Ecocentric Environmental Consulting

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MONITORING OF TREE & SHRUB RECRUITMENT & CANOPY CONDITION FOR SWIFT PARROT OFFSETS

237 – 240 Old Glenorchy Road, Deep Lead (EPBC 2016/7809) Spring 2023 – Year 5

INTRODUCTION

Ecocentric Environmental Consulting was engaged to complete ecological monitoring on behalf of landowners Deep Lead Property Pty Ltd for EPBC biodiversity offsets located at 237-240 Old Glenorchy Road (Bush Broker Credit Site BB-3018) in Deep Lead, Victoria.

The offset was established in 2018 as part of infrastructure works undertaken by VicRoads which involved the removal of vegetation identified as foraging habitat of critically endangered Swift Parrot (EPBC 2016/7809).

The landowner is required to submit a report annually to DEECA (formerly DELWP) and DCCEEW (formerly DoEE) for each year of the ten year Offset Management Plan (OMP) (Biosis 2017). The annual report must include:

- Details of management actions, including on ground works, undertaken within the reporting period;
- Results of monitoring activities, including fence condition, weeds, pest animals and overstorey condition;
- Site photographs;
- Details of compliance or non-compliance with the schedule of management actions; and
- Details of compliance or non-compliance with performance targets.

This monitoring report has been completed to address the requirement for independent ecological monitoring of overstory condition within the Swift Parrot offset area and is to be submitted to DCCEEW and DEECA alongside the landowner's report. Annual assessment is required to monitor regeneration and overstory condition to inform ongoing management actions, with the aim to protect existing large trees and to ensure the ongoing replacement of key tree and shrub species over time.

AIM

The aim of the assessment is the collection of field data to determine site condition and to inform management actions in line with the following statement, as presented on Page 29 of the Landowner Agreement (BLA 2017), and in OMP section 3.9.4 *Tree and shrub recruitment and canopy condition*:

> *If the cover of immature canopy trees, understorey trees or medium shrubs (1 to 5 m tall) is greater than 20% higher than the EVC benchmark then the relevant species will be thinned to achieve a cover of approximately 5%. If the cover of either group is significantly less than 5% then action to encourage regeneration of Yellow Gum and other medium shrubs will be implemented by either addressing threats to regeneration or planting nursery stock to achieve a cover closer to 5%.*

PROJECT SCOPE

On-site monitoring of tree and shrub recruitment and canopy condition included the following:

- Vegetation Quality Assessment – Habitat Hectare Scoring in 6 permanent quadrats (30x30m); and,
- Photo points.

STUDY AREA

The study area is comprised of 4.5ha, the total area of Habitat Zones 1F and 1G, within a larger offset site. The area was selected for Swift Parrot offsets due to the presence of moderate to high quality habitat, including the prevalence of preferred foraging canopy trees Yellow Gum (*Eucalyptus leucoxylon*), Grey Box (*Eucalyptus macrocarpa*) with some occurrence of Yellow Box (*Eucalyptus melliodora*).

The property is located within the Wimmera Bioregion, with vegetation types having strong associations with the Goldfields Bioregion due to proximity and contains a mosaic of EVC 882_61 *Higher rainfall Shallow Sands Woodland* and EVC 283 *Plains Sedgy Woodland*. The property and broader region have a history of extensive goldmining, with evidence including mullock heaps, open mine shafts, and other indications of significant historical soil disturbance.

Shallow Sands Woodland Habitat Zone 1G has a mid-story of generally sparse cover, predominantly *Acacia pycnantha*. Ground-story consists of ericoid-leaved shrubs including (*Acacia acinacea*) and Cranberry Heath (*Styphelia humifusa*) among others heathy species, as well as a range of graminoids, typically Wattle Mat-rush (*Lomandra filiformis*), Common Rapier-sedge (*Lepidosperma filiforme*), as well as several *Poa*, *Rytidosperma, and Austrostipa* species. A high diversity of geophytes is also visible in Spring amongst a natural litter-dominated surface.

Plains Sedgy Woodland Habitat Zone 1F covers a small open area in the north-east section of the study area and features seasonally inundated depressions that contrast to the surrounding woodland. Canopy cover is sparse, and the shrub layer is generally absent within this zone. The groundstorey comprises a diverse mosaic of rushes and sedges, along with a range of geophytes and herbs.

Weed cover is generally low overall; Onion Grass (*Romulea rosea*) is present throughout, with higher cover in the Habitat Zone 1F. Weed species of note present in the woodland include Chickweed (*Stellaria media*), Annual Veldt-grass (*Ehrharta longiflora*) and Common Sow-thistle (*Sonchus oleraceus*), and with Silky Plantain (*Plantago bellardii*) also present within the wetter sedge woodland.

METHODOLOGY

HABITAT HECTARE ASSESSMENT

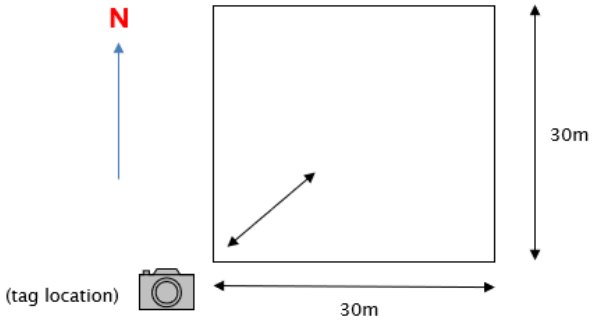
A Vegetation Quality Assessment is required in permanent plots (quadrats) within the Swift Parrot offset area. Six (6) 30x30 metre plots are established across the 4.5 ha offset site with one (1) quadrat in Habitat Zone 1F and five (5) quadrats established in Habitat Zone 1G. Plots are marked by permanent posts, placed in the South-West corner, and tagged with a plot number identifier – Swift Parrot Offset Quadrat (SPOQ).

The Habitat scoring method is applied to the quadrats as directed by the OMP, and as outlined in the Vegetation Quality Assessment Manual – Guidelines for applying the habitat hectares scoring method (DSE 2004).

PHOTO POINTS

Photo points for each quadrat are taken annually in Spring and were taken at the time of the quadrat assessment on 7th November 2023. Photographs are taken from the south-west corner marker of each quadrat (Figure 1) looking in a north-easterly direction and including the corner marker post in the centre of the photograph. Photo points collected as part of this assessment are provided an Appendix E of this report.

Figure 1. Diagram of quadrat and photo point setup



RESULTS

HABITAT HECTARE ASSESSMENT

The assessments were conducted on 7th November 2023 by DEECA-accredited assessor Peter Gannon. Assessments were conducted within each of the 6 quadrats. Results are presented in Table 1 below.

Table 1. Habitat Hectare Assessment results, comparison against 2020 baseline

Habitat Zone / Quadrat			SPOQ1		SPOQ2		SPOQ3		SPOQ4		SPOQ5		SPOQ6	
Bioregion			WIM		WIM		WIM		WIM		WIM		WIM	
EVC name (initials)			PSW		SSW		SSW		SSW		SSW		SSW	
EVC number			283		882_61		882_61		882_61		882_61		882_61	
EVC Conservation Status			DE		EN		EN		EN		EN		EN	
Size of quadrat (ha)			0.009		0.009		0.009		0.009		0.009		0.009	
Year			2020	2023	2020	2023	2020	2023	2020	2023	2020	2023	2020	2023
Site condition	Large Old Trees (LT)	10	0	0	10	10	9	0	10	10	10	10	9	10
	Canopy cover (TCC)	5	5	3	2	5	4	5	3	5	3	5	5	5
	Understorey (U)	25	15	5	10	15	10	15	10	10	15	10	15	15
	Lack of weeds (W)	15	7	6	13	13	9	9	13	13	13	13	9	13
	Recruitment (R)	10	0	1	3	3	10	3	5	3	3	3	10	3
	Organic litter (O)	5	5	3	3	3	5	3	5	3	5	3	5	3
	Logs (L)	5	0	0	3	3	3	3	5	5	5	5	2	2
	EVC standardiser	n/a	1	1	1	1	1	1	1	1	1	1	1	1
	Standardised score	75	33	**19**	45	**53**	51	**39**	52	**50**	55	**50**	56	**52**
Site condition	Patch size	10	19	19	19	19	19	19	19	19	19	19	19	19
	Neighbourhood	10												
	Distance to core	5												
Habitat quality score		100	52	38	64	72	70	58	71	69	74	69	75	71
Habitat score as above = #/100		1	0.52	**.38**	0.64	**.72**	0.70	**.58**	0.71	**.69**	0.74	**.69**	0.75	**.71**

DISCUSSION

HABITAT HECTARE ASSESSMENT

Habitat scores show a general decrease in overall condition, largely due to a reduction in recruitment in the Small Shrub and Prostrate Shrub lifeform categories.

Large tree scores (LT) remain consistent, with no loss of large trees within the study area. Note that the LT score in SPOQ-03 was reduced, as the large tree previously documented within was found to be located just outside the boundary of the quadrat during 2023 survey; the result of this technical assessment accounts for 9 points of the total VQA difference of 12 points. This error can be resolved in future by having all four corners of each quadrat permanently marked on site, as opposed to a single corner.

Tree Canopy Cover (TCC) generally improved; all quadrats in Habitat Zone 1G showing an increase. This is likely a protracted response to favourable rainfall in the region in the past 2 years (BOM 2023). Canopy cover within SPOQ-01 recorded a reduction in canopy cover, potentially caused by seasonal variations of hydrology associated with the wetland habitat present within this quadrat.

Understory (U) varied across the quadrats and from comparison to the baseline scores, due to presence/ absence of species and affecting individual lifeform scores. Most notable, SPOQ1 was missing a total of 6 lifeforms c.f. the 2020 assessment (MS, SS, LH, LTG, LNG, MNG), and of those present, all but one were substantially modified, resulting in a reduction of score to 5, from 15 as baseline scores (see also Attachment B for details). Again, the presence of herbs and graminoids across seasons / year may be explained through the changes in hydrology in this particular quadrat, and an increase in cover of the dominant wetland species Black Bristle-rush (*Chorizandra enodis*) in favourable conditions. Understory species diversity in the other plots, and in general, remains high.

For Recruitment (R), eucalypt canopy species (*E. leucoxylon*, *E. microcarpa*) are observed to be actively recruiting within the study area and across the broader property. There are no Understory Trees documented within the study area. Acacia species (*A. pycnantha, A. acinacea, A. genistifolia*) are also observed to be actively recruiting. Small and prostrate shrubs that generally are not observed to be recruiting are Cranberry Heath (*Styphelia humifusa*), Peach Heath (*Lissanthe strigose*), Eutaxia (*Eutaxia microphylla*) and Guinea-flower (*Hibbertia* spp.). The absence of these small shrubs may be symptomatic of seasonal conditions on site.

Weed score (W) remains mostly consistent across the quadrats, with no significant infestations of high-threat weeds resulting in a reduction in score. Weed score in SPOQ1 is due to increased cover of low threat weed Silky Plaintain (*Plantago bellardii*) in areas that were previously soil crust. Presence of main high-threat weeds Sweet Vernal-grass (*Anthoxanthum odoratum*) and Spear Thistle (*Cirsium vulgare*) remain low in all quadrats.

Organic litter (O) scores decrease, with an observed increase in soil crust, and bryophyte / lichen layer. Wetter conditions in recent years have likely assisted in the decomposition of the organic litter and active growth, compared to conditions in 2020.

Log (L) scores remain consistent.

GENERAL OBSERVATIONS

- SPOQ1 noted as very dry, higher cover of grasses than previous years.
- Signs of rabbits, including scats and inactive warrens – no signs of any other pest animal were observed.

RECOMMENDATIONS

- Installation of permanent markers for all 4 corners of each quadrat, to ensure accurate and comparable results.
- Completion of additional cohort monitoring to be considered for Year 6 survey season.
    - Ecological thinning of wattle in the understorey is not recommended at this time due to evidence of ongoing recruitment of canopy species in areas with high cover of acacia.
- No additional planting recommended at this time in Zone 1F due to the adequate recruitment and success of revegetation of canopy species across the broader property.
- Continued monitoring / management of rabbit populations and closing of inactive warrens present in mullock heaps – hand collapsing only to reduce disturbance to tree roots and surrounding vegetation.
- Identification and numbering of large trees within the offset site is recommended for future monitoring and accounting of Swift Parrot canopy habitat.

Please call me if you have any queries.

Sincerely,

Peter Gannon

Ecocentric Environmental Consulting

ATTACHMENTS

A- References

B- Quadrat species list – indigenous

C- Quadrat species list – exotic

D- Monthly Rainfall Data - BOM

E- Photopoints

F- Maps

LIMITATIONS

This report relies on contributions from several consultancies and information provided by the landowner. Findings contained herein are therefore based on the reports provided at the date of publication; Ecocentric will not be held accountable for post-publication variations associated with report updates from external consultancies, agencies, or parties.

This report assumes that the reader is familiar with the proposed development and its objectives, and the planning and financing context that brought about its instigation.

ATTACHMENT A: REFERENCES

Biosis (2017). *Old Glenorchy Road, Deep Lead, Victoria: Offset Management Plan*. Report for VicRoads.

Bureau of Meteorology (BOM) (2023) Monthly Rainfall (mm) STAWELL AERODROME [Data set] Bureau of Meteorology. http://www.bom.gov.au/jsp/ncc/cdio/weatherData/av?p_nccObsCode=139&p_display_type=dataFile&p_startYear=&p_c=-1251524097&p_stn_num=079019

Brett Lane & Associates (2017). *Offset Management Plan for Credit Site BB-3018-LA01*. Prepared for Deep Lead Property Pty Ltd.

Deep Lead Property (2022). *BBA-3018 LA01 Annual Report – Year 5*. Prepared for Department of Environment, Land, Water and Planning (DELWP).

DSE (2004). *Native Vegetation: Sustaining a living landscape. Vegetation Quality Assessment Manual – Guidelines for applying the Habitat hectares scoring method. Version 1.3.* Victorian Government Department of Sustainability & Environment, Melbourne.

Ecocentric (2023). *Monitoring of Tree & Shrub Recruitment & Canopy Condition for Swift Parrot Offsets: 237 – 240 Old Glenorchy Road, Deep Lead (EPBC 2016/7809) Spring 2022 – Year 4*. Monitoring report prepared 27 April 2023 for Deep Lead Property Pty Ltd, Ecocentric Environmental Consulting, Melbourne.

Practical Ecology (2020). *Swift Parrot Offset Monitoring Year 1. Old Glenorchy Road, Deep Lead*. Report prepared for Deep Lead Property Pty Ltd.

Practical Ecology (2021). *Swift Parrot Offset Monitoring Year 2. Old Glenorchy Road, Deep Lead*. Report prepared for Deep Lead Property Pty Ltd.

White Gums Australia Environmental Consulting (2016). *Flora Survey, Private Property, Od Glenorchy Road, Deep Lead, Vic.* Report prepared for Lincoln Kern Ecological and Bushfire Management Consultant.

ATTACHMENT B: QUADRAT SPECIES LIST – INDIGENOUS

Scientific name	Common name	SPOQ1	SPOQ2	SPOQ3	SPOQ4	SPOQ5	SPOQ6
Acacia acinacea	Gold Dust Wattle		x		x		x
Acacia genistifolia	Spreading wattle				x		
Acacia pycnantha	Golden Wattle		x	x	x	x	x
Acaena echinata	Sheep's Burr	x	x		x	x	x
Arthropodium sp.	Chocolate-lily	x					
Arthropodium strictum	Chocolate Lily						
Asperula wimmerana	Wimmera Woodruff	x					
Austrostipa sp. 1	Spear Grass	x	x	x		x	x
Brachyscome dentata	Lobe-seed Daisy						
Bulbine bulbosa	Bulbine Lily						
Calocephalus citreus	Lemon Beauty-heads					x	
Caladenia sp.	Pink fingers						
Chamaescilla corymbosa	Blue Stars		x				
Chorizandra enodis	Black Bristle-brush	x	x		x	x	x
Convolvulus sp.	Pink Bindweed	x					
Crassula sp.	Crassula						
Cymbonotus preissianus	Austral Bears Ears						
Daucus glochidiatus	Native Carrot						
Dianella admixta	Black-anther Flax-lily		x		x	x	x
Drosera sp.	Sundew						
Eucalyptus leucoxylon	Yellow Gum	x	x	x	x	x	x
Eucalyptus microcarpa	Grey Box		x	x			
Eutaxia microphylla	Spreading Eutaxia	x		x	x		
Geranium sp.	Geranium sp.						
Goodenia pinnatifida	Cut-leaf Goodenia				x	x	x
Hibbertia sp.	Hibbertia sp.						
Hydrocotyle sp.	Pennywort		x				
Juncus sp. 1	Juncus		x			x	
Lagenophora stipitata	Common Lagenophora	x	x			x	x

Scientific name	Common name	SPOQ1	SPOQ2	SPOQ3	SPOQ4	SPOQ5	SPOQ6
Lepidosperma laterale	Variable Sword-sedge			x	x	x	x
Lepidosperma sp. 2	Sword-sedge 2		x	x	x	x	x
Leptorhynchos squamatus	Scaly Buttons	x	x	x	x	x	
Linum marginale	Native Flax	x					
Lissanthe strigosa	Peach Heath					x	
Lomandra filiformis	Wattle Matt-rush		x				
Microseris lanceolata	Yam Daisy						
Oxalis perennans	Grassland Wood-sorrel	x					
Plantago varia	Variable plantain						
Poa sp. 1	Poa sp 1						
Poa sp. 2	Poa sp 2						
Poa sp. 3	Poa sp 3						
Pterostylis sp.	Greenhood						x
Rush 3.	Rush			x	x		
Rytidosperma caespitosum	Common Wallaby Grass	x		x	x	x	x
Rytidosperma sp. 2	Wallaby Grass			x		x	
Senecio quadridentatus	Cottony Fireweed				x	x	x
Senecio picridioides	Fireweed		x	x	x		
Senecio hispidulus	Rough fireweed						
Schoenus apogon	Common Bog-sedge	x			x		x
Siloxerus multiflorus	Small Wrinklewort						
Styphelia humifusa	Cranberry Heath	x	x	x	x	x	x
Swainsona procumbens	Broughton Pea	x				x	
Thelymitra sp.	Sun orchid						
Thysanotus patersonii	Twining Fringe Lily	x					
Veronica plebeia	Creeping Speedwell		x			x	x
Vittadinia gracilis	Cottony New Holland Daisy	x		x	x	x	x
Wahlenbergia sp.	Bluebell		x	x		x	x
Wurmbea dioica	Early Nancy						

ATTACHMENT C: QUADRAT SPECIES LIST – EXOTIC

Scientific name	Common name	SPOQ1	SPOQ2	SPOQ3	SPOQ4	SPOQ5	SPOQ6
Aira sp.	Hairgrass	x	x		x		x
Anthoxanthum odoratum	Sweet Vernal-grass	x					
Briza maxima	Large Quaking Grass	x			x		
Briza minor	Small Quaking Grass	x	x				x
Centurium erythraea	Common Centaury	x		x			
Cirsium vulgare	Spear Thistle	x					
Ehrhata longiflora	Annual Veldt-grass						
Hypochaeris radicata	Cats Ear	x	x	x	x	x	x
Plantago bellardii	Silky plantain	x		x			
Romulea rosa	Onion grass	x	x		x		x
Rumex sp.	Dock						
Sonchus oleraceus	Common Sow Thistle						
Stellaria media	Chickweed		x		x		
Vulpia bromoides	Squirrel-tail Fescue	x					

*Note: species lists include species that may be blank (not present in any quadrat), these have been identified in previous surveys, but were not present at the time of 2023 survey

ATTACHMENT D: MONTHLY RAINFALL DATA - BOM

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2012	18.6	24.6	43.8	15.6	23.8	50.6	53.4	61.2	31.0	15.2	10.4	18.2	366.4
2013	0.0	50.2	3.4	13.2	24.2	56.6	82.8	68.6	41.8	57.0	9.2	10.2	417.2
2014	19.4	4.8	4.8	48.6	31.2	66.0	35.0	12.8	14.2	5.2	29.2	16.0	287.2
2015	66.4	10.8	10.6	24.2	26.6	46.8	48.4	15.8	42.8	1.6	19.8	14.6	328.4
2016	32.4	17.2	26.4	11.4	110.0	59.4	69.4	54.6	136.2	54.0	17.0	53.2	641.2
2017	31.6	13.4	23.8	59.0	62.0	4.0	57.8	75.0	31.8	46.8	33.6	24.8	463.6
2018	9.8	8.4	15.8	9.8	49.2	41.2	45.8	78.0	7.6	21.0	26.0	66.0	378.6
2019	2.4	22.2	4.2	1.4	133.0	77.6	44.4	43.4	23.4	9.8	21.0	1.8	384.6
2020	20.8	37.2	10.6	58.8	43.2	34.2	22.0	43.8	54.6	59.8	(35.8)	17.6	438.4
2021	110.4	3.2	32.0	8.2	36.4	91.6	67.8	47.6	35.8	63.6	48.6	4.6	549.8
2022	42.8	16.6	24.6	36.0	29.4	52.2	44.0	103.4	64.0	144.0	85.8	18.6	661.4
2023	3.0	15.4	25.4	58.2	16.2	104.6	49.2	27.0	20.8	19.8	#		*339.6

Data retrieved from Stawell Aerodrome, approx. 10km from Study Area

() missing data retrieved from weather station at Great Western, approx. 22km from Study Area

Time of Assessment

*Average to date

ATTACHMENT E: PHOTOPOINTS

SPOQ1 – 7th January 2020

SPOQ1 – 7th November 2023

SPOQ2 – 7th January 2020

SPOQ2 - 7th November 2023

SPOQ3 – 7th January 2020

SPOQ3 - 7th November 2023

SPOQ4 - 7th January 2020

SPOQ4 - 7th November 2023

SPOQ5 – 7th January 2020

SPOQ5 - 7th November 2023

SPOQ6 – 7th January 2020

SPOQ6 - 7th November 2023

ATTACHMENT F: MAPS

(overleaf)


SWIFT PARROT OFFSET SITE
Old Glenorchy Road, Deep Lead
Swift Parrot Offset Site
Property boundary (cadastre)
Offset monitoring quadrats
SPOQ1
SPOQ2
SPOQ3
SPOQ4
SPOQ5
SPOQ6
0
100
200 m
ecocentric
environmental consulting™
27 April 2023
1:4,000 @A4
GDA94VicGridl
ESRI public aerial