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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 2022 – Year 4

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 DELWP (now DEECA) and DOEE (now DCCEEW) 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);
- Assessment of canopy condition and recruitment, as described by Practical Ecology (2020); 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 *Astroloma humifusum* 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.*

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).

TREE AND SHRUB RECRUITMENT AND CANOPY CONDITION

The following methodology was developed by Practical Ecology (2020) for the purpose of detecting adequate recruitment of preferred eucalypts, and to provide evidence behind decisions to either complete supplementary planting or ecological thinning.

Data is collected across the entirety of the study area at points of set distance – approximately every 20 meters along a transect line. These transect lines are the same as those completed for the woody/herbaceous weed survey, therefore both the weed survey and vegetation cover assessment occur at the same time. Survey points are located through GPS navigation.

The following information is recorded for a 10m radius from each point along the transect:

- Presence and identification of Eucalypt species;
- If Yellow Gum is present, information on the number of different cohorts present;
- If Yellow Gum seedlings are present, estimation of number of seedlings;
- Presence and identification of Wattle species or other shrubs; and
- If Golden Wattle *Acacia pynantha* is present (as opposed to low and sparse gold dust wattle), collect information on their number and proximity to Yellow Gum seedlings.

Definitions of size classes are listed in Table 1 below.

Table 1. Classification and definition of cohorts / size classes

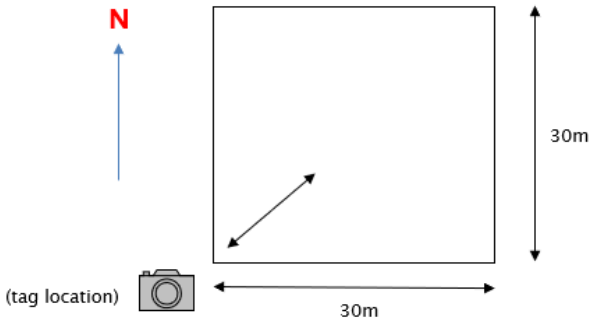
Eucalypt species Yellow Gum and Grey Box				**Acceptable window (# trees / quadrat)**
Size classes	Large Old Tree (LOT)	>70cm DBH	>15m tall	Any
	Canopy tree	<70cm DBH	8m – 15m tall	>5
	Immature canopy tree	>5cm DBH	1.5m – 8m tall	>5
	Seedlings / saplings	<5cm DBH	<1.5m tall	30 – 90
Acacia / shrubs				**Acceptable window (# shrubs / quadrat)**
Size classes	Mature	>5cm DBH	>1.5m tall	<40
	Seedlings / saplings	<5cm DBH	<1.5m tall	<1.5 x more than Yellow Gum seedlings

Note that no transect / point information was collected at the time of assessment in October 2022. September 2021 was the second implementation of this additional methodology, with results being similar to that determined in 2020. Therefore, due to the slow changes associated with canopy species, assessment of tree and canopy condition in Spring 2022 involved an *onsite review only* of the data collected in 2020 and 2021 to detect any significant changes and the need for management through either ecological thinning or additional planting.

PHOTO POINTS

Photo points for each quadrat are taken annually in Spring, and were taken at the time of the quadrat assessment on 5th October 2022. 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 3 of this report.

Figure 1. Diagram of quadrat and photo point setup



RESULTS

HABITAT HECTARE ASSESSMENT

The assessments were conducted on 5th October 2022 by DELWP-accredited assessor Peter Gannon. Assessments were conducted within each of the 6 quadrats. Results are presented in Table 2 below.

Table 2. Habitat Hectare Assessment results, comparison against 2019 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	2022	2020	2022	2020	2022	2020	2022	2020	2022	2020	2022
Site condition	Large Old Trees	10	0	0	10	10	9	9	10	10	10	10	9	10
	Canopy cover	5	5	3	2	3	4	5	3	3	3	5	5	5
	Understorey	25	15	15	10	15	10	15	10	15	15	15	15	15
	Lack of weeds	15	7	13	13	13	9	9	13	13	13	13	9	9
	Recruitment	10	0	3	3	3	10	3	5	3	3	3	10	3
	Organic litter	5	5	5	3	3	5	5	5	5	5	5	5	5
	Logs	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	**40**	45	**51**	51	**50**	52	**55**	55	**57**	56	**50**
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	59	64	70	70	69	71	74	74	76	75	69
Habitat score as above = #/100		**1**	**0.52**	**0.59**	**0.64**	**0.70**	**0.70**	**0.69**	**0.71**	**0.74**	**0.74**	**0.76**	**0.75**	**0.69**

DISCUSSION

HABITAT HECTARE ASSESSMENT

Habitat scores show a slight general improvement in overall condition. Some lifeforms are missing from several of the quadrats, including understory trees, prostrate shrubs, and medium / large non-tufted graminoids, however, species diversity in general within each of the plots was high. Variation in canopy cover scores can be expected due to difference in assessors and are within an acceptable range.

COHORT MONITORING

Cohort monitoring methodology introduced by Practical Ecology is useful for collecting very detailed data on the presence of eucalypt cohorts and understory acacia, however, is not necessary to be completed each year due to the slow pace of detectable change in canopy species abundance and vegetation growth within this region. Mapping of cohort assessment in 2020 and 2021 does indicate defined areas where Golden Wattle occurs as relatively dense cover, however eucalypt seedlings and saplings are also present in these areas. Landowners have completed revegetation of canopy species Yellow Gum and Grey Box across the broader property with a success of approximately 70%, including approximately 40 plants installed in Zone 1F. Natural regeneration of Yellow Gum and Grey Box is also present within the study area as well as the broader offset site (Deep Lead Property 2022).

GENERAL OBSERVATIONS

- Revegetation works within Habitat Zone 1F should continue to be monitored for visible effects on the surrounding wetland vegetation. Recruitment of canopy species is considered adequate within Habitat Zone IG for sustaining foraging habitat for Swift Parrot, and the introduction of many eucalypts may result in changes in water availability over time.
- Signs of rabbits, including scats and inactive warrens – no signs of any other pest animal were observed.

RECOMMENDATIONS

- 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. Future monitoring will determine the need for thinning as required where eucalypts are seen as being negatively affected.
- No additional planting 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.
- Further improvement in Habitat Score can be achieved through timely weed control works to prevent flowering / seed setting.
- 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

References

Quadrat species list – indigenous

Quadrat species list – exotic

Photographs

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.

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.

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.

ATTACHMENT B: QUADRAT SPECIES LIST – INDIGENOUS

Scientific name	Common name	SPOQ1	SPOQ2	SPOQ3	SPOQ4	SPOQ5	SPOQ6
Acacia acinacea	Gold Dust Wattle				x		x
Acacia genistifolia	Spreading wattle						x
Acacia pycnantha	Golden Wattle				x	x	x
Acaena echinata	Sheep's Burr				x	x	x
Arthropodium spp.	Small Chocolate-lily	x	x			x	
Arthropodium strictum	Chocolate Lily					x	x
Asperula spp.	Woodruff					x	x
Astroloma humifusum	Cranberry Heath			x	x		
Brachyscome dentata	Lobe-seed Daisy				x	x	
Bulbine bulbosa	Bulbine Lily			x			x
Caladenia spp.	Pink fingers						x
Chamaescilla corymbosa	Blue Stars						x
Crassula spp.	Crassula	x	x	x	x	x	
Cymbonotus preissianus	Austral Bears Ears		x		x		
Daucus glochidiatus	Native Carrot						x
Dianella admixta	Black-anther Flax-lily					x	x

Scientific name	Common name	SPOQ1	SPOQ2	SPOQ3	SPOQ4	SPOQ5	SPOQ6
Drosera spp.	Sundew			x			x
Eucalyptus leucoxylon	Yellow Gum				x		x
Eucalyptus microcarpa	Grey Box						
Eutaxia microphylla	Spreading Eutaxia	x		x			
Geranium spp.	Geranium sp.				x		
Goodenia spp.	Goodenia sp.		x		x		x
Hibbertia spp.	Hibbertia sp.						
Hydrocotyle spp.	Pennywort				x		
Lagenophora stipitata	Common Lagenophora	x	x	x	x	x	x
Lepidosperma laterale	Variable Sword-sedge					x	x
Lepidosperma spp. 2	Sword-sedge 2						x
Leptorhynchos squamatus	Scaly Buttons	x		x			
Lissanthe strigosa	Peach Heath						x
Lomandra spp.	Matt-rush				x		
Microseris lanceolata	Yam Daisy	x					
Oxalis perennans	Grassland Wood-sorrel				x	x	
Plantago bellardii	Silky plantain	x					
Plantago varia	Variable plantain		x	x			
Poa spp 1	Poa sp 1				x	x	x
Poa spp 2	Poa sp 2				x		
Poa spp 3	Poa sp 3						
Pterostylis spp.	Greenhood				x		x
Rush 1	Rush 1	x					
Rush 2	Rush 2	x					
Senecio 1	Senecio 1				x	x	x
Senecio 2	Senecio 2					x	
Senecio 3	Senecio 3				x		

Scientific name	Common name	SPOQ1	SPOQ2	SPOQ3	SPOQ4	SPOQ5	SPOQ6
Siloxerus multiflorus	Small Wrinklewort	x	x				
Swainsona procumbens	Broughton Pea	x					
Thelymitra spp.	Sun orchid					x	x
Thysanotus patersonii	Twining Fringe Lily	x		x	x		
Veronica plebeia	Creeping Speedwell				x	x	
Vittadinia gracilis	Cottony New Holland Daisy				x		
Wurmbea dioica subsp. dioica	Early Nancy	x					

ATTACHMENT C: QUADRAT SPECIES LIST – EXOTIC

Scientific name	Common name	SPOQ1	SPOQ2	SPOQ3	SPOQ4	SPOQ5	SPOQ6
Aira sp.	Hairgrass						x
Briza maxima	Large Quaking Grass						x
Cirsium vulgare	Spear Thistle	x					
Ehrhata longiflora	Annual Veldt-grass				x	x	
Plantago bellardii	Silky plantain	x	x				
Romulea rosa	Onion grass	x	x	x	x	x	
Rumex spp.	Dock					x	
Sonchus oleraceus	Common Sow Thistle	x	x	x	x	x	
Stellaria media	Chickweed	x	x	x	x	x	

ATTACHMENT D: PHOTOGRAPHS

SPOQ1

SPOQ2

SPOQ3

SPOQ4

SPOQ5

SPOC6

ATTACHMENT E: 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™
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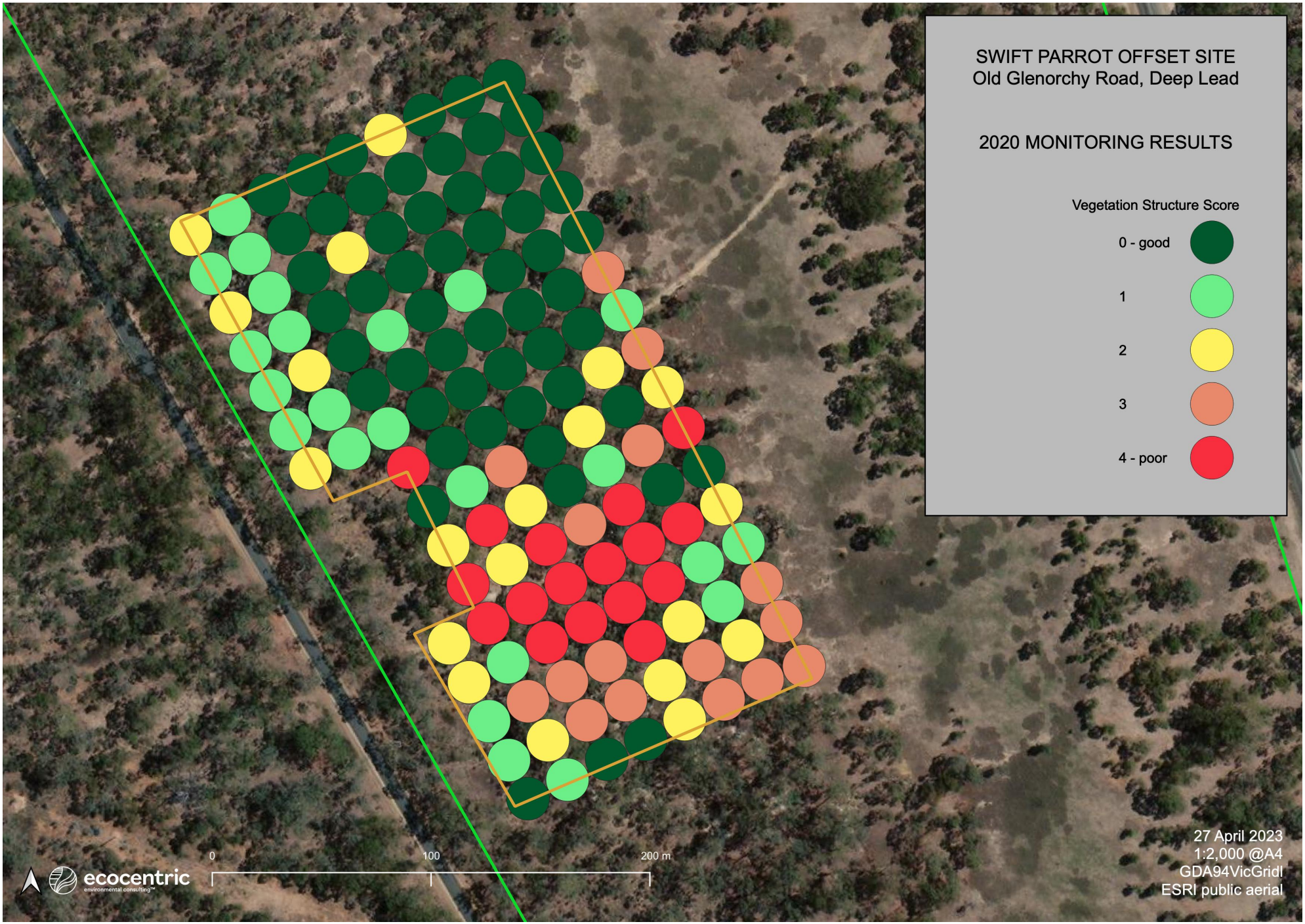
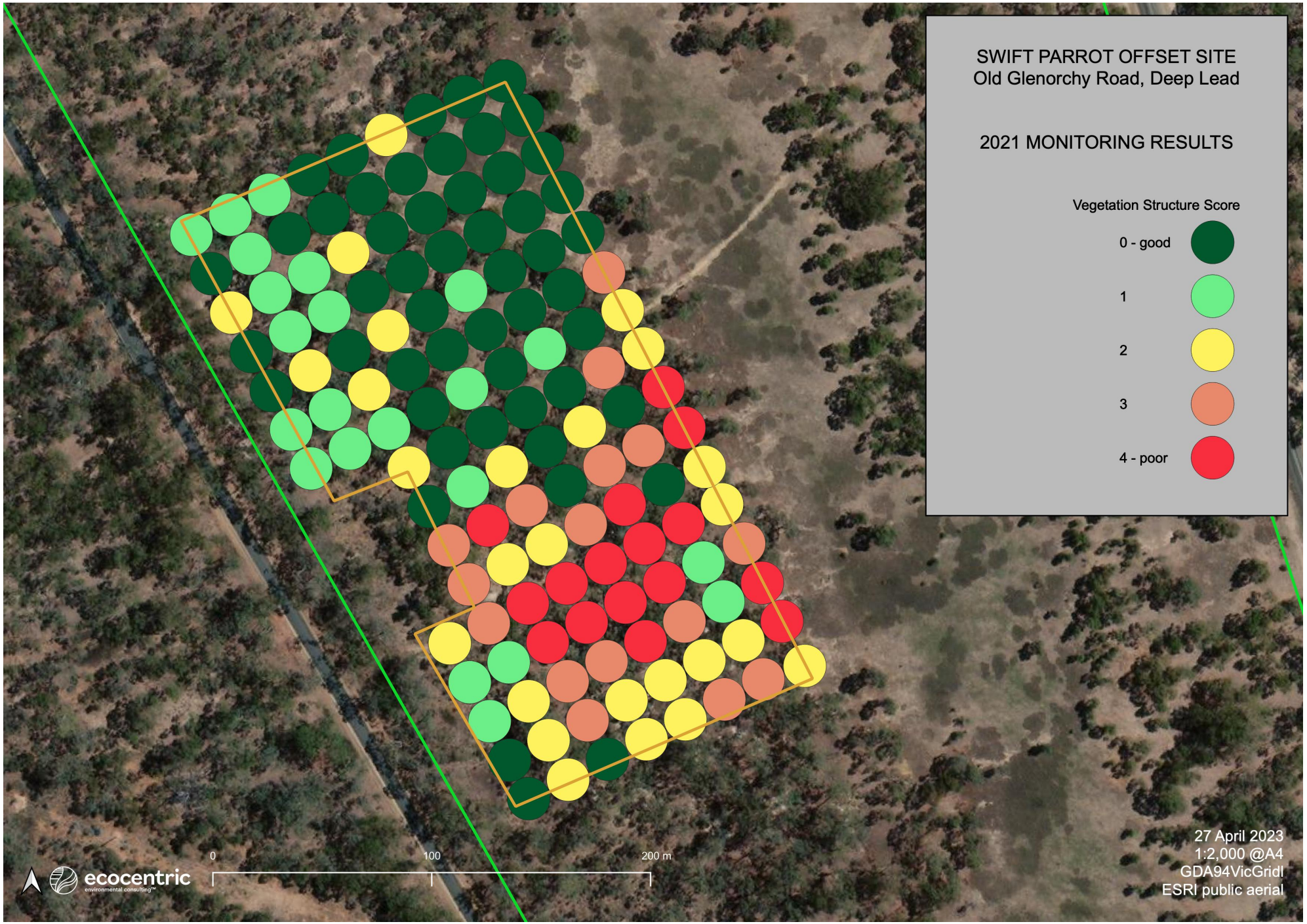
ESRI public aerial


SWIFT PARROT OFFSET SITE
Old Glenorchy Road, Deep Lead
2020 MONITORING RESULTS
Vegetation Structure Score
0 - good
1
2
3
4 - poor
0
100
200 m
ecocentric
environmental consulting™
27 April 2023
1:2,000 @A4
GDA94VicGridI
ESRI public aerial


SWIFT PARROT OFFSET SITE
Old Glenorchy Road, Deep Lead
2021 MONITORING RESULTS
Vegetation Structure Score
0 - good
1
2
3
4 - poor
0
100
200 m
ecocentric
environmental consulting™
27 April 2023
1:2,000 @A4
GDA94VicGridI
ESRI public aerial