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Dear Yi tong

Albanvale Offset for Striped Legless Lizard Habitat and Natural Temperate Grassland of the Victorian Volcanic Plain: Site Condition Report for 6060 Hamilton Highway, Cressy

Project no. 30833

Introduction

The study area is located on a former pastoral property located in the district of Cressy, approximately 110 kilometres west of Melbourne on the Victorian Volcanic Plain (Lot 5, 6060 Hamilton Highway, Cressy, Figure 1). The property supports a large, contiguous area of native grassland vegetation (more than 200 hectares) and a smaller proportion was identified for further investigation as to support an offset site proposal. The study area has been subject to recent ecological investigations (EHP 2018, Biosis 2019a) so that a suitably sized area (15 hectares) was selected for further detailed investigation based on these previous studies.

The proposed offset site will compensate for residual impacts on Striped Legless Lizard *Delma impar* (SLL) and Natural Temperate Grassland of the Victorian Volcanic Plain (NTGVVP) associated with the development at 80A & 80B Oakwood Road, Albanvale. Both SLL and NTGVVP are Matters of National Environmental Significance listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The impacts on SLL and NTGVVP are being assessed via preliminary documentation under EPBC referral 2018/8158). The results of the EPBC Act offsets assessment guide (offsets calculator) indicate that the offset site must provide 14 hectares of SLL habitat and 2.4 hectares of NTGVVP. This result is slightly smaller compared to the initial estimate of 15 hectares of SLL habitat provided in previous reports.

The purpose of this condition report is to document the extent and condition of the NTGVVP known to be present within the study area and collect the supporting data required by the Commonwealth Department of Agriculture, Water and Environment (DAWE) to assess offset site proposals. At the same time, further supporting evidence of the presence of SLL was collected from three survey grids of ceramic roof tiles that had been previously placed within the study area. The total extent of SLL habitat was also confirmed.

Methods

For this investigation, the study area was surveyed by Stephen Mueck on 20 February 2020 (accredited DELWP vegetation quality assessor HH173 – current until 19/04/2020). A vegetation assessment was undertaken to quantify the extent and condition of NTGVVP according to the characteristics provided in the relevant policy document (DSEWPaC 2011). Data was also collected to complete a Habitat hectares assessment (DSE 2004). Notes were taken as to the presence and extent of pest plants and animals, including the location and extent of target weeds such as woody weeds. The assessment was also conducted to document the suitability of the area within this parcel of land to provide an offset of or exceeding 4.2 hectares



of NTGVVP as prescribed for the development of the Albanvale site by the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Offsets Policy.

The area selected for the proposed offset site (Figure 2) has confirmed records of SLL documented on two previous occasions (EHP 2018 and Biosis 2019a). Figure 2 shows the location of the three tiles grids, each of 50 tiles that were used to collect these records. For this assessment, the extent of habitat suitable for SLL was defined by mapping all parts of the study area that had a clearly defined tussock structure, surface rock cover and or cracking clays, all of which provide habitat for the species (TSSC 2016). The three tile grids within the study area were also checked by flipping each tile and making observations of any evidence of native fauna occupation.

Results

A total of 44 indigenous and 29 introduced flora species were recorded during the site inspection, many of which are characteristic of high quality NTGVVP (Appendix 1). The vegetation within the offset area is variously dominated by Kangaroo Grass *Themeda triandra*, Spear-grasses *Austrostipa* spp., Tussock-grasses *Poa* spp. and Wallaby-grasses *Rytidosperma* spp. No indigenous trees or shrubs were observed within the study area.

The grassy, often herb-rich groundcover includes a range of herbaceous species include Bindweed *Convolvulus angustissimus*, Cut-leaf Burr-daisy *Calotis anthemoides*, Common Woodruff *Asperula conferta*, Wattle Mat-rush *Lomandra filiformis*, Blue Devil *Eryngium ovinum*, Kidney-weed *Dichondra repens*, Smooth Solenogyne *Solenogyne dominii*, and Poison Lobelia *Lobelia pratioides*.

No woody weeds were observed within the study area. Common herbaceous weeds include Soft Brome *Bromus hordeaceus*, Hair-grass *Aira* spp., Fescue *Vulpia spp.*, clovers *Trifolium* spp., Hairy Hawkbit *Leontodon saxatilis*, Flatweed *Hypochaeris radicata* and other annual weedy grasses.

The entire study area was assessed to meet the definition of NTGVVP in DSEWPaC (2011) (Table 1, Figure 2). The NTGVVP had varying cover of weeds throughout the 15 hectares but the overall quality defined by a high cover of native tussock grasses, presence of a diversity of native herbs and space for recruitment was consistent across the study area. An average Habitat Score of 63/100 was obtained using the Vegetation Quality Assessment method (DSE 2004) against the Plains Grassland (EVC 132-61) benchmark (Table 2). Observed details are provided in Table 2.

Twenty (20) SLL skin sloughs were observed under two of the three grids of roofs tiles (Grid 11 and 13). The entire study area supported structural characteristics consistent with SLL habitat: native tussock grass structure with surface rocks and cracking clay soils.

There was also evidence of the presence of Fat-tailed Dunnart *Sminthopsis crassicaudata*, a native marsupial species that is listed as near threatened in Victoria.

No pest animals or evidence of their current presence was noted on site.

Photos of the offset site are provided in Appendix 2.



Table 1 NTGVVP assessment results (DSEWPaC 2011)

Condition	Assessment								
Step 1: Is the Natural Temperate Grassland ecological community present at my site?									
Does the patch occur within the Victorian Volcanic Plain?	YES								
Is the site dominated by native vegetation?	YES								
Are trees absent or sparse such that the projective foliage cover of native trees in the patch is 5% or less?	YES								
Is the ground vegetation layer dominated by native grasses and/or other native herbs?	YES The grassland ecological community is present. Go to Step 2.								
Step 2: Is the patch of sufficient quality for national listing?									
Is the patch bigger than or equal to 0.05 hectares (e.g. 10 x 50m OR 20 x 25m)?	YES								
The dominant native species represent at least 50% of the native species and the perennial tussock cover; OR non- grass weeds comprise less than 30% of ground cover; OR native forbs (wildflowers) comprise at least 50% of total vegetation cover during spring – summer.	YES. The patch of the ecological community is of sufficient quality to consider EPBC protection.								

Table 2 Vegetation condition results for the offset site within 6060 Hamilton Highway, Cressy

Site ID			1
Habitat Zo	one ID		A
EVC Name	e - #	Plains Grassland (EVC 132-61)	
		Max Score	Score
	Large Old Trees	10	Not Applicable
	Canopy Cover	5	Not Applicable
E	Lack of Weeds	15	6
Site Condition	Understorey		15
Si	Recruitment	10	10
Ŭ	Organic Matter	5	5
	Logs	5	Not Applicable
	Site Score (standardised x1.36)		49.09
be	Patch Size	10	8
ndsca Value	Neighbourhood	10	2
Landscape Value	Distance to Core	5	4
La	Landscape Score		14
HABITAT S	SCORE	100	63.09
Habitat po	oints = #/100	1	0.6309
Habitat Zo	ne area (ha)		15.0
Habitat he	ectares (Hha)		9.46



Assessment of offset suitability

The results of the conditions assessment confirm that the study area provides 15 hectares of SLL habitat. The results of this assessment (20 SLL skin sloughs), combined with two previous assessments, confirm that SLL has been reliably recorded from the defined area of SLL habitat.

The entire study area also meets the definition of Natural Temperate Grassland of the Victorian Volcanic Plain (NTGVVP) (Figure 2). The condition of the study area as assessed with Habitat hectares demonstrates that the proposed offset site is of higher quality than the NTGVVP impacted by the proposed development.

Adjustments to the offset calculator using the habitat scores provided by this assessment have the meant that the initial offset estimate of 15 hectares of SLL habitat could be reduced to 14.0 hectares and still supply 100% of the offset requirements for this matter of national environmental significance (Appendix 3).

Conclusion

The current survey confirms the suitability of the study area at 6060 Hamilton Highway, Cressy, as an offset site for EPBC referral 2018/8158.

The study area can provide the prescribed 14.0 hectares of occupied SLL habitat and NTGVVP and therefore provides all the offset requirements (14 hectares) associated with the development of 80A & 80B Oakwood Road, Albanvale.

Please contact me on 8686 4833 if you would like to discuss further.

Yours sincerely,

Steve Mueck. Senior Consultant Botanist Mobile 0429 808 732



References

EHP 2018, *Targeted Striped Legless Lizard* Delma impar *Survey within a proposed offset site, Cressy, Victoria.* Prepared for Star Pronunciation. Author A. Wong, Ecology and Heritage Partners, Ascot Vale.

Biosis 2019a. 6060 Hamilton Highway Cressy: Native Grassland Offset Site Vegetation condition assessment. Report for Warrambine Pastoral. Author: Mueck S, Biosis Pty Ltd, Melbourne. Project no. 27953

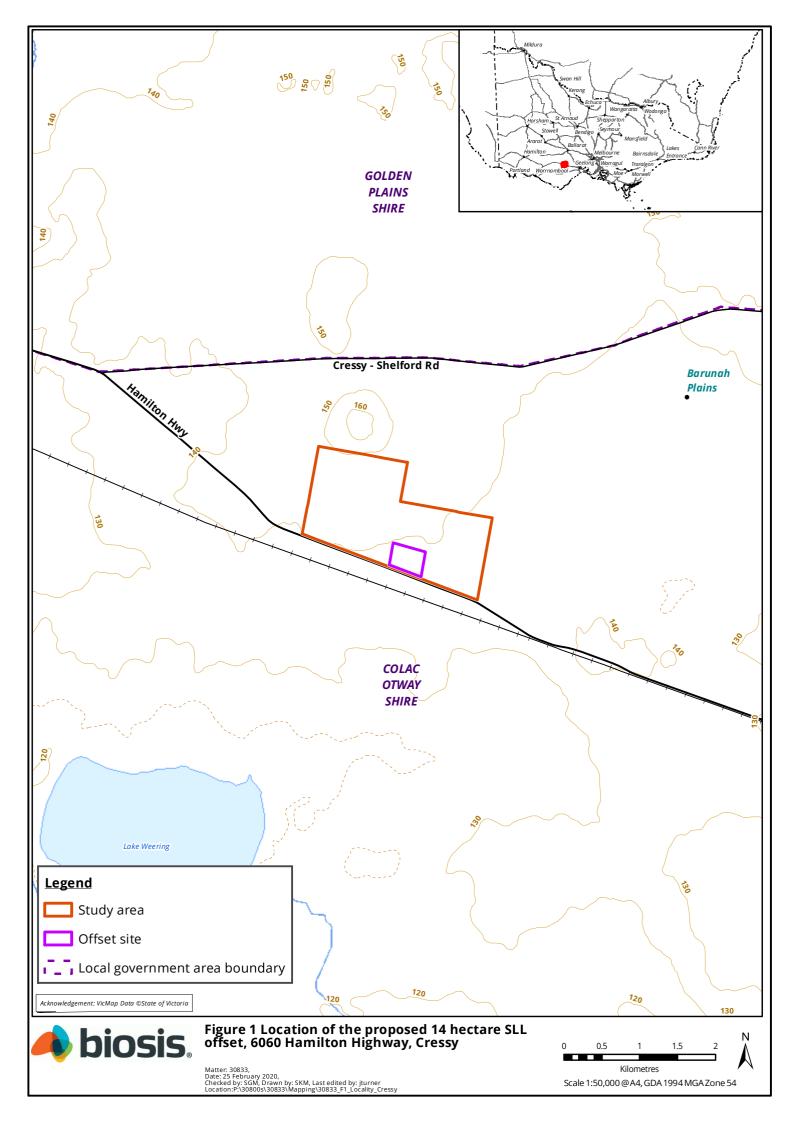
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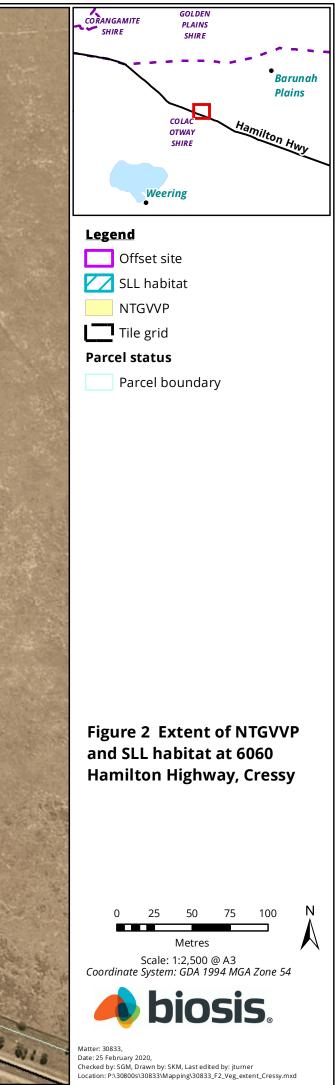
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DSEWPaC 2011. Nationally Threatened Ecological Communities of the Victorian Volcanic Plain: Natural Temperate Grassland & Grassy Eucalypt Woodland A guide to the identification, assessment and management of nationally threatened ecological communities. The Australian Government, Canberra.

TSSC 2016. Conservation Advice. Delma impar. Striped Legless Lizard. Department of Environment, Canberra.









Appendix 1 Flora species recorded from 6060 Hamilton Highway Cressy

Notes to tables:

EPBC Act: CR - Critically Endangered EN - Endangered VU - Vulnerable PMST – Protected Matters Search Tool	DEPI 2014a: e - endangered v - vulnerable r - rare k - poorly known				
FFG Act: L - listed as threatened under FFG Act P - protected under the FFG Act (public land only)	# - Native species outside natural range				
Noxious weed status:SP- State prohibited speciesRP- Regionally prohibited species	RC - Regionally controlled speciesRR - Regionally restricted species				

Plant species (44 native, 29 weeds) recorded from the offset area within 6060 Hamilton Highway, Cressy **Table A1.1 Flora species (44 native, 29 weeds) recorded at Hamilton Road, Cressy**

Status	Scientific Name	Common Name				
Indigenou	is species					
	Amphibromus recurvatus	Dark Swamp Wallaby-grass				
	Anthosachne scabra s.s.	Common Wheat-grass				
	Asperula conferta	Common Woodruff				
	Austrostipa bigeniculata	Kneed Spear-grass				
	Austrostipa semibarbata	Fibrous Spear-grass				
	Austrostipa spp.	Spear-grass				
Р	Calocephalus citreus	Lemon Beauty-heads				
Р	Calotis anthemoides	Cut-leaf Burr-daisy				
	Convolvulus angustissimus	Blushing Bindweed				
Р	Cymbonotus preissianus	Austral Bear's-ear				
	Deyeuxia quadriseta	Reed Bent-grass				
	Dichelachne crinita	Long-hair Plume-grass				
	Dichondra repens	Kidney-weed				
	Eleocharis pusilla	Small Spike-sedge				
	Eryngium ovinum	Blue Devil				
	Eryngium vesiculosum	Prickfoot				
Р	Euchiton sphaericus	Annual Cudweed				
	Hakea ulicina	Furze Hakea				
	Juncus amabilis	Hollow Rush				
	Juncus bufonius	Toad Rush				



Status	Scientific Name	Common Name
	Juncus holoschoenus	Joint-leaf Rush
	Juncus subsecundus	Finger Rush
	Linum marginale	Native Flax
	Lobelia pratioides	Poison Lobelia
	Lomandra nana	Dwarf Mat-rush
	Lythrum hyssopifolia	Small Loosestrife
Р	Microtis unifolia	Common Onion-orchid
	Oxalis perennans	Grassland Wood-sorrel
	Plantago gaudichaudii	Narrow Plantain
	Poa labillardierei	Common Tussock-grass
	Poa sieberiana	Grey Tussock-grass
	Rumex dumosus	Wiry Dock
	Rytidosperma caespitosum	Common Wallaby-grass
	Rytidosperma duttonianum	Brown-back Wallaby-grass
	Rytidosperma setaceum	Bristly Wallaby-grass
	<i>Rytidosperma</i> spp.	Wallaby-grass
	Schoenus apogon	Common Bog-sedge
Р	Solenogyne dominii	Smooth Solenogyne
	Themeda triandra	Kangaroo Grass
Р	Triptilodiscus pygmaeus	Common Sunray
	Veronica gracilis	Slender Speedwell
	Wahlenbergia communis s.s.	Tufted Bluebell
	Wahlenbergia gracilis	Sprawling Bluebell
	Wahlenbergia multicaulis	Branching Bluebell
Introduce	ed species	
	Acetosella vulgaris	Sheep Sorrel
	Agrostis capillaris	Brown-top Bent
	Aira spp.	Hair Grass
	Briza maxima	Large Quaking-grass
	Briza minor	Lesser Quaking-grass
	Bromus hordeaceus subsp. hordeaceus	Soft Brome
	Centaurium erythraea	Common Centaury
	Centaurium tenuiflorum	Slender Centaury
RR	Cirsium vulgare	Spear Thistle
	Helminthotheca echioides	Ox-tongue
	Hordeum leporinum	Barley-grass
	Hordeum marinum	Sea Barley-grass
	Hypochaeris radicata	Flatweed
	Isolepis hystrix	Awned Club-sedge

Capitate Rush Prickly Lettuce

Juncus capitatus

Lactuca serriola



Status	Scientific Name	Common Name
	Leontodon saxatilis	Hairy Hawkbit
	Lolium rigidum	Wimmera Rye-grass
	Lysimachia arvensis	Pimpernel
	Phalaris aquatica	Toowoomba Canary-grass
	Plantago coronopus	Buck's-horn Plantain
	Romulea rosea	Onion Grass
	Solanum nigrum s.s.	Black Nightshade
	Sonchus oleraceus	Common Sow-thistle
	Tolpis barbata	Yellow Hawkweed
	Trifolium dubium	Suckling Clover
	Trifolium glomeratum	Cluster Clover
	Trifolium subterraneum	Subterranean Clover
	Vulpia bromoides	Squirrel-tail Fescue



Appendix 2 Photos of the proposed offset site at 6060 Hamilton Highway



Photo 1 The site supports scattered surface rock in an open grassland.



Photo 2 Looking north from the south western corner.





Photo 3 The southern boundary of the offset is defined by a dry stone wall.



Photo 4 Hairy Hawkbit (yellow flowers) was the most prominent weed at the time of the assessment.





Photo 5 Canary-grass invades the grassland from roadside infestations and needs to be controlled.



Photo 6

A small pile of rubbish on the southern boundary needs to be removed.





Photo 7 Portions of the site are dominated by Kangaroo Grass while others are dominated by Speargrass, Wallaby-grass or other native grasses. Spear thistle is an uncommon weed.









Photo 9

Tile where a Striped Legless Lizard skin slough was recorded.



Photo 10 Tile where Fat-tailed Dunnart evidence was recorded (nest and distinctive faeces).



Appendix 3 EPBC Act offset calculator incorporating the results of this assessment of the offset site at 6060 Hamilton Highway

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	Striped Legless Lizard				
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 calcu	lator							
	Protected matter attributes	Units	Information source								
			Ecological c	ommunities							
				Area							
	Area of community	No		Quality							
				Total quantum of impact	0.00						
	Threatened species habitat										
				Area	5.23	Hectares					
ator	Area of habitat	Yes	SLL habitat	Quality	5	Scale 0-10	Habitat hassessment				
Impact calculator				Total quantum of impact	2.62	Adjusted hectares					
Imp	Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact U		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									
			Threatene	ed 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	Yes	Matted Flax-lily	18		Count	targeted survey				

										Offset c	alculato	r									
	Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horiz (years)		Start are quali		Future are quality witho		Future are quality with		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
										Ecolog	ical Com	munities									
	Area of community	No				Risk-related time horizon (max. 20 years)		Start area (hectares)		Risk of loss (%) without offset Future area without offset (adjusted hectares)	0.0	Risk of loss (%) with offset 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																				
ator	Area of habitat	Yes	2.62	Adjusted hectares	14	Time over which loss is averted (max. 20 years)	20	Start area (hectares)	14	Risk of loss (%) without offset Future area without offset (adjusted hectares)	10%	Risk of loss (%) with offset Future area with offset (adjusted hectares)	1%	1.26	90%	1.13	1.09	100.01%	Yes		
Offset calculator						Time until ecological benefit	10	Start quality (scale of 0-10)	6	Future quality without offset (scale of 0-10)	5	Future quality with offset (scale of 0-10)	7	2.00	75%	1.50	1.47				
Offs	Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horiz (years)		Start v	alue	Future value offset		Future val offse		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																			
										Thr	eatened s	pecies									
	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	Yes	18	Count	60	20		60		45		75		30	80%	24.00	23.06	128.11%	Yes		

				Sur	nmary					
				Cost (\$)						
	Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Direct offset (\$)	Other compensatory measures (\$)	Total (\$)		
	Birth rate	0				\$0.00		\$0.00		
nary	Mortality rate	0				\$0.00		\$0.00		
Summary	Number of individuals	18	23.06	128.11%	Yes	\$0.00	N/A	\$0.00		
	Number of features	0				\$0.00		\$0.00		
	Condition of habitat	0				\$0.00		\$0.00		
	Area of habitat	2.615	2.62	100.01%	Yes	\$0.00	N/A	\$0.00		
	Area of community	0				\$0.00		\$0.00		
						\$0.00	\$0.00	\$0.00		

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	NTGVVP				
EPBC Act status	Critically Endangered				
Annual probability of extinction Based on IUCN category definitions	6.8%				

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

			Impact calcul	lator										
	Protected matter attributes	pact	Units	Information source										
			Ecological c	ommunities										
				Area	1.17	Hectares								
	Area of community	Yes	Site Assessment	Quality	3	Scale 0-10	site survey							
				Total quantum of impact	0.35	Adjusted hectares								
	Threatened species habitat													
				Area										
ator	Area of habitat	No		Quality										
Impact calculator				Total quantum of impact	0.00									
Imi	Protected matter attributes	Attribute relevant to case?	Description	Quantum of imp	pact	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 c	alculato	r										
	Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horiz (years)		Start are quali		Future are quality witho		Future ar quality wit		Raw gain	Confidence in result (%)	Adjusted gain	Net prese (adjusted l		% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source
							Ecological Communities															
	Area of community	Yes	0.35	Adjusted hectares	4.2	Risk-related time horizon (max. 20 years)	20	Start area (hectares)	4.2	Risk of loss (%) without offset Future area without offset (adjusted hectares)	10% 3.8	Risk of loss (%) with offset Future area with offset (adjusted hectares)	1% 4.2	0.38	90%	0.34	0.09	0.36	101.87%	Yes		
						Time until ecological benefit	10	Start quality (scale of 0-10)	6	Future quality without offset (scale of 0-10)	5	Future quality with offset (scale of 0-10)	7	2.00	75%	1.50	0.78					
	Threatened species habitat																					
lator	Area of habitat	No				Time over which loss is averted (max. 20 years)		Start area (hectares)		Risk of loss (%) without offset Future area without offset (adjusted hectares)	0.0	Risk of loss (%) with offset Future area with offset (adjusted hectares)	0.0									
Offset calculator						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)										
Offs	Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horiz (years)		Start value		Future value without offset		Future value with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net prese	nt value	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source
	Number of features e.g. Nest hollows, habitat trees	No																				
	Condition of habitat Change in habitat condition, but no change in extent	No																				
	Threatened species																					
	Birth rate e.g. Change in nest success	No																				
	Mortality rate e.g Change in number of road kills per year	No																				
	Number of individuals e.g. Individual plants/animals	No																				

	Summary												
Summary		Quantum of impact		% of impact offset		Cost (\$)							
	Protected matter attributes		Net present value of offset		Direct offset adequate?	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	0				\$0.00		\$0.00					
	Area of community	0.351	0.36	101.87%	Yes	\$0.00	N/A	\$0.00					
	-					\$0.00	\$0.00	\$0.00					