Van Diemen CONSULTING

Cattle Hill Wind Farm

Flora Offset Strategy Information

Developed in partial compliance with Condition 23(a) of the Commonwealth EPBC approval 2009/4839 for the Cattle Hill Wind Farm

Date	Revision	Prepared	Reviewed	Approved
16-01-2018	Draft 1	R Barnes & C McCoull	R Barnes	R Barnes
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29-01-2018	Final Draft	R Barnes & C McCoull	R Barnes and S Marsh	S Marsh
12-02-2018	Final Draft	R Barnes & C McCoull	Post Approvals Section, DOEE	
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01-03-2018	Final 2 Draft	R Barnes & C McCoull	Post Approvals Section, DOEE	
06-03-2018	Final 2	R Barnes & C McCoull	R Barnes	R Barnes
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11-03-2018	Final 3	R Barnes & C McCoull	R Barnes	R Barnes
12-03-2018	Final 3	R Barnes & C McCoull	Post Approvals Section, DOEE	

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Definitions and Acronyms

In this document, the following definitions and acronyms apply:

CPR8065	means the reserve [conservation covenant] established under the Tasmanian *Nature Conservation Act 2002* which is identified by the Central Plan Register document 8065.
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)
MCP	minimum convex polygon (the area formed by the joining of the outer most points of interest)
Offset Areas	The three areas identified in Figure 1a as Covenant Areas 1, 2 and 3.
Owner	applied in the context of conservation covenant CPR8065
SFS	Significant flora species - the flora species known as Liawenee greenhood (*Pterostylis pratensis*) and Crowded leek orchid (*Prasophyllum crebriflorum*)
Strategy	The document entitled 'Flora Offset Strategy Information'
VDC	Van Diemen Consulting Pty Ltd

1. Background to the Flora Offset Strategy

The information provided here addresses the following aspects of working towards the development and finalisation of a flora offset strategy for approval EPBC 2009/4839:

- A summary of the quantified impacts (habitat and plant number) for the relevant flora species listed on the *Environment Protection and Biodiversity Conservation Act 1999* (*Prasophyllum crebriflorum* and *Pterostylis pratensis*) from the layout provided by Goldwind Australia;
- The outputs of the EPBC Offset Calculator (ie the quantum of the offsets required) with the inputs derived from the impact quantification assessment;
- Identification and information on proposed Offsets Areas that meet the requirements of the EPBC Offset Calculator;
- Information on the natural values within each proposed Offset Area and comments about the assumptions made of data source, survey effort, habitat condition and data confidence;
- Information on the extent of habitat for *Prasophyllum crebriflorum and Pterostylis pratensis* on non-reserved land that may be considered as additional Offset Areas if they are required; and
- Copies of the correspondence with the landowners whom own the land upon which the two proposed Offset Areas are located.

The information provided here does not include the

- specific details of management for the proposed offset areas;
- comments or approval from the State Government in relation to acceptance of the Offset Areas being conserved by means of the *Nature Conservation Act 2002*; or
- the monitoring regime to be employed to ensure the Offset Areas are appropriately protected and managed via the proposed legal mechanism.

These matters will be the subject of a separate report.

2. Introduction

2.1 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.

'Lake Echo' is currently used for grazing, small forestry operations, conservation and hunting.

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 1a relative to the proposed Offset Areas which are described in this Strategy.

2.2 The Proponent (Approval Holder)

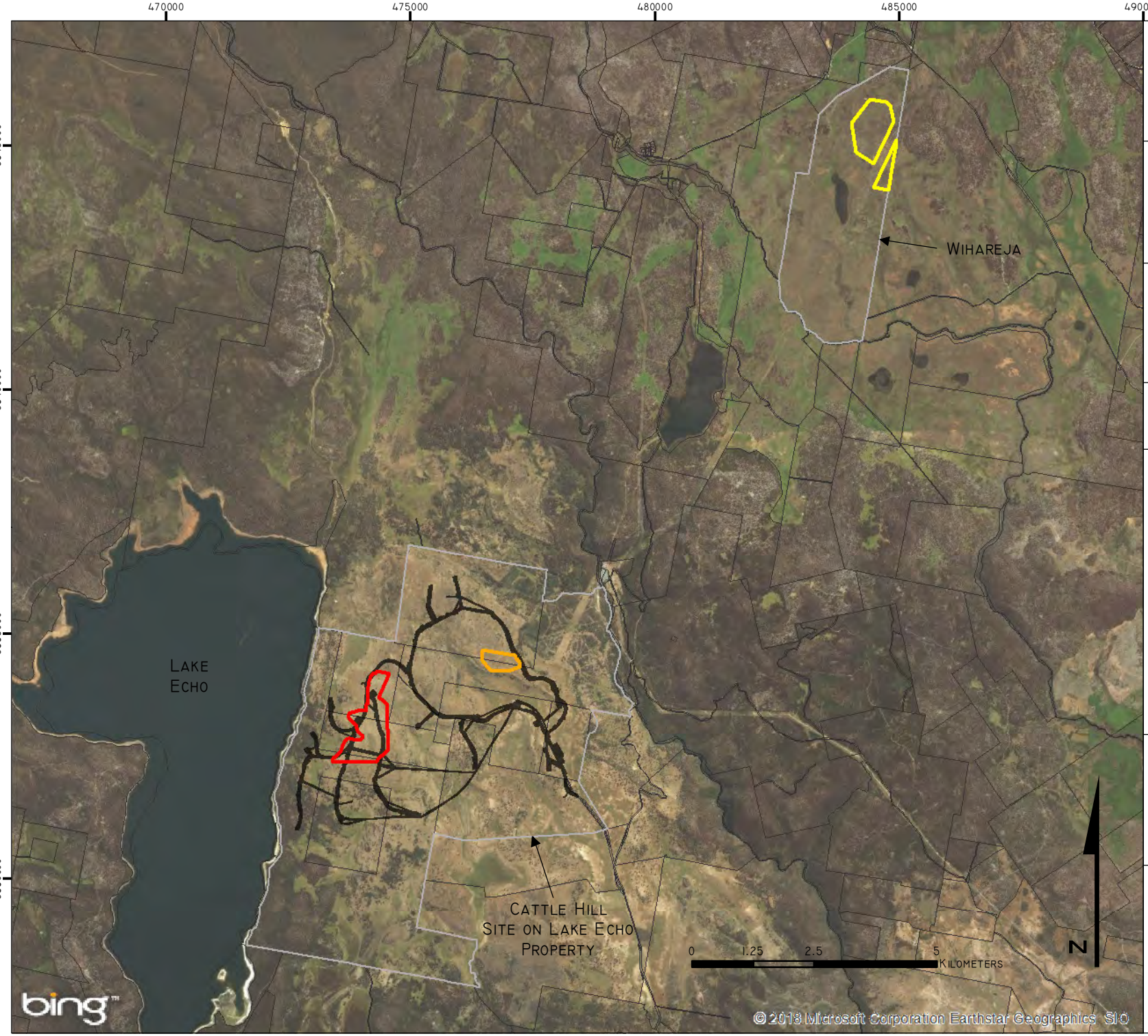
The proponent of the wind farm development is Wild Cattle Hill Pty Ltd (ACN 610 777 369).

2.3 Relevant Approval Conditions

A flora offset strategy and an offset management plan are required pursuant to Condition 23 of the Commonwealth EPBC approval 2009/4839 for the Cattle Hill Wind Farm.

This Condition states:

> *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.*
> *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 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.*



FLORA OFFSET STRATEGY

INFORMATION MAP

FIGURE 1A:
PROPOSED COVENANT AREAS ON LAKE ECHO AND WIHAREJA

TASMAP:	LGA:
WADDAMANA 4633	CENTRAL HIGHLANDS

- COVENANT AREA 1
- COVENANT AREA 2
- COVENANT AREA 3
- DEVELOPMENT IMPACT AREA

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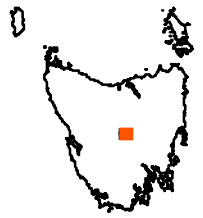

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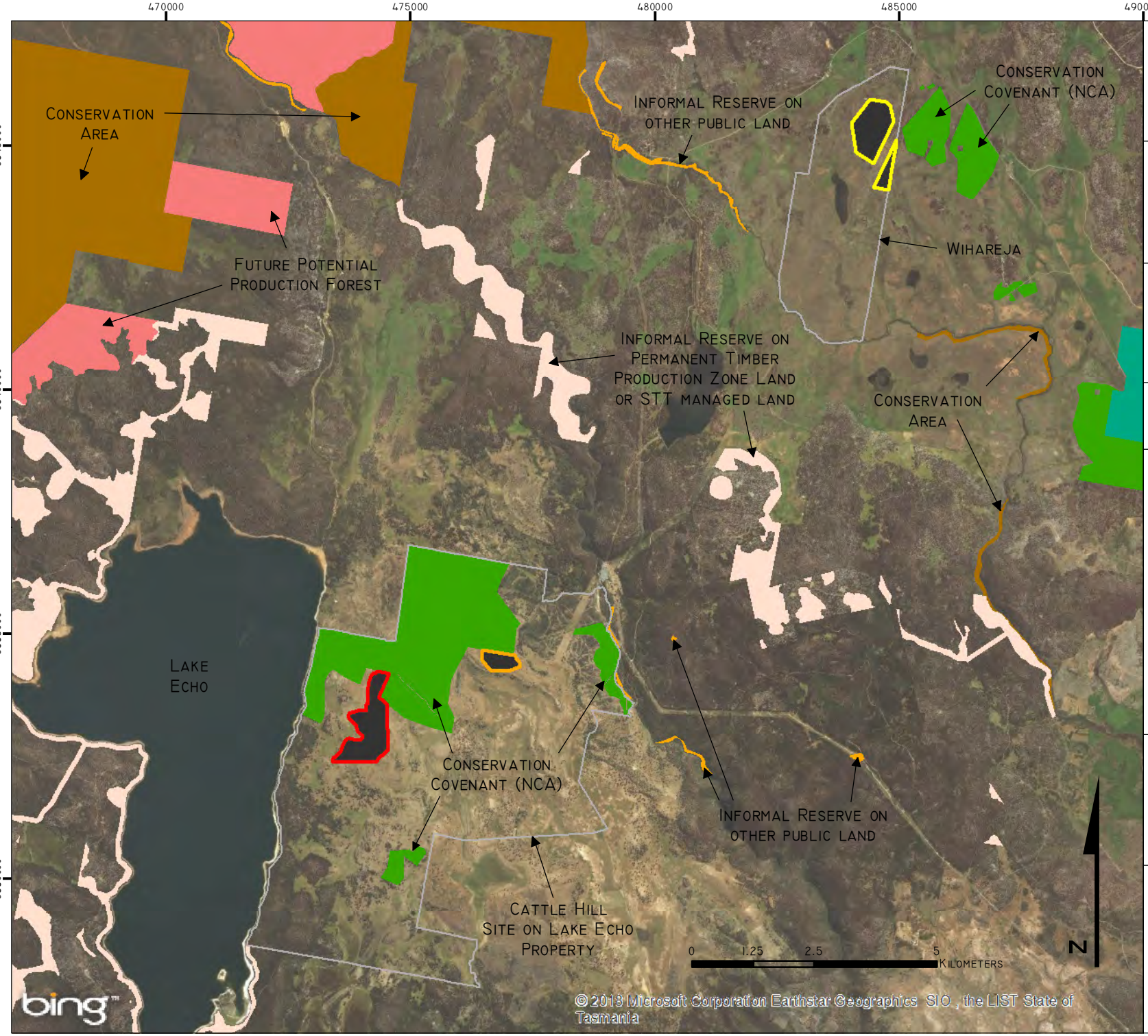
GOLDWIND AUSTRALIA PTY LTD

DATE: 5TH JAN 2018



FLORA OFFSET STRATEGY

INFORMATION MAP

FIGURE 1B: PROPOSED COVENANTS ON LAKE ECHO AND WIHAREJA AND SURROUNDING RESERVES

TASMAP:	LGA:
WADDAMANA 4633	CENTRAL HIGHLANDS

- COVENANT AREA 1
- COVENANT AREA 2
- COVENANT AREA 3

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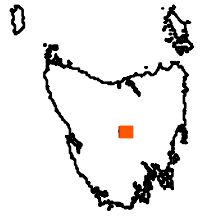

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DATE: 5TH JAN 2018

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

ii. the short and longer term arrangements and responsibilities of parties involved in the management of each offset site.

d. The approved offset management plan must be implemented. If the offset management plan has not been approved by the Department within 8 months of the approval holder having first submitted a draft offset management plan to the Department for approval, the approval holder must make an additional contribution of $75 000 equivalent to fund research in accordance with the plan, strategy or program approved under condition 16. The Department must provide any review comments regarding the offset management plan to the approval holder within eight (8) weeks of receiving the first draft from the approval holder and will not unreasonably delay or withhold approval of the offset management plan.

Condition 23 encompasses impacts to *Liawenee Greenhood and Crowded Leek Orchid* from the wind farm development.

2.5 Significant Flora Species

The Significant Flora Species (SFS) for this report, 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 than those identified and assessed as part of Commonwealth EPBC approval 2009/4839.

Figure 2a shows the NVA-held records for both species with the Central Highlands Bioregion (IBRA V) also depicted.

2.5.1 *Prasophyllum crebriflorum* – crowded leek orchid

Prasophyllum species are deciduous terrestrials with small, fleshy, round or oval tubers and a few fleshy, irregular roots (Jones *et al.* 1999, Threatened Species Section 2013). Most species are dormant over summer and autumn and begin growth in early winter (Threatened Species Section 2010).

Prasophyllum crebriflorum is a small, fleshy, terrestrial orchid with a single green onion-like leaf up to 26 cm long. The flowering stem emerges from the end of the leaf and has a spike of crowded, widely opening reddish-brown flowers (Jones 2003). It is recognised by its crowded, widely opening, reddish-brown flowers, the labellum recurved just above the middle, the apical tail-like part of the labellum comprising about one-third of the length of the labellum and the labellum callus being smooth. *Prasophyllum crebriflorum* is most like *Prasophyllum incorrectum* but that is a species of lowland grassland habitats (Jones 2003).

Prasophyllum crebriflorum is listed as Endangered on the *Environment Protection and Biodiversity Conservation Act 1999* (see Approved Conservation Advice in Attachment 1) and endangered on the *Threatened Species Protection Act 1995*.

Samples of *Prasophyllum crebriflorum* from the Lake Echo property are housed in the curated collection at the Tasmanian Herbarium (duplicates for some samples have also been lodged elsewhere, such as the Australian National Herbarium (CANBR)).

The Threatened Species Section (2010) provides a description of *Prasophyllum crebriflorum* habitat:

> '*Prasophyllum crebriflorum* is known from 2 native grasslands in the Surrey Hills area in north-western Tasmania, and from 2 native grasslands and grassy woodlands on the southern part of the Central Plateau.
>
> In north-western Tasmania, *Prasophyllum crebriflorum* occurs in montane tussock grassland dominated by *Poa labillardierei*, with scattered patches of the woody shrub *Hakea microcarpa*. Some individuals grow in fairly dense patches of *Poa labillardierei* tussocks but most occur in naturally open areas of more bare ground with herbs such as *Herpolirion novaezelandiae* and *Trachymene humilis* (Jones 2003).
>
> The species grows in brown clay loams derived from Tertiary basalts at altitudes of 660–670 m elevation, with an annual rainfall greater than 2000 mm (Jones 2003, Craven 1998).
>
> On the Central Plateau, *Prasophyllum crebriflorum* occurs in native grassland dominated by Poa gunnii and in grassy woodland with a sparse overstorey of *Eucalyptus gunnii*. The Central Highlands subpopulations occur on soils derived from Jurassic dolerite, at altitudes of 900-1050 m elevation.'

The Central Highlands population (northern extent of St Patricks Plains; included with Figure 1 of Threatened Species Section 2010) was discovered by the authors of this document and as such they are very familiar with the species' identification and habitat in the Central Highlands.

Surveys within the December 2010 flowering period for the species of a few sites by the authors of this document identified an additional 3 populations; Skittleball Plains near Miena (>25 plants over 1 hectare), St Patricks Plains (south-eastern extent of the plain; 1 plant) and north and north-west of Bronte Lagoon near Bronte (2 sub-populations occurring at either extent of the plains between 14 Mile Road and Bronte Lagoon; >25 plants over several hectares and 1 plant respectively).

These additional sites (supported by vouchered specimens at the Tasmanian herbarium) were found in one day of surveying in areas that were likely to support the species based on the similarity of those habitats to that in which the species occurs. These environments included open grassy plains (mosaic of native and non-native species), eastern alpine heath vegetation, highland and lowland *Poa* grasslands, rockplate grasslands on basalt and dolerite soils and damp soaks dominated by *Poa* and *Empodisma* surrounded by eastern alpine heathland

vegetation. In addition to sites where the species was recorded, there were several sites examined where it was not recorded. These sites included Todds Corner, Miena, The Steppes, Liawenee Moor (several sites towards Lake Augusta and Lake Ada, native grasslands at Liawenee) and some creekline vegetation along the Marlborough Highway towards Bronte.

The Threatened Species Section (Drs Wendy Potts and Richard Schahinger) advised in January and February 2011 that there are now recorded locations for this species at Noel Plain and Netherbey Plain (north-western grasslands near Surrey Hills), Waratah and Barren Tier.

The Threatened Species Section (2010) noted that:

> 'The likelihood of additional subpopulations of *Prasophyllum crebriflorum* being discovered outside its currently known extent of occurrence is considered to be relatively low given the past survey efforts. However, the recent detection and recognition of the species on the Central Plateau, about 100 km southeast of the Surrey Hills location, suggests that additional discoveries may still be made in potential habitat. It should be noted that even if additional subpopulations were to be discovered, significant range extensions or increased population estimates (e.g. orders of magnitude) are not likely because of the relatively limited extent of the high elevation grassland habitat.'

Clearly, previous assertions that this species is restricted to Surrey Hills or even to Surrey Hills and St Patricks Plains (e.g. Threatened Species Section 2010), are incorrect. The species is more widespread in the Central Highlands and higher elevated areas of the north-west where there is suitable habitat.

Conservation Advice

The Approved Conservation Advice from the Commonwealth (Attachment 1) states as threats to the species –

> 'Threats to the Crowded Leek-orchid include inappropriate fire frequencies, land clearance and conversion of the species' montane grassland habitat. In addition, at least some of the native grasslands in the key Surrey Hills area are known to have been aerially fertilised to improve grass quality (for cattle grazing) in the post-1950s period, and have also been subjected to regular spring burns (Craven, 1998).'

The Commonwealth (Attachment 1) has 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.

2.5.2 *Pterostylis pratensis* - Liawenee greenhood

Pterostylis species have a growth habit of fertile and sterile plants which is described as dissimilar, meaning that sterile plants are represented by a rosette of basal leaves only, and fertile plants have flowering scapes, but the rosette of basal leaves is absent or at least senescent (Jones *et al.* 1999).

Pterostylis pratensis is endemic to the Tasmanian Central Highlands at altitudes of between 850 to 1,100 m and extends over an area of approximately 400 square kilometres, occupying an area of 20 or more hectares in total (Threatened Species Unit 2008).

The species is listed as Vulnerable on the *Environment Protection and Biodiversity Conservation Act 1999* (see Approved Conservation Advice in Attachment 2) and vulnerable on the *Threatened Species Protection Act 1995*.

It grows in subalpine *Poa* tussock grassland which is very exposed, low and open, with patches of often stunted *Olearia algida* and *Hakea microcarpa* scrub on red–brown loamy to clay soils

derived from basalt (Threatened Species Unit 2008, Approved Conservation Advice in Attachment 2).

Conservation Advice

The Approved Conservation Advice from the Commonwealth (Attachment 2) states as threats to the species –

> 'There is little information on the level of threat to *Pterostylis pratensis*. The Liawenee Moor population is outside the World Heritage Area, and has been subject to grazing and frequent burning. These factors have probably maintained an open grassy habitat for the species. The St Patricks Plains colonies are on private land used for grazing. They are confined to a rocky basalt exposure which has not been ploughed or fertilised, unlike adjacent similar habitat where the species could not be found. Clearing, cultivation and fertilisers are the main threats to any other colonies that may occur on private land in the district. Colonies in the World Heritage Area should be safe in the long-term, provided *Poa* tussocks are occasionally burnt. Checks in apparently suitable habitat along the Lake Highway have shown *Pterostylis pratensis* to be very patchy in distribution, suggesting that stochastic risks are a relevant consideration (TSU, 2008).'

More recent information, based on the surveys from Cattle Hill and others conducted mainly by Hydro Tasmania Consulting (Stephen Casey pers. comm.), suggests that there are many more plants and subpopulations than previously thought for this species across its range. This includes for example large and geographically extensive populations at Liawenee Moor, Miena, Todds Corner to the east of Great Lake, St Patricks Plains, Shannon Lagoon and nearby Barren Tier, Penstock Lagoon and the eastern side of Lake Echo.

This species in the Cattle Hill Wind Farm site occupies areas of *Poa* (mainly *Poa clivicola*) dominated grasslands. Most of the native grasslands in the study site appear to have been woodland or forest in the past (based on the presence of tree stumps, some standing living trees, and some 'stump' holes in the ground where stumps have rotted or been burnt out) and have been induced through land clearing and tree decline. *Pterostylis pratensis* was found in these modified areas, but it was generally low in abundance compared to areas where the landscape was originally less likely to have been heavily wooded by trees (e.g. frost hollows, areas of *Eucalyptus pauciflora* woodland as opposed to areas having standing *Eucalyptus delegatensis* trees).

Most of the plants and suitable habitat, within the impact area, occur in an area reserved under a Conservation Covenant between the landowner and the State of Tasmania (reserved under the *Nature Conservation Act 2002*).

The Commonwealth (Attachment 2) has identified the following Priority Actions for the species that are of relevance to the current report –

> '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.

2.6 Natural Values Data Sources

2.6.1 Survey Effort and Distribution Data Sources

Location data for SFS have accumulated from the flora surveys conducted for the development since 2008. Surveys conducted within the peak flowering periods (December - January) of SFS include 2008, 2010-11, 2012-13, 2014-15, 2016-17 and 2017-18. The data are contained within, and can be accessed from, the NVA.

Pooled distribution data collected over several flowering seasons (listed above) provides a high level of accuracy and certainty that the distribution map of SFS in the impact area for this assessment truly reflects the spatial location of plants (and therefore, habitat) on-ground.

2.6.2 Potential and Known Habitat

To reflect the actual (*known*) and possible (*potential*) occurrence of SFS in areas of suitable habitat the analyses were conducted using the below concepts -

- *Potential habitat* was applied to the Minimum Convex Polygon (MCP) of the species locations with unsuitable habitat areas removed.
- *Known habitat* was applied for those areas within a 50m radius of an observed threatened plant.

These concepts are further described in the report entitled 'Cattle Hill Wind Farm, Overall Development Impact Assessment' (prepared by Van Diemen Consulting Pty Ltd 2018).

A MCP approach was used for geographic extent calculations because the 'Highland Poa grassland' vegetation community was not a useful surrogate for the SFS distribution in this case. That is, the use of the vegetation classification as a surrogate to the occurrence of the SFS was not a true reflection of the distribution of the SFS.

It was observed that on occasion the 'Highland Poa grassland' vegetation community did not support SFS. In some cases, grassland may have been dominated by native species, mainly *Poa*, which qualified it as 'Highland Poa grassland' but the topographic location was, for example, a drainage line/flat. In some cases, the 'Highland Poa grassland' did not support the SFS in any of the years that surveys were done, strengthening the case for the species being absent, for whatever reason, from these areas.

Of note, and in support of using the MCP approach, the distribution extremities of the SFS is generally marked by the disappearance of suitable habitat (eg native grassland becomes

pasture or heathy/scrubby forest) and/or reduction in site altitude (eg the slopes leading down to the Ouse River do not support either species). Historical land management practices may also be fully or partially responsible for the geographic limits observed – for example, sheep grazing on the adjacent property (Macclesfield) seems to have virtually eradicated both species from the otherwise native grasslands (ie vegetation that would be assigned to the 'Highland Poa grassland' TASVEG category) present that should support SFS.

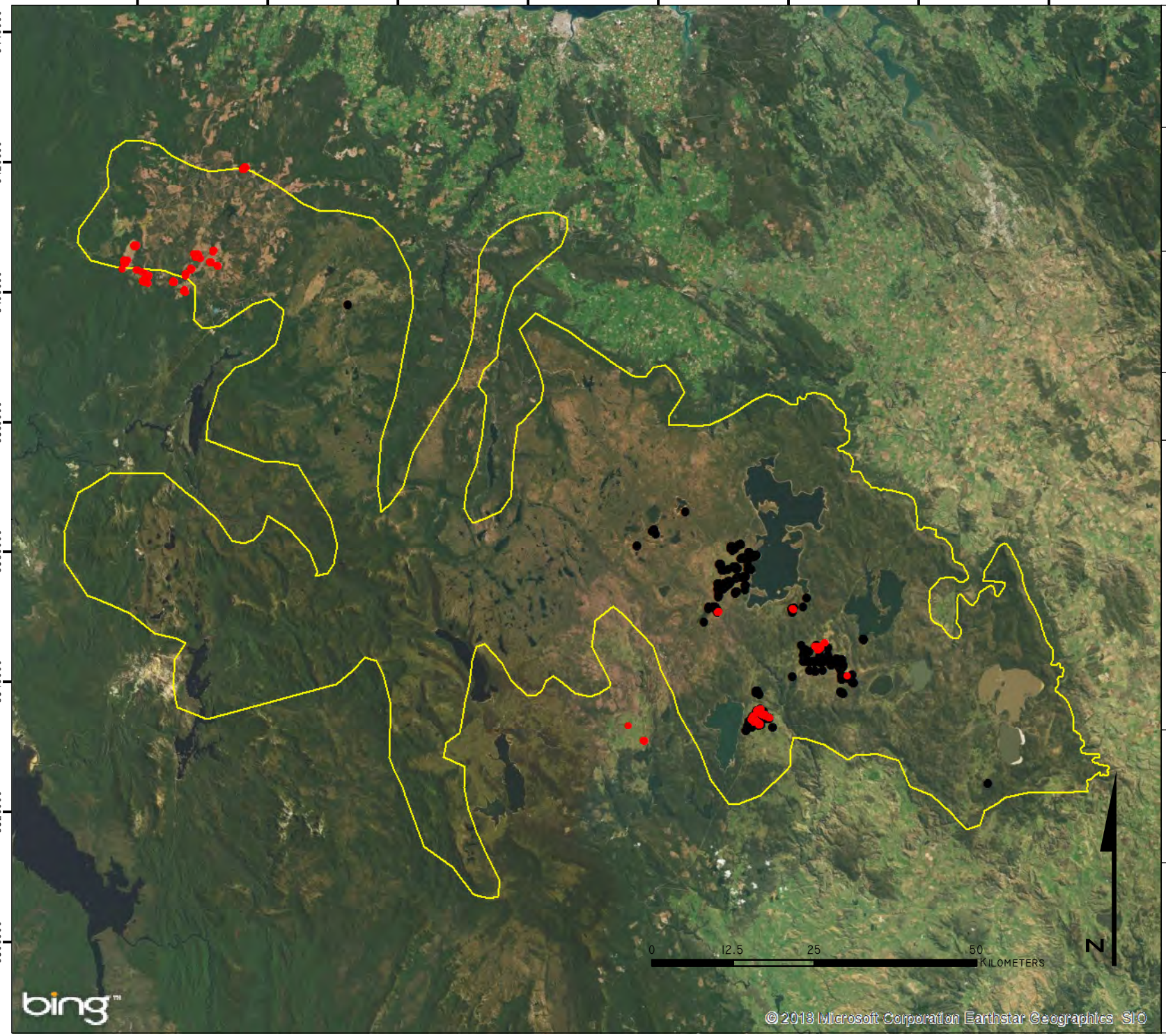
High quality habitat for SFS was abundant in the northern part of the 'Lake Echo' property, with most occurring in the area covered by CPR8065[1] (Plate 1). Unsuitable habitat was initially included within the MCP for the SFS when drafted. Areas within the MCP that were not suitable habitat (eg. permanently winter-wet areas, poorly drained organosols, localised pasture grass dominated areas) were identified by ground-truthing (achieved from surveys over several years - 2008, 2010-11, 2012-13, 2014-15, 2016-17 and 2017-18), with these areas removed from the 'potential habitat' component of the MCP assessment if that area did **not** occur within a buffer of *Known* habitat.

This approach meant habitat was deemed -

(a) suitable for SFS and used in calculating extent of habitat loss if it was within 50m of a known location; OR
(b) was **suitable habitat** for SFS within the MCP.

As a precautionary approach to spatially describing *known habitat*, a 50m radius was applied around *known locations* for the SFS. This buffer was applied because it was noted during the many years surveying at the site that *Prasophyllum crebriflorum* (and to a lesser degree *Pterostylis pratensis*) occurred in patches, rather than as a continuous occurrence across areas of suitable habitat. The occurrence of one orchid plant of a SFS meant there were likely to be others nearby, hence the buffer approach was a way to account for plants that may not have been directly observed (eg grass tussocks were tall, heathy vegetation made searching difficult).

[1] CPR8065 is the reserve [conservation covenant] established under the Tasmanian *Nature Conservation Act 2002* which is identified by the Central Plan Register document 8065.



FLORA OFFSET STRATEGY

INFORMATION MAP

FIGURE 2A: NVA RECORDS OF PTEROSTYLIS PRATENSIS AND PRASOPHYLLUM CREBRIFLORUM

TASMAP:	LGA:
VARIOUS	VARIOUS

- PRASOPHYLLUM CREBRIFLORUM
- PTEROSTYLIS PRATENSIS
- CENTRAL HIGHLANDS BIOREGION

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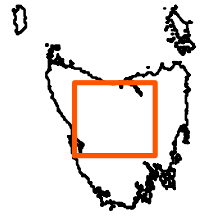

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CLIENT:
GOLDWIND
AUSTRALIA
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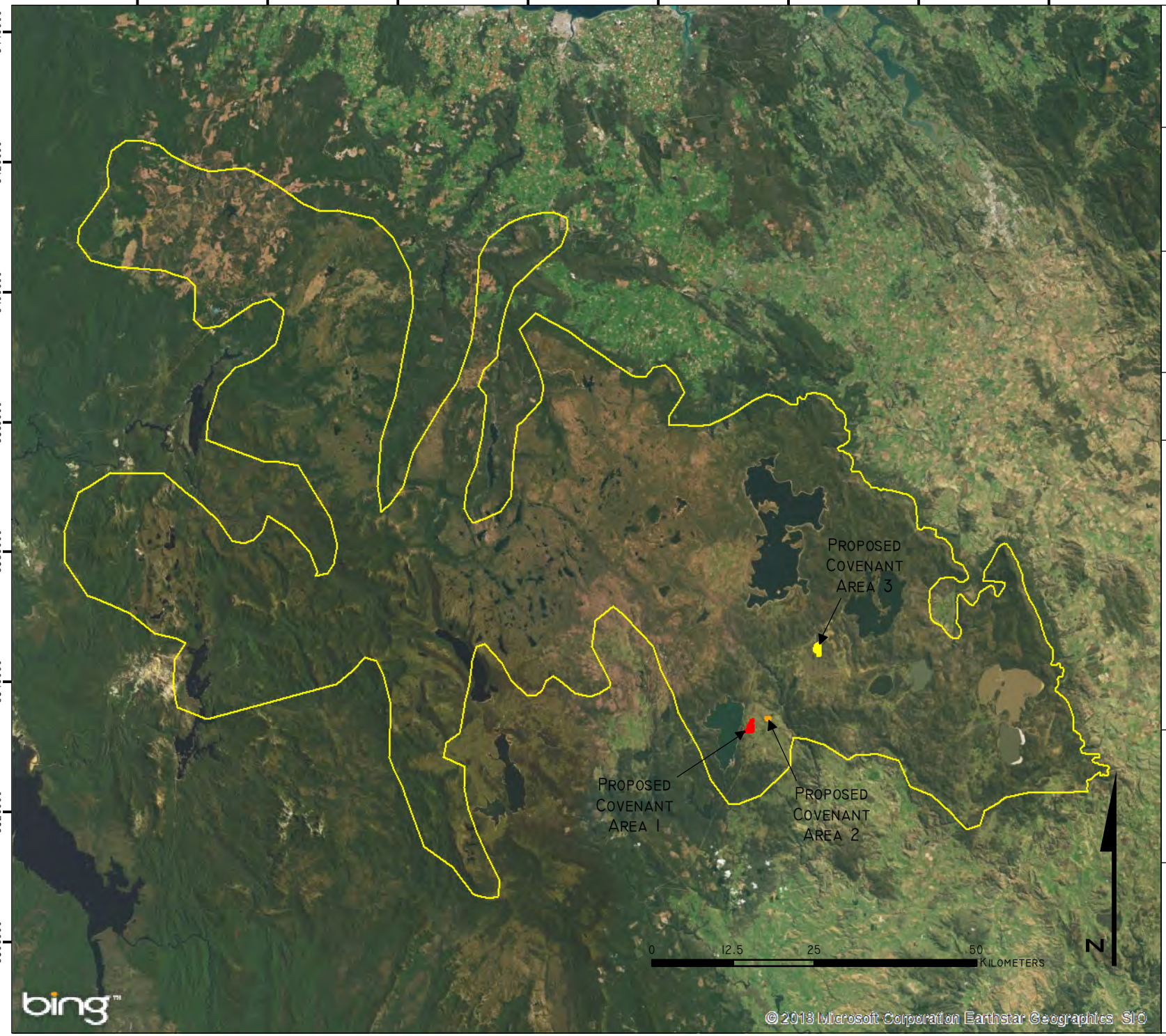
DATE: 5TH JAN 2018



FLORA OFFSET STRATEGY

INFORMATION MAP

FIGURE 2B: LOCATION OF PROPOSED COVENANT AREAS IN THE CENTRAL HIGHLANDS

TASMAP:	LGA:
VARIOUS	VARIOUS

- COVENANT AREA 1
- COVENANT AREA 2
- COVENANT AREA 3
- CENTRAL HIGHLANDS BIOREGION

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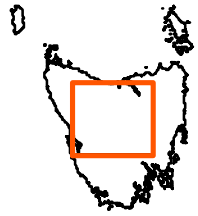

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The use of a buffer captured more area within the known habitat calculations, *even if no plants were present* and/or the habitat was unsuitable – the extent of *known* habitat was therefore over-estimated by the impact assessment process. This is consistent with the precautionary principle.

***Plate 1. High quality grassland habitat for* Pterostylis pratensis *and* Prasophyllum crebriflorum**

Crowded leek orchid and Liawenee greenhood occur sporadically within Highland *Poa* grassland and associated grassy woodlands

Crowded leek orchid and Liawenee greenhood occur sporadically within Highland *Poa* grassland and associated grassy woodlands

.
Winter-wet drainage areas, even when dominated by native grass and herb species, did not support Crowded leek orchid or Liawenee greenhood

***Plate 2. Unsuitable habitat for* Pterostylis pratensis *and* Prasophyllum crebriflorum**

Crowded leek orchid and Liawenee greenhood were never observed in the small areas of pasture grass dominated vegetation within areas of Highland *Poa* grassland

Crowded leek orchid and Liawenee greenhood were never observed in the small areas of pasture grass dominated vegetation dotted within areas of Highland *Poa* grassland

Localised wet soaks and springs on shallow soils (arrow) did not support Crowded leek orchid or Liawenee greenhood

Winter-wet drainage areas, even when dominated by native grass and herb species, did not support Crowded leek orchid or Liawenee greenhood

3. Impact Analyses and Assessment

3.1 Infrastructure

The assessment of impact includes the construction (and associated indirect impacts) of the following wind farm infrastructure items:

- Hardstands for turbines;
- Roads and drains;
- Laydown areas for blades, machinery, equipment etc;
- Installation (hardstands for the camera towers) and cabling associated with IdentiFlight;
- Temporary stockpile areas;
- Operation and maintenance facility;
- Construction compound;
- Batching plants and washdown facility;
- Cabling installation between turbines and to the substation; and
- The sub-station.

The layout (maps) used to conduct the impact assessment, are provided in the report entitled 'Cattle Hill Wind Farm, Overall Development Impact Assessment' (prepared by Van Diemen Consulting Pty Ltd).

3.2 Impact Quantification

The methods used to quantify the impact to these species, and the layout (including maps) used to conduct the impact assessment, are comprehensively described in the report entitled 'Cattle Hill Wind Farm, Overall Development Impact Assessment' (prepared by Van Diemen Consulting Pty Ltd 2018).

A summary of the key assumptions and methods used in the report by VDC is provided below.

3.2.1 Habitat

Habitat impacts (short-term, long-term and the 7.5m buffer[2]) to SFS are shown in Table 1.

The definitions should be noted –

[2] Refer to the report entitled 'Cattle Hill Wind Farm, Overall Development Impact Assessment' (prepared by Van Diemen Consulting Pty Ltd).

Known habitat – that area within a 50m radius of an observed SFS.

Potential habitat – that area in the Minimum Convex Polygon (MVC) of each SFS species locations with unsuitable habitat areas removed.

Liawenee greenhood and crowded leek orchid have figures provided in Table 1 for impacts to *known* and *potential* habitat.

Table 1. Total long and short-term impact to Significant Flora Species by the development

SPECIES	LONG-TERM CONVERSION ha or *number*	SHORT-TERM REMOVAL ha or *number*	7.5METER BUFFER AREA ha or *number*
Pterostylis pratensis Known Habitat (ha)	4.7	6.9	3.8
Pterostylis pratensis Potential Habitat (ha)	13	21.9	13.3
Prasophyllum crebriflorum Known Habitat (ha)	1.8	4.4	2.0
Prasophyllum crebriflorum Potential Habitat (ha)	8.5	15.8	9.1

3.2.2 Plant Number

An *average number of SFS plants per hectare* was used calculate the number of plants of each SFS being impacted upon by the development. This approach enabled the number of 'impacted' plants to be calculated without the need to find every plant. Indeed, it is impossible to locate every SFS plant because ground-based orchids can be difficult to find in heathy-scrubby grassland environments. Grazing pressures at the Lake Echo property, mainly from feral deer, wallabies and domestic cattle, could also contribute to not seeing all plants present (ie the flowerhead may have been eaten).

The average number of plants per hectare for the SFS are taken from the document entitled *Cattle Hill Wind Farm DPEMP Non-Eagle Supplement - February 2011* - see page 157 for *Pterostylis pratensis* and page 176 for *Prasophyllum crebriflorum*.

The average number of plants per hectare presented in the DPEMP of 2011 were based on plot surveys taken during the peak flowering periods of 2 flowering seasons (there was a large flowering event in 2009-10) and were accepted as part of the impact assessment process conducted at that time. More recent surveys in 2012-13, 2014-15 and 2016-17 indicated that the densities of SFS described in the DPEMP remained valid.

The 'number of plants' impacts (short-term, long-term and the 7.5m buffer) to SFS are shown in Table 2 using the hectares of habitat identified in Table 1.

Table 2. Total number of whole plants of Significant Flora Species impacted by the development

SPECIES	LONG-TERM CONVERSION	SHORT-TERM REMOVAL	7.5 METER BUFFER AREA	**TOTAL Less Buffer**	**% of TOTAL in CPR8065[1]**	**TOTAL Including Buffer**
Pterostylis pratensis Known Habitat (30/ha)	141	207	114	348	68	462
Prasophyllum crebriflorum Known Habitat (5/ha)	9	22	10	31	90	41

[1] CPR8065 is the reserve [conservation covenant] established under the Tasmanian *Nature Conservation Act 2002* which is identified by the Central Plan Register document 8065.

3.3 Offset Quantification

There is a "mitigation hierarchy" generally applied across regulatory jurisdictions to manage impacts to natural values. The first consideration is whether impacts can be avoided or minimised, followed by remedying of the impacts on site, followed by mitigation options within the footprint area of the development, followed by offsetting some or all the residual impacts, as appropriate.

In accordance with these principles, the layout of the wind farm went through numerous iterations to avoid impacts where possible and to minimise the impacts where they could not be avoided. Offsets are defined as measures that compensate for the residual adverse impacts of an action on the environment, which in this case are the residual impacts of the Development on SFS.

The Australian Government has a policy which outlines the approach to using environmental offsets under the EPBC Act.

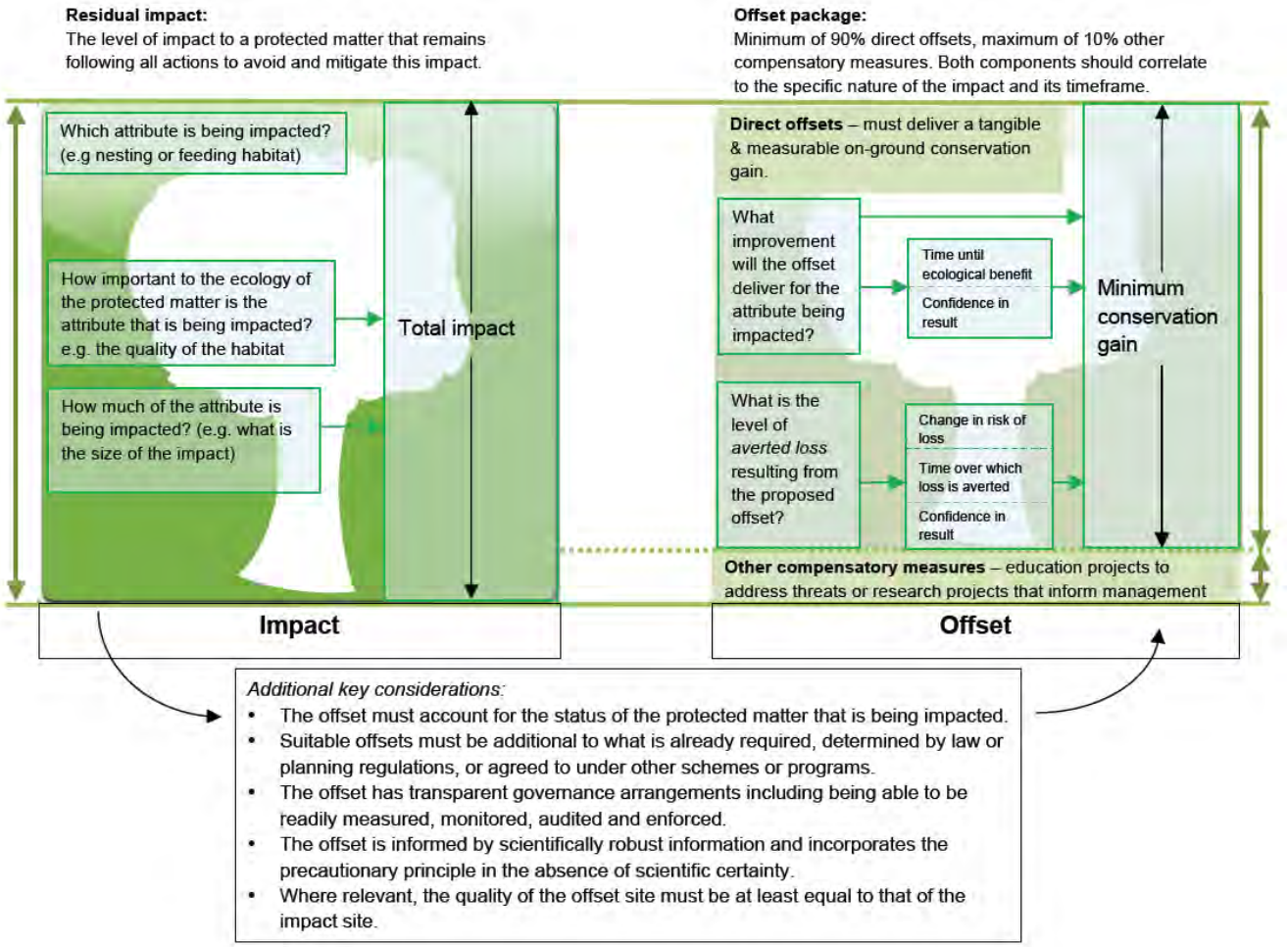
The *EPBC Act environmental offsets policy* has five key aims, to:

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 *Offsets Assessment Guide* will be used by DOEE if the impacted protected matter is a threatened species or ecological community and is based on the identification of the residual impact and offset package.

The process is illustrated below.



The impacts quantified from the impact assessment for the SFS (Tables 1 and 2) were used as inputs to the EPBC Offset Calculator.

The results of using the EPBC Offset Calculator for both species (habitat – inclusive of short and long-term removal, but not the buffer, and plants) are provided in Attachments 1 and 2 respectively.

Characteristics of the Offset Areas identified in Attachments 3 and 4 are the areas used to populate the 'offset' columns of the EPBC Calculator sheets.

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

3.3.1 Quality

Background

The quality score for area of habitat or area of community is a measure of how well a particular site supports a particular threatened species or ecological community and contributes to its ongoing viability.

There are three components that contribute to the calculation of habitat quality: site condition, site context, and species stocking rates.

It is important to note that the assessment of quality for threatened species habitat and ecological communities is not simply a scoring of vegetation 'pristineness'. Rather, there are three components that contribute to the calculation of habitat quality:

- *Site condition*: This is the condition of a site in relation to the ecological requirements of a threatened species or ecological community. This includes considerations such as 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, taking into account 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 particular site. The principle acknowledges that a particular site may have a high value for a particular threatened species, despite appearing to have poor condition and/or context. It includes considerations such as survey data for a site in regards to a particular species population or, in the case of a threatened ecological community this may be a number of different populations. It also includes consideration of the role of the site population in regards to the overall species population viability or community extent.

These components contribute to the final habitat quality score 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 the presence of the species itself is the main factor in .

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

The impact area spans land protected by a conservation covenant (where grazing is regulated) and land that is otherwise managed at the discretion of the owner – existing rights are in place for the land management practices even if they are to the detriment of MNES. The Offset Areas include for the Lake Echo proposal (Figures 4a and 4b) land that is more intensively grazed by cattle and sheep, whereas the conservation covenant has less intense grazing regimes. Over the course of the surveys conducted at the site by the authors of this report and all other flora-related reports for the project, we have directly observed fewer orchids in areas outside the conservation covenant. This trend has continued for the past 8 years. The SFS are both susceptible to inappropriate grazing regimes (Threatened Species Unit 2008, Threatened Species Section 2010).

For example, Threatened Species Section (2010) describes for *Prasophyllum crebriflorum* (emphasis added) -

> 'Inappropriate disturbance (grazing) regime: Many montane grasslands have been used for stock grazing, with varying degrees of "pasture improvement" applied. At least some of the native grasslands in the key Surrey Hills area are known to have been aerially fertilised to improve grass quality (for cattle grazing) in the post-1950s period and have also been subjected to regular spring burns at about a 2–3 year frequency (Craven 1998), primarily to improve the quality of the grasslands for cattle grazing. Such "improvement" of native pasture may have been detrimental to species such as *Prasophyllum crebriflorum* if the disturbance regime did not mimic natural disturbance events. Spring burning, for example, may have reduced opportunity for seed set, and fertilising may have altered soil conditions such that the delicate mycorrhizal fungal association was altered. Stock is no longer present on any of the native grasslands supporting *Prasophyllum crebriflorum* in the Surrey Hills area, but remain present in extensive parts of the Central Plateau, including at sites supporting *Prasophyllum crebriflorum*.'

The three components that contribute to the calculation of **habitat quality** for the EPBC Offset Calculator are Site condition, Site context and Species stocking rate.

Tables 3 and 4 provide information on how we interpreted the quality attribute in the EPBC Offset Calculator for each relevant species, including the three components that comprise 'quality'.

We allocated of the 10 points for the Quality score in the EPBC Offset Calculator across the three quality components as described for each species in Tables 3 and 4.

*Table 3. 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 4. 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 5 and 6 provide information on how we interpreted the quality attribute in the EPBC Offset Calculator for each relevant species at the Impact and Offset Areas.

We allocated of the 10 points for the Quality score in the EPBC Offset Calculator across the three quality components as described for each species in Tables 3 and 4.

Site condition will be calculated separately for the final Offset Areas (after approval of the Strategy) using TASVEG vegetation condition methods. TASVEG benchmarks for the main communities within which the SFS occur are contained in Attachment 7. Other measurable parameters suitable to defining habitat condition for the orchids may be included in the monitoring regime.

The offset management plan (required as part of Condition 23c) will describe methods for the monitoring of habitat quality scores separately for each Offset Area. It will also describe those parameters which would need to record improvements (eg flora species diversity, presence of SFS in higher numbers) and reductions (eg coverage of exotic species) as an outcome to the management objectives of the Offset Areas.

Quantitative assessments to verify **Species Stocking Rate** values used in the EPBC Calculator for this Strategy will be specifically done for Offset Areas and recorded separately for the final Offset Areas (after approval of the Strategy) using plots. These will enable more refined assessments and comparisons to be made over the years of proposed monitoring of the Offset Areas to demonstrate improvements in number and/or density of plants.

*Table 5. Comments and information about the three components of habitat quality for Liawenee greenhood (***Pterostylis pratensis***)*

	Impact Area	Offset Areas
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.	There are various habitat types present in the form of three ecological communities within which the species inhabits. Lake Echo – signs of overgrazing, decreasing flora species diversity within native grassland (8 years of observation), increasing feral deer population, few exotic plant species, low exotic species diversity. Wihareja – few signs of overgrazing, feral deer population present (numbers and population trend unknown), few exotic plant species present, low exotic species coverage. 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.
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.	Lake Echo – signs of overgrazing, decreasing flora species diversity within native grassland (8 years of observation). Wihareja – widespread but low abundance *Pterostylis pratensis*. A score of 4 out of 6 is allocated.
TOTAL QUALITY SCORE	**8 out of 10**	**7 out of 10**

*Table 6. Comments and information about the three components of habitat quality for Crowded leek orchid (***Prasophyllum crebriflorum***)*

	Impact Area	Offset Areas
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.	There are various habitat types present. The species inhabits the open grassland areas of the Offset Areas. 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. Wihareja – few signs of overgrazing, feral deer population present (numbers and population trend unknown), few exotic plant species present, low exotic species coverage. 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.	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.	Lake Echo – signs of overgrazing, decreasing flora species diversity within native grassland (8 years of observation), very few *Prasophyllum crebriflorum* observed. Wihareja – has a centralised area with a very high density of *Prasophyllum crebriflorum*, as noted by the distribution of the species shown in Figure 5. The densities observed are marginally lower than those observed within the Impact Area, making this population significant in terms of plant abundance. A score of 3 out of 5 is allocated.
TOTAL QUALITY SCORE	**8 out of 10**	**7 out of 10**

3.3.2 Time over which loss is averted

Background

The time over which loss is averted is the foreseeable timeframe (in years) over which changes in the level of risk to a proposed 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. The number (of years) used in the EPBC Offset Calculator should be the duration of the risk mitigation actions to be taken, or 20 years, whichever is shorter.

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.

Significant Flora Species

Once a Conservation Covenant is established the application of the legal instrument and mandatory Operations Plan/Nature Conservation Plan should see any further loss averted. Consequently, for both SFS at all Offset Areas, a timeframe of 20 years has been applied in the EPBC Offset Calculator even though the mechanism is intended to be in perpetuity.

3.3.3 Time until ecological benefit

Background

The time until ecological benefit is the estimated time (in years) that it will take for the habitat quality improvement of the proposed offset to be realised. For example, if the proposed offset is erecting nest boxes, then this timeframe would be quite short - nest boxes may be able to deliver a habitat quality improvement within months. However, revegetation actions may take decades to provide the required improvement in habitat quality.

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. Shorter time frames until ecological benefits are realised are valued more highly than longer time frames.

Significant Flora Species

The time to ecological benefit has been set to 10 years. Baseline plots and transects will be established in the Offset Areas as soon as possible within the relevant flowering periods of the SFS. This is likely to occur as early as the 2018-19 flowering period.

It may take 5 to 10 years to gather empirical data to determine a trend in habitat improvement (and plant numbers) through the implementation of an appropriate management regime. Being orchids that dieback to tubers, they both have brief flowering periods (about 3 months) within which they can be detected, making it impossible to conduct meaningful surveys at an interval of more than once per annum: 10 years represents 10 flowering seasons over which data can be collected for trends to be identified.

3.3.4 Risk of loss (%)

Background

The risk of loss (RoL) is a percentage figure that describes the chance that the habitat on the proposed 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).

Significant Flora Species

The risk of loss for both species in the Offset Areas has been assigned a score or 0 based on the interpretation of the *Offsets Assessment Guide* provided by DOEE. That is, RoL with offset is 0% as the proposed management actions and securing the Offset Areas in perpetuity mitigates the risk of a complete loss of habitat for *Prasophyllum crebriflorum* and *Pterostylis pratensis*.

RoL without offset must be scored as 0% because of the approach dictated by 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 with inappropriate grazing regimes. It is worthy to note that these regimes are exempt from the EPBC Act as they are pre-existing to the commencement of the Act.

3.3.5 Confidence in result (%)

Background

The confidence in result is a percentage figure that describes the level of certainty about the success of the proposed offset. Proposed offset actions that are designed to have a lower risk of failure should 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.

Where available, the confidence in result should be based on scientifically sound evidence and knowledge. Where this information is not available, the onus is on the proponent to provide information about the efficacy of proposed techniques or methods.

Significant Flora Species

There is high confidence by the authors of this report, 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 (Attachments 3 and 4) are present and worthy of inclusion into the reserve system for Tasmania.

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

An *example* Nature Conservation Plan is provided within Attachment 6.

4. Offset Description

4.1 Location of Offsets

Three areas have been identified as offsets to address the residual impact calculated to occur from the development. These Offset Areas are shown in Figure 1a relative to each other and the actual footprint of the development. Surrounding reserves are depicted in Figure 1b to provide context to the proposed Offset Areas.

Covenant Areas 1, 2 and 3 all occur within the Central Highlands Bioregion of Tasmania (IBRA V). The impacts caused by the development will occur within this same bioregion.

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

Table 7. The total geographic extent of habitat for the Significant Flora Species in each Offset Area

SPECIES	Covenant Area 1 Lake Echo (Ha)	Covenant Area 2 Lake Echo (Ha)	Covenant Area 3 Wihareja (Ha)	**TOTAL (Ha)**
Prasophyllum crebriflorum	13.7	16.2	84.0	**113.9**
Pterostylis pratensis	83.4	16.24	84.0	**183.64**

4.1.1 On-property offsets

The Lake Echo Offset Area is on-property where the impacts are to occur (Attachment 3) and joins the existing conservation covenant on that property.

The area proposed for reservation is comprised of two parts, as shown in Figure 3. Each part is shown in Figures 4a and 4b respectively.

The Offset Areas (approximately 114 hectares in total) add to the existing reserve and as proposed the Offset Area would result in the reservation of nearly all the known crowded leek orchid (*Prasophyllum crebriflorum*) habitat on the property.

The Lake Echo Offset Area contains –

- Highland *Poa* grassland (TASVEG - GPH) – a State threatened vegetation community;
- Lowland grassland complex (TASVEG - GCL);
- *Eucalyptus dalrympleana – E. pauciflora* forest (TASVEG – DDP);
- Agricultural land (TASVEG – FAG) – included to provide a buffer and context to adjacent habitat for SFS;
- Known and potential habitat for crowded leek orchid (*Prasophyllum crebriflorum*) and Liawenee greenhood (*Pterostylis pratensis*);
- 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*), white bellied sea eagle (*Haliaeetus leucogaster*) and wedge-tailed eagle (*Aquila audax fleayi*).

Attachment 4 provides a *EPBC Protected Matters Report* for the location of the Offset Areas which identifies other MNES that may or do occur in the region.

4.1.2 Off-site offsets

The Wihareja Offset Area is not on the property where the project's impacts will occur.

The property Wihareja is located north-east of the CHWF and occurs within the same bioregion as the development (see Figure 1a). Some images showing the habitat present are provided in Plate 3.

The proposed Offset Area (Covenant Area 3) is approximately 89.6 hectares in size and is located near a forest reserve on adjacent land established under the Forest Conservation Fund (FCF) program.

The Wihareja Offset Area contains –

- Highland *Poa* grassland (TASVEG - GPH) – a State threatened vegetation community;
- Lowland grassland complex (TASVEG - GCL);
- Eastern alpine heathland (TASVEG – HHE);
- *Eucalyptus dalrympleana – E. pauciflora* forest (TASVEG – DDP);
- Known and potential habitat for crowded leek orchid (*Prasophyllum crebriflorum*) and Liawenee greenhood (*Pterostylis pratensis*);
- 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*).

Attachment 5 provides an *EPBC Protected Matters Report* for the location of the Offset Area which identifies other MNES that may or do occur in the region.

4.1.3 Additional and/or Alternative Offset Areas

There are additional habitat areas for both species on non-reserved land which may be available for reservation/improved management practices if required. Such a circumstance

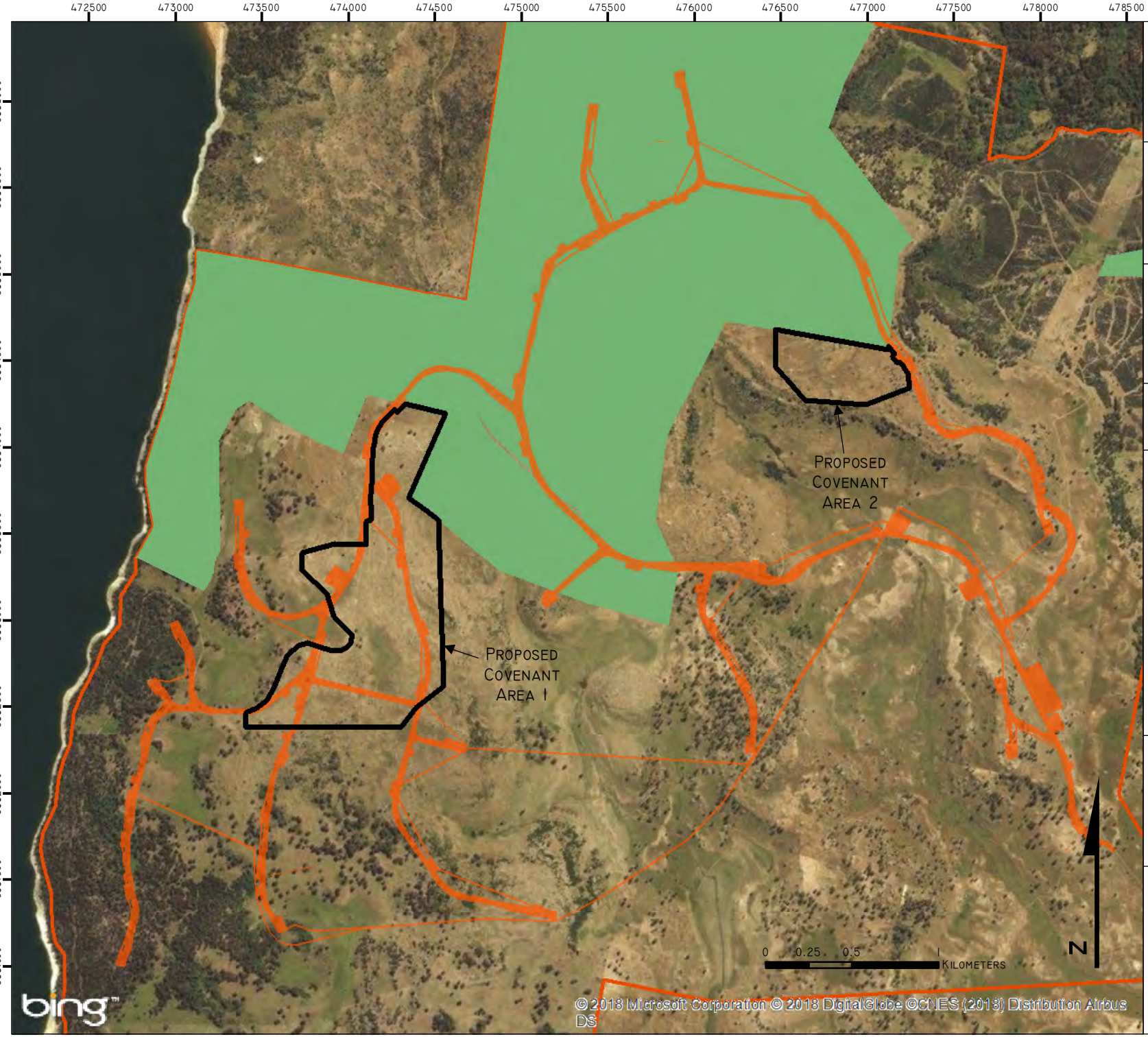
may include when additional area is needed to achieve the required offset if the associated works 'buffer' where the SFS occur is impacted (an unlikely scenario) or the current landowners with whom in principle agreement has been reached fail to translate into a formal agreement for reservation and ongoing management under the *Nature Conservation Act 2002.*

Information is provided below and in Figures 6a and 6b that demonstrates that additional and alternative areas are available for reservation by the proponent of the development that will cause the impact to SFS.

Figure 6a illustrates the extent of habitat for *Pterostylis pratensis* based on an intersection of known records for the species and suitable habitat types (using TASVEG mapping). The analysis indicates that 11,785 hectares of habitat may be available to secure additional or alternative Offset Areas.

Figure 6b illustrates the extent of habitat for *Prasophyllum crebriflorum* based on an intersection of known records for the species and suitable habitat types (using TASVEG mapping). The analysis indicates that 5,697 hectares of habitat may be available to secure additional or alternative Offset Areas.

For both species, the quantum of available land for additional or alternative Offset Areas is vastly more than the amount required to satisfy.



FLORA OFFSET STRATEGY

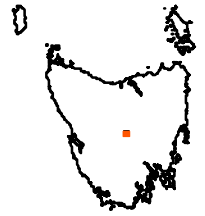
INFORMATION MAP

FIGURE 3:
PROPOSED COVENANT AREAS ON LAKE ECHO

TASMAP:	LGA:
WADDAMANA 4633	CENTRAL HIGHLANDS

- DEVELOPMENT IMPACT AREA
- EXISTING COVENANT
- CATTLE HILL BOUNDARY

Van Diemen CONSULTING
PO Box 1 New Town TAS 7008



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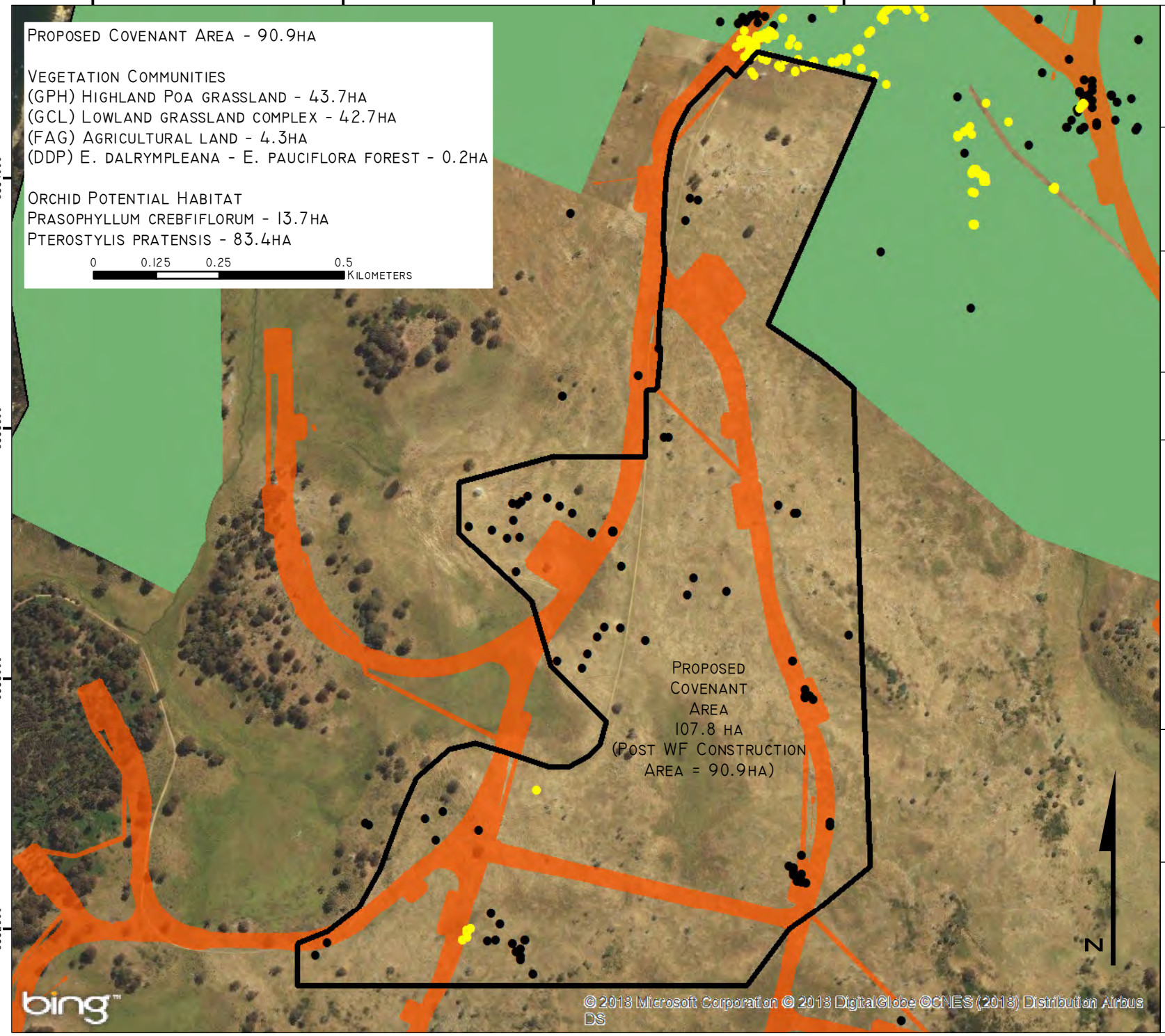
GOLDWIND AUSTRALIA PTY LTD

DATE: 5TH JAN 2018



Flora Offset Strategy

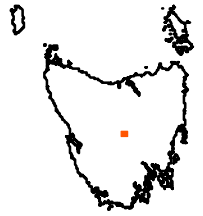
Information Map

Figure 4a: Covenant Area 1 PID 2189572

TASMAP:	LGA:
Waddamana 4633	Central Highlands

- Prasophyllum crebfiflorum
- Pterostylis pratensis
- Development Impact Area
- Existing Covenant

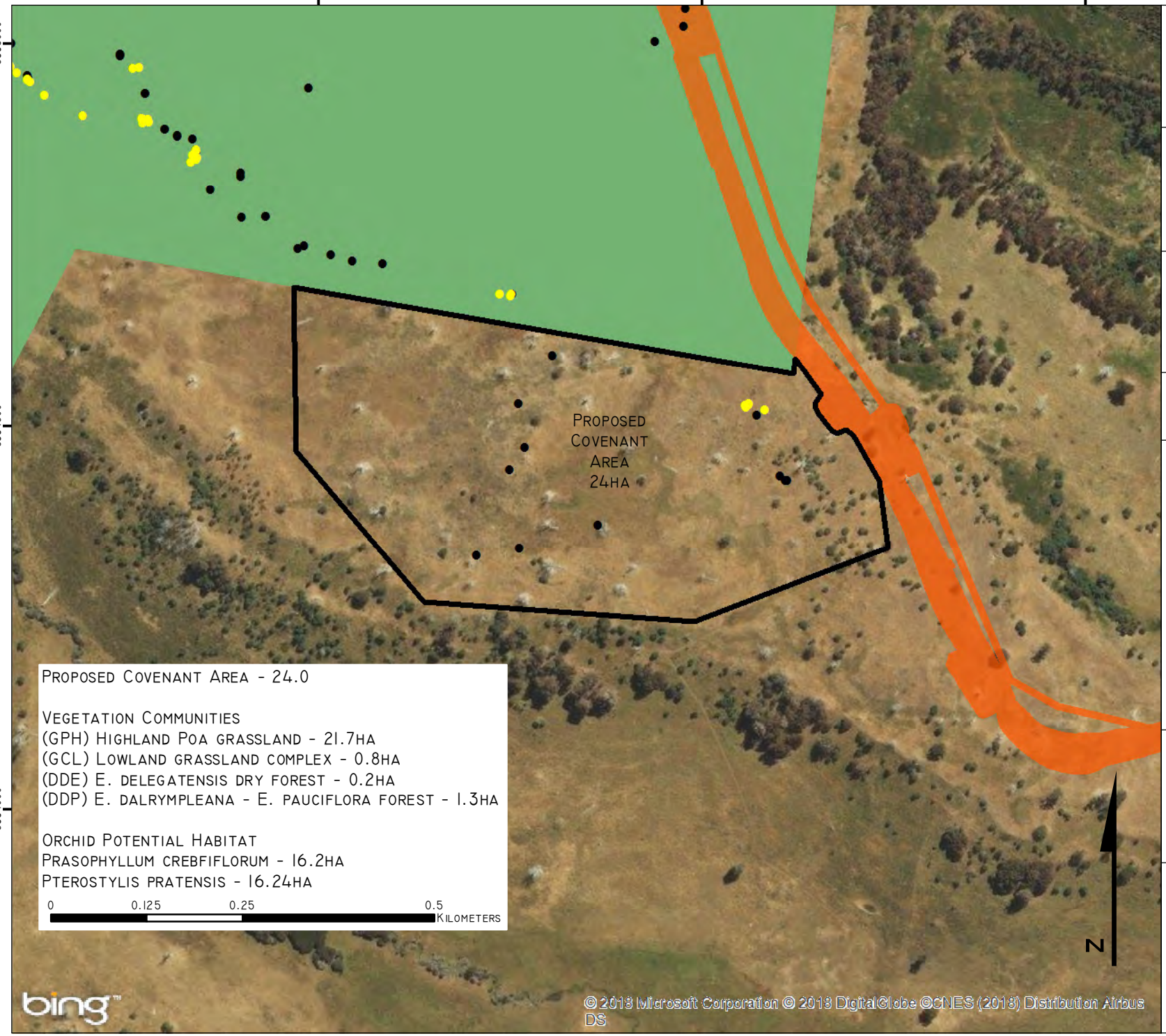
Van Diemen Consulting
PO Box 1 New Town TAS 7008



Datum: GDA94
Grid: MGA zone 55
Scale: @A4 - 1:40,000

Client: Goldwind Australia Pty Ltd

Date: 5th Jan 2018



Flora Offset Strategy

Information Map

Figure 4b: Covenant Area 2 PID 2189572

TASMAP:	LGA:
Waddamana 4633	Central Highlands

- Prasophyllum crebfiflorum
- Pterostylis pratensis
- Development Impact Area
- Existing Covenant

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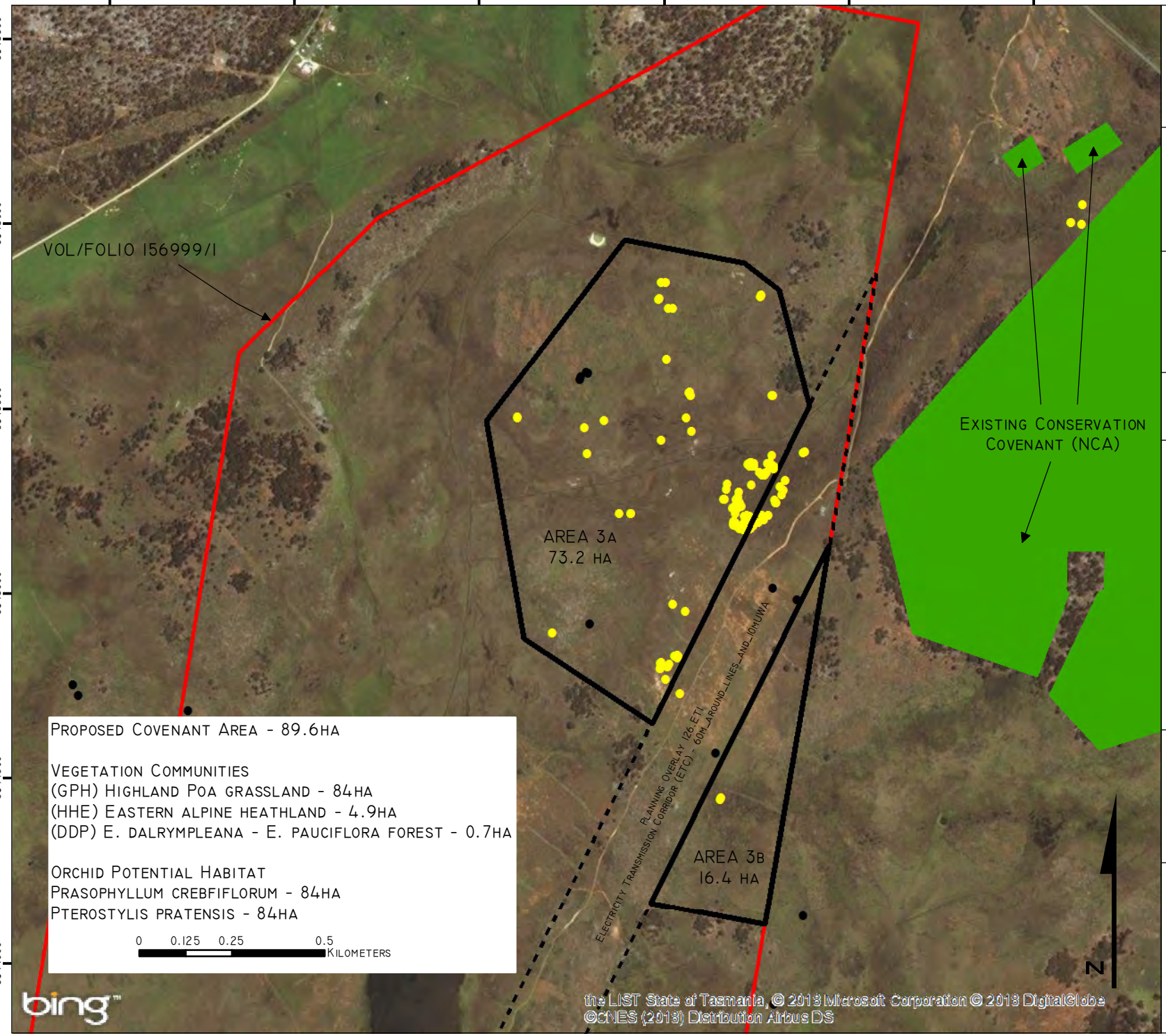
Datum: GDA94
Grid: MGA zone 55
Scale: @A4 - 1:40,000

Client:
Goldwind Australia Pty Ltd

Date: 5th Jan 2018



FLORA OFFSET STRATEGY

INFORMATION MAP

FIGURE 5:
COVENANT AREA 3
PID 2813013
VOL/FOLIO 156999/1

TASMAP:	LGA:
WIHAREJA 4834	CENTRAL HIGHLANDS

- PTEROSTYLIS PRATENSIS
- PRASOPHYLLUM CREBRIFLORUM

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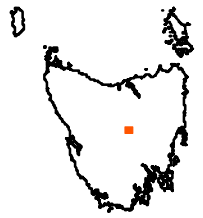

DATUM: GDA94
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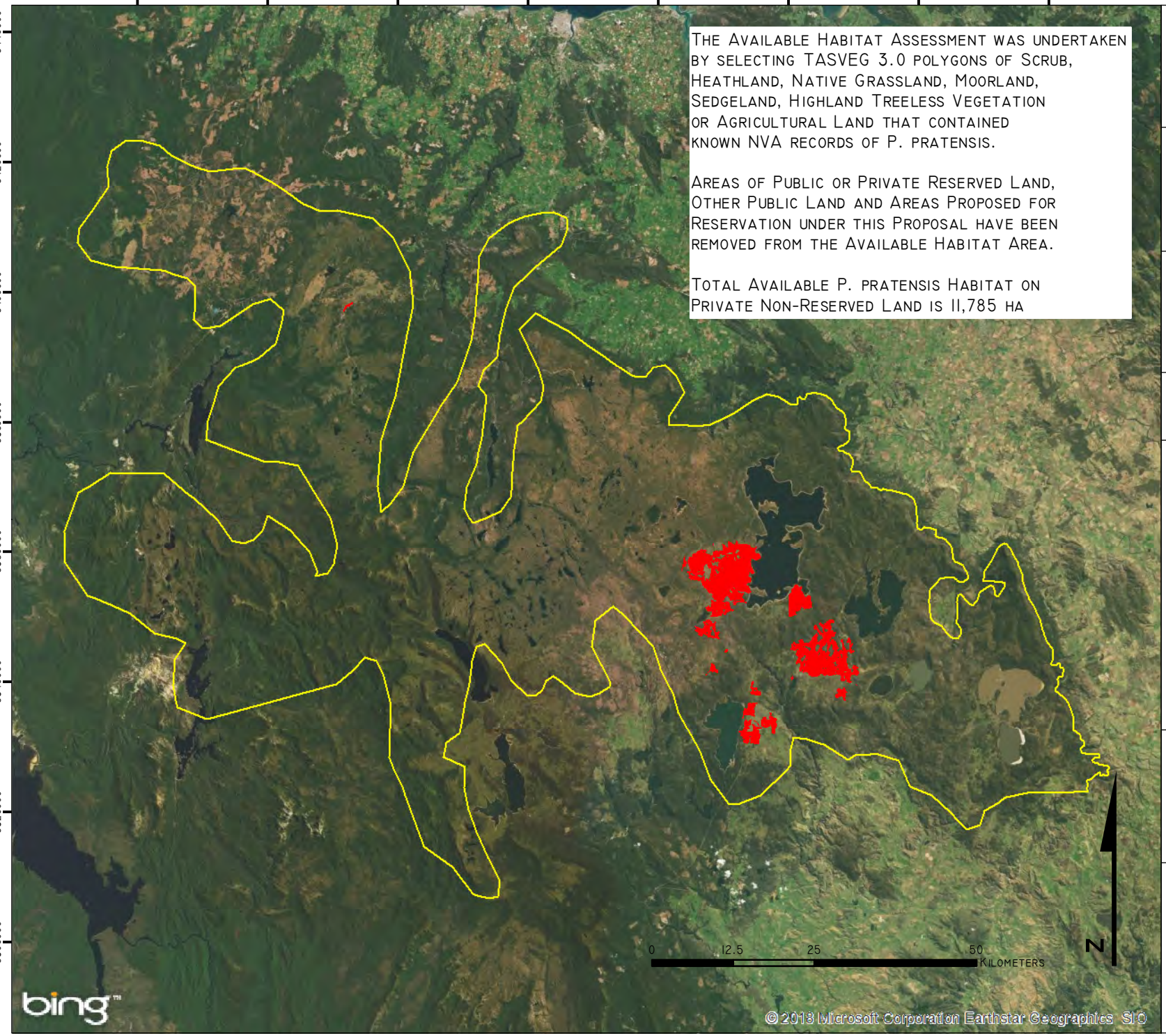
SCALE: @A4 - 1:40,000

CLIENT:
GOLDWIND AUSTRALIA PTY LTD

DATE: 1ST JAN 2018



The Available Habitat Assessment was undertaken by selecting TASVEG 3.0 polygons of Scrub, Heathland, Native Grassland, Moorland, Sedgeland, Highland Treeless Vegetation or Agricultural Land that contained known NVA records of P. pratensis.

Areas of Public or Private Reserved Land, Other Public Land and Areas Proposed for Reservation under this Proposal have been removed from the Available Habitat Area.

Total Available P. pratensis Habitat on Private Non-Reserved Land is 11,785 ha

FLORA OFFSET STRATEGY

INFORMATION MAP

Figure 6a: P. pratensis Habitat on Non-Reserved Private Land

TASMAP:	LGA:
VARIOUS	VARIOUS

P. pratensis Habitat

Central Highlands Bioregion

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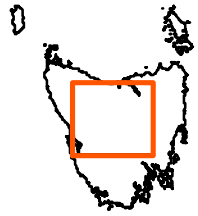
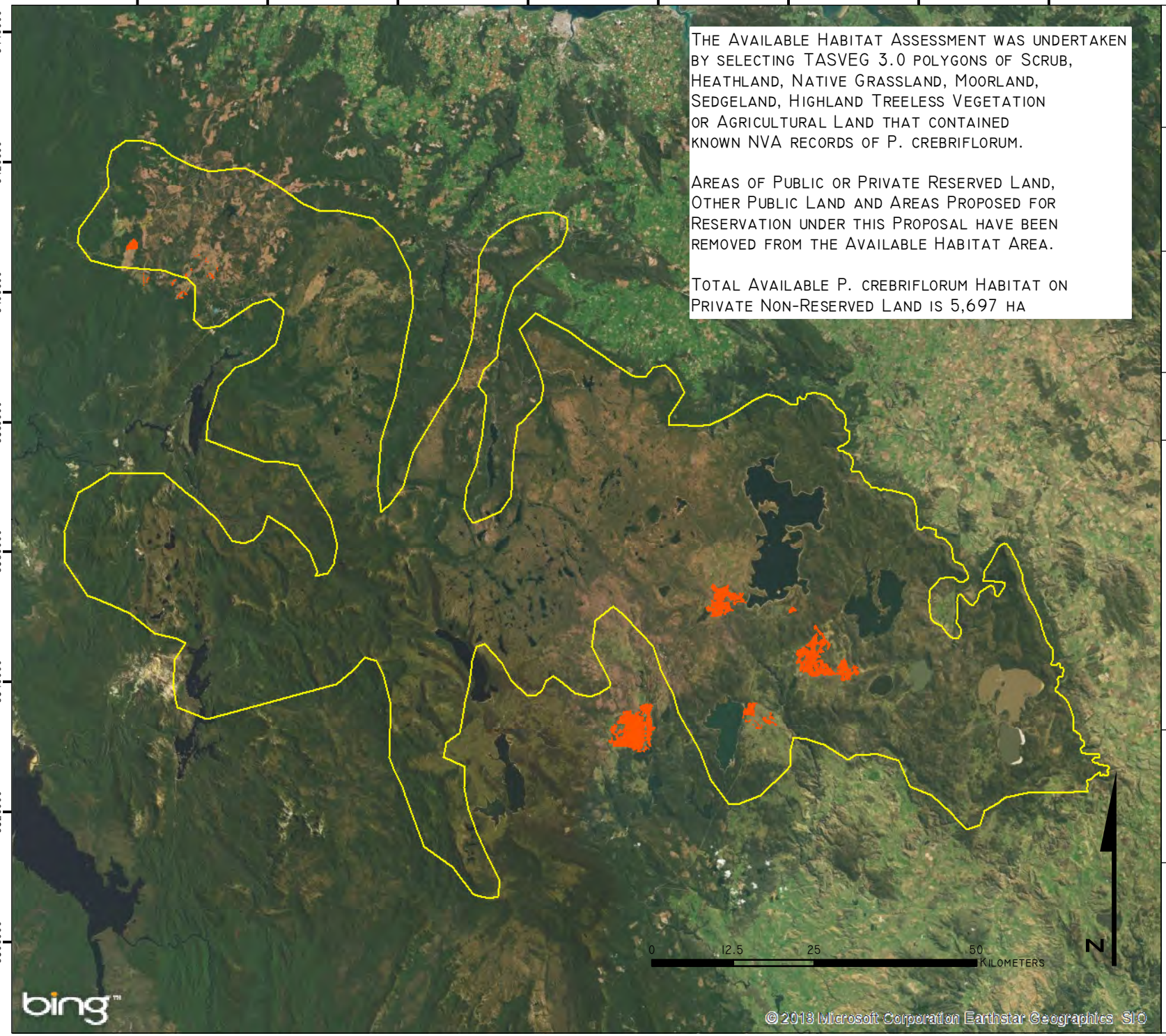


DATUM: GDA94
GRID: MGA ZONE 55

CLIENT:
GOLDWIND AUSTRALIA PTY LTD

DATE: 5th Jan 2018



The Available Habitat Assessment was undertaken by selecting TASVEG 3.0 polygons of Scrub, Heathland, Native Grassland, Moorland, Sedgeland, Highland Treeless Vegetation or Agricultural Land that contained known NVA records of P. crebriflorum.

Areas of Public or Private Reserved Land, Other Public Land and Areas Proposed for Reservation under this Proposal have been removed from the Available Habitat Area.

Total Available P. crebriflorum Habitat on Private Non-Reserved Land is 5,697 ha

FLORA OFFSET STRATEGY

INFORMATION MAP

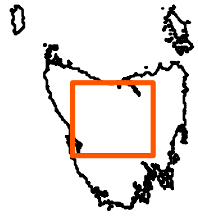
Figure 6b: P. crebriflorum Habitat on Non-Reserved Private Land

TASMAP:	LGA:
VARIOUS	VARIOUS

P. crebriflorum Habitat

Central Highlands Bioregion

Van Diemen Consulting
PO Box 1 New Town TAS 7008



DATUM: GDA94
GRID: MGA ZONE 55

CLIENT:
GOLDWIND AUSTRALIA PTY LTD

DATE: 5th Jan 2018

4.2 Legal Mechanism for Offset Areas

The Offset Areas are proposed to be reserved and managed under the *Nature Conservation Act 2002* – Conservation Covenant provision.

The Offset Areas would be protected in perpetuity by the legal instrument.

The legal instrument establishing each conservation covenant would be in place prior to practical completion of the wind farm development.

4.3 Landowner Engagement

There has been discussion and correspondence with landowners whom own the land upon which the two Offset Areas have been identified (see Attachment 5).

4.4 Offset Area Management

The management of the Offset Areas will be dictated by the content of an Operations Plan/Nature Conservation Plan which will sit alongside the legal instrument that establishes the Offset Areas as reserves under the *Nature Conservation Act 2002*.

It would need to be approved by the State Minister administering the *Nature Conservation Act 2002* as part of the covenant establishment process.

The development of the Operations Plan/Nature Conservation Plan would be the subject of the approval 2009/4839, namely condition 23 –

> '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
>
> ii. the short and longer term arrangements and responsibilities of parties involved in the management of each offset site.'

An *example* Nature Conservation Plan is provided within Attachment 6. 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.

5. References

Craven, B. (1998). Vegetation management plan for Surrey Hills grassland reserves, northwest Tasmania. Unpublished report to North Forests Burnie.

Jones, D., Wapstra, H., Tonelli, P. & Harris, S. (1999). The Orchids of Tasmania. Melbourne University Press, Carlton South, Victoria.

Threatened Species Unit (2008). Listing Statement Liawenee greenhood *Pterostylis pratensis*. Department of Primary Industries & Water, Tasmania.

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

Threatened Species Section (2013). Listing Statement for *Prasophyllum incorrectum* (golfers leek-orchid), Department of Primary Industries, Parks, Water and Environment, Tasmania.

ATTACHMENTS

Attachment 1	*Prasophyllum crebriflorum* information • Approved Conservation Advice for *Prasophyllum crebriflorum* (Crowded Leek-orchid) • EPBC Offset Calculator Spreadsheet
Attachment 2	*Pterostylis pratensis* Information • Approved Conservation Advice for *Pterostylis pratensis* (liawenee greenhood) • EPBC Offset Calculator Spreadsheet
Attachment 3	Offset Option for 'Lake Echo' EPBC Act Protected Matters Report Ecological Assessment Report
Attachment 4	Offset Option for 'Wihareja' EPBC Act Protected Matters Report Ecological Assessment Report
Attachment 5	Letters issued to landowners with Offset Options
Attachment 6	Example Nature Conservation Plan ('Operations Plan')
Attachment 7	Vegetation Condition Assessment Form V1.0 and relevant benchmarks

Prasophyllum crebriflorum information

Attachment 1

- Approved Conservation Advice for *Prasophyllum crebriflorum* (Crowded Leek-orchid)
- EPBC Offset Calculator Spreadsheet

A statement for the purposes of approved conservation advice
(s266B of the *Environment Protection and Biodiversity Conservation Act 1999*)

Approved Conservation Advice for *Prasophyllum crebriflorum* (Crowded Leek-orchid)

This Conservation Advice has been developed based on the best available information at the time this conservation advice was approved.

Description

Prasophyllum crebriflorum, commonly known as the Crowded Leek-orchid, is a small fleshy terrestrial orchid with a single green onion-like leaf which grows to 26 cm long. The flowering stem emerges from the end of the leaf and has a spike of crowded, widely opening reddish-brown flowers. Flowering occurs in late November and December.

Conservation Status

The Crowded Leek-orchid is eligible for listing as **endangered** under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) because its numbers are very low and its geographic distribution is restricted and precarious for its survival. The Crowded Leek-orchid is not currently listed under the Tasmanian *Threatened Species Protection Act 1995*, however the Tasmanian government is preparing to list it as **endangered**.

Distribution and Habitat

The Crowded Leek-orchid is endemic to north-western Tasmania, where it is known from two subpopulations, 2.7 km apart, in the Surrey Hills area to the southeast of Hellyer Gorge (North West NRM region). The estimated total number of mature individuals of the Crowded Leek-orchid is between 125 and 135 mature individuals.

Threats

Threats to the Crowded Leek-orchid include inappropriate fire frequencies, land clearance and conversion of the species' montane grassland habitat. In addition, at least some of the native grasslands in the key Surrey Hills area are known to have been aerially fertilised to improve grass quality (for cattle grazing) in the post-1950s period, and have also been subjected to regular spring burns (Craven, 1998).

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.

This list does not necessarily encompass all actions that may be of benefit to the Crowded Leek-orchid but highlights those that are considered to be of highest priority at the time of preparing the conservation advice.

Information Sources:

Craven, B. (1998). *Vegetation management plan for Surrey Hills grassland reserves, northwest Tasmania.* Unpublished report to North Forests Burnie.

Craven, B., Duncan, F. and Miller G. (2000). *Grasslands and grassy woodlands of significance in Mersey district.* Unpublished Forestry Tasmania report.

Department of Primary Industries, Water and Environment (2005). Unpublished data.

Gilfedder, L. (1995). *Montane grasslands of north-western Tasmania.* Unpublished report to North Forests Burnie & Forestry Tasmania.

Johnson, K. (2003). *Grasslands and grassy woodlands.* Unpublished report to Forestry Tasmania, Mersey District.

Jones, D. L. (2003). A revisionary treatment of four species of *Prasophyllum* R. Br. (Orchidaceae) loosely related to *P. correctum* D. L. Jones. *Muelleria* 18: 99–109.

Jones, D. L. (2004). Two new species of *Prasophyllum* R.Br. (Orchidaceae) from Tasmania. *The Orchadian* 14: 372–377.

Jones, D., Wapstra, H., Tonelli, P. and Harris, S. (1999). *The Orchids of Tasmania*. Melbourne University Press, Carlton South, Victoria.

Kirkpatrick, J. B. and Duncan, F. (1987). Distribution, community composition and conservation of Tasmanian high altitude grassy ecosystems. *Australian Journal of Ecology* **12:** 73–86.

Department of Primary Industries, Water and Environment (2004). *Draft Flora Recovery Plan: Tasmanian Threatened Orchids 2004–2008.*

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	Prasophyllum crebriflorum
EPBC Act status	Endangered
Annual probability of extinction Based on IUCN category definitions	**1.2%**

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

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**	30.5	Hectares	
			Quality	**8**	Scale 0-10	
			Total quantum of impact	24.40	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	24.40	Adjusted hectares		**Time over which loss is averted (max. 20 years)**	20	**Start area (hectares)**	113.9	**Risk of loss (%) without offset**	0%	**Risk of loss (%) with offset**	0%	0.00	90%	0.00	0.00	27.29	111.86%	Yes	
									Future area without offset (adjusted hectares)	113.9	**Future area with offset (adjusted hectares)**	113.9								
					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	24.4	27.29	111.86%	**Yes**	$0.00	N/A	$0.00
Area of community	0				$0.00		$0.00
					$0.00	**$0.00**	**$0.00**

Pterostylis pratensis Information

Attachment 2

- Approved Conservation Advice for *Pterostylis pratensis* (liawenee greenhood)
- EPBC Offset Calculator Spreadsheet

Approved Conservation Advice for *Pterostylis pratensis* (liawenee greenhood)

(s266B of the *Environment Protection and Biodiversity Conservation Act 1999*)

This Conservation Advice has been developed based on the best available information at the time this Conservation Advice was approved; this includes existing and draft plans, records or management prescriptions for this species.

Description

Pterostylis pratensis (liawenee greenhood), family Orchidaceae, is a deciduous, terrestrial orchid growing to 7 to 15 cm tall in flower, with a green hood-like structure dominating the flower. *Pterostylis pratensis* flowers from mid-November to mid-December. They have 2 to 12 densely crowded white flowers with dark green stripes. The flowers are 7 to 8.5 mm long and 4.5 mm wide. They have fleshy tubers which are replaced annually (TSU, 2008).

The darker green and white flowers and larger leaves can distinguish *Pterostylis pratensis*, which grows in montane and subalpine regions on the Tasmanian Central Plateau from another similar greenhood, *Pterostylis ziegeleri*, a greenhood of lowland areas. The dark green apex on the appendage of the labellum of *Pterostylis pratensis* is also broader and blunter than that of *Pterostylis ziegeleri*. A similar greenhood found below Table Mountain needs further investigation (TSU, 2008).

Conservation Status

Pterostylis pratensis (liawenee greenhood) is listed as vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) under the name *Pterostylis pratensis* (liawenee greenhood). In 2001 the species was found eligible for listing as "the number of mature individuals recorded, 600, was low" (TSSC, 2001).

This species is also listed as vulnerable in Tasmania under the *Tasmanian Threatened Species Protection Act 1995* (TSP Act). Note, however, that in 2009 the state government Threatened Species Section undertook an assessment of all Tasmanian orchid species, and made recommendations on their conservation status under the TSP Act (TSS, 2009). This review indicated that several species, including *Pterostylis pratensis,* probably warrant delisting. The finding for this species was due to a further population being found in 2009. The Tasmanian Scientific Advisory Committee to the TSP Act is currently reviewing all species listed on the TSP Act. This will consider the recommendations of TSS (2009). The listing of this species will subsequently be re-considered under the EPBC Act.

Distribution and Habitat

Pterostylis pratensis is endemic to Tasmania and occurs at an altitude of 850 to 1100 m. It grows in subalpine *Poa labillardierei* tussock grassland which is very exposed, low and open, with patches of often stunted *Olearia algida* and *Hakea microcarpa* scrub on red–brown loamy to clay soils derived from basalt. *Pterostylis pratensis* grows in montane and subalpine regions on the Central Plateau (TSU, 2008). The habitat requirements, and disturbance regimes required to maintain suitable habitat, are not well known.

There are 11 known populations of *Pterostylis pratensis* (TSS, 2013). Estimating the size of populations of terrestrial orchids is often difficult unless conditions are favourable for flowering. In 2008 the largest population, on Liawenee Moor, had a maximum of 500 plants, and the total number of individuals was estimated to be at least 600. The species was estimated to extend over an area of approximately 400 square kilometres, occupying an area of 20 or more hectares in total (TSU, 2008). An ecological survey report has since identified a large population covering hundreds of hectares and estimated to be in excess of 10 000 plants (SEMF Pty Ltd, 2009).

Pterostylis pratensis is not well represented in conservation reserves, with all but two known populations occurring on private land (TSS, 2013). The Lake Augusta/Lake Botsford sites are in the Central Plateau Conservation Area, which is included in the Tasmanian Wilderness World Heritage Area (TSU, 2008).

The species occurs in the Tasmanian Central Highlands IBRA bioregion, and the South and North West Tasmanian Natural Resource Management Regions.

The distribution of this species is not known to overlap with any EPBC Act-listed threatened ecological community.

Threats

There is little information on the level of threat to *Pterostylis pratensis*. The Liawenee Moor population is outside the World Heritage Area, and has been subject to grazing and frequent burning. These factors have probably maintained an open grassy habitat for the species. The St Patricks Plains colonies are on private land used for grazing. They are confined to a rocky basalt exposure which has not been ploughed or fertilised, unlike adjacent similar habitat where the species could not be found. Clearing, cultivation and fertilisers are the main threats to any other colonies that may occur on private land in the district. Colonies in the World Heritage Area should be safe in the long-term, provided *Poa* tussocks are occasionally burnt. Checks in apparently suitable habitat along the Lake Highway have shown *Pterostylis pratensis* to be very patchy in distribution, suggesting that stochastic risks are a relevant consideration (TSU, 2008).

Research Priorities

Research priorities that would inform future regional and local priority actions include:

- assessing and identifying physical and biological habitat requirements
- determining appropriate grazing regimes for *Pterostylis pratensis*
- determining appropriate fire regimes required to keep the habitat of *Pterostylis pratensis* open

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.

<u>Habitat Disturbance and Modification</u>

- 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.

Conservation Information

- Communicate with and engage the community and stakeholders regarding conservation of *Pterostylis pratensis.*
- Communicate management information to landholders e.g. ensuring *Poa* tussock grasslands in the vicinity of populations remain open through occasional burning or grazing; not overgrazing from November to January to avoid damaging colonies and to allow plants to set seed; not ploughing or fertilising in the vicinity of *Pterostylis pratensis* populations.

This list does not necessarily encompass all actions that may be of benefit to *Pterostylis pratensis*, but highlights those that are considered to be of highest priority at the time of preparing the Approved Conservation Advice.

Existing Plans/Management Prescriptions that are Relevant to the Species

- The world heritage area is managed to protect and preserve its wilderness values (TPWS, 1999 and 2002).
- The draft threatened Tasmanian orchids flora recovery plan (TSS, 2013) was released for public comment on 23 November 2013. This plan outlines recovery actions for all threatened orchid species within Tasmania, including *Pterostylis pratensis.*

These plans/prescriptions were current at the time of publishing; please refer to the relevant agency's website for any updated versions.

References

SEMF Pty Ltd (2009). *Proposed Cattle Hill Wind Farm ecological survey for National Power Pty Ltd*. Hobart.

Tasmanian Parks and Wildlife Service (TPWS) (1999 and 2002) *Tasmanian Wilderness World Heritage Area management plan 1999 and 2002*. Department of Primary Industries, Water and Environment, Hobart.

Threatened Species Section (TSS) (2009). *Summary of surveys and actions arising from the threatened orchid and* Euphrasia *project 2006–2009*. Department of Primary Industries Parks Water and the Environment, Hobart.

Threatened Species Section (TSS) (2013). Draft *threatened Tasmanian orchids flora recovery plan.* Department of Primary Industries, Parks, Water and Environment, Hobart.

Threatened Species Scientific Committee (TSSC) (2001). *Commonwealth Listing advice on Pterostylis pratensis*.
Available on the Internet at:
http://www.environment.gov.au/biodiversity/threatened/species/p-pratensis.html

Threatened Species Unit (TSU) (2008). Listing statement *Pterostylis pratensis*. Department of Primary Industries and Water, Hobart.

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

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**	46.5	Hectares	
			Quality	**8**	Scale 0-10	
			Total quantum of impact	37.20	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	37.20	Adjusted hectares		**Time over which loss is averted (max. 20 years)**	20	**Start area (hectares)**	183.64	**Risk of loss (%) without offset**	0%	**Risk of loss (%) with offset**	0%	0.00	90%	0.00	0.00	48.60	130.65%	Yes	
									Future area without offset (adjusted hectares)	183.6	**Future area with offset (adjusted hectares)**	183.6								
					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																			

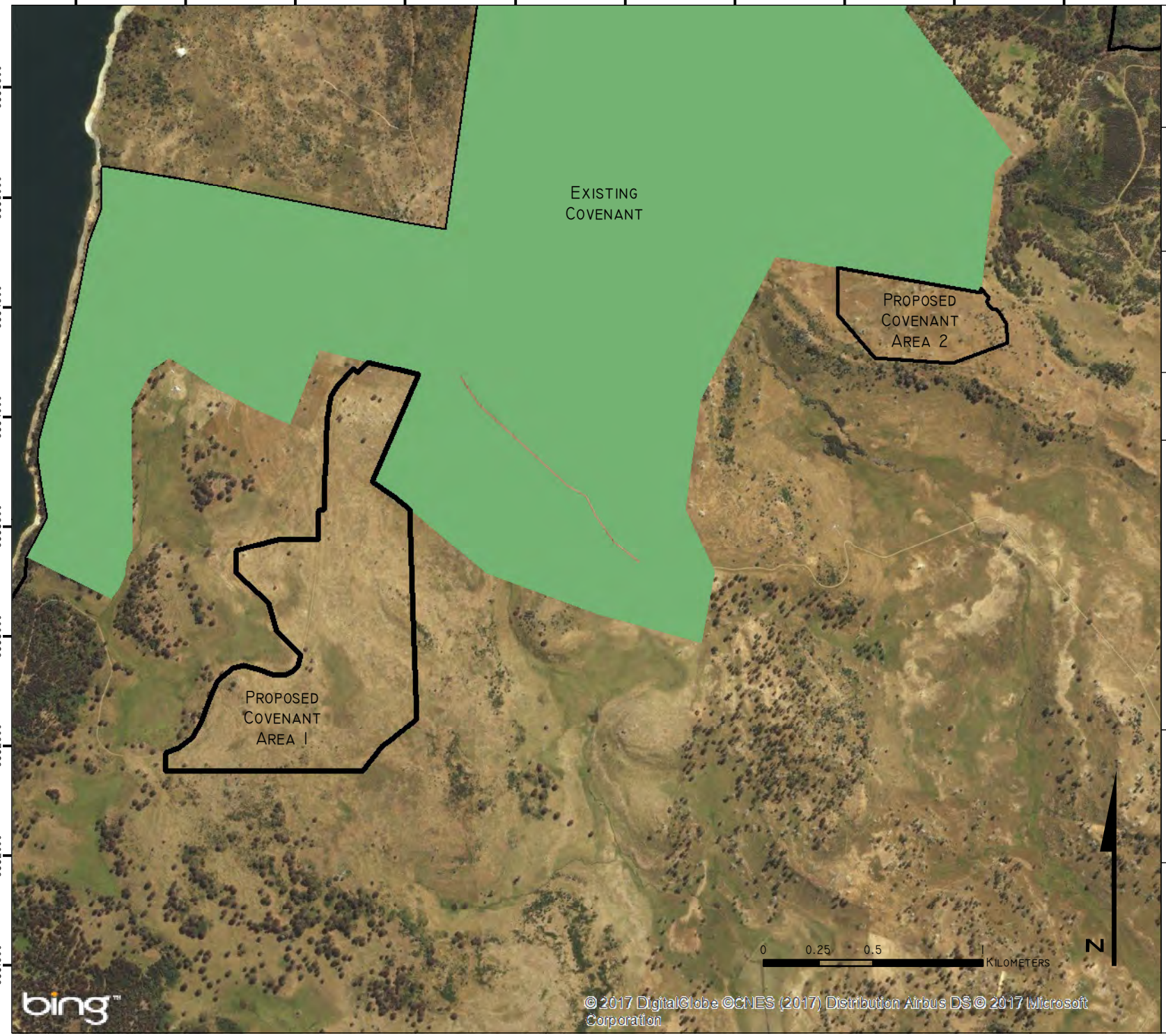
Summary

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	37.2	48.60	130.65%	**Yes**	$0.00	N/A	$0.00
Area of community	0				$0.00		$0.00
					$0.00	**$0.00**	**$0.00**

Attachment 3

Offset Option for 'Lake Echo'

EPBC Act Protected Matters Report



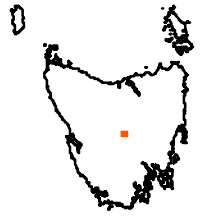
OFFSET CHWF LANDOWNER ENGAGEMENT

PROPERTY MAP

FIGURE 1:
PROPOSED
COVENANT AREAS

TASMAP:	LGA:
WADDAMANA 4633	CENTRAL HIGHLANDS

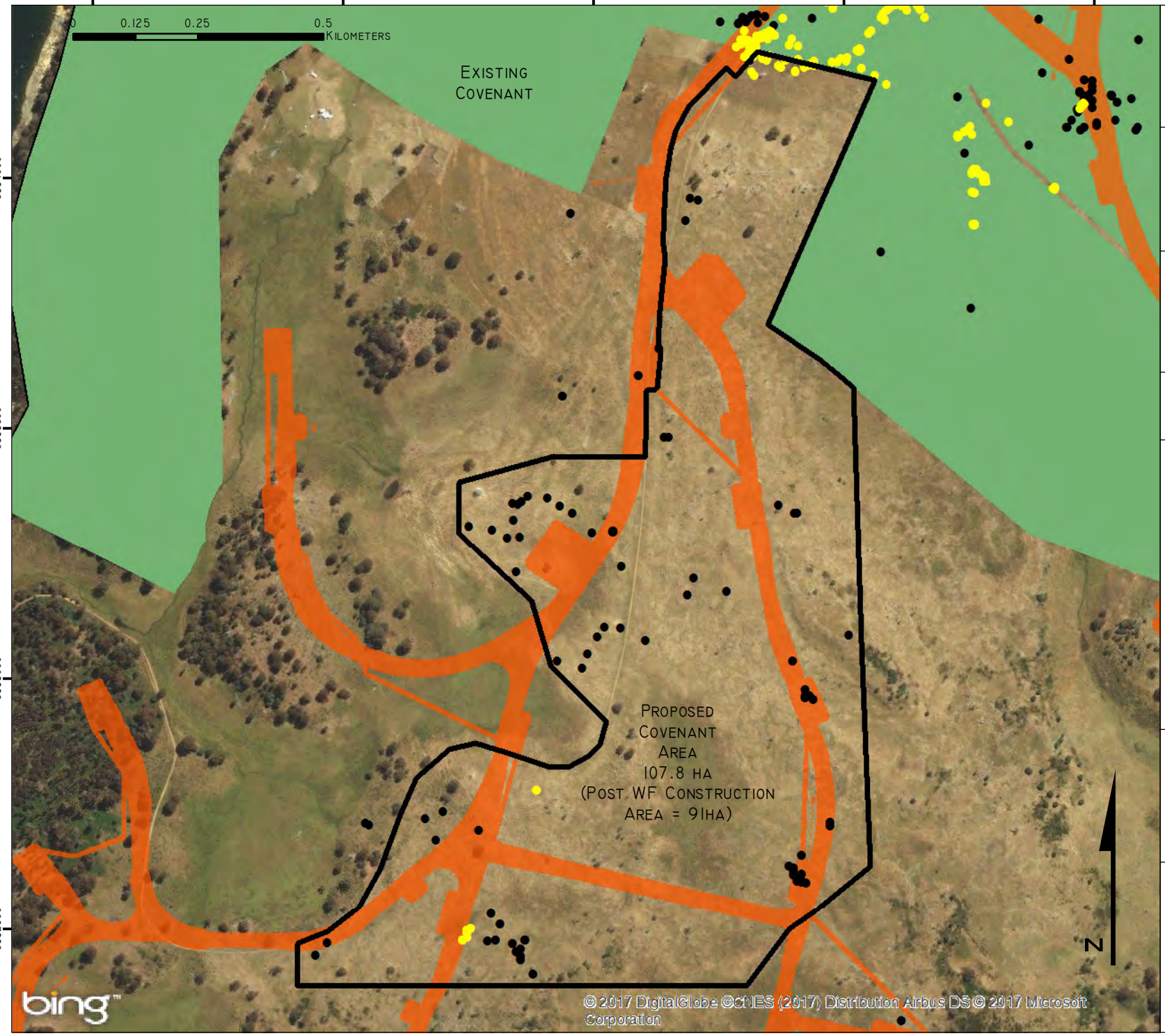
Van Diemen CONSULTING
PO Box 1 New Town TAS 7008



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

CLIENT:
GOLDWIND
AUSTRALIA
PTY LTD

DATE: 5TH JAN 2018



OFFSET CHWF LANDOWNER ENGAGEMENT

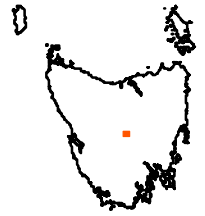
PROPERTY MAP

FIGURE 2A:
COVENANT AREA 1
PID 2189572

TASMAP:	LGA:
WADDAMANA 4633	CENTRAL HIGHLANDS

- Prasophyllum crebfiflorum
- Pterostylis pratensis

Van Diemen CONSULTING
PO Box 1 New Town TAS 7008



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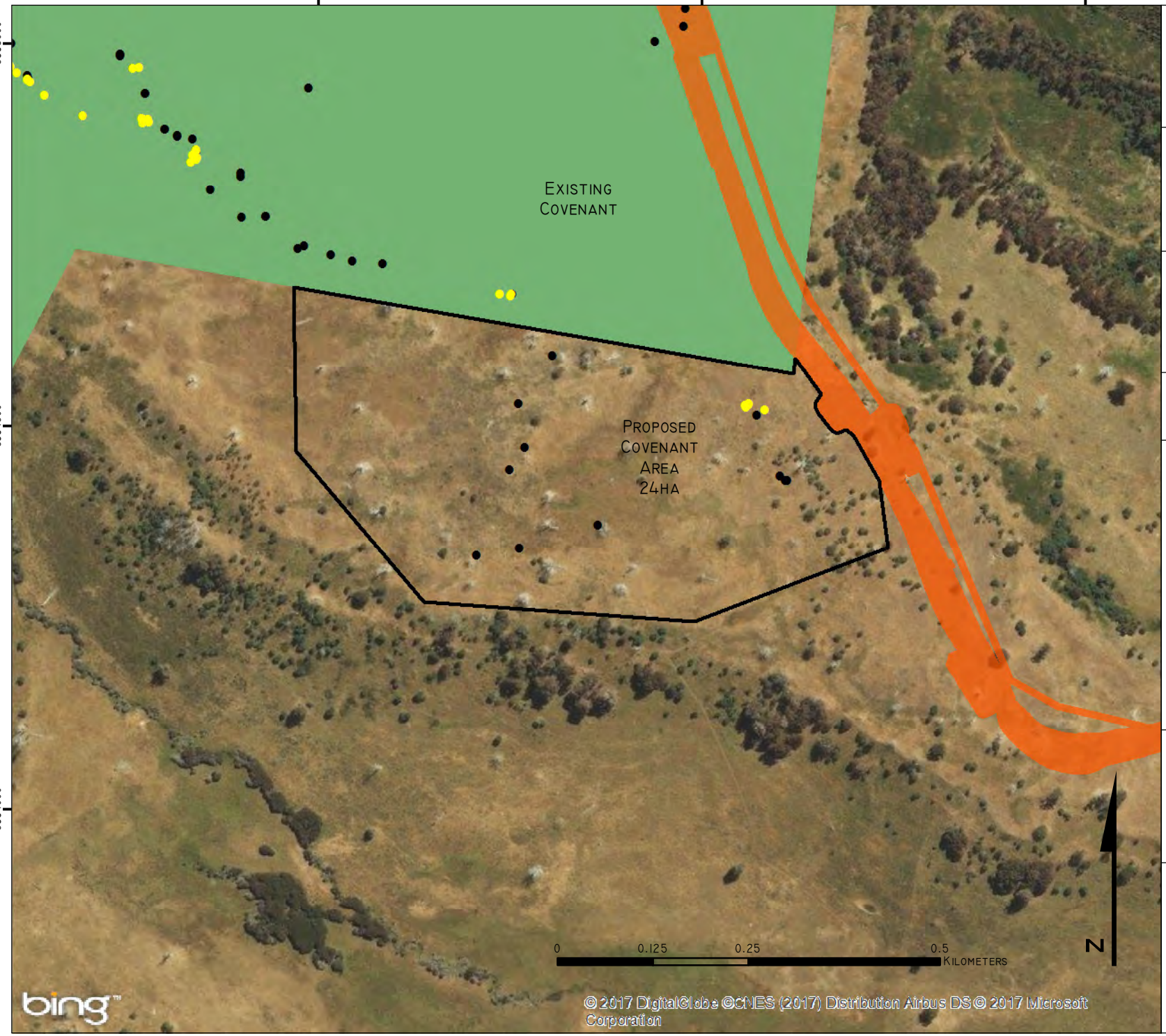


OFFSET CHWF LANDOWNER ENGAGEMENT

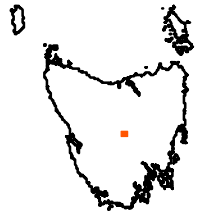
PROPERTY MAP

FIGURE 2B:
COVENANT AREA 2
PID 2189572

TASMAP:	LGA:
WADDAMANA 4633	CENTRAL HIGHLANDS

- Prasophyllum crebfiflorum
- Pterostylis pratensis

Van Diemen CONSULTING
PO BOX 1 NEW TOWN TAS 7008



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

CLIENT:
GOLDWIND AUSTRALIA PTY LTD

DATE: 5TH JAN 2018

Australian Government
Department of the Environment and Energy

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

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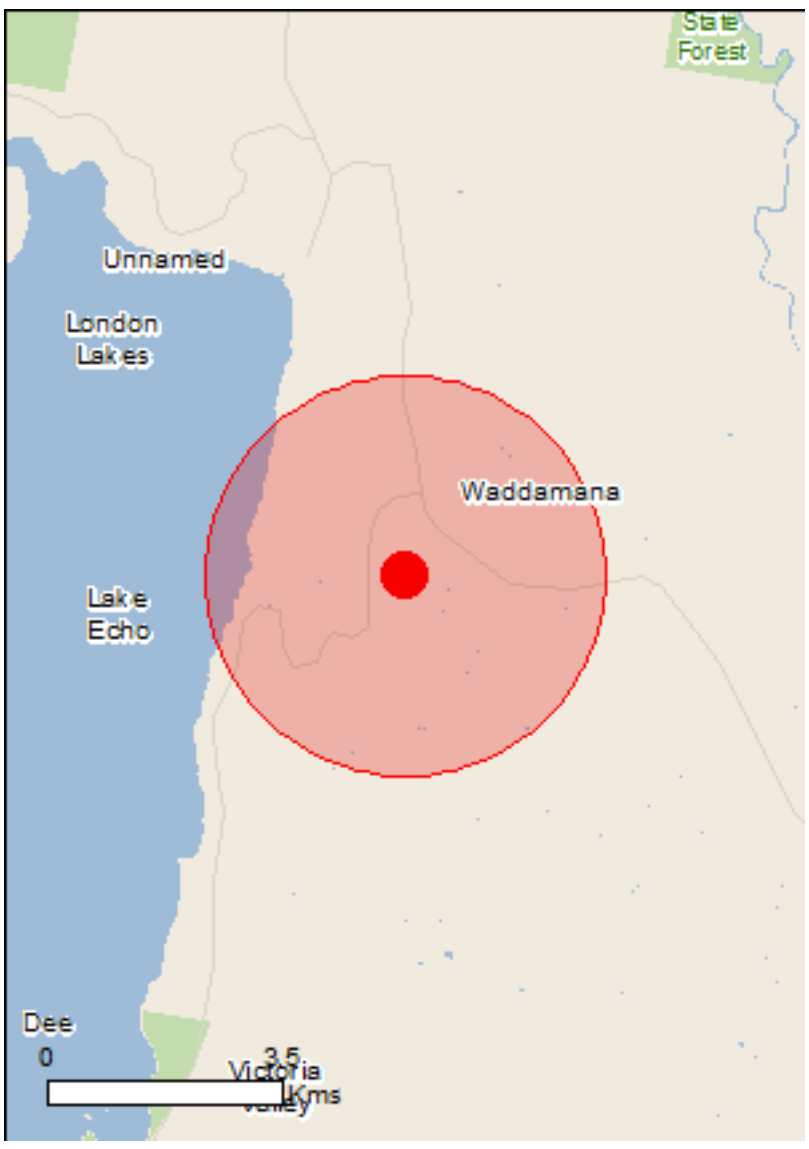
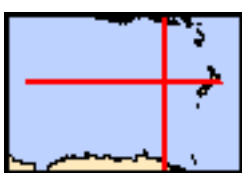


This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2010

Coordinates

Buffer: 3.0Km



Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	1
Listed Threatened Species:	23
Listed Migratory Species:	8

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	12
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Commonwealth Reserves Marine:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves:	3
Regional Forest Agreements:	1
Invasive Species:	16
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Name	Status	Type of Presence
Alpine Sphagnum Bogs and Associated Fens	Endangered	Community likely to occur within area

Listed Threatened Species [Resource Information]

Name	Status	Type of Presence
Birds		
Aquila audax fleayi Tasmanian Wedge-tailed Eagle, Wedge-tailed Eagle (Tasmanian) [64435]	Endangered	Breeding likely to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Ceyx azureus diemenensis Tasmanian Azure Kingfisher [25977]	Endangered	Species or species habitat may occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area
Tyto novaehollandiae castanops (Tasmanian population) Masked Owl (Tasmanian) [67051]	Vulnerable	Species or species habitat may occur within area
Insects		
Oreixenica ptunarra Ptunarra Brown, Ptunarra Brown Butterfly, Ptunarra Xenica [26327]	Endangered	Species or species habitat known to occur within area
Mammals		
Dasyurus maculatus maculatus (Tasmanian population) Spotted-tail Quoll, Spot-tailed Quoll, Tiger Quoll (Tasmanian population) [75183]	Vulnerable	Species or species habitat known to occur within area

Name	Status	Type of Presence
Dasyurus viverrinus Eastern Quoll, Luaner [333]	Endangered	Species or species habitat known to occur within area
Perameles gunnii gunnii Eastern Barred Bandicoot (Tasmania) [66651]	Vulnerable	Species or species habitat may occur within area
Sarcophilus harrisii Tasmanian Devil [299]	Endangered	Species or species habitat likely to occur within area
Plants		
Acacia axillaris Midlands Mimosa, Midlands Wattle [13563]	Vulnerable	Species or species habitat may occur within area
Barbarea australis Native Wintercress, Riverbed Wintercress [12540]	Endangered	Species or species habitat may occur within area
Colobanthus curtisiae Curtis' Colobanth [23961]	Vulnerable	Species or species habitat likely to occur within area
Eucalyptus gunnii subsp. divaricata Miena Cider Gum [68394]	Endangered	Species or species habitat likely to occur within area
Glycine latrobeana Clover Glycine, Purple Clover [13910]	Vulnerable	Species or species habitat known to occur within area
Lepidium hyssopifolium Basalt Pepper-cress, Peppercress, Rubble Pepper-cress, Pepperweed [16542]	Endangered	Species or species habitat likely to occur within area
Leucochrysum albicans var. tricolor Hoary Sunray, Grassland Paper-daisy [56204]	Endangered	Species or species habitat may occur within area
Prasophyllum crebriflorum Crowded Leek-Orchid [78897]	Endangered	Species or species habitat likely to occur within area
Pterostylis pratensis Liawenee Greenhood [66896]	Vulnerable	Species or species habitat known to occur within area
Xerochrysum palustre Swamp Everlasting, Swamp Paper Daisy [76215]	Vulnerable	Species or species habitat likely to occur within area

Listed Migratory Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat likely to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat likely to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Breeding known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species

Name	Threatened	Type of Presence
		habitat likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area

Extra Information

State and Territory Reserves [Resource Information]

Name	State
Lake Echo	TAS
Lake Echo Forest	TAS
Martin Cash's Scrub	TAS

Regional Forest Agreements [Resource Information]

Note that all areas with completed RFAs have been included.

Name	State
Tasmania RFA	Tasmania

Invasive Species [Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Alauda arvensis Skylark [656]		Species or species habitat likely to occur within area
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
Carduelis chloris European Greenfinch [404]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Turdus merula Common Blackbird, Eurasian Blackbird [596]		Species or species habitat likely to occur within area
Mammals		

Name	Status	Type of Presence
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Plants		
Cytisus scoparius Broom, English Broom, Scotch Broom, Common Broom, Scottish Broom, Spanish Broom [5934]		Species or species habitat likely to occur within area
Genista monspessulana Montpellier Broom, Cape Broom, Canary Broom, Common Broom, French Broom, Soft Broom [20126]		Species or species habitat likely to occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Ulex europaeus Gorse, Furze [7693]		Species or species habitat likely to occur within area

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

-42.15062 146.69186

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

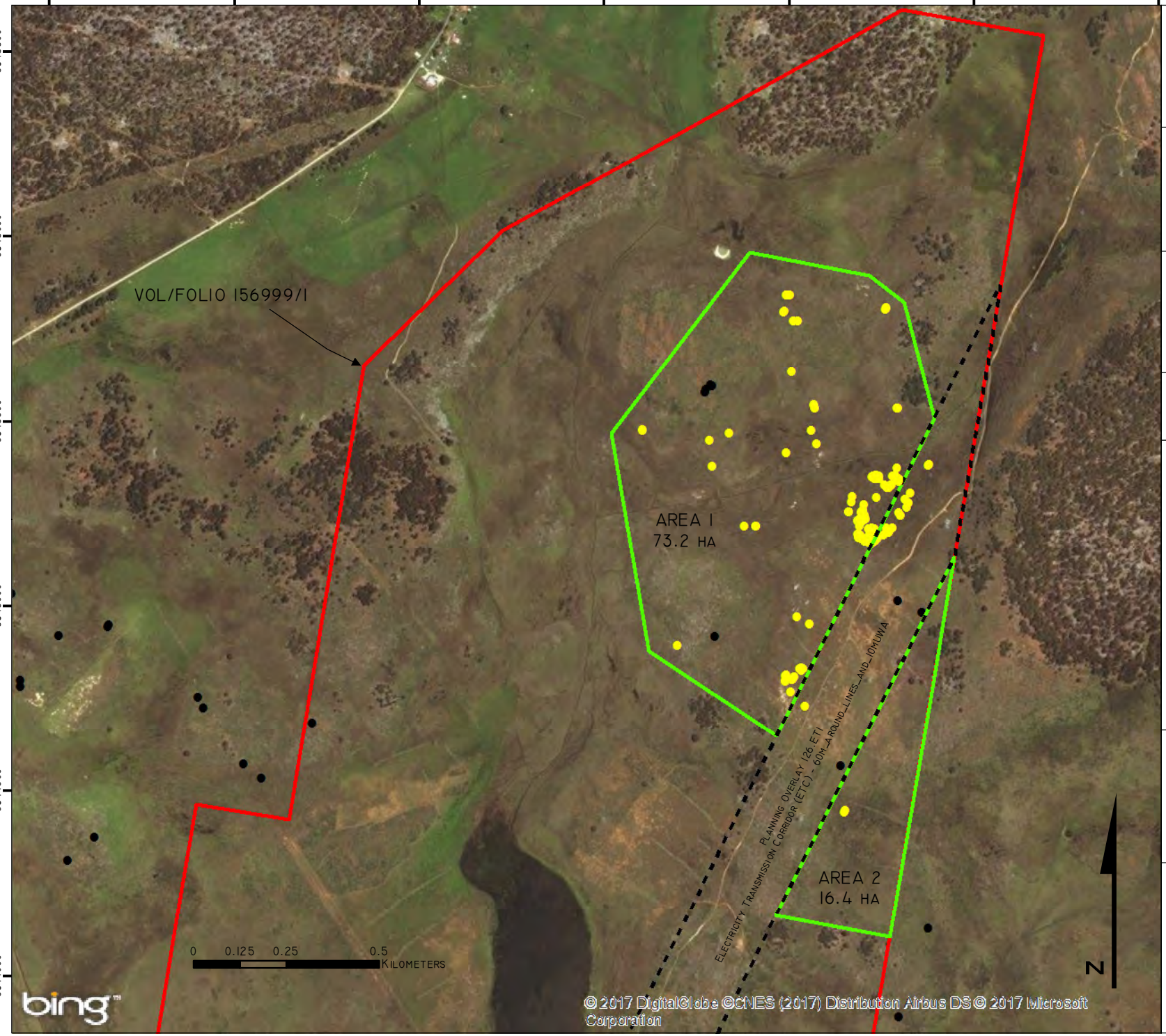
The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

Department of the Environment
GPO Box 787
Canberra ACT 2601 Australia
+61 2 6274 1111

Attachment 4 **Offset Option for 'Wihareja'**

EPBC Act Protected Matters Report



OFFSET CHWF LANDOWNER ENGAGEMENT

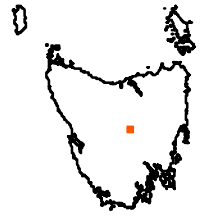
PROPERTY MAP

PID 2813013
VOL/FOLIO 156999/1

TASMAP:	LGA:
WIHAREJA 4834	CENTRAL HIGHLANDS

- Pterostylis pratensis
- Prasophyllum crebriflorum

Van Diemen Consulting
PO Box 1 New Town TAS 7008



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GRID: MGA ZONE 55
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CLIENT:
GOLDWIND AUSTRALIA PTY LTD

DATE: 1st JAN 2018

Australian Government
Department of the Environment and Energy

EPBC Act Protected Matters Report

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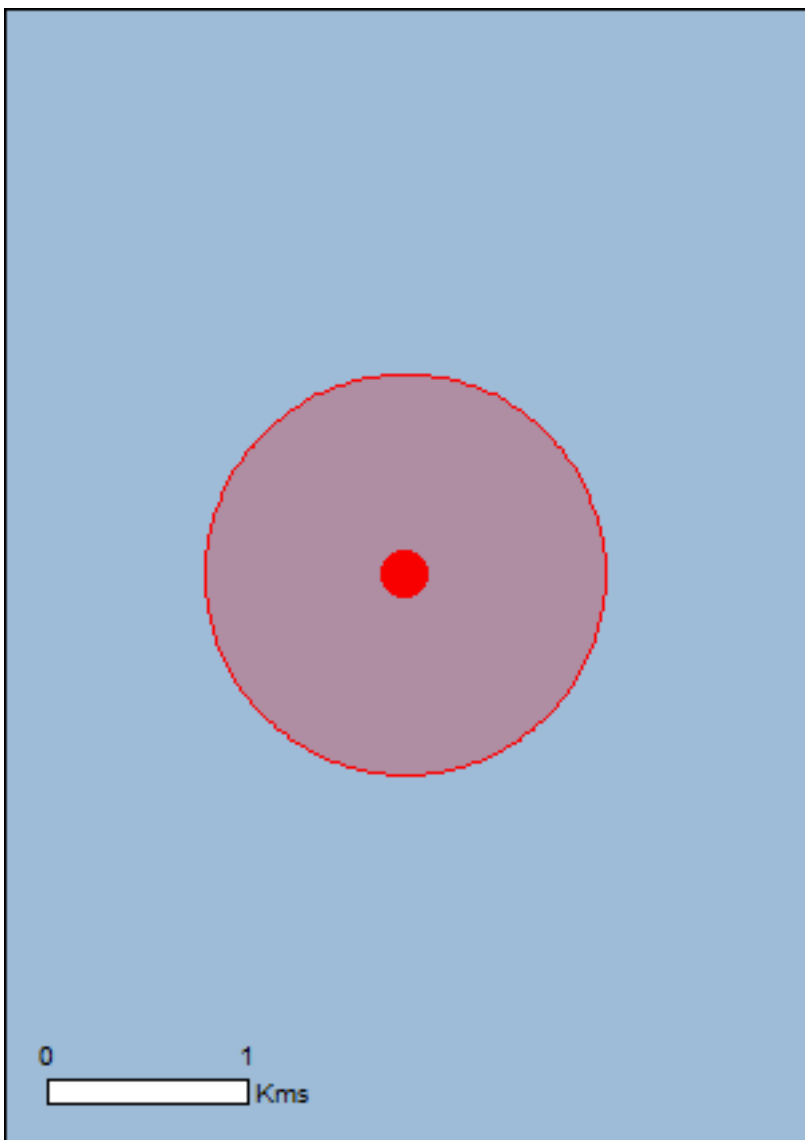
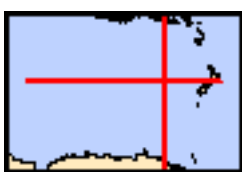


Coordinates

Buffer: 1.0Km



Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	1
Listed Threatened Species:	22
Listed Migratory Species:	8

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	12
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Commonwealth Reserves Marine:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves:	1
Regional Forest Agreements:	1
Invasive Species:	17
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Name	Status	Type of Presence
Alpine Sphagnum Bogs and Associated Fens	Endangered	Community likely to occur within area

Listed Threatened Species [Resource Information]

Name	Status	Type of Presence
Birds		
Aquila audax fleayi Tasmanian Wedge-tailed Eagle, Wedge-tailed Eagle (Tasmanian) [64435]	Endangered	Breeding likely to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Ceyx azureus diemenensis Tasmanian Azure Kingfisher [25977]	Endangered	Species or species habitat may occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area
Tyto novaehollandiae castanops (Tasmanian population) Masked Owl (Tasmanian) [67051]	Vulnerable	Species or species habitat may occur within area
Fish		
Galaxias tanycephalus Saddled Galaxias [26176]	Vulnerable	Species or species habitat may occur within area
Insects		
Oreixenica ptunarra Ptunarra Brown, Ptunarra Brown Butterfly, Ptunarra Xenica [26327]	Endangered	Species or species habitat known to occur within area
Mammals		

Name	Status	Type of Presence
Dasyurus maculatus maculatus (Tasmanian population)		
Spotted-tail Quoll, Spot-tailed Quoll, Tiger Quoll (Tasmanian population) [75183]	Vulnerable	Species or species habitat likely to occur within area
Dasyurus viverrinus		
Eastern Quoll, Luaner [333]	Endangered	Species or species habitat may occur within area
Perameles gunnii gunnii		
Eastern Barred Bandicoot (Tasmania) [66651]	Vulnerable	Species or species habitat may occur within area
Sarcophilus harrisii		
Tasmanian Devil [299]	Endangered	Species or species habitat likely to occur within area
Plants		
Acacia axillaris		
Midlands Mimosa, Midlands Wattle [13563]	Vulnerable	Species or species habitat may occur within area
Colobanthus curtisiae		
Curtis' Colobanth [23961]	Vulnerable	Species or species habitat known to occur within area
Eucalyptus gunnii subsp. divaricata		
Miena Cider Gum [68394]	Endangered	Species or species habitat likely to occur within area
Glycine latrobeana		
Clover Glycine, Purple Clover [13910]	Vulnerable	Species or species habitat may occur within area
Lepidium hyssopifolium		
Basalt Pepper-cress, Peppercress, Rubble Pepper-cress, Pepperweed [16542]	Endangered	Species or species habitat may occur within area
Prasophyllum crebriflorum		
Crowded Leek-Orchid [78897]	Endangered	Species or species habitat likely to occur within area
Pterostylis pratensis		
Liawenee Greenhood [66896]	Vulnerable	Species or species habitat known to occur within area
Xerochrysum palustre		
Swamp Everlasting, Swamp Paper Daisy [76215]	Vulnerable	Species or species habitat may occur within area

Listed Migratory Species [Resource Information]		
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Myiagra cyanoleuca		
Satin Flycatcher [612]		Species or species habitat known to occur within area
Migratory Wetlands Species		
Actitis hypoleucos		
Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata		
Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos		
Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii		
Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Numenius madagascariensis		
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos		
Common Sandpiper [59309]		Species or species habitat may occur within area
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba		
Great Egret, White Egret [59541]		Species or species habitat likely to occur within area
Ardea ibis		
Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata		
Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos		
Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii		
Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Haliaeetus leucogaster		
White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Lathamus discolor		
Swift Parrot [744]	Critically Endangered	Species or species habitat may occur within area

Name	Threatened	Type of Presence
Myiagra cyanoleuca		
Satin Flycatcher [612]		Species or species habitat known to occur within area
Numenius madagascariensis		
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area

Extra Information

State and Territory Reserves [Resource Information]

Name	State
St. Patricks Plains	TAS

Regional Forest Agreements [Resource Information]

Note that all areas with completed RFAs have been included.

Name	State
Tasmania RFA	Tasmania

Invasive Species [Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Alauda arvensis		
Skylark [656]		Species or species habitat likely to occur within area
Anas platyrhynchos		
Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis		
European Goldfinch [403]		Species or species habitat likely to occur within area
Carduelis chloris		
European Greenfinch [404]		Species or species habitat likely to occur within area
Columba livia		
Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Passer domesticus		
House Sparrow [405]		Species or species habitat likely to occur within area
Sturnus vulgaris		
Common Starling [389]		Species or species habitat likely to occur within area
Turdus merula		
Common Blackbird, Eurasian Blackbird [596]		Species or species habitat likely to occur within area
Mammals		

Name	Status	Type of Presence
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Feral deer Feral deer species in Australia [85733]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Plants		
Cytisus scoparius Broom, English Broom, Scotch Broom, Common Broom, Scottish Broom, Spanish Broom [5934]		Species or species habitat likely to occur within area
Genista monspessulana Montpellier Broom, Cape Broom, Canary Broom, Common Broom, French Broom, Soft Broom [20126]		Species or species habitat likely to occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Ulex europaeus Gorse, Furze [7693]		Species or species habitat likely to occur within area

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

-42.04293 146.8135

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

Department of the Environment
GPO Box 787
Canberra ACT 2601 Australia
+61 2 6274 1111

Attachment 5 Letters issued to landowners with Offset Options

Wild Cattle Hill Pty Ltd
ACN 610 777 369

9 January 2018

Geoff and Irene Glover
4244A Waddamana Road
Steppes TAS 7030

Dear Geoff and Irene,

Cattle Hill Wind Farm – Conservation Covenant Assistance

Thank you for your past support with providing an option to offset endangered flora species that may be impacted at the Cattle Hill Wind Farm ('wind farm') site. As we'd discussed, the wind farm is proceeding into construction and now needs to re-establish its option with you to offset these flora species.

This letter has been written to address the requirements of the Commonwealth Department of Environment and Energy.

The Wind Farm

Wild Cattle Hill Pty Ltd (ACN 610 777 369) is the approval holder of the Cattle Hill Wind Farm (the '**Project**'). The Project will see the installation of approximately 49 wind turbines on land to the east of Lake Echo in the central highlands of Tasmania.

The Project was approved by Tasmanian State Regulators in April 2012 and by the (now) Commonwealth Department of Environment and Energy in December 2014. To construct and operate the Project there will be an impact to specific threatened species and communities (the '**Natural Values**') protected by the Tasmanian *Threatened Species Protection Act 1995* (the '**TSP Act**') and/or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (the '**EPBC Act**').

The Purpose of this Letter

Your land (defined in Attachment A with associated Land Title documents) has been identified from previous surveys, database records and/or anecdotal evidence as supporting Natural Values of interest to the Project.

Recent surveys of your land by ecological consultants from Van Diemen Consulting have confirmed the presence of Natural Values of interest to Goldwind Australia. Those surveys have enabled the area in Attachment A to be defined more clearly as containing Natural Values.

Goldwind Australia needs to provide evidence to the Commonwealth Government that there are landowners that have Natural Values on their land which can be used and are available as an offset to the Project.

We are seeking an option with you to apply a Conservation Covenant over the portion of your land highlighted in Attachment A (approximate boundaries) to meet our obligations with the Commonwealth Government. In return for this option, Goldwind Australia (on behalf of Wild Cattle Hill Pty Ltd) will negotiate in good faith a settlement for this exclusive right, should the option be required.

G. J. G.

Signing this Letter

By signing this letter and initialling the pages in Attachment A, you agree to:

- Provide reasonable and timely access to your land for the assessment by suitably qualified persons the natural values of interest to the Project;
- Negotiate in good faith with Goldwind Australia to identify an area of your land suitable as an offset for the Project and compensation for you to enter into such an arrangement;
- Be prepared to sign a statutory instrument to create a Conservation Covenant (established under the *Nature Conservation Act 2002*) over part of your land to protect and manage Natural Values, an example with which has been previously provided to you;
- Be prepared to manage the Conservation Covenant area of land in accordance with agreed management practices, which may include stock grazing limitations and weed control; and
- Continue to manage the land as shown in the area highlighted in Attachment A as you have been until this offset matter is concluded – it is important that the Natural Values present in the area of interest to Goldwind Australia continue to be managed as they are such that they remain a viable offset option.

Term

Given the current state of the Cattle Hill Wind Farm, we would suggest a 5-year term to execute this option would be sufficient. To execute the option, Goldwind Australia will provide you with a draft Nature Conservation Plan and/or Conservation Covenant for your consideration, and at which point a commercial settlement will be proposed.

Thank you again for your past support of this wind farm. If you have any questions or concerns, please don't hesitate to contact Laura Jeffery at Goldwind Australia, Level 7, Queen Street, Melbourne VIC 3087 or 0404 302 974.

I hereby agree to the terms stated above:

G. J. Glover

Signature

GEOFFREY JAMES GLOVER

Printed Name

18.1.018

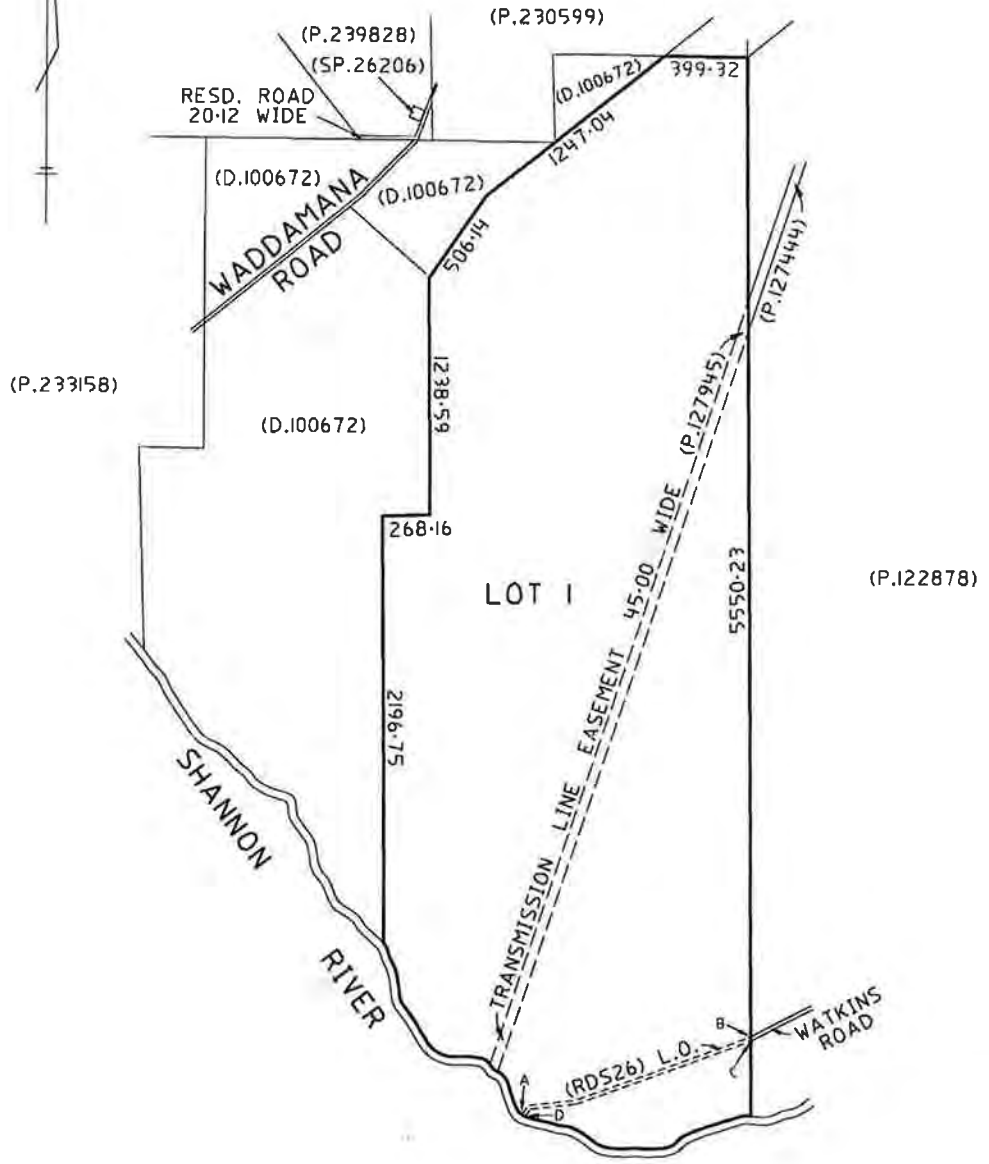
Date

ATTACHMENT A

OWNER FOLIO REFERENCE CT.100672-2 CT.152126-1 GRANTEE	**PLAN OF TITLE** LOCATION WESTMORLAND - OOLUMPTA (LOCALITY OF STEPPES) CONVERTED BY PLAN No. D.100672 COMPILED BY LDRB NOT TO SCALE LENGTHS IN METRES	Registered Number **P.156999** APPROVED 21 APR 2009 Alice Kava Recorder of Titles
MAPSHEET MUNICIPAL CODE No. 105 (4834)	LAST UPI No FYP74	LAST PLAN No. D.100672, P.152126 — ALL EXISTING SURVEY NUMBERS TO BE CROSS REFERENCED ON THIS PLAN

"EXCEPTED LANDS"

SKETCH BY WAY OF ILLUSTRATION ONLY
DERIVED FROM CONV.67/9453 (2NDLY DESC)
EXCEPTING THE LAND MARKED ABCD
WHICH IS COMPILED FROM P.152126



LOT 1 COMPILED FROM P.152126 & D.100672

NC

PROPERTY INFORMATION REPORT

VALUER-GENERAL, TASMANIA

Issued pursuant to the Valuation of Land Act 2001

PROPERTY ID:	2813013
MUNICIPALITY:	CENTRAL HIGHLANDS
PROPERTY ADDRESS:	4244A WADDAMANA RD STEPPES TAS 7030
TITLE OWNER:	100672/1 : JAMES GLOVER & SONS PTY LTD 100672/3 : JAMES GLOVER & SONS PTY LTD 100672/4 : JAMES GLOVER & SONS PTY LTD 142487/1 : JAMES GLOVER & SONS PROPRIETARY LIMITED 156999/1 : JAMES GLOVER & SONS PTY LTD 159592/1 : JAMES GLOVER & SONS PROPRIETARY LIMITED 159592/2 : JAMES GLOVER & SONS PROPRIETARY LIMITED. 233157/1 : JAMES GLOVER & SONS PROPRIETARY LIMITED 233158/1 : JAMES GLOVER & SONS PROPRIETARY LIMITED 239828/1 : JAMES GLOVER AND SONS PROPRIETARY LIMITED 239852/1 : JAMES GLOVER & SONS PTY. LTD. 34891/1 : JAMES GLOVER & SONS PROPRIETARY LIMITED
INTERESTED PARTIES:	JAMES GLOVER & SONS PTY LTD
POSTAL ADDRESS: (Interested Parties)	4244A WADDAMANA RD STEPPES TAS 7030

MAIN IMPROVEMENTS SUMMARY

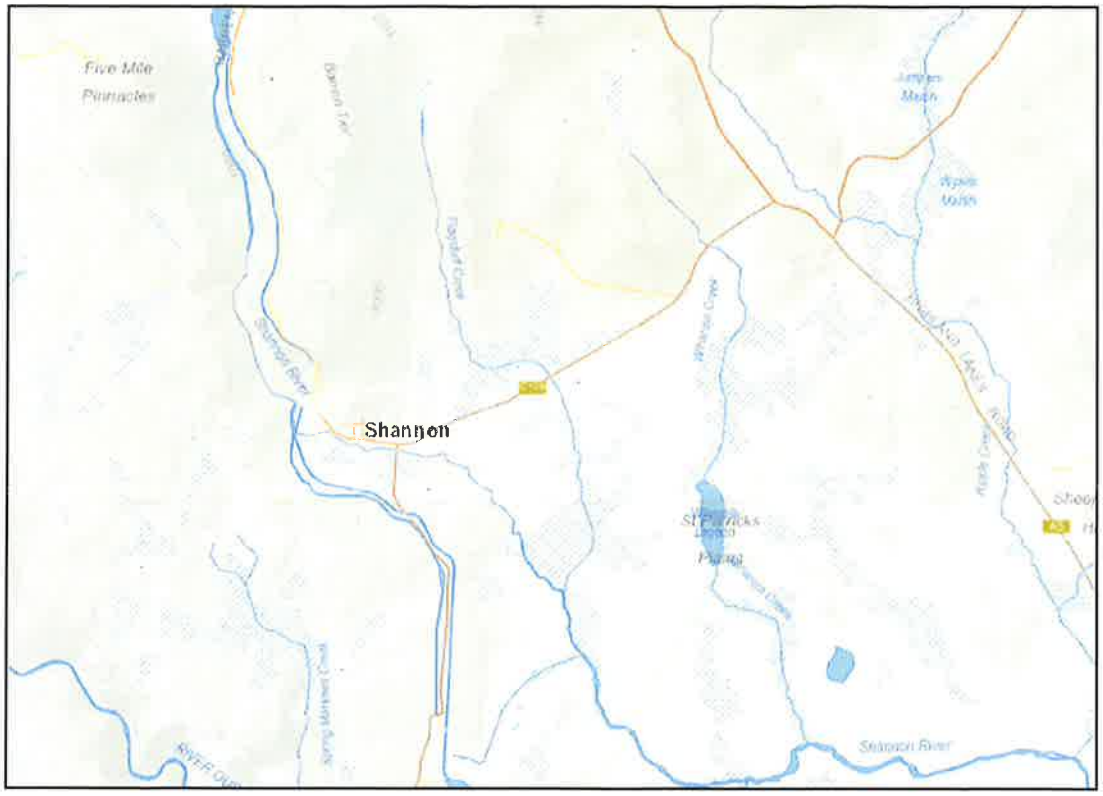
Improvements:	HOUSE,FARM IMPTS	
Improvement Sizes (Top 3 by Size):	Improvement:	Area:
	HOUSE	188.0 square metres
Number of Bedrooms:	3	
Construction Year of Main Building:	1958	
Roof Material:	Imitation Tile	
Wall Material:	Brick Veneer	
Land Area:	2,406 hectares	

LAST SALES

Contract Date	Settlement Date	Sale Price
10/08/2007	10/08/2007	$2,076
03/05/2007	10/08/2007	$2,076

LAST VALUATIONS

Date Inspected	Levels At	Land	Capital	A.A.V.	Reason
02/12/2014	01/07/2014	$1,250,000	$1,650,000	$66,000	Revaluation
04/03/2009	01/10/2008	$1,310,000	$1,780,000	$71,200	Revaluation



Explanation of Terms

Property ID - A unique number used for Valuation purposes.

Date Inspected - The date the property was inspected for the valuation.

Levels At - Levels At - or Levels of Valuation Date means the date at which values of properties are determined for all valuations in a Municipal Area.

Land Value - Land Value is the value of the property including drainage, excavation, filling, reclamation, clearing and any other invisible improvements made to the land. It excludes all visible improvements such as buildings, structures, fixtures, roads, standings, dams, channels, artificially established trees and pastures and other like improvements.

Capital Value - Capital Value is the total value of the property (including the land value), excluding plant and machinery.

AAV - Assessed Annual Value. AAV is the gross annual rental value of the property excluding GST, municipal rates, land tax and fixed water and sewerage, but cannot be less than 4% of the capital value.

Interested Parties - This is a list of persons who have been recorded by the Valuer-General as having interest in the property (ie owner or Government agency).

Postal Address - This is the last advised postal address for the interested parties.

Multiple Tenancies - Properties that have multiple tenants are assessed for separate AAV's. e.g. a house and flat.

RESULT OF SEARCH

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

Tasmanian Government

SEARCH OF TORRENS TITLE

VOLUME	FOLIO
156999	1
EDITION	DATE OF ISSUE
1	04-May-2009

SEARCH DATE : 06-Dec-2017
SEARCH TIME : 12.16 PM

DESCRIPTION OF LAND

Parish of OOLUMPTA Land District of WESTMORLAND
Lot 1 on Plan 156999
Being the land secondly described in Indenture 67/9453
Derivation : Part of Lots 650, 652 & 653 Gtd to G Nicholas, Whole of Lot 498 Gtd to G.C. Carr and Whole of Lot 1 on Plan 152126 Gtd. to The Crown
Prior CTs 100672/2 and 152126/1

SCHEDULE 1

C766811 TRANSFER to JAMES GLOVER & SONS PTY LTD Registered 20-Sep-2007 at 12.01 PM

SCHEDULE 2

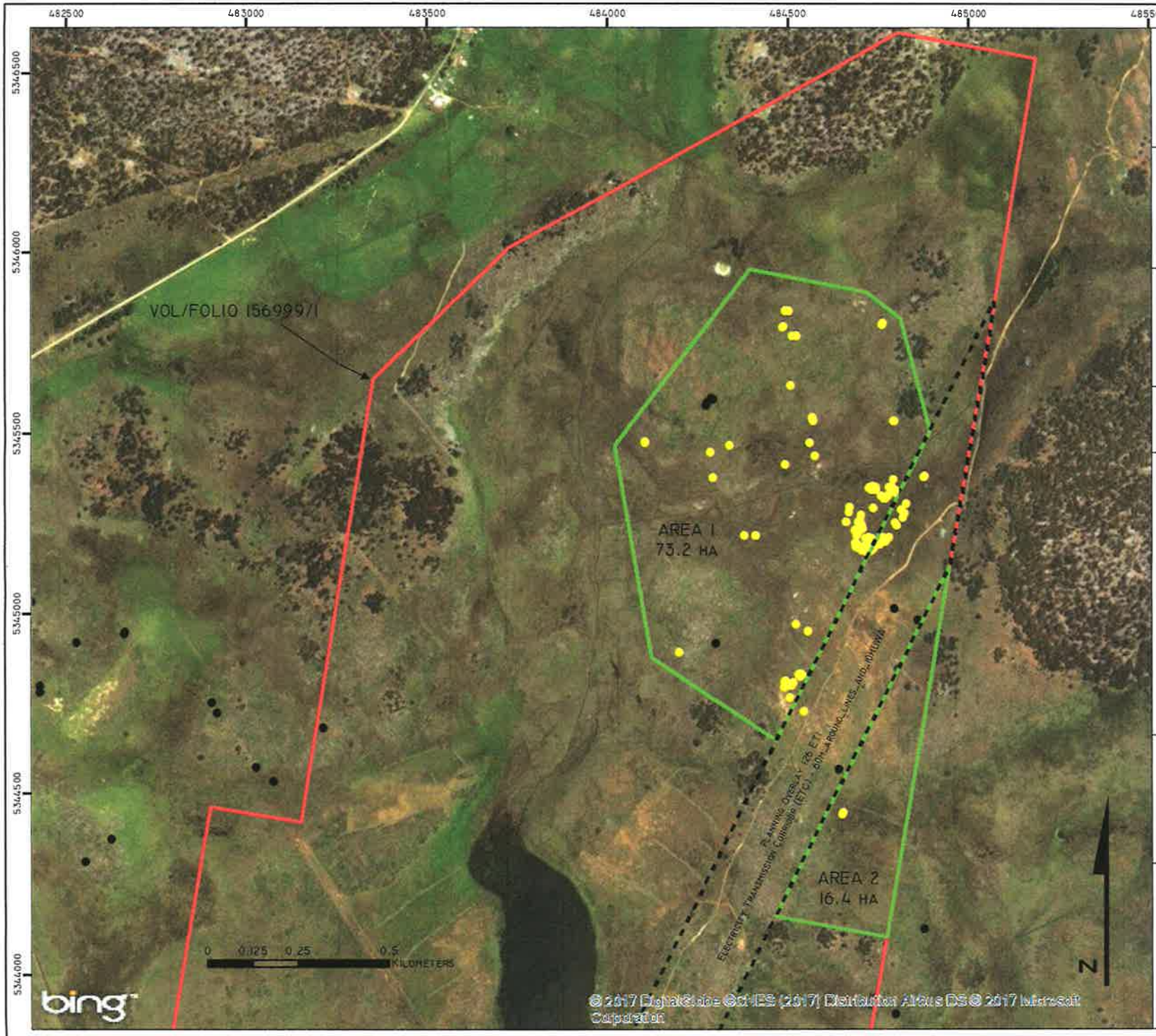
C766810 Land is limited in depth to 15 metres, excludes minerals and is subject to reservations relating to drains sewers and waterways in favour of the Crown

C140351 BURDENING EASEMENT: Transmission Line Easement for Hydro-Electric Corporation (subject to the covenant contained therein) over Transmission Line Easement 45.00 wide shown on Plan 156999 Registered 27-Nov-1998 at noon

C811020 ADHESION ORDER under Section 110 of the Local Government (Building and Miscellaneous Provisions) Act 1993 Registered 04-May-2009 at noon

UNREGISTERED DEALINGS AND NOTATIONS

No unregistered dealings or other notations



OFFSET CHWF LANDOWNER ENGAGEMENT

PROPERTY MAP

PID 2813013
VOL/FOLIO 156999/1

TASMAP:	LGA:
WIHAREJA 4834	CENTRAL HIGHLANDS

- *Pterostylis pratensis*
- *Prasophyllum crebriflorum*

Van Diemen CONSULTING
PO Box 1 NEW TOWN TAS 7008

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

CLIENT:
GOLDWIND AUSTRALIA PTY LTD

DATE: 1ST JAN 2018

Wild Cattle Hill Pty Ltd
ACN 610 777 369

9 January 2018

Peter Downie
3289 Highland Lakes Rd
Bothwell TAS 7030

Dear Peter,

Cattle Hill Wind Farm – Conservation Covenant Assistance

Thank you for your past support with providing an option to offset endangered flora species that may be impacted at the Cattle Hill Wind Farm ('wind farm') site. As we'd discussed, the wind farm is proceeding into construction and now needs to re-establish its option with you to offset these flora species.

This letter has been written to address the requirements of the Commonwealth Department of Environment and Energy.

The Wind Farm

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The Project was approved by Tasmanian State Regulators in April 2012 and by the (now) Commonwealth Department of Environment and Energy in December 2014. To construct and operate the Project there will be an impact to specific threatened species and communities (the **'Natural Values'**) protected by the Tasmanian *Threatened Species Protection Act 1995* (the '**TSP Act**') and/or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (the '**EPBC Act**').

The Purpose of this Letter

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Goldwind Australia needs to provide evidence to the Commonwealth Government that there are landowners that have Natural Values on their land which can be used and are available as an offset to the Project.

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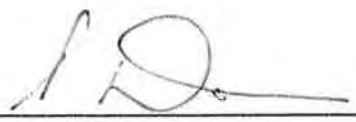
Term

Given the current state of the Cattle Hill Wind Farm, we would suggest a 5-year term to execute this option would be sufficient. To execute the option, Goldwind Australia will provide you with a draft Nature Conservation Plan and/or Conservation Covenant for your consideration, and at which point a commercial settlement will be proposed.

Thank you again for your past support of this wind farm. If you have any questions or concerns, please don't hesitate to contact Laura Jeffery at Goldwind Australia, Level 7, Queen Street, Melbourne VIC 3087 or 0404 302 974.

I hereby agree to the terms stated above:



Signature

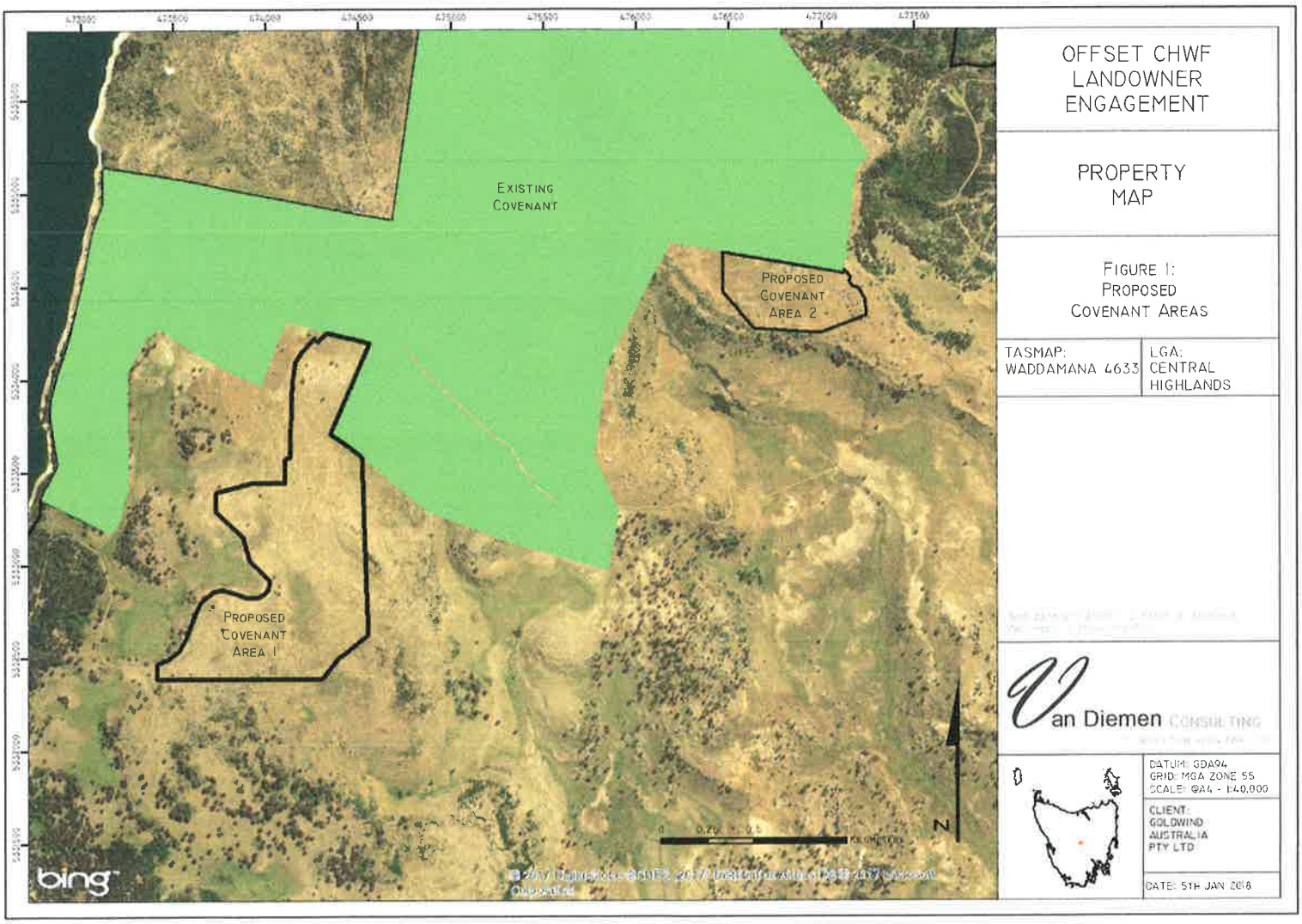
PETER DONNIE

Printed Name

18.1.18

Date

ATTACHMENT A



OFFSET CHWF LANDOWNER ENGAGEMENT

PROPERTY MAP

FIGURE 1: PROPOSED COVENANT AREAS

TASMAP: WADDAMANA 4633	LGA: CENTRAL HIGHLANDS

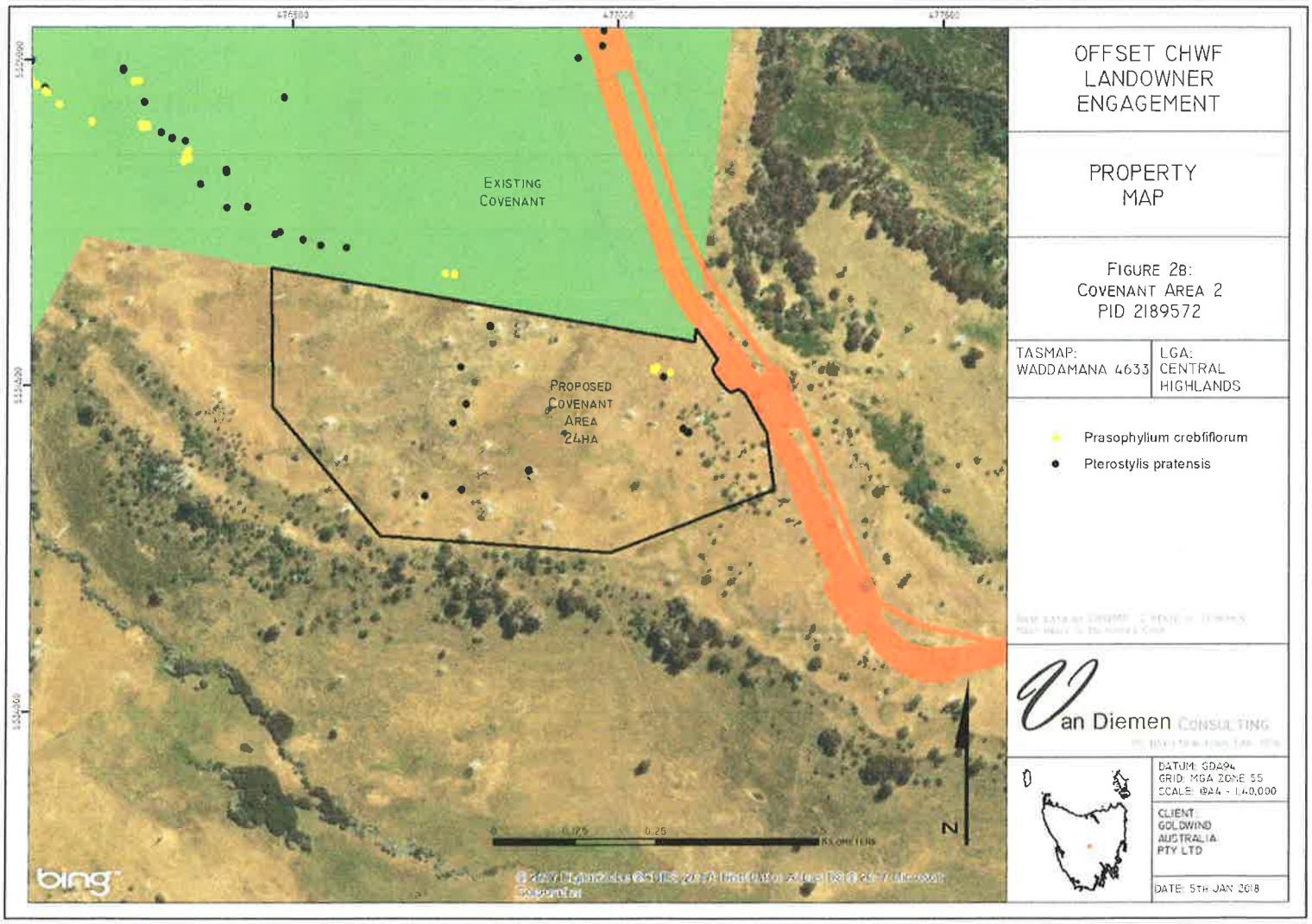
Van Diemen CONSULTING

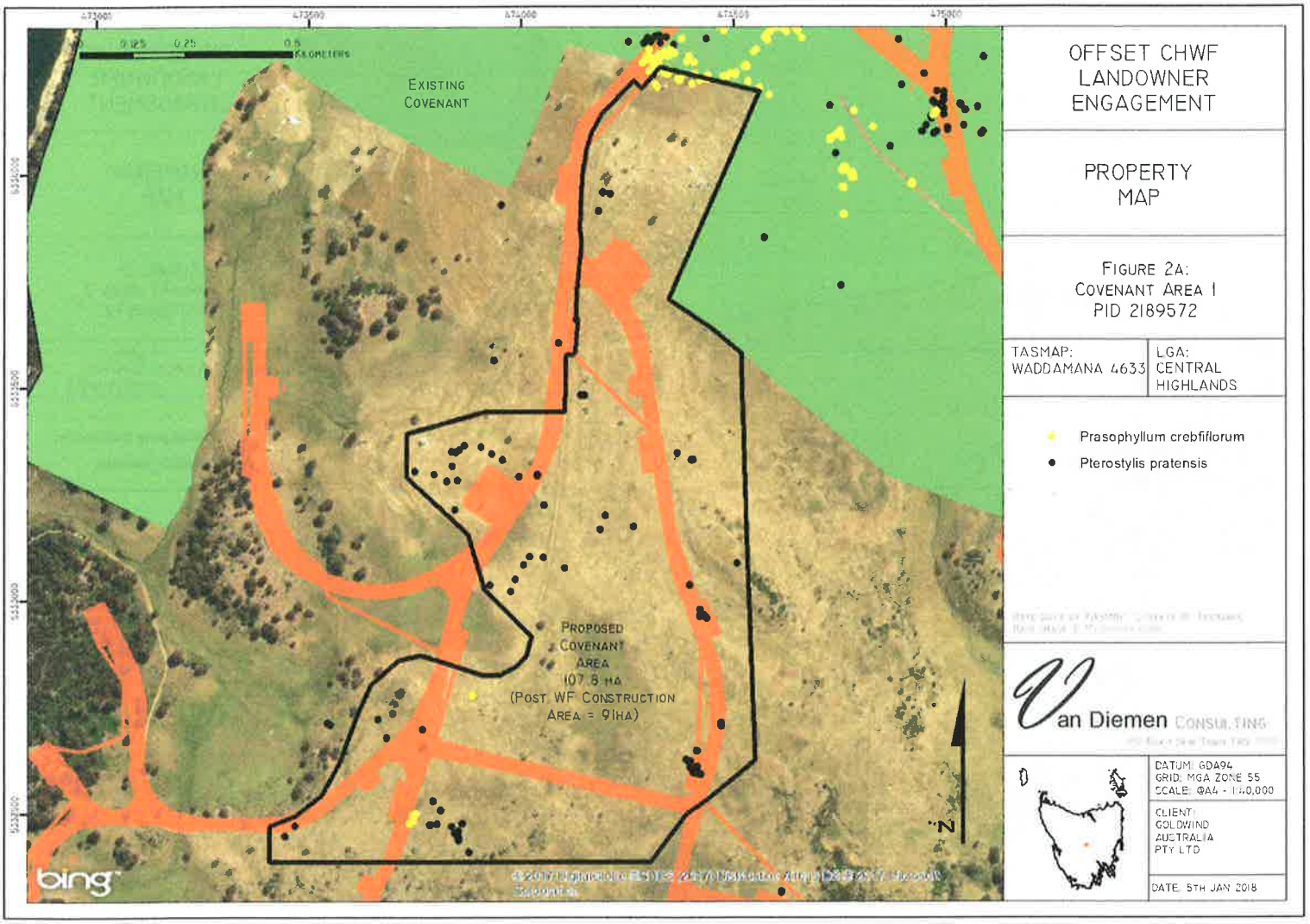
DATUM: GDA94
GRID: MGA ZONE 55
SCALE: @A4 - 1:40,000

CLIENT: GOLDWIND AUSTRALIA PTY LTD

DATE: 5TH JAN 2018

12


EXISTING COVENANT
PROPOSED COVENANT AREA 24HA
0 0.125 0.25 0.5 KILOMETERS
N
bing
OFFSET CHWF LANDOWNER ENGAGEMENT
PROPERTY MAP
FIGURE 28: COVENANT AREA 2 PID 2189572
TASMAP: WADDAMANA 4633
LGA: CENTRAL HIGHLANDS
Prasophylium crebriflorum
Pterostylis pratensis
Van Diemen CONSULTING
DATUM: GDA94
GRID: MGA ZONE 55
SCALE: @A4 - 1:40,000
CLIENT: GOLDWIND AUSTRALIA PTY LTD
DATE: 5TH JAN 2018


0.125 0.25 0.5
KILOMETERS
EXISTING COVENANT
PROPOSED COVENANT AREA 107.8 HA (POST WF CONSTRUCTION AREA = 91HA)
N
bing
OFFSET CHWF LANDOWNER ENGAGEMENT
PROPERTY MAP
FIGURE 2A: COVENANT AREA 1 PID 2189572
TASMAP: WADDAMANA 4633
LGA: CENTRAL HIGHLANDS
Prasophyllum crebfilorum
Pterostylis pratensis
Van Diemen CONSULTING
DATUM: GDA94
GRID: MGA ZONE 55
SCALE: @A4 - 1:40,000
CLIENT: GOLDWIND AUSTRALIA PTY LTD
DATE: 5TH JAN 2018

Attachment 6 Example Nature Conservation Plan ('Operations Plan')

NATURE CONSERVATION PLAN FOR 'x'

(insert date and picture)

Table of Contents

1 Introduction to this Nature Conservation Plan

This Nature Conservation Plan ("Plan") must be read in conjunction with the attached Conservation Covenant ("Covenant") registered on the land title. In this Plan, all definitions follow those described in Clause 3.1 of the Covenant.

The Covenant lists in Clause 4.2 those activities that are prohibited from the Land. Clause 4.2 also details those activities that may only be undertaken with authorisation in writing by the Minister. This Nature Conservation Plan contains Authorisation(s) from the Minister, for the purposes of Clause 4.2 of the Covenant, and details the extent to which these activities are permitted in the Land. This Plan also contains the management prescriptions issued by the Minister which are referred to in Clause 4.3 of the Covenant.

All decisions, approvals, consents, recommendations, monitoring and other responsibilities of the Minister specified in this Nature Conservation Plan may be made, given or carried out by the Minister or a duly appointed delegate (or authorised person) of the Minister.

The Minister will provide succeeding owners of the Land a Nature Conservation Plan containing authorisations, management prescriptions, and/or recommendations that will facilitate the ongoing management of the Land. Before transferring the property, the Owner may direct any enquires from purchasers regarding the Conservation Covenant and Nature Conservation Plan to the Department.

Any Management Prescriptions provided in this Nature Conservation Plan:

(a) may be varied at any time by agreement between the parties; and

(b) will be reviewed jointly by the parties every 10 years (or as otherwise agreed) and if both parties agree, may be amended by the Minister pursuant to that review.

Any Authorisation(s) provided in this Nature Conservation Plan (in relation to the Covenant):

(a) may be reviewed by the Minister and the Owner at any time;

(b) will be reviewed by the Minister and the Owner at intervals no longer than 10 years (or as otherwise agreed); and

(c) may be amended by the Minister pursuant to that review.

All notices or other communications given by the Owner to the Minister under the terms of this Nature Conservation Plan must be in writing and sent to the following address:

The Minister,
C/- The Secretary,
Department Primary Industries & Water
Private Property Conservation Program
GPO Box 44
HOBART TASMANIA 7001

OR

Facsimile number (03) 6223 8603

2 Management Objectives

2.1 General Objectives

The following general objectives apply to the management of the Land:

Protection and conservation of the natural systems and features in the Land, including the diversity of species, habitats and communities;

Protection of significant vegetation communities and populations of threatened and/or priority plant and animal species;

Protection of the Land from damage by introduced plants and animals, disease and inappropriate management regimes.

2.2 Specific Management Objectives for Natural values

The management objectives are:

- To maintain the structure of vegetation community and allow for regeneration of native species under the proposed management regime;
- To implement appropriate fire regimes;
- To protect the habitat of threatened and/or priority species;
- To eradicate or control weeds and feral animals and prevent any further introduction(s) of exotic species.

The success, or otherwise, of the management regimes will be monitored by the Department of Primary Industries and Water ("the Department"). In general, the measures of success of the management regimes are:

- the maintenance or improvement in native species diversity, richness and abundance;
- adequate and appropriate opportunities for recruitment or regeneration of native species;
- the maintenance or an improvement in the population(s) of threatened species and their habitat; and
- a reduction in infestations of environmental weed species (where present).

3 Boundaries of the Land

The property x is located on x as shown on the map below. The Land is shown on the attached map (see page …). The vegetation that occurs on the Land is outlined on the attached vegetation map (see page…).

Figure 1 Location of x

.

4 Natural Values on the Land

4.1 Vegetation communities

The following vegetation community present on the Land:

- x.

4.2 Threatened and/or priority species

The following threatened species &/or priority species are present on the Land:

- x

5 Management Prescriptions, Authorisations & Recommendations

This section of the Plan may contain the **'Authorisations'** from the Minister to the Owner as referred to in Clause 4.2 of the Conservation Covenant.

To achieve the objectives of this Plan, the Owner, the Minister and the Department must abide by the **'Management Prescriptions'** detailed in this section of the Plan.

These Management Prescriptions (listed in dot-point throughout this section) are:
The conditions under which an Authorisation is provided; and/or
The prescriptions issued by the Minister which are referred to in Clause 4.3 of the Covenant.

5.1 Demarcation

- The Land must be clearly marked on the Owner's property map.
- The Owner must inform everyone undertaking activities &/or development in or around the Land about the existence and purpose of the Conservation Covenant as well as the location of the Land, and inform them of any relevant prescriptions listed below.
- Signs will be supplied by the Department to indicate the location and significance of the Land and to recognise the efforts of the Owner. These signs should be placed at strategic points around the Land (eg. gates that enter onto the Land).

5.2 Threatened and/or priority species

- The historical grazing management of the site will be maintained through this Plan to ensure the persistence of crowded leek orchid in the site. No other direct or indirect management actions are deemed to be necessary for this species at this time. This will be reviewed over time through the monitoring of the species in the site (see Section 5.21 Monitoring, Reporting and Review);

- The Minister, in conjunction with the Owner, will develop specific management prescriptions that may be required if additional threatened and/or priority species are found on the Land.

5.3 Timber Harvesting

- No timber harvesting is to take place on the Land.
- No commercial firewood collecting is permitted on the Land.

5.4 Domestic Firewood

- No domestic firewood collecting is permitted on the Land.

5.5 Stock grazing

Authorisation: The Owner is permitted to graze sheep in the Land but only under the conditions outlined below:

- The grazing of sheep will be limited to the period between February and November (ie no stock grazing in December and January inclusive).
- Enhancing the productivity of the Land is not permitted. Such activities include the application of fertilisers or sowing Exotic pasture species.
- Wherever possible, the Owner must ensure that the movement of stock onto the Land is managed in such a way that the introduction of weeds and diseases is minimised. The movement of stock into the Land from an area with a high incidence of weed species must be avoided.
- The use of fodder (for example, hay and grains) must be restricted on the Land to prevent the introduction of Exotic seeds. Fodder can be used in designated areas approved by the Minister.

5.6 Fencing

- All the boundaries of the Land are currently unfenced. Fenceing will only be necessary if the paddock within which the Land occurs is to be managed dirreently to the Land, otherwise the Land can remain unfenced there are several internal fences that are necessary to control stock grazing on the Land (see Fence map, page xxx).
- Wherever possible, clearing along fencelines should avoid soil disturbance in order to reduce the potential for weeds to establish.

5.7 Clearing of Vegetation

- No clearing (or slashing) of vegetation – including shrubs, grasses and other understorey species – is to occur in the Land unless it is:
  - (i) part of the weed management prescriptions (see section 5.12 *Control of Exotic plant species* for details);
  - (ii) for track maintenance or construction (see page xxx for location of tracks; see section 5.19 *Vehicle Use and Tracks* for further information);
  - (iii) for fence maintenance or construction (see page xxx for location of fences; see section 5.7 *Fencing* for further information); and

(iv) for fire hazard reduction, fire-fighting, ecological burns and/or firebreaks (see section 5.9 *Fire* and 5.10 *Firebreaks* for further information);

Vegetation cleared during the process of "approved clearing" operations (such as shrubs, branches, trunks etc.) may be removed from, and used external to, the Land.

5.8 Fire

Planned Fire (Fire Hazard Reduction &/or Ecological Burns)

Authorisation: The Owner may use fire to achieve fire hazard reduction if and where the Minister or the Tasmania Fire Service deems it necessary for safety reasons but only under the conditions outlined below.

Authorisation: The Owner may use fire to conduct ecological burns for management but only under the conditions outlined below.

- Any fire hazard reduction burn or ecological burn must take account of the ecological requirements of native plant and animal species, particularly species that are threatened and/or a priority.
- The Owner must seek approval from the Minister prior to each fire hazard reduction burn or ecological burn.
- Fire Hazard reduction does not necessarily need to occur frequently, as fuel loads usually take time to accumulate. (Note: Advice regarding fuel loads should be obtained from Tasmanian Fire Service, and further information regarding the ecological impacts of burning can be obtained from the Department).
- Prior to any planned burn being undertaken, the Owner must inform all relevant authorities and obtain all relevant permits. The Tasmania Fire Service is the responsible authority for granting fire-permits. It is the Owner's responsibility to comply with the fire-permit conditions.
- The Owner is responsible for ensuring that all planned burning is conducted in a safe manner and under conditions that will ensure that fires can be safely contained within the intended area on the Land. The Owner should refer to publications distributed by the Tasmania Fire Service eg. *Guidelines for development in bushfire prone areas of Tasmania.*
  The following (at a minimum) must be considered:
  - Adequate preparation to maintain any firebreaks necessary to ensure the protection of high values assets (life and property) within or adjacent to the Land;
  - The weather outlook, with particular attention to appropriate limits for wind speed, temperature, relative humidity and fuel dryness (*Note: advice should be obtained from Tasmania Fire Service &/or Bureau of Meteorology*);
  - Adequate fire suppression resources on site and on stand-by. Assistance from the local TFS Brigade would be appropriate in order to prevent the fire from spreading onto adjacent land;
  - The use of properly trained personnel.
- Burning should occur in a mosaic pattern so that different areas are burnt in different years. A mosaic pattern of burning should help vary the intensity of fire at different sites on the Land and its communities.

- The season and frequency at which the Land is burnt should be varied. Maintaining an unvaried fire regime may lead to the decline or local extinction of some species. The fire regime can be varied in a number of ways: burning in a different season (ie. autumn versus spring); and/or allowing the burn to be more patchy (ie. some areas remain unburnt). *Note: autumn fires are generally better for the maintenance of native plant species over weedy, exotic species.*
- Burning during late spring and summer should generally be avoided, as this will affect many native species' ability to produce seeds and therefore their ability to regenerate. This period will often overlap with the Fire-Permit Period (see Tasmania Fire Service for further information).
- Burning should not occur if unseasonably dry conditions are predicted for the ensuing period or year (contact the Bureau of Meteorology regarding drought indicators and long-term rainfall predictions).
- Following a fire, stock will be excluded (where practicable) from the burnt area until both the Owner and the Minister agree that the regeneration is sufficient to sustain stock grazing.
- Machinery used for fire control must be cleaned prior to entering the Land (if practicable) to prevent the establishment or entrenchment of weeds or pathogens.

In the Event of Wildfire:

- The Owner must inform the Tasmania Fire Service (TFS) of any fire that threatens the Land as soon as possible after the Owner becomes aware of the fire. The TFS is the responsible authority for fighting fires in Tasmania.
- The Owner must, as soon as possible after becoming aware of the fire, inform those directing the fire-fighting that TFS personnel should (wherever practicable) use existing firebreaks or access tracks and avoid creating new firebreaks through sensitive areas, such as the Eagle Nest Management Areas (refer to section 6.2 *Threatened Species*).
- The Eagle Nest Management Areas (refer to section 6.2 *Threatened Species*) should be protected from wildfire. If a fire threatens the Land, the Owner will use his best endeavours to inform those directing the fire-fighting that this site should be protected if it is possible.
- Following a fire, stock will be excluded (where practicable) from the burnt area until both the Owner and the Minister agree that the regeneration is sufficient to sustain stock grazing.

5.9 Firebreaks

Permanent Firebreaks:

- The Department must be consulted prior to the creation of new permanent firebreaks to ensure that no firebreak has an adverse impact on areas with important Natural Values such as threatened species.
- The creation and maintenance of permanent firebreaks must be in accordance with guidelines obtained from the Tasmania Fire Service and the Department.
- Machinery used for firebreak construction or maintenance must be cleaned prior to entering the Land (if practicable) to prevent the establishment or entrenchment of weeds or pathogens.

- The Owner is responsible for creating and maintaining any firebreaks necessary to ensure the protection of high value assets (life and property).

Emergency Firebreaks:

Authorisation: Emergency firebreaks will be permitted if there is an immediate threat to life or property but only under the conditions outlined below.

- The Owner will make all reasonable efforts to consult with the Tasmania Fire Service regarding the placement of emergency firebreaks before construction begins.
- The placement of emergency firebreaks should not disturb, unless unavoidable, the Eagle Nest Management Areas (refer to section 5.2 *Threatened Species*).

5.10 Herbicides, Pesticides, Fertilisers and other Chemicals

- No fertilisers are to be applied on the Land.
- Herbicides may only be applied on the Land if used as part of the weed management program described in section 5.12 *Control of Exotic Plant Species*.
- Pesticides may only be applied on the Land if required as part of the feral animal management program described in the section 5.13 *Control of Exotic Animal Species*.

5.11 Control of Exotic plant species (Weeds)

- The Owner will make annual inspections of the Land and must control and (if possible) eradicate infestations of environmental weeds. Particular attention should be made to the margins of roads and tracks, and to any recently disturbed sites.
- Only herbicides that are registered in Tasmania for the control of the target species are to be applied (see product label &/or contact the Department for advice). The Owner will apply and dispose of herbicides in accordance with the manufacturer's recommendations.
- The Owner will inform the Minister of any weed infestations or species that do not respond to standard control methods (refer to attached Department weed fact sheets).
- If spraying Exotic plants with herbicide, then the spray-drift should where possible avoid native species or be minimised.

5.12 Control of Exotic (Feral) animal species

- The Owner is responsible for the control or eradication (if feasible) of feral animals (including feral cats, goats, rabbits and hares) on the Land.
- Control of feral animals on the Land must be by shooting or trapping in accordance with current Codes of Practice, legal permits and conditions.
- The use of pesticides – including '1080' poison – for feral animal control is not permitted on the Land unless otherwise authorised by the Minister (eg. for fox control).
- The Owner must inform the Minister of any feral animal population that does not respond to standard control methods.

5.13 Control of Native animals

- There will be no control of native animals within the Land.

5.14 Exotic (non-Native) flora or fauna species

- For the purpose of this Plan, 'Native species' means species occurring naturally on the Land or its immediate surrounds prior to the year 1788. 'Exotic species' means all species not occurring naturally on the Land or its immediate surrounds prior to the year 1788.

Authorisation: Dogs and horses may be used on the Land to assist with mustering stock.

Authorisation: Dogs and horses may be used on the Land for recreation but must not cause harm to Native animals or their habitat, must be accompanied by the Owner and be under the control of the Owner at all times.

- Exotic species may be deliberately established on the Land, if they are biological control organisms (as listed on the *Biological Control Act 1986*) that are specifically for the control of target weed &/or pest species that are present on or adjacent to the Land.

5.15 Native flora and fauna species

- For the purpose of this Plan, 'Native species' means species occurring naturally on the Land or its immediate surrounds prior to the year 1788.
- No Native flora and/or fauna species are to be deliberately introduced to the Land unless approved by the Minister (for example, as part of a rehabilitation, revegetation or translocation strategy).

5.16 Natural flow of water

- No Native flora and/or fauna species are to be deliberately introduced to the

5.17 Effluent and Irrigation

- The use of irrigation water or effluent of any kind is prohibited on the Land.

5.18 Vehicle Use and Tracks

Authorisation: The Owner may introduce Foreign Materials (limited to the following: road base and gravel) along existing and approved carriageways (tracks) but only under the conditions listed below:

- Foreign Materials such as road base and gravel used to construct or maintain tracks must be sourced from sites that are free of Root-rot Fungus, *Phytophthora cinnamomi.* Seek advice from the Department regarding suitable sites. (Note: Root-rot Fungus is a plant pathogen that can devastate the ecology of many communities across Tasmania. This prescription will help prevent the introduction of the Root-rot Fungus into the habitat of susceptible species.)
- Vehicle use on the Land must be confined to existing vehicle tracks except for vehicles involved in farm activities such as mustering.

- The Owner may maintain any existing and/or approved tracks on the Land in accordance with Local Government standards.
- Off-track vehicle use is permitted in emergency situations (eg. bushfires or medical evacuations).
- Vehicles must be washed prior to entering the Land (if practicable) if they have come from areas infested by weeds (especially those in seed) or disease (especially areas with Root Rot Fungus).

5.19 Recreational Use

- Recreational activities that are not considered deleterious to the Natural Values (including bushwalking, bird watching) are permitted on the Land.
- No recreational activities (including but not confined to, trail bike riding, shooting and horse riding) which are or may be considered deleterious to the Natural Values are permitted on the Land unless approved by the Minister.

5.20 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.
- The Owner must notify the Minister of any proposed changes in land use on land adjacent to the Land in case any management issues need to be addressed.

5.21 Monitoring, Reporting and Review

- The Owner must notify the Minister of any actions by a third party that affect the Natural Values on the Land.
- The Owner and the Minister will advise each other of any proposed action that could adversely affect the Natural Values.
- The Minister and the Owner will respond promptly to all communications from each other relating to this Plan.
- Monitoring by the Department will continue as required so that management practices can be modified as necessary to achieve the conservation objectives.
- The Department may establish monitoring plots on the Land and revisit these sites from time to time.
- The Minister may undertake site inspections and will periodically contact the landowner to discuss the outcomes of any activities, or other issues affecting the Land and its Natural Values.

5.22 Additional Issues

- Nil.

Land

(insert map here)

Vegetation Map

(insert map here)

x (insert map here)

This Nature Conservation Plan has been signed as follows on the of 200…

SIGNED by DULY AUTHORISED OFFICER)
as a duly authorised agent of the Minister)
administering the *Nature Conservation Act* 2002)
to indicate his approval of the terms of this)
Nature Conservation Plan) .....

SIGNED by [*NAME OF OWNER*])
being the current owner of the abovementioned)
Property to indicate that the terms of this)
Nature Conservation Plan have been read,)
understood and accepted) .....
Owner

Attachment 7 Vegetation Condition Assessment Form V1.0 and relevant benchmarks

TASVEG

NON-FOREST VEGETATION

(including grasslands, saltmarsh & wetlands, moorlands and scrub, heath & coastal complexes)

Vegetation Condition Assessment Form V1.0

DATE: ..... **LOCATION:** **MAP :** .....

SITE NAME: ....

GRID REFERENCE (centre of zone):

ZONE no./name ....

E.....**N** .....

TASVEG VC CODE: ..... **ASSESSOR:**.....

GPS DATUM (circle one):

SIZE of zone (ha): ....

WGS84 / GDA94 / AGD66

COMMENTS: .....

.....

.....Site Condition Score.....

Dominant Life Form Cover

Benchmark cover ..... % Observed Cover ..... % ***Score***

Category & Description	
<10% overall (observed) cover	0
≥10% overall (observed) cover <50% of benchmark cover	5
≥ 150% benchmark cover	9
≥50% to <150% of benchmark cover	15

Dominant life forms are the most common life form in the EVC being assessed (see benchmark for species and life form).
Cover is the percentage projective foliage cover of the dominant life form averaged over the zone.

Understorey Life Forms

Benchmark No. Life forms .....
Phytophthora cinnamomi symptoms (tick if observed)

LF code From benchmark	# spp observed/ benchmark # spp.	% cover observed/ benchmark % cover	Present (tick)	Modified (tick)
T	/	/		
S	/	/		
PS	/	/		
H	/	/		
TG	/	/		
LTG	/	/		
MTG	/	/		
NTG	/	/		
TGS	/	/		
LSR	/	/		
MSR	/	/		
GF	/	/		
TF	/	/		
SCE	/	/		
ML	/	/		
SC	/	/		
Total	/	**Total**		

Present	Life forms with benchmark cover of <10% are considered 'present' if any specimens are observed Life forms with benchmark cover of ≥ 10% are considered 'present' if the life form occupies at least 10% of benchmark cover
Modified (apply only where life form is 'present')	Life forms with benchmark cover of <10% are considered substantially modified if the life form has either: - <50% of benchmark species diversity; or - no reproductively mature specimens are observed Life forms with benchmark cover of ≥ 10% are considered substantially modified if the life form has either: - <50% of benchmark cover; or - < 50% of benchmark species diversity

Understorey Summary

Benchmark Life forms present.....% ***Score***

Category and Description		
All strata and life forms effectively absent		0
Up to 50% of life forms present		5
≥50% to 90% of life forms present	- of those present ≥50% substantially modified	10
	- of those present, <50% substantially modified	15
≥90% of life forms present	- of those present, ≥50% substantially modified	15
	- of those present, <50% substantially modified	20
	- of those present, none substantially modified	25

Lack of Weeds

Observed weed cover .....%
Observed high threat weeds .....% ***Score***

Category & Description	'high' threat weeds*		
	None	≤ 50%	>50%
> 75% cover of weeds	0	0	0
25-75% cover of weeds	4	2	0
10-25% cover of weeds	7	6	4
5-10% cover of weeds	11	9	7
<5% cover of weeds**	15	13	11

*Proportion of weed cover due to 'high threat' weeds.
'High threat' weed species are defined as introduced species (including non-indigenous 'natives') that achieve >5% cover in the zone or those weed species listed as high threat weeds in Tasmania.
A list of high threat weeds in Tasmania is provided in the TASVEG Vegetation Condition Assessment manual.
**if total weed cover is negligible (<1%) and high threat weed species are present then score '13'.
The Assessor should determine the threat posed by any weed in the zone listed or not.

Vegetation Condition Assessment Form V1.0

NON-FOREST VEGETATION

Persistence Potential

Score ☐

Category	High diversity*	Low diversity*
Low	2	0
Medium	6	4
High	10	8

*High native species diversity defined as ≥ 50% of benchmark species present for all life forms and > 50% of life forms present.
High persistence - adequate regeneration or potential for regeneration observed, appropriate management regime (fire, grazing, weed control) for community in place. No evidence of *Phytophthora cinnamomi*.
Medium persistence - some regeneration or potential for regeneration observed, management regime not completely appropriate. Some evidence *P. cinnamomi* present but no significant changes to species numbers or cover.
Low persistence -no regeneration or potential for regeneration observed, totally inappropriate management regime for community. *P. cinnamomi* present in highly susceptible vegetation.

Organic Litter

Benchmark ..... % Observed litter ..... % ***Score*** ☐

Category & Description	Dominated by native organic litter	Dominated by non-native organic litter
<10% of benchmark cover	0	0
<50% of benchmark cover	3	2
≥50% of benchmark cover	5	4

Litter is defined as dead organic material *detached* from the parent plant, including plant debris, fallen leaves and twigs <10cm.

.....Landscape Context Score.....

Neighbourhood

Score ☐

Radius from site	% Native vegetation*	Weighting	
100 m		0.03	
1 km		0.04	
5 km		0.03	
subtract 2 if the neighbourhood is 'significantly disturbed'			
		Add Values and 'round-off'	

*to nearest 20%
Multiply % native vegetation X weighting for each radius from the zone
(eg.) 40% x 0.03 = 1.2); then add values to obtain final Neighbourhood Value

Patch Size

Patch size ..... ***Score*** ☐

Category & Description	
< 2 ha	1
Between 2 and 5 ha	2
Between 5 and 10 ha	4
Between 10 and 20 ha	6
≥20 ha, but 'significantly disturbed'*	8
≥20 ha, but **not** 'significantly disturbed'*	10

The patch is the area of native vegetation continuous with the assessment area (zone), regardless of EVC, condition or land tenure. Includes adjoining wetlands.
*'significantly disturbed' if activities such as grazing, timber harvesting, roading, fuel reduction burning or *Phytophthora* infestation have occurred. Effectively most patches within fragmented landscapes are significantly disturbed.

Distance to Core Area

Score ☐

Distance	Core Area not significantly disturbed*	Core Area significantly disturbed*
> 5 km	0	0
1 to 5 km	2	1
< 1 km	4	3
contiguous	5	4

A 'core area' is native vegetation > 50 ha regardless of type, condition or tenure. Includes natural wetlands and lakes, estuaries and rivers.
*'significantly disturbed' see definition under patch size.

FINAL HABITAT SCORE

	'Site Condition Score'							'Landscape Context Score'				
Component	Dominant Life Form cover	Life Forms Summary	Lack of Weeds	Persistence Potential	Organic Litter	**Sub-total**	**Multiply sub-total by 1.07**	Patch Size	Neighbourhood	Distance to Core Area	**Sub-total**	**TOTAL** ('Site Condition' + 'Landscape Context' Scores)
						/70	**/75**				**/25**	**/100**
Score												

Native Grasslands

GCL Lowland grassland complex

Community Description:

Lowland grassland complex generally contains natural or disturbance-induced grasslands dominated by a species-poor grassy sward of *Rytidosperma* or *Austrostipa,* with occasional patches of *Poa* species and *Themeda triandra*. *Rytidosperma/Austrostipa* grasslands occur naturally in valley bottoms and lower slopes.

Benchmarks:

Component	Cover %	LF Code
Dominant Life Form	60%	MTG
Organic Litter	10%	

Expected Life Forms	LF code	# Spp	Cover %
Shrub	S	2	5
Prostrate shrub	PS	2	5
Herbs and orchids	H	18	10
Large tussock grass	LTG	1	5
Medium to small tussock grass	MTG	6	60
Medium to small non-tussock grass	NTG	1	1
Tiny grass/tiny sedge/lily	TGS	3	5
Large sedge/rush/sagg/lily	LSR	3	10
Medium to small sedge/rush/sagg/lily	MSR	3	2
Ground fern	GF	1	1
Mosses and lichens	ML	1	5
Total	**11**	**41**	

Species lists:

Dominant Species	Common Name	LF Code
Rytidosperma spp.	wallabygrass	MTG
Austrostipa spp.	speargrass	MTG

Emergent Tree Species	Common Name	Notes
Acacia spp.	wattle	Scattered trees only, when present
Banksia marginata	silver banksia	Scattered trees only, when present
Bursaria spinosa	prickly box	Scattered trees only, when present

Other Typical Species *	Common Name	LF Code
Bossiaea riparia	leafless bossia	S
Pimelea humilis	dwarf riceflower	S
Astroloma humifusum	native cranberry	PS
Bossiaea prostrata	creeping bossia	PS
Hibbertia spp.	guineaflower	PS
Lissanthe strigosa	peachberry heath	PS
Acaena spp.	sheepsburr	H
Asperula spp.	woodruff	H
Chrysocephalum apiculatum	common everlasting	H
Cymbonotus preissianus	southern bears-ears	H
Convolvulus angustissimus	blushing bindweed	H
Cynoglossum suaveolens	sweet houndstongue	H
Dichondra repens	kidneyweed	H
Drosera spp.	sundew	H
Geranium spp.	cranesbill	H
Gonocarpus tetragynus	common raspwort	H
Helichrysum scorpioides	curling everlasting	H
Hypericum gramineum	small st johns-wort	H
Leptorhynchos spp.	buttons	H
Oxalis spp.	woodsorrel	H
Plantago varia	variable plantain	H
Rumex dumosus	wiry dock	H
Scleranthus spp.	knawel	H
Senecio spp.	fireweed	H
Solenogyne spp.	flat-herb	H
Veronica spp.	speedwell	H
Viola spp.	violet	H
Vittadinia spp.	New Holland daisy	H
Wahlenbergia spp.	bluebell	H
Poa spp.	tussockgrass	LTG
Themeda triandra	kangaroo grass	MTG
Ehrharta spp.	ricegrass	NTG
Arthropodium minus	small vanilla-lily	TGS
Carex breviculmis	shortstem sedge	TGS
Hypoxis spp.	yellowstar	TGS
Schoenus spp.	bogsedge	TGS
Wurmbea spp.	early nancy	TGS
Juncus spp.	rush	LSR
Lepidosperma spp.	swordsedge	LSR
Lomandra longifolia	sagg	LSR
Arthropodium spp.	vanilla-lily	MSR
Bulbine spp.	bulbine lilies	MSR
Luzula spp.	woodruff	MSR
Asplenium flabellifolium	necklace fern	GF
Cheilanthes austrotenuifolia	green rockfern	GF
Lindsaea linearis	screw fern	GF

*This list is provided as a guide only. The species listed are typical of this plant community type but may not necessarily be present.

Native Grasslands

GPH Highland Poa grassland: open tussock grassland facies

Community Description:

Highland *Poa* grasslands are dominated by large tussock grasses (*Poa gunnii* and/or *P. labillardierei*) that may form a closed or open cover, with a variety of smaller inter-tussock grasses and herbs. These communities occur in valleys and on plains between 600 m and about 1000 m above sea level generally on fertile soils, usually formed on basalt or limestone. Small highland grassland strips occur at higher altitudes on fertile mineral soils derived from dolerite, usually on the well-drained edges of broad basins. This benchmark is one of 2 benchmarks available to assess the condition of GPH. It is the appropriate benchmark to use in assessing the condition of the core open tussock grassland expression of the listed *Highland Poa grassland* community (Schedule 3A, *Nature Conservation Act 2002*).

Benchmarks:

Component	Cover %	LF Code
Dominant Life Form	40%	LTG
Organic Litter	15%	

Expected Life Forms	LF code	# Spp	Cover %
Shrub	S	4	5
Prostrate shrub	PS	2	1
Herbs and orchids	H	30	20
Large tussock grass	LTG	1	40
Medium to small tussock grass	MTG	2	30
Non-tussock grass	NTG	2	1
Medium to small sedge/rush/sagg/lily	MSR	5	5
Mosses and lichens	ML	1	5
Ground fern	GF	3	1
Total	**9**	**50**	

Species lists:

Dominant Species	Common Name	LF Code
Poa labillardierei	silver tussockgrass	LTG

Other Typical Species *	**Common Name**	**LF Code**
Bellendena montana	mountain rocket	S
Coprosma nitida	*mountain currant*	S
Epacris spp.	heath	S
Gaultheria tasmanica	tasmanian waxberry	S
Grevillea australis	southern grevillea	S
Hakea microcarpa	smallfruit needlebush	S
Hovea montana	mountain purplepea	S
Leptecophylla juniperina subsp. *parvifolia*	mountain pinkberry	S
Leptospermum rupestre	mountain teatree	S
Leucopogon spp.	beardheath	S
Lissanthe montana	peachberry heath	S
Orites acicularis	yellow orites	S
Ozothamnus rodwayi	common alpine everlasting bush	S
Richea spp.	candleheath	S
Tasmannia lanceolata	mountain pepper	S
Cyathodes dealbata	carpet cheeseberry	PS
Pentachondra pumila	carpet frillyheath	PS
Acaena spp.	sheepsburr	H
Ajuga australis	australian bugle	H
Asperula spp.	woodruff	H
Brachyscome spp.	daisy	H
Celmisia spp.	snowdaisy	H
Chionogentias spp.	snowgentian	H
Cotula spp.	alpine buttons	H
Craspedia spp.	billybuttons	H
Dichondra repens	kidneyweed	H
Erigeron spp.	mountaindaisy	H
Euphrasia spp.	eyebright	H
Geranium spp.	cranesbill	H
Gonocarpus micranthus	creeping raspwort	H
Helichrysum rutidolepis	pale everlasting	H
Hypericum japonicum	small st johns-wort	H
Oreomyrrhis spp.	caraway	H
Podolepis jaceoides	showy copperwire-daisy	H
Ranunculus spp.	buttercup	H
Rubus gunnianus	alpine raspberry	H
Scleranthus biflorus	twinflower knawel	H
Stylidium spp.	triggerplant	H
Velleia montana	mountain velleia	H
Viola spp.	violet	H
Australopyrum pectinatum	prickly wheatgrass	MTG
Poa gunnii	gunns snowgrass	MTG
Agrostis spp.	bent	NTG
Deyeuxia spp.	bentgrass	NTG
Rytidosperma spp.	wallabygrass	NTG

*This list is provided as a guide only. The species listed are typical of this plant community type but may not necessarily be present.

Native Grasslands

GPH Highland *Poa* grassland: wet tussock grassland facies

Community Description:

Highland *Poa* grasslands are dominated by large tussock grasses (*Poa gunnii* and/or *P. labillardierei*) that may form a closed or open cover, with a variety of smaller inter-tussock grasses and herbs. These communities occur in valleys and on plains between 600 m and about 1000 m above sea level generally on fertile soils, usually formed on basalt or limestone. Small highland grassland strips occur at higher altitudes on fertile mineral soils derived from dolerite, usually on the well-drained edges of broad basins. This benchmark is one of 2 benchmarks available to assess the condition of GPH. It describes the facies unique to the Central Plateau near Lake Augusta, which is dominated by a few tall grass species (*Deschampsia cespitosa, Poa labillardierei, Poa costiniana*), with a few *Ranunculus* species as the only ground cover. It is the appropriate benchmark to use in assessing the condition of the wet tussock component of the listed *Highland Poa grassland* community (Schedule 3A, *Nature Conservation Act 2002*).

Benchmarks:

Component	Cover %	LF Code
Dominant Life Form	90%	LTG
Organic Litter	15%	

Expected Life Forms	LF code	# Spp	Cover %
Herbs and orchids	H	1	5
Large tussock grass	LTG	1	90
Total	**2**	**2**	

Species lists:

Dominant Species	**Common Name**	**LF Code**
Deschampsia cespitosa	tufted hairgrass	LTG
Poa costiniana	prickly snowgrass	LTG
Poa gunnii	guns snowgrass	LTG
Poa labillardierei	silver tussockgrass	LTG

Other Typical Species *	**Common Name**	**LF Code**
Ranunculus spp.	buttercup	H

*This list is provided as a guide only. The species listed are typical of this plant community type but may not necessarily be present.