CATTLE HILL WIND FARM

FLORA OFFSET MANAGEMENT PLAN

Van Diemen CONSULTING

DOCUMENT CONTROL

Version	Date	Comments	Comments updated by
Draft 1	20-1-2019	Internal VDC review	
Draft 1	22-1-2019	GWA comments integrated into Draft 1	VDC
Draft 2	28-7-2019	DoEE comments integrated into Draft 1	VDC
Draft 3	1-8-2019	Internal VDC review	VDC

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DEFINITIONS AND ACRONYMS

In this FOMP, the following definitions and acronyms apply:

AH	Approval Holder (Wild Cattle Hill Pty Ltd (ACN 610 777 369))
CPR8065	means the reserve [conservation covenant] established under the Tasmanian *Nature Conservation Act 2002* which is identified by the Central Plan Register document 8065.
Crowded leek orchid	*Prasophyllum crebriflorum* D.L.Jones, *Muelleria* 18: 103 (2003)
DoEE	Department of the Environment and Energy (Commonwealth)
DPIPWE	Department of Primary Industries, Parks, Water and Environment (Tas)
EPBC Act	means *Environment Protection and Biodiversity Conservation Act 1999* and any statutory modification, substitution or re-enactment of that legislation or legislative provision
EPA	Environment Protection Authority (Tas)
FOMP	Flora Offset Management Plan
Liawenee greenhood	*Pterostylis pratensis* D. L. Jones 1998
Offset Areas	The three areas identified in Figure 1 and more detailed Figures 2-1, 3-1 and 4-1.
Owner	applied in the context of conservation covenant CPR8065
PAG	Property Assessment Group (DPIPWE)
PLCP	Private Land Conservation Program (DPIPWE)
SFS	Significant flora species - the flora species Liawenee greenhood and Crowded leek orchid
Strategy	The document entitled 'Flora Offset Strategy Information' dated 2018
VDC	Van Diemen Consulting Pty Ltd

PREFACE

This Flora Offset Management Plan (FOMP) fulfils the statutory requirement for flora offsets under approval EPBC 2009/4839 granted under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) to construct and operate the Cattle Hill Wind Farm in Tasmania's Central Highlands.

This FOMP has been developed to meet the EPBC Act requirements for offsets caused by impacts to –

- Liawenee greenhood (*Pterostylis pratensis*); and
- Crowded leek orchid (*Prasophyllum crebriflorum*

The table below identifies for each relevant EPBC 2009/4839 approval condition the associated section of the FOMP.

Condition	**FOMP Reference (section)**	**Demonstration of how the plan addresses condition requirements and commitments made in the plan to address condition requirements**
23. To compensate for unavoidable impacts to the Liawenee Greenhood and Crowded Leek Orchid, the approval holder must submit to the Department a flora offset strategy and an offset management plan.	DoEE approved a flora offset strategy ('Strategy') on 15 March 2018 to meet conditions associated with approval EPBC 2009/4839.	Not relevant to the FOMP
a. The approval holder must not commence Construction unless the flora offset strategy has been approved in writing by the Department. The flora offset strategy must include: i. a quantification of all impacts to listed threatened flora; ii. proposed offset(s) for the Liawenee Greenhood and Crowded Leek Orchid and any other affected threatened species, in accordance with the EPBC Act Offsets Policy, based on	DoEE approved a flora offset strategy ('Strategy') on 15 March 2018 to meet conditions associated with approval EPBC 2009/4839.	Not relevant to the FOMP

the estimated impacts to listed threatened flora; iii. assumptions, values and calculations used, demonstrating that the proposed offsets are in accordance with the EPBC Act Offsets Policy; and iv. the proposed mechanism by which the offset(s) will be protected for at least the life of the approval.		
b. The approved flora offset strategy must be implemented. If offsets additional to those in the approved flora offset strategy are required as a result of previously unrecorded threatened species encountered during construction and/or preconstruction activities (as required by condition 24), a revised version of the flora offset strategy must be submitted for the written approval of the Minister within 3 months of the completion of all ground breaking construction activities.	DoEE approved a flora offset strategy ('Strategy') on 15 March 2018 to meet conditions associated with approval EPBC 2009/4839.	Not relevant to the FOMP
c. The approval holder must submit the offset management plan to the Department within ten (10) months of the Department having approved the flora offset strategy. The offset management plan must include: i. details of short- and long-term management measures to maintain and improve the condition of the offset(s), including timeframes, proposed for each offset site; and	The approval conditions are addressed respectively: i) Sections 2.4, 2.5, 3.4, 3.5, 4.4, 4.5, 5, Tables 11, 15, 18 provide descriptions of management measures to maintain/improve habitat quality; Sections 2.4.1, 3.4.1 and 5.4.1 detail management constraints for each Offset Area. ii) Section 1.6.4 1.6.5 1.6.6 provide for the legal mechanism, plan and adaptive management approach to the Offset Areas; sections 2.4.2, 3.4.2 and 4.5.2 provide short-term management responsibilities for identified actions; Section 5	The FOMP has been prepared in accordance with the DoEE *Environmental Management Plan Guidelines* (2014) and the *EPBC Act Environmental Offsets Policy* (2012).

ii. the short- and longer-term arrangements and responsibilities of parties involved in the management of each offset site.	provides audit, monitoring and reporting measures.	

DECLARATION OF ACCURACY

In making this declaration, I am aware that section 491 of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) makes it an offence in certain circumstances to knowingly provide false or misleading information or documents to specified persons who are known to be performing a duty or carrying out a function under the EPBC Act or the Environment Protection and Biodiversity Conservation Regulations 2000 (Cth). The offence is punishable on conviction by imprisonment or a fine, or both.

I am authorised to bind the approval holder to this declaration and that I have no knowledge of that authorisation being revoked at the time of making this declaration.

Signed

Full name (please print)

Organisation (please print)

Date / /

1. INTRODUCTION

1.1 THE PROJECT

The Cattle Hill Wind Farm occupies privately-owned land (the property 'Lake Echo') situated east of Lake Echo in Tasmania's Central Highlands, approximately 93 kilometres to the north-west of Hobart. The wind farm site is bounded by Lake Echo to the west and grazing and forestry land to the north, east and south. The nearest settlement of Waddamana is located to the north east.

The wind farm development was approved by Tasmanian State Regulators in April 2012 and by the (now) Commonwealth Department of the Environment and Energy in December 2014.

The wind farm development footprint is shown in Figure 1 relative to the Offset Areas described in this FOMP.

1.2 THE APPROVAL HOLDER

The proponent of the wind farm development is Wild Cattle Hill Pty Ltd (ACN 610 777 369).

1.3 SIGNIFICANT FLORA SPECIES

The Significant Flora Species (SFS) for this FOMP, per condition 23, are –

- Liawenee greenhood (*Pterostylis pratensis*); and
- Crowded leek orchid (*Prasophyllum crebriflorum*).

No additional EPBC-listed flora species have been observed in the **impact area** for Commonwealth EPBC approval 2009/4839.

1.3.1 *PRASOPHYLLUM CREBRIFLORUM* – CROWDED LEEK ORCHID

Prasophyllum crebriflorum is listed as Endangered on the *Environment Protection and Biodiversity Conservation Act 1999* and endangered on the *Threatened Species Protection Act 1995*.

The Commonwealth Approved Conservation Advice identified the following Priority Actions for the species that are of relevance to the current report –

> *Regional Priority Actions*
>
> The local priority recovery and threat abatement actions for this species are identified below:
>
> Habitat Loss, Disturbance and Modification
>
> - Protect areas of native vegetation which contain subpopulations of the species or which could support subpopulations in the future.
>
> Invasive Weeds
>
> - Ensure chemicals used to control weeds do not impact on the species.

Establishing Additional Populations

- Investigate options for establishing additional subpopulations.
- Undertake seed germination and/or vegetative propagation trials to determine the requirements for successful establishment, including mycorrhizal association trials.

Local Priority Actions

The local priority recovery and threat abatement actions for this species are identified below:

Habitat Loss, Disturbance and Modification

- Monitor known sites to identify any changes in threats or numbers of individuals.
- Undertake surveys of suitable habitat or potentially suitable habitat to locate any additional subpopulations.
- Encourage land management activities that benefit the species.
- Investigate formal conservation arrangements, such as covenants or inclusion in reserve tenure, for the subpopulations not currently reserved.

Fire

- Identify appropriate intensity and interval of fire to promote seed germination.'

These Priority Actions were considered in the assessment of the impact and identification of the Offset Areas.

1.3.2 *PTEROSTYLIS PRATENSIS* - LIAWENEE GREENHOOD

Pterostylis pratensis is listed as Vulnerable on the *Environment Protection and Biodiversity Conservation Act 1999* and vulnerable on the *Threatened Species Protection Act 1995*.

The Commonwealth Approved Conservation Advice identified the following Priority Actions for the species that are of relevance to this FOMP –

'Priority Actions

The following priority recovery and threat abatement actions can be done to support the recovery of *Pterostylis pratensis*:

- Monitor known populations for threats and declines.
- Survey to determine whether there are any more populations in existence, from mid-November to mid-December when the plants are in flower.
- Verify older records.
- Establish a mechanism to ensure management intervention when required.
- Undertake appropriate seed and mycorrhizal fungi collection and storage, and conduct mycorrhizal fungi association trials.
- Coordinate implementation, including manage and analyse data, review the progress of recovery and effectiveness of management actions, and adapting actions if necessary.

Habitat Disturbance and Modification

- Pursue management options with landowners/managers to protect populations of Pterostylis pratensis against possible changes in land use that would be detrimental, particularly regarding ploughing and fertilising of pastures, and grazing levels.
- Promote conservation options for private land e.g. private nature reserve, management agreement, covenants.

These Priority Actions were considered in the assessment of the impact and identification of the Offset Areas.

1.4 REVISED IMPACT ASSESSMENT

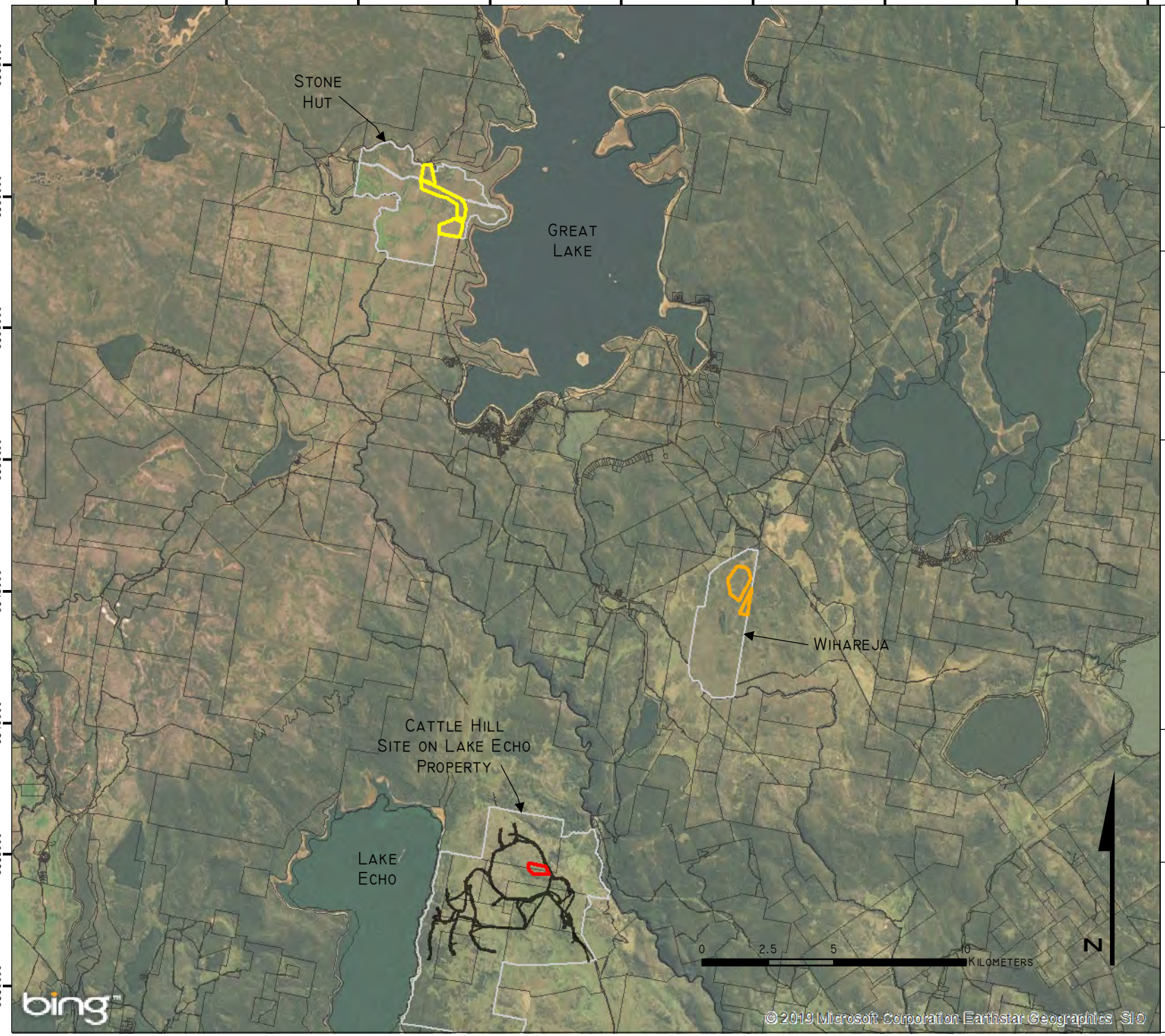
The development involves the installation and operation of 48 wind turbine generators and associated infrastructure (eg roads, tracks, hardstands, sub-station, cabling).

Condition CN1 of Environment Protection Notice (9715/1) required the submission of a Design Report (DR) to the Tasmanian EPA; the DR was approved on 1 March 2018.

The impact quantified to SFS in the Strategy was based on the 1 March approved DR. Minor layout variations have since been approved by the Tasmanian EPA. Therefore, a revised impact to SFS (hectares for total habitat, including known and potential) is in Table 1.

Table 1. Total impact to Significant Flora Species by the development

SPECIES	AREA OF HABITAT TO BE IMPACTED hectares
Pterostylis pratensis Liawenee greenhood	48.43
Prasophyllum crebriflorum Crowded leek orchid	32.35



FLORA OFFSET MANAGEMENT PLAN

INFORMATION MAP

FIGURE 1:
PROPOSED COVENANT AREAS ON LAKE ECHO, STONE HUT AND WIHAREJA

TASMAP:	LGA: CENTRAL HIGHLANDS

- BASHAN LEDGE
- STONE HUT
- WIHAREJA
- DEVELOPMENT IMPACT AREA

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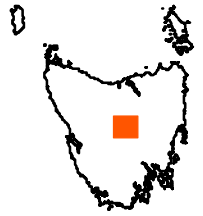


DATUM: GDA94
GRID: MGA ZONE 55

CLIENT:
GOLDWIND AUSTRALIA PTY LTD

DATE: 15TH JAN 2019

1.5 APPROACH TO IDENTIFYING OFFSET AREAS

The Australian Government *EPBC Act environmental offsets policy* outlines the approach to using environmental offsets under the EPBC Act.

The *EPBC Act environmental offsets policy* has five key aims, to:

1. ensure the efficient, effective, timely, transparent, proportionate, scientifically robust and reasonable use of offsets under the EPBC Act;
2. provide proponents, the community and other stakeholders with greater certainty and guidance on how offsets are determined and when they may be considered under the EPBC Act;
3. deliver improved environmental outcomes by consistently applying the policy;
4. outline the appropriate nature and scale of offsets and how they are determined; and
5. provide guidance on acceptable delivery mechanisms for offsets.

The *Offsets Assessment Guide* gives effect to the offset principles in the *EPBC Act environmental offsets policy* and provides a decision-making framework for the DOEE to consider the appropriateness and adequacy of proposed offsets for listed threatened species and ecological communities.

The impacts quantified from the impact assessment for the SFS (Table 1) were used as inputs to the EPBC Offset Calculator. The results of using the EPBC Offset Calculator for both species (*Prasophyllum crebriflorum* and *Pterostylis pratensis*) in the impact area are provided in Attachments 1 and 2 respectively.

A summary of the key assumptions and methods outlined in the *Offsets Assessment Guide* is provided below.

1.5.1 QUALITY

BACKGROUND

The quality score for area of habitat or community is a measure of how well a site supports a threatened species or ecological community and contributes to its ongoing viability. The assessment of 'quality' is not simply a scoring of vegetation 'pristineness'.

Habitat quality has three components:

- *Site condition*: This is the condition of a site in relation to the ecological requirements of a threatened species or ecological community. This includes for example vegetation condition and structure, the diversity of habitat species present, and the number of relevant habitat features.
- *Site context*: This is the relative importance of a site in terms of its position in the landscape, considering the connectivity needs of a threatened species or ecological community. This includes considerations such as movement patterns of the species, the proximity of the site in relation to other areas of suitable habitat, and the role of the site in relation to the overall population or extent of a species or community.
- *Species stocking rate*: This is the usage and/or density of a species at a site. The principle acknowledges that a site may have a high value for a threatened species, despite appearing

to have poor condition and/or context. It includes considerations such as survey data for a site regarding a species population or, in the case of a threatened ecological community this may be several different populations. It also includes consideration of the role of the site population regarding the overall species population viability or community extent.

These components contribute to the final habitat quality score used in the EPBC Offset Calculator, however the weighting given to each component is dependent on the ecological requirements of the impacted species or ecological community. For example, for some species the most important consideration is the location of a site in the landscape, whereas for others it is the presence of the species itself.

In the offset calculator, start quality should be the quality of the offset site at the time of assessment. The two future values of quality in the offset calculator - future quality without offset and future quality with offset - should be estimated at the time at which the ecological benefit of the offset is expected to be realised (this time is input at time until ecological benefit). Future quality without offset is the estimate of the habitat quality at this future time based on a business as usual scenario – that is, considering current management practices, use of the site and historic trends for the quality of habitat on the site. Future quality with offset should be the estimated habitat quality at the same future time incorporating the proposed offset activities.

SIGNIFICANT FLORA SPECIES

The quality of habitat for the SFS within the impact area is variable – it ranges from high quality 'Highland *Poa* grassland' with high herb and forb diversity to an almost monoculture of the native grass *Poa clivicola* and semi-dominant pasture grasses (eg *Agrostis capillaris, A. stolonifera, Holcus lanatus*).

The impact area spans land protected by (i) a conservation covenant (where livestock grazing is regulated) and (ii) otherwise managed at the discretion of the owner.

Tables 2 and 3 provide information on how we interpreted the *quality* attribute in the EPBC Offset Calculator for each SFS at the site of impact, including the three components that comprise *quality*. We allocated the 10 points for the *quality* score in the EPBC Offset Calculator across the three quality components described for each species in Tables 2 and 3.

Table 2. Habitat Quality component descriptions for Liawenee greenhood (*Pterostylis pratensis*)

Quality Component	Comments
Site condition	This species seems to be tolerant of moderate quality habitats where there is a moderate (20-30%) coverage of exotic grasses and herbs. Of the 10 points attributed to the quality score, 3 points were assigned to site condition as this was less of a driving factor for the occurrence of the species at a site.
Site context	Location within the landscape for the site does not seem to be a main or driving factor in the presence or abundance of either species

	Of the 10 points attributed to the quality score, 1 was assigned to site context.
Species stocking rate	Of the 10 points attributed to the quality score, 6 points were assigned to species stocking rate given the presence of the species should be duly recognised as the critical factor in determining the overall quality of habitat present.

Table 3. Habitat Quality component descriptions for Crowded leek orchid (*Prasophyllum crebriflorum*)

Quality Component	Comments
Site condition	This species seems to be intolerant of lower quality habitats, such as where there is a moderate (20-30%) coverage of exotic grasses and herbs. It also seems to be absent where there is a high grazing regime, especially by sheep. Of the 10 points attributed to the quality score, 4 points were assigned to site condition as this was less of a driving factor for the occurrence of the species at a site.
Site context	Location within the landscape for the site does not seem to be a main or driving factor in the presence or abundance of either species. Of the 10 points attributed to the quality score, 1 was assigned to site context.
Species stocking rate	Of the 10 points attributed to the quality score, 5 points were assigned to species stocking rate given the presence of the species should be duly recognised as the main factor in determining the overall quality of habitat present.

Tables 4 and 5 provide information on how we interpreted the *quality* attribute in the EPBC Offset Calculator for each SFS at the impact site. We allocated of the 10 points for the *quality* score in the EPBC Offset Calculator across the three quality components described for each species in Tables 2 and 3.

Table 4. Comments about habitat quality for Liawenee greenhood at the impact site

	Impact Area
Site condition	The Highland *Poa* grassland to be impacted by the development is variable in its coverage of exotic plant cover, but it is predominantly of low coverage (<10%). A score of 2 out of 3 is allocated.
Site context	Location within the landscape for the site does not seem to be a main or driving factor in the occurrence of this species in the impact area.

	A score of 1 out of 1 is allocated.
Species stocking rate	There are areas where there will be no impact by the development that have a higher density of plants. A score of 5 out of 6 is allocated.
TOTAL QUALITY SCORE	**8 out of 10**

Table 5. Comments about habitat quality for Crowded leek orchid at the impact site

	Impact Area
Site condition	The Highland *Poa* grassland to be impacted by the development is variable in its coverage of exotic plant cover, but it is predominantly of low coverage (<10%). A score of 3 out of 4 is allocated.
Site context	Location within the landscape for the site does not seem to be a main or driving factor in the occurrence of this species in the impact area. A score of 1 out of 1 is allocated.
Species stocking rate	There are areas where there will be no impact by the development that have a higher density of plants. The species in the impact area is sporadic but regular across the landscape making this a key component of the species stocking rate for the impact area. A score of 4 out of 5 is allocated.
TOTAL QUALITY SCORE	**8 out of 10**

1.6 OFFSET AREAS

1.6.1 LOCATION

Three Offset Areas identified in this FOMP cater for the residual impact; these are shown in Figure 1 relative to each other and the development footprint.

The Offset Areas occur within the Central Highlands Bioregion of Tasmania (IBRA V), the same bioregion as the impacts caused by the development.

The Offset Areas are –

- Bashan Ledge – Figure 2-1;
- Stone Hut – Figure 3-1; and
- Wihareja – Figure 4-1.

1.6.2 KNOWN CONSERVATION SIGNIFICANT VALUES WITHIN OFFSET AREAS

The vegetation communities (TASVEG code) in each Offset Area is listed in Table 6 and mapped in –

- Bashan Ledge – Figure 2-2;
- Stone Hut – Figure 3-2; and
- Wihareja – Figure 4-2.

Most of the Offset Areas is Highland *Poa* grassland which is a threatened ecological community listed on Schedule 3A of the *Nature Conservation Act 2002*. Lowland grassland complex and eastern alpine heath also feature in Offset Areas and are habitat for the SFS. Small areas of forest (*Acacia dealbata* forest and *Eucalyptus dalrympleana – E. pauciflora* forest and woodland) have been incidentally included in two of the Offset Areas.

Table 7 provides the geographic extent of habitat for SFS in each Offset Area.

Sections 2, 3 and 4 provide more detailed information about the known conservation for each Offset Area. Additional conservation significant values (eg threatened flora species) may be observed in the future with further surveys and mapping associated with the monitoring of vegetation condition and SFS abundance/presence.

Table 6. The geographic extent of vegetation types within each Offset Area

VEGETATION TYPE	Bashan Ledge (Lake Echo) (Ha)	Stone Hut (Ha)	Wihareja (Ha)	**TOTAL (Ha)**
Highland *Poa* grassland	22.1	121.8	83.9	**227.8**
Lowland grassland complex	1.1			**1.1**
Eastern alpine heathland		14.8	5.0	**19.8**
Acacia dealbata forest	1.0			**1.0**
Eucalyptus dalrympleana – E. pauciflora forest and woodland	0.2		0.7	**0.9**

Table 7. The geographic extent of habitat for Significant Flora Species in Offset Areas

SPECIES	Bashan Ledge (Lake Echo) (Ha)	Stone Hut (Ha)	Wihareja (Ha)	**TOTAL (Ha)**
Pterostylis pratensis Liawenee greenhood	24.4		84	**108.8**
Prasophyllum crebriflorum Crowded leek orchid	24	136.6	84	**244.6**

1.6.3 CONTRIBUTION OF EACH OFFSET AREA TO TOTAL REQUIRED OFFSET

Table 8 provides the percentage contribution for each Offset Area to meet the total required offset.

Table 8. The percentage each Offset Area contributes to meeting EPBC Offset requirements

SPECIES	Bashan Ledge (Lake Echo)	Stone Hut	Wihareja	**TOTAL (%)**
Prasophyllum crebriflorum	22.2		77.8	**100.00**
Pterostylis pratensis	16.39	31.10	57.38	**104.87**

1.6.4 LEGAL MECHANISM TO ESTABLISH OFFSET AREAS

Offset Areas are to be reserved and managed under the *Nature Conservation Act 2002* – Conservation Covenant provision. The Offset Areas will be protected in perpetuity by the legal instrument. The legal instrument establishing each conservation covenant should be in place prior to practical completion of the wind farm development.

Given the Offset Areas are being reserved to protect and manage in perpetuity Matters of National Environmental Significance (MNES) associated with impacts approved under EPBC approval 2009/4839 the Commonwealth must provide written agreement for proposed changes to the Conservation Covenant.

Draft documents (Conservation Covenant and Nature Conservation Plan) will be provided to the DoEE for comment and approval prior to their registration on land title.

1.6.5 MANAGEMENT RESPONSIBILITIES AND ADAPTIVE MANAGEMENT

The broad responsibilities, obligations and requirements for management are detailed in the Conservation Covenant (ie the legal instrument to establish the Offset Area as a reserve under the *Nature Conservation Act 2002*.

Specific land management tasks and expectations for each Offset Area are to be described within the Nature Conservation Plan and are summarised within the sections of this FOMP for each Offset Area;

- Bashan Ledge – Section 2.4;
- Stone Hut – Section 3.4; and
- Wihareja – Section 4.4.

The Approval Holder will adaptively implement this FOMP to address learnings from implementing the FOMP, to mitigate uncertainty associated with FOMP implementation, and where implementing the FOMP is not delivering improvements to site habitat condition.

The adaptive management cycle is based on core adaptive management principles, outlined in the diagram below.

Adaptively implementing the FOMP is critical to achieving its objectives, for example where adjustment actions and arrangements to enhance effectiveness can be made to deliver improvements to site habitat condition.

To maintain an adaptive approach, the Approval Holder will:

- Collect and incorporate new data / information as a result of implementing the plan, with new findings from data collected or from new information derived from external sources;
- Effectively schedule monitoring of the Offset Areas on an annual basis (or more frequently if required to collect relevant information inform management actions) to make informed decisions on risk management, auditing and reporting activities, as per Section 5;
- Commit to periodically reviewing risks, including those in response to the changing risk level, new information, changing circumstances or the results from implementing corrective actions, as per Section 5;
- On an annual basis, undertake a review of the effectiveness of management measures with significant levels of uncertainty and relatively long implementation timeframes, upon which the plan is highly dependent as per Section 5;
- Identify and address the causes and/or consequences of significant environmental incidents are addressed, as per Section 5; and
- Review the FOMP as soon as possible when there are indications of FOMP failure/s.

Information and data gained by the Approval Holder through monitoring the Offset Areas will be provided to the Minister administering the *Nature Conservation Act 2002* such that he/she can maintain, alter and/or modify land management arrangements considering the results. The mechanism exists in the Nature Conservation Plan for the Minister to effect management change if it is required or desirable to do so.

1.6.6 NATURE CONSERVATION PLAN

The management of each Offset Area will be guided by the content of a Nature Conservation Plan which will sit alongside the legal instrument that establishes the Offset Areas as reserves under the *Nature Conservation Act 2002*. The Nature Conservation Plan must be approved by the State Minister administering the *Nature Conservation Act 2002* as part of the covenant establishment process.

The development of the Nature Conservation Plan would be the subject of the approval 2009/4839 - condition 23 and this FOMP. It describes the main elements of management including how threats will be managed and/or mitigated – for example, grazing will be limited to the main non-flowering period for both species, the owner will be required to control weeds, there will be no 'improvement' to the land by the application of wastes, fertilisers etc.

The Nature Conservation Plan for each Offset Area will be prepared based on the State template and the specific land management terms and conditions in Table 11.

Specific land management constraints for each Offset Area are tabulated within the sections of this FOMP for each Offset Area;

- Bashan Ledge – Section 2.4.1;
- Stone Hut – Section 3.4.1; and
- Wihareja – Section 4.4.1.

As noted in Section 1.6.5, information and data gained by the Approval Holder through monitoring the Offset Areas will be provided to the Minister administering the *Nature Conservation Act 2002* such that he/she can maintain, alter and/or modify land management arrangements considering the results. The mechanism exists in the Nature Conservation Plan for the Minister to effect management change if it is required or desirable to do so.

1.6 7 EPBC CALCULATOR CHARACTERISTICS OF OFFSET AREAS

Characteristics of the Offset Areas identified in this FOMP were used to populate the 'offset' columns of the EPBC Calculator sheets. Each Offset Area was separately assessed using the EPBC Calculator sheet. Tables 6 and 7 provide information on how we interpreted the *quality* attribute in the EPBC Offset Calculator for each SFS at each Offset Area. We allocated of the 10 points for the *quality* score in the EPBC Offset Calculator across the three quality components described for each species in Tables 2 and 3.

The parameters used in the EPBC Offset Calculator are described below in the context of SFS.

TIME OVER WHICH LOSS IS AVERTED

The time over which loss is averted is the foreseeable timeframe (in years) over which changes in the level of risk to an offset site can be considered and quantified. That is, it is the time that any measures for securing a site for conservation purposes, such as conservation covenants on title, are intended to last. Longer time frames are valued more highly than shorter time frames. This component is connected to the risk of loss (%) with, and without the proposed offset, as it defines the time over which these risks are estimated.

Once a Conservation Covenant is established the application of the legal instrument and mandatory Nature Conservation Plan, should see loss (and habitat degradation) averted. Consequently, a timeframe of 20 years has been applied in the EPBC Offset Calculator even though the mechanism is to be applied in perpetuity.

TIME UNTIL ECOLOGICAL BENEFIT

The time until ecological benefit is the estimated time (in years) that it will take for the habitat quality improvement of the offset to be realised. This component is connected to the future quality with offset, and future quality without offset, as it defines the future point in time for which these quality scores are predicted.

The time to ecological benefit has been set at 10 years for the SFS in relevant Offset Areas. Some vegetation condition benchmarks, photopoints and transects have been established in Offset Areas. It may require 5 to 10 years of empirical data to determine a trend in habitat improvement (and plant numbers) by the implementation of an appropriate management regime. Being orchids that dieback to tubers annually, they have brief flowering periods (about 2-3 months) within which they can be detected, making it impossible to conduct meaningful surveys at an interval of more than once (maximum twice) per annum: 10 years represents 10 flowering seasons over which data can be collected for trends to be identified.

RISK OF LOSS (%)

The risk of loss is a percentage figure that describes the chance that the habitat on the offset site will be completely lost (i.e. no longer hold any value for the protected matter) over the foreseeable future (either the life of the offset or 20 years, whichever is shorter).

The risk of loss (RoL) for the SFS in Offset Areas has been assigned a score or 0 based on interpretation of the *Offsets Assessment Guide*. Habitat for these species may persist based on current and historical land use although there is anecdotal and observational evidence, supported by the views of the Threatened Species Section (2010), that the SFS may decline in the presence of inappropriate grazing regimes.

CONFIDENCE IN RESULT (%)

The confidence in result is a percentage figure that describes the level of certainty about offset success. Offset actions with a lower risk of failure would have a higher confidence in result score. For the area of community and area of habitat attributes, there are two components to which confidence in result relates: change in habitat quality and averted loss.

For the change in habitat quality component, the confidence in result captures the level of certainty about the successful achievement of the proposed change in quality. This includes the degree to which the proposed offset actions can be achieved and how likely they are to provide a benefit to the protected matter. For the averted loss component, confidence in result captures the level of certainty about the strength and effectiveness of the proposed risk-mitigation measures and the capacity of these measures to mitigate the risk of loss of the site.

There is high confidence by the authors of this FOMP, and previous ecological reports for the CHWF development (eg DPEMP, Supplement which have been publicly advertised and provided to the Australian Government as part of the approval of the development), that the natural values being

proposed for reservation in the Offset Areas are present and worthy of inclusion into the reserve system for Tasmania.

The management of the Offset Areas will be dictated by the content of a Nature Conservation Plan which will sit alongside the legal instrument that establishes the Offset Areas as reserves under the *Nature Conservation Act 2002*. Accordingly, a score of 90% has been ascribed to the SFS for the Offset Areas.

Table 9. Comments about the three components of habitat quality for Liawenee greenhood at Offset Areas

	Bashan Ledge	Stone Hut	Wihareja
Site condition	Low to moderate native flora species diversity within native grassland (8 years of observation). Feral deer population present (numbers and population trend unknown). A score of 2 out of 3 is allocated.	Moderate to high native flora species present, bare ground coverage moderate to high, erosion scars present (overgrazing and/or too frequent fire events). A score of 2 out of 3 is allocated.	Few signs of overgrazing, Feral deer population present (numbers and population trend unknown). A score of 2 out of 3 is allocated.
Site context	Location within the landscape for the site does not seem to be a main or driving factor in the occurrence of this species in the impact area. A score of 1 out of 1 is allocated.	Location within the landscape for the site does not seem to be a main or driving factor in the occurrence of this species in the impact area. A score of 1 out of 1 is allocated.	Location within the landscape for the site does not seem to be a main or driving factor in the occurrence of this species in the impact area. A score of 1 out of 1 is allocated.
Species stocking rate	There are areas where there will be no impact by the development that have a higher density of plants. A score of 4 out of 6 is allocated.	Widespread but low abundance of *Pterostylis pratensis* plants. A score of 5 out of 6 is allocated.	Widespread but low abundance of *Pterostylis pratensis* plants. A score of 5 out of 6 is allocated.
TOTAL QUALITY SCORE	**7 out of 10**	**8 out of 10**	**8 out of 10**

Table 10. Comments about the three components of habitat quality for Crowded leek orchid at Offset Areas

	Bashan Ledge	Wihareja
Site condition	Lake Echo – signs of overgrazing, high flora species diversity within native grassland (cf. TASVEG benchmark), increasing feral deer population, few exotic plant species, low exotic species diversity. A score of 3 out of 4 is allocated.	Few signs of overgrazing, feral deer population present (numbers and population trend unknown), few exotic plant species present and low exotic species coverage. A score of 1 out of 1 is allocated.
Site context	Location within the landscape for the site does not seem to be a main or driving factor in the occurrence of this species in the impact area. A score of 1 out of 1 is allocated.	Location within the landscape for the site does not seem to be a main or driving factor in the occurrence of this species in the impact area. A score of 1 out of 1 is allocated.
Species stocking rate	Signs of overgrazing, decreasing flora species diversity within native grassland (8 years of observation), very few *Prasophyllum crebriflorum* observed. A score of 3 out of 5 is allocated.	Has a centralised area with a very high density of *Prasophyllum crebriflorum*, as noted by the distribution of the species. The densities observed are marginally lower than those observed within the highest density areas of the impact site. A score of 3 out of 5 is allocated.
TOTAL QUALITY SCORE	**7 out of 10**	**7 out of 10**

2. BASHAN LEDGE OFFSET AREA

2.1 LOCATION AND EXISTING MANAGEMENT

The Bashan Ledge Offset Area is on the same property as the development (Figure 2-1). The Offset Area adds to the existing reserve on the Lake Echo property protected by Conservation Covenant CPR 8065.

The land appears to not have been ploughed or actively 'worked' by machinery. It has been used regularly for the grazing of stock, mainly cattle. Fertiliser (super phosphate based) has been applied to the land, but it is unknown when it was last applied, and at what rate.

The land is currently being stocked (cattle) at a rate of 2 DSE per acre at intermittent periods throughout the year. The area is currently grazed at any time of the year on an ad hoc basis.

2.2 CONSERVATION SIGNIFICANT VALUES

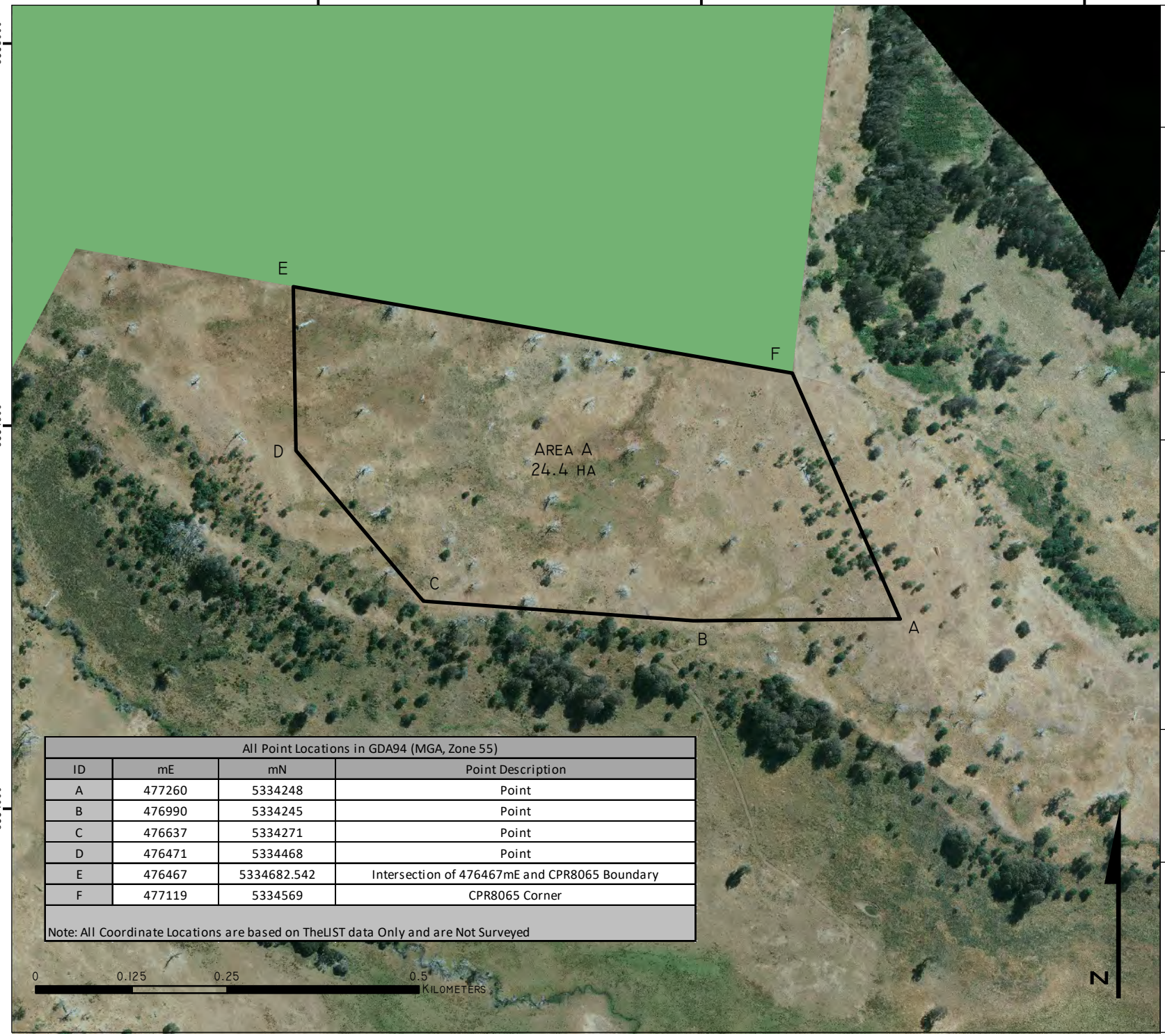
The Bashan Ledge Offset Area contains the following known conservation significant values –

- Highland *Poa* grassland (TASVEG - GPH) – a State threatened vegetation community (Figure 3-1);
- Known and potential habitat for crowded leek orchid (*Prasophyllum crebriflorum*);
- Known and potential habitat for Liawenee greenhood (*Pterostylis pratensis*);
- Habitat for Ptunarra brown butterfly (*Oreixenica ptunarra*) – a State and EPBC Vulnerable listed invertebrate species;
- Known occurrence of clover glycine (*Glycine latrobeana*) - a State and EPBC Vulnerable listed herb species;
- Foraging and denning habitat for threatened mammal species, including Tasmania devil (*Sarcophilus harrisii*), spotted-tailed quoll (*Dasyurus maculatus maculatus*) and Eastern quoll (*Dasyurus viverrinus*); and
- Foraging habitat for masked owl (*Tyto novaehollandiae castanops*), white bellied sea eagle (*Haliaeetus leucogaster*) and wedge-tailed eagle (*Aquila audax fleayi*).

The known locations of some threatened flora species are shown in Figure 2-5. Additional conservation significant values may be recorded within the Offset Area with further surveys and monitoring.

2.3 PHOTOGRAPHS

The following photographic images are provided to illustrate the type of habitats present in the Offset Area.



FLORA OFFSET MANAGEMENT PLAN

INFORMATION MAP

FIGURE 2-1:
BASHAN LEDGE
COVENANT
PID 2189572

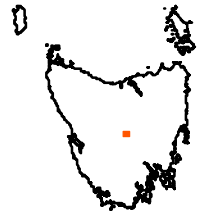
TASMAP:	LGA:
WADDAMANA 4633	CENTRAL HIGHLANDS

EXISTING COVENANT

All Point Locations in GDA94 (MGA, Zone 55)			
ID	mE	mN	Point Description
A	477260	5334248	Point
B	476990	5334245	Point
C	476637	5334271	Point
D	476471	5334468	Point
E	476467	5334682.542	Intersection of 476467mE and CPR8065 Boundary
F	477119	5334569	CPR8065 Corner

Note: All Coordinate Locations are based on TheLIST data Only and are Not Surveyed

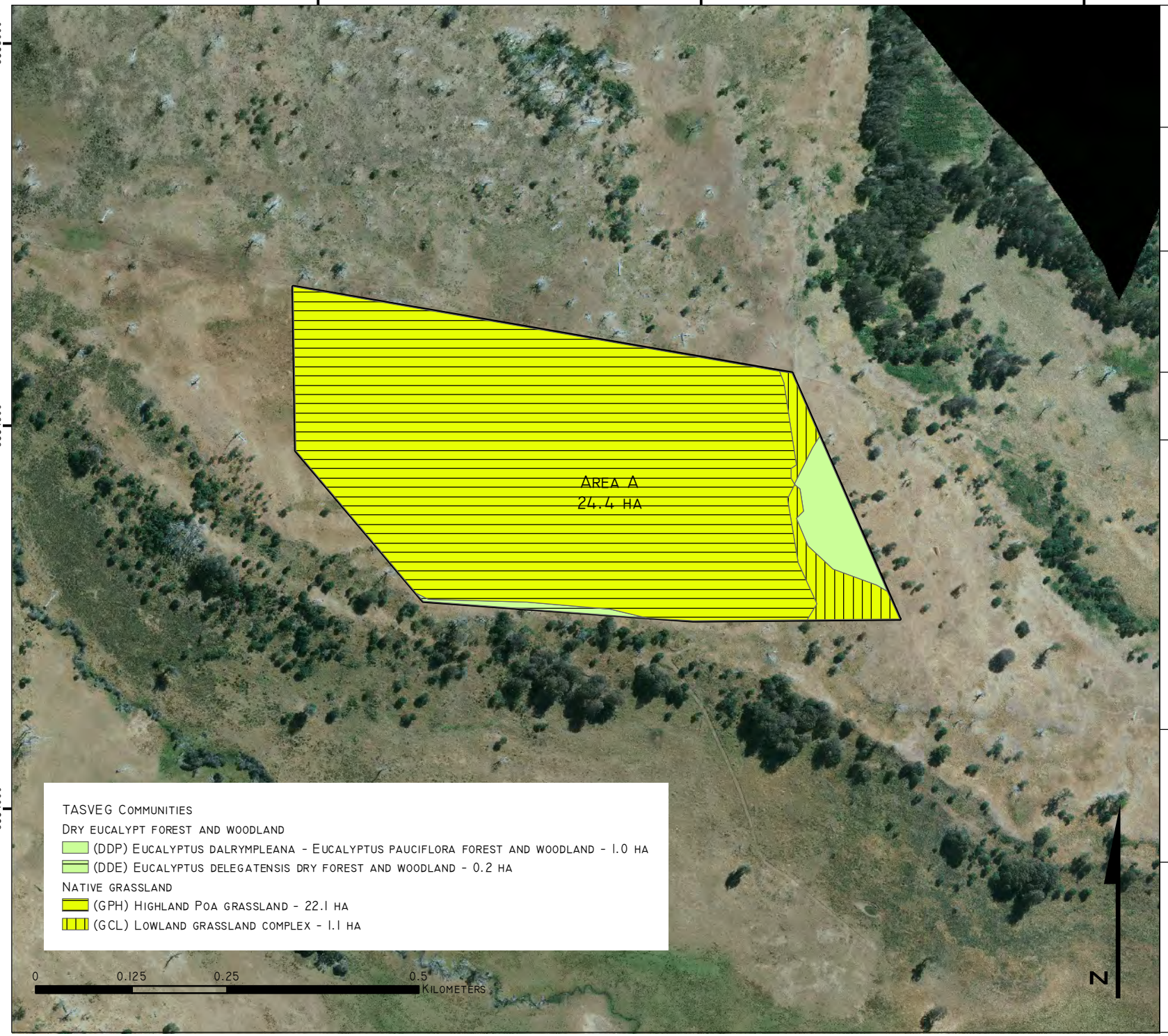
Van Diemen CONSULTING
PO Box 1 New Town TAS 7008



DATUM: GDA94
GRID: MGA ZONE 55
SCALE: @A4 - NA

CLIENT:
GOLDWIND
AUSTRALIA
PTY LTD

DATE: 15TH JAN 2019



FLORA OFFSET MANAGEMENT PLAN

INFORMATION MAP

FIGURE 2-2:
BASHAN LEDGE
COVENANT
VEGETATION COMMUNITIES

TASMAP:	LGA:
WADDAMANA 4633	CENTRAL HIGHLANDS

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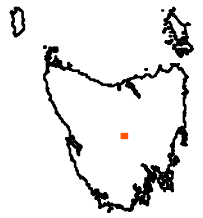
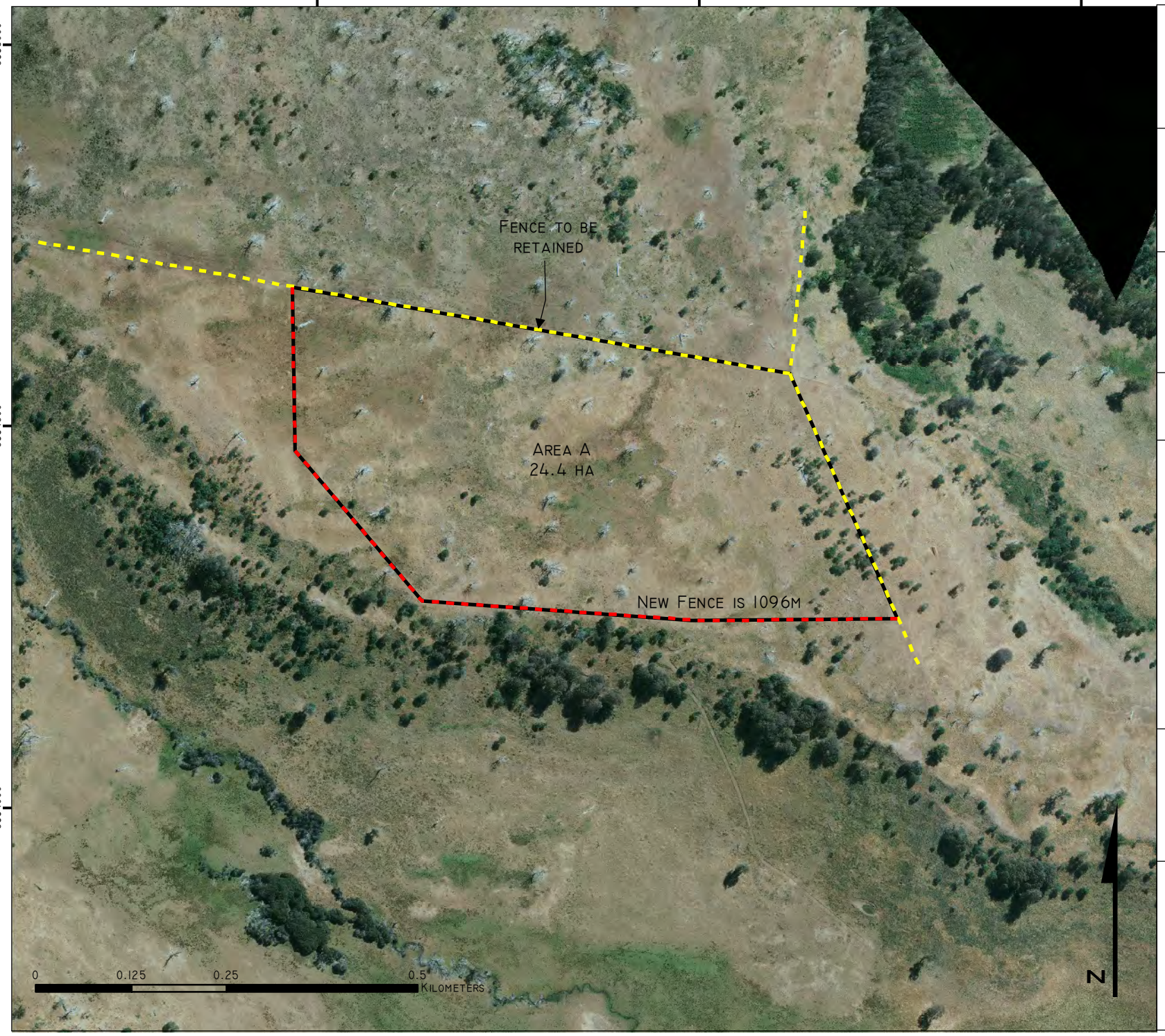


DATUM: GDA94
GRID: MGA ZONE 55
SCALE: @A4 - NA

CLIENT:
GOLDWIND
AUSTRALIA
PTY LTD

DATE: 15TH JAN 2019



FLORA OFFSET MANAGEMENT PLAN

INFORMATION MAP

FIGURE 2-3:
BASHAN LEDGE
COVENANT
INFRASTRUCTURE MAP

TASMAP:	LGA:
WADDAMANA 4633	CENTRAL HIGHLANDS

NEW FENCING (TO CONSTRUCT)
EXISTING FENCE (RETAINED)

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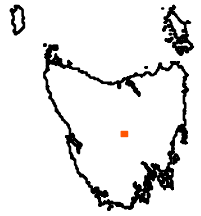
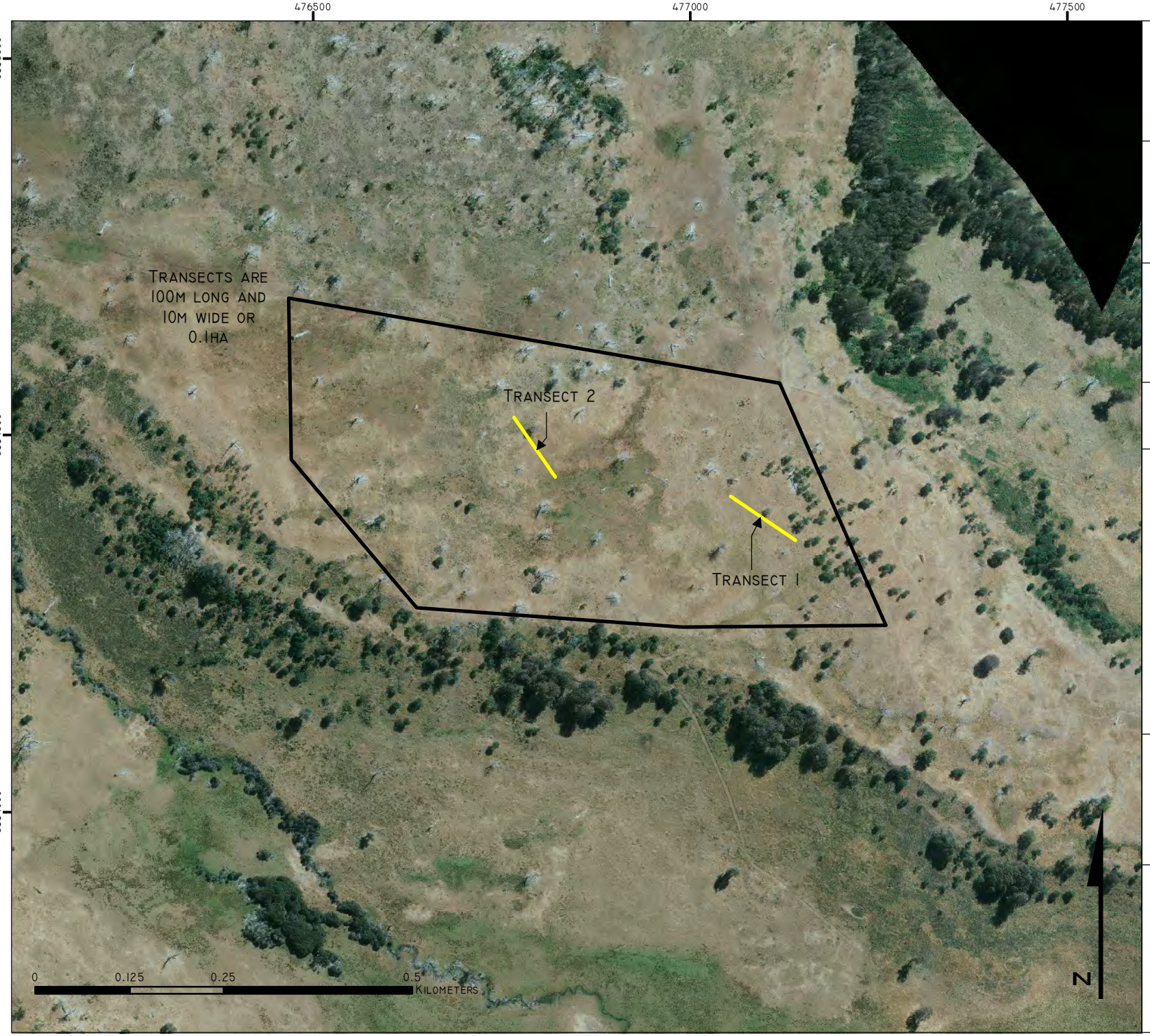


DATUM: GDA94
GRID: MGA ZONE 55
SCALE: @A4 - NA

CLIENT:
GOLDWIND
AUSTRALIA
PTY LTD

DATE: 15TH JAN 2019



FLORA OFFSET MANAGEMENT PLAN

INFORMATION MAP

FIGURE 2-4:
BASHAN LEDGE COVENANT
TRANSECT LOCATIONS

TASMAP:	LGA:
WADDAMANA 4633	CENTRAL HIGHLANDS

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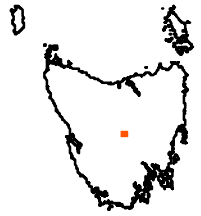
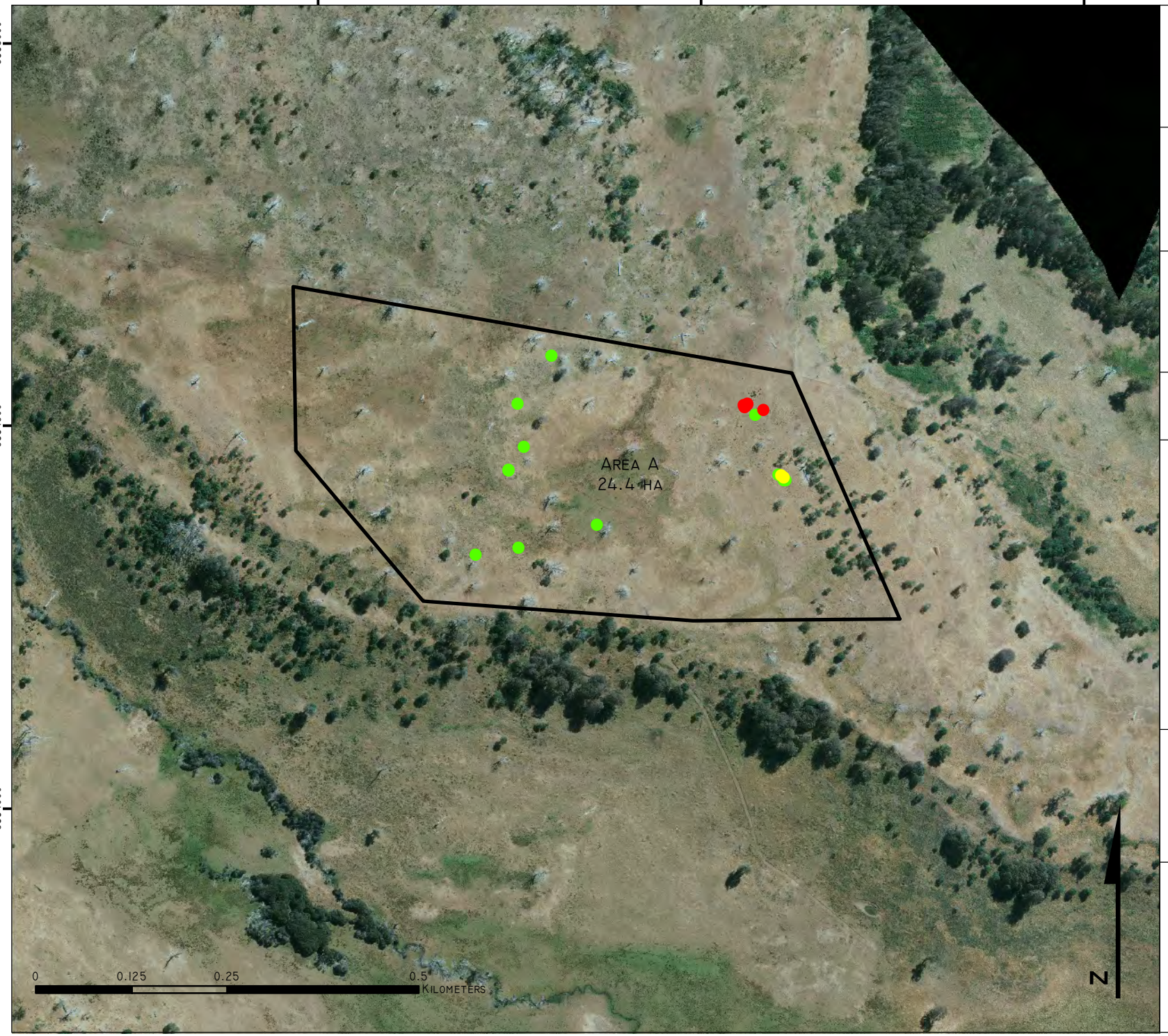


DATUM: GDA94
GRID: MGA ZONE 55
SCALE: @A4 - NA

CLIENT:
GOLDWIND AUSTRALIA PTY LTD

DATE: 15TH JAN 2019



FLORA OFFSET MANAGEMENT PLAN

INFORMATION MAP

FIGURE 2-5:
BASHAN LEDGE
COVENANT KNOWN
THREATENED FLORA

TASMAP:	LGA:
WADDAMANA 4633	CENTRAL HIGHLANDS

- GLYCINE LATROBEANA
- PRASOPHYLLUM CREBRIFLORUM
- PTEROSTYLIS PRATENSIS

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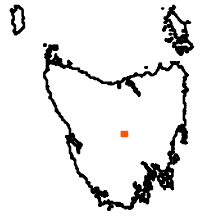


DATUM: GDA94
GRID: MGA ZONE 55
SCALE: @A4 - NA

CLIENT:
GOLDWIND
AUSTRALIA
PTY LTD

DATE: 7TH JUNE 2019

2.4 MANAGEMENT CONSTRAINTS AND ACTIONS

The following terms are used in this section –

Owner – Tasberry Holdings Pty Ltd

Approval Holder – Wild Cattle Hill Pty Ltd (ACN 610 777 369)

Minister – the Tasmanian Minister administering the *Nature Conservation Act 2002*.

2.4.1 MANAGEMENT CONSTRAINTS

The management activities which are to be constrained by the conservation covenant and Nature Conservation Plan for the Offset area are described below.

Theme	Comments and information
THREATENED AND/OR PRIORITY SPECIES	Species known to be present are: • *Pterostylis pratensis* (Liawenee greenhood); • *Prasophyllum crebriflorum* (crowded leek orchid); • *Glycine latrobeana* (clover glycine). PAG stated that monitoring is required from the site and in the local area to support the assessment of improvement or deterioration of threatened species on site and the condition of their habitat and the determination of the causes of any changes and development of appropriate adaptive management. The presence of *Glycine latrobeana* was noted by PAG as a significant value of the site, in addition to the threatened orchid species and listed vegetation type (GPH). The GPH has potential with improvement in condition to support a range of other threatened species.
TIMBER HARVESTING	Not permitted.
DOMESTIC FIREWOOD	Not permitted.
STOCK GRAZING	Stock grazing must be excluded from the reserve until the vegetation condition improves to an acceptable level. Measurement of condition will be based on data collected through onsite monitoring by the Approval Holder. Monitoring will be required from the site and in the local area to support the assessment of improvement or deterioration of threatened species on

	site and the condition of their habitat and the determination of the causes of any changes and development of appropriate adaptive management. Reintroduction of stock grazing can only occur if it will support the maintenance of the grassland and the recruitment and maintenance of the threatened orchid species. The Minister in making such a determination would be guided by the results of monitoring conducted by the Approval Holder and staff of the PLCP. Dogs and off-road vehicles may be used to assist with mustering stock.
EXISTING FENCING	The eastern boundary is fully fenced, and it is in fair condition (Figure 2-3). This fence must be maintained by the Owner
NEW FENCES PROPOSED OR REQUIRED	A stock-proof fence along the southern and western extent of the Offset Area (Figure 2-3) will be constructed by the Approval Holder.
FUEL REDUCTION AND ECOLOGICAL BURNS	The Owner may use fire to achieve fire hazard reduction if and when the Owner and the Minister, or the Tasmania Fire Service deem it necessary for safety reasons, and the Owner may use fire to conduct ecological burns (NOTE – only in August to October and April to June for reducing woody vegetation cover) if they comply with all other regulations and permit processes.
CAMPFIRE(S)	Not permitted.
PERMANENT FIREBREAKS	Authorisation for construction and maintenance of permanent firebreaks is to be provided for the following: • If and when the owner and the Minister, or the Tasmanian Fire Service deem it necessary.
EMERGENCY FIREBREAKS	Emergency firebreaks will be permitted if there is an immediate threat to life or property.
HERBICIDES, PESTICIDES, FERTILISERS AND OTHER CHEMICALS	The Owner may use herbicides on the land as part of a weed management program. No fertilisers are to be applied on the land. Pesticides and other chemicals may only be applied on the land if they are required as part of a feral animal management program.
CONTROL OF EXOTIC PLANT SPECIES (WEEDS)	The Owner will make annual inspections and control and (if possible) eradicate infestations of Declared and environmental weeds.

CONTROL OF EXOTIC (FERAL) ANIMAL SPECIES	The Owner is responsible for the control or eradication (if feasible) of feral animals on the land. Fallow deer control can occur on the Land. The taking of Fallow Deer is currently controlled under the *Wildlife Regulations 1999*.
CONTROL OF NATIVE ANIMALS	Not permitted.
DOGS OR HORSES IN THE OFFSET AREA?	Dogs allowed when under effective control for recreation **and** stock mustering. Horses allowed for stock mustering only. *Note. Dogs and horses must not cause harm to native animals or their habitat.*
INTRODUCTION OF NATIVE FLORA FOR THE PURPOSE OF REVEGETATION	Not permitted.
TAKING OF WATER FOR DOMESTIC USE	Not permitted.
NATURAL FLOW OF WATER	Not permitted.
EFFLUENT AND IRRIGATION	The use of irrigation water or effluent of any kind is prohibited on the land.
ARE THERE EXISTING VEHICLE OR WALKING TRACKS?	No.
NEW VEHICLE TRACKS	No new carriageways are permitted.
NEW WALKING TRACKS	No new tracks are permitted.
OFF-ROAD VEHICLE USE	Except for emergencies (medical evacuation, bushfire) off-road vehicle use will only be permitted for - • To assist with approved maintenance activities • To assist with weed control activities • To assist with inspections/monitoring of the reserve

	• To assist with stock mustering
RECREATIONAL USE	Recreational activities that are not considered deleterious to the natural values are permitted on the land.
DELETERIOUS ACTIVITIES	No activities (including, but not confined to removal of natural resources, dumping of rubbish, general disturbance etc) which are or may be considered deleterious to the natural values are permitted on the land unless approved by the Minister.
CONSTRUCTION OF INFRASTRUCTURE (EXCLUDING FENCING)	Construction of infrastructure is not permitted.
INTRODUCTION OF FOREIGN MATERIALS	Introduction of foreign materials (e.g. gravel for road maintenance) is only permitted with the authorisation of the Minister.
MONITORING	The installation of star pickets and associated monitoring plot infrastructure such as pegs, tape and wildlife cameras (for monitoring of deer numbers and the presence/abundance of other grazing vectors) will be permitted. Two transects (Figure 2-4) have already been established within the reserve to record for the SFS the following - plant number, spatial distribution within a sub-area of the reserve (ie distance from a central line so that mapping spatial extent is possible), photopoints, vegetation condition benchmark (as per TASVEG) and flora species present in that area. The transects are 100m long and 10m wide – an area of 0.1 hectares – and are marked in the field at 0, 50 and 100 m with permanent metal markers. Additional transects and monitoring plots/quadrats (permanent and temporary) may be installed as part of the monitoring program (see Table 12).

2.4.2 MANAGEMENT ACTIONS

Management actions to help achieve the management objectives of the Offset Area are presented in Table 11.

Table 11. Bashan Ledge Offset Area Management Actions Table

Year from commencement	Management Action Description	Responsible	Timing	Environmental outcome to be achieved
Fencing				
1	Erect new fence (Figure 2-3)	AH	June 2020	Manage stock access; exclude stock until the vegetation (threatened orchid species habitat) can support stock grazing
1-20	Maintain existing fences	Owner	Ongoing	Manage stock access; exclude stock until the vegetation (threatened orchid species habitat) can support stock grazing
Weeds				
1-20	Eradicate woody weeds	Owner	Ongoing	Maintain woody weed cover at 0% in the Offset Area
1-20	Manage/control herbaceous weeds	Owner	Ongoing	No increase in weed (woody and herbaceous) cover. Reduce herbaceous weed cover to 30% of the Offset Area within 5 years.
Biomass Management				
1-20	Ecological burning	Owner	By agreement with the AH and Minister	Enough bare ground (approximately 15 to 30% cover) maintained in order to establish space for the recruitment of native herbs and grasses. No loss of native plant diversity as a result of burning regimes.
1-20	Pulse grazing	Owner	Reintroduction of stock grazing can only occur if it	No loss of native plant diversity as a result of grazing regimes.

			will support the maintenance of the grassland and the recruitment and maintenance of the threatened orchid species. The Minister in making such a determination would be guided by the results of monitoring conducted by the Approval Holder and staff of the PLCP.	No negative impact to the recruitment and maintenance of the threatened orchid species. No increase in weed (woody and herbaceous) cover.
Monitoring				
1-20	Monitoring will be required from the site and in the local area (the adjacent CPR8065) to support the assessment of improvement or deterioration of threatened species on site and the condition of their habitat and the determination of the causes of any changes and development of appropriate adaptive management. Monitoring per Table 12.	AH	For 20 years starting the establishment of monitoring plots in Spring 2019	Enough bare ground (approximately 15 to 30% cover) maintained in order to establish space for the recruitment of native herbs and grasses. No loss of native plant diversity as a result of burning regimes.

2.5 ECOLOGICAL MONITORING REGIME

The land is being reserved for the protection of, and habitat improvement for, the orchid species the subject of the EPBC Approval - *Pterostylis pratensis* (Liawenee greenhood) and *Prasophyllum crebriflorum* (crowded leek orchid).

2.5.1 OBJECTIVES

It must be demonstrated that the habitat is being **improved** for both species.

The main objectives for the Offset Area are to –

1. reduce the coverage of exotic grasses and herbs with an associated increase in native grass and herb cover;
2. create site habitat conditions which promote the recruitment, flowering and seed set of both orchid species; and
3. have both orchid species increase in their number and geographic extent.

2.5.2 TIMEFRAME

Ecological – biodiversity related monitoring will be for 20 years, as a minimum, and is likely to be about 25 years in accordance with the timeframe of EPBC Approval 2009/4839.

2.5.3 APPROACH

The monitoring approach will include but not necessarily be limited to those tasks listed in Table 12.

Table 12. Monitoring tasks for the Bashan Ledge Offset Area

Method	Comments	Timing
Transects	2 are already established (Figure 2-4) to record population demographics and plant number of *Pterostylis pratensis* and *Prasophyllum crebriflorum*	Biannual; coincide with peak flowering periods of each orchid species for at least 5 years then reviewed
Photo-points	Some have been installed with the transects but additional locations may be warranted	Annually
Use of wildlife cameras	To record/detect feral animals such as deer To observe grazing behaviours of livestock	Ad hoc
Plots/quadrats	Installation of permanent plots to monitor the same location over time; focus on species occurrence, vegetation structure, trends in native v exotic grass and herb cover	Quarterly for at least 5 years then reviewed
Time meander surveys	Conducted at various seasons of the year (mainly spring, summer and autumn) to detect land	Quarterly for at least 5 years then reviewed

	management issues such as erosion, orchid emergence and browsing by feral animals (eg rabbits) or livestock,	

2.5.4 EVALUATION CRITERIA

To effect adaptive management there needs to be an assessment made of Habitat Quality before and after land management change has been implemented.

Table 13 provides the EPBC Offset Calculator figures used to identify the crowded leek orchid Habitat Quality of the Bashan Ledge Offset Area (Start Quality) and the Future Quality of the habitat under improved/constrained land management practices enforced by the FOMP.

Table 14 provides the EPBC Offset Calculator figures used to identify the Liawenee greenhood Habitat Quality of the Bashan Ledge Offset Area (Start Quality) and the Future Quality of the habitat under improved/constrained land management practices enforced by the FOMP.

Table 13. Evaluation Criteria for Crowded leek orchid in the Bashan Ledge Offset Area

Habitat Quality Component	Start Quality	Future Quality
Site condition	Signs of overgrazing, high flora species diversity within native grassland (cf. TASVEG benchmark), increasing feral deer population, few exotic plant species, low exotic species diversity. A score of 3 out of 4 is allocated.	Reduce the coverage of exotic grasses and herbs with an associated increase in native grass and herb cover. Create site habitat conditions which promote the recruitment, flowering and seed set of both orchid species. A score of 2 or 2.5 out of 3 is proposed.
Site context	Location within the landscape for the site does not seem to be a main or driving factor in the occurrence of this species in the impact area. A score of 1 out of 1 is allocated.	Cannot effect change to location. A score of 1 out of 1 is allocated.
Species stocking rate	Signs of overgrazing, decreasing flora species diversity within native grassland, very few *Prasophyllum crebriflorum* observed. A score of 3 out of 5 is allocated.	Increase in orchid number and geographic extent in Offset Area. A score of 4 to 5 out of 6 is proposed.
TOTAL SCORE	**7 out of 10**	**8 out of 10 (minimum)**

Table 14. Evaluation Criteria for Liawenee greenhood in the Bashan Ledge Offset Area

Habitat Quality Component	Start Quality	Future Quality
Site condition	Low to moderate native flora species diversity within native grassland. Feral deer population present (numbers and population trend unknown). A score of 2 out of 3 is allocated.	Reduce the coverage of exotic grasses and herbs with an associated increase in native grass and herb cover. Create site habitat conditions which promote the recruitment, flowering and seed set of both orchid species. A score of 2 or 2.5 out of 3 is proposed.
Site context	Location within the landscape for the site does not seem to be a main or driving factor in the occurrence of this species in the impact area. A score of 1 out of 1 is allocated.	Cannot effect change to location. A score of 1 out of 1 is allocated.
Species stocking rate	There are areas where there will be no impact by the development that have a higher density of plants. A score of 4 out of 6 is allocated.	Have both orchid species increase in their number and geographic extent. A score of 4 to 5 out of 6 is proposed.
TOTAL SCORE	**7 out of 10**	**8 out of 10 (minimum)**

3. STONE HUT OFFSET AREA

3.1 LOCATION

The Offset Area is part of the larger farming properties 'Stone Hut' and 'Split Rock' which cover most of the Liawenee Moor to the south of the Liawenee township. The reserve is bounded on its eastern side by the Highland Lakes Road. Liawenee Moor is an expansive area of mainly native vegetation dominated by non-forest communities such as grasslands and scrubs.

The Offset Area is comprised of three parts, as shown in Figure 3-1, and is approximately 136.6 hectares in total. The Offset Area protects part of a much larger area of highland grassland communities present on the Liawenee moor - it is the type location for the Liawenee greenhood (*Pterostylis pratensis*).

The land appears to not have been ploughed are actively 'worked' by machinery, other than to historically 'drag scrub' with a chain as occurred on some Central Highlands heathlands/grassland plains. It has been used regularly for the grazing of stock, mainly sheep. Fertiliser (super phosphate based) does not seem to have been applied to the land proposed for reservation.

The land is stocked (sheep) at a rate of 1 DSE per acre at intermittent periods throughout the year.

3.2 CONSERVATIOPN SIGNIFICANT VALUES

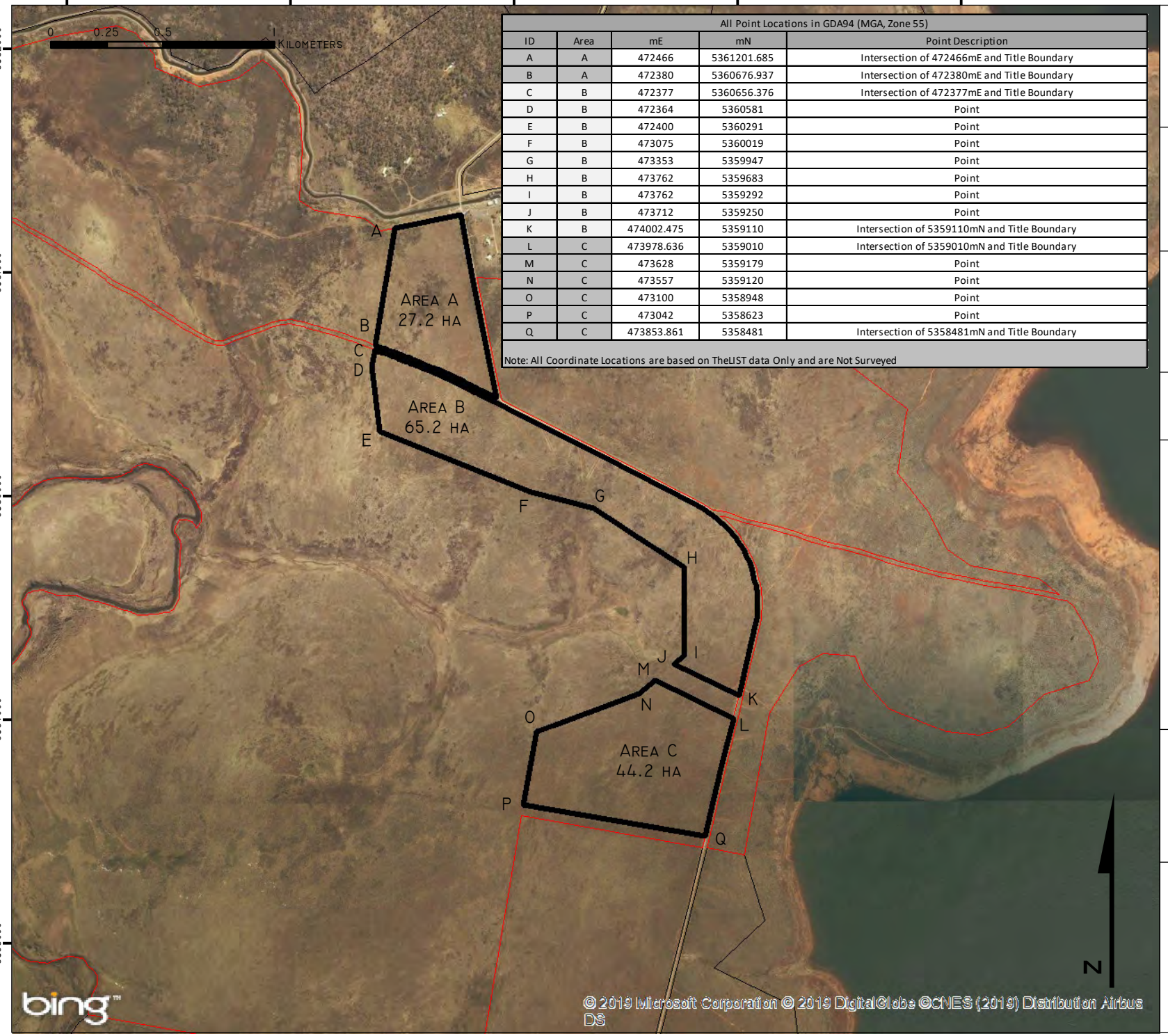
The Stone Hut Offset Area contains the following known conservation significant values –

- Known and potential habitat Liawenee greenhood (*Pterostylis pratensis)* – – a State and EPBC vulnerable flora species;
- Known habitat of lanky buttons (*Leptorhynchos elongatus)* – a State endangered flora species;
- Known habitat of mountain dandelion (*Taraxacum aristum)* – a State rare flora species;
- Highland *Poa* grassland (TASVEG - GPH) – a State threatened vegetation community (Figure 3-2);
- Eastern alpine heathland (TASVEG – HHE) – known habitat for the Miena jewel beetle (*Castiarina insculpta*) a State vulnerable invertebrate with a very limited geographic range and host plant species *Ozothamnus hookeri* for foraging/breeding;
- Habitat for Ptunarra brown butterfly (*Oreixenica ptunarra*) – a State and EPBC Vulnerable listed invertebrate species;
- Foraging and denning habitat for threatened mammal species, including spotted-tailed quoll (*Dasyurus maculatus maculatus*), Tasmania devil (*Sarcophilus harrisii*) and Eastern quoll (*Dasyurus viverrinus*); and
- Foraging habitat for white bellied sea eagle (*Haliaeetus leucogaster*) and wedge-tailed eagle (*Aquila audax fleayi*).

The known locations of some threatened flora species are shown in Figure 3-5. Additional conservation significant values may be recorded within the Offset Area with further surveys and monitoring.

3.3 PHOTOGRAPHS

The following photographic images are provided to illustrate the type of habitats present in the Offset Area.



All Point Locations in GDA94 (MGA, Zone 55)				
ID	Area	mE	mN	Point Description
A	A	472466	5361201.685	Intersection of 472466mE and Title Boundary
B	A	472380	5360676.937	Intersection of 472380mE and Title Boundary
C	B	472377	5360656.376	Intersection of 472377mE and Title Boundary
D	B	472364	5360581	Point
E	B	472400	5360291	Point
F	B	473075	5360019	Point
G	B	473353	5359947	Point
H	B	473762	5359683	Point
I	B	473762	5359292	Point
J	B	473712	5359250	Point
K	B	474002.475	5359110	Intersection of 5359110mN and Title Boundary
L	C	473978.636	5359010	Intersection of 5359010mN and Title Boundary
M	C	473628	5359179	Point
N	C	473557	5359120	Point
O	C	473100	5358948	Point
P	C	473042	5358623	Point
Q	C	473853.861	5358481	Intersection of 5358481mN and Title Boundary

Note: All Coordinate Locations are based on TheLIST data Only and are Not Surveyed

FLORA OFFSET MANAGEMENT PLAN

INFORMATION MAP

FIGURE 3-1:
STONE HUT COVENANT
PID 3448345
VOL/FOLIO 171135/1

TASMAP:	LGA:
MIENA 4635 SPLIT ROCK 4636	CENTRAL HIGHLANDS

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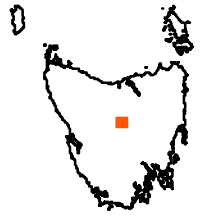
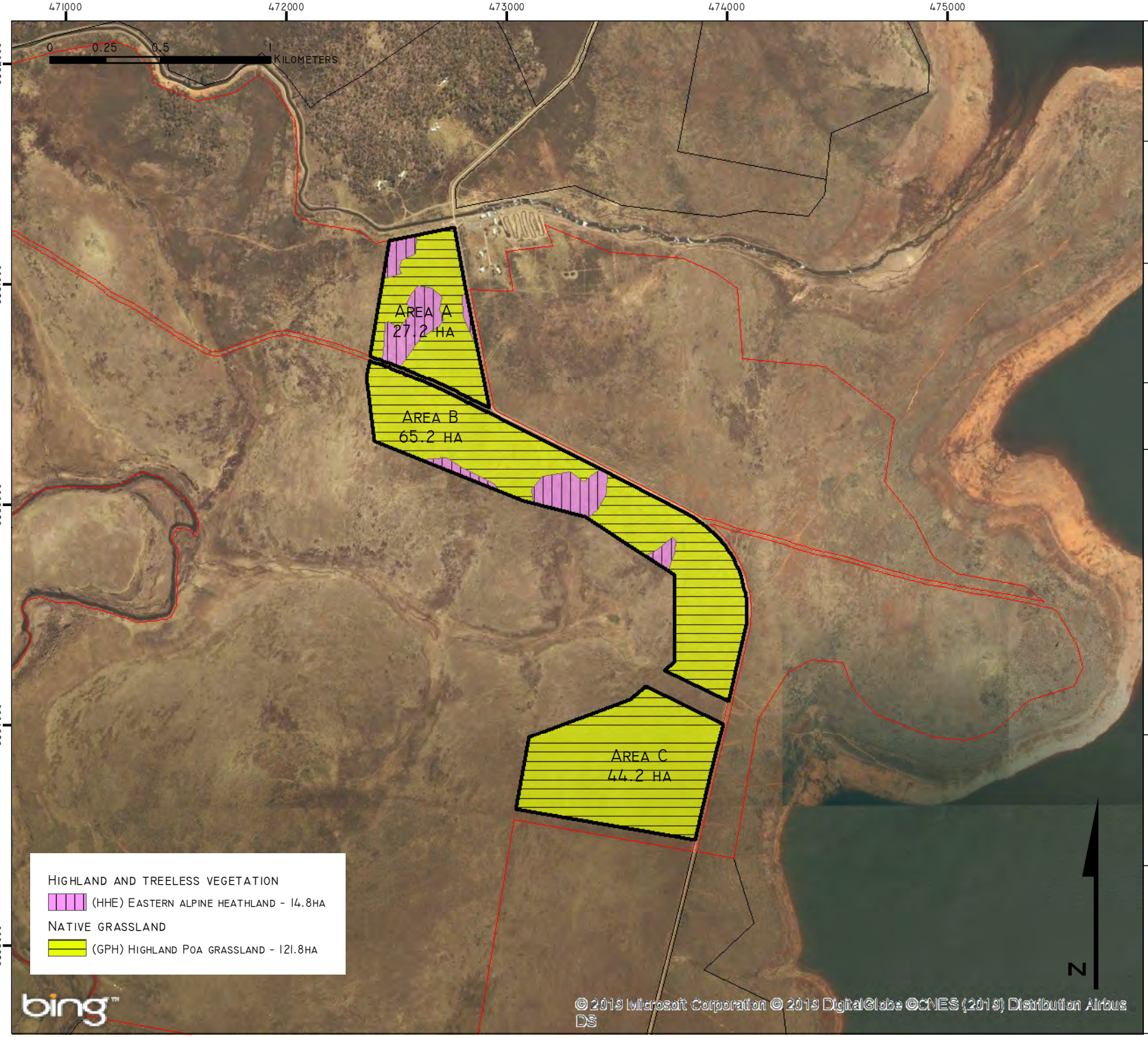


DATUM: GDA94
GRID: MGA ZONE 55
SCALE: @A4 - NA

CLIENT:
GOLDWIND
AUSTRALIA
PTY LTD

DATE: 15TH JAN 2019



FLORA OFFSET MANAGEMENT PLAN

INFORMATION MAP

FIGURE 3-2:
STONE HUT COVENANT
VEGETATION COMMUNITIES

TASMAP:	LGA:
MIENA 4635 SPLIT ROCK 4636	CENTRAL HIGHLANDS

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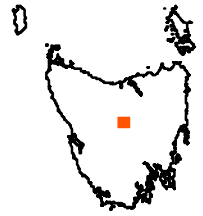

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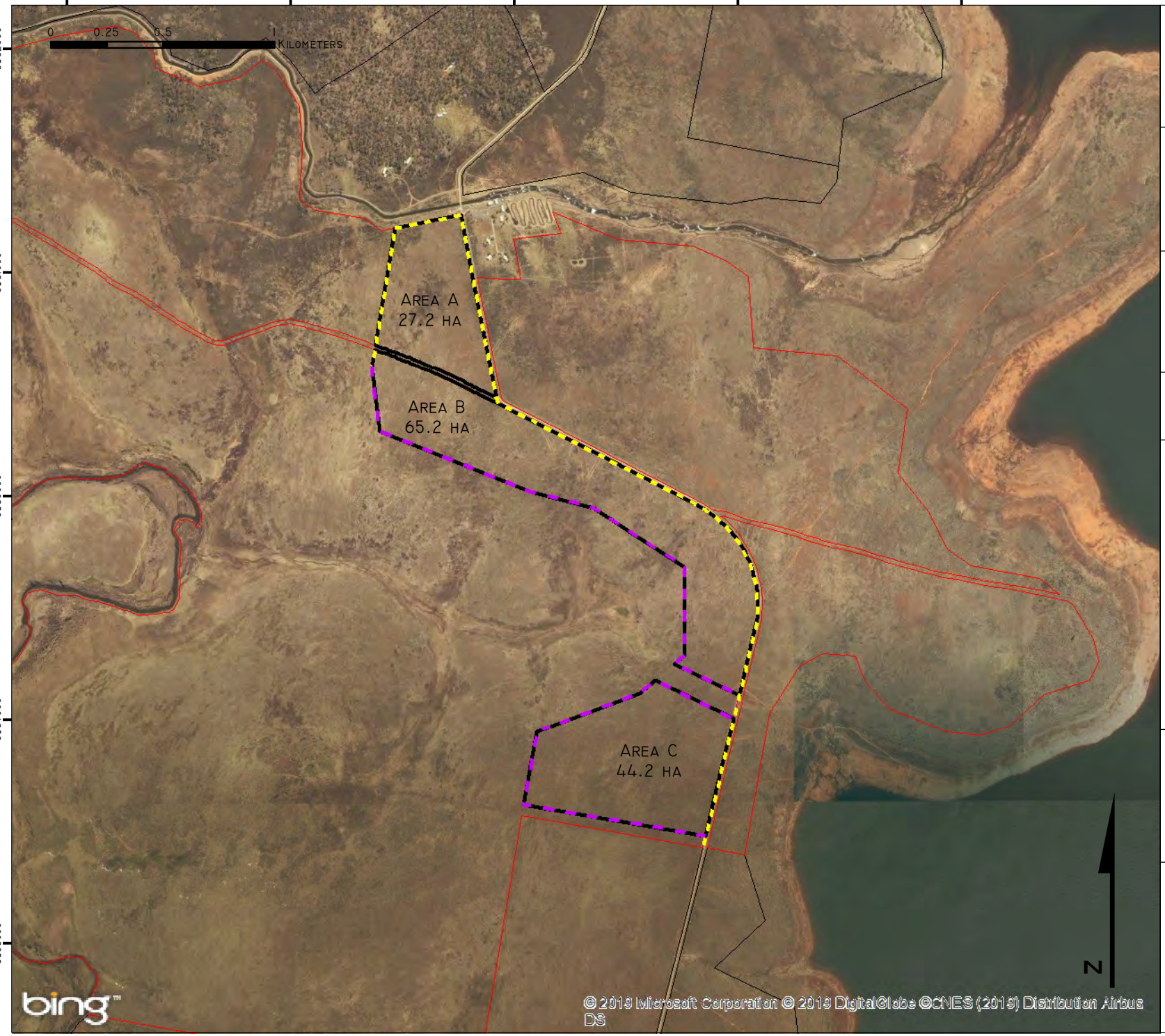
CLIENT:
GOLDWIND
AUSTRALIA
PTY LTD

DATE: 15TH JAN 2019



FLORA OFFSET MANAGEMENT PLAN

INFORMATION MAP

FIGURE 3-3:
STONE HUT COVENANT
INFRASTRUCTURE MAP

TASMAP:	LGA:
MIENA 4635 SPLIT ROCK 4636	CENTRAL HIGHLANDS

NEW FENCING

EXISTING FENCING

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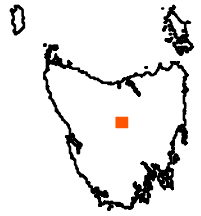

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GRID: MGA ZONE 55
SCALE: @A4 - NA

CLIENT:
GOLDWIND
AUSTRALIA
PTY LTD

DATE: 15TH JAN 2019

FLORA OFFSET MANAGEMENT PLAN

INFORMATION MAP

FIGURE 3-4:
STONE HUT COVENANT
TRANSECT LOCATIONS

TASMAP:	LGA:
MIENA 4635 SPLIT ROCK 4636	CENTRAL HIGHLANDS

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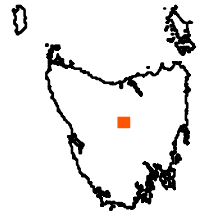

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GRID: MGA ZONE 55
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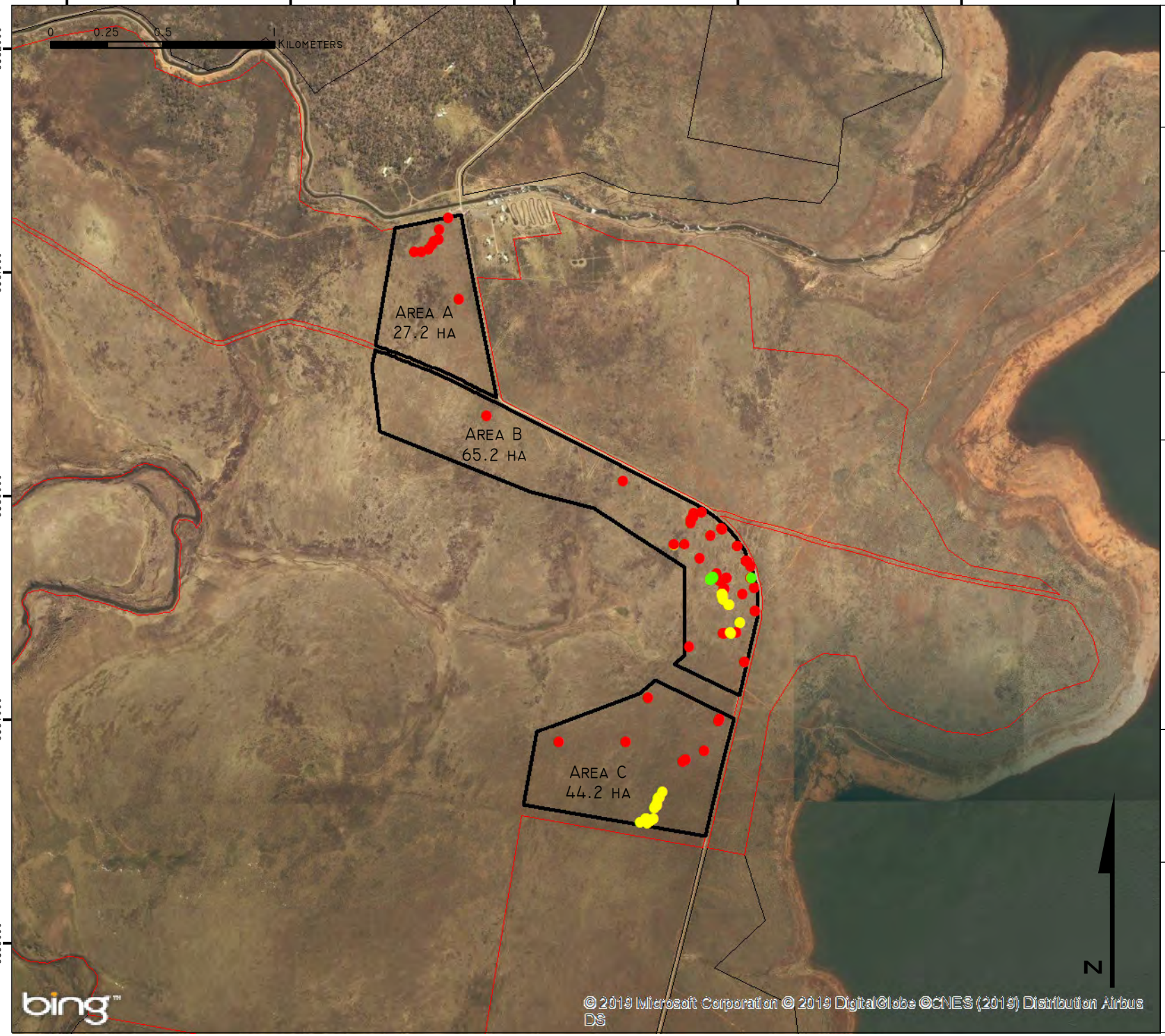
CLIENT:
GOLDWIND
AUSTRALIA
PTY LTD

DATE: 15TH JAN 2019



FLORA OFFSET MANAGEMENT PLAN

INFORMATION MAP

FIGURE 3-5:
STONE HUT COVENANT
THREATENED FLORA

TASMAP:	LGA:
MIENA 4635 SPLIT ROCK 4636	CENTRAL HIGHLANDS

- LEPTORHYNCHOS ELONGATUS
- PTEROSTYLIS PRATENSIS
- TARAXACUM ARISTUM

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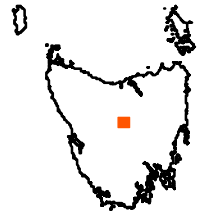


DATUM: GDA94
GRID: MGA ZONE 55
SCALE: @A4 - NA

CLIENT:
GOLDWIND
AUSTRALIA
PTY LTD

DATE: 7TH JUNE 2019

3.4 MANAGEMENT CONSTRAINTS AND ACTIONS

The following terms are used in this section –

Owner – Peter John Downie

Approval Holder – Wild Cattle Hill Pty Ltd (ACN 610 777 369)

Minister – the Tasmanian Minister administering the *Nature Conservation Act 2002*.

3.4.1 MANAGEMENT CONSTRAINTS

The management activities which are to be constrained by the conservation covenant and Nature Conservation Plan for the Offset area are described below.

Theme	Comments and information
THREATENED AND/OR PRIORITY SPECIES	Species known to be present are: • *Pterostylis pratensis* (Liawenee greenhood). No specific management measures are proposed for this species. Monitoring at the site is required to assess improvement or deterioration of Liawenee greenhood numbers on site and the condition of its habitat and the determination of the causes of any changes and development of appropriate adaptive management.
TIMBER HARVESTING	Not permitted.
DOMESTIC FIREWOOD	Not permitted.
STOCK GRAZING	Cattle grazing is not permitted within the reserve; sheep only. Stock should be excluded from the reserve during the flowering and seeding period of the listed orchid Pterostylis pratensis, and at a minimum between October and January (inclusive) [which, at the time of covenant registration, is understood to be the main period of flowering and seeding]. Grazing in the non-grazing period (Oct-Jan as outlined above) and/or the stocking rate during the agreed grazing period may be adjusted with mutual agreement with the Owner and the Minister subject to consideration of the information gained through the monitoring program or other scientific assessment. Use of fodder, e.g. hay or grains, must not occur on the land to prevent the introduction of exotic seeds.

	The fence required to ensure the effective management of the reserve will be installed by the Approval Holder prior to June 2020 in readiness for the 2020-2021 stock grazing season. Hence, the exclusion of stock grazing for Oct-Jan will not be enacted until October 2020. Grazing, when permitted, is not to exceed 1 DSE per acre during the period of grazing (annualised stocking rate of 1.7 DSE/ha/yr). If the Owner or the Minister is of the view that a significant deterioration in the condition of the native understorey and grassland due to grazing has occurred, then the stock must be removed. That section of the Land must then be spelled for a suitable period to allow the understorey and grassland to recover. Dogs and off-road vehicles may be used to assist with mustering stock.
EXISTING FENCING	The property boundary with the adjoining land to the east is fully fenced (adjoins Lakes Highway) and the fence is in good condition. The Liawenee Canal to the north is also fenced from the Offset Area as too is part of the western boundary where it adjoins land not in the Offset Area. The existing fences, shown in Figure 3-3, must be maintained by the Owner.
NEW FENCES PROPOSED OR REQUIRED	The fence required to ensure the effective management of the reserve is shown in Figure 3-3. The fence will be installed by the Approval Holder prior to June 2020 in readiness for the 2020-2021 stock grazing season. Hence, the exclusion of stock grazing for Oct-Jan will not be enacted until October 2020. The disturbance caused by fence installation must be minimised e.g. use of a hand- or tractor- slasher in preference to heavy earth-moving machinery. The design and construction technique for new fences would be subject to approval by the Minister.
FUEL REDUCTION AND ECOLOGICAL BURNS	The Owner may use fire to achieve fire hazard reduction if and when the Owner and the Minister, or the Tasmania Fire Service deem it necessary for safety reasons, and the Owner may use fire to conduct ecological burns (NOTE – only in August to October and April to June for reducing woody vegetation cover) if they comply with all other regulations and permit processes.
CAMPFIRE(S)	Not permitted.
PERMANENT FIREBREAKS	Authorisation for construction and maintenance of permanent firebreaks is to be provided for the following:

	If and when the owner and the Minister, or the Tasmanian Fire Service deem it necessary.
EMERGENCY FIREBREAKS	Emergency firebreaks will be permitted if there is an immediate threat to life or property.
HERBICIDES, PESTICIDES, FERTILISERS AND OTHER CHEMICALS	The Owner may use herbicides on the land as part of a weed management program. No fertilisers are to be applied on the land. Pesticides and other chemicals may only be applied on the land if they are required as part of a feral animal management program.
CONTROL OF EXOTIC PLANT SPECIES (WEEDS)	The Owner will make annual inspections and control and (if possible) eradicate infestations of Declared and environmental weeds.
CONTROL OF EXOTIC (FERAL) ANIMAL SPECIES	The Owner is responsible for the control or eradication (if feasible) of feral animals on the land. Fallow deer control can occur on the Land. The taking of Fallow Deer is currently controlled under the *Wildlife Regulations 1999* (section 25).
CONTROL OF NATIVE ANIMALS	Not permitted.
DOGS OR HORSES IN THE OFFSET AREA?	Dogs allowed when under effective control for recreation **and** stock mustering. Horses allowed for stock mustering only. *Note. Dogs and horses must not cause harm to native animals or their habitat.*
INTRODUCTION OF NATIVE FLORA FOR THE PURPOSE OF REVEGETATION	Not permitted.
TAKING OF WATER FOR DOMESTIC USE	Not permitted.
NATURAL FLOW OF WATER	Minor interference with the natural flow of water is permitted where it is associated with drainage from carriageways (e.g. drains that lead into the Offset Area from roads such as the Lake Highway).
EFFLUENT AND IRRIGATION	The use of irrigation water or effluent of any kind is prohibited on the land.

ARE THERE EXISTING VEHICLE OR WALKING TRACKS?	No.
NEW VEHICLE TRACKS	No new carriageways are permitted.
NEW WALKING TRACKS	No new tracks are permitted.
OFF-ROAD VEHICLE USE	Except for emergencies (medical evacuation, bushfire) off-road vehicle use will only be permitted for - • To assist with approved maintenance activities • To assist with weed control activities • To assist with inspections/monitoring of the reserve To assist with stock mustering
RECREATIONAL USE	Recreational activities that are not considered deleterious to the natural values are permitted on the land.
DELETERIOUS ACTIVITIES	No activities (including, but not confined to removal of natural resources, dumping of rubbish, general disturbance etc) which are or may be considered deleterious to the natural values are permitted on the land unless approved by the Minister.
CONSTRUCTION OF INFRASTRUCTURE (EXCLUDING FENCING)	Construction of infrastructure is not permitted.
MAINTENANCE OF INFRASTRUCTURE (EXCLUDING FENCING)	In relation to the existing drains from Highland Lakes Road, the Owner must notify the Department of State Growth (TAS) if road maintenance works are proposed which could affect the covenant area.
INTRODUCTION OF FOREIGN MATERIALS	Introduction of foreign materials (e.g. gravel for road maintenance) is only permitted with the authorisation of the Minister.
MONITORING	The installation of star pickets and associated monitoring plot infrastructure such as pegs, tape and wildlife cameras (for monitoring of deer numbers and the presence/abundance of other grazing vectors) will be permitted.

	Transects have already been established within the reserve as part of the FOMP (Figure 3-4) to record for Liawenee greenhood the following - plant number, spatial distribution within a sub-area of the reserve (ie distance from a central line so that mapping spatial extent is possible), photopoints, vegetation condition benchmark (as per TASVEG) and flora species present in that area. The transects are 100m long and 10m wide – an area of 0.1 hectares – and are marked in the field at 0, 50 and 100 m with permanent metal markers. Additional transects and monitoring plots/quadrats (permanent and temporary) may be installed as part of the monitoring program (see Table 14).

3.4.2 MANAGEMENT ACTIONS

Management actions to help achieve the management objectives of the Offset Area are presented in Table 15.

Table 15. Stone Hut Offset Area Management Actions Table

Year from commencement	Management Action Description	Responsible	Timing	Environmental outcome to be achieved
Fencing				
1	Erect new fence (Figure 3-3)	AH	June 2020	Manage stock access; exclude stock October to February inclusive
1	Develop Fence Management Plan to minimise vegetation/soil disturbance. Seek approval of the FMP from the Minister.	AH	December 2019	The disturbance caused by fence installation must be minimised e.g. use of a hand- or tractor- slasher in preference to heavy earth-moving machinery. The design and construction technique for new fences would be subject to approval by the Minister.
2-20	Maintain existing fences	Owner	Ongoing	Manage stock access; exclude stock October to January inclusive
Weeds				
1-20	Exclude woody weeds	Owner	Ongoing	Maintain woody weed cover at 0% in the Offset Area
1-20	Manage/control herbaceous weeds	Owner	Ongoing	No increase in weed (woody and herbaceous) cover. Reduce herbaceous weed cover to 30% of the Offset Area within 5 years.
Biomass Management				
1-20	Ecological burning	Owner	By agreement with the AH and Minister	Enough bare ground (approximately 15 to 30% cover) maintained in order to establish space for the recruitment of native herbs and grasses.

				No loss of native plant diversity as a result of burning regimes.
1-20	Pulse grazing	Owner	Exclude livestock from October to January inclusive	No loss of native plant diversity as a result of grazing regimes. No negative impact to the recruitment and maintenance of the threatened orchid species. No increase in weed (woody and herbaceous) cover.
Monitoring				
1-20	Monitoring will be required from the site and in the local area to support the assessment of improvement or deterioration of threatened species on site and the condition of their habitat and the determination of the causes of any changes and development of appropriate adaptive management.	AH	For 20 years starting the establishment of monitoring plots in Spring 2019	Enough bare ground (approximately 15 to 30% cover) maintained in order to establish space for the recruitment of native herbs and grasses. No loss of native plant diversity as a result of burning regimes.

3.5 ECOLOGICAL MONITORING REGIME

The land is being reserved for the protection of, and habitat improvement for, the orchid species the subject of the EPBC Approval which occurs in the Offset Area - *Pterostylis pratensis* (Liawenee greenhood).

3.5.1 OBJECTIVE

It must be demonstrated that the habitat is being **maintained**, and preferably improved, for *Pterostylis pratensis*.

The main objectives for the Offset Area are to –

1. maintain site habitat conditions which promote the recruitment, flowering and seed set of *Pterostylis pratensis*; and
2. increase the number and geographic extent of *Pterostylis pratensis* in the Offset Area.

3.5.2 TIMEFRAME

Ecological – biodiversity related monitoring will be for 20 years, as a minimum, and is likely to be about 25 years in accordance with the timeframe of EPBC Approval 2009/4839.

3.5.3 APPROACH

PAG recommended that a monitoring program for the site include the fencing of the southern block (Area C in Figure 3-1) to exclude stock - provides a control site to allow assessment of the impact of grazing on the vegetation communities and threatened species in the remainder of the covenant. For the first 3 years of monitoring Area C will be stock grazed like Areas A and B. This approach will be reviewed at the end of 3 years to determine if any future stock exclusion is required of Area C to enable the quantification of any detrimental changes observed within that 3-year period.

PAG stated that the monitoring program should consider the effect of grazing and shrub invasion on *Pterostylis pratensis* and other threatened flora species. Use should be made, if possible, of previous monitoring data and infrastructure (sites) established in the 1960's within the proposal area. PAG recommended that these be re-established (since the posts are still in place requiring upgrading of the wire) and the monitoring resumed. The re-instatement of the plots will be investigated.

The monitoring approach will include but not necessarily be limited to those tasks listed in Table 16.

Table 16. Monitoring tasks for the Stone Hut Offset Area

Method	Comments	Timing
Transects	5 are already established (Figure 3-4) to record population demographics and plant number of *Pterostylis pratensis*	Annual; coincide with the peak flowering periods of *Pterostylis pratensis* for at least 5 years then reviewed

Photo-points	Some have been installed with the transects but additional locations may be warranted	Annually
Use of wildlife cameras	To record/detect feral animals such as deer To observe grazing behaviours of livestock	Ad hoc
Plots/quadrats	Installation of permanent plots to monitor the same location over time; focus on species occurrence, vegetation structure, trends in native v exotic grass and herb cover	Quarterly for at least 3 years then reviewed
Time meander surveys	Conducted at various seasons of the year (mainly spring, summer and autumn) to detect land management issues such as erosion, orchid emergence and browsing by feral animals (eg rabbits) or livestock,	Quarterly for at least 3 years then reviewed

3.5.4 EVALUATION CRITERIA

To effect adaptive management there needs to be an assessment made of Habitat Quality before and after land management change has been implemented.

Table 17 provides the EPBC Offset Calculator figures used to identify the Liawenee greenhood Habitat Quality of the Stone Hut Offset Area (Start Quality) and the Future Quality of the habitat under improved/constrained land management practices enforced by the FOMP.

Table 17. Evaluation Criteria for Liawenee greenhood in the Stone Hut Offset Area

Habitat Quality Component	Start Quality	Future Quality
Site condition	Moderate to high native flora species present, bare ground coverage moderate to high, erosion scars present (overgrazing and/or too frequent fire events). A score of 2 out of 3 is allocated.	Maintain high native species diversity and coverage. Maintain site habitat conditions which promote the recruitment, flowering and seed set of the species. Maintain low weed coverage. A score of 2 or 2.5 out of 3 is proposed.
Site context	Location within the landscape for the site does not seem to be a main or driving factor in the occurrence of this species in the impact area. A score of 1 out of 1 is allocated.	Cannot effect change to location. A score of 1 out of 1 is allocated.

Species stocking rate	Widespread but low abundance of *Pterostylis pratensis* plants. A score of 5 out of 6 is allocated.	Have the species increase, even marginally, in number and geographic extent. A score of 5 out of 6 is proposed.
TOTAL SCORE	**8 out of 10**	**8 out of 10 (minimum)**

4. WIHAERJA OFFSET AREA

4.1 LOCATION

The Offset Area is in the northern part of St Patrick's Plains, to the south east of Barren Tier (Figure 1) and is near Wihareja Creek which has its headwaters to the north on Barren Tier.

The Offset Area is one of the larger 'back' paddocks of the farming property 'Wihareja' – the paddock that contains the Offset Area is more than 1,000 acres (>400 hectares). It is in two parts (split by an easement for high-voltage transmission lines and towers) and totals approximately 89.6 hectares in size (Figure 4-1).

The Offset Area and property generally have been used to farm sheep for decades with relatively small areas of the property converted to agricultural land.

4.2 CONSERVATIOPN SIGNIFICANT VALUES

The Wihareja Offset Area contains the following known conservation significant values –

- Highland *Poa* grassland (TASVEG - GPH) – a State threatened vegetation community (Figure 4-2);
- Known and potential habitat for Liawenee greenhood (*Pterostylis pratensis*);
- Known and potential habitat for crowded leek orchid (*Prasophyllum crebriflorum*);
- Habitat for Ptunarra brown butterfly (*Oreixenica ptunarra*) – a State and EPBC Vulnerable listed invertebrate species;
- Foraging and denning habitat for threatened mammal species, including spotted-tailed quoll (*Dasyurus maculatus maculatus*), Tasmania devil (*Sarcophilus harrisii*) and Eastern quoll (*Dasyurus viverrinus*); and
- Foraging habitat for masked owl (*Tyto novaehollandiae castanops*) and wedge-tailed eagle (*Aquila audax fleayi*).

The known locations of some threatened flora species are shown in Figure 4-5. Additional conservation significant values may be recorded within the Offset Area with further surveys and monitoring.

4.3 PHOTOGRAPHS

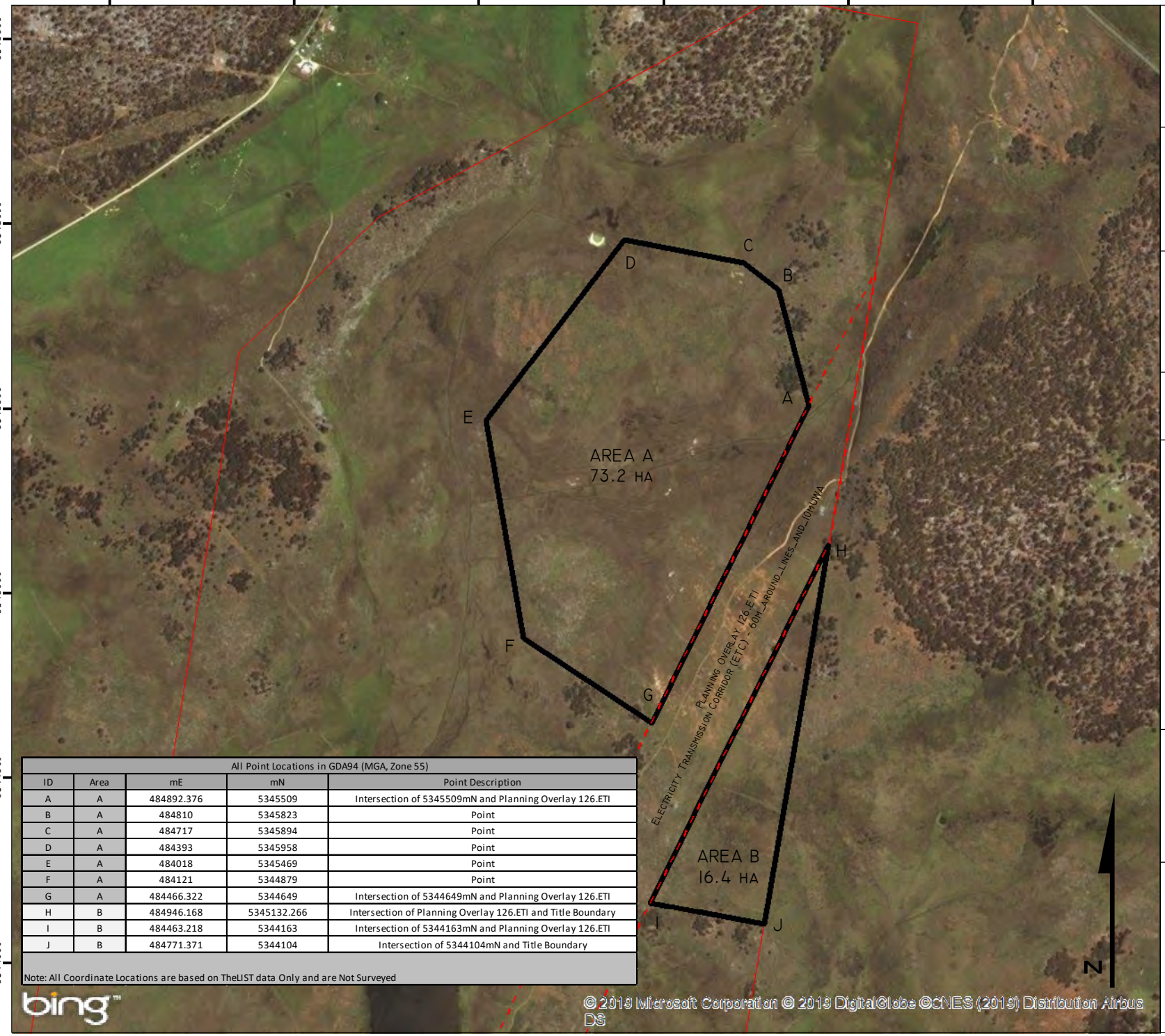
The following photographic images are provided to illustrate the type of habitats present in the Offset Area.

FLORA OFFSET MANAGEMENT PLAN

INFORMATION MAP

FIGURE 4-1:
WIHAREJA COVENANT
PID 2813013
VOL/FOLIO 156999/1

TASMAP:	LGA:
WIHAREJA 4834	CENTRAL HIGHLANDS



All Point Locations in GDA94 (MGA, Zone 55)				
ID	Area	mE	mN	Point Description
A	A	484892.376	5345509	Intersection of 5345509mN and Planning Overlay 126.ETI
B	A	484810	5345823	Point
C	A	484717	5345894	Point
D	A	484393	5345958	Point
E	A	484018	5345469	Point
F	A	484121	5344879	Point
G	A	484466.322	5344649	Intersection of 5344649mN and Planning Overlay 126.ETI
H	B	484946.168	5345132.266	Intersection of Planning Overlay 126.ETI and Title Boundary
I	B	484463.218	5344163	Intersection of 5344163mN and Planning Overlay 126.ETI
J	B	484771.371	5344104	Intersection of 5344104mN and Title Boundary

Note: All Coordinate Locations are based on TheLIST data Only and are Not Surveyed

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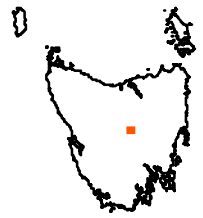

DATUM: GDA94
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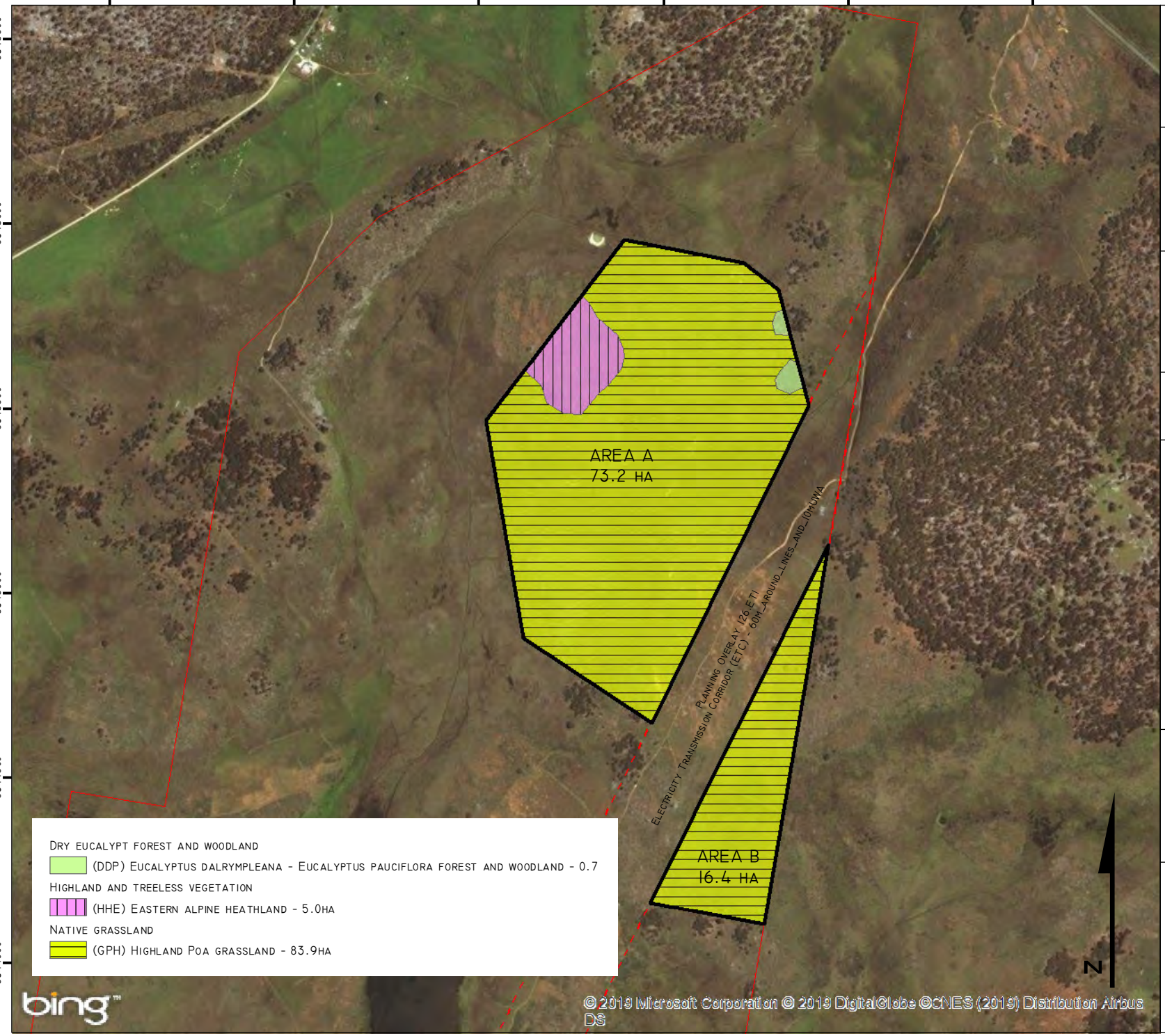
SCALE: @A4 - 1:40,000

CLIENT:
GOLDWIND
AUSTRALIA
PTY LTD

DATE: 15TH JAN 2019



FLORA OFFSET MANAGEMENT PLAN

INFORMATION MAP

FIGURE 4-2: WIHAREJA COVENANT VEGETATION COMMUNITIES

TASMAP:	LGA:
WIHAREJA 4834	CENTRAL HIGHLANDS

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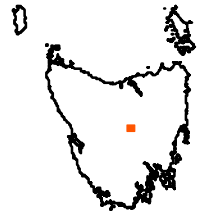

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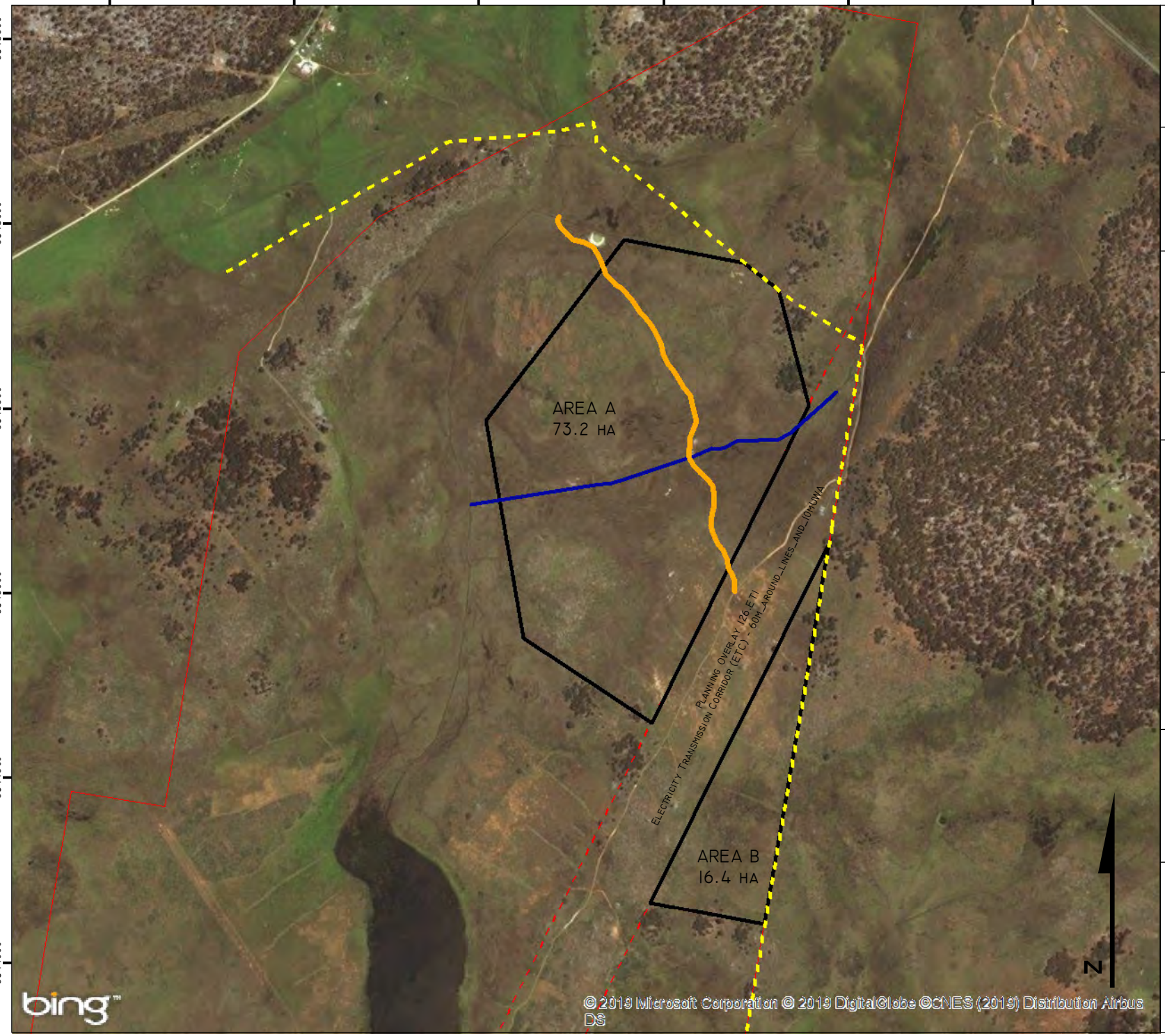
SCALE: @A4 - 1:40,000

CLIENT:
GOLDWIND AUSTRALIA PTY LTD

DATE: 15TH JAN 2019



FLORA OFFSET MANAGEMENT PLAN

INFORMATION MAP

FIGURE 4-3:
WIHAREJA COVENANT
INFRASTRUCTURE MAP

TASMAP:	LGA:
WIHAREJA 4834	CENTRAL HIGHLANDS

- EXISTING FENCES
- EXISTING TRACKS
- EXISTING DRAIN LINE

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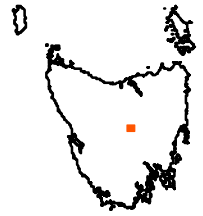

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GRID: MGA ZONE 55
SCALE: @A4 - 1:40,000

CLIENT:
GOLDWIND
AUSTRALIA
PTY LTD

DATE: 15TH JAN 2019

FLORA OFFSET MANAGEMENT PLAN

INFORMATION MAP

FIGURE 4-4:
WIHAREJA COVENANT
TRANSECT LOCATIONS

TASMAP:	LGA:
WIHAREJA 4834	CENTRAL HIGHLANDS

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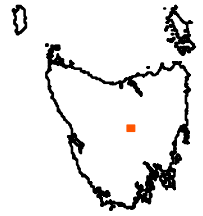

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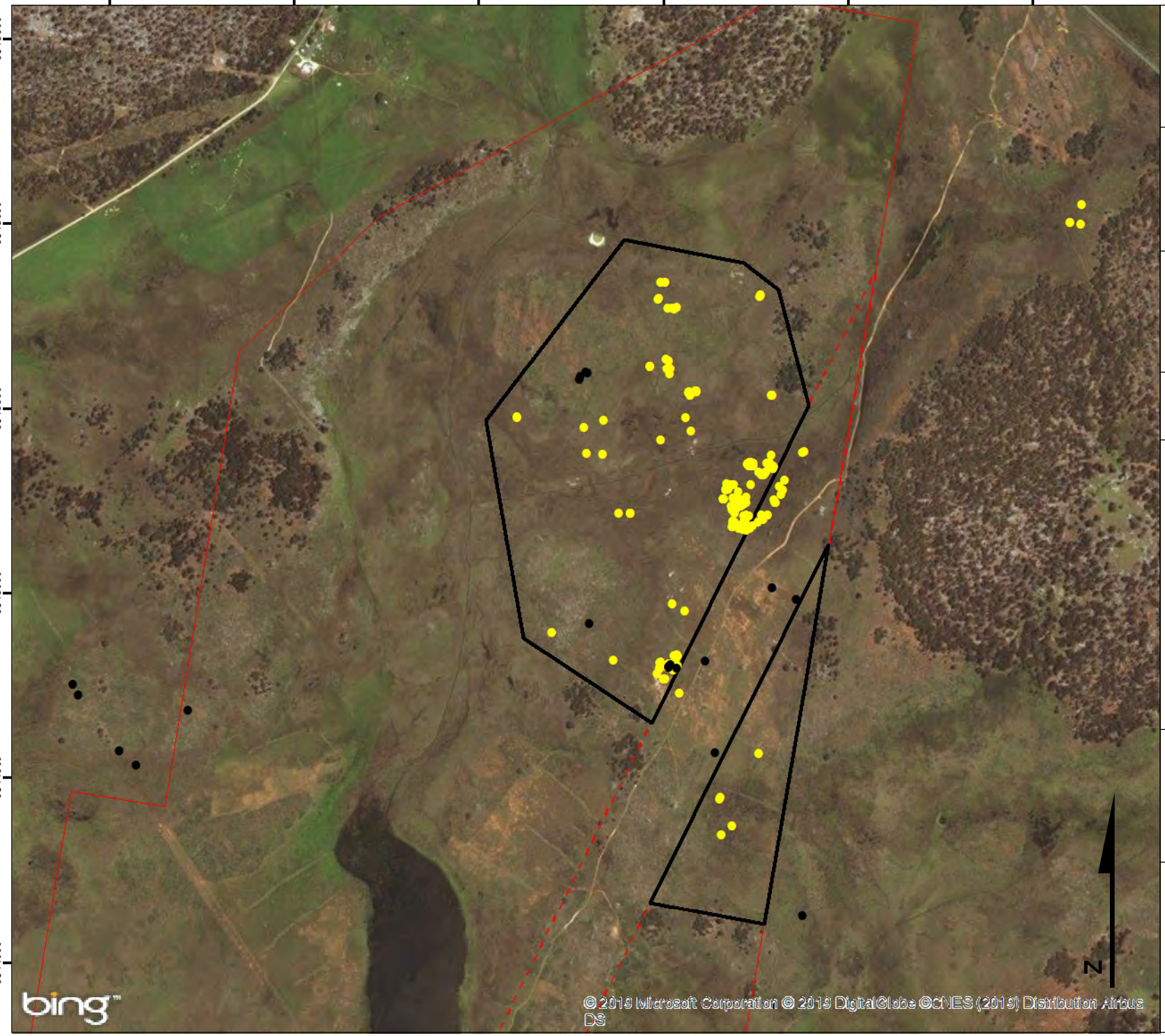

FLORA OFFSET MANAGEMENT PLAN

INFORMATION MAP

FIGURE 4-5: WIHAREJA COVENANT THREATENED FLORA

TASMAP:	LGA:
WIHAREJA 4834	CENTRAL HIGHLANDS

- PTEROSTYLIS PRATENSIS
- PRASOPHYLLUM CREBRIFLORUM

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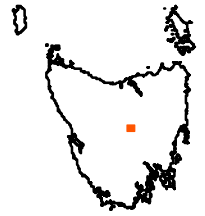

DATUM: GDA94
GRID: MGA ZONE 55
SCALE: @A4 - 1:40,000

CLIENT:
GOLDWIND AUSTRALIA PTY LTD

DATE: 15TH JAN 2019

4.4 MANAGEMENT CONSTRAINTS AND ACTIONS

The following terms are used in this section –

Owner – James Glover & Sons Pty Ltd

Approval Holder – Wild Cattle Hill Pty Ltd (ACN 610 777 369)

Minister – the Tasmanian Minister administering the Nature Conservation Act 2002.

4.4.1 MANAGEMENT CONSTRAINTS

The management activities which are to be constrained by the conservation covenant and Nature Conservation Plan for the Offset area are described below.

Theme	Comments and information
THREATENED AND/OR PRIORITY SPECIES	Species known to be present are: • *Pterostylis pratensis* (Liawenee greenhood); and • *Prasophyllum crebriflorum* (crowded leek orchid). No specific management measures are proposed for these species. Monitoring at the site is required to assess improvement or deterioration of crowded leek orchid and Liawenee greenhood numbers on site and the condition of their habitat and the determination of the causes of any changes and development of appropriate adaptive management.
TIMBER HARVESTING	Not permitted.
DOMESTIC FIREWOOD	Not permitted.
STOCK GRAZING	Stock grazing may occur on the reserve – sheep only. The Offset Area is to be kept as part of the 1,000-acre paddock which is to be stocked with no more than 400 sheep at any one time. Grazing is to be excluded from the paddock in the months of December and January when the two orchid species are completing their flowering and seed set stages of growth. If the paddock is to be stocked at a greater intensity or at differing times of the year (ie in January or December) then the reserve must be fenced by the Owner to manage stock access such that the permitted intensity and grazing duration can be achieved. Dogs and off-road vehicles may be used to assist with mustering stock.

EXISTING FENCING	The property boundary with the adjoining land to the east of the Offset Area is fully fenced and the fence is in fair condition (Figure 4-3). This fence must be maintained by the Owner.
NEW FENCES PROPOSED OR REQUIRED	A stock-proof fence around the Offset Area must be constructed by the Owner if the grazing regime on it is to be different to the non-reserved land adjacent to it (ie if the 1,000-acre paddock is to be managed at a different regime than that permitted for the Offset Area). If the non-reserved land within the larger paddock in which the Offset Area is situate is grazed more intensively than the Offset Area, then it must be fenced to comply with the grazing regime authorised by the Minister.
FUEL REDUCTION AND ECOLOGICAL BURNS	The Owner may use fire to achieve fire hazard reduction if and when the Owner and the Minister, or the Tasmania Fire Service deem it necessary for safety reasons, and the Owner may use fire to conduct ecological burns (NOTE – only in August to October for reducing woody vegetation cover.
CAMPFIRE(S)	Not permitted.
PERMANENT FIREBREAKS	Authorisation for construction and maintenance of permanent firebreaks is to be provided for the following: If and when the owner and the Minister, or the Tasmanian Fire Service deem it necessary.
EMERGENCY FIREBREAKS	Emergency firebreaks will be permitted if there is an immediate threat to life or property.
HERBICIDES, PESTICIDES, FERTILISERS AND OTHER CHEMICALS	The Owner may use herbicides on the land as part of a weed management program. No fertilisers are to be applied on the land. Pesticides and other chemicals may only be applied on the land if they are required as part of a feral animal management program.
CONTROL OF EXOTIC PLANT SPECIES (WEEDS)	The Owner will make annual inspections and control and (if possible) eradicate infestations of Declared and environmental weeds.
CONTROL OF EXOTIC (FERAL) ANIMAL SPECIES	The owner is responsible for the control or eradication (if feasible) of feral animals on the land. Fallow deer control can occur on the Land. The taking of Fallow Deer is currently controlled under the *Wildlife Regulations 1999* (section 25).
CONTROL OF NATIVE ANIMALS	Not permitted.

DOGS OR HORSES IN THE OFFSET AREA?	Dogs allowed when under effective control for recreation **and** stock mustering. Horses allowed for stock mustering only. *Note. Dogs and horses must not cause harm to native animals or their habitat.*
INTRODUCTION OF NATIVE FLORA FOR THE PURPOSE OF REVEGETATION	Not permitted.
TAKING OF WATER FOR DOMESTIC USE	Not permitted.
NATURAL FLOW OF WATER	Minor interference with the natural flow of water is permitted where it is associated with existing carriageways, dams and infrastructure (e.g. drain shown in Figure 4-3).
EFFLUENT AND IRRIGATION	The use of irrigation water or effluent of any kind is prohibited on the land.
ARE THERE EXISTING VEHICLE OR WALKING TRACKS?	Yes. The existing off-road track is mapped in Figure 4-3. The Owner can use and maintain this track for ongoing use.
NEW VEHICLE TRACKS	No new carriageways are permitted.
NEW WALKING TRACKS	No new tracks are permitted.
OFF-ROAD VEHICLE USE	Except for emergencies (medical evacuation, bushfire) off-road vehicle use will only be permitted for - • To assist with approved maintenance activities • To assist with weed control activities • To assist with inspections/monitoring of the reserve To assist with stock mustering
RECREATIONAL USE	Recreational activities that are not considered deleterious to the natural values are permitted on the land.
DELETERIOUS ACTIVITIES	No activities (including, but not confined to removal of natural resources, dumping of rubbish, general disturbance etc) which are or may be

	considered deleterious to the natural values are permitted on the land unless approved by the Minister.
CONSTRUCTION OF INFRASTRUCTURE (EXCLUDING FENCING)	Construction of infrastructure is not permitted.
INTRODUCTION OF FOREIGN MATERIALS	Introduction of foreign materials (e.g. gravel for road maintenance) is only permitted with the authorisation of the Minister.
MONITORING	The NCP must allow for the installation of star pickets and associated monitoring plot infrastructure such as pegs, tape and wildlife cameras (for monitoring of deer numbers and the presence/abundance of other grazing vectors). Transects have already been established within the Offset Area (Figure 4-4) as part of the FOMP. These transects have been established to record, for the two significant orchid species, the following - plant number, spatial distribution within a sub-area of the reserve (ie distance from a central line so that mapping spatial extent is possible), photopoints, vegetation condition benchmark (as per TASVEG) and flora species present in that area. The transects are 100m long and 10m wide – an area of 0.1 hectares – and are marked in the field at 0, 50 and 100 m with permanent metal markers. Additional transects and monitoring plots/quadrats (permanent and temporary) may be installed as part of the monitoring program.

4.4.2 MANAGEMENT ACTIONS

Management actions to help achieve the management objectives of the Offset Area are presented in Table 18.

Table 18. Wihareja Offset Area Management Actions Table

Year from commencement	Management Action Description	Responsible	Timing	Environmental outcome to be achieved
Fencing				
2-20	Maintain existing fences	Owner	Ongoing	Manage stock access
When required	Erect fence around Offset Area to manage stock access if the paddock is to be stocked in December and/or January or if stock numbers will be more than 400 sheep in the 1,000-acre paddock	Owner	When required	Manage stock access to – • exclude livestock in December and January; and • maintain no more than 400 sheep in the paddock which contains the Offset Area.
Weeds				
1-20	Exclude woody weeds	Owner	Ongoing	Maintain woody weed cover at 0% in the Offset Area
1-20	Manage/control herbaceous weeds	Owner	Ongoing	No increase in weed (woody and herbaceous) cover. Reduce herbaceous weed cover to 30% of the Offset Area within 5 years.
Biomass Management				
1-20	Ecological burning	Owner	By agreement with the AH and Minister	Enough bare ground (approximately 15 to 30% cover) maintained in order to establish space for the recruitment of native herbs and grasses. No loss of native plant diversity as a result of burning regimes.

1-20	Pulse grazing - timing	Owner	Exclude livestock in December and January	No loss of native plant diversity as a result of grazing regimes. No negative impact to the recruitment and maintenance of the threatened orchid species. No increase in weed (woody and herbaceous) cover.
1-20	Pulse grazing – sheep numbers	Owner	Limit stock numbers to 400 sheep in the 1,000 acre paddock	No loss of native plant diversity as a result of grazing regimes. No negative impact to the recruitment and maintenance of the threatened orchid species. No increase in weed (woody and herbaceous) cover.
Monitoring				
1-20	Monitoring will be required from the site support the assessment of improvement or deterioration of threatened species on site and the condition of their habitat and the determination of the causes of any changes and development of appropriate adaptive management.	AH	For 20 years starting the establishment of monitoring plots in Spring 2019	Enough bare ground (approximately 15 to 30% cover) maintained in order to establish space for the recruitment of native herbs and grasses. No loss of native plant diversity as a result of burning regimes.

4.5 MONITORING

The land is being reserved for the protection of, and habitat improvement for, the listed orchid species the subject of the EPBC Approval - *Pterostylis pratensis (Liawenee greenhood)* and *Prasophyllum crebriflorum* (crowded leek orchid).

4.5.1 OBJECTIVE

It must be demonstrated that the habitat is being **improved** for both species.

The main objectives for the Offset Area are to –

1. reduce the coverage of exotic grasses and herbs with an associated increase in native grass and herb cover;
2. create site habitat conditions which promote the recruitment, flowering and seed set of both orchid species; and
3. have both orchid species increase in their number and geographic extent.

4.5.2 TIMEFRAME

Ecological – biodiversity related monitoring will be for 20 years, as a minimum, and is likely to be about 25 years in accordance with the timeframe of EPBC Approval 2009/4839.

4.5.3 APPROACH

The monitoring approach will include but not necessarily be limited to those tasks listed in Table 19.

Table 19. Monitoring tasks for the Wihareja Offset Area

Method	Comments	Timing
Transects	5 are already established (Figure 4-4) to record population demographics and plant number of *Pterostylis pratensis* and *Prasophyllum crebriflorum*	Annual; coincide with the peak flowering periods of each orchid species for at least 3 years then reviewed
Photo-points	Some have been installed with the transects but additional locations may be warranted	Annually
Use of wildlife cameras	To record/detect feral animals such as deer To observe grazing behaviours of livestock	Ad hoc
Plots/quadrats	Installation of permanent plots to monitor the same location over time; focus on species occurrence, vegetation structure, trends in native v exotic grass and herb cover	Quarterly for at least 3 years then reviewed
Time meander surveys	Conducted at various seasons of the year (mainly spring, summer and autumn) to detect land	Quarterly for at least 3 years then reviewed

	management issues such as erosion, orchid emergence and browsing by feral animals (eg rabbits) or livestock,	

4.5.4 EVALUATION CRITERIA

To effect adaptive management there needs to be an assessment made of Habitat Quality before and after land management change has been implemented.

Table 20 provides the EPBC Offset Calculator figures used to identify the crowded leek orchid Habitat Quality of the Wihareja Offset Area (Start Quality) and the Future Quality of the habitat under improved/constrained land management practices enforced by the FOMP.

Table 21 provides the EPBC Offset Calculator figures used to identify the Liawenee greenhood Habitat Quality of the Wihareja Offset Area (Start Quality) and the Future Quality of the habitat under improved/constrained land management practices enforced by the FOMP.

Table 20. Evaluation Criteria for Crowded leek orchid in the Wihareja Offset Area

Habitat Quality Component	Start Quality	Future Quality
Site condition	Few signs of overgrazing, feral deer population present (numbers and population trend unknown), few exotic plant species present and low exotic species coverage. A score of 3 out of 3 is allocated.	Reduce the coverage of exotic grasses and herbs with an associated increase in native grass and herb cover. Create site habitat conditions which promote the recruitment, flowering and seed set of both orchid species. A score of 3 out of 3 is proposed.
Site context	Location within the landscape for the site does not seem to be a main or driving factor in the occurrence of this species in the impact area. A score of 1 out of 1 is allocated.	Cannot effect change to location. A score of 1 out of 1 is allocated.
Species stocking rate	Has a centralised area with a very high density of *Prasophyllum crebriflorum*, as noted by the distribution of the species. The densities observed are marginally lower than those observed within the highest density areas of the impact site. A score of 3 out of 5 is allocated.	Increase in geographic extent within Offset Area. A score of 4 to 5 out of 6 is proposed.

TOTAL SCORE	**7 out of 10**	**8 out of 10 (minimum)**

Table 21. Evaluation Criteria for Liawenee greenhood in the Wihareja Offset Area

Habitat Quality Component	Start Quality	Future Quality
Site condition	Few signs of overgrazing, Feral deer population present (numbers and population trend unknown). A score of 2 out of 3 is allocated.	Reduce the coverage of exotic grasses and herbs with an associated increase in native grass and herb cover. Enhance site habitat conditions to promote the recruitment, flowering and seed set of Liawenee greenhood. A score of 2 or 2.5 out of 3 is proposed.
Site context	Location within the landscape for the site does not seem to be a main or driving factor in the occurrence of this species in the impact area. A score of 1 out of 1 is allocated.	Cannot effect change to location. A score of 1 out of 1 is allocated.
Species stocking rate	Widespread but low abundance of *Pterostylis pratensis* plants. A score of 5 out of 6 is allocated.	Increase in orchid number and geographic extent in Offset Area. A score of 5 out of 6 is proposed.
TOTAL SCORE	**8 out of 10**	**8 out of 10 (minimum)**

5. MONITORING, AUDITING AND REPORTING

5.1 INTRODUCTION

Suitable offsets must have transparent governance arrangements including being able to be readily measured, monitored (ecological based), audited and enforced.

The monitoring program is designed to:

- Inform and report 'early-control', i.e. to demonstrate that management actions are effective in achieving interim performance targets, and therefore in time completion criteria; and
- Support an 'early warning' function, i.e. to inform timely decisions on corrective actions to ensure performance and completion criteria are achieved / maintained.

Adaptively implementing the FOMP is critical to achieving its objectives, for example where adjustment actions and arrangements to enhance effectiveness can be made to deliver improvements to site habitat condition.

Information and data gained by the Approval Holder through monitoring the Offset Areas will be provided to the Minister administering the *Nature Conservation Act 2002* such that he/she can maintain, alter and/or modify land management arrangements considering the results. The mechanism exists in the Nature Conservation Plan for the Minister to effect management change if it is required or desirable to do so.

The monitoring will be undertaken by a suitably qualified ecologist or botanist in accordance with the FOMP; specifically, Sections 2.5 (Bashan Ledge), 3.5 (Stone Hut) and 4.5 (Wihareja).

5.2 MEASUREMENT ATTRIBUTES

The objective of the monitoring program is to evaluate the progress of Offset Area management activities and inform successful and timely interventions. To achieve this goal, relevant data and information need to be gathered, collated and interpreted as described below.

5.2.1 ECOLOGICAL MEASURES

Site specific ecological-focused monitoring methods to be applied at each Offset Area are described in each section:

- Bashan Ledge – Section 2.5
- Stone Hut – Section 3.5
- Wihareja – Section 4.5

As a minimum, monitoring will:

- Identify trends and areas for improvement through early control and early warning functions;
- Assess effectiveness of environmental constraints and controls implemented;

- Where necessary, identify modifications required for the monitoring program, practices or areas requiring research;
- Compare flora species present against baseline conditions;
- Assess vegetation health and predict trends to adapt future management arrangements;
- Assess vegetation structure (upper, mid and understorey);
- Assess SFS presence/abundance and geographic extent in each Offset Area relative to baseline conditions; and
- Assess the impact, if any, of feral/undesirable fauna species on SFS in each Offset Area.

Data for each of the attributes monitored will be collected to quantify habitat condition improvement from the baseline condition to be collected in 2019. This will enable any change in attributes measured to be identified, thus enabling a comparison to previous years' data and progress towards attainment of the habitat improvements/maintenance identified in the EPBC Offset Assessment Guide Calculator inputs (see also Tables 14, 17 and 20).

5.2.1 PHYSICAL SITE - MANAGEMENT MEASURES

In addition to ecological characteristics, the incidence and extent of fire occurrence, significant weed incursions/occurrences, presence of pest animals and other deleterious impacts (eg unauthorised clearing, installation of tracks and drains) in each Offset Area will be recorded through transect/plot and time meander surveys.

Other impacts and/or land management activities (eg. unlawful access to an area by off-road vehicle users) will be recorded by the Owner and reported to the Approval Holder. These events may initiate a monitoring event to determine if there has been an impact and its magnitude.

5.3 SUITABLY QUALIFIED PERSONS

All ecological – biodiversity related monitoring actions will be carried out by a suitably qualified person, with the necessary training and induction to access the Project site.

A suitably qualified person(s) will have a relevant degree and enough experience that makes them competent to undertake field-based activities. For Offset Area monitoring, this includes qualified ecologists and botanists with relevant experience to carry out site assessments.

5.4 DATA COLLECTION AND HANDLING

A data handling program will be implemented to ensure proper data storage and protection, data extraction, quality control, analysis, interpretation, reporting and presentation.

Key features of the data handling program will include:

- A standard template and structure for all reports;
- Standardised data collection methods by qualified personnel;
- Use of field assessment form tailored to capture relevant site data;

- Quality Assurance review process by informed individuals; and
- Consistent filing within the Approval Holder's network.

Data will be sent to DoEE on an annual basis via electronic means, e.g. email or via data sharing software. DoEE is authorised by the Approval Holder to receive, distribute and utilise data collected from FOMP implementation to formulate and implement compliance audits and recovery planning purposes.

5.5 AUDITS AND REVIEWS

5.5.1 AUDITS

A formal internal audit will be undertaken every two years from commencement of the FOMP to evaluate plan implementation and attainment and/or maintenance of performance targets and completion criteria. Systems for recording plan implementation and performance will be auditable, and include details of who, what, where and how implementation and performance were identified and/or assessed.

If reporting indicates performance targets and/or completion criteria are unlikely to be achieved, a full internal audit of the FOMP will be conducted, the plan subject to a technical review by a suitably qualified person other than a person who prepared or implemented the plan, and the outcomes of the audit and review process reported to the DoEE along with proposed corrective actions.

A full audit will to evaluate the implementation and effectiveness of the FOMP will be undertaken in 2021, 2026, 2031, 2036 and 2041 - the audit would be complete by the end of each nominated calendar year.

Documentary evidence providing proof of the date of publication and details of non-compliance with any of the conditions of this approval will be provided to the DoEE in accordance with the EPBC conditions of approval.

5.5.2 REVIEWS

The objectives, responsibilities and management actions within the FOMP will need to consider and adapt to new information as it becomes available.

A review of the FOMP will be conducted each year in conjunction with the monitoring activities.

Reviewed versions of the FOMP will be provided to DoEE for comment and approval before any actions are altered.

5.6 REPORTING

Reports detailing the progress against the FOMP objectives will be prepared following each ecological monitoring event. Reporting is to be completed by the personnel conducting monitoring and following the completion of each monitoring event.

The report, prepared for each Offset Area, will contain as a minimum:

- A description of the monitoring conducted;
- A discussion of the weather in the lead up to and during the monitoring;
- Photos from photo monitoring points;
- Site data including site description and location and results for all site-based condition attributes;
- An overview of the progress of the management area in achieving the management outcomes and how any risks or threats have impacted on the area; and
- An indication of any risks or potential threats that have become apparent to the management area since the development of this management plan, and activities to be undertaken to manage these threats and/or risks.

The reporting will provide commentary of each point listed above and include a discussion of how the above points relate to each other. Comparison of relevant photo monitoring points, and a comparison of the previous year's data (ie transects, plots, meander surveys) as well as a discussion on how the photos back up or contradict the ecological data for all site-based condition attributes will form part of the discussion. This will serve to outline how each Offset Area is improving or declining in condition and how the self-audit and review process ensures the site improves in condition for the relevant SFS.

The Approval Holder will report on FOMP implementation as part of EPBC Approval 2009/4839 compliance reporting to the DoEE. The report to DoEE will summarise FOMP implementation (including monitoring activities), learnings from implementing the FOMP, and how implementation of the FOMP in forward years will be modified to maximise the likelihood of achieving and/or maintaining the desired conservation outcomes.

Within three months of every 12-month anniversary of the commencement of the FOMP, condition monitoring, assessment and management reports will be submitted to the Minister and published on the Approval Holders website.

6. RISKS TO ACHIEVING OFFSET MANAGEMENT OBJECTIVES

6.1 INTRODUCTION

Any land management program must consider the impacts of unplanned/stochastic events.

This section of the FOMP has reviewed the impact of these events and impacts via a risk-based approach which assesses the potential consequences and mitigation measures in terms of the consequence category - environment.

6.2 ASSESSMENT OF RISK

The key risks associated with biodiversity and land management have been assessed using the likelihood ratings, maximum reasonable consequence ratings, risk matrix and classifications listed in Tables 22 and 23.

Table 22. Likelihood Rating

		Consequence				
		Minor	Moderate	High	Major	Critical
Likelihood	Highly Likely	Medium	High	High	Severe	Severe
	Likely	Low	Medium	High	High	Severe
	Possible	Low	Medium	Medium	High	Severe
	Unlikely	Low	Low	Medium	High	High
	Rare	Low	Low	Low	Medium	High

Table 23. Maximum reasonable consequence rating

Qualitative measure of likelihood (how likely is it that this event/circumstances will occur after management actions have been put in place/are being implemented)	
Highly likely	Is expected to occur in most circumstances
Likely	Will probably occur during the life of the project
Possible	Might occur during the life of the project
Unlikely	Could occur but considered unlikely or doubtful
Rare	May occur in exceptional circumstances
Qualitative measure of consequences (what will be the consequence/result if the issue does occur)	
Minor	Minor risk of failure to achieve the plan's objectives. Results in short term delays to achieving plan objectives, implementing low cost, well characterised corrective actions.
Moderate	Moderate risk of failure to achieve the plan's objectives. Results in short term delays to achieving plan objectives, implementing well characterised, high cost/effort corrective actions.
High	High risk of failure to achieve the plan's objectives. Results in medium-long term delays to achieving plan objectives, implementing uncertain, high cost/effort corrective actions.
Major	The plan's objectives are unlikely to be achieved, with significant legislative, technical, ecological and/or administrative barriers to attainment that have no evidenced mitigation strategies.
Critical	The plan's objectives are unable to be achieved, with no evidenced mitigation strategies.

6.3 IDENTIFICATION OF RISKS

Table 24 outlines the key identified risks and feasible correction actions for these risks associated with failure of the Offset Areas to achieve completion criteria related to habitat quality. The ratings assume that the risks are untreated i.e. have not been addressed by specific risk mitigation measures other

than routine design and operational practice. All risks are considered manageable and actions within sections of this FOMP address relevant risks.

The residual risk resulting from each risk event or circumstance is explained through the following:

1. Change in landowner prior to covenant being lodged on land title. The development of draft covenant documents and progression to signing by the landowner is urgent for all Offset Areas – the risk is considered higher for a landowner change at Wihareja.

2. Impacts of wildfires. The residual risk to planned objectives from fire events has been considered as fire can be unpredictable and difficult to manage. Further, fires may differ in intensity and frequency across each Offset Area. Fire management activities will be implemented in each Offset Area to reduce the risk of high intensity fire, however residual risk remains as fires may not always respond to management activities.

3. Impacts of weed species. The residual risk to planned objectives from weeds has been considered as impacts may occur rapidly once infestation occurs, having a detrimental impact on Offset Area condition. Weeds will be monitored closely to ensure they are not encroaching on an Offset Area or creating additional fuel load for potential fire events.

4. Impacts of pest species. The residual risk to planned objectives from pest species, such as fallow deer, has been considered as impacts may occur rapidly once deer numbers become high, having a detrimental impact on Offset Area condition. This impact is more likely to be a problem at Bashan Ledge given it is at a slightly lower elevation and the environment is more conducive to high deer numbers.

Table 24. Risk assessment and management table for all Offset Areas

Management objectives/desired outcome	Event or circumstance	Relevant management actions/measures	Residual risk			Trigger detection and monitoring activity/ies	Feasible/effective corrective actions
			L	C	RR		
To legally secure approved offset Areas for conservation	Failure to legally secure approved Offset Areas	Engage with the PLCP about the statutory process	Unlikely	Moderate	Low	N/A	Utilise a recognised statutory process
	Landowner changes prior to Offset Areas being secured by conservation covenant	Liaise with new landowner to reiterate commitment to the Offset Area being placed under covenant	Possible	Major	High	Direct contact with landowner. Monitor land title information for change in landowner.	Covenant documents are progressed as soon as possible for signing by landowner
	Legislative reform prejudices proposed tenure arrangements for	Monitor DoEE and DPIPWE for changes to offset administration	Rare	High	Low	Expert liaison, press releases, direct contact with regulatory authorities	Adjust offset calculations accordingly
To achieve performance targets and completion criteria for all MNES	Landowner – approval holder agreements fail to adequately address management commitments in the FOMP	Engage an expert to manage this process. Ensure all impacts are suitably offset.	Unlikely	High	Medium	Quality assurance monitoring	Revise and audit on-title and/or Approval Holder agreements
	Minister inadequately constrains land management practices which may lead to the deterioration of habitat	Reiterate to the Minister the importance of maintaining and enforcing land management constraints to achieve desired outcomes Provide the Minister with expert advice and	Unlikely	High	Medium	Monitoring, audits and/or annual reporting Direct contact with the landowner and/or manager	Encourage Minister to apply adaptive management to ensure that the objectives of the FOMP are not compromised

		monitoring results to demonstrate					
	Insufficient funds provided by the Approval Holder to implement plan	Approval Holder identifies budget for immediate and long-term activities required by the FOMP Engage a consultant to conduct the monitoring works and reporting.	Unlikely	High	Medium	Failure to implement monitoring activities and reporting	Approval Holder identifies activities in budget and allocates funds to meet FOMP requirements
	Stochastic events (wildfire, drought) prejudice attainment of interim performance targets and/or completion criteria for MNES	Ensure appropriate biomass management regime is in place. Plan for delayed completion; revise management regime to reflect changed conditions.	Possible	High	Medium	Monitoring, audits and/or annual reporting Direct contact with the landowner and/or manager	Apply adaptive management to ensure that the objectives of the FOMP are not compromised
	Grazing impacts are - a. more significant than anticipated; and/or b. not enough to effect positive change in vegetation condition.	Modify grazing regime and continue to monitor changes	Possible	Major	High	Monitoring, audits and/or annual reporting Direct contact with the landowner and/or manager	Apply adaptive management to ensure that the objectives of the FOMP are not compromised

6. REFERENCES

Threatened Species Section (2010). Listing Statement for *Prasophyllum crebriflorum* (crowded leek-orchid). Department of Primary Industries, Parks, Water and Environment, Tasmania.

ATTACHMENTS

Attachment 1 *Prasophyllum crebriflorum* – EPBC Offset Calculator Spreadsheets

Attachment 2 *Pterostylis pratensis* – EPBC Offset Calculator Spreadsheets

Attachment 1 ***Prasophyllum crebriflorum*** **– EPBC Offset Calculator Spreadsheets**

Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012

This guide relies on Macros being enabled in your browser.

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

BASHAN LEDGE

Matter of National Environmental Significance	
Name	Prasophyllum crebriflorum
EPBC Act status	Endangered
Annual probability of extinction Based on IUCN category definitions	**1.2%**

Impact calculator

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Ecological communities						
Area of community	No		**Area**			
			Quality			
			Total quantum of impact	0.00		
Threatened species habitat						
Area of habitat	Yes		**Area**	32.35	Hectares	
			Quality	**8**	Scale 0-10	
			Total quantum of impact	25.88	Adjusted hectares	
Protected matter attributes	**Attribute relevant to case?**	**Description**	**Quantum of impact**		**Units**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No					
Condition of habitat Change in habitat condition, but no change in extent	No					
Threatened species						
Birth rate e.g. Change in nest success	No					
Mortality rate e.g Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator

Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost ($ total)	Information source
Ecological Communities																				
Area of community	No				**Risk-related time horizon (max. 20 years)**		**Start area (hectares)**		**Risk of loss (%) without offset**		**Risk of loss (%) with offset**									
									Future area without offset (adjusted hectares)	0.0	**Future area with offset (adjusted hectares)**	0.0								
					Time until ecological benefit		**Start quality (scale of 0-10)**		**Future quality without offset (scale of 0-10)**		**Future quality with offset (scale of 0-10)**									
Threatened species habitat																				
Area of habitat	Yes	25.88	Adjusted hectares		**Time over which loss is averted (max. 20 years)**	20	**Start area (hectares)**	24	**Risk of loss (%) without offset**	0%	**Risk of loss (%) with offset**	0%	0.00	90%	0.00	0.00	5.75	22.22%	No	
									Future area without offset (adjusted hectares)	24.0	**Future area with offset (adjusted hectares)**	24.0								
					Time until ecological benefit	10	**Start quality (scale of 0-10)**	7	**Future quality without offset (scale of 0-10)**	5	**Future quality with offset (scale of 0-10)**	8	3.00	90%	2.70	2.40				
Protected matter attributes	**Attribute relevant to case?**	**Total quantum of impact**	**Units**	**Proposed offset**	**Time horizon (years)**		**Start value**		**Future value without offset**		**Future value with offset**		**Raw gain**	**Confidence in result (%)**	**Adjusted gain**	**Net present value**	**% of impact offset**	**Minimum (90%) direct offset requirement met?**	**Cost ($ total)**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No																			
Condition of habitat Change in habitat condition, but no change in extent	No																			
Threatened species																				
Birth rate e.g. Change in nest success	No																			
Mortality rate e.g Change in number of road kills per year	No																			
Number of individuals e.g. Individual plants/animals	No																			

Summary

Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost ($)		
					Direct offset ($)	Other compensatory measures ($)	Total ($)
Birth rate	0				$0.00		$0.00
Mortality rate	0				$0.00		$0.00
Number of individuals	0				$0.00		$0.00
Number of features	0				$0.00		$0.00
Condition of habitat	0				$0.00		$0.00
Area of habitat	25.88	5.75	22.22%	**No**	$0.00	#DIV/0!	#DIV/0!
Area of community	0				$0.00		$0.00
					$0.00	**#DIV/0!**	**#DIV/0!**

Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012

This guide relies on Macros being enabled in your browser.

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Wihareja

Matter of National Environmental Significance	
Name	Prasophyllum crebriflorum
EPBC Act status	Endangered
Annual probability of extinction Based on IUCN category definitions	**1.2%**

Impact calculator

Impact calculator	Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
	Ecological communities						
	Area of community	No		**Area**			
				Quality			
				Total quantum of impact	0.00		
	Threatened species habitat						
	Area of habitat	Yes		**Area**	32.35	Hectares	
				Quality	**8**	Scale 0-10	
				Total quantum of impact	25.88	Adjusted hectares	
	Protected matter attributes	**Attribute relevant to case?**	**Description**	**Quantum of impact**		**Units**	**Information source**
	Number of features e.g. Nest hollows, habitat trees	No					
	Condition of habitat Change in habitat condition, but no change in extent	No					
	Threatened species						
	Birth rate e.g. Change in nest success	No					
	Mortality rate e.g Change in number of road kills per year	No					
	Number of individuals e.g. Individual plants/animals	No					

Offset calculator

Offset calculator	Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost ($ total)	Information source
	Ecological Communities																				
	Area of community	No				**Risk-related time horizon (max. 20 years)**		**Start area (hectares)**		**Risk of loss (%) without offset**		**Risk of loss (%) with offset**									
										Future area without offset (adjusted hectares)	0.0	**Future area with offset (adjusted hectares)**	0.0								
						Time until ecological benefit		**Start quality (scale of 0-10)**		**Future quality without offset (scale of 0-10)**		**Future quality with offset (scale of 0-10)**									
	Threatened species habitat																				
	Area of habitat	Yes	25.88	Adjusted hectares		**Time over which loss is averted (max. 20 years)**	20	**Start area (hectares)**	84	**Risk of loss (%) without offset**	0%	**Risk of loss (%) with offset**	0%	0.00	90%	0.00	0.00	20.13	77.78%	No		
										Future area without offset (adjusted hectares)	84.0	**Future area with offset (adjusted hectares)**	84.0								
						Time until ecological benefit	10	**Start quality (scale of 0-10)**	7	**Future quality without offset (scale of 0-10)**	5	**Future quality with offset (scale of 0-10)**	8	3.00	90%	2.70	2.40				
	Protected matter attributes	**Attribute relevant to case?**	**Total quantum of impact**	**Units**	**Proposed offset**	**Time horizon (years)**		**Start value**		**Future value without offset**		**Future value with offset**		**Raw gain**	**Confidence in result (%)**	**Adjusted gain**	**Net present value**	**% of impact offset**	**Minimum (90%) direct offset requirement met?**	**Cost ($ total)**	**Information source**
	Number of features e.g. Nest hollows, habitat trees	No																			
	Condition of habitat Change in habitat condition, but no change in extent	No																			
	Threatened species																				
	Birth rate e.g. Change in nest success	No																			
	Mortality rate e.g Change in number of road kills per year	No																			
	Number of individuals e.g. Individual plants/animals	No																			

Summary

Summary	Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost ($)		
						Direct offset ($)	Other compensatory measures ($)	Total ($)
	Birth rate	0				$0.00		$0.00
	Mortality rate	0				$0.00		$0.00
	Number of individuals	0				$0.00		$0.00
	Number of features	0				$0.00		$0.00
	Condition of habitat	0				$0.00		$0.00
	Area of habitat	25.88	20.13	77.78%	**No**	$0.00	#DIV/0!	#DIV/0!
	Area of community	0				$0.00		$0.00
						$0.00	**#DIV/0!**	**#DIV/0!**

Attachment 2 *Pterostylis pratensis* – EPBC Offset Calculator Spreadsheets

Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012

This guide relies on Macros being enabled in your browser.

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Matter of National Environmental Significance	
Name	Pterostylis pratensis
EPBC Act status	Vulnerable
Annual probability of extinction Based on IUCN category definitions	**0.2%**

Bashan Ledge

Impact calculator

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Ecological communities						
Area of community	No		**Area**			
			Quality			
			Total quantum of impact	0.00		
Threatened species habitat						
Area of habitat	Yes		**Area**	48.43	Hectares	
			Quality	**8**	Scale 0-10	
			Total quantum of impact	38.74	Adjusted hectares	
Protected matter attributes	**Attribute relevant to case?**	**Description**	**Quantum of impact**		**Units**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No					
Condition of habitat Change in habitat condition, but no change in extent	No					
Threatened species						
Birth rate e.g. Change in nest success	No					
Mortality rate e.g Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator

Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost ($ total)	Information source
Ecological Communities																				
Area of community	No				**Risk-related time horizon (max. 20 years)**		**Start area (hectares)**		**Risk of loss (%) without offset**		**Risk of loss (%) with offset**									
									Future area without offset (adjusted hectares)	0.0	**Future area with offset (adjusted hectares)**	0.0								
					Time until ecological benefit		**Start quality (scale of 0-10)**		**Future quality without offset (scale of 0-10)**		**Future quality with offset (scale of 0-10)**									
Threatened species habitat																				
Area of habitat	Yes	38.74	Adjusted hectares		**Time over which loss is averted (max. 20 years)**	20	**Start area (hectares)**	24	**Risk of loss (%) without offset**	0%	**Risk of loss (%) with offset**	0%	0.00	90%	0.00	0.00	6.35	16.39%	No		
									Future area without offset (adjusted hectares)	24.0	**Future area with offset (adjusted hectares)**	24.0								
					Time until ecological benefit	10	**Start quality (scale of 0-10)**	7	**Future quality without offset (scale of 0-10)**	5	**Future quality with offset (scale of 0-10)**	8	3.00	90%	2.70	2.65				
Protected matter attributes	**Attribute relevant to case?**	**Total quantum of impact**	**Units**	**Proposed offset**	**Time horizon (years)**		**Start value**		**Future value without offset**		**Future value with offset**		**Raw gain**	**Confidence in result (%)**	**Adjusted gain**	**Net present value**	**% of impact offset**	**Minimum (90%) direct offset requirement met?**	**Cost ($ total)**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No																			
Condition of habitat Change in habitat condition, but no change in extent	No																			
Threatened species																				
Birth rate e.g. Change in nest success	No																			
Mortality rate e.g Change in number of road kills per year	No																			
Number of individuals e.g. Individual plants/animals	No																			

Summary

Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost ($)		
					Direct offset ($)	Other compensatory measures ($)	Total ($)
Birth rate	0				$0.00		$0.00
Mortality rate	0				$0.00		$0.00
Number of individuals	0				$0.00		$0.00
Number of features	0				$0.00		$0.00
Condition of habitat	0				$0.00		$0.00
Area of habitat	38.744	6.35	16.39%	**No**	$0.00	#DIV/0!	#DIV/0!
Area of community	0				$0.00		$0.00
					$0.00	**#DIV/0!**	**#DIV/0!**

Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012

This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Pterostylis pratensis
EPBC Act status	Vulnerable
Annual probability of extinction Based on IUCN category definitions	**0.2%**

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Stone Hut

Impact calculator

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Ecological communities						
Area of community	No		**Area**			
			Quality			
			Total quantum of impact	0.00		
Threatened species habitat						
Area of habitat	Yes		**Area**	48.43	Hectares	
			Quality	**8**	Scale 0-10	
			Total quantum of impact	38.74	Adjusted hectares	
Protected matter attributes	**Attribute relevant to case?**	**Description**	**Quantum of impact**		**Units**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No					
Condition of habitat Change in habitat condition, but no change in extent	No					
Threatened species						
Birth rate e.g. Change in nest success	No					
Mortality rate e.g Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator

Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost ($ total)	Information source
Ecological Communities																				
Area of community	No				**Risk-related time horizon (max. 20 years)**		**Start area (hectares)**		**Risk of loss (%) without offset**		**Risk of loss (%) with offset**									
									Future area without offset (adjusted hectares)	0.0	**Future area with offset (adjusted hectares)**	0.0								
					Time until ecological benefit		**Start quality (scale of 0-10)**		**Future quality without offset (scale of 0-10)**		**Future quality with offset (scale of 0-10)**									
Threatened species habitat																				
Area of habitat	Yes	38.74	Adjusted hectares		**Time over which loss is averted (max. 20 years)**	20	**Start area (hectares)**	136.6	**Risk of loss (%) without offset**	0%	**Risk of loss (%) with offset**	0%	0.00	90%	0.00	0.00	12.05	31.10%	No	
									Future area without offset (adjusted hectares)	136.6	**Future area with offset (adjusted hectares)**	136.6								
					Time until ecological benefit	10	**Start quality (scale of 0-10)**	**8**	**Future quality without offset (scale of 0-10)**	7	**Future quality with offset (scale of 0-10)**	**8**	1.00	90%	0.90	0.88				
Protected matter attributes	**Attribute relevant to case?**	**Total quantum of impact**	**Units**	**Proposed offset**	**Time horizon (years)**		**Start value**		**Future value without offset**		**Future value with offset**		**Raw gain**	**Confidence in result (%)**	**Adjusted gain**	**Net present value**	**% of impact offset**	**Minimum (90%) direct offset requirement met?**	**Cost ($ total)**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No																			
Condition of habitat Change in habitat condition, but no change in extent	No																			
Threatened species																				
Birth rate e.g. Change in nest success	No																			
Mortality rate e.g Change in number of road kills per year	No																			
Number of individuals e.g. Individual plants/animals	No																			

Summary

Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost ($)		
					Direct offset ($)	Other compensatory measures ($)	Total ($)
Birth rate	0				$0.00		$0.00
Mortality rate	0				$0.00		$0.00
Number of individuals	0				$0.00		$0.00
Number of features	0				$0.00		$0.00
Condition of habitat	0				$0.00		$0.00
Area of habitat	38.744	12.05	31.10%	**No**	$0.00	#DIV/0!	#DIV/0!
Area of community	0				$0.00		$0.00
					$0.00	**#DIV/0!**	**#DIV/0!**

Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012

This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Pterostylis pratensis
EPBC Act status	Vulnerable
Annual probability of extinction Based on IUCN category definitions	**0.2%**

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Wihareja

Impact calculator

Ecological communities

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Area of community	No		**Area**			
			Quality			
			Total quantum of impact	0.00		

Threatened species habitat

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Area of habitat	Yes		**Area**	48.43	Hectares	
			Quality	**8**	Scale 0-10	
			Total quantum of impact	38.74	Adjusted hectares	

Threatened species

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact	Units	Information source
Number of features e.g. Nest hollows, habitat trees	No				
Condition of habitat Change in habitat condition, but no change in extent	No				
Birth rate e.g. Change in nest success	No				
Mortality rate e.g Change in number of road kills per year	No				
Number of individuals e.g. Individual plants/animals	No				

Offset calculator

Ecological Communities

Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost ($ total)	Information source
Area of community	No				**Risk-related time horizon (max. 20 years)**		**Start area (hectares)**		**Risk of loss (%) without offset**		**Risk of loss (%) with offset**									
									Future area without offset (adjusted hectares)	0.0	**Future area with offset (adjusted hectares)**	0.0								
					Time until ecological benefit		**Start quality (scale of 0-10)**		**Future quality without offset (scale of 0-10)**		**Future quality with offset (scale of 0-10)**									

Threatened species habitat

Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost ($ total)	Information source
Area of habitat	Yes	38.74	Adjusted hectares		**Time over which loss is averted (max. 20 years)**	20	**Start area (hectares)**	84	**Risk of loss (%) without offset**	0%	**Risk of loss (%) with offset**	0%								
									Future area without offset (adjusted hectares)	84.0	**Future area with offset (adjusted hectares)**	84.0	0.00	90%	0.00	0.00	57.38%	No		
					Time until ecological benefit	10	**Start quality (scale of 0-10)**	7	**Future quality without offset (scale of 0-10)**	5	**Future quality with offset (scale of 0-10)**	8	3.00	90%	2.70	2.65	22.23			

Threatened species

Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start value	Future value without offset	Future value with offset	Raw gain	Confidence in result (%)	Adjusted gain	Net present value	% of impact offset	Minimum (90%) direct offset requirement met?	Cost ($ total)	Information source
Number of features e.g. Nest hollows, habitat trees	No															
Condition of habitat Change in habitat condition, but no change in extent	No															
Birth rate e.g. Change in nest success	No															
Mortality rate e.g Change in number of road kills per year	No															
Number of individuals e.g. Individual plants/animals	No															

Summary

Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost ($)		
					Direct offset ($)	Other compensatory measures ($)	Total ($)
Birth rate	0				$0.00		$0.00
Mortality rate	0				$0.00		$0.00
Number of individuals	0				$0.00		$0.00
Number of features	0				$0.00		$0.00
Condition of habitat	0				$0.00		$0.00
Area of habitat	38.744	22.23	57.38%	**No**	$0.00	#DIV/0!	#DIV/0!
Area of community	0				$0.00		$0.00
					$0.00	**#DIV/0!**	**#DIV/0!**