiversity assessment and subsequent reporting, to assess the biodiversity impacts of the Valley of the Winds Project (the Project).

ELA initially prepared a Biodiversity Development Assessment Report (BDAR) in April 2022, in accordance with the Biodiversity Assessment Method (BAM; DPIE, 2020). The BDAR was drafted to comply with the requirements of the Secretary's Environmental Assessment Requirements (SEARs) for the Project, the general requirements of the NSW *Biodiversity Conservation Act 2016* (BC Act), and the requirements of the Referral Decision under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

In response to submissions received and Agency feedback from the NSW Biodiversity Conservation & Science Directorate (BCS), the BDAR was updated in October 2023 to accommodate Project design refinements, which sought to avoid and minimise impacts to biodiversity by nearly 50% of the initial proposal. The revised BDAR was re-submitted to the Department of Planning, Housing, and Infrastructure (DPHI) in October 2023. BCS provided comments on the revised BDAR, and identified the following key residual matters to be addressed:

- the use and duplication of certain BAM plots collected for the Project
- the provision of spatial data to inform our review of assessment outcomes
- the bilateral assessment criteria detailed in our previous response have not been addressed
- the turbine risk assessment for bird and bat strike
- the need to provide further details regarding the package of additional and appropriate measures proposed for Box Gum Woodland
- uncertainty regarding impacted microbat species.

These six residual matters have been detailed in 36 specific comments provided by BCS. This report seeks to close out all residual matters, by detailing additional field studies and clarifications related to this assessment.

Project context

When drafting this report, ELA has considered the content of other wind farm assessments that have recently been approved in NSW, as a mark of the quality and adequacy required for consistent assessment of biodiversity impacts (Bowmans Creek Wind Farm (BCWF) SSD-10315, Hills of Gold Wind Farm (HoGWF) SSD-9679, and Yanco Delta Wind Farm (YDWF) SSD-41743746). This report also considers the approach, assessment, survey adequacy, and BCS recommendations from other State Significant Developments (SSD) in the Central West, which were approved by the Department of Planning and Environment (DPE – now DPHI) in recent years (Stubbo Solar Farm (SSF) SSD-10452, Wellington North Solar Farm (WNSF) SSD-8895), which were subject to field studies concurrently with the Valley of the Winds Project. As part of this review, ELA identified several instances whereby approved projects have taken a similar approach to data collection and interpretation as ELA did in the revised BDAR, without apparent comparative concern by BCS. Where this is the case, ELA have discussed the approach directly with BCS.

When formulating this report, ELA met with BCS and DPHI on 23 February 2024, to discuss a pathway forward for this assessment.

This report provides a detailed response to each of the concerns raised by BCSand includes details of:

- the plots used in this assessment, and their suitability to measure the vegetation integrity score of impacted native vegetation
- additional spatial data (provided in a separate file) to assist BCS in interpreting the survey adequacy and conclusions drawn by the accredited assessor
- additional tables detailing the requested information associated with the Bilateral Assessment
- a bird and bat strike risk assessment, including additional data relating to each wind turbine generator (WTG)
- the Additional and Appropriate Measures (AAM) package presented to minimise impacts to the Threatened Ecological Community (TEC) *White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions* (Box Gum Woodland)
- the bird and bat strike assessment, including additional data for protected Microchiropteran bat species. Additional consideration has also been given to any species identified as candidates for Serious and Irreversible Impacts (SAII).

As a result of the revised calculations, the Project will directly impact on a total of 634.45 hectares (ha) of native vegetation, of which 78% (494.47 ha) is in low or poor condition This is reduced from the 695 ha of native vegetation identified in the revised BDAR as directly impacted. In addition, another 31.9 ha has been included to compensate for prescribed impacts. Direct impacts to native vegetation will include impacts to 281.07 ha of the BC Act Critically Endangered Ecological Community (CEEC) *White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions* (BC Act Box Gum Woodland). This 281.07 ha comprises of 118.64 ha of Box Gum Woodland and 162.43 ha of Box Gum Woodland Derived Native Grassland (DNG).

Direct impacts will also affect Matters of National Environmental Significance (MNES) under the EPBC Act, including 34.7 ha of the CEEC White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (EPBC Act Box Gum Woodland). Direct impacts to other MNES known to the development site includes 3.92 ha of foraging habitat for *Chalinolobus dwyeri* (Large-eared Pied Bat) (Endangered under the EPBC Act). No breeding habitat for this species will be directly or indirectly impacted. All occurrences of *Dichanthium setosum* (Bluegrass) (Vulnerable under the EPBC Act) have been avoided through project design.

Direct impacts will impact on six species credit species which are known to the development site. As a result of direct impacts, the Project will require 6,349 ecosystem credits, and 1,163 species credits (reduced from the 6,357 ecosystem credits and 3,126 species credits identified as being required in the revised BDAR).

To avoid any SAII as a result of clearing of BC Act Box Gum Woodland, the applicant has included a representative case of additional and appropriate measures (AAM), which includes a replanting proposal, at a rate by area (ha) of 1:1 of all impacted Box Gum Woodland (both woodland and DNG components).

The value of the representative case of AAM would increase the Project's investment in biodiversity by approximately **$7-9M**.

This report is to be interpreted in conjunction with the spatial data provided to BCS and contains updated biodiversity credit calculations, which have been externally audited for accuracy. When reviewing the spatial data associated with this project, the correct projection (GDA2020 Zone 55) using geodesic measurement will result in the most accurate result, as presented in this report.

This report also serves as an addendum to the revised BDAR, and should be interpreted as such, with each new BCS comment addressed in separate sections within this report.

New BCS Comments (January 2024)

For ease of interpretation, ELA responses have been drafted following the numbering as per the BCS's 'Valley of the Winds Wind Farm – Response to Submissions (SSD-10461) recommendations letter provided 21 December 2023.

1.1. Additional harp trapping

1.1 Conduct additional harp trapping surveys for threatened microbats at turbine clusters which are proximate to potential breeding habitat, in accordance with the threatened microbat survey guidelines.

ELA have conducted additional harp trapping during January 2024 within the Girragulang Cluster. A total of 32 harp trap nights were conducted from 22-26 January (in addition to the 64 harp nights already conducted), outside of the subject site but within close proximity to accessible cliffline areas. Surveys in 2019-2020 focussed on trapping microbats that utilise the development site, rather than a focus of features outside the subject land.

In 2024, all harp traps successfully trapped microbats. The microbats listed below were trapped during the survey period (listed in order of most to least frequently trapped):

- Little Forest Bat (*Vespadelus vulturnus*)
- Lesser Long-eared Bat (*Nyctophilus geoffroyi*)
- Chocolate Wattled Bat (*Chalinolobus morio*)
- Gould's Wattled Bat (*Chalinolobus gouldii*)
- Large-eared Pied Bat (*Chalinolobus dwyeri*)

The single specimen of Large-eared Pied Bat was a lone male. The lack of cartilage in metatarsal joints indicates this specimen is not a juvenile. No other Large-eared Pied Bats were captured. Details of the survey are provided in Appendix A.

In accordance with the *'Species credit' threatened bats and their habitats NSW survey guide for the Biodiversity Assessment Method* (OEH, 2018), "breeding habitat is considered present on the subject land if there is 1) potential breeding habitat (see Table 2) AND 2) breeding individuals of the target species. Where these criteria are not met but the species is present on the subject land then the proposed impact is not a potential SAII and standard species credits will be generated." To avoid confusion, the guideline defines breeding individuals as "at least one female bat of the target species that is pregnant, carrying pups or lactating; or a juvenile bat of the target species present or has been previously recorded, or is assumed to be present (development and biocertification only), on the subject land."

An updated table of microbat survey has been provided (Table 1). This includes all effort conducted across the study area for both Large-eared Pied Bat as well as *Miniopterus orianae oceanensis* (Large Bentwing-bat).

Table 1: Microbat survey summary 2024

Species	Credit type	Species polygon (OEH, 2018)	Area within Development site	Minimum required effort per 50 ha (OEH, 2018)	Effort undertaken
Large-eared Pied Bat	Species credit	All habitat on the subject land where the subject land is within 2km of caves, scarps, cliffs, rock overhangs and disused mines. All breeding habitat on or within 100m of the subject land and the area immediately surrounding the feature (see Section 3.1). Note all habitat for this species should also be mapped if present (i.e. including that described in Table 1). Use high resolution aerial imagery and topographic maps to identify potential roost habitat features on the subject land when it is within 2km caves, scarps, cliffs etc. Species polygon boundary should align with plant community types (PCTs) on the subject land to which the species is associated (listed in the TBDC) that are within 2km of identified potential roost habitat features.	3.92 ha foraging habitat 0.00 breeding habitat	Harp trap or mist net – 16 trap nights over 4 nights Acoustic detection - 16 detector nights over 4 nights	64 harp trap nights in December to January 2019-2020. An additional 32 harp trap nights conducted in January 2024. Total 96 harp trapping nights. 466 acoustic detector nights, plus 330 detector nights on met masts (out of breeding season). Total detector nights 796.
Large Bentwing-bat	Dual species credit/ecosystem credit	All breeding habitat including the cave, or other features, used for breeding and the area immediately surrounding this feature. Species polygon boundaries should have a 100m radius buffer around an accurate GPS point location centred on the cave/feature entrance.	0.00 ha breeding habitat Foraging habitat is ecosystem credit	Harp trap or mist net – 16 trap nights over 4 nights	64 harp trap nights in December to January 2019-2020. An additional 32 harp trap nights conducted in January 2024. Total 96 harp trapping nights.

The findings of this harp trapping validate the original mapping presented in the BDAR prepared in October 2023. The clifflines have not been identified as breeding habitat, as a sufficient survey has been conducted and no breeding individuals have been identified. Regardless, the development site has avoided clifflines and associated 100m buffers from the very first design iteration of the development site, to specifically avoid all impacts to any known or potential breeding habitat. As a result of this survey there have been no further changes to species credit mapping. The area of impact for Large-eared Pied Bat foraging habitat is detailed within Appendix B.

1.2. At height data for SAII entity microbats

1.2 Collect at-height data for each turbine cluster across multiple seasons to determine activity patterns of SAII entity microbats across seasons.

The request to collect at-height data across all three turbine clusters has not previously been raised in any of the meetings between ACEN, BCS, and ELA over the past 3 years. As such there has not been opportunity to collect this data during a reasonable timeframe in responding to BCS. Review of other wind farm applications recently recommended for Approval by the DPHI indicates that collection of this data is appropriate as part of the Project Bird and Bat Adaptive Management Plan (BBAMP).

The proposed development includes 12 temporary and 10 permanently installed meteorological masts (metmasts) across the wind farm as part of the Project. As such there will be opportunity to collect data across the wind farm (two within each cluster), with microphones at a height of 2, 50, and 100m (approximately). The details of the duration and location of at height monitoring will be included in the BBAMP, to be drafted as a condition of consent. The final BBAMP will be subject to review by BCS prior to project commissioning.

The metmast data was collected from 30 July to 15 December 2021, as part of the preparation of the EIS. Data was collected as soon as possible following installation of the metmasts, and all data collected was analysed at the timing of the drafting of the EIS BDAR (ELA, 2022). ELA notes that the data collected is outside of the prescribed period for assessing breeding habitats for threatened microbat species, but this does not discount the value of the data collected. Importantly, the actual breeding timing for Large-eared Pied Bat is from early winter, and birthing occurs from September. BAM survey windows are prescribed for later in summer when lactating females leave nurseries, and are most identifiable due to hairless patches around nipples. As such, the metmast data timing for this project can give valuable information in detecting a breeding colony. No records of Large-eared Pied Bat were recorded at any metmast microphone during this time period when the species is known to breed.

Similarly, Large Bent-wing Bat breeds from early winter and leaves maternity roosts later in summer. This species was recorded more frequently than Large-eared Pied Bat, however activities were very low, with a maximum rate of 0.23 calls per night. Furthermore, this species requires very specific cave design for suitable maternity sites, which are not present within or nearby to the Project (Figure 66 of the revised BDAR).

Using data collected during this period, the following nightly rates of detection for both threatened microbats are described in Table 2 and Table 3.

Table 2: Large-eared Pied Bat metmast detection summary

Cluster	Microphone height (m)	Total nights data	Number of detections	Detections per night
Girragulang Road	2	99	0	n/a
Girragulang Road	50	101	0	n/a
Girragulang Road	100	97	0	n/a
Mount Hope	2	87	0	n/a
Mount Hope	50	138	0	n/a
Mount Hope	100	135	0	n/a

Table 3: Large Bentwing-bat metmast detection summary

Cluster	Microphone height (m)	Total nights data	Number of detections	Detections per night
Girragulang Road	2	99	5	0.05
Girragulang Road	50	101	1	<0.01
Girragulang Road	100	97	1	<0.01
Mount Hope	2	87	7	0.08
Mount Hope	50	138	25	0.18
Mount Hope	100	135	31	0.23

Direct comparative analysis to other projects data is difficult, with no government endorsed framework for measuring microbat activity for wind projects in NSW. Notwithstanding this, some comparisons of species activity can be broadly reviewed from those available datasets.

HoGWF collected metmast data from April to May 2020. This project recorded data at 0, 30, and 60m heights at three metmasts, and recorded a similar suite of species to the Valley of the Winds Project. For Large-eared Pied Bat, detectors at HoGWF recorded activity levels at all three heights, with detections per night ranging up to 7.25 detections per night (Table 4). Similarly, Large Bent-wing Bat was recorded regularly, with up to 18 calls per night recorded.

Table 4: Large-eared Pied Bat metmast detection summary at Hills of Gold Wind Farm

Cluster	Microphone height (m)	Detections per night
MM1	2	7.25
MM1	30	1.50
MM1	60	0.06
MM2	2	0.71
MM2	30	0.26
MM2	60	0.14
MM3	2	1.75
MM3	30	0.50
MM3	60	0.03

Table 5: Large Bent-wing Bat metmast detection summary at Hills of Gold Wind Farm

Cluster	Microphone height (m)	Detections per night
MM1	2	18.00
MM1	30	3.83
MM1	60	1.63
MM2	2	3.14
MM2	30	13.89
MM2	60	0.24
MM3	2	1.25
MM3	30	2.25
MM3	60	1.39

As survey timing differed from Valley of the Winds, this discrepancy of detection rates may be due to seasonal influences. Regardless, survey data within the Valley of the Winds Project is significantly lower, and was conducted during the seasons when the species is known to inhabit maternity roosts. No data is available to make other comparison to wind farm applications nearby. ELA notes that Liverpool Range Wind Farm Mod 1 (SSD-6696-Mod-1), which is located more than 8km east of Valley of the Winds, has not been requested by BCS for any metmast microbat monitoring data (as of February 2024).

1.3. Locations of the current meteorological masts

1.3 Provide the locations of the current meteorological masts in the BDAR and spatial data and justify the exclusion of the 'SM Wombat' songmeter in the BDAR

A map of the locations of the two current metmasts is shown in Figure 1.

ELA has collected sufficient data in accordance with the 'Species credit' threatened bats and their habitats NSW survey guide for the Biodiversity Assessment Method (OEH, 2018). SM Wombat was set in a location outside of any potential breeding habitat, and as such will not change the outcome of the BDAR. ELA notes that this unit has not contributed to the total survey effort undertaken as described in Table 1. No further analysis will be undertaken with this data at this time.

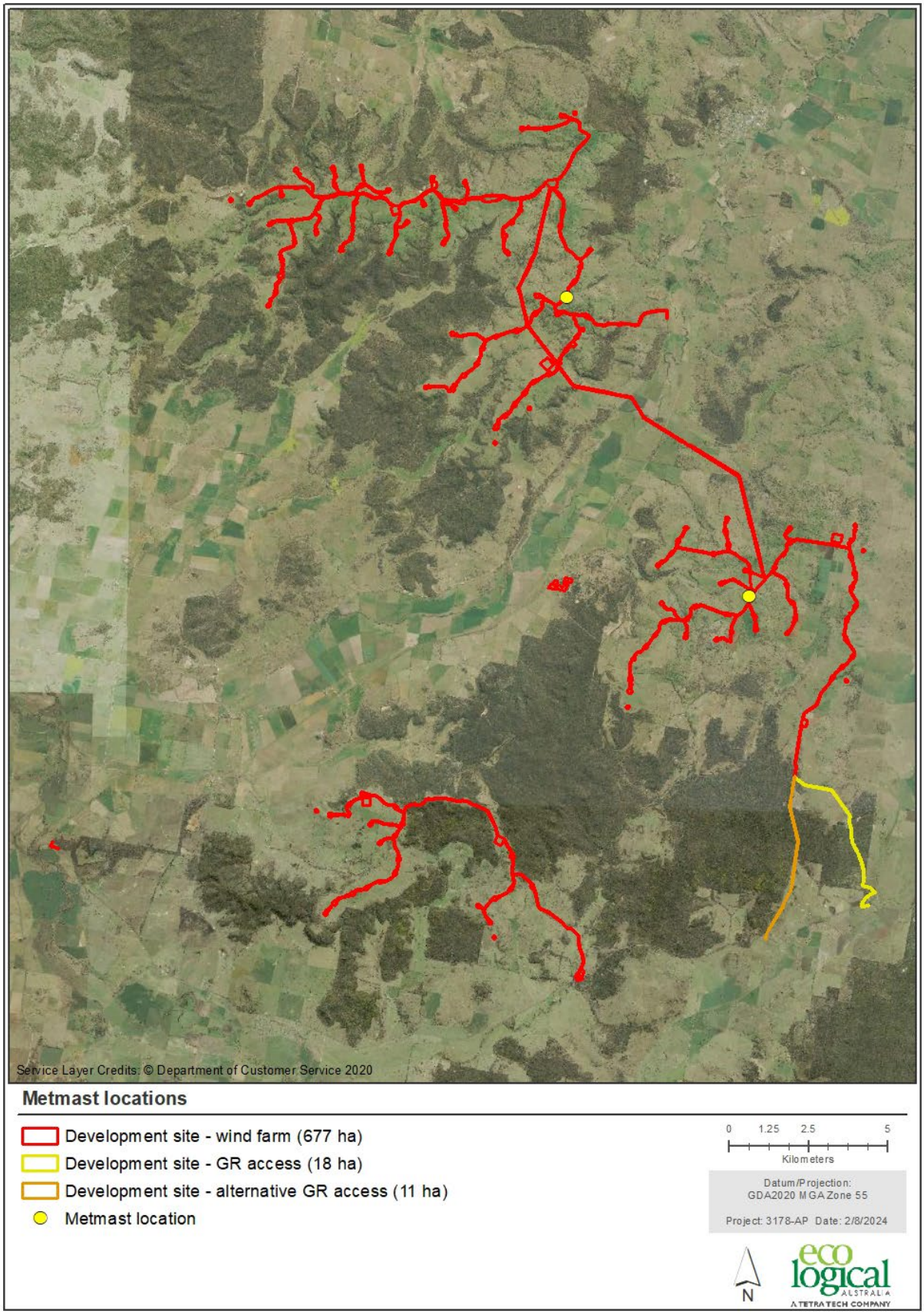


Figure 1: Metmast locations

1.4. SAII assessments for large-eared pied bat and large bent-winged bat

1.4 Review the SAII assessments for large-eared pied bat and large bent-winged bat, having regard to the additional data collected for these species under Recommendation 1.1. Alternatively, commit to further avoidance and mitigation measures during operation to reduce potential SAII, such as low-wind speed turbine curtailment during operation or deleting/relocating turbines proximate to cave habitat.

The outcomes of the surveys outlined in Section 2.1 resulted in no change to any potential breeding habitat within the development site. No direct impacts will occur to any potential breeding habitat for threatened microbats. ELA notes, that whilst the Rotor Swept Area (RSA) overlaps with potential breeding habitat buffers horizontally, the rotor will never directly impact this area of land because:

- The turbines rotate, and will only sweep over the buffer when the wind direction is NE/SW for MH15, and NNE/SSW for LV22
- The height of the hubs means the RSA over the breeding habitat buffers will be close to 180m above ground level.

In recognition of the proximity to potential breeding habitat and the overswung area of rotors, ACEN have committed to avoiding this indirect impact by micrositing the turbine location, such that the RSA is completely outside of the potential breeding habitat buffer. In addition, turbines LV22 and MH15 will be identified as mandatory locations for monitoring in the BBAMP.

2.1. Additional and appropriate measures (AAM) package

2.1 Revise the proposed package of additional and appropriate measures to be commensurate to the impacts on both grassland and woodland formations of Box Gum Woodland, this being 162 ha and 119 ha respectively.

The package of AAM presented in the BDAR (ELA, 2023) includes provision for a 1:1 (by area) package for the ongoing management and permanent conservation of Box Gum Woodland (including both woodland and derived native grassland condition states). The Proponent has indicated that a detailed design phase will occur prior to development, and it is likely the development site will be reduced by up to 25%. As such it is feasible that the potential use of the Tomahawk site could then accommodate the entire final AAM requirement. Should additional land be required by the proponent to fulfil the 1:1 (by area) AAM package, then ACEN would secure such land at other suitable location/s.

Additional benefits to the example Tomahawk site include the restoration of habitat to increase fauna habitat connectivity throughout the landscape, with the restoration of DNG also providing connectivity for adjacent forests that were burned in the Sir Ivan Fire.

ELA notes that any starting condition, and completion criteria will be detailed in a Vegetation Management Plan (VMP) for the final location and extent of the AAM site.

ELA notes that the AAM package proposed by ACEN exceeds recent precedent (SSD-10315), which only proposed restoration of the impacted woodland component of this TEC and proposed no additional measures for DNG impacted by the Project. Furthermore, the proposal in BCWF to only provide AAM for the woodland component of the TEC was not questioned by BCS, and the Project was subsequently

recommended for approval by the NSW DDPE (now DPHI, and granted development consent by the NSW Independent Planning Commission (IPC).

ELA also notes that similar projects within the region (SSF), proposed >200 ha of impact to the same TEC in a similar condition, and was not requested to provide *any* package of AAM.

The value of the AAM proposed will increase the projects investment in biodiversity by approximately **$7-9M**.

3.1. Timeframes for AAM

3.1 Reduce the timeframe for the proposed additional and appropriate measure conservation sites to be secured from five years:

- *Seek written confirmation from the NSW Biodiversity Conservation Trust or NSW Credits Supply Taskforce on the likely minimum timeframe to process and secure the proposed conservation areas under an in-perpetuity mechanism.*
- *Revise the proposed timeframe for securing additional and appropriate measure conservation sites, according to likely minimum timeframes suggested by the relevant approval authority.*

ACEN has considered this request and has committed to securing the AAM package within three (3) years of Notice to Proceed (NtP). The rationale for this timeframe is to further reduce impacts to the TEC by encouraging the construction team to minimise impacts during the initial clearing phase of the Project. The timing required to process the private land conservation agreement is expected to be in the order of 6 months from submission of applications to the Credit Supply Taskforce (CST)/Biodiversity Conservation Trust (BCT).

ELA notes that this AAM package is separate to any biodiversity credit requirements, which must be retired prior to any impacts.

4.1. AAM commitments and SMART Principles

4.1 Revise the commitment to restoration at additional and appropriate measure conservation sites according to SMART Principles (Specific, Measurable, Achievable, Realistic and Timely), considering:

- *the initial condition of the vegetation proposed to be restored*
- *what proposed restoration activities are being considered*
- *the likelihood of success.*

All details associated with the AAM will be detailed within a VMP associated with the final AAM location. ELA suggests this VMP be captured as a condition of consent.

Vegetation targets for restoration will be set to the mean vegetation integrity (VI) of the woodland component of the TEC proposed to be impacted. The initial condition of vegetation is contingent on the timing of baseline surveys, and final location and extent of the AAM.

ELA notes the requested level of detail regarding the AAM package is inconsistent with recently approved projects that impact the same TEC (e.g. BCWF, SSF).

5.1. Secure AAM based on quantum of impacts

5.1 Secure proposed additional and appropriate measures based on the quantum of impact currently proposed, with any future changes assessed on merit in consultation with the consent authority.

As discussed in Section 2.1 above, the final quantum of AAM will be refined following detailed design of the project. Any changes to the quantum of impacts, and associated changes to AAM package, will be amended via regular process for any other SSD.

6.1. AAM and characteristic fauna species credits

6.1 Consider retirement of characteristic fauna species credits listed in the Final Determination for Box Gum Woodland CEEC as part of the proposed additional and appropriate measures for the CEEC.

The AAM package already exceeds the precedent set by BCWF, and the proponent proposes no additional species credits to be retired as part of the AAM package.

ELA notes that the *Final Determination to list White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions* (TSSC, 2020) does not specifically identify any characteristic fauna species. The only species mentioned is European Rabbit (*Oryctolagus cuniculus*) in reference to a Key Threatened Process.

7.1. Vegetation zone condition and plot allocation

7.1 Explain and further justify the rationale behind stratifying 'low' versus 'poor' condition vegetation zones for PCT 483 and the plot allocation for each vegetation zone.

The assessor has considered the comments by the BCS and has reviewed the data presented in the BDAR (ELA, 2023). The mean VI scores calculated by the BAM-C across the project is presented below (Figure 2).

An un-paired t-test confirmed the values collected between vegetation zones are statistically different ($P < 0.0001$) confirming the assessor's separation of these two vegetation zones.

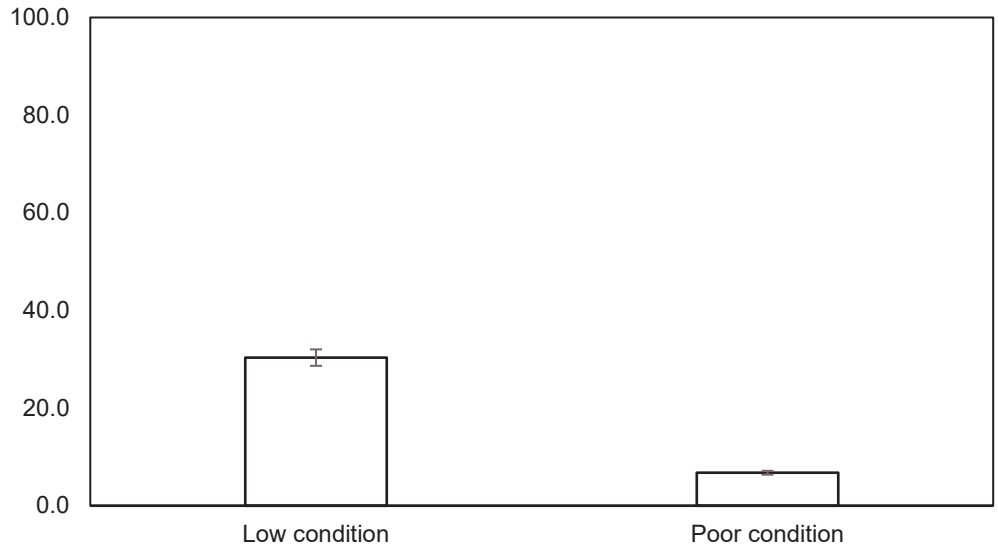


Figure 2: Mean vegetation integrity scores between low and poor condition

The assessor notes that the data presented in Figure 2 above only includes site data collected from the project which reflects the true condition of vegetation proposed to be impacted. As such one vegetation zone – 17 483 P from inland slopes has not been used as this vegetation zone only includes benchmark data to supplement a data gap. No benchmark data was used for any 'Low condition' calculations.

Any other variation observed between floristic plots is considered natural variation in time and space.

7.2. Vegetation zones and plots

7.2 Ensure all plots entered for a vegetation zone are located within that zone.

ELA has reviewed all vegetation integrity VI plots that are located outside the final development footprint. When reviewing this request, ELA notes that this level of justification has not been requested for other approved wind farm assessments. ELA notes that for HoGWF, the BDAR specifically included the following description within the BAMC notes: "*BAM plot data was entered consistently across the three BAM-C cases. BAM pots entered were not split based on where each plot was collected on-ground. For example if a vegetation zone occurred across two IBRA regions/sub-regions, and three plots were collected in Peel and two collected in Tomalla, all five plots were entered into each BAM-C case*". BCS did not query this approach.

Further to this observation, the BCWF BDAR did not replicate all plots between the four IBRA subregions within the BCWF site, and based the minimum plot requirements on the BCWF site total impacts. Similar to the Project evolution for Valley of the Winds, the BDAR accompanying BCWF details that "*Due to ongoing refinements in the proposed Project layout, including removal of some proposed turbines for non-ecological reasons, it is acknowledged that not all BAM plots lie completely within the disturbance area or subject land. However, all BAM plots utilised for this assessment are located within the survey area. As the areas of PCTs within the survey area are representative of the PCTs contained within the subject land and disturbance area, all BAM plots within the survey area have therefore been utilised for the BAM assessments*". For BCWF, BCS did not query this approach.

Notwithstanding, ELA has reviewed all plots outside of the VoW development site and considered suitability of the floristics for each vegetation zone by considering:

- Distance to development site
- Tree species present
- If no tree species, the spatial proximity to treed areas and the PCT present
- The number of native species
- The cover of non-tree species

Table 6 below details each plot and the findings of the review.

One (1) out of the 64 plots reviewed (plot 135), was moved to an alternate vegetation zone (from poor to low) to assist in aligning calculations. This represents a change in plot suitability for those outside the development site, from 98% to 100%. This change has no effect on the mapping within the study area, and also has no meaningful change to vegetation integrity scores or biodiversity credit calculations.

All other plots were considered suitable for calculations.

Table 6: Review of suitability of vegetation zone allocation to VI plots

Plot ID	Distance to development site (m)	Assigned Vegetation Zone in revised BDAR	Review of adequacy
Plot 03	151	17 483 P	This plot contains 9 native species, with a native ground cover of 5.2%. The plot is indicative of the species and condition of PCT483 in poor condition.
Plot 04	22	17 483 P	This plot contains 6 native species, with a native ground cover of 4.8%. The plot is indicative of the species and condition of PCT483 in poor condition.
Plot 06	57	15 483 M	The plot contains one *Eucalyptus albemol*, as well as 24 native species with a native ground cover of 12.5%. The plot is indicative of PCT483 in moderate condition.
Plot 08	69	11 479 B	The plot contains one *Eucalyptus crebra*, as well as 38 native species with a native ground cover of 28.6%. The plot is indicative of PCT479 in moderate condition.
Plot 09	258	17 483 P	This plot contains 7 native species, with a native ground cover of 4.0%. The plot is indicative of the species and condition of PCT483 in poor condition.
Plot 10	349	15 483 M	The plot contains one *Brachychiton populneus*, as well as 7 native species with a native ground cover of 3.8%. The plot is indicative of PCT483 in moderate condition.
Plot 12	68	15 483 M	This plot contains 12 native species, with a native ground cover of 11.6%. The plot is located within a woodland area in close proximity to WTG GR20, and although the floristics indicate the condition is poor, the presence of nearby trees is indicative of PCT483 in moderate condition.
Plot 13	133	15 483 M	The plot contains one *E. albemol*, as well as 6 native species with a native ground cover of 2.6%. The plot is indicative of PCT483 in moderate condition.

Plot ID	Distance to development site (m)	Assigned Vegetation Zone in revised BDAR	Review of adequacy
Plot 14	569	15 483 M	The plot contains one *E. albemol*, as well as 7 native species with a native ground cover of 2.6%. The plot is indicative of PCT483 in moderate condition.
Plot 15	966	15 483 M	The plot contains one *E. albemol*, as well as 9 native species with a native ground cover of 4%. The plot is indicative of PCT483 in moderate condition.
Plot 17	245	15 483 M	The plot contains one *E. albemol*, as well as 10 native species with a native ground cover of 5.3%. The plot is indicative of PCT483 in moderate condition.
Plot 18	40	15 483 M	The plot contains one *E. albemol*, as well as 7 native species with a native ground cover of 3.5%. The plot is indicative of PCT483 in moderate condition.
Plot 19	48	11 479 M	The plot contains one *E. crebra* and one *Angophora floribunda*, as well as 25 native species with a native ground cover of 106.4%. The plot is indicative of PCT479 in moderate condition.
Plot 20	35	09 478 G	The plot contains three tree species including *Acacia doratoxylon*, *Eucalyptus rossii*, and *Eucalyptus sparsifolia*. The plot also contains 25 native species with a native ground cover of 61.6%. The plot is indicative of PCT478 in good condition.
Plot 21	12	05 281 G	The plot contains two trees *A. floribunda* and *Eucalyptus blakelyi*, as well as 25 native species with a native ground cover of 59.8%. The plot is indicative of PCT281 in good condition.
Plot 23	25	14 483 G	The plot contains one *Eucalyptus moluccana*, as well as 12 native species with a native ground cover of 25.5%. The plot is indicative of PCT483 in good condition.
Plot 26	153	06 281 M	The plot contains one *Eucalyptus melliodora*, as well as 23 native species with a native ground cover of 36.9%. The plot is indicative of PCT281 in moderate condition.
Plot 27	49	14 483 G	The plot contains one *E. moluccana*, as well as 21 native species with a native ground cover of 59.3%. The plot is indicative of PCT483 in good condition.
Plot 28	58	16 483 L	The plot contains no trees, 16 native species with a native ground cover of 77.9%. The plot is indicative of PCT483 in low condition.
Plot 29	174	06 281 M	The plot contains one *E. melliodora*, as well as 20 native species with a native ground cover of 79.5%. The plot is indicative of PCT281 in moderate condition.
Plot 30	38	02 84 M	The plot contains one *Casuarina cunninghamiana* subsp. *cunninghamiana*, as well as 4 native species with a native ground cover of 20.9%. The plot is indicative of PCT84 in moderate condition.

Plot ID	Distance to development site (m)	Assigned Vegetation Zone in revised BDAR	Review of adequacy
Plot 32	142	06 281 M	The plot contains one *A. floribunda* and one *Eucalyptus albens*, as well as 11 native species with a native ground cover of 23.0%. The plot is indicative of PCT281 in moderate condition.
Plot 35	11	12 479 Reg	The plot contains five shrub species including *Acacia gladiiformis*, *Acacia sertiformis*, *Brachyloma daphnoides*, *Dodonaea viscosa* subsp. *cuneata*, *Lomatia silaifolia*, and *Pimelea stricta*. Although the plot does not contain any trees, it is surrounded by a forest containing *E. crebra*, and is indicative of PCT479 in regenerating condition.
Plot 37	70	10 479 B	The plot contains one *E. crebra*, as well as 18 native species with a native ground cover of 98.0%. The plot is indicative of PCT479 in burned condition.
Plot 38	54	05 281 G	The plot contains two trees *A. floribunda* and *E. blakelyi*, as well as 21 native species with a native ground cover of 70.4%. The plot is indicative of PCT281 in good condition.
Plot 39	20	05 281 G	The plot contains two trees *A. floribunda* and *Acacia melanoxylon*, as well as 24 native species with a native ground cover of 42.6%. The plot is indicative of PCT281 in good condition.
Plot 42	32	03 267 M	The plot contains two trees *E. crebra* and *Eucalyptus microcarpa*, as well as 18 native species with a native ground cover of 28.4%. The plot is indicative of PCT267 in moderate condition.
Plot 44	45	04 267 L	The plot contains no trees. The plot contains 3 native species with a native ground cover of 43.1%. The plot is indicative of PCT267 in low condition.
Plot 45	241	07 281 L	The plot contains no trees. The plot contains 3 native species with a native ground cover of 15.2%. The plot is indicative of PCT267 in low condition.
Plot 47	109	11 479 M	The plot contains *A. floribunda, E. mollucana*, and *E. sparsifolia*, as well as 28 native species with a native ground cover of 20.1%. The plot is indicative of PCT479 in moderate condition.
Plot 48	44	09 478 G	The plot contains three tree species *A. floribunda, A. melanoxylon* and *E. blakelyi*, as well as 21 native species (8 shrub species) with a native ground cover of 59.1%. The plot is indicative of PCT478 in good condition.
Plot 49	20	10 479 B	The plot contains tree species *Acacia doratoxylon*, *Allocasuarina* sp, and *E. crebra*, as well as 25 native species with a native ground cover of 46.8%. The plot is indicative of PCT479 in burned condition.
Plot 51	28	03 267 M	The plot contains *E. microcarpa*, as well as 10 native species with a native ground cover of 29%. The plot is indicative of PCT267 in moderate condition.

Plot ID	Distance to development site (m)	Assigned Vegetation Zone in revised BDAR	Review of adequacy
Plot 52	61	04 267 L	The plot contains no trees. The plot contains 9 native species with a native ground cover of 21.1%. The plot is indicative of PCT267 in low condition.
Plot 53	714	11 479 M	The plot contains tree species *A. doratoxylon* and *E. crebra*, as well as 33 native species with a native ground cover of 60.3%. The plot is indicative of PCT479 in moderate condition.
Plot 54	46	13 479 L	The plot contains no trees. The plot contains 7 native species with a native ground cover of 17.2%. The plot is indicative of PCT479 in low condition.
Plot 55	18	11 479 M	The plot contains one *E. crebra*, as well as 7 native species with a native ground cover of 12.6%. The plot is indicative of PCT479 in moderate condition.
Plot 57	37	13 479 L	The plot contains no trees. The plot contains 8 native species with a native ground cover of 13.3%. The plot is indicative of PCT479 in low condition.
Plot 58	381	18 616 M	The plot contains *Ficus rubiginosa*, as well as 17 native species with a native ground cover of 16.9%. The plot is indicative of PCT616 in moderate condition. This plot is not used in any calculations.
Plot 59	30	17 483 P	The plot contains no trees. The plot contains 15 native species, with a native ground cover of 7%. The plot is indicative of PCT483 in poor condition.
Plot 60	61	16 483 L	The plot contains no trees. The plot contains 12 native species, with a native ground cover of 43.2%. The plot is indicative of PCT483 in low condition.
Plot 61	25	11 479 M	The plot contains tree species *A. floribunda*, *E. albens*, and *Eucalyptus macrorhyncha*, as well as 26 native species with a native ground cover of 16.7%. The plot is indicative of PCT479 in moderate condition.
Plot 66	1	17 483 P	The plot contains no trees. The plot contains 5 native species, with a native ground cover of 1.8%. The plot is indicative of PCT483 in poor condition.
Plot 69	31	15 483 M	The plot contains no trees. The plot only contains one native species, with a cover of 0.1%. This plot would otherwise be considered poor condition, but is located within the inter-canopy space of 483M. As such this plot is indicative of PCT483 in moderate condition.
Plot 70	4	16 483 L	The plot contains no trees. The plot contains 4 native species, with a native ground cover of 100.3%. The plot is indicative of PCT483 in low condition.
Plot 74	12	17 483 P	The plot contains no trees. The plot contains 3 native species, with a native ground cover of 2.2%. The plot is indicative of PCT483 in poor condition.

Plot ID	Distance to development site (m)	Assigned Vegetation Zone in revised BDAR	Review of adequacy
Plot 75	4	16 483 L	The plot contains no trees. The plot contains 9 native species, with a native ground cover of 20.8%. The plot is indicative of PCT483 in low condition
Plot 79	11	07 281 M	The plot contains no trees. The plot contains 3 native species, with a native ground cover of 85.3%. The plot is located within the inter-canopy area along a creekline interspersed with *E. melliodora* and *E. blakelyi*. The plot is indicative of PCT281 in moderate condition
Plot 80	46	07 281 M	The plot contains *A. floribunda*, as well as 5 native species with a native ground cover of 3.4%. The plot is indicative of PCT281 in moderate condition.
Plot 85	34	15 483 M	The plot contains one *E. albemol*, as well as 5 native species with a native ground cover of 0.9%. The plot is indicative of PCT483 in moderate condition.
Plot 86	2	17 483 P	The plot contains no trees. The plot contains 9 native species, with a native ground cover of 4.6%. The plot is indicative of PCT483 in poor condition.
Plot 87	2	17 483 P	The plot contains no trees. The plot contains 3 native species, with a native ground cover of 2.2%. The plot is indicative of PCT483 in poor condition.
Plot 90	452	15 483 M	The plot contains *E. albemol*, as well as 15 native species, with a native ground cover of 28.0%. The plot is indicative of PCT483 in moderate condition.
Plot 119	25	16 483 L	The plot contains no trees. The plot contains 26 native species, with a native ground cover of 108.3%. The plot is indicative of PCT483 in low condition.
Plot 131	463	14 483 G	The plot contains *E. albemol*, as well as 13 native species, with a native ground cover of 23.0%. The plot is located within a large, better-connected patch of woodland, and is therefore indicative of PCT483 in good condition.
Plot 135	696	17 483 P	The plot contains no trees. The plot contains 11 native species, with a native ground cover of 24.1%. **The plot is indicative of PCT483 in low condition, and has been reallocated to that vegetation zone**.
Plot 136	621	17 483 P	The plot contains no trees. The plot contains 4 native species, with a native ground cover of 2.4%. The plot is indicative of PCT483 in poor condition.
Plot 144	328	06 281 M	The plot contains *A. floribunda*, as well as 9 native species, with a native ground cover of 2.2%. The plot is indicative of PCT281 in moderate condition.
Plot 145	166	15 483 M	The plot contains *E. albemol*, as well as 9 native species, with a native ground cover of 2.2%. The plot is indicative of PCT483 in moderate condition.

Plot ID	Distance to development site (m)	Assigned Vegetation Zone in revised BDAR	Review of adequacy
Plot 148	595	15 483 M	The plot contains *E. albemol*, as well as 10 native species, with a native ground cover of 5.2%. The plot is indicative of PCT483 in moderate condition.
Plot 149	69	03 267 L	The plot contains one unidentified regenerating eucalypt, as well as 17 native species with a native ground cover of 66.1%. The plot is in a cleared paddock surrounded by isolated patches of PCT267, and as such as been mapped as PCT267 in low condition.
Plot 150	32	03 267 L	The plot contains no trees. The plot contains 9 native species, with a native ground cover of 31.0%. The plot is indicative of PCT267 in low condition.
Plot 151	28	10 479 B	The plot contains *E. crebra*, *Eucalyptus fibrosa*, and another unidentified Eucalyptus sp. (regenerating and likely *E. crebra* or *E. fibrosa*) as well as 31 native species with a native ground cover of 80.2%. The plot is indicative of PCT479 in a burned condition.
Plot 152	23	10 479 B	The plot contains *E. fibrosa*, and another unidentified Eucalyptus sp. (regenerating and likely *E. crebra* or *E. fibrosa*) as well as 33 native species with a native ground cover of 58.4%. The plot is indicative of PCT479 in a burned condition.

7.3. Native vegetation and vegetation zones

7.3 Ensure areas which do not contain any native vegetation are not included in native vegetation zones.

ELA has reviewed the data and confirms that the plot data entered for vegetation zones is suitable and correct for the assessment based on the condition of the site at the time of survey. In response to the queries from BCS – the assessor notes the following:

- Plot 117 contains 0.3% native vegetation, including similar species identified in other VI Plots across the Project. This plot is suitable for inclusion as PCT 483 Poor
- Plot 118 contains 0.2% native vegetation, including similar species identified in other VI Plots across the Project. This plot is suitable for inclusion as PCT 483 Poor
- Plot 140 contains no native species, has been cropped, and is removed from calculations
- Plot 136 contains 2.4% native vegetation, including similar species identified in other VI Plots across the Project. This plot is suitable for inclusion as PCT 483 Poor
- Plot 116 does not contain any native vegetation, however, is indicative of the variation observed across the condition class of 'Poor'.

As a result of the review of these plots, the assessor has removed plot 140 from any further calculations of vegetation integrity.

The assessor notes, that these areas were all identified as Category-1 land within the BDAR that accompanied the EIS in 2021. Whilst the land categorisation was not approved by BCS (despite having been an approved method), the condition of the plots highlighted above reinforces the original assessment and lack of biodiversity values present in these locations.

As a result of the review of plots, the assessor has removed plot 140 from any further calculations of vegetation integrity.

8.1. Native vegetation and cover class assessment

8.1 Include all areas of native vegetation within the landscape vegetation cover class assessment.

The assessor has included all areas of native vegetation within the landscape assessment.

9.1. Justification for exclusion of candidate threatened species

9.1 Provide further justification for the exclusion of candidate threatened species in each of the BAM-C cases, in accordance with section 5.2.2 of the BAM.

ELA has considered the review of candidate species presented by BCS and has provided a detailed response for each species below.

9.1.1. Pomaderris cotoneaster

This species is present within the following BAM-C cases:

- 21960 – Kerrabee subregion of the Leadville Cluster
- 40557 – Pilliga subregion of the alternate access to Girragulang Road
- 40560 - Kerrabee subregion of the alternate access to Girragulang Road

ELA has reviewed the PCT associations for this species using the dataset provided at (https://www.environment.nsw.gov.au/research-and-publications/publications-search/bionet-threatened-species-to-plant-community-types-association-data). Review of the predicted species for PCTs 84, 267, 281, 483, and 479 notes that *Pomaderris cotoneaster* is not associated with any of these PCTs.

In accordance with 5.2.1.4 of the BAM, a threatened species is identified as requiring assessment if all the criteria relevant for the species in (2.a–2.f.) are met. This species does not meet Section 5.2.1.c of the BAM whereby the species is associated with any of the PCTs occurring within the development site.

This species is therefore removed from further assessment.

9.1.2. Diuris tricolor & Indigofera efoliata

Diuris tricolor is predicted within the following BAM-C cases:

- 40557 – Pilliga subregion of the alternate access to Girragulang Road
- 40560 - Kerrabee subregion of the alternate access to Girragulang Road

Indigofera efoliata is predicted within the following BAM-C cases:

- 40557 – Pilliga subregion of the alternate access to Girragulang Road

These species are associated only within PCT 267, which occurs between the Golden Highway and Girragulang Road cluster along the alternate access route. These species can be surveyed in September or October to identify when in flower. Both of these species are unmistakeable, and easily recognisable in the field.

Habitat within box woodland is marginal for the species. Habitats within this stage of the Project are too degraded from a history of agricultural disturbance including; clearing, cropping, pasture improvement and grazing. No other suitable habitat occurs across the development site. A photograph of the site condition within PCT 267 Low, is shown in Photograph 1.

Photograph 1: Site condition within 267 low

Notwithstanding the site condition, ELA ecologists surveyed a grid pattern across the development site, within PCT267, in September 2021. This survey included targeted searches within the best areas of habitat, during the appropriate season. The location of survey is shown in Figure 3 and Figure 4. Neither species was identified, and both have been selected as surveyed – no in the BAM-C. As such, no further assessment is deemed required.

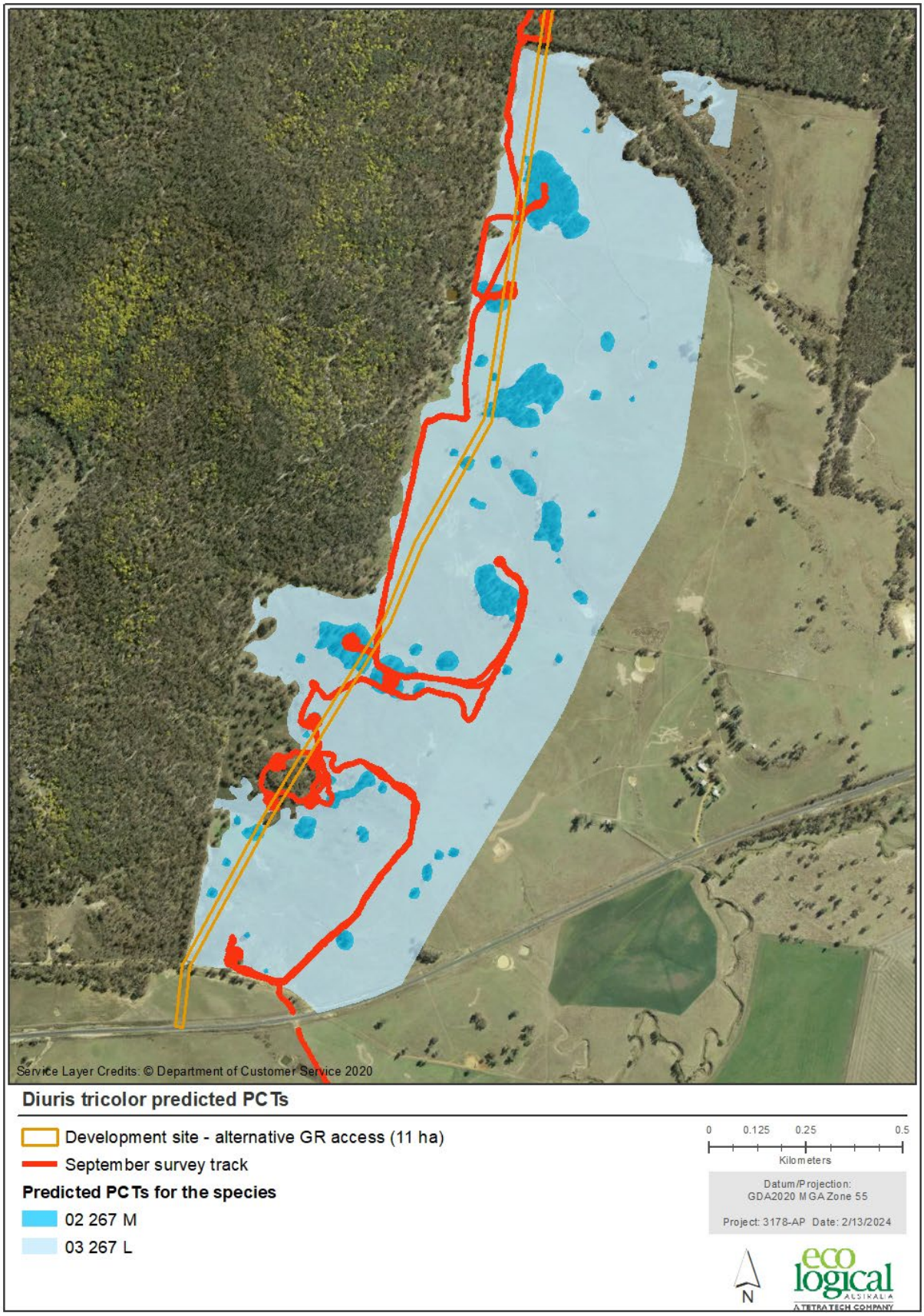


Figure 3: Diuris tricolor predicted PCTs - Survey effort in suitable season

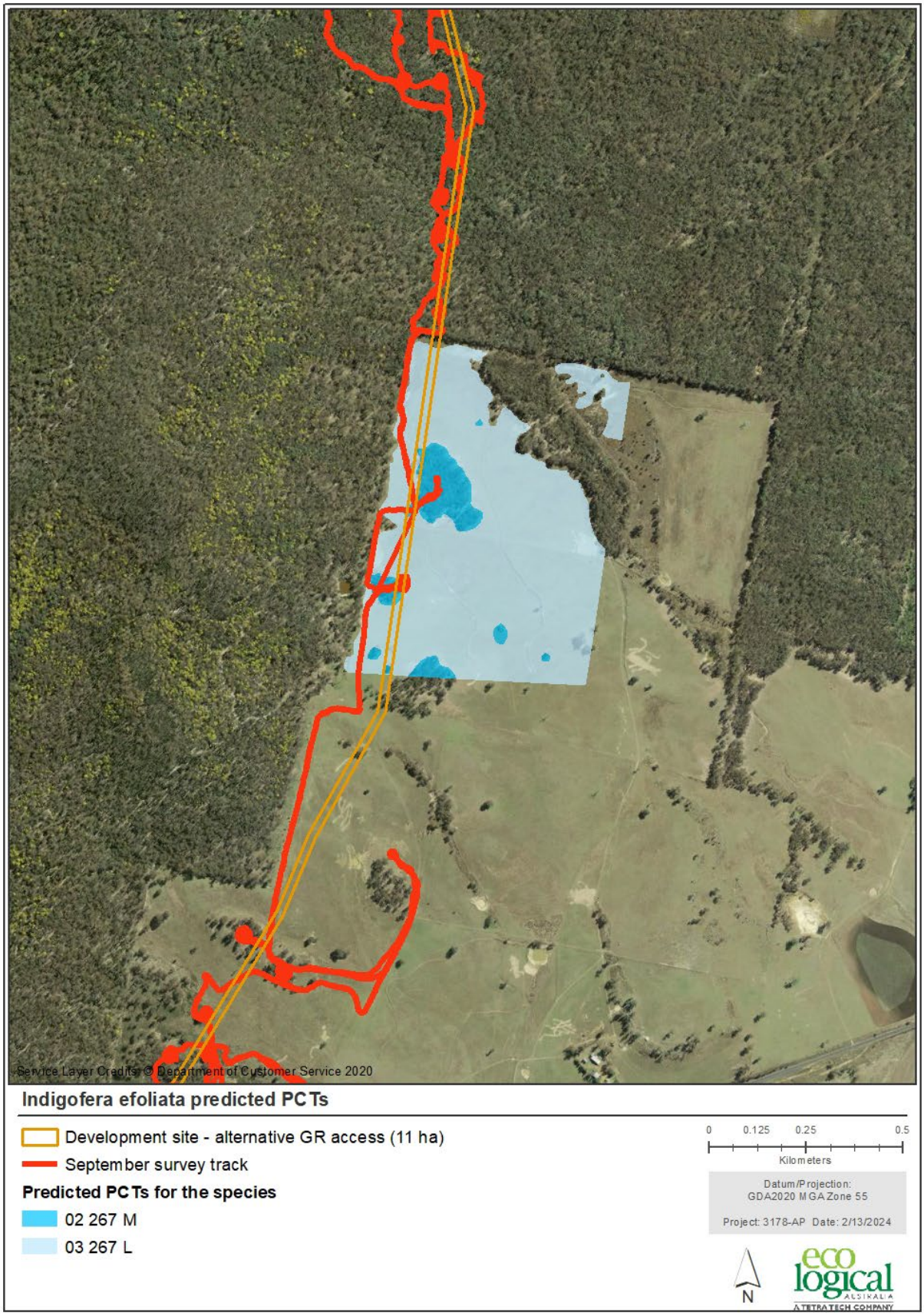


Figure 4: *Indigofera efoliata* predicted PCTs - Survey effort in suitable season

9.1.3. Square-tailed Kite & Little Eagle

Both species are dual credit species, whereby only their breeding habitat is required to generate species credits. Both species utilise stick nests.

Square-tailed Kite has the habitat constraint 'nest trees'. The TBDC identifies breeding habitat for this species as 'live large old trees within suitable vegetation AND the presence of a male and female; or female with nesting material; or an individual on a large stick nest in the top half of the tree canopy.'

Little Eagle similarly has a habitat constraint 'Nest trees - live (occasionally dead) large old trees within vegetation'. The TBDC identifies breeding habitat as '*live (occasionally dead) large old trees within suitable vegetation AND the presence of a male and female; or any adult with nesting material; or an individual on a large stick nest in the top half of the tree canopy; or pairs displaying (soaring, diving, engaging in chases, or a male observed calling in flight with a female begging from tree)*.'

A habitat assessment was conducted across the entire development site, including marking up any stick nests or hollow-bearing trees, as described in 4.2.2.1 of the BDAR. No stick nests were identified within the development site, and as such both species are removed from further assessment.

ELA notes that in addition to the lack of stick nests, neither of these species were identified during any survey across the project, which included over 500 BUS surveys.

9.1.4. Powerful Owl & Masked Owl

Both species are dual credit species, whereby only their breeding habitat is required to generate species credits.

Powerful Owl has the species credit habitat constraint *'Living or dead trees with hollow greater than 20cm diameter'. The TBDC also prescribes that 'species polygons should be circular in shape and must include a buffer RADIUS of 100 m around each tree. The purpose of the buffer is to minimise disturbance/avoid clearing, for a development application, or to conserve and improve habitat, for a biodiversity stewardship agreement, within the area essential for breeding. This includes habitat suitable for male roosts, feeding/grooming perches and fledgling requirements. It does not account for foraging habitat. The shape of the buffer can be modified where evidence provided in the Biodiversity Assessment Report indicates an alternative shape would better meet the species needs in the context of the assessment site. For example, extant vegetation is linear, and the nest tree is already located near the edge of the wooded area*.' Powerful Owl is associated with PCT84 and PCT281 only.

Masked Owl has the species credit habitat constraint 'Living or dead trees with hollows greater than 20cm diameter.' The TBDC also prescribes '*where a breeding site has been identified in accordance with the BAM the species polygon should be established by providing a circular buffer with a 100m radius around the nest tree. The purpose of the buffer is to minimise disturbance/avoid clearing, for a development application, or to conserve and improve habitat, for a biodiversity stewardship agreement, within the area essential for breeding. This includes habitat suitable for male roosts, feeding/grooming perches and fledgling requirements. It does not account for foraging habitat. The shape of the buffer can be modified where evidence provided in the Biodiversity Assessment Report indicates an alternative shape would better meet the species needs in the context of the assessment site. For example, extant vegetation is linear and the nest tree is already located near the edge of the wooded area.*' Masked Owl is associated with PCT84, PCT281, and PCT267 only.

Neither species is associated with PCT479 nor PCT483. ELA notes that neither of these species were recording as a breeding pair as per the TBDC.

The species polygon has been drawn for both species, in accordance with the TBDC as described for each species above. The species polygon for each species includes woodland areas that are within 100m of a potential breeding hollow, and includes the PCT which each relevant species is associated with. An example of the species polygon methodology is shown on Figure 5.

Whereby the 100m buffer does not intersect the development site, or where there are no suitable hollows to generate the buffer, no species credits are calculated. Similarly, where the development site impacts low or poor condition grassland, no species polygons are calculated.

The area of impact for each forest owl is detailed in Appendix B:.

9.1.5. Squirrel Glider

Squirrel Glider does not have any habitat constraints listed in the TBDC. This species is associated with PCT 84, PCT 267, and PCT 281.

The species polygon includes all areas of the associated PCTs that occur within the development site. Details of the areas of impact are presented in Appendix B:.

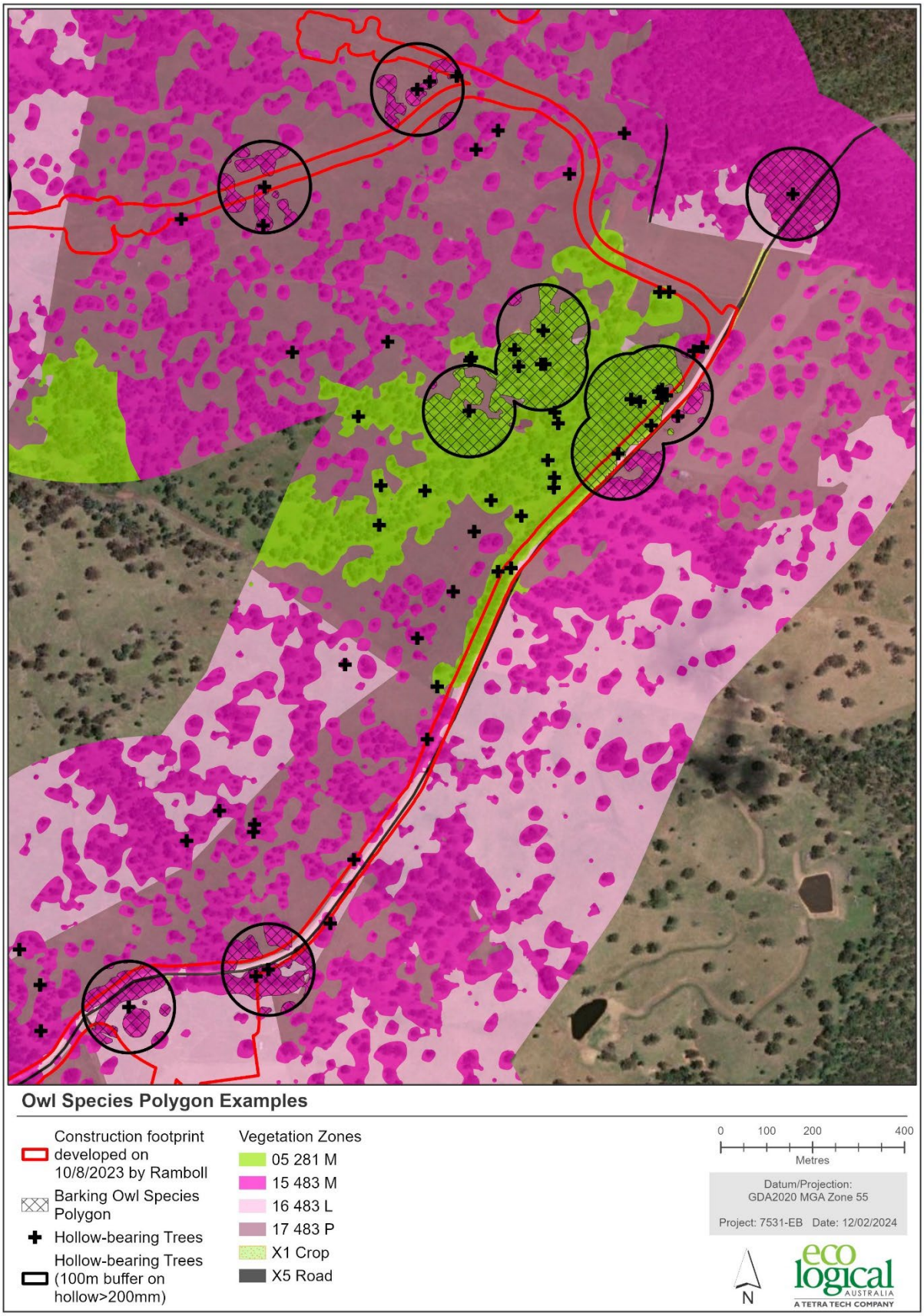


Figure 5: Owl species polygon examples

10.1. Justification for exclusion of vegetation zones for candidate species

10.1 Include a list of candidate species and their associated PCTs and provide justification for any excluded vegetation zones, in accordance with 4.4.5 of the BAM Operational Manual – Stage 1.

A list of all associated PCTs, and the IBRA subregions in which they occur was presented in Table 16 from Pages 105 – 115 of the BDAR (ELA, 2023). A complete list of all species associations is available from https://www.environment.nsw.gov.au/research-and-publications/publications-search/bionet-threatened-species-to-plant-community-types-association-data.

The following species were removed from the assessment, as previously agreed by BCS:

- *Delma impar* (Striped Legless Lizard)
- *Phascogale tapoatafa* (Brush-tailed Phascogale)

In addition, the following species were removed from all calculations, based on the rationale presented below:

- *Anthochaera phrygia* (Regent Honeyeater) – No mapped important areas present in any vegetation zone
- *Goodenia macbarronii* (Narrow Goodenia) – The species is no longer listed in NSW
- *Haliaeetus leucogaster* (White-bellied Sea Eagle) – No breeding habitat present in any vegetation zone (living or dead mature trees within suitable vegetation within 1 km of a rivers, lakes, large dams or creeks, wetlands and coastlines)
- *Hamirostra melanosternon* (Black-breasted Buzzard) – No breeding habitat present in any vegetation zone (land within 40 m of riparian woodland on inland watercourses/waterholes containing dead or dying eucalypts)
- *Hieraaetus morphnoides* (Little Eagle) – No breeding habitat present in any vegetation zone (nest trees - live (occasionally dead) large old trees within vegetation)
- *Lathamus discolor* (Swift Parrot) – No mapped important areas present in any vegetation zone
- *Lophoictinia isura* (Square-tailed Kite) – No breeding habitat present in any vegetation zone (nest trees)
- *Pomaderris cotoneaster* (Cotoneaster Pomaderris) – Species not associated with any vegetation zones.

All other species were retained for further assessment within their relevant BAM-C cases.

In the case where a species habitat constraint is not present within a particular project stage, a species may be removed from that individual assessment. This is the case when a project stage only impacts grassland vegetation zones (such as the workers camp), and there are no woodland areas or tree buffers present as described in the Forest Owl section above.

10.2. Species Polygon review for large-eared pied bat

10.2 Review the species polygon for the large-eared pied bat and provide further justification for excluding PCT 479 and PCT 483.

The polygon for Large-eared Pied Bat has been drawn consistent with the *'Species credit' threatened bats and their habitats NSW survey guide for the Biodiversity Assessment Method* (OEH, 2018), as described in Figure 6 below.

Table 1 Features and approach required to develop the species polygon for species credit bat species.

Species	Features to include in species polygon	Approach to create species polygon
Large-eared pied bat (*Chalinolobus dwyeri*)	All habitat on the subject land where the subject land is within 2km of caves, scarps, cliffs, rock overhangs and disused mines. **Note:** any breeding habitat identified for this species (see Table 2) is a potential serious and irreversible impact.	Use high resolution aerial imagery and topographic maps to identify potential roost habitat features on the subject land when it is within 2km caves, scarps, cliffs etc. Species polygon boundary should align with PCTs on the subject land to which the species is associated (listed in the TBDC) that are within 2km of identified potential roost habitat features.

Figure 6: Species polygon approach required for *Chalinolobus dwyeri* (OEH, 2018)

This approach aligns with the proposal by ELA on 14 July 2022 during a meeting with BCS and DPE, whereby ELA proposed to align exactly with the information presented in the TBDC. ELA notes that during this meeting BCS agreed with the approach to map all species polygons as per the associated PCTs in TBDC.

ELA has reviewed section 4.4.1 of the *Biodiversity Assessment Method 2020 Operational Manual – Stage 1* (DPIE 2020) as referenced in BCSs comments on the revised BDAR, and notes that this section of the document refers to inclusion of incidentally observed species within the subject land, which would otherwise not be considered a candidate species for the assessment. ELA notes that this is not the case with Large-eared Pied Bat, which has always been considered as a candidate species for this assessment. Similarly, sections 5.2.2 to 5.2.6 of the BAM makes no reference to including any incidental observations of the species within vegetation zones outside of the associated PCTs described in the TBDC.

The approach to species polygons presented by ELA is consistent with other biodiversity assessments for wind farms within NSW, which were granted (or recommended for) approval by DPHI in the past 6 months. In particular, the BDAR that accompanied BCWF only mapped habitats for this species within 0.18 ha of a single PCT, despite it being recorded at four ultrasonic detectors across the subject land. Similarly for HoGWF, Large-eared Pied Bat was recorded at 20 out of 25 detectors, broadly spaced across the entire subject land. The assessor for this project only mapped habitats within four of the 20 PCTs onsite, despite the species being recorded more broadly across the subject land. In response to the calculation of Large-eared Pied Bat species credits, BCS did not query the mapping presented in either of the examples described above.

Based on this approach to mapping the species polygon, and applying consistency with other approved projects, the total direct impact area for Large-eared Pied Bat for this assessment includes 3.92 ha of foraging habitat only. No breeding habitat is directly impacted.

10.3. Data audit for candidate threatened species

10.3 Conduct an audit of the total area of impact in the BDAR, spatial data and BAM-C cases for each candidate threatened species.

The total impact area for each candidate threatened species that was identified within the development site is presented in Appendix B:. The values within this table have been audited by both ELA and Ramboll, and contain the correct development site boundary, correct projection of all layers, and have been audited for accuracy.

11.1. Bluegrass (*Dichanthium setosum*)

11.1 Conduct additional targeted surveys for bluegrass in all associated PCTs across the Project. Alternatively obtain an expert report, or assume presence and generate a revised species polygon for bluegrass.

The assessor suggests that a complete walk of the whole project is unreasonable for the reasons outlined below. Surveys for threatened flora species across the development site were conducted over several months in 2021, and field teams conducted targeted surveys in areas of suitable habitat. Suitable habitats are patchy across the landscape, and there is significant areas of unsuitable habitat within the development site. Close up figures of summer survey effort are shown on Figure 7 to Figure 9.

In accordance with Section 5.2.3.2.a.ii of the BAM, a candidate species credit species is considered unlikely to occur on the subject land (or specific vegetation zones) if the assessor determines that the habitat constraints or microhabitats are degraded to the point that the species is unlikely to use the subject land (or specific vegetation zones). In this case, the assessor identified that threatened flora (including *Dichanthium setosum*) are unlikely to occur across the majority of the subject land, due to ongoing degradation from a long and sustained history of agricultural disturbance, including clearing, cropping, pasture improvement, and grazing. This approach and justification is consistent with similar assessments in the region (such as HoGWF, SSF, Forest Glen Solar Farm (FGSF), Glanmire Solar Farm (GSF), Beryl Solar Farm (BSF)).

To justify the claim of site degradation, ELA has provided to BCS several lines of evidence. This includes in the first instance, 153 VI plots which include full floristic analysis across the development site. These VI plots confirm quantitatively, the majority of site condition being:

- Poor condition, with an average VI score of 6.8
- Low condition, with an average VI score of 30.3.

By comparison to other assessments:

- HoGWF excluded threatened flora surveys from a large portion of the Project due to exotic cover, without any quantitative data
- SSF excluded threatened flora from the majority of the site, in which VI scores ranged from 7.6 to 30.5 within areas identified as degraded
- FGSF excluded threatened flora from vegetation zones with scores up to 51.6.

To further assist BCS in understanding the site degradation, ELA has provided example photographs of the site condition in areas that have been identified as not suitable for threatened flora. This includes

Mount Hope Cluster (Photograph 2 to Photograph 6), Leadville cluster (Photograph 8 to Photograph 12), and Girragulang Road (Photograph 13 to Photograph 15). Some photographs of suitable areas considered to provide potential habitat, which have been surveyed, have also been included for comparison.

No additional surveys are proposed.

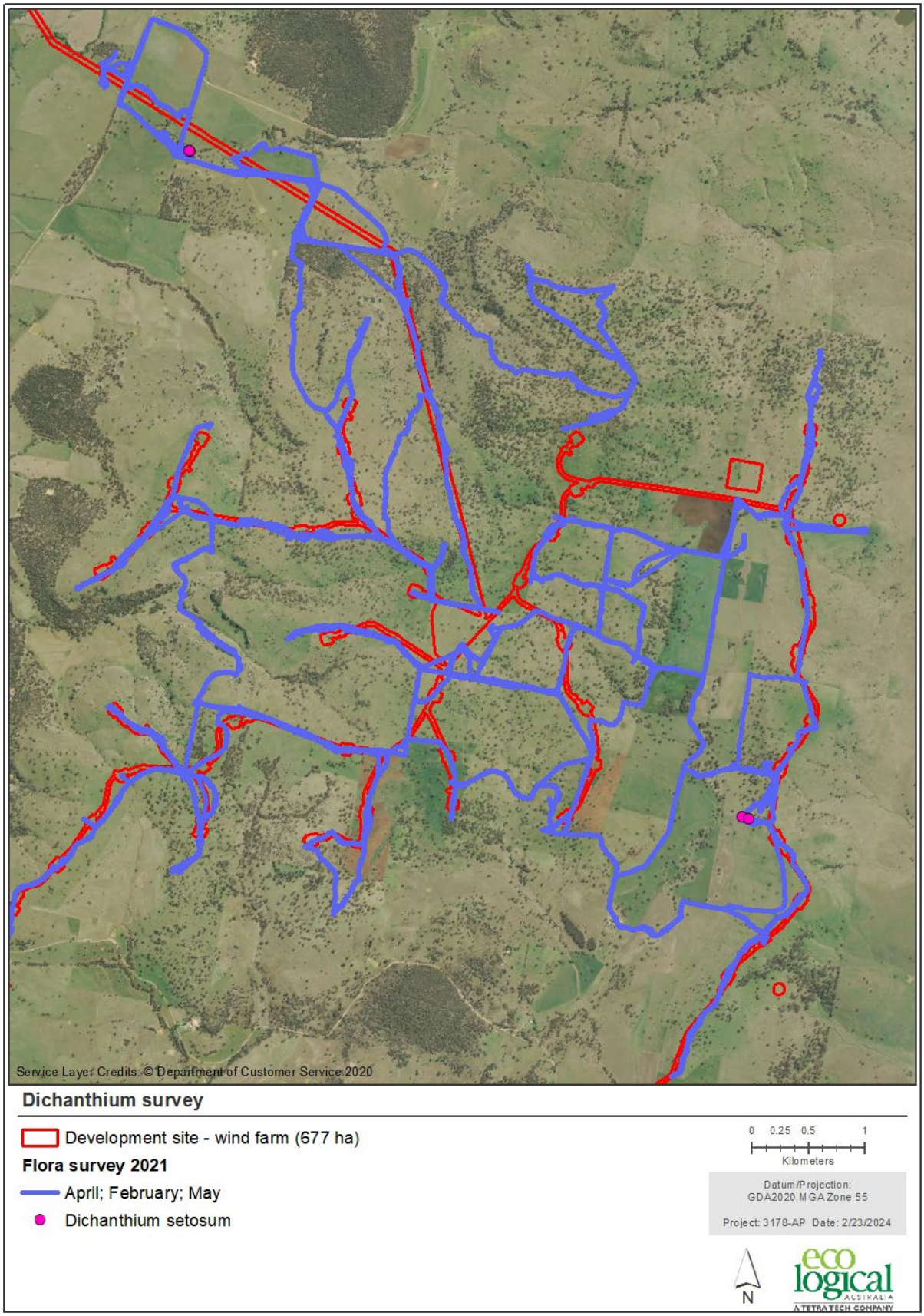


Figure 7: Dichanthium survey - Targeted flora surveys within the Girragulang Road cluster

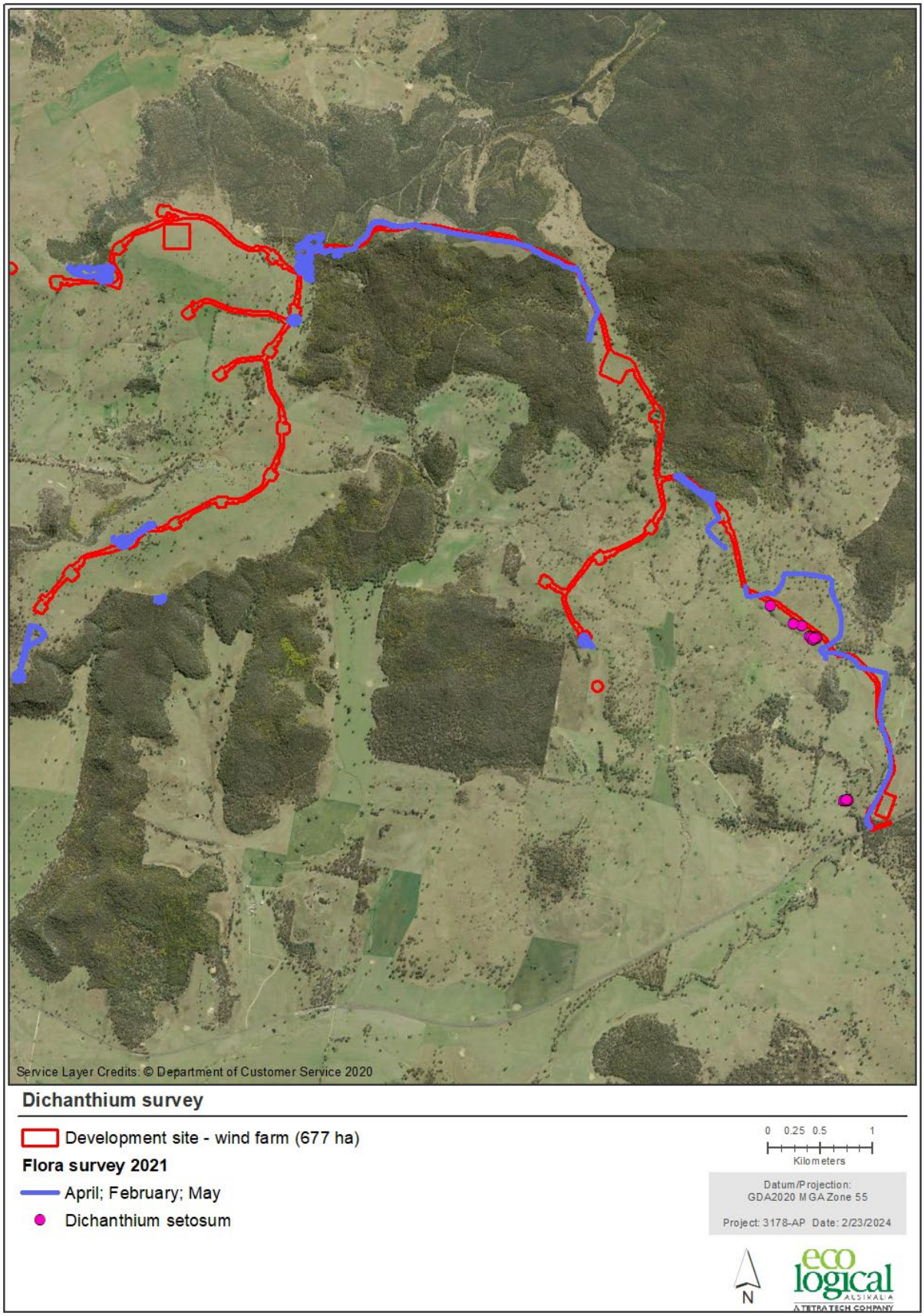


Figure 8: Dichanthium survey -Targeted flora surveys within the Leadville Road cluster

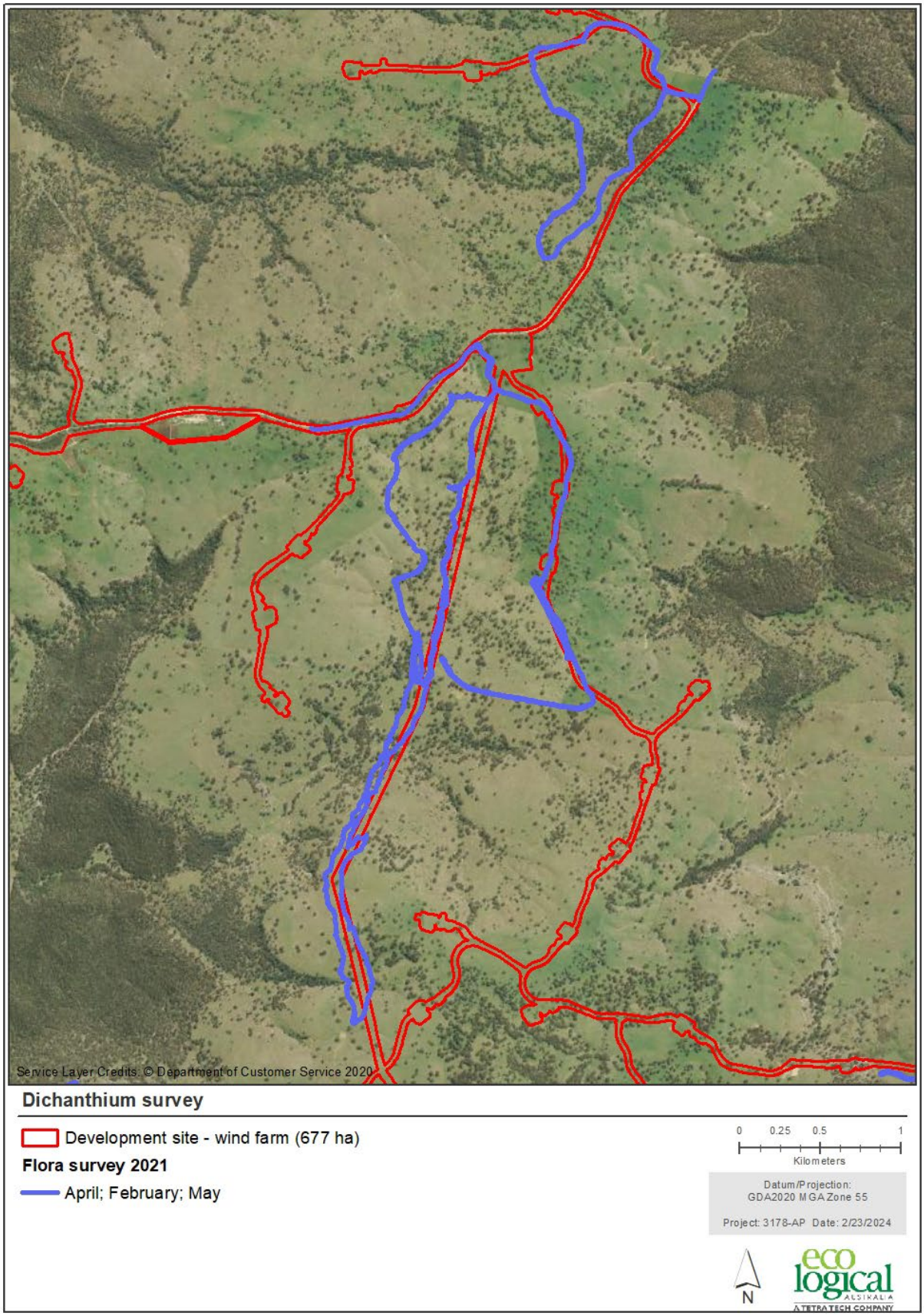


Figure 9: Dichanthium survey -Targeted flora surveys within the Mount Hope Road cluster

Photograph 2: Exotic dominated pastures within the northern portion of the Mount Hope cluster – not threatened flora habitat

Photograph 3: Exotic dominated pastures within the eastern portion of the Mount Hope cluster – not threatened flora habitat

Photograph 4: Exotic dominated pastures within the central portion of the Mount Hope cluster – not threatened flora habitat

Photograph 5: Exotic dominated pastures within the central portion of the Mount Hope cluster – not threatened flora habitat

Photograph 6: Exotic dominated pastures within the southern portion of the Mount Hope cluster – not threatened flora habitat

Photograph 7: Exotic dominated pastures within the north-western portion of the Mount Hope cluster – not threatened flora habitat

Photograph 8: Burned vegetation within Leadville cluster – potential threatened flora habitat and surveyed in appropriate seasons

Photograph 9: Exotic dominated pastures within the south-western portion of the Leadville cluster – not threatened flora habitat

Photograph 10: Exotic dominated pastures within the south-western portion of the Leadville cluster – not threatened flora habitat

Photograph 11: Exotic dominated pastures within the eastern portion of the Leadville cluster – not threatened flora habitat

Photograph 12: Exotic dominated pastures within the eastern portion of the Leadville cluster – not threatened flora habitat

Photograph 13: Exotic dominated pastures within the western portion of the Girragulang Road cluster – not threatened flora habitat

Photograph 14: Exotic dominated pastures within the transmission line easement between Girragulang Road and Mount Hope cluster – not threatened flora habitat

Photograph 15: Gully within the transmission line easement between Girragulang Road and Mount Hope cluster – potential threatened flora habitat and surveyed in appropriate seasons

12.1. Risk assessment for turbine strike risk

12.1 Complete a risk assessment for each turbine to predict which individual turbines and turbine arrays are at highest risk of striking birds and bats.

The risk assessment presented in the BDAR (ELA, 2023) has adopted, in full, the recommendations of the BCS provided on 30 June 2022. It is unclear why the BCS has now requested another strike assessment to be undertaken for individual turbines. Review of recently approved wind farms in NSW has identified that the risk and consequence values presented by ELA (Figure 10) are nearly identical to other risk matrices presented by other accredited assessors (Figure 11 to Figure 13), which the BCS did not seek to reform. Furthermore, the risk assessment used in BCWF (SSD-41743746) (the first NSW wind farm approved in 4 years) specifically cites the assessment undertaken by ELA for the Valley of the Winds as a recent framework for assessment.

Table 43 Consequence ratings for collision risk assessment

Consequence	Description
Severe	Extreme loss in numbers of individuals, leading to reduction in regional or state population viability for a period of at least 10 years
High	Major loss in numbers, leading to reduction in regional or state population viability for between five and ten years
Moderate	Moderate loss in numbers of individuals, leading to a minor reduction in localised or regional population viability for between one and five years
Low	Repeated loss of small numbers of individuals but no reduction in local or regional population viability
Negligible	Occasional individuals lost but no reduction in local or regional population viability

Figure 10: Consequence ratings applied to the Valley of the Winds assessment

Table 38: Consequence Criteria for Risk Event to occur

Negligible	Low	Moderate	High	Severe
Occasional individuals lost - no reduction in local or regional population viability	Repeated loss of small numbers of individuals but no significant reduction in local or regional population viability	Moderate loss in numbers of individuals leading to reduction in localised or regional population viability for 1-5 years	Major loss in numbers of individuals leading to reduction in regional or state population viability for 5-10 years	Extreme loss in numbers of individuals leading to reduction in regional and state population viability for a period of at least 10 years

Figure 11: Consequence ratings applied for BCWF

Consequence	Criteria
Negligible	Occasional individuals lost but no impact to the viability of the local or broader population.
Minimal	Repeated loss of small number but no impact to the viability of the local or broader population.
Moderate	Repeated loss of individuals that may cause changes to the local abundance of a species and affect the viability of the local or broader population.
Significant	Major loss of individuals that may cause changes to the regional or state population and affect the viability of the local or broader population.

Figure 12: Consequence ratings applied to HoGWF

Table 6-8. Consequence criteria

Consequence	Description
Negligible	Occasional individuals lost but no reduction in local or regional population viability
Minor	Repeated loss of small numbers of individuals but no reduction in local or regional population viability
Moderate	Moderate loss in numbers of individuals, leading to a minor reduction in localised or regional population viability for between one and five years
Major	Major loss in numbers, leading to reduction in regional or state population viability for between five and ten years
Critical	Extreme loss in numbers of individuals, leading to reduction in regional or state population viability for a period of at least 10 years

Figure 13: Consequence ratings applied to YDWF

When reviewing the information presented in Table 4 of the BCS advice on RTS, it is unclear how this criteria can be applied reasonably to the landscapes where wind farms are currently proposed in NSW. Analysis of the turbine strike likelihood indicates that 89.8% of the Central-West Orana Renewable Energy Zone (CWO-REZ) would result in a 'very likely' strike likelihood (Figure 14). This likelihood assessment does not appear to be reflected in the current knowledge of strike rates in NSW, and does not account for any design features (such as the turbine height and RSA), nor any local information gathered from field surveys.

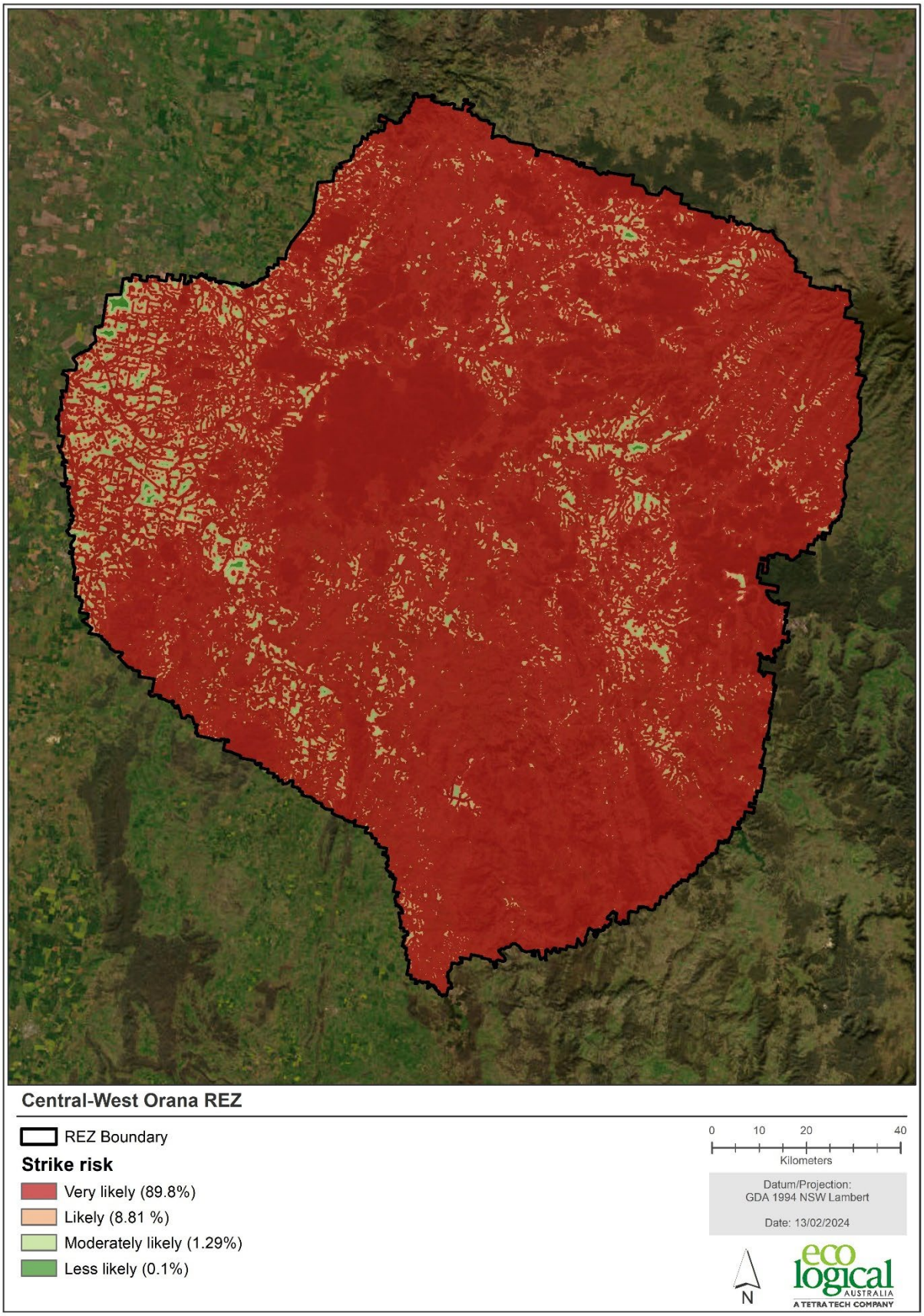


Figure 14: Central-West Orana REZ - Strike risk rating based on BCS

Given that this likelihood criteria cannot be reasonably applied to the project, and is inconsistent with industry standards, a more suitable turbine risk assessment is proposed, adapted from the qualitative assessment completed for HoGWF. This risk assessment considered the following elements when applying risk ratings to each turbine:

- Proximity of the RSA to retained woodland canopy (based on an assumed RSA of 90m and a canopy height of 15m)
- Proximity to closest adjacent wind turbine
- Proximity to hollow-bearing trees (nearest HBT)
- Proximity to nearest conservation area (NPWS Estate)
- Proximity to cliff features

Proximity of the RSA to woodland was calculated using the following equation:

$$Proximity\ to\ woodland = \left(\sqrt{\ }(x^2) + (y^2)\right) - 105$$

Whereby:

- X = rotor height (180m)
- Y = horizontal distance from WTG base to the closest patch of woodland/forest, for each turbine
- 105 is subtracted from the total, to exclude rotor length (90m), and tree height (15m)

Proximity of the RSA to clifflines was calculated using the following equation:

$$Proximity\ to\ cliffline = \left(\sqrt{\ }(x^2) + (y^2)\right) - 90$$

Whereby:

- X = rotor height (180m)
- Y = horizontal distance from WTG base to the closest cliffline feature, for each turbine
- 90 is subtracted from the total, to exclude rotor length (90m).

The assessor notes that all clifflines are below the ground level of WTGs, and therefore the proximity to cliffline estimate likely underestimates the true buffer distance.

This risk assessment applied the following framework to collision risk, based on the consideration of factors identified above:

- Very Low - Bird and Bat strike triggers considered very unlikely. Habitat buffers >100m. Adaptive management and monitoring of impact triggers may be required within the BBAMP
- Low – Bird and Bat strike triggers considered unlikely. Habitat buffers 65 – 100m. Adaptive management and monitoring of impact triggers may be required within the BBAMP
- Moderate - Bird and Bat strike triggers considered possible. Habitat buffer 35 – 65m. Stringent mitigation may be required pending adaptive management to be identified within the BBAMP
- High - Bird and Bat strike triggers considered probable. Habitat buffers <40m. Turbine location unsuitable. Stringent mitigation measures required prior to construction and detailed within BBAMP

Recent micrositing criteria for recently approved wind farms considers a mandatory buffer of 50m to habitat features (unless the approved WTG is already closer than 50m). For this assessment, an individual WTG with proximity further than 100m from a habitat feature was considered 'Very Low'.

The assessment identified that no RSA's are closer than 50m to any of the reviewed habitat features below. As such the risk rating has resulted in Very Low or Low for all WTGs. There are no Moderate or High WTGs within the final design.

The results of the risk assessment were compared to the risk ratings and buffer distances presented for the HoGWF (Figure 15), which was recently recommended for approval by DPHI in late 2023. HoGWF did not identify any WTGs as 'Very Low' strike risk across the Project. Comparison of buffer distance to clifflines between the two projects is not possible, as the HoGWF BDAR did not present this data.

A statistical analysis was undertaken on the 'low' ratings for each project to compare the relative buffer distance between project designs. Based on a t-test, the buffer distances between projects are significantly different ($P < 0.001$), with Valley of the Winds having on average 29m greater buffer distance for Low risk turbines.

No comparison has been made to BCWF (approved in February 2024), as the BDAR did not present individual turbine strike risk.

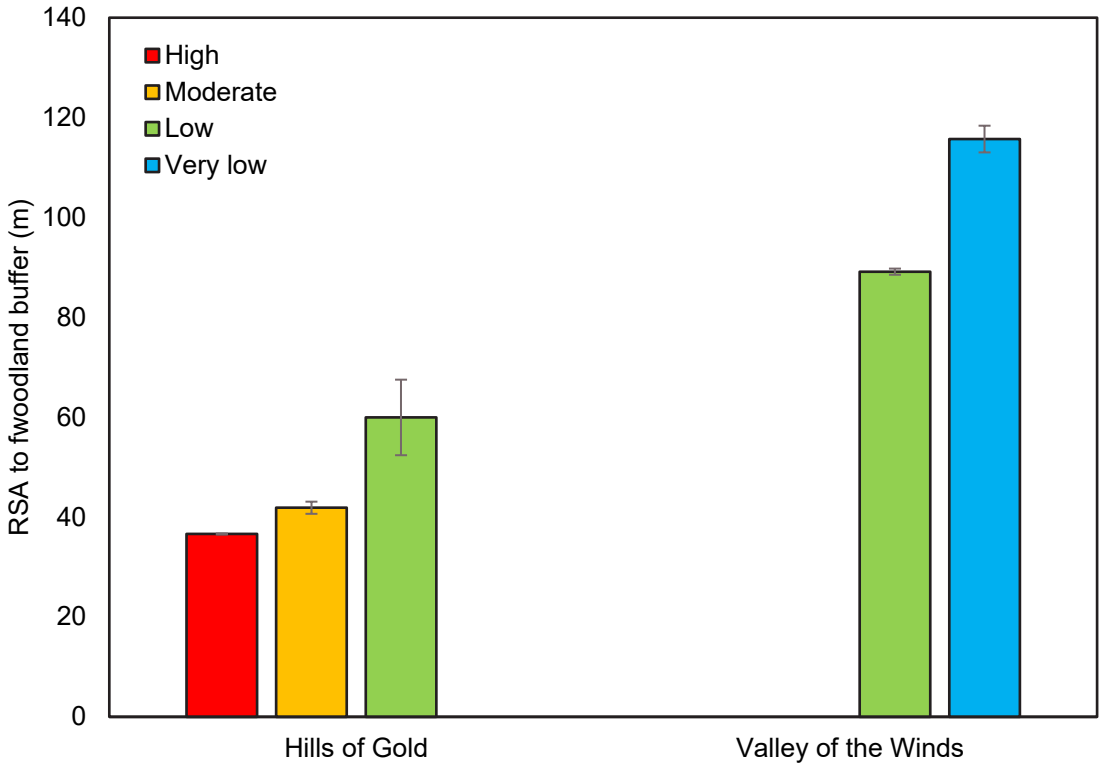


Figure 15: Buffer distance between rotor swept area (RSA) and woodland habitats, and the relative risk rating applied between Valley of the Winds Wind Farm and Hills of Gold Wind Farm

Table 7: Turbine strike risk assessment

Turbine ID	RSA to woodland (m)	Nearest adjacent WTG (m)	Nearest HBT (m)	Nearest cliff feature (m)	Nearest Conservation (nearest 000's m)	Risk rating
GR02	80	457	248	5035	13,000	Low
GR03	97	457	214	5116	12,000	Very Low
GR04	115	464	663	5267	13,000	Very Low
GR05	100	598	366	4816	13,000	Very Low
GR06	82	501	276	4693	14,000	Low
GR07	86	501	765	4916	14,000	Low
GR08	86	495	1738	4841	15,000	Low
GR09	84	487	1383	4775	15,000	Low
GR10	84	474	665	4949	16,000	Low
GR11	84	474	203	5199	16,000	Low
GR13	82	540	173	3090	14,000	Low
GR14	91	509	297	3137	15,000	Very Low
GR15	87	509	158	2964	15,000	Low
GR16	83	595	276	2703	16,000	Low
GR17	87	500	270	2343	16,000	Low
GR18	83	445	204	2722	17,000	Low
GR19	84	445	105	3063	17,000	Low
GR20	77	486	81	3325	17,000	Low
GR23	76	463	187	2213	15,000	Low
GR24	83	463	315	1926	16,000	Low
GR25	95	501	120	1618	16,000	Very Low
GR26	79	894	282	1437	17,000	Low
GR29	78	551	466	1721	16,000	Low
GR30	85	551	248	1748	16,000	Low
GR31	80	607	598	1173	16,000	Low
GR32	84	878	916	596	17,000	Low
GR33	83	581	220	825	18,000	Low
GR34	83	460	230	1392	18,000	Low
GR36	85	611	101	1483	17,000	Low
GR37	89	470	156	1036	17,000	Very Low
GR38	85	470	570	516	17,000	Low
GR40	86	379	795	1961	17,000	Low
GR41	82	379	404	1834	17,000	Low
GR42	86	542	238	1460	22,000	Low

Turbine ID	RSA to woodland (m)	Nearest adjacent WTG (m)	Nearest HBT (m)	Nearest cliff feature (m)	Nearest Conservation (nearest 000's m)	Risk rating
GR43	83	542	107	1814	22,000	Low
GR44	79	488	244	1866	17,000	Low
GR45	79	488	147	1355	17,000	Low
GR46	83	606	455	1045	18,000	Low
GR47	80	543	1413	262	23,000	Low
GR48	82	516	1116	480	22,000	Low
GR49	79	467	969	969	22,000	Low
GR50	86	467	1001	1313	22,000	Low
GR51	82	386	142	1679	18,000	Low
GR52	84	386	248	1963	19,000	Low
GR53	94	496	1248	4730	15,000	Very Low
LV03	97	696	199	2378	15,000	Very Low
LV04	111	699	248	1663	15,000	Very Low
LV05	84	561	189	1482	15,000	Low
LV06	81	561	394	1912	15,000	Low
LV07	92	573	174	2103	15,000	Very Low
LV08	104	1,121	134	1465	18,000	Very Low
LV09	83	428	105	368	23,000	Low
LV10	99	428	206	284	19,000	Very Low
LV11	77	463	117	256	19,000	Low
LV12	91	463	354	414	18,000	Very Low
LV13	91	493	832	835	18,000	Very Low
LV14	131	471	573	1330	20,000	Very Low
LV15	94	457	218	1216	19,000	Very Low
LV16	82	457	93	1010	18,000	Low
LV17	83	602	95	1455	18,000	Low
LV18	93	531	192	1597	19,000	Very Low
LV19	86	661	207	984	19,000	Low
LV20	91	687	683	337	21,000	Very Low
LV21	82	563	1002	187	20,000	Low
LV22	81	563	982	174	20,000	Low
LV23	88	466	1028	1350	18,000	Low
MH03	81	455	382	1859	21,000	Low
MH04	81	456	378	1846	19,000	Low
MH05	88	456	690	954	18,000	Low

Turbine ID	RSA to woodland (m)	Nearest adjacent WTG (m)	Nearest HBT (m)	Nearest cliff feature (m)	Nearest Conservation (nearest 000's m)	Risk rating
MH06	89	455	266	1471	19,000	Very Low
MH07	82	476	226	1163	19,000	Low
MH08	87	456	1136	1000	18,000	Low
MH09	106	459	898	811	18,000	Very Low
MH10	108	459	802	575	18,000	Very Low
MH11	81	463	1080	714	17,000	Low
MH12	94	545	695	1048	17,000	Very Low
MH15	91	867	1864	161	17,000	Low
MH16	121	545	1772	762	18,000	Very Low
MH17	94	545	1404	514	17,000	Very Low
MH18	107	533	1277	737	17,000	Very Low
MH19	136	533	1080	971	17,000	Very Low
MH20	111	559	578	1500	17,000	Very Low
MH21	82	1,083	95	786	16,000	Low
MH22	87	662	135	2150	16,000	Low
MH23	87	588	368	2041	16,000	Low
MH24	77	605	266	1461	16,000	Low
MH25	109	605	554	953	16,000	Very Low
MH26	82	588	415	1827	16,000	Low
MH27	77	493	876	558	15,000	Low
MH28	81	493	690	660	15,000	Low
MH29	82	607	692	1455	15,000	Low
MH31	78	468	225	1844	13,000	Low
MH32	77	468	110	1748	13,000	Low
MH33	93	528	112	1448	12,000	Very Low
MH37	82	653	258	1921	10,000	Low
MH38	87	653	205	1999	10,000	Low
MH39	77	744	296	2648	10,000	Low
MH41	80	527	129	2825	14,000	Low
MH42	76	484	448	3077	14,000	Low
MH43	94	484	109	3007	13,000	Very Low
MH44	81	486	225	2736	13,000	Low
MH46	95	595	493	1998	13,000	Very Low
MH47	82	593	496	2110	13,000	Low
MH48	79	593	173	1560	13,000	Low

Turbine ID	RSA to woodland (m)	Nearest adjacent WTG (m)	Nearest HBT (m)	Nearest cliff feature (m)	Nearest Conservation (nearest 000's m)	Risk rating
MH49	88	1,022	128	1184	12,000	Low
MH50	90	625	786	1684	12,000	Very Low
MH51	82	567	181	1874	13,000	Low
MH52	91	556	148	1766	13,000	Very Low
MH53	89	730	543	693	12,000	Very Low
MH54	84	924	423	211	12,000	Low
MH55	83	469	804	376	13,000	Low
MH56	83	469	327	435	13,000	Low
MH57	85	550	289	721	12,000	Low
MH58	85	600	195	1014	12,000	Low
MH59	88	882	872	693	12,000	Very Low
MH60	79	600	145	1507	11,000	Low
MH61	79	606	225	279	16,000	Low
MH64	83	482	752	1096	15,000	Low
MH65	84	482	280	814	15,000	Low
MH66	87	518	237	905	15,000	Low
MH67	89	519	251	750	14,000	Very Low
MH68	90	694	250	787	13,000	Very Low
MH69	81	752	529	309	13,000	Low
MH70	98	787	275	993	12,000	Very Low
MH71	88	552	399	680	11,000	Low
MH72	80	552	130	496	11,000	Low
MH74	90	682	365	364	13,000	Very Low
MH75	104	682	302	975	13,000	Very Low
MH76	80	1,071	343	698	12,000	Low
MH77	89	838	117	1248	12,000	Very Low
MH78	87	1,164	101	427	12,000	Low

12.2. Turbine-based risk assessment for birds and bats based on the ecology and behaviour of each species

12.2 Review the turbine-based risk assessment for birds and bats in consultation with BCS to more accurately reflect the impact of turbines on the ecology and behaviour of each species.

Noting BCS's concerns over strike risk for protected microbat species, ELA has applied the criteria from the BDAR (ELA, 2023) to each individual species identified onsite, as was undertaken for HoGWF (SSD-9679) in 2023. The updated strike assessment relating to microbats is presented in Appendix C.

This strike assessment considered:

- Foraging space
- Flight characteristic
- Foraging relative to canopy
- Evidence of strike in NSW

The risk assessment then applied these criteria to the existing risk assessment in Section 6.6 of the revised BDAR.

As a result of the risk assessment identified, all present microbat species were determined as being negligible or low impact.

BCS's Recommendations to the exhibited EIS that remain outstanding

3.1 Justification of plots for exclusion

3.1 Include all plots in the BAM-C or provide justification for their exclusion in the BDAR.

Discussion of inclusion of plots is detailed in response to Items 7.1-7.3 above.

4.1 Plot duplication across IBRA subregion boundaries

4.1 Revise the plot duplication method so that plots are not duplicated across IBRA subregion boundaries. For any plots which are proposed to be duplicated provide evidence that:

- *the vegetation zone within the IBRA subregion has been adequately sampled and is representative of the variability of condition that is present*
- *that the duplicated plot represents the highest vegetation integrity score likely to be present within the portion of the Project intersecting the relevant IBRA subregion.*

If this justification cannot be provided duplicated plots will need to duplicate benchmark condition.

Discussion of inclusion of plots is detailed in response to Items 7.1-7.3 above.

4.2 Plot duplication for review

4.2 Submit a plot duplication proposal for review.

Discussion of inclusion of plots is detailed in response to Items 7.1-7.3 above.

5.1 Justification of plot location

5.1 Provide justification on the use of plots that are not located in the Project footprint, including evidence that the plot is in the correct PCT and vegetation zone.

Discussion of inclusion of plots is detailed in response to Items 7.1-7.3 above.

21.1 Large-eared pied bat impacts

21.1. Clarify impacts to the large-eared pied bat.

Impacts to Large-eared Pied Bat are clarified in Item 10.2 above. The project will impact 3.92 ha of foraging habitats for the species.

22.1 Rocky habitat mapping for targeted reptile surveys

22.1 Provide mapping of rocky habitat so BCS can review the adequacy of targeted reptile surveys.

During September 2021, ELA conducted ten reptile searches (spread across all three wind turbine clusters), in accordance with the *Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities Working Draft* (DEC, 2004), which requires two 30 minute searches (on separate days) for every 200 ha of potential habitat (Figure 16). During September 2021, ELA conducted ten searches for threatened reptiles (approximately 500 rocks turned), within areas of suitable habitat.

A map of rocky habitat has been created and is provided in Figure 17, and supplied as a spatial file for review. The polygon has been developed in accordance with the TBDC, by mapping rocky habitat within the study area, and buffering by 50m to capture all associated PCTs for *Aprasia parapulchella* (Pink-tailed Legless Lizard). A total of 17.03 ha of potential habitat is present for the species. ELA notes that this 17.03 hectares of habitat is spread across multiple patches across the development site.

ELA notes that the 2004 DEC survey guidelines consider the patchy nature of habitats, and describes in Section 5.1:

"Where the same stratification unit is fragmented or naturally patchy in structure and distribution, the calculation of the number of sampling sites required for that unit treats the area of each patch cumulatively, ie. four 75 hectare patches are treated as 300 hectares for the calculation of sampling effort."

As such, the level of survey effort conducted is consistent with the survey guidelines at the time of field studies.

Table 5.4 Suggested survey methods and effort for reptiles

Method	Effort per stratification unit up to 100 hectares on the coast and ranges, and up to 200 hectares west of the ranges	Survey period
Habitat search	30-minute search on two separate days targeting specific habitat	November to March
Pitfall traps with drift nets	24 trap nights, preferably using six traps for a minimum of four consecutive nights	November to March
Spotlighting	30-minute search on two separate nights targeting specific habitat	November to March

Note: The survey period for *Aprasia parapulchella* (Pink-tailed Legless Lizard) in the TBDC and updated reptile guidelines (2022) is September – December.

Figure 16: Survey effort required for threatened reptiles (DEC, 2004).

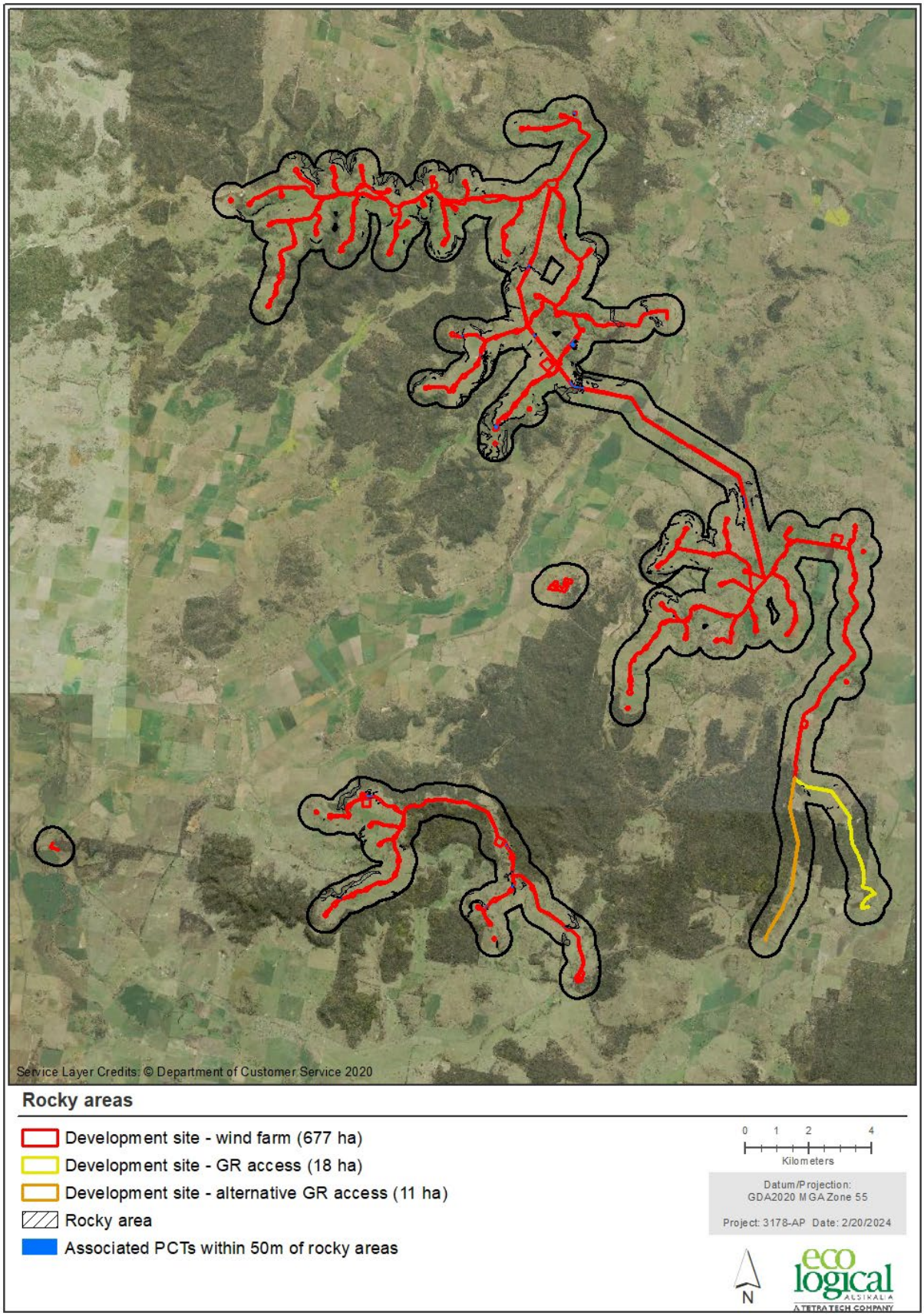


Figure 17: Rocky Areas - Rocky habitat within the study area

23.1 Targeted flora survey and grid points

23.1 Provide a spatial file of the grid points which were surveyed during targeted flora survey and display these grid points within the BDAR.

The survey points and paths have already been presented in the BDAR (ELA, 2023) and in the data package provided to BCS in 2023. The line file of search areas includes both spring and summer data.

Spring survey, which was conducted in September 2021, is only required in PCTs 84, 267, and 281, all of which were adequately covered by the surveys conducted by ELA. Spring survey represents approximately 252 hours of searching time across the project.

ELA has prepared several maps of the areas required for survey (Figure 18 to Figure 20). In addition to the minimum required effort, ELA also conducted surveys more broadly in spring for threatened flora (outside of associated PCTs). These areas are shown on Figure 20 to Figure 22. The spring survey effort significantly exceeds the requirements of the BAM, and no further survey is required.

Summer surveys, which includes the surveys for *Dichanthium setosum*, were conducted within suitable habitats across the study area. These surveys were conducted over 342 hours across the Project study area, targeting areas considered to comprise the most suitable habitat for the target species, across all three wind farm clusters (Figure 7 to Figure 9). Particular focus was given to sections of the study area that traversed sheltered slopes whereby the species is most likely to occur. Surveys did not focus on areas of exotic grassland, and sections of the Projectstudy area that were not surveyed were considered too degraded (in accordance with Section 5.2.3.2.a.ii of the BAM) for the species by the field team. This approach is consistent with other projects (HoGWF and YDWF), which have recently been approved.

Surveys were also conducted in areas nearby to known records within the Girragulang Road, in areas that are not considered suitable habitat, in order to confirm whether the species is more widespread within the development site. The species was not identified in any other locations within the development site.

Surveys in 2023 conducted by WSP for the Central-West Orana Renewable Energy Zone Transmission line (CWO TxL), identified *D. setosum* within their Biodiversity Study Area. These new records are within a similar gully to the location of identified individuals within the Girragulang Road and are approximately 70m outside the Valley of the Winds Project. WSP conducted an additional 41 searches within the Leadville and Girragulang Road Clusters without identifying the species at any other location.

As a precautionary measure, and noting the very patchy distribution of this species, ELA suggest including *D. setosum* as a micro siting consideration, as part of the pre-clearing surveys once the Project design has been refined. This would only apply in areas that have not been already searched as part of targeted surveys.

ELA notes that HoGWF identified *Tasmannia purpurascens* in two locations in close proximity to the infrastructure footprint for that project, and were not required by BCS to search the entire footprint.

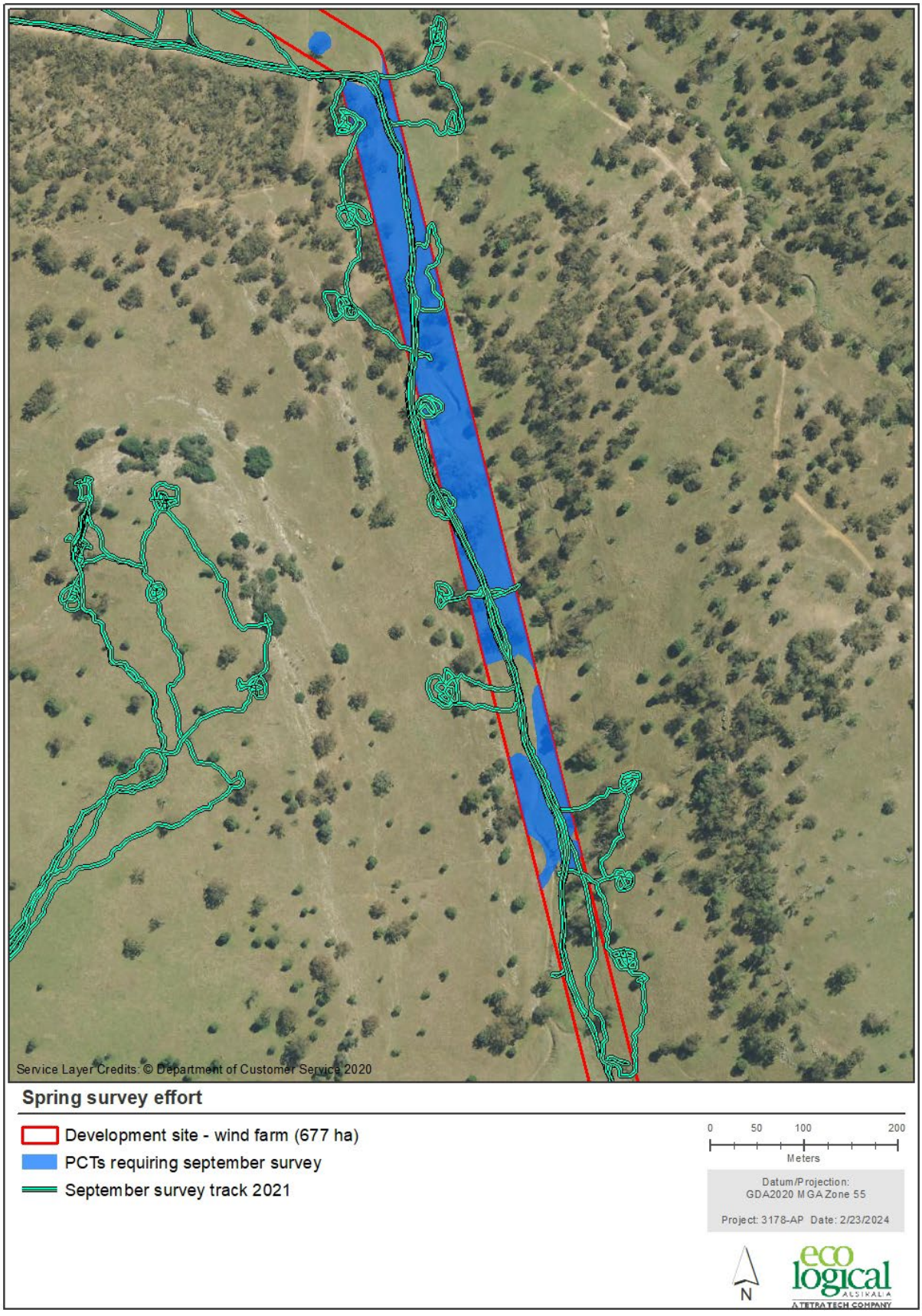


Figure 18: Spring survey effort - Spring flora survey within Girragulang Road cluster

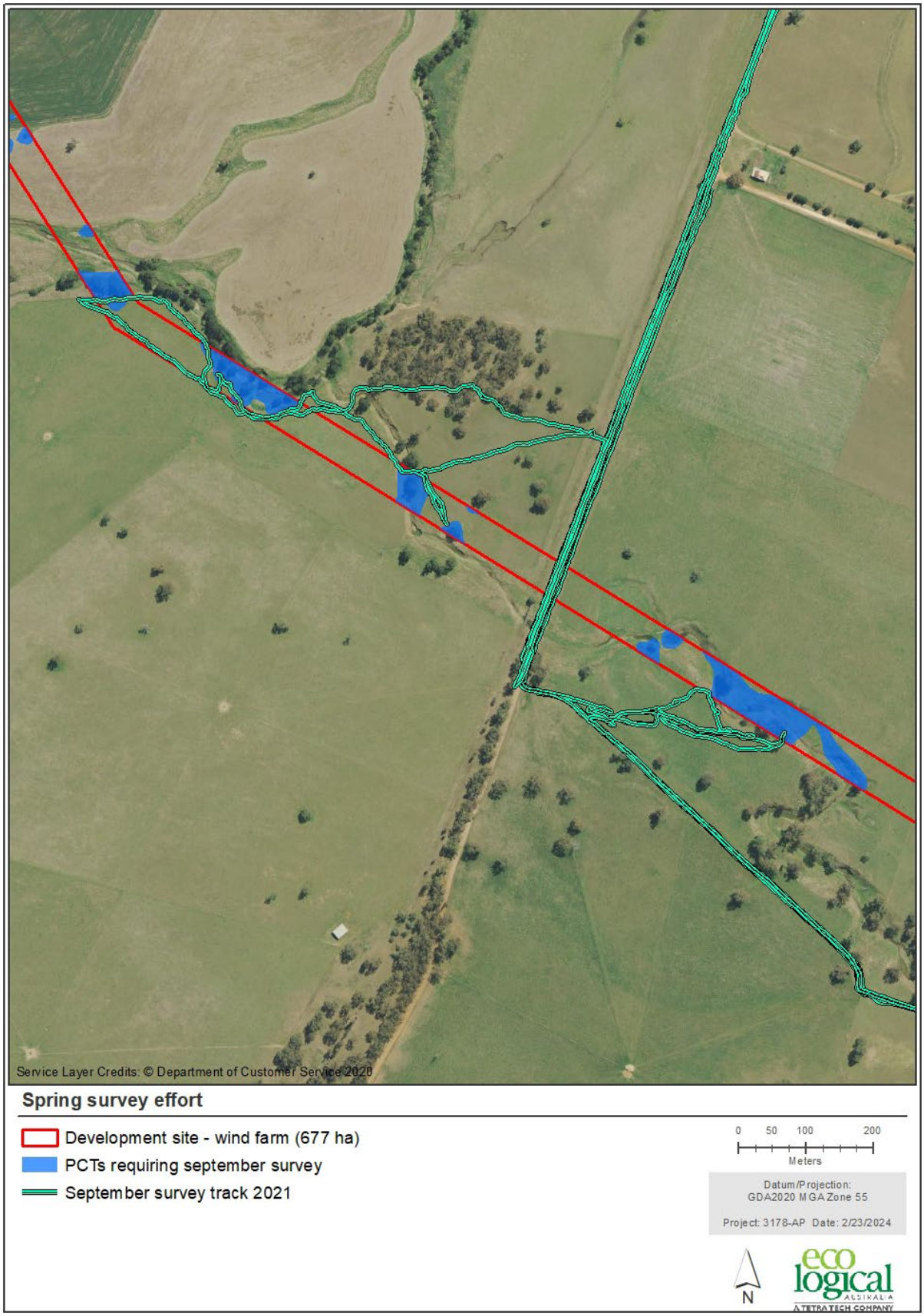


Figure 19: Spring survey effort - Spring flora survey along Girragulang Road – Mount Hope transmission line

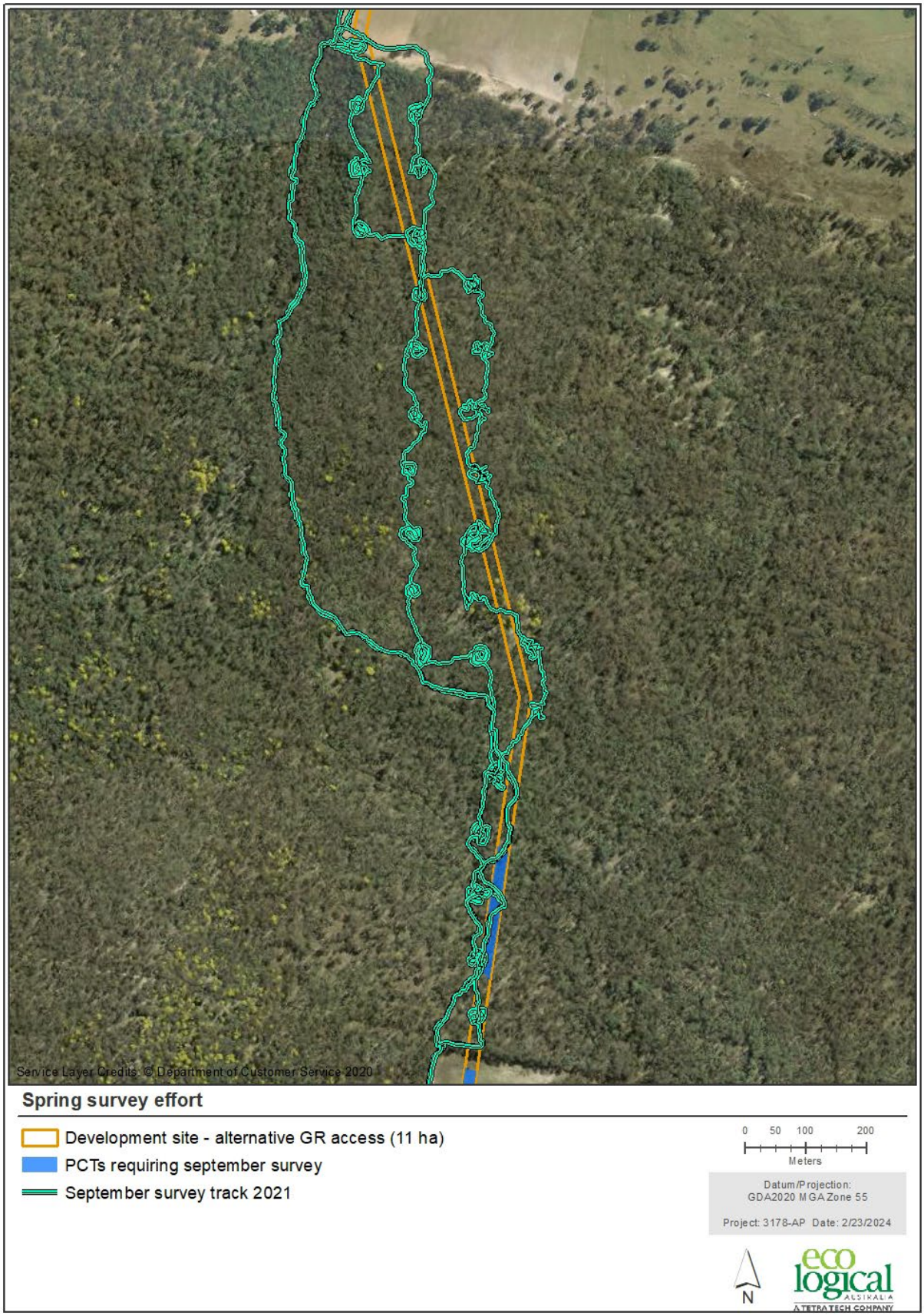


Figure 20: Spring survey effort - Spring flora survey in bushland along the Girragulang Road Alternative Access

Figure 21: Spring survey effort - Additional spring flora survey within Girragulng Road cluster

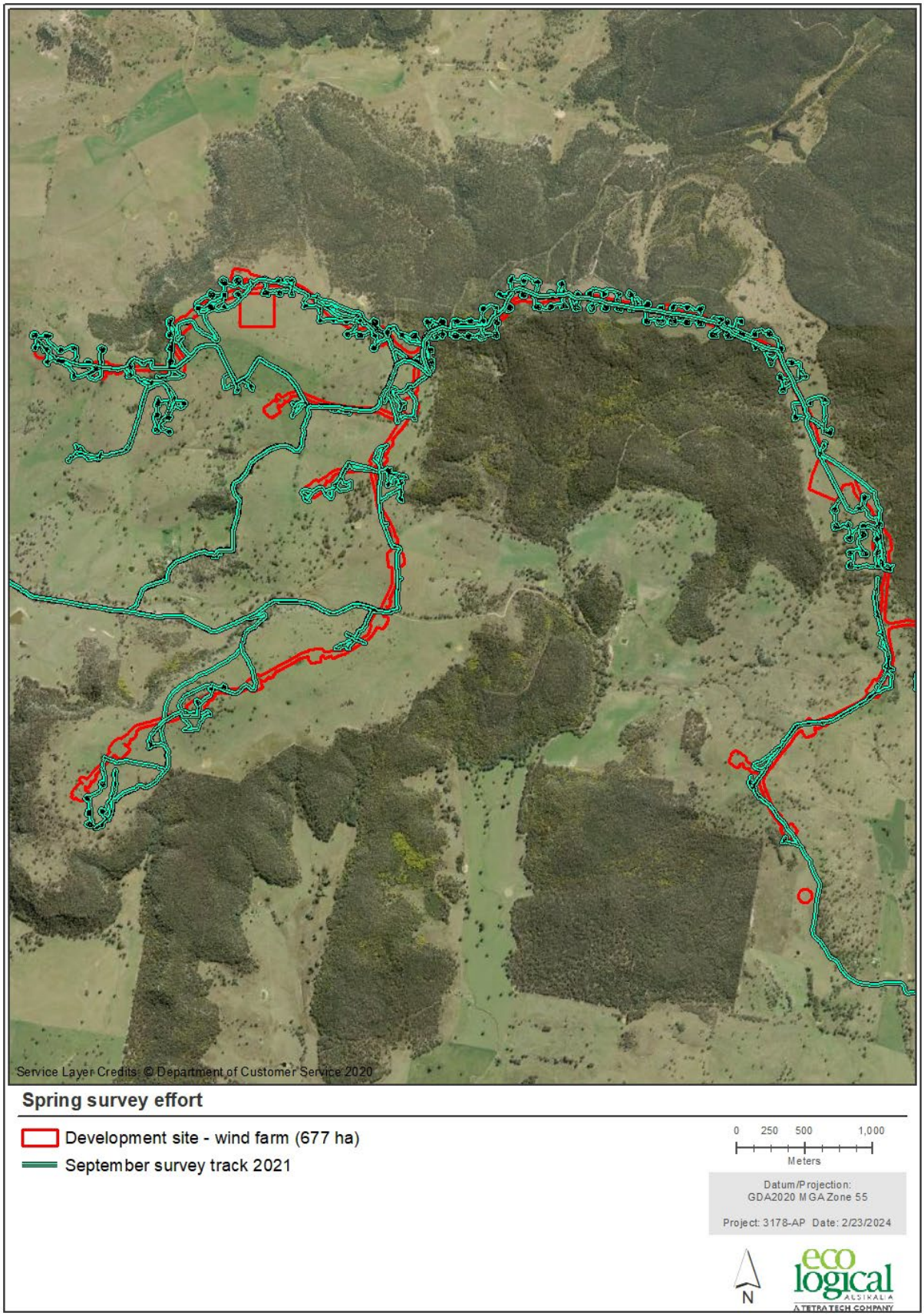


Figure 22: Spring survey effort - Additional spring flora survey within Leadville cluster

38.1 Review of bilateral assessment requirements

38.1 Review the guidance document provided in Attachment D of the BDAR review and provide a consistency table to facilitate review of bilateral assessment requirements.

A review of the guidance document has been completed and a consistency table (Table 8) has been provided to facilitate the review of the bilateral assessment requirements. Additionally, an EPBC Act Impact Assessment Summary table (Table 9) and EPBC Act Offsets Summary (Table 10) has also been developed to assist with ease of interpretation of the data for the bilateral assessment requirements.

Table 8: Bilateral assessment data requirements and response

Bilateral Assessment Information and Data Requirements	Data location/response
Background & Description of Action	
1. Descriptions and maps of the operational and construction footprints of the Project with regards to Matters of National Environmental Significance (MNES).	Revised BDAR (ELA, 2023), Figure 75
2. Descriptions and maps of staging and timing of the action that may impact on MNES.	Revised BDAR (ELA, 2023), Section 11.3 and Figure 3
3. Maps of the subject land boundary showing the final proposal and disturbance footprint with regards to MNES.	Revised BDAR (ELA, 2023), Figure 75
Submit GIS shapefiles of all maps that relate to MNES.	Attached
Landscape Context of the MNES	
Ensure that the 'Landscape Context' of BAM 2017 (section 4) or 'Establishing the site context' of BAM 2020 (section 3) have been fully met in the BDAR in relation to MNES.	Revised BDAR (ELA, 2023), Chapter 2
EPBC Act Listed Threatened Species and Communities	
1. Demonstration that field-based survey effort meets BCD survey guidelines and, where available, Commonwealth survey guideline.	Revised BDAR (ELA, 2023) as well as Section 22 of this response
2. Demonstration of access and use of supporting databases (e.g. NSW BioNet Vegetation Classification, NSW BioNet Threatened Biodiversity Data Collection, NSW BioNet Atlas, Commonwealth Species Profile and Threats Database search results	Revised BDAR (ELA, 2023), Section 11.3
3. Demonstration of access and use of published peer-reviewed literature	Revised BDAR (ELA, 2023), Section 11.3 and Section 12
4. Demonstration of access and use of local data (if relevant)	N/A
5. Demonstration of appropriate mapping of all EPBC Act-listed threatened species and communities in accordance with the relevant Commonwealth listing advice.	Revised BDAR (ELA, 2023), Chapter 3 and Chapter 4
6. Demonstration of consideration of important populations and critical habitat as defined in Approved Listing Advice, Approved Conservation Advice and Recovery Action Plans.	Revised BDAR (ELA, 2023), Section 11.3

Bilateral Assessment Information and Data Requirements	Data location/response
7. A list of all EPBC Act listed threatened species and communities that occur on the subject land, or in the vicinity (including species that are 'ecosystem credits' in BAM)	Revised BDAR (ELA, 2023), Section 11.3 and Table 9 and 10 of this letter
8. A discussion, with data and analysis where any species and communities identified by the Department of Climate Change, Energy, the Environment and Water (DCCEEW) referral documents have been ruled out as occurring on or near the subject site.	Revised BDAR (ELA, 2023), Section 11.3
Avoidance, Minimisation, Mitigation and Management	
The demonstration of all feasible alternatives and efforts to avoid and minimise impacts on EPBC Act listed threatened species and communities (including direct, indirect and prescribed impacts) including an analysis of alternative: a. designs and engineering solutions b. modes or technologies c. routes and locations of facilities d. sites within the subject site e. the identification of any other site constraints in determining the location and design of the proposal (such as bushfire protection requirements, flood planning levels, servicing constraints, etc).	Revised BDAR (ELA, 2023), Chapter 7
A discussion and justification of all feasible impact avoidance, minimisation, and management all feasible alternatives and efforts to avoid and manage impacts (including adaptive management) Provide feasible measures to mitigate and/or manage impacts on EPBC Act listed threatened species and communities (including direct, indirect and prescribed impacts) including: a. techniques, timing, frequency and responsibility b. identify measures for which there is risk of failure c. evaluate the risk and consequence of any residual impacts d. any adaptive management strategy proposed to monitor and respond to impacts.	Revised BDAR (ELA, 2023), Chapter 7
Impact Assessment	
1. Identification of the residual adverse impacts likely to occur to each EPBC Act listed threatened species and/or community after the proposed avoidance and mitigation measures are taken into account.	Revised BDAR (ELA, 2023), Chapter 8 and Section 11.3
2. Justification and evidence for the predicted level of impact, with reference to the Commonwealth's Significant Impact Guideline and DPIE's 'Guidance to Assist a Decision-Maker to Determine a Serious and Irreversible Impact (SAII)'	Revised BDAR (ELA, 2023), Section 11.3
3. Provide a summary table with the following information:	Information is provided in Table 9 below.

Bilateral Assessment Information and Data Requirements	Data location/response

Name of EPBC Act listed entity	Nature & consequence of impact (direct & indirect)	Duration of impact (e.g. construction, operation, life of project)	Quantum of impact	Consequence of impact (local, state & national scales)	Impact requires offsetting? (significant or not)

4. Provide data and justification where any EPBC Act-listed threatened species or communities to be considered in the BDAR are considered to be at low risk of impact during the assessment.	Revised BDAR (ELA, 2023), Chapters 6, 7, and 8, and Section 11.3
5. For projects that DCCEEW considers that MNES have been significantly impacted by the 2019-2020 bushfires additional assessment is required. Those MNES will be identified in DCCEEW's 'Decision on referral'. The proponent must discuss in the EIS whether any additional bushfire impacts to those MNES were significant, and also whether any other local MNES were significantly impacted by those fires.	Not applicable
Offsets	
1. The identification of any MNES that haven't been offset using the BAM	All MNES are offset. See Table 9 and table 10 below.
2. Details of how impacts requiring offset corelate to the MNES impacts	All MNES are offset. See Table 9 and table 10 below.
3. Details of the Plant Community Types that require offsetting and the number and type of ecosystem credits required for impacts to MNES	All MNES are offset. See Table 9 and table 10 below.
4. Details of threatened species requiring offset and the number of species credits required for impacts to MNES	All MNES are offset. See Table 9 and table 10 below.
5. A demonstration of the correct uses the BAM (and BAM calculator) to identify the number and class of biodiversity credits that need to be offset to achieve a standard of 'no net loss' of biodiversity	All MNES are offset. See Table 9 and table 10 below..
6. Any details of ecological rehabilitation and/or biodiversity conservation actions proposed for offsetting	All offsets will be provided in accordance with s6.2 of the NSW *Biodiversity Conservation Regulation 2017* and limited by the provisions of s6.6A of that regulation
7. The identification of any other offsetting approach proposed, such as land-based offsets, retiring credits by payment into the Biodiversity Conservation Fund and/or through supplementary measures	All offsets will be provided in accordance with s6.2 of the NSW *Biodiversity Conservation Regulation 2017* and limited by the provisions of s6.6A of that regulation
8. Provide a summary table with the following information:	Information is provided in Table 9 below.

Threatened Species / Community listed under EPBC Act	PCTs associated with the ecosystem credit species / ecological community (if applicable)	Area of Impact (ha)	Credits Required	Offsetting Approach	Reference (EIS/BDAR)
TOTAL					

Bilateral Assessment Information and Data Requirements	Data location/response
Other considerations	
1. Consideration of all relevant Commonwealth guidelines and policy statements that are appliable to the action and listed threatened species and/or communities, including but not limited to: a. International environmental obligations b. Recovery Plans c. Approved Conservation Advice d. Threat Abatement Plans	Revised BDAR (ELA, 2023), Section 11.3
2. An assessment for each EPBC Act listed threatened species and/or community, that has been informed by applicable Commonwealth guidelines and/or policy statements. For example, the interaction between the proposed action and important populations or critical habitat identified in policy documents and/or the interaction between the proposed action and threatening processes or recommended conservation actions outlined in Commonwealth policies and plans.	Revised BDAR (ELA, 2023), Section 11.3

Table 9: EPBC Act Impact Assessment Summary

Entity type	Species name	Name of EPBC Act listed entity	BAM assessment entity or type	EPBC Act	Nature & consequence of impact (direct & indirect)	Duration of impact	Quantum of impact	Consequence of impact	Impact requiring offsetting
Community	-	Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	PCT 267	Endangered	Community identified within the alternative access route to Girragulang Road cluster. Direct impacts: clearing of vegetation. Indirect impacts: potential impacts to retained vegetation through edge effects, sedimentation or erosion and weed incursion.	Direct and indirect impacts may occur during the construction phase and across the lifetime of the Project.	Direct impacts to a total area of 4.71 ha (comprising 0.67 ha of Woodland and 4.04 ha of DNG).	Reduction in the extent of the ecological community through clearing of vegetation and potential reduction in the quality of retained vegetation due to potential indirect impacts.	Like-for-like ecosystem credits comprising: 77 credits for PCT 267
Community	-	White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	PCT 281, PCT 483	Critically Endangered	Community identified within the study area. Direct impacts: clearing of vegetation. Indirect impacts: potential impacts to retained vegetation through edge effects, sedimentation or erosion and weed incursion.	Direct and indirect impacts may occur during the construction phase and across the lifetime of the Project.	Direct impacts to a total area of 34.15 ha woodland	Reduction in the extent of the ecological community through clearing of vegetation and potential reduction in the quality of retained vegetation due to potential indirect impacts.	Like-for-like ecosystem credits comprising: 542 credits for PCT 483 and 195 credits for PCT 281.
Fauna	*Chalinolobus dwyer*	Large-eared Pied Bat	Species credit	Vulnerable	Species identified within the study area. Direct impacts: The proposed action is estimated to reduce the extent of potential foraging habitat for this species. Indirect impacts: Species may be indirectly impacted by edge effects and disturbance during construction. Prescribed impacts: As the proposed action is a wind farm, all microbats are at risk of blade strike.	Direct and indirect impacts may occur across the lifetime of the Project. Prescribed impacts will potentially occur during the operational phase of the Project.	Removal of habitat covering a total area of 3.92 ha.	Loss of potential foraging habitat through clearing of vegetation and potential reduction in the quality of habitat due to potential indirect impacts. Potential impacts to local species population due to prescribed impacts.	Species credits for foraging habitat comprising: 191 credits
Fauna	*Nyctophilus corbeni*	Corben's Long-eared Bat	Ecosystem Credit Species	Vulnerable	This species was identified by the Commonwealth for assessment in the referral decision. Species assessed in accordance with the BAM and retained as Ecosystem credit species. This species was not identified during field surveys. Direct impacts: The proposed action is estimated to reduce the extent of potential habitat for this species. Indirect impacts: Species may be indirectly impacted by edge effects and disturbance during construction. Prescribed impacts: As the proposed action is a wind farm, all microbats are at risk of blade strike.	Direct and indirect impacts may occur across the lifetime of the Project. Prescribed impacts will potentially occur during the operational phase of the Project.	Removal of habitat surrogates (PCTs 84 and 267) covering a total area of 5.77 ha.	Loss of potential habitat through clearing of vegetation and potential reduction in the quality of habitat due to potential indirect impacts. Potential impacts to local species population due to prescribed impacts.	Ecosystem credits for habitat using associated PCTs as surrogates comprising: 12 credits for PCT 84 and 77 credits for PCT 267 (if alternative access to GR selected).

Entity type	Species name	Name of EPBC Act listed entity	BAM assessment entity or type	EPBC Act	Nature & consequence of impact (direct & indirect)	Duration of impact	Quantum of impact	Consequence of impact	Impact requiring offsetting
Fauna	*Callocephalon fimbriatum*	Gang-gang Cockatoo	Dual Credit Species	Endangered	This species was not identified by the Commonwealth as requiring assessment in the referral decision. Species assessed in accordance with the BAM. Retained as Ecosystem credit species for potential foraging habitat. Species removed from consideration as species credit species as no Gang-gang Cockatoo were detected during the extensive survey conducted across the Study Area. Direct impacts: The proposed action is estimated to reduce the extent of potential foraging habitat for this species. Indirect impacts: Species may be indirectly impacted by edge effects and disturbance during construction. Prescribed impacts: As the proposed action is a wind farm, all avifauna are at risk of blade strike.	Direct and indirect impacts may occur across the lifetime of the Project. Prescribed impacts will potentially occur during the operational phase of the Project.	Removal of habitat surrogates (PCTs 281 and 267) covering a total area of 9.26 ha.	Loss of potential foraging habitat through clearing of vegetation and potential reduction in the quality of foraging habitat due to potential indirect impacts. Potential impacts to local species population due to prescribed impacts.	Ecosystem credits for foraging habitat using associated PCTs as surrogates comprising: 599 credits for PCT 281 and 77 credits for PCT 267.
Fauna	*Falco hypoleucos*	Grey Falcon	Ecosystem Credit Species	Vulnerable	This species was not identified by the Commonwealth for assessment in the referral decision. Species assessed in accordance with the BAM and retained as Ecosystem credit species. This species was not identified during field surveys. Direct impacts: The proposed action is estimated to reduce the extent of potential habitat for this species. Indirect impacts: Species may be indirectly impacted by edge effects and disturbance during construction. Prescribed impacts: As the proposed action is a wind farm, all avifauna are at risk of blade strike.	Direct and indirect impacts may occur across the lifetime of the Project. Prescribed impacts will potentially occur during the operational phase of the Project.	Removal of habitat surrogates (PCT 84) covering a total area of 1.06 ha.	Loss of potential habitat through clearing of vegetation and potential reduction in the quality of habitat due to potential indirect impacts. Potential impacts to local species population due to prescribed impacts.	Ecosystem credits for habitat using associated PCTs as surrogates comprising: 12 credits for PCT 84.
Fauna	*Pteropus poliocephalus*	Grey-headed Flying Fox	Dual Credit Species	Vulnerable	This species was identified by the Commonwealth for assessment in the referral decision. Species assessed in accordance with the BAM. Retained as Ecosystem credit species for potential foraging habitat. Species removed from consideration as species credit species as no camps were detected within the Study Area. Direct impacts: The proposed action is estimated to reduce the extent of potential foraging habitat for this species. Indirect impacts: Species may be indirectly impacted by edge effects and disturbance during construction. Prescribed impacts: As the proposed action is a wind farm, all megabats are at risk of blade strike.	Direct and indirect impacts may occur across the lifetime of the Project. Prescribed impacts will potentially occur during the operational phase of the Project.	Removal of habitat surrogates (PCTs 281, 267 and 84) covering a total area of 22.69 ha.	Loss of potential foraging habitat through clearing of vegetation and potential reduction in the quality of habitat due to potential indirect impacts. Potential impacts to local species population due to prescribed impacts.	Ecosystem credits for foraging habitat using associated PCTs as surrogates comprising: 599 credits for PCT 281, 77 credits for PCT 267 and 12 credits for PCT 84.

Entity type	Species name	Name of EPBC Act listed entity	BAM assessment entity or type	EPBC Act	Nature & consequence of impact (direct & indirect)	Duration of impact	Quantum of impact	Consequence of impact	Impact requiring offsetting
Fauna	*Lophochroa leadbeateri*	Major Mitchell's Cockatoo	Dual Credit Species	Endangered	This species was not identified by the Commonwealth as requiring assessment in the referral decision. Species assessed in accordance with the BAM. Retained as Ecosystem credit species for potential foraging habitat. Species removed from consideration as species credit species as no Major Mitchell's Cockatoo were detected during the extensive survey conducted across the Study Area. Direct impacts: The proposed action is estimated to reduce the extent of potential foraging habitat for this species. Indirect impacts: Species may be indirectly impacted by edge effects and disturbance during construction. Prescribed impacts: As the proposed action is a wind farm, all avifauna are at risk of blade strike.	Direct and indirect impacts may occur across the lifetime of the Project. Prescribed impacts will potentially occur during the operational phase of the Project.	Removal of habitat surrogates (PCT 84) covering a total area of 1.06 ha.	Loss of potential foraging habitat through clearing of vegetation and potential reduction in the quality of habitat due to potential indirect impacts. Potential impacts to local species population due to prescribed impacts.	Ecosystem credits for foraging habitat using associated PCTs as surrogates comprising: 12 credits for PCT 84.
Fauna	*Grantiella picta*	Painted Honeyeater	Ecosystem Credit Species	Vulnerable	This species was identified by the Commonwealth for assessment in the referral decision. Species assessed in accordance with the BAM and retained as Ecosystem credit species. This species was not identified during field surveys. Direct impacts: The proposed action is estimated to reduce the extent of potential habitat for this species. Indirect impacts: Species may be indirectly impacted by edge effects and disturbance during construction. Prescribed impacts: As the proposed action is a wind farm, all avifauna are at risk of blade strike.	Direct and indirect impacts may occur across the lifetime of the Project. Prescribed impacts will potentially occur during the operational phase of the Project.	Removal of habitat surrogates (PCT 84, 267, 281, 479 and 483) covering a total area of 643.52 ha.	Loss of potential habitat through clearing of vegetation and potential reduction in the quality of habitat due to potential indirect impacts. Potential impacts to local species population due to prescribed impacts.	Ecosystem credits for habitat using associated PCTs as surrogates comprising: 12 credits for PCT 84, 77 credits for PCT 267, 599 credits for PCT 281, 420 credits for PCT 479 and 542 credits for PCT 483.
Fauna	*Anthochaera phrygia*	Regent Honeyeater	Dual Credit Species	Critically Endangered	This species was identified by the Commonwealth for assessment in the referral decision. Species assessed in accordance with the BAM. Retained as Ecosystem credit species for potential foraging habitat. Species removed from consideration as species credit species as there is no mapped important areas within the Study Area. This species was not detected during extensive field surveys. Direct impacts: The proposed action is estimated to reduce the extent of potential foraging habitat for this species. Indirect impacts: Species may be indirectly impacted by edge effects and disturbance during construction. Prescribed impacts: As the proposed action is a wind farm, all avifauna are at risk of blade strike.	Direct and indirect impacts may occur across the lifetime of the Project. Prescribed impacts will potentially occur during the operational phase of the Project.	Removal of habitat surrogates (PCT 84, 267, 281, 479 and 483) covering a total area of 643.52 ha.	Loss of potential habitat through clearing of vegetation and potential reduction in the quality of habitat due to potential indirect impacts. Potential impacts to local species population due to prescribed impacts.	Ecosystem credits for foraging habitat using associated PCTs as surrogates comprising: 12 credits for PCT 84, 77 credits for PCT 267, 599 credits for PCT 281, 420 credits for PCT 479 and 542 credits for PCT 483.

Entity type	Species name	Name of EPBC Act listed entity	BAM assessment entity or type	EPBC Act	Nature & consequence of impact (direct & indirect)	Duration of impact	Quantum of impact	Consequence of impact	Impact requiring offsetting
Fauna	*Dasyurus maculatus*	Spotted-tailed Quoll	Ecosystem Credit Species	Endangered	This species was identified by the Commonwealth for assessment in the referral decision. Species assessed in accordance with the BAM and retained as Ecosystem credit species. This species was not identified during field surveys. Direct impacts: The proposed action is estimated to reduce the extent of potential habitat for this species. Indirect impacts: Species may be indirectly impacted by edge effects and disturbance during construction.	Direct and indirect impacts may occur across the lifetime of the Project.	Removal of habitat surrogates (PCT 84, 267 and 281) covering a total area of 22.69 ha.	Loss of potential habitat through clearing of vegetation and potential reduction in the quality of habitat due to potential indirect impacts.	Ecosystem credits for habitat using associated PCTs as surrogates comprising: 12 credits for PCT 84, 77 credits for PCT 267 and 599 credits for PCT 281.
Fauna	*Polytelis swainsonii*	Superb Parrot	Dual Credit Species	Vulnerable	This species was identified by the Commonwealth as requiring assessment in the referral decision. Species assessed in accordance with the BAM. Retained as Ecosystem credit species for potential foraging habitat. Species removed from consideration as species credit species as no Superb Parrots were detected during the extensive survey conducted across the Study Area. Direct impacts: The proposed action is estimated to reduce the extent of potential foraging habitat for this species. Indirect impacts: Species may be indirectly impacted by edge effects and disturbance during construction. Prescribed impacts: As the proposed action is a wind farm, all avifauna are at risk of blade strike.	Direct and indirect impacts may occur across the lifetime of the Project. Prescribed impacts will potentially occur during the operational phase of the Project.	Removal of habitat surrogates (PCT 84, 267 and 281) covering a total area of 9.16 ha.	Loss of potential foraging habitat through clearing of vegetation and potential reduction in the quality of habitat due to potential indirect impacts. Potential impacts to local species population due to prescribed impacts.	Ecosystem credits for foraging habitat using associated PCTs as surrogates comprising:12 credits for PCT 84, 77 credits for PCT 267 and 599 credits for PCT 281.
Fauna	*Lathamus discolor*	Swift Parrot	Dual Credit Species	Critically Endangered; Marine	This species was identified by the Commonwealth for assessment in the referral decision. Species assessed in accordance with the BAM. Retained as Ecosystem credit species for potential foraging habitat. Species removed from consideration as species credit species as there is no mapped important areas within the Study Area. This species was not detected during extensive field surveys. Direct impacts: The proposed action is estimated to reduce the extent of potential foraging habitat for this species. Indirect impacts: Species may be indirectly impacted by edge effects and disturbance during construction. Prescribed impacts: As the proposed action is a wind farm, all avifauna are at risk of blade strike.	Direct and indirect impacts may occur across the lifetime of the Project. Prescribed impacts will potentially occur during the operational phase of the Project.	Removal of habitat surrogates (PCT 84, 267, 281, 479 and 483) covering a total area of 643.52 ha.	Loss of potential foraging habitat through clearing of vegetation and potential reduction in the quality of habitat due to potential indirect impacts. Potential impacts to local species population due to prescribed impacts.	Ecosystem credits for foraging habitat using associated PCTs as surrogates comprising: 12 credits for PCT 84, 77 credits for PCT 267, 599 credits for PCT 281, 420 credits for PCT 479 and 542 credits for PCT 483.

Entity type	Species name	Name of EPBC Act listed entity	BAM assessment entity or type	EPBC Act	Nature & consequence of impact (direct & indirect)	Duration of impact	Quantum of impact	Consequence of impact	Impact requiring offsetting
Fauna	*Hirundapus caudacutus*	White-throated Needletail	Ecosystem Credit Species	Vulnerable; Marine; Migratory (CAMBA, JAMBA, ROKAMBA)	This species was identified by the Commonwealth for assessment in the referral decision. Species assessed in accordance with the BAM and retained as Ecosystem credit species. This species was identified in the study area during field surveys. Further assessment has been undertaken. Direct impacts: The proposed action is estimated to reduce the extent of potential habitat for this species. Indirect impacts: Species may be indirectly impacted by edge effects and disturbance during construction. Prescribed impacts: As the proposed action is a wind farm, all avifauna are at risk of blade strike.	Direct and indirect impacts may occur across the lifetime of the Project. Prescribed impacts will potentially occur during the operational phase of the Project.	Removal of habitat surrogates (PCT 84, 267, 281, 479 and 483) covering a total area of 643.52 ha.	Loss of potential habitat through clearing of vegetation and potential reduction in the quality of habitat due to potential indirect impacts. Potential impacts to local species population due to prescribed impacts.	Ecosystem credits for foraging habitat using associated PCTs as surrogates comprising: 12 credits for PCT 84, 77 credits for PCT 267, 599 credits for PCT 281, 420 credits for PCT 479 and 542 credits for PCT 483.

Table 10 EPBC Act Offsets Summary

Name of EPBC Act listed entity	PCTs Associated	Area of Impact	Credits required	Offsetting approach	Reference
Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	PCT 267	Direct impacts to a total area of 4.71 ha (comprising 0.67 ha of Woodland and 4.04 ha of DNG).	77 credits for PCT 267	Like for like ecosystem credits	This letter, and revised BDAR
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	PCT 281, PCT 483	Direct impacts to a total area of 34.15 ha woodland	542 credits for PCT 483 and 195 credits for PCT 281.	Like for like ecosystem credits	This letter, and revised BDAR
Large-eared Pied Bat	Species credit	Removal of 3.92 ha of foraging habitat	191 species credits	Species credits	This letter, and revised BDAR
Corben's Long-eared Bat	Ecosystem Credit Species	Removal of habitat surrogates (PCTs 84 and 267) covering a total area of 5.77 ha.	12 credits for PCT 84 and 77 credits for PCT 267 (if alternative access to GR selected).	Ecosystem credits for habitat using associated PCTs as surrogates	This letter, and revised BDAR
Gang-gang Cockatoo	Dual Credit Species	Removal of habitat surrogates (PCTs 281 and 267) covering a total area of 9.26 ha.	599 credits for PCT 281 and 77 credits for PCT 267.	Ecosystem credits for habitat using associated PCTs as surrogates	This letter, and revised BDAR
Grey Falcon	Ecosystem Credit Species	Removal of habitat surrogates (PCT 84) covering a total area of 1.06 ha.	12 credits for PCT 84.	Ecosystem credits for habitat using associated PCTs as surrogates	This letter, and revised BDAR
Grey-headed Flying Fox	Dual Credit Species	Removal of habitat surrogates (PCTs 281, 267 and 84) covering a total area of 22.69 ha.	599 credits for PCT 281, 77 credits for PCT 267 and 12 credits for PCT 84.	Ecosystem credits for habitat using associated PCTs as surrogates	This letter, and revised BDAR

Name of EPBC Act listed entity	PCTs Associated	Area of Impact	Credits required	Offsetting approach	Reference
Major Mitchell's Cockatoo	Dual Credit Species	Removal of habitat surrogates (PCT 84) covering a total area of 1.06 ha.	12 credits for PCT 84.	Ecosystem credits for habitat using associated PCTs as surrogates	This letter, and revised BDAR
Painted Honeyeater	Ecosystem Credit Species	Removal of habitat surrogates (PCT 84, 267, 281, 479 and 483) covering a total area of 643.52 ha.	12 credits for PCT 84, 77 credits for PCT 267, 599 credits for PCT 281, 420 credits for PCT 479 and 542 credits for PCT 483.	Ecosystem credits for habitat using associated PCTs as surrogates	This letter, and revised BDAR
Regent Honeyeater	Dual Credit Species	Removal of habitat surrogates (PCT 84, 267, 281, 479 and 483) covering a total area of 643.52 ha.	12 credits for PCT 84, 77 credits for PCT 267, 599 credits for PCT 281, 420 credits for PCT 479 and 542 credits for PCT 483.	Ecosystem credits for habitat using associated PCTs as surrogates	This letter, and revised BDAR
Spotted-tailed Quoll	Ecosystem Credit Species	Removal of habitat surrogates (PCT 84, 267 and 281) covering a total area of 22.69 ha.	12 credits for PCT 84, 77 credits for PCT 267 and 599 credits for PCT 281.	Ecosystem credits for habitat using associated PCTs as surrogates	This letter, and revised BDAR
Superb Parrot	Dual Credit Species	Removal of habitat surrogates (PCT 84, 267 and 281) covering a total area of 9.16 ha.	12 credits for PCT 84, 77 credits for PCT 267 and 599 credits for PCT 281.	Ecosystem credits for habitat using associated PCTs as surrogates	This letter, and revised BDAR
Swift Parrot	Dual Credit Species	Removal of habitat surrogates (PCT 84, 267, 281, 479 and 483) covering a total area of 643.52 ha.	12 credits for PCT 84, 77 credits for PCT 267, 599 credits for PCT 281, 420 credits for PCT 479 and 542 credits for PCT 483.	Ecosystem credits for habitat using associated PCTs as surrogates	This letter, and revised BDAR

Name of EPBC Act listed entity	PCTs Associated	Area of Impact	Credits required	Offsetting approach	Reference
White-throated Needletail	Ecosystem Credit Species	Removal of habitat surrogates (PCT 84, 267, 281, 479 and 483) covering a total area of 643.52 ha.	12 credits for PCT 84, 77 credits for PCT 267, 599 credits for PCT 281, 420 credits for PCT 479 and 542 credits for PCT 483.	Ecosystem credits for habitat using associated PCTs as surrogates	This letter, and revised BDAR

Appendix A Additional harp trapping

SURVEY METHODS

Additional surveys targeting Large-eared Pied Bat (*Chalinolbus dwyeri*) and Large Bent-winged Bat (*Miniopterus schreibersii oceanensis*) were conducted in the Girragulang Road Cluster of the Valley of the Winds Project. Survey was undertaken over four nights between 22-26 January 2024 by ELA Ecologists Sophie Montgomery and Alex Yates. This week was the only week available to survey within the suitable survey period for both species.

The weather details and dates of survey are provided below in Table 11.

Table 11: Weather details at time of survey (Dunedoo Post Office - Station 064009)

Date	Rainfall (mm)	Minimum temperature (°C)	Maximum temperature (°C)
22-Jan-24	0	16.8	34.0
23-Jan-24	0	17.5	32.2
24-Jan-24	0	15.6	38.2
25-Jan-24	0	21.0	40.7
26-Jan-24	0	25.9	Data not available

Targeted microbat survey involved the deployment of eight harp traps over a four-night period (total trap nights = 32). Harp traps were placed in natural microbat fly-ways between exposed rock faces and adjacent vegetation or near the entrance of small caves and fissures (Photograph 16). Each harp trap was checked for trapped microbats every morning within an hour of sunrise. Microbats were identified to species and kept in a cool, dark location until sunset when they could be released near the trap in which they were captured. Survey and unit details are provided below in Table 12 and the location of each survey is included in Figure 23.

Table 12: Survey method and unit details

Method	Unit ID	Date Set	Date Collected
Harp trap	NEW_HARP_01	22-Jan-24	26-Jan-24
Harp trap	NEW_HARP_02	22-Jan-24	26-Jan-24
Harp trap	NEW_HARP_03	22-Jan-24	26-Jan-24
Harp trap	NEW_HARP_04	22-Jan-24	26-Jan-24
Harp trap	NEW_HARP_05	22-Jan-24	26-Jan-24
Harp trap	NEW_HARP_06	22-Jan-24	26-Jan-24
Harp trap	NEW_HARP_07	22-Jan-24	26-Jan-24
Harp trap	NEW_HARP_08	22-Jan-24	26-Jan-24

During the field survey all clifflines near the survey sites were traversed in order to identify large cracks, fissures, caves or overhangs that may offer roosting and/or breeding habitat to cave-dwelling microbat species. Any identified habitat features were inspected by Ecologists using a handheld torch to look for the presence of microbats or evidence of previous occupation in the form of scats. Any potential habitat was recorded in FieldMaps.

Photograph 16: Example of harp trap deployed during microbat survey.

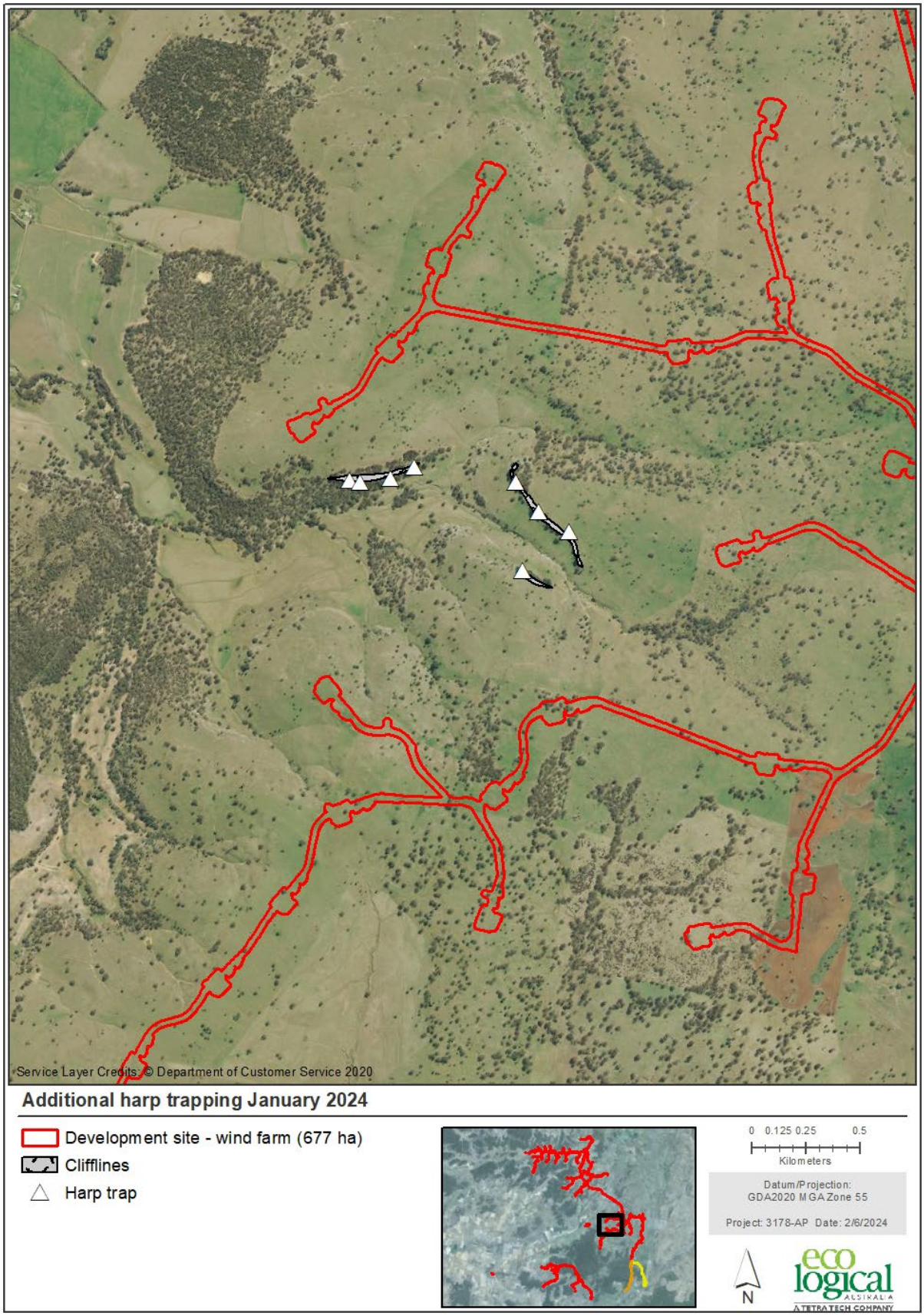


Figure 23: Additional Microbat survey effort - Girragulang Road cluster

SURVEY RESULTS

All harp traps successfully trapped microbats (Photograph 17). The microbats listed below were trapped during the survey period (listed in order of most to least frequently trapped):

- Little Forest Bat (*Vespadelus vulturnus*)
- Lesser Long-eared Bat (*Nyctophilus geoffroyi*)
- Chocolate Wattled Bat (*Chalinolobus morio*)
- Gould's Wattled Bat (*Chalinolobus gouldii*)
- Large-eared Pied Bat (*Chalinolobus dwyeri*)

Photograph 17: Microbats trapped in harp trap during survey.

Clifflines near the survey sites were traversed by Ecologists in order to identify any suitable breeding and/or roosting habitat for cave dwelling microbats. All habitat features were identified, inspected, documented and photographed. All documented habitat features may provide suitable habitat to microbats, however no evidence of current or past microbat occupation was detected during the survey period. Example photographs of microbat habitat inspected during field survey are provided below in Photograph 18 and Photograph 19.

Photograph 18: Example of small cave inspected during survey

Photograph 19: Example of small cave inspected during survey

One Large-eared Pied Bat (*Chalinolobus* dwyeri) was trapped during survey. This species is listed as Vulnerable under the BC Act and Endangered under the EPBC Act. Details surrounding the age and sex of this trapped individual are discussed further in the section below. The location of the trapped Large-eared Pied Bat is provided in Figure 24.

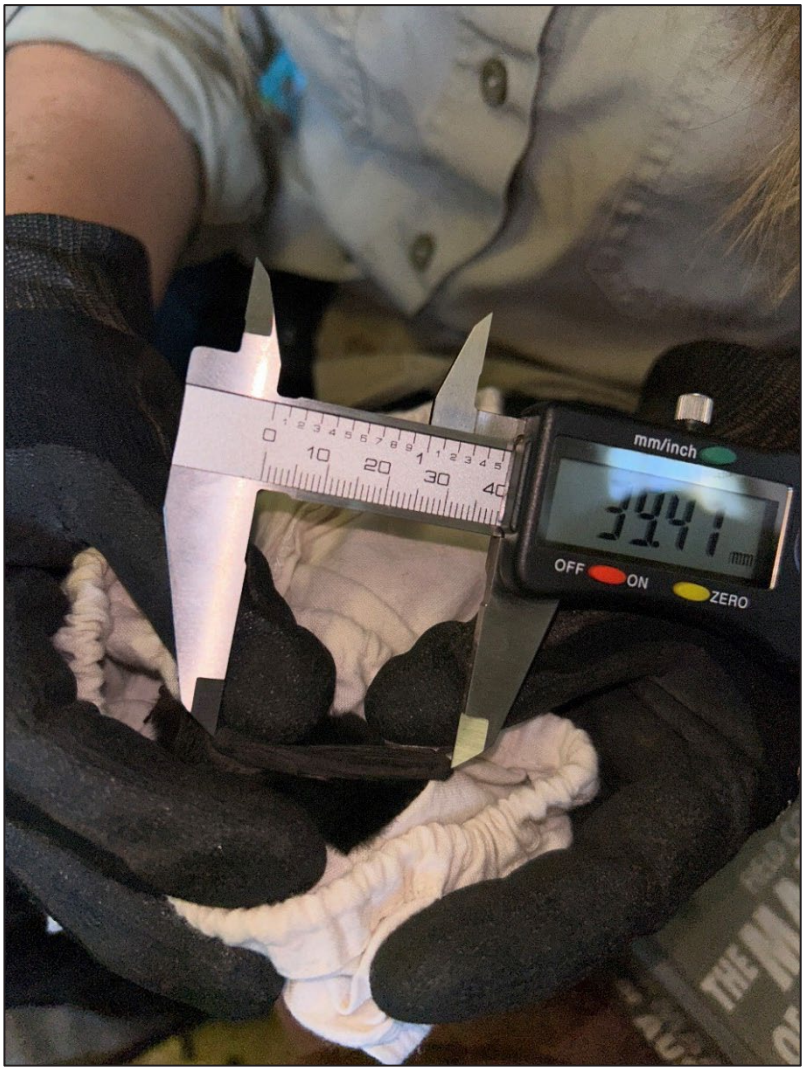
One Large-eared Pied Bat was trapped in NEW_HARP_07 on 24 January 2024. The location of the trapped microbat is shown above in Figure 1. NEW_HARP_07 was set in front of a small sandstone overhang with a roughened ceiling and numerous crevices (Photograph 5). The overhang was approximately 4 m by 3 m deep with the ceiling being 1.2 m high at the entrance and 0.2 m high at its lowest. It was inspected for microbats and evidence of microbats on 22 January 2024 and again on 25 January 2024 by ELA Ecologist Sophie Montgomery. No evidence was observed.

Photograph 20: Harp trap where Large-eared Pied Bat was trapped during survey.

The Large-eared Pied Bat was identified using the taxonomic key in 'Field Companion to the Mammals of Australia' by Dyck, S.V. et al. and 'Australian Bats' by Churchill, S. All key measurements were taken and photographed and are provided below in Photographs 7 to 10. The individual was identified as an adult male (Photograph 7 and Photograph 11).

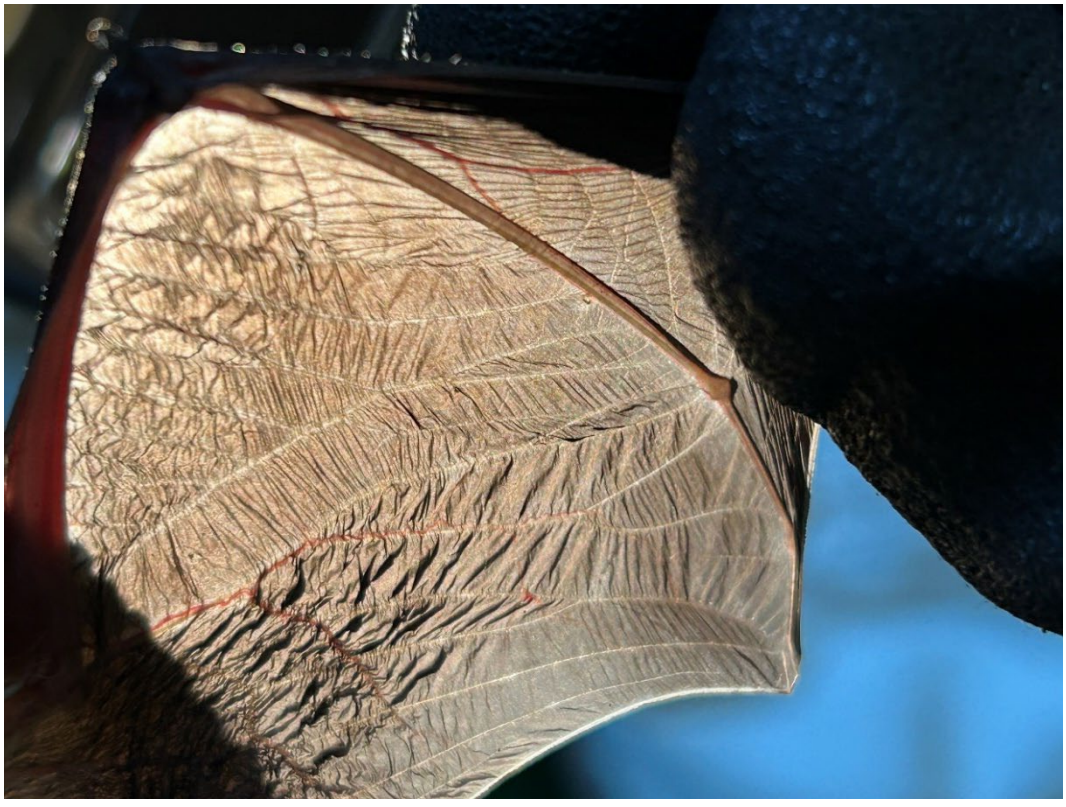
Photograph 21: Photograph displaying sex and distinct white fur colouration where the wing meets the underside of body.

Photograph 22: Length of shin bone



Photograph 23: Length of forearm

Photograph 24: Length of ear



Photograph 25: Backlit finger joints lack bands of cartilage and are an indication of age being > 3 months.

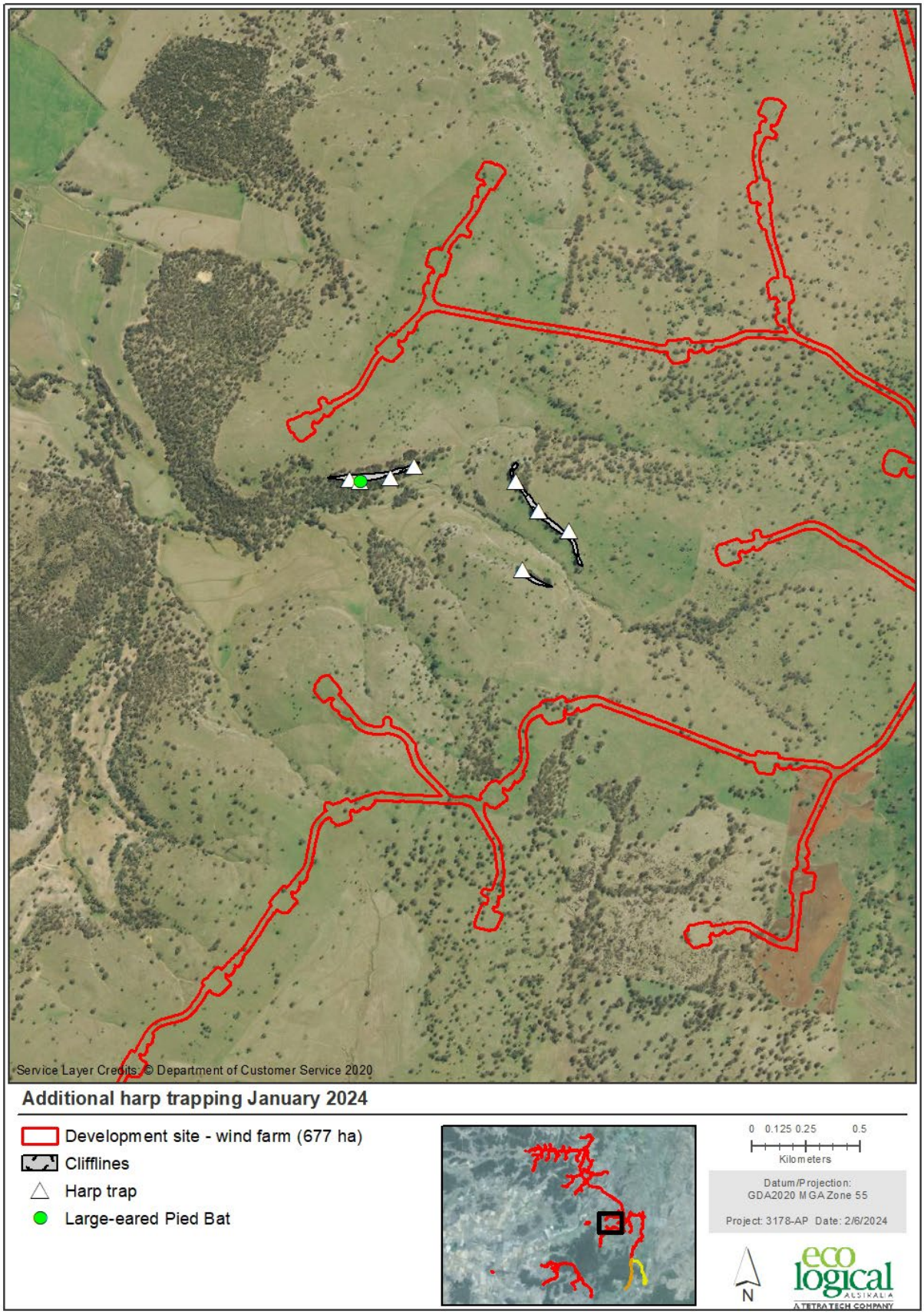


Figure 24: Additional harp trapping January 2024 - survey results

Appendix B Updated impact calculations

Table 13 Final area calculations

Project stage	IBRA Subregion	Vegetation Zone	Area	Area RSA	Area total	VI	Credits	Squirrel Glider area	Squirrel Glider credits	Powerful Owl Area	Powerful Owl Credits	Masked Owl Area	Masked Owl Credits	Barking Owl Area	Barking Owl Credits	Pale-headed Snake Area	Pale-headed Snake Credits	Large-eared Pied Bat area	Large-eared Pied Bat credits	BAM-C Case
Girragulang Road access via Moorfield Road (public road upgrade)	Kerrabee	06 281 L	0.03	0.00	0.03	19.1	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	00021959/BAAS17021/23/00040556
Girragulang Road access via Moorfield Road (public road upgrade)	Pilliga	06 281 L	0.21	0.00	0.21	100	13	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	00021959/BAAS17021/20/00021962
Girragulang Road access via Moorfield Road (public road upgrade)	Pilliga	17 483 P	0.56	0.00	0.56	5.7	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	00021959/BAAS17021/20/00021962
Girragulang Road access via Moorfield Road (public road upgrade)	Pilliga	11 479 M	0.84	0.00	0.84	66.7	21	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	00021959/BAAS17021/20/00021962
Girragulang Road access via Moorfield Road (public road upgrade)	Pilliga	15 483 M	0.95	0.00	0.95	32.7	19	N/A	N/A	N/A	N/A	N/A	N/A	0.01	1	N/A	N/A	N/A	N/A	00021959/BAAS17021/20/00021962
Girragulang Road access via Moorfield Road (public road upgrade)	Kerrabee	05 281 M	1.28	0.00	1.28	36.6	29	1.28	23	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	00021959/BAAS17021/23/00040556
Girragulang Road access via Moorfield Road (public road upgrade)	Pilliga	05 281 M	1.53	0.00	1.53	78.8	75	1.53	60	0.32	13	0.32	13	0.32	13	N/A	N/A	N/A	N/A	00021959/BAAS17021/20/00021962
Girragulang Road access via Moorfield Road (public road upgrade)	Pilliga	16 483 L	2.43	0.00	2.43	28.5	43	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	00021959/BAAS17021/20/00021962
Girragulang Road access via Moorfield Road (public road upgrade)	Pilliga	10 479 B	5.09	0.00	5.09	55.2	105	N/A	N/A	N/A	N/A	N/A	N/A	1.22	34	N/A	N/A	N/A	N/A	00021959/BAAS17021/20/00021962
Girragulang Road alternative access	Kerrabee	05 281 M	0.01	0.00	0.01	36.6	1	0.01	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	00021959/BAAS17021/23/00040560
Girragulang Road alternative access	Pilliga	16 483 L	0.12	0.00	0.12	29.6	2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	00021959/BAAS17021/23/00040557
Girragulang Road alternative access	Pilliga	02 267 M	0.30	0.00	0.30	43.3	6	0.3	6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	00021959/BAAS17021/23/00040557
Girragulang Road alternative access	Kerrabee	02 267 M	0.37	0.00	0.37	72	13	0.37	13	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	00021959/BAAS17021/23/00040560
Girragulang Road alternative access	Kerrabee	10 479 B	0.39	0.00	0.39	37.7	6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	00021959/BAAS17021/23/00040560
Girragulang Road alternative access	Pilliga	11 479 M	0.44	0.00	0.44	66.7	11	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	00021959/BAAS17021/23/00040557
Girragulang Road alternative access	Pilliga	04 281 G	0.55	0.00	0.55	79.1	27	0.55	22	0.37	15	0.37	15	0.37	15	N/A	N/A	N/A	N/A	00021959/BAAS17021/23/00040557

Project stage		IBRA Subregion	Vegetation Zone	Area	Area RSA	Area total	VI	Credits	Squirrel Glider area	Squirrel Glider credits	Powerful Owl Area	Powerful Owl Credits	Masked Owl Area	Masked Owl Credits	Barking Owl Area	Barking Owl Credits	Pale-headed Snake Area	Pale-headed Snake Credits	Large-eared Pied Bat area	Large-eared Pied Bat credits	BAM-C Case
Girragulang alternative access	Road	Pilliga	03 267 L	1.39	0.00	1.39	38.3	27	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	00021959/BAAS17021/23/00040557
Girragulang alternative access	Road	Kerrabee	03 267 L	2.64	0.00	2.64	23.6	31	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	00021959/BAAS17021/23/00040560
Girragulang alternative access	Road	Pilliga	10 479 B	3.00	0.00	3.00	55.2	62	N/A	N/A	N/A	N/A	N/A	N/A	0.31	9	N/A	N/A	N/A	N/A	00021959/BAAS17021/23/00040557
Girragulang cluster	Road	Liverpool Range	04 281 G	0.11	0.00	0.11	38.1	3	0.11	2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	00021959/BAAS17021/23/00039289
Girragulang cluster	Road	Pilliga	10 479 B	0.15	0.00	0.15	55.2	3	N/A	N/A	N/A	N/A	N/A	N/A	0.03	1	N/A	N/A	N/A	N/A	00021959/BAAS17021/23/00040564
Girragulang cluster	Road	Pilliga	14 483 G	0.22	0.60	0.28	70.3	12	N/A	N/A	N/A	N/A	N/A	N/A	0.05	2	N/A	N/A	N/A	N/A	00021959/BAAS17021/23/00040564
Girragulang cluster	Road	Pilliga	11 479 M	0.94	0.00	0.94	66.7	24	N/A	N/A	N/A	N/A	N/A	N/A	0.49	16	N/A	N/A	N/A	N/A	00021959/BAAS17021/23/00040564
Girragulang cluster	Road	Pilliga	01 84 M	1.06	0.00	1.06	27.3	11	1.06	14	0.21	3	0.21	3	0.21	3	1.06	14	N/A	N/A	00021959/BAAS17021/23/00040564
Girragulang cluster	Road	Pilliga	05 281 M	1.63	0.00	1.63	78.8	80	1.63	64	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	00021959/BAAS17021/23/00040564
Girragulang cluster	Road	Pilliga	16 483 L	1.68	0.00	1.68	29.6	31	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	00021959/BAAS17021/23/00040564
Girragulang cluster	Road	Liverpool Range	13 479 L	1.87	0.00	1.87	8	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	00021959/BAAS17021/23/00039289
Girragulang cluster	Road	Pilliga	13 479 L	2.32	0.00	2.32	12.3	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	00021959/BAAS17021/23/00040564
Girragulang cluster	Road	Liverpool Range	05 281 M	3.90	0.00	3.90	67.4	164	3.9	131	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	00021959/BAAS17021/23/00039289
Girragulang cluster	Road	Pilliga	15 483 M	5.02	2.30	5.25	34.3	113	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	00021959/BAAS17021/23/00040564
Girragulang cluster	Road	Liverpool Range	16 483 L	18.41	0.00	18.41	27.2	313	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	00021959/BAAS17021/23/00039289
Girragulang cluster	Road	Liverpool Range	15 483 M	21.70	7.60	22.46	25.3	355	N/A	N/A	N/A	N/A	N/A	N/A	3.11	39	N/A	N/A	N/A	N/A	00021959/BAAS17021/23/00039289
Girragulang cluster	Road	Pilliga	17 483 P	31.15	0.00	31.15	6	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	00021959/BAAS17021/23/00040564
Girragulang cluster	Road	Liverpool Range	17 483 P	80.57	0.00	80.57	8.1	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	00021959/BAAS17021/23/00039289
Intersection Upgrade		Inland Slopes	05 281 M	0.00	0.00	0.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Intersection Upgrade		Inland Slopes	08 461 M	0.00	0.00	0.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Project stage	IBRA Subregion	Vegetation Zone	Area	Area RSA	Area total	VI	Credits	Squirrel Glider area	Squirrel Glider credits	Powerful Owl Area	Powerful Owl Credits	Masked Owl Area	Masked Owl Credits	Barking Owl Area	Barking Owl Credits	Pale-headed Snake Area	Pale-headed Snake Credits	Large-eared Pied Bat area	Large-eared Pied Bat credits	BAM-C Case
Leadville cluster	Inland Slopes	11 479 M	0.35	0.00	0.35	78.6	10	N/A	N/A	N/A	N/A	N/A	N/A	0.35	14	N/A	N/A	N/A	N/A	00021959/BAAS17021/20/00021961
Leadville cluster	Inland Slopes	17 483 P	0.84	0.00	0.84	100	53	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	00021959/BAAS17021/20/00021961
Leadville cluster	Inland Slopes	10 479 B	0.92	0.50	0.97	100	36	N/A	N/A	N/A	N/A	N/A	N/A	0.51	26	N/A	N/A	N/A	N/A	00021959/BAAS17021/20/00021961
Leadville cluster	Inland Slopes	15 483 M	1.08	0.90	1.17	36.1	26	N/A	N/A	N/A	N/A	N/A	N/A	0.07	1	N/A	N/A	N/A	N/A	00021959/BAAS17021/20/00021961
Leadville cluster	Kerrabee	05 281 M	1.23	0.00	1.23	36.6	28	1.23	23	1.16	21	1.16	21	1.16	21	N/A	N/A	1.23	34	00021959/BAAS17021/20/00021960
Leadville cluster	Inland Slopes	12 479 Reg	2.20	0.00	2.20	33.9	28	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	00021959/BAAS17021/20/00021961
Leadville cluster	Kerrabee	12 479 Reg	3.49	0.00	3.49	11.6	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	00021959/BAAS17021/20/00021960
Leadville cluster	Kerrabee	06 281 L	3.70	0.00	3.70	19.1	44	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	00021959/BAAS17021/20/00021960
Leadville cluster	Kerrabee	11 479 M	4.39	0.80	4.47	40.5	68	N/A	N/A	N/A	N/A	N/A	N/A	0.57	12	N/A	N/A	N/A	N/A	00021959/BAAS17021/20/00021960
Leadville cluster	Kerrabee	15 483 M	7.97	2.50	8.22	57.2	294	N/A	N/A	N/A	N/A	N/A	N/A	1.24	35	N/A	N/A	N/A	N/A	00021959/BAAS17021/20/00021960
Leadville cluster	Inland Slopes	16 483 L	20.85	0.00	20.85	41.8	544	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	00021959/BAAS17021/20/00021961
Leadville cluster	Kerrabee	17 483 P	28.66	0.00	28.66	8.7	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	00021959/BAAS17021/20/00021960
Leadville cluster	Kerrabee	16 483 L	30.20	0.00	30.20	30.9	583	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	00021959/BAAS17021/20/00021960
Mount Hope cluster	Pilliga	01 84 M	0.08	0.00	0.08	27.3	1	0.08	1	0.08	1	0.08	1	0.08	1	0.08	1	N/A	N/A	00021959/BAAS17021/23/00040568
Mount Hope cluster	Liverpool Range	05 281 M	0.25	0.00	0.25	67.4	11	0.25	8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.25	13	00021959/BAAS17021/23/00040567
Mount Hope cluster	Talbragar Valley	17 483 P	0.48	0.00	0.48	n/a	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Added to Pilliga calculations
Mount Hope cluster	Pilliga	11 479 M	1.80	0.50	1.85	66.7	46	N/A	N/A	N/A	N/A	N/A	N/A	1.34	45	N/A	N/A	N/A	N/A	00021959/BAAS17021/23/00040568
Mount Hope cluster	Pilliga	05 281 M	2.49	0.00	2.49	78.8	123	2.49	98	0.95	37	0.95	37	0.95	37	N/A	N/A	2.44	144	00021959/BAAS17021/23/00040568
Mount Hope cluster	Liverpool Range	16 483 L	5.56	0.00	5.56	27.2	95	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	00021959/BAAS17021/23/00040567
Mount Hope cluster	Liverpool Range	15 483 M	7.33	0.80	7.41	25.3	117	N/A	N/A	N/A	N/A	N/A	N/A	0.53	7	N/A	N/A	N/A	N/A	00021959/BAAS17021/23/00040567
Mount Hope cluster	Liverpool Range	17 483 P	9.62	0.00	9.62	8.1	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	00021959/BAAS17021/23/00040567
Mount Hope cluster	Pilliga	15 483 M	61.94	15.40	63.48	34.3	1361	N/A	N/A	N/A	N/A	N/A	N/A	4.35	75	N/A	N/A	N/A	N/A	00021959/BAAS17021/23/00040568
Mount Hope cluster	Pilliga	16 483 L	79.36	0.00	79.36	29.6	1466	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	00021959/BAAS17021/23/00040568
Mount Hope cluster	Talbragar Valley	15 483 M	0.00	0.00	0.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Mount Hope cluster	Pilliga	17 483 P	169.12	0.00	175.98	6	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	00021959/BAAS17021/23/00040568
Workers Camp	Pilliga	05 281 M	0.01	0.00	0.01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	00021959/BAAS17021/23/00040555

Project stage	IBRA Subregion	Vegetation Zone	Area	Area RSA	Area total	VI	Credits	Squirrel Glider area	Squirrel Glider credits	Powerful Owl Area	Powerful Owl Credits	Masked Owl Area	Masked Owl Credits	Barking Owl Area	Barking Owl Credits	Pale-headed Snake Area	Pale-headed Snake Credits	Large-eared Pied Bat area	Large-eared Pied Bat credits	BAM-C Case
Workers Camp	Pilliga	17 483 P	6.86	0.00	6.86	6	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	00021959/BAAS17021/23/00040555

Appendix C Microbat strike risk assessment

The microbat strike risk assessment below is adapted from the analysis presented in the BDAR accompanying SSD-9679, which was recently recommended for Approval by DPHI.

The strike assessment considers microbat behaviour for each species identified onsite, and applies those individual characteristics to the risk assessment presented in Section 6.6 of the revised BDAR. The microbat behaviour characteristics is presented in Table 14.

Table 14 Microbat behaviour review and strike assessment

Species	Habitat characteristics	Flight characteristics	Foraging relative to canopy	Species ecology	Evidence of strike in NSW	Likelihood	Consequence	Risk rating
Austronomus australis White-striped Free-tailed Bat	Open space	Fast, not designed for manoeuvrability	Above canopy	Fast-flying species intercepting their prey 50 m or more above the ground. (Churchill 2008).	Yes	Likely. Strike rates can range up to 0.27 strikes per turbine per year in NSW	Low. Species is widespread and common and the risk consequences to the population are considered to be Low	Low
Chalinolobus dwyeri Large-eared Pied Bat	Edge of forest/woodland	Slow, direct, moderately manoeuvrable	Below	Insectivorous bat that flies relatively slowly with rapid but shallow wing beats (Churchill 2008). The relatively short, broad wing indicates manoeuvrability suggesting the species forages below the forest canopy (DPIE profile 2018).	No	Rare Species has never been recorded in any strike monitoring, and habitat characteristics suggest unlikely to be impacted by the Project.	Negligible. Occasional strike may occur but no measurable reduction in local or regional population viability	Negligible
Chalinolobus gouldii Gould's Wattled Bat	Edge of forest/woodland	Fast, agile	Just below, within the lower level of the tree canopy and along forest edges, creeklines and isolated paddock trees.	Feeds on a wide variety of prey, regularly foraging 5 - 10 km from their roost site. They fly just below or within the lower level of the tree canopy and along the forest edges, creeklines and around isolated	Yes	Likely Strike rates can range up to 0.3 strikes per turbine per year	Low Species is widespread and common and the risk consequences to the population are	Low

Species	Habitat characteristics	Flight characteristics	Foraging relative to canopy	Species ecology	Evidence of strike in NSW	Likelihood	Consequence	Risk rating
				paddock tree with fast, agile flight (Churchill 2008).			considered to be Low	
Chalinolobus morio Chocolate Wattled Bat	Edge of forest/woodland	Fast, agile, direct	Below canopy	In inland areas their distribution is associated with water courses that provide large trees for roosts. They prefer forests to small forest patches (Churchill 2008). They forage up to 5 km from their roost site, their flight is usually fast and direct with considerable agility (Churchill 2008). They mostly forage in the zone between the top of the understorey and the canopy, although sometimes fly low along forest trails.	Yes	Rare Strike rates can range up to 0.04 strikes per turbine per year	Negligible. Occasional strike may occur but no measurable reduction in local or regional population viability	Negligible
Falsistrellus tasmaniensis Eastern False Pipistrelle	Open space/ Edge of forest/woodland	Swift, direct	Below canopy	Flight is swift, direct, within or just below the tree canopy. Can travel large distances between roost and foraging area (12 km). Absent from small forest patches preferring continuous forest to forage along tracks, creeks and rivers.	No	Rare Species has never been recorded in any strike monitoring, and habitat characteristics suggest unlikely	Negligible. Occasional strike may occur but no measurable reduction in local or regional population viability	Negligible

Species	Habitat characteristics	Flight characteristics	Foraging relative to canopy	Species ecology	Evidence of strike in NSW	Likelihood	Consequence	Risk rating
				Capable of moving through cleared landscapes and foraging over open areas.		to be impacted by the Project.		
Miniopterus oriania oceansis Large Bent-wing Bat	Open space/ Edge of forest/woodland	Very fast, direct	Above canopy	Flies high, from just above the canopy to many times canopy height or above grasslands, flight may be just above the ground. Flight is very fast, and they can forage long distances from the roost site.	No	Likely Species has never been recorded in any strike monitoring, however data collected at height suggests the species may occupy the RSA from time to time	Low Species is widespread and common, there are no maternity roosts nearby, and the risk consequences to the population are considered to be Low	Low
Nyctophilus sp. Large-eared Bat Sp.	Closed canopy	Slow, manoeuvrable	Below canopy	Species tend to fly close to vegetation and into the understorey as they feed on moths, crickets and grasshoppers	Yes	Rare Strike rates can range up to 0.03 strikes per turbine per year	Negligible. Occasional strike may occur but no measurable reduction in local or regional population viability	Negligible
Ozimops petersi Inland Free-tailed Bat	Open space/ Edge of forest/woodland	Fast	Above canopy	Forage in open unobstructed areas. They fly fast above the canopy. They are not	Yes	Rare Strike rates can range up to 0.01 strikes per turbine per year	Negligible. Occasional strike may occur but no measurable	Negligible

Species	Habitat characteristics	Flight characteristics	Foraging relative to canopy	Species ecology	Evidence of strike in NSW	Likelihood	Consequence	Risk rating
				very manoeuvrable in flight.			reduction in local or regional population viability	
Ozimops planiceps South-eastern Free-tailed Bat	Open space/ Edge of forest/woodland	Fast	Above canopy	Forage at or above canopy height in the spaces between trees, and the outer edge of remnant vegetation and above the forest canopy.	Yes	Rare Species has never been recorded in any strike monitoring, and habitat characteristics suggest unlikely to be impacted by the Project.	Negligible. Occasional strike may occur but no measurable reduction in local or regional population viability	Negligible
Ozimops ridei Eastern Free-tailed Bat	Open space/ Edge of forest/woodland	Fast	Above canopy	Fly predominantly in the spaces between trees.	No	Rare Species has never been recorded in any strike monitoring, and habitat characteristics suggest unlikely to be impacted by the Project.	Negligible. Occasional strike may occur but no measurable reduction in local or regional population viability	Negligible
Rhinolophus megaphyllus Eastern Horseshoe-bat	Closed canopy	Slow, highly manoeuvrable	Below canopy	Short, broad wings and low wing loading. Adapted to cluttered habitats. Slow, but highly manoeuvrable flight. They often hover and	No	Rare Species has never been recorded in any strike	Negligible. Occasional strike may occur but no measurable	Negligible

Species	Habitat characteristics	Flight characteristics	Foraging relative to canopy	Species ecology	Evidence of strike in NSW	Likelihood	Consequence	Risk rating
				manoeuvre successfully among the branches and foliage of dense shrubs. (Churchill 2008).		monitoring, and habitat characteristics suggest unlikely to be impacted by the Project.	reduction in local or regional population viability	
Saccolaimus flaviventris Yellow-bellied Sheathtail-bat	Open space	Fast, direct, not manoeuvrable	Above canopy	Almost all habitats, migratory, probably fly high. Long, narrow wings.	Yes	Likely Strike rates can range up to 0.03 strikes per turbine per year	Low Species is widespread and common and the risk consequences to the population are considered to be Low	Low
Scoteanax rueppellii Greater Broad-nosed Bat	Edge of forest/woodland	Limited manoeuvrability and moderate speed	Below canopy	Forage about 5 m from the edge of isolated trees, forest remnants or along forest crowns with a slow, direct flight pattern.	No	Rare Species has never been recorded in any strike monitoring, and habitat characteristics suggest unlikely to be impacted by the Project.	Negligible. Occasional strike may occur but no measurable reduction in local or regional population viability	Negligible
Scotorepens balstoni Inland Broad-nosed Bat	Edge of forest/woodland	Moderately fast, agile	Below canopy	Flight is continuous with sudden rapid diversions. Forage mostly between trees but also at the edges of forests, and out	No	Rare Species has never been recorded in any	Negligible. Occasional strike may occur but no	Negligible

Species	Habitat characteristics	Flight characteristics	Foraging relative to canopy	Species ecology	Evidence of strike in NSW	Likelihood	Consequence	Risk rating
				in open areas. (Churchill 2008). They stay within 15 m of the ground and do not forage above the canopy		strike monitoring, and habitat characteristics suggest unlikely to be impacted by the Project.	measurable reduction in local or regional population viability	
Scotorepens orion Eastern Broad-nosed Bat	Edge of forest/woodland	Moderately fast, agile	Below canopy	Fast-flying bat that is less manoeuvrable than most Vespadelus. Avoid cluttered regrowth and rainforest by foraging mainly within the spaces among trees and between the canopy and the understorey.	No	Rare Species has never been recorded in any strike monitoring, and habitat characteristics suggest unlikely to be impacted by the Project.	Negligible. Occasional strike may occur but no measurable reduction in local or regional population viability	Negligible
Vespadelus darlingtonia Large Forest Bat	Edge of forest/woodland	Fast, less manoeuvrable	Below canopy	Fast-flying bat that is less manoeuvrable than most Vespadelus. Avoid cluttered regrowth and rainforest by foraging mainly within the spaces among trees and between the canopy and the understorey.	Yes	Rare Strike rates can range up to 0.1 strikes per turbine per year	Negligible. Occasional strike may occur but no measurable reduction in local or regional population viability	Negligible
Vespadelus regulus Southern Forest Bat	Edge of forest/woodland	Fast, agile, manoeuvrable	Below canopy	Highly manoeuvrable, moderately fast insectivores. Fly with great agility very close to vegetation and readily	Yes	Likely Strike rates can range up to 0.27	Negligible. Occasional strike may occur but no	Negligible

Species	Habitat characteristics	Flight characteristics	Foraging relative to canopy	Species ecology	Evidence of strike in NSW	Likelihood	Consequence	Risk rating
				enter gaps in the understorey, usually foraging at less than half the canopy height. Small foraging range of less than 10 ha.		strikes per turbine per year	measurable reduction in local or regional population viability	
Vespadelus vulturnus Little Forest Bat	Edge of forest/woodland	Fast, agile, manoeuvrable	Below canopy	Highly manoeuvrable, moderately fast insectivores. Fly with great agility very close to vegetation and readily enter gaps in the understorey, usually foraging at less than half the canopy height. Small foraging range of less than 10 ha.	Yes	Rare Strike rates can range up to 0.04 strikes per turbine per year	Negligible. Occasional strike may occur but no measurable reduction in local or regional population viability	Negligible

Appendix D Biodiversity credit reports

Please refer to the BAM-C Exports provided separately.

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