UCMPL 2023 Brokenback Area 1 VCA Monitoring Report

Ulan Coal Mines Pty Ltd

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Template 2.8.1

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Abbreviations

Abbreviation	Description
ELA	Eco Logical Australia
UCMPL	Ulan Coal Mines Pty Ltd
BC Act	NSW *Biodiversity Conservation Act 2016*
CTRSWMP	Central Tablelands Regional Strategic Weed Management Plan
DPIE	Department of Planning, Industry and the Environment
DPI	Department of Primary Industries
EPBC Act	Commonwealth *Environment Protection Biodiversity Conservation Act 1999*
ha	Hectares
LLS	Local Land Services
NPW Act	*National Parks and Wildlife Act 1974*
NSW	New South Wales
PCT	Plant Community Type
pfc	projected foliage cover

Executive Summary

Eco Logical Australia (ELA) was engaged by Ulan Coal Mines Pty Ltd (UCMPL) to undertake floristic monitoring during Autumn 2023 throughout the Brokenback Conservation Area - Area 1 (the Conservation Area). The Conservation Area, located in part Lot 46 in Deposited Plan 750735, was established to satisfy commitments to secure biodiversity offsets relating to the NSW Project Approval 08_0184 and *Environmental Protection and Biodiversity Conservation Act* 1999 (EPBC Act) Approval No 2009/5252. The Conservation Area is to be managed to restore and protect the conservation values at the site. The Conservation Area comprises 21.9 ha of intact vegetation.

A Conservation Agreement was established between the NSW Department of Planning, Industry and the Environment (DPIE) administering the NSW *National Parks and Wildlife Act 1974* (NPW Act) and UCMPL, under Part 4 Division 12 of the NPW Act. The Brokenback Conservation Area – Area 1 Conservation Agreement (the Conservation Agreement) was signed on 5 May 2019. UCMPL received confirmation from the NSW Biodiversity Conservation Trust that the Conservation Area was registered on title on 11 December 2019.

Outlined in the Conservation Agreement is a monitoring program (Annexure D) which must be undertaken for a minimum 10-year period, including full floristic assessments within five (5) designated quadrats, establishment of photo monitoring points and a walk-through assessment to record opportunistic sightings. This report outlines results of the fourth monitoring program undertaken since the establishment of sites in 2017.

Quadrat monitoring, photo point monitoring and walk-through assessments undertaken within the Conservation Area indicates that the Conservation Area remains intact with little to no damage or disturbance recorded, with the exception of some observed areas of Feral Pig (*Sus scrofa*) diggings.

Native species richness has increased at all sites. Incremental changes and minor fluctuations continue to be observed across all sites for groundcover attributes, attributed to seasonal variation caused by rainfall and survey timing. Exotic groundcover within the Conservation Area remains low with exotic species being recorded at only two (2) out of five (5) sites.

Overall, the Conservation Area remains ecologically stable with the condition of the vegetation monitored in 2023 remaining consistent with the results from previous monitoring and with PCT descriptions provided in the Brokenback Conservation area – Area 1 Conservation Agreement (UCMPL 2019a).

1. Introduction

The Brokenback Conservation Area – Area 1 (the Conservation Area) is located approximately 13 km northwest of the village of Ulan, located in the Mid-Western Regional Council Local Government Area in the geographical region of the Central Tablelands, NSW as shown in Figure 1 below.

The Conservation Area is approximately 21.9 ha in size and contains three plant community types (PCT's) as shown in Table 1 and Figure 2 (UCMPL 2019a).

Table 1: PCTs within the Brokenback Conservation Area - Area 1

PCT Number	PCT Name	Condition	Area (ha)
PCT 479	Narrow-leaved Ironbark – Black Cypress Pine – stringybark +/- Grey Gum +/- Narrow-leaved Wattle shrubby open forest in sandstone hills in the southern Brigalow Belt South Bioregion and Sydney Basin Bioregion	Intact	2.25
PCT 481	Rough-barked Apple – Blakely's Red Gum – Narrow-leaved Stringybark +/- Grey Gum sandstone riparian grass fern open forest in the southern Brigalow Belt South Bioregion and Upper Hunter region	Intact	18.91
PCT478	Red Ironbark – Black Cypress Pine – stringybark +/- Narrow-leaved Wattle shrubby open forest on sandstone in the Gulgong – Mendooran region, southern Brigalow Belt South Bioregion	Intact	0.69
		Total	**21.85**

The Conservation Area contains habitat for 30 vulnerable and 3 endangered species listed under the *Biodiversity Conservation Act 2016* (BC Act) and 9 species listed as either vulnerable, endangered, or critically endangered under the *Environment Protection Biodiversity Conservation Act 1999* (EPBC Act). These species are listed in Table 2 Annexure B of the Conservation Agreement. Aboriginal artefacts have also been found within the Conservation Area (Table 3, Annexure B of the CA) (UCMPL 2019a).

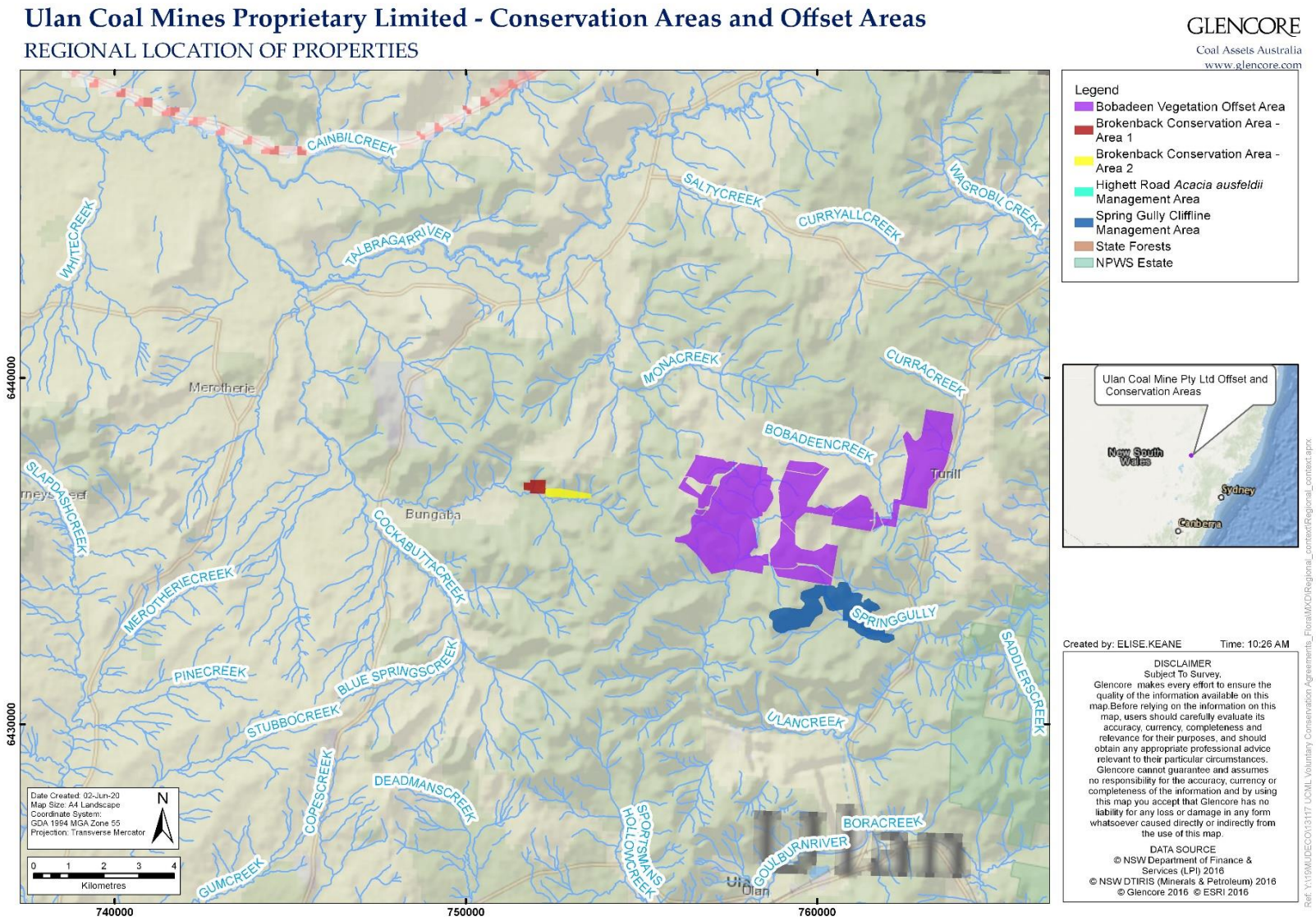

Figure 1: Regional location of Brokenback Conservation Area – Area 1

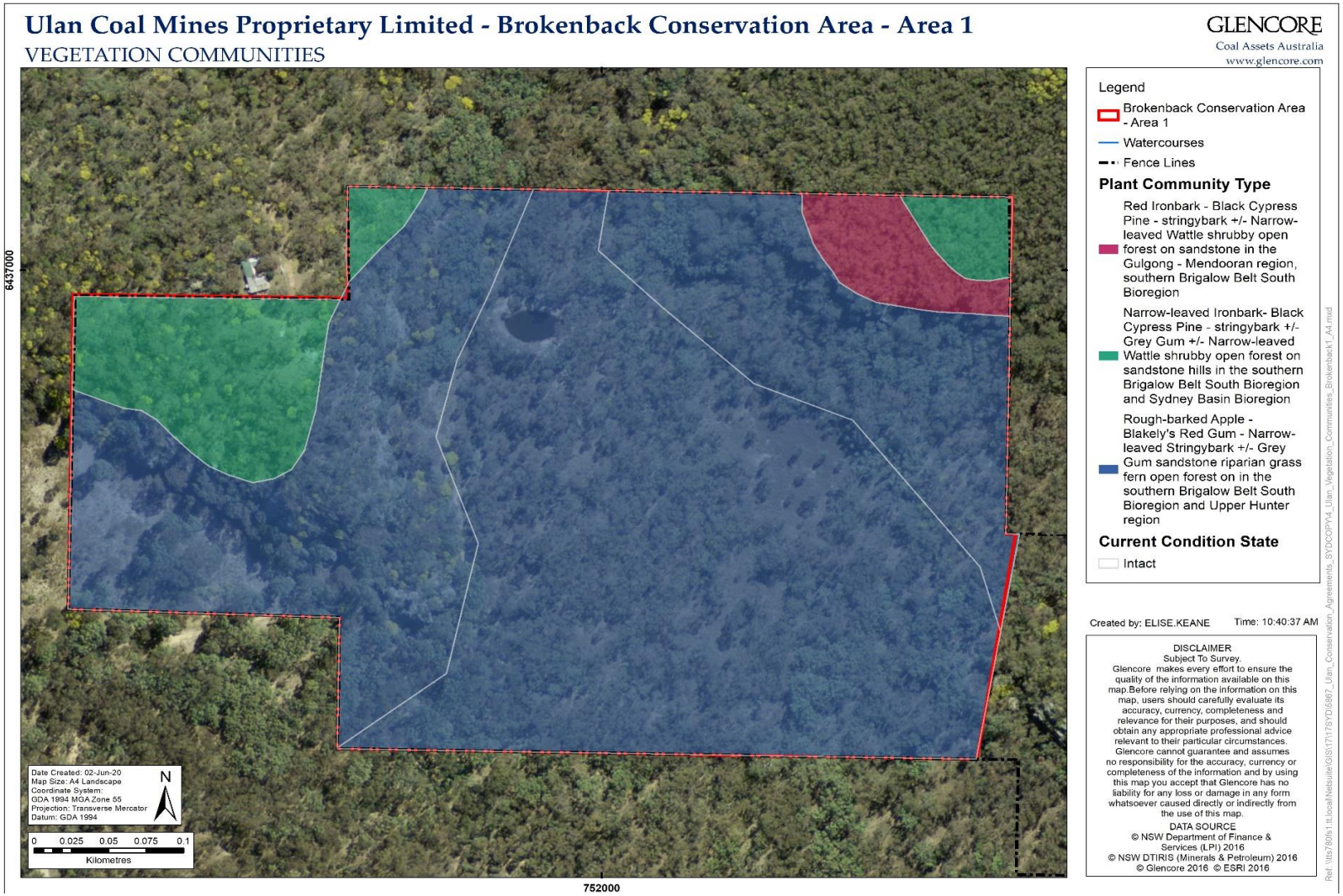

Figure 2: Brokenback Conservation Area – Area 1 vegetation communities

2. Methodology

Monitoring, including floristic quadrat monitoring, photo point monitoring and a walk-through assessment, of the Conservation Area was undertaken in accordance with the Section 7 and Annexure D of the Conservation Agreement (UCMPL 2019a) and the Bio Banking assessment methodology (OEH 2014) on 5 and 6 June 2023 by ELA ecologists.

Monitoring in 2023 forms the fourth round of monitoring for the Conservation Area as per the Conservation Agreement; however, the 2023 monitoring is the fifth iteration of monitoring for these sites. As part of the establishment of the Conservation Agreement for the Conservation Area, sites were established and underwent monitoring in 2017 (baseline monitoring). As per Annexure D, Section c) iii) of the Conservation Agreement, the results of the 2023 monitoring were compared to results from 2017, 2020, 2021, and 2022 to determine changes from previous monitoring.

2.1. Quadrat and Photo-point Monitoring

Quadrat data was collected at five (5) monitoring locations as shown in Figure 3. Data collected at each monitoring plot was undertaken in accordance with the Bio Banking assessment methodology (OEH 2014) within a 20 x 20 m quadrat nested in a 20 x 50 m quadrat. This methodology is consistent with floristic monitoring undertaken across UCMPL biodiversity and vegetation offset areas as a part of the UCMPL BMP. The following attributes were recorded:

- Floristic cover and abundance within the nested 20 x 20 m quadrat.
  - Cover estimates for each species were recorded from 1 – 5 % and thereafter in 5% increments.
  - Abundance estimates for each species were recorded using the intervals of 1 – 10, 20, 50, 100, 500, 1000 individuals.
- Proportion of canopy species naturally regenerating within the 20 x 50 m quadrat
- Non-vascular ground cover percentage (litter, cryptogam, logs >10 cm in diameter, rocks >5 cm in diameter, bare soil) for the 20 x 50 m quadrat
- Vascular plant cover for the 20 x 50 m quadrat including native overstorey cover, native mid-storey cover (>1 m), native ground cover – grasses, native ground cover – shrubs (<1 m), native ground cover – other and exotic ground cover.
- The occurrence of weeds, feral animal disturbance and other observable impacts
- Total length of large woody debris (LWD) and hollow bearing trees (HBTs) within the 20 x 50 m quadrat

Total native cover, which is not prescribed by the Bio Banking assessment methodology but by the Conservation Agreement (UCMPL 2019a) was calculated from the total of native overstorey cover, native midstorey cover, native ground cover – grasses, native ground cover – shrubs and native ground cover – other. An anomaly of this method is that more than 100% cover can be recorded; however, covers for attributes are also presented singularly in this report.

Photographs were taken facing north, east, south and west from the transect / plot start point as per methodology outlined in Annexure D of the Conservation Agreement (UCMPL 2019a).

As a part of the UCMPL *Biodiversity Management Plan* (BMP) (UCMPL 2019b), annual inspections are undertaken by UCMPL representatives within the Conservation Area.

2.2. Walk-through Assessment

A walk-through assessment was also undertaken within the Conservation Area to record opportunistic observations of issues such as fire events or impacts of fire management, weeds (involving compilation of a list of exotic species identified and recording the location and extent of new weed infestations), pest animal species and their locations, visitor impacts and vehicle access (including evidence of any recent usage, and the presence of any new tracks, rubbish dumping, natural regeneration of previously disturbed areas and sightings of any threatened species listed under the EPBC Act and / or the BC Act. Observations were recorded with a handheld GPS.

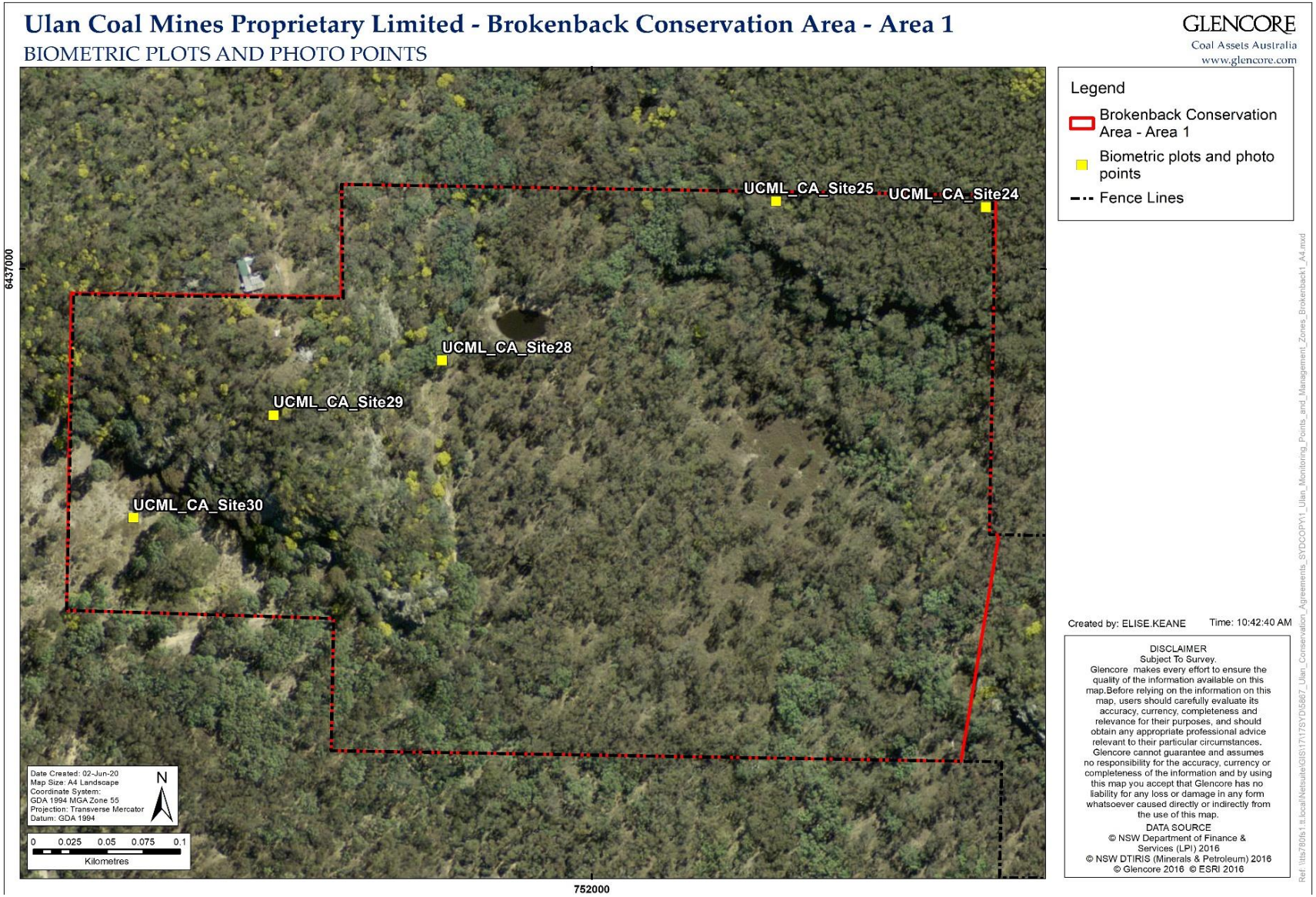

Figure 3: Brokenback Conservation Area - Area 1 biometric plots and photo points

3. Results

3.1. Quadrat and Photo-point Monitoring

A total of 111 species comprising of 98 native species, 10 exotic species and three species that could not be identified to species level nor confidently be determined as native or exotic were recorded across the five (5) monitoring plots within the Conservation Area. A summary of results is provided in Table 2 below.

A full species list is provided in Appendix A. Monitoring data sheets and photos for each site are presented in Appendix B.

Table 2: Quadrat 2023 monitoring results summary

Photo Point / Quadrat No	Native species richness	Overstorey cover %pfc	Mid-storey cover %pfc	Ground cover – grasses %pfc	Ground cover – shrubs %pfc	Ground cover – other %pfc	Proportion overstorey regen. %	Exotic cover %pfc	Number of Trees with Hollows	Total length of fallen logs
478 Red Ironbark - Black Cypress Pine - stringybark +/- Narrow-leaved Wattle shrubby open forest on sandstone in the Gulgong - Mendooran region, southern Brigalow Belt South Bioregion (HU707)										
Benchmark values	**25**	**20**	**10**	**5**	**5**	**5**	**N/A**	**N/A**	**0.8**	**46**
UCML_CA_Site25	36	6.7	14	0	10	20	100	0	2	95
479 Narrow-leaved Ironbark- Black Cypress Pine - stringybark +/- Grey Gum +/- Narrow-leaved Wattle shrubby open forest on sandstone hills in the southern Brigalow Belt South Bioregion and Sydney Basin Bioregion (HU702)										
Benchmark values	**31**	**5**	**2**	**2**	**2**	**2**	**N/A**	**N/A**	**2**	**40**
UCML_CA_Site24	37	4.8	3.6	4	20	22	100	0	2	30
UCML_CA_Site29	33	3.6	2.8	30	16	4	100	0	0	43
481 Rough-barked Apple - Blakely's Red Gum - Narrow-leaved Stringybark +/- Grey Gum sandstone riparian grass fern open forest on in the southern Brigalow Belt South Bioregion and Upper Hunter region (HU713)										
Benchmark values	**31**	**10**	**5**	**0**	**10**	**5**	**N/A**	**N/A**	**1.5**	**10**
UCML_CA_Site28	45	16.5	23.5	40	8	0	100	2	0	10
UCML_CA_Site30	40	26.5	0.5	26	0	8	100	2	0	0

pfc: projected foliage cover

3.2. Walk through assessment summary

Results from the walk-through assessment across the entire Conservation Area is provided in Table 3. A map depicting the location of the management issues described in Table 3 is provided in Appendix C.

Table 3: Walk-through assessment results summary 2023

Category	Comment
Fire events or impacts of fire management	No fire events or fire management occurred in the Conservation Area.
Weeds	One weed species listed under the Local Land Services (LLS) *Central Tablelands Regional Strategic Management Plan* (CTRSWMP) 2023 – 2027 (LLS 2023) was identified within the Conservation Area during monitoring undertaken in 2023 (Appendix C): • *Opuntia stricta* (Common Prickly Pear) – 55H 751899 6436938 (UCML_CA_Site28), 55H 751904, 6437016 (opportunistically) and 55H 751895, 6436930 (opportunistically). • *Rubus fruticosus* spp. agg. (Blackberry) – recorded opportunistically 55H 751845 6436789 Exotic species present within the Conservation Area include: • *Conyza bonariensis* (Fleabane) • *Conyza sp.* (a Fleabane species) • *Dittrichia graveolens* (Stinkwort) • *Hypochaeris glabra* (Smooth cat's-ear) • *Hypochaeris radicata* (Cats-ear) • *Paronychia brasiliana* (Brazilian whitlow) • *Rumex acetosella* (Sorrell) • *Stellaria media* (Chickweed) • *Taraxacum officinale* (Dandelion)
Pest animals	Feral pig (*Sus scrofa*) diggings were recorded at UCML_CA_Site30 (55H 751708, 6436820). Rabbit (*Oryctolagus cuniculus*) scats were recorded opportunistically.
Visitor impact and vehicle access	No evidence of recent usage and no presence of new tracks
Rubbish dumping	One pile of rubbish was recorded at UCML_CA_Site30 (Figure 4). This rubbish is considered to have been in the area prior to the Conservation Agreement and was also recorded previously in 2022.  **Figure 4: Rubbish recorded within the Conservation Area (UTM 55H 751722, 6436799)**
Natural regeneration of disturbed areas	Natural regeneration of canopy species was identified at all five plots monitored within the Conservation Area, with all canopy species regenerating at these sites.

Category	Comment
	The areas surrounding UCML_CA_Site28 and UCML_CA_Site30 have been historically cleared / thinned.
Threatened species observations	No threatened species were recorded within the Conservation Area during 2023.

3.3. Management actions undertaken

Annual inspections of fencing, signage and security throughout the Conservation Area were undertaken by UCMPL. Weed management for *Opuntia stricta* (Common Prickly Pear) was undertaken during 2023.

4. Discussion

4.1. Changes from previous monitoring

Results of 2017, 2020, 2021, 2022, and 2023 for each monitoring transect and comparison to benchmark values (UCMPL 2019a) are provided in Table 4 below.

Trends for each site cannot be determined as only five years of data is available; however, discussion regarding change from the previous monitoring period on a site-by-site basis within each PCT is provided below. Furthermore, due to the small sample size, statistically vigorous analysis to determine trends for each PCT, and the broader Conservation Area cannot be undertaken. The results of attributes including native species richness, ground cover grasses pfc, ground cover shrubs pfc and ground cover other pfc are sensitive to rainfall and survey timing, with each of these attributes also subject to small additional variations year to year due to observer interpretation.

Overall, the Conservation Area remains ecologically stable with the condition of the vegetation monitored in 2023 remaining largely consistent with the results from previous monitoring and with PCT descriptions provided in the Conservation Agreement (UCMPL 2019a).

Table 4: Monitoring results 2017 to 2022

Photo Point / Quadrat No		Native species richness	Overstorey cover %pfc	Mid-storey cover %pfc	Ground cover – grasses %pfc	Ground cover – shrubs %pfc	Ground cover – other %pfc	Proportion overstorey regen.	Exotic cover %pfc	Number of Trees with Hollows	Total length of fallen logs
478 Red Ironbark - Black Cypress Pine - stringybark +/- Narrow-leaved Wattle shrubby open forest on sandstone in the Gulgong - Mendooran region, southern Brigalow Belt South Bioregion (HU707)											
Benchmark values		**25**	**20**	**10**	**5**	**5**	**5**	**N/A**	**N/A**	**0.8**	**46**
	2017	27	7.9	7.2	0	4	0	1	2	1	66
	2020	27	8.5	5.5	8	2	0	0.67	0	2	100
UCML_CA_Site25	2021	31	9	25	2	0	22	1	0	2	100
	2022	25	20.2	3.5	16	6	36	1	0	2	95
	2023	36	6.7	14	0	10	20	1	0	2	95
479 Narrow-leaved Ironbark- Black Cypress Pine - stringybark +/- Grey Gum +/- Narrow-leaved Wattle shrubby open forest on sandstone hills in the southern Brigalow Belt South Bioregion and Sydney Basin Bioregion (HU702)											
Benchmark values		**31**	**5**	**2**	**2**	**2**	**2**	**N/A**	**N/A**	**2**	**40**
	2017	30	10.5	6.4	0	0	8	1	0	4	24
	2020	24	8.7	13	4	0	2	0.5	0	4	50
UCML_CA_Site24	2021	25	12	3.6	10	0	22	1	0	4	50
	2022	28	12	5.5	10	0	40	1	0	4	95
	2023	37	4.8	3.6	4	20	22	1	0	4	95
	2017	19	13	8.5	2	6	8	1	0	1	47
	2020	28	12.6	0	20	0	4	0.33	0	1	100
UCML_CA_Site29	2021	27	11	0.6	22	0	28	1	0	1	100
	2022	28	20.1	3.6	32	10	8	0	0	1	100
	2023	33	3.6	2.8	30	16	4	1	0	1	100
481 Rough-barked Apple - Blakely's Red Gum - Narrow-leaved Stringybark +/- Grey Gum sandstone riparian grass fern open forest on in the southern Brigalow Belt South Bioregion and Upper Hunter region (HU713)											
Benchmark values		**31**	**10**	**5**	**0**	**10**	**5**	**N/A**	**N/A**	**1.5**	**10**
	2017	35	18.5	3.8	8	12	2	1	4	0	0
	2020	37	25	6.6	4	8	2	1	2	0	1
UCML_CA_Site28	2021	44	12	11	28	18	4	0.67	0	0	1
	2022	37	22.5	1.3	38	16	4	1	0	0	1
	2023	45	16.5	23.5	40	8	0	1	2	0	1
	2017	33	34	0.2	8	12	4	1	0	0	2
	2020	37	35.5	4.5	0	4	18	0.33	0	0	10
UCML_CA_Site30	2021	34	22	2.5	18	0	10	1	0	0	10
	2022	29	32.5	0.5	26	0	24	1	0	0	10
	2023	40	26.5	0.5	26	0	8	1	2	0	10

4.1.1. PCT 478 Red Ironbark - Black Cypress Pine - stringybark +/- Narrow-leaved Wattle shrubby open forest on sandstone in the Gulgong - Mendooran region, southern Brigalow Belt South Bioregion (HU707)

The one (1) site located within this PCT (UCML_CA_Site25) recorded an increase in native species richness compared to previous monitoring periods. Despite this, overall native groundcover pfc decreased compared to 2022. This reduction is likely due to drier conditions compared to the previous monitoring period. Exotic pfc, canopy species regeneration and HBTs remained consistent with previous years.

UCML_CA_Site25 recorded a decrease in native overstorey and increase in mid-storey pfc during 2023. Overstorey pfc has fluctuated over the years, with 2023 being the lowest cover recorded since monitoring began in 2017. The low overstorey pfc may be attributable to climatic conditions and is comparable to dry conditions experienced during 2017 and 2020.

4.1.2. PCT 479 Narrow-leaved Ironbark- Black Cypress Pine - stringybark +/- Grey Gum +/- Narrow-leaved Wattle shrubby open forest on sandstone hills in the southern Brigalow Belt South Bioregion and Sydney Basin Bioregion (HU702)

There are two (2) sites located within this PCT, UCML_CA_Site24 and UCML_CA_Site29. Native species richness increased across these sites in 2023. At UCML_CA_Site24, native groundcover pfc was similar to 2022, however native ground grasses and native ground other saw a decrease in pfc and native ground shrubs increased in pfc. Native groundcover at UCML_CA_Site29 was consistent with results from 2022. Exotic pfc was again 0% at both sites in 2023. Native overstorey cover declined at both PCT 479 sites.

Overstorey cover has fluctuated since 2017 at both sites, with 2023 recording the lowest overstorey pfc since monitoring began in 2017. The low overstorey pfc may be attributable to climatic conditions and is comparable to dry conditions experienced during 2017 and 2020.

HBTs and LWD remain consistent with previous years.

4.1.3. Rough-barked Apple - Blakely's Red Gum - Narrow-leaved Stringybark +/- Grey Gum sandstone riparian grass fern open forest on in the southern Brigalow Belt South Bioregion and Upper Hunter region HU713)

There are two (2) sites located within this PCT, UCML_CA_Site28 and UCML_CA_Site30.

Species richness increased at both sites in 2023 compared to 2022, whilst native groundcover pfc remained consistent.

Canopy pfc slightly decreased at both sites in 2023, however this follows a fluctuating trend across previous monitoring years. Midstorey pfc increased significantly at UCML_CA_Site28, likely due to the native shrub groundcover from previous monitoring years exceeding 1m in height.

No HBTs occur within these sites. Exotic pfc increased slightly at both sites. LWD remains consistent with previous years.

Extensive pig diggings were recorded at UCML_CA_Site30, which have degraded ground cover and may be responsible for the increase in exotic species cover. Pig and rabbit diggings were also recorded at site UCML_CA_Site28, however were much smaller in scale.

4.2. Condition of conservation values

The Conservation Area contains four main conservation values as identified in the Conservation Agreement (UCMPL 2019a):

- Three (3) PCTs: PCT481, PCT478 and PCT479
- Habitat for 31 Vulnerable and three (3) Endangered species listed under the BC Act with nine (9) of these species also listed under the EPBC Act.
- Approximately 21.9 ha of native vegetation and fauna habitat which has good connectivity to surrounding remnant woodland / forest areas and the adjacent Brokenback Conservation Area – Area 2 and contributes to flora and fauna species conservation outcomes in the Hunter-Central Rivers Catchment Management Authority.
- 17 identified Aboriginal objects that are listed on the Department of Planning, Industry and Environment Aboriginal Heritage Information Management System register.

Each of these conservation values remain intact, with no damage or disturbance to these conservation values recorded throughout the Conservation Area.

4.3. Effectiveness of management actions

The occurrence of priority weed species throughout the Conservation Area remains very low, with incidences of *Opuntia stricta* (Common Prickly Pear) not currently threatening biodiversity values.

On-going Feral Pig management will contribute to the reduction of this species within the Conservation Area in the long-term and allow degraded areas to recover.

Removal of rubbish and derelict sheds has reduced the amount of rubbish within the Conservation Area.

5. Recommendations

ELA recommends that monitoring continues to be undertaken on an annual basis as per the methodology outlined in Annexure D of the Brokenback Conservation Area – Area 1 Conservation agreement (UCMPL 2019a).

Weed control measures in accordance with site specific control procedures should be implemented to control and prevent the spread of CTRSWMP listed weeds *Opuntia stricta* and *Rubus fruiticosa* (Appendix C).

Continued Feral Pig management is also recommended to reduce the impact of this species within the Conservation Area.

6. References

Department of Primary Industries (DPI) 2020. *Combined drought indicator.* Website accessed from https://edis.dpi.nsw.gov.au/ on 12 May 2020.

NSW Office of Environment and Heritage (OEH) 2014. *Framework for Biodiversity Assessment – NSW Biodiversity Offsets Policy for Major Projects.*

Local Land Services (LLS) 2017. *Central Tablelands Regional Strategic Weed Management Plan 2017 – 2022.*

Local Land Services (LLS) 2023. *Central Tablelands Regional Strategic Management Plan* (CTRSWMP) *2023 – 2027*.

Ulan Coal Mines Pty Ltd (UCMPL) 2019a. Brokenback Conservation Area – Area 2 Conservation Agreement.

Ulan Coal Mines Pty Ltd (UCMPL) 2019b. *Biodiversity Management Plan* (BMP).

Appendix A Flora species list

Table 5: Flora species list

Scientific name	Native / Exotic
Acacia doratoxylon	Native
Acacia linearifolia	Native
Acacia spectabilis	Native
Acianthus fornicatus	Native
Allocasuarina gymnanthera	Native
Amyema miquelii	Native
Amyema quandang	Native
Angophora floribunda	Native
Aotus subglauca	Native
Aristida ramosa	Native
Aristida vagans	Native
Arundinella nepalensis	Native
Astroloma humifusum	Native
Austrostipa densiflora	Native
Austrostipa scabra	Native
Billardiera scandens	Native
Bossiaea sp.	Native
Brachyloma daphnoides	Native
Brachyscome sp.	Native
Calotis cuneifolia	Native
Calytrix tetragona	Native
Cassinia quinquefaria	Native
Cassinia sifton	Native
Cassytha pubescens	Native
Cheilanthes sieberi	Native
Conyza bonariensis	Exotic
Conyza sp.	Exotic
Correa reflexa var. reflexa	Native
Cryptandra spinescens	Native
Cynoglossum australe	Native
Cyperus difformis	Native
Cyperus sp.	Native/Exotic

Scientific name	Native / Exotic
Dampiera purpurea	Native
Dianella revoluta	Native
Dichelachne micrantha	Native
Dichondra repens	Native
Digitaria breviglumis	Native
Digitaria parviflora	Native
Dittrichia graveolans	Exotic
Dodonaea viscosa	Native
Echinopogon caespitosus	Native
Echinopogon ovatus	Native
Einadia hastata	Native
Entolasia stricta	Native
Eragrostis brownii	Native
Eucalyptus blakelyi	Native
Eucalyptus crebra	Native
Eucalyptus dwyeri	Native
Eucalyptus fibrosa	Native
Eucalyptus sparsifolia	Native
Gahnia aspera	Native
Geranium solanderi	Native
Glycine clandestina	Native
Glycine tabacina	Native
Gonocarpus elatus	Native/exotic
Gonocarpus tetragynus	Native
Haloragis heterophylla	Native
Hibbertia circumdans	Native
Hibbertia obtusifolia	Native
Hydrocotyle laxiflora	Native
Hypericum gramineum	Native
Hypochaeris glabra	Exotic
Hypochaeris radicata	Exotic
Imperata cylindrica	Native
Juncus sp.	Native/Exotic

Scientific name	Native / Exotic
Juncus sp. alexandri or vaginatus	Native/Exotic
Lachnagrostis filiformis	Native
Lepidosperma laterale	Native
Leucopogon muticus	Native
Lomandra confertifolia	Native
Lomandra filiformis	Native
Lomandra glauca	Native
Lomandra multiflora	Native
Macrozamia secunda	Native
Melichrus erubescens	Native
Microlaena stipoides	Native
Opuntia stricta	Exotic
Oxalis perennans	Native
Ozothamnus diosmifolius	Native
Ozothamnus diosmifolius	Native
Panicum effusum	Native
Paronychia brasiliana	Exotic
Paspalidium distans	Native
Persoonia linearis	Native
Phyllanthus hirtellus	Native
Phyllanthus occidentalis	Native
Platysace ericoides	Native
Podolepis neglecta	Native
Pomax umbellata	Native
Poranthera microphylla	Native
Pteridium esculentum	Native
Pterostylis sp.	Native
Pultenaea microphylla	Native
Rumex acetosella	Exotic
Rumex brownii	Native
Rytidosperma pallidum	Native
Rytidosperma sp.	Native
Sannantha cunninghamii	Native
Schoenus apogon	Native
Senecio linearifolius	Native
Stellaria media	Exotic
Stylidium laricifolium	Native
Stylidium sp.	Native
Stypandra glauca	Native
Styphelia triflora	Native
Taraxacum officinale	Exotic
Thysanotus patersonii	Native
Urtica incisa	Native
Veronica plebeia	Native
Vittadinia muelleri	Native
Wahlenbergia communis	Native

Appendix B Monitoring data sheets and site photos

Table 6: UCML_CA_Site24 monitoring data sheet 2023

Monitoring Data Sheet			
Monitoring Point Number	UCML_CA_Site24	Date	6/06/2023
Vegetation Community	479 – Narrow-leaved Ironbark – Black Cypress Pine – stringybark shrubby open forest		
1. Site Photo(s)Taken	Figure 5 to Figure 8		
2. Floristic BioMetric attributes			
Native cover			54.4
Overstorey:			4.8
Midstorey:			3.6
Groundcover(grass):			4
Groundcover (shrub):			20
Groundcover (other):			22
Native species richness:			37
Proportion of canopy species regenerating			100%
Exotic cover			0
Number of trees with hollows			2
Total length of fallen logs			30
3. Opportunistic observations	**GPS coordinates**	**Photo number**	**Observations**
Natural regeneration of disturbed areas			Nil
Threatened species sightings			Nil
Fire event/fuel			Nil
Weeds			Nil
Pest animals			Nil
Visitor impact/vehicles			Nil
Rubbish dumping			Nil

Figure 5: UCML_CA_Site24 North

Figure 6: UCML_CA_Site24 East

Figure 7: UCML_CA_Site24 South

Figure 8: UCML_CA_Site24 West

Table 7: UCML_CA_Site25 monitoring data sheet 2023

Monitoring Data Sheet			
Monitoring Point Number	UCML_CA_Site25	**Date**	6/06/2023
Vegetation Community	478 - Red Ironbark - Black Cypress Pine - stringybark shrubby open forest		
1. Site Photo(s)Taken	Figure 9 to Figure 12 below.		
2. Floristic BioMetric attributes			
Native cover			50.7
Overstorey:			6.7
Midstorey:			14
Groundcover(grass):			0
Groundcover (shrub):			10
Groundcover (other):			20
Native species richness:			36
Proportion of canopy species regenerating			100%
Exotic cover			0
Number of trees with hollows			2
Total length of fallen logs			95
3. Opportunistic observations	**GPS coordinates**	**Photo number**	**Observations**
Natural regeneration of disturbed areas			Nil
Threatened species sightings			Nil
Fire event/fuel			Nil
Weeds			Nil
Pest animals			Nil
Visitor impact/vehicles			Nil
Rubbish dumping			Nil

Figure 9: UCML_CA_Site25 North

Figure 10: UCML_CA_Site25 East

Figure 11: UCML_CA_Site25 South

Figure 12: UCML_CA_Site25 West

Table 8: UCML_CA_Site28 monitoring data sheet 2023

Monitoring Data Sheet			
Monitoring Point Number	UCML_CA_Site28	**Date**	5/06/2023
Vegetation Community	481 - Rough-barked Apple - Blakely's Red Gum - Narrow-leaved Stringybark open forest		
1. Site Photo(s)Taken	Figure 13 to Figure 16 below.		
2. Floristic BioMetric attributes			
Native cover			88
Overstorey:			16.5
Midstorey:			23.5
Groundcover(grass):			40
Groundcover (shrub):			8
Groundcover (other):			0
Native species richness:			45
Proportion of canopy species regenerating			100%
Exotic cover			2
Number of trees with hollows			0
Total length of fallen logs			10
3. Opportunistic observations	**GPS coordinates**	**Photo number**	**Observations**
Natural regeneration of disturbed areas			Nil
Threatened species sightings			Nil
Fire event/fuel			Nil
Weeds			One priority weed species (*Opuntia stricta*) listed under the CTRSWMP was recorded within the monitoring plot. Exotic species recorded at UCMPL_CA_28 include: • *Conyza bonariensis* (approx. 0.1% pfc, 20 abundance) • *Conyza sp.* (approx. 0.1% pfc, 20 abundance) • *Hypochaeris radicata* (approx. 0.1% pfc, 10 abundance) • *Paronychia brasiliana* (approx. 0.1% pfc, 10 abundance) • *Rumex acetosella* (approx. 0.1% pfc, 20 abundance) • *Stellaria media* (approx. 0.1% pfc, 20 abundance) • *Taraxacum officinale* (approx. 0.1% pfc, 20 abundance)

Monitoring Data Sheet	
Pest animals	Evidence of pig (*Sus scrofa*) diggings and rabbit (*Oryctolagus cuniculus*) diggings
Visitor impact/vehicles	Nil
Rubbish dumping	Nil

Figure 13: UCML_CA_Site28 North

Figure 14: UCML_CA_Site28 East

Figure 15: UCML_CA_Site28 South

Figure 16: UCML_CA_Site28 West

Table 9: UCML_CA_Site29 monitoring data sheet 2023

Monitoring Data Sheet			
Monitoring Point Number	UCML_CA_Site29	**Date**	6/06/2023
Vegetation Community	479 - Narrow-leaved Ironbark - Black Cypress Pine - stringybark shrubby open forest		
1. Site Photo(s)Taken	Figure 17 and Figure 20 below.		
2. Floristic BioMetric attributes			
Native cover			56.4
Overstorey:			3.6
Midstorey:			2.8
Groundcover(grass):			30
Groundcover (shrub):			16
Groundcover (other):			4
Native species richness:			33
Proportion of canopy species regenerating			100%
Exotic cover			0
Number of trees with hollows			0
Total length of fallen logs			43
3. Opportunistic observations	**GPS coordinates**	**Photo number**	**Observations**
Natural regeneration of disturbed areas			Nil
Threatened species sightings			Nil
Fire event/fuel			Nil
Weeds			Nil
Pest animals			Nil
Visitor impact/vehicles			Nil
Rubbish dumping			Nil

Figure 17: UCML_CA_Site29 North

Figure 18: UCML_CA_Site29 East

Figure 19: UCML_CA_Site29 South

Figure 20: UCML_CA_Site29 West

Table 10: UCML_CA_Site30 monitoring data sheet 2023

Monitoring Data Sheet			
Monitoring Point Number	UCML_CA_Site30	**Date**	5/06/2023
Vegetation Community	481 - Rough-barked Apple - Blakely's Red Gum - Narrow-leaved Stringybark open forest		
1. Site Photo(s)Taken	Figure 21 to Figure 24 below		
2. Floristic BioMetric attributes			
Native cover			61
Overstorey:			26.5
Midstorey:			0.5
Groundcover(grass):			26
Groundcover (shrub):			0
Groundcover (other):			8
Native species richness:			40
Proportion of canopy species regenerating			100%
Exotic cover			2
Number of trees with hollows			0
Total length of fallen logs			0
3. Opportunistic observations	**GPS coordinates**	**Photo number**	**Observations**
Natural regeneration of disturbed areas			Nil
Threatened species sightings			Nil
Fire event/fuel			Nil
Weeds			Exotic species recorded at UCMPL_CA_30 include: • *Conyza bonariensis* (approx. 0.1% pfc, 20 abundance) • *Dittrichia graveolans* (approx. 0.1% pfc, 50 abundance) • *Hypochaeris glabra* (approx. 0.5% pfc, 500 abundance) • *Rumex acetosella* (approx. 0.2% pfc, 50 abundance)
Pest animals			Extensive pig (*Sus scrofa*) diggings have degraded the site and groundcover layer. This may impact the composition of native groundcover in future monitoring years, with increases in exotic cover likely.
Visitor impact/vehicles			Nil

Monitoring Data Sheet	
Rubbish dumping	Old rubbish pile that has been recorded over previous monitoring periods. See Figure 4 above.

Figure 21: UCML_CA_Site30 North

Figure 22: UCML_CA_Site30 East

Figure 23: UCML_CA_Site30 South

Figure 24: UCML_CA_Site30 West

Appendix C Management Issues

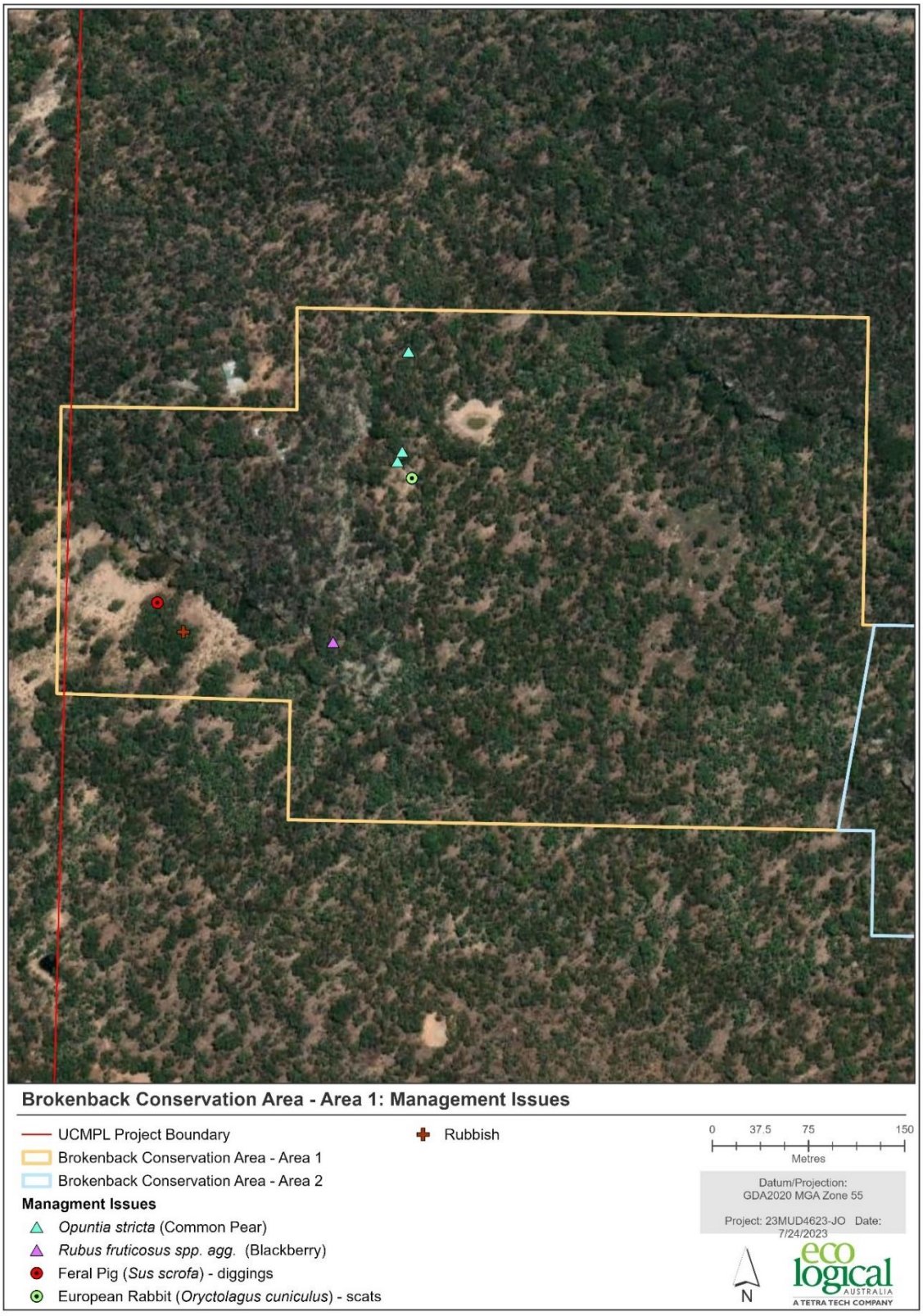

Figure 25: Brokenback Conservation Area – Area 1 Management Issues

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