

APPENDIX R1

BUSHLAND CONDITION MONITORING

BIRD IN HAND GOLD PROJECT

MINING LEASE PROPOSAL MC 4473



ABN | 66 122 765 708
Unit 7 / 202-208 Glen Osmond Road | Fullarton SA 5063

Bushland Condition Monitoring

ASSESSMENT SITE REPORT

Site: WOO-HIST-A-1

Region: Mount Lofty Ranges Property: Reefton Rd, Woodside

Surveyed on: 18/09/2015 by Peter Mahoney

Australian map grid reference: 309102 E 6129886 N

Permanent stake location: From junction of Riverview Rd and Onkaparing Valley Rd (about 1.5 km S of Woodside) head E about 1 km to Pfeiffer Rd. Turn left onto Pfeiffer Rd and head NE 1.5 km to Drummond Rd. Turn right and then left onto Bird In Hand Rd. Head E 1.8 km to Reefton Rd. Turn left on Reefton Rd and go about 200 m N. Park on side of road. Walk approximately 80 m SW across creek to NE facing hillslope

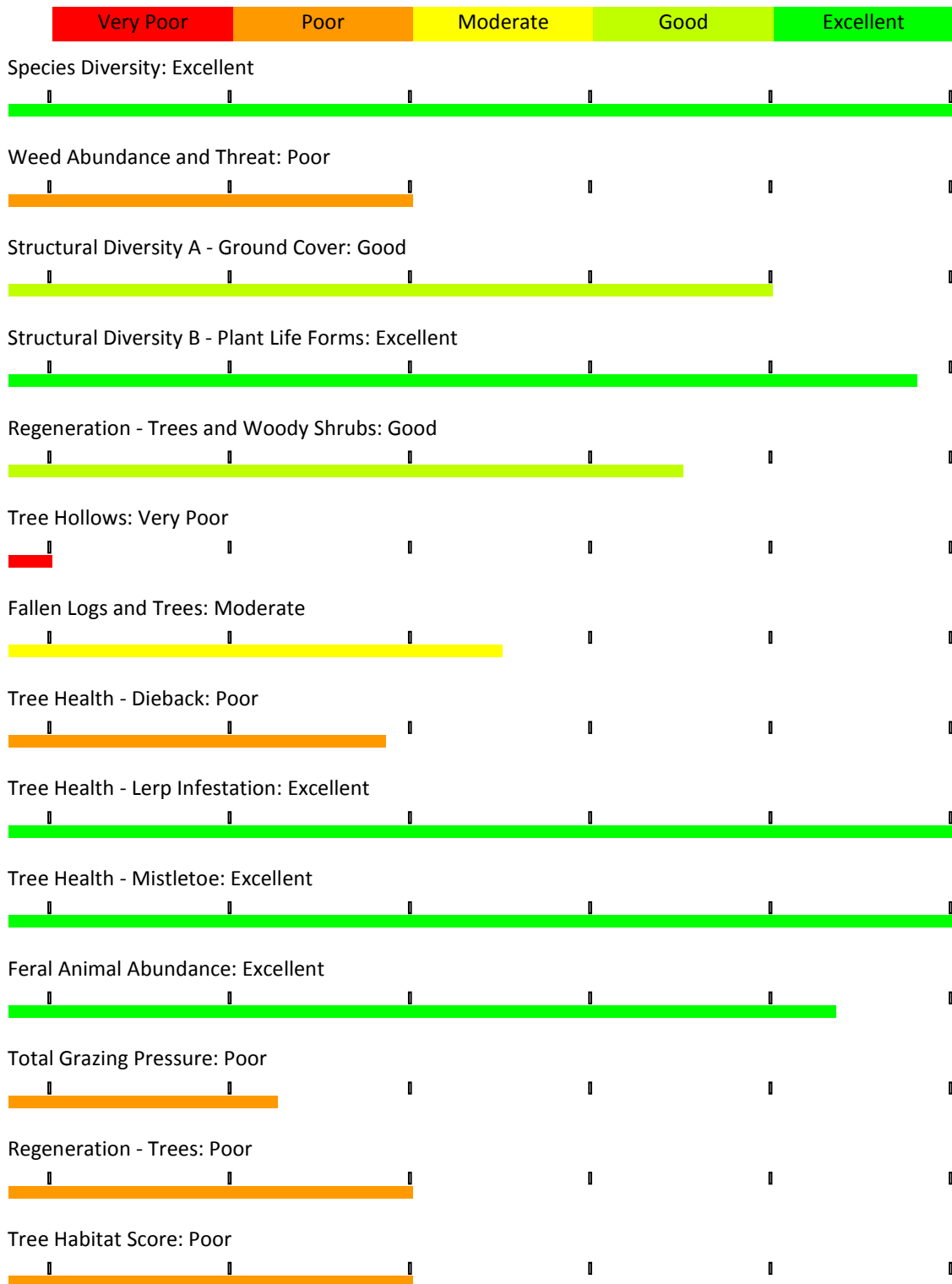
Vegetation community type: SMLR3.1 - Smooth Barked Gum Woodlands with an Open Shrub and Grassy Understorey

Vegetation association: *Eucalyptus leucoxylon* ssp. *leucoxylon*, Woodland

Understorey: Over mid-dense to open tall and medium shrubs of *Acacia paradoxa*, *Olearia ramulosa*, +/- *Acacia pycnantha*, over *Lomandra densiflora*, *Lomandra* spp., +/- *Dianella revoluta*, *Lepidosperma curtisiae* open low tussocks, over mid-dense herbs, dominated by native lilies: *Caesia calliantha*, *Bulbine bulbosa*, *Arthropodium* sp. , over mid-dense to dense **Pentaschistis pallida* low grasses.



Habitat Condition Indicator Values



Habitat Condition Notes

Species Diversity

- There were 41 native plant species present within the 900sqm survey site and the site is therefore considered to be in EXCELLENT condition for this indicator.

Weed Abundance and Threat

- There were 14 introduced plant species recorded in the survey site. The site is considered to be in POOR condition for this indicator.

Structural Diversity A - Ground Cover

- The estimated percentage of non-bare ground cover components is 106%
- The site is considered to be in GOOD condition for this indicator.

Structural Diversity B - Plant Life Forms

- There were 13 distinct layers/strata in the survey site. These most dominant were:
 - Tall Trees > 15m
 - Medium Trees 5 - 15m
 - Small Trees < 5m
 - Medium Shrubs 0.5 - 2m
 - Herbs
 - Low Tussocks < 0.5m
- The site is considered to be in EXCELLENT condition for this indicator.

Regeneration - Trees and Woody Shrubs

- At this site there were 4 tree or shrub species with juvenile plants or seedlings present.
- The site is considered to be in GOOD condition for this indicator.

Tree Hollows

- The number of hollows indicates that this site provides VERY POOR habitat for hollow-using fauna. 0 of the 10 trees measured had one or more hollows.

Fallen Logs and Trees

- There were 4 fallen logs at the site.
- The site is considered to be in MODERATE condition for this indicator.

Tree Health - Dieback

- The health of the 10 adult trees closest to the star dropper was assessed. The following trees were found:
 - 10 South Australian Blue Gum (*Eucalyptus leucoxylon* ssp. *leucoxylon*) with average dieback of 50%
- The site is therefore considered to be in POOR condition for this indicator.

Tree Health - Lerp Infestation

- No species had lerp infestation of 5% or greater.
- The site is therefore considered to be in EXCELLENT condition for this indicator.

Feral Animal Abundance

- Signs of the following feral animal species were observed at the site:
 - Fox
 - Rabbit (disused warren)
- The site is considered to be in EXCELLENT condition for this indicator.

Total Grazing Pressure

- Severe grazing damage was found in:
 - *Acacia pycnantha* (Golden Wattle)
- Heavy grazing damage was found in:
 - *Acacia pycnantha* (Golden Wattle)
 - *Hibbertia* sp. (Guinea-flower)
 - *Lomandra densiflora* (Soft Tussock Mat-rush)
- Light grazing damage was found in:
 - *Lomandra densiflora* (Soft Tussock Mat-rush)
- The site is therefore considered to be in POOR condition for this indicator.

Tree Habitat Score

- The tree habitat indicator is based on the presence of tree hollows, large sized trees and the health of the tree canopy. In all mature communities where trees are naturally present these factors provide important habitat for native animals.
- 4 of the 10 trees measured are considered to be 'habitat' trees.
- The site is therefore considered to be in POOR condition for this indicator.

Native Species List

Species	Common Name
<i>Acacia paradoxa</i>	Kangaroo Thorn
<i>Acacia pycnantha</i>	Golden Wattle
<i>Acaena echinata</i>	Sheep's Burr
<i>Arthropodium</i> sp.	Vanilla-lily
<i>Austrostipa</i> sp.	Spear-grass
<i>Austrostipa</i> sp.	Spear-grass
<i>Bossiaea cinerea</i>	Showy Bossiaea
<i>Bossiaea prostrata</i>	Creeping Bossiaea
<i>Bulbine bulbosa</i>	Bulbine-lily
<i>Burchardia umbellata</i>	Milkmaids
<i>Caesia calliantha</i>	Blue Grass-lily
<i>Cheilanthes austrotenuifolia</i>	Annual Rock-fern
<i>Convolvulus angustissimus</i> ssp.	Pink Convolvulus
<i>Cynoglossum suaveolens</i>	Sweet Hound's-tongue
<i>Daucus glochidiatus</i>	Native Carrot
<i>Dianella revoluta</i> var. <i>revoluta</i>	Black-anther Flax-lily
<i>Dichondra repens</i>	Kidney Weed
<i>Diuris</i> sp.	Donkey Orchid
<i>Eucalyptus leucoxylon</i> ssp. <i>leucoxylon</i>	South Australian Blue Gum
<i>Geranium potentilloides</i> var. <i>potentilloides</i>	Downy Geranium
<i>Geranium retrorsum</i>	Grassland Geranium
<i>Gonocarpus tetragynus</i>	Small-leaf Raspwort
<i>Hibbertia</i> sp.	Guinea-flower
<i>Hypoxis glabella</i> var. <i>glabella</i>	Tiny Star
<i>Kennedia prostrata</i>	Scarlet Runner
<i>Lissanthe strigosa</i> ssp. <i>subulata</i>	Peach Heath
<i>Lomandra collina</i>	Sand Mat-rush
<i>Lomandra densiflora</i>	Soft Tussock Mat-rush
<i>Lomandra sororia</i>	Sword Mat-rush
<i>Microlaena stipoides</i> var. <i>stipoides</i>	Weeping Rice-grass
<i>Olearia ramulosa</i>	Twiggy Daisy-bush
<i>Oxalis perennans</i>	Native Sorrel
<i>Pimelea humilis</i>	Low Riceflower
<i>Plantago hispida</i>	Hairy Plantain
<i>Plantago varia</i>	Variable Plantain
<i>Platylobium obtusangulum</i>	Holly Flat-pea
<i>Scaevola albida</i>	Pale Fanflower
<i>Schoenus apogon</i>	Common Bog-rush
<i>Senecio hispidulus</i>	Rough Groundsel
<i>Stackhousia monogyna</i>	Creamy Candles
<i>Thysanotus patersonii</i>	Twining Fringe-lily

Conservation Rated Species (E=Endangered, V=Vulnerable, T=Threatened, R=Rare, U=Uncommon, K=Uncertain)

Species	Common Name	Region	Regional	State	National
<i>Cynoglossum suaveolens</i>	Sweet Hound's-tongue	SL	U		
<i>Geranium potentilloides</i> var. <i>potentilloides</i>	Downy Geranium	SL	Q		
<i>Lomandra collina</i>	Sand Mat-rush	SL	R		
<i>Lomandra sororia</i>	Sword Mat-rush	SL	U		
<i>Senecio hispidulus</i>	Rough Groundsel	SL	U		

Weed Abundance List

Species Name	Common Name	% Cover	Cover Rating	Threat Category
<i>Anagallis arvensis</i>	Pimpernel	0.1	1	1
<i>Arctotheca calendula</i>	Cape Weed			
<i>Avena barbata</i>	Bearded Oat	1	1	2
<i>Briza minor</i>	Lesser Quaking-grass	1	1	2
<i>Galium murale</i>	Small Bedstraw			
Gramineae sp.	Grass Family			
<i>Hypochaeris radicata</i>	Rough Cat's Ear			
<i>Medicago</i> sp.	Medic			
<i>Pentstemonis pallida</i>	Pussy Tail	20	3	3
<i>Plantago lanceolata</i> var. <i>lanceolata</i>	Ribwort	5	3	2
<i>Rosa</i> sp.	Wild Rose/Briar			
<i>Senecio pterophorus</i>	African Daisy			
<i>Sonchus oleraceus</i>	Common Sow-thistle			
<i>Sparaxis tricolor</i>	Tricolor Harlequin Flower			

Red Alert Weeds

Species Name	Common Name	Quadrat	Bushland	Property
<i>Freesia cultivar</i>	Freesia	N	Y	Y
<i>Pentstemonis pallida</i>	Pussy Tail	Y	Y	Y
<i>Senecio pterophorus</i>	African Daisy	Y	Y	Y
<i>Sparaxis tricolor</i>	Tricolor Harlequin Flower	Y	Y	Y
<i>Ulex europaeus</i>	Gorse	N	Y	Y
<i>Watsonia meriana</i> var. <i>bulbillifera</i>	Bulbil Watsonia	N	Y	Y

Structural Diversity A

Ground Cover Component	% Cover
Native Ground Cover	30
Weed Ground Cover	15
Leaf Litter	50
Exposed Rock	0.5
Moss, Lichens, Microphytic Crust	10
Bare Ground	1

Structural Diversity B

Life Form	% Cover	Cover Rating
Tall Trees > 15m	10	2
Medium Trees 5 - 15m	5	2
Small Trees < 5m	5	2
Tall Shrubs > 2m	1	1
Medium Shrubs 0.5 - 2m	15	2
Small Shrubs < 0.5m	1	1
Herbs	15	2
Mat Plants/Groundcovers	0.5	1
Tall Grasses > 0.5m	0.1	1
Low Grasses < 0.5m	0.1	1
Low Tussocks < 0.5m	5	2
Vines, Twiners, Climbers	0.1	1
Ferns	2	1

Regeneration

Species	Common Name	Adults	Seedlings	Juveniles	Height Class
<i>Acacia paradoxa</i>	Kangaroo Thorn	75	0	1	3
<i>Acacia pycnantha</i>	Golden Wattle	0	0	35	2
<i>Eucalyptus leucoxylon</i>	SA Blue Gum	11	0	11	2
<i>Olearia ramulosa</i>	Twiggy Daisy-bush	75	0	5	2

Tree Details

Tree	Species Name	Dist (m)	Bearing	% Dieback
1	<i>Eucalyptus leucoxylon</i> ssp. <i>leucoxylon</i>	4.1	23	0
2	<i>Eucalyptus leucoxylon</i> ssp. <i>leucoxylon</i>	5.6	86	40
3	<i>Eucalyptus leucoxylon</i> ssp. <i>leucoxylon</i>	4.4	155	50
4	<i>Eucalyptus leucoxylon</i> ssp. <i>leucoxylon</i>	15.3	163	95
5	<i>Eucalyptus leucoxylon</i> ssp. <i>leucoxylon</i>	12.2	164	0
6	<i>Eucalyptus leucoxylon</i> ssp. <i>leucoxylon</i>	15.1	179	90
7	<i>Eucalyptus leucoxylon</i> ssp. <i>leucoxylon</i>	12.6	183	50
8	<i>Eucalyptus leucoxylon</i> ssp. <i>leucoxylon</i>	12.7	210	40
9	<i>Eucalyptus leucoxylon</i> ssp. <i>leucoxylon</i>	16.4	250	80
10	<i>Eucalyptus leucoxylon</i> ssp. <i>leucoxylon</i>	5.7	292	50

Fallen Logs and Trees: 4

Tree Habitat

Tree	Species	Common Name	GBH (cm)	Size Category	Canopy (%)	Lerp Damage (%)	Mistletoe	Hollows
1	<i>Eucalyptus leucoxylon</i> ssp. <i>leucoxylon</i>	SA Blue Gum	50	Small	100	0	0	N
2	<i>Eucalyptus leucoxylon</i> ssp. <i>leucoxylon</i>	SA Blue Gum	110	Small	60	0	0	N
3	<i>Eucalyptus leucoxylon</i> ssp. <i>leucoxylon</i>	SA Blue Gum	188	Medium	50	0	0	N
4	<i>Eucalyptus leucoxylon</i> ssp. <i>leucoxylon</i>	SA Blue Gum	79	Small	5	0	0	N
5	<i>Eucalyptus leucoxylon</i> ssp. <i>leucoxylon</i>	SA Blue Gum	27	Small	100	0	0	N
6	<i>Eucalyptus leucoxylon</i> ssp. <i>leucoxylon</i>	SA Blue Gum	94	Small	10	0	0	N
7	<i>Eucalyptus leucoxylon</i> ssp. <i>leucoxylon</i>	SA Blue Gum	114	Small	50	0	0	N
8	<i>Eucalyptus leucoxylon</i> ssp. <i>leucoxylon</i>	SA Blue Gum	58	Small	60	0	0	N
9	<i>Eucalyptus leucoxylon</i> ssp. <i>leucoxylon</i>	SA Blue Gum	58	Small	20	0	0	N
10	<i>Eucalyptus leucoxylon</i> ssp. <i>leucoxylon</i>	SA Blue Gum	125	Medium	50	0	0	N

Tree Density (Trees/Ha)

Tree Count	Search Radius	Tree Density
10	16.4	118.41

Feral Animals

Animal	Sign	# Signs	Comments
Fox	Dung or Dung Patch	1	
Rabbit	Disused Warren	1	Old burrow of 2 holes near the corner post - but not currently active and no other signs of rabbits in the area

Grazing Pressure

Species	Common Name	Light %	Heavy %	Severe %
<i>Acacia pycnantha</i>	Golden Wattle		14.3	85.7
<i>Hibbertia</i> sp.	Guinea-flower		100	
<i>Lomandra densiflora</i>	Soft Tussock Mat-rush	80	5	