



Biodiversity Offset Area –
Land Management Action Plan 2022-23

Orica Mining Services – Kurri Kurri NSW – August 2022

This Land Management Action Plan was produced for Orica Mining Services in August 2022 to outline the management works undertaken during 2021-2022 period and planning the ongoing requirements for the Kurri Kurri Site Biodiversity Offset area for the period 2022-23.

SUBMITTED	DATE	REVISION
Ryan Bremmell	09/08/2022	Draft 1



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1. Introduction

For the past 10 years Hunter Land Management (HLM) carried out weed and pest control at the Orica Biodiversity Offset Area (BOA) at Kurri Kurri NSW (see Figure 1). This includes both primary and secondary treatment of the targeted weeds as identified in the Biodiversity Offset Area Vegetation Management Plan (Umwelt 2012) and 1080 Wild Dog and Fox Baiting in 2018, 2019, 2020, 2021 and 2022. The creation of the 2013-14, 2014-15, 2016-2017, 2017-2018, 2018-2019, 2019-2020, 2020-2021 and 2021-2023 Land Management Action Plans (LMAP) is an evolution of this original plan of management. This LMAP identifies further issues which are not only impacting on the ability to control weeds at the site but broader land management issues which are impacting on the overall health of the BOA.

Hunter Land Management undertook the following methodology to develop this Land Management Action Plan in 2022-23 for Orica Mining Services Biodiversity Offset area at Kurri Kurri NSW to observe and record noxious and environmental weeds, erosion, waste, fence condition and any vertebrate pest signs in the area. Other land management issues affecting the health of the biodiversity area were also noted.

2. Land Management Actions 2021-22

The two main land management actions which were undertaken on site during 2021/2022 period focusing on weed and pest control. A weed control campaign was undertaken in the high priority area during January 2022 along with a vertebrate pest control (1080 baiting) program was undertaken in May/June 2022. Details of these programs can be found below.

2.1 Weeds

Weed control at the site has been effective over the 2012-2022 control period with a large reduction in density and species present. Primary control has seen a major reduction in large volumes of major weeds on site with this years focus moved to upstream and border areas. Weeds controlled during this recent control period are mapped below:

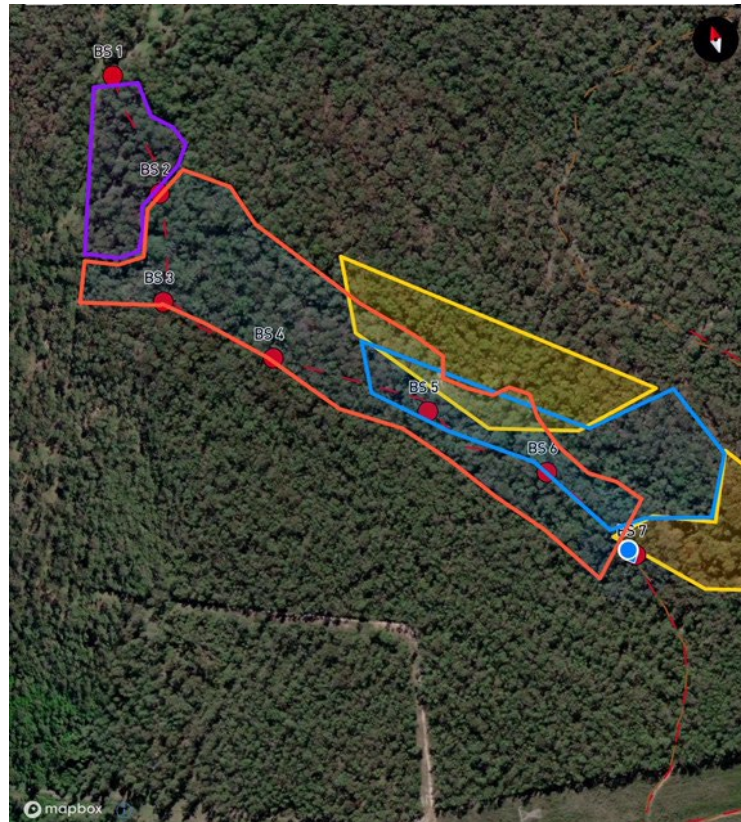


Plate 1: GIS Mapping of 2021-2022 Weed Control Locations

A majority of the previous weed infestation areas remains clean with it being close to weed free, as there were no observed weeds during the monitoring surveys in July 2022. The area declared as “low density” or weed free has increased in the past 12 months.

Detailed reports on the weed control undertaken during this period can be found in Appendix 2.

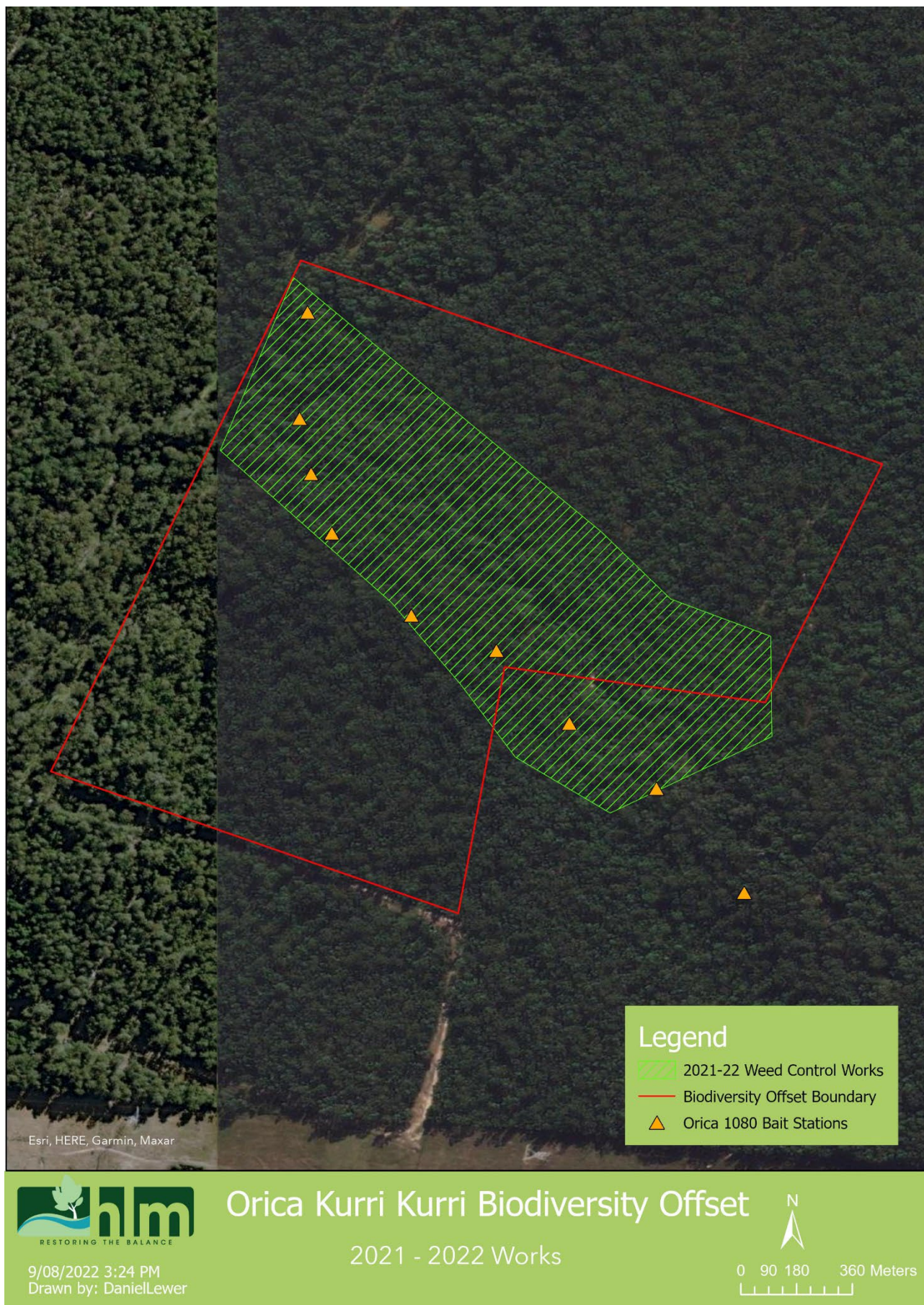


Figure 1: Orica Biodiversity Offset Area – Biodiversity Offset Work Areas 2021 - 2022

2.2 Vertebrate Pest Control – 1080 Baiting

A 1080 baiting program was undertaken from 16th May 2022 through to 13th June 2022 at the locations described in Figure 1. This was completed as a result of the motion camera monitoring results from cameras deployed in May 2021.

A total of 9 bait stations were used to present the 1080 baits. Each station consisted of a small dirt/sand mound where the processed meat injected with Sodium monofluoroacetate (1080 poison) was placed inside. The meat bait is tethered using a bamboo skewer to hold the bait in place. The skewer acts as an indicator as to whether the bait has been tampered with or taken. This ground baiting method aligns with the Code of Practice and Standard Operation Procedures – Ground Baiting of Wild Dogs and Foxes with 1080 – produced by NSW DPI.

Each station was checked on at the completion of a month's presentation with all baits not taken, removed by HLM during this check. The remaining baits are buried onsite at a depth not less than 500mm away from all water courses (as per the Pesticide Control Order 2008).

Results

Name	Date Laid	Check 1 Date	Check 1 Species	Check 2 Date	Check 2 Species	Check 3 Date	Check 3 Species	Check 4 and Removal Date	Check 3 Species
BS 1	16-05-22	23-05-22	Fox	30-05-22	No Sign	06-06-22	No Sign	13-06-22	No Sign
BS 2	16-05-22	23-05-22	Fox	30-05-22	Fox	06-06-22	No Sign	13-06-22	No Sign
BS 3	16-05-22	23-05-22	No Sign	30-05-22	No Sign	06-06-22	No Sign	13-06-22	No Sign
BS 4	16-05-22	23-05-22	No Sign	30-05-22	Fox	06-06-22	No Sign	13-06-22	No Sign
BS 5	16-05-22	23-05-22	No Sign	30-05-22	Fox	06-06-22	No Sign	13-06-22	No Sign
BS 6	16-05-22	23-05-22	Fox	30-05-22	Fox	06-06-22	Fox	13-06-22	Fox
BS 7	16-05-22	23-05-22	No Sign	30-05-22	Wild Dog	06-06-22	No Sign	13-06-22	No Sign
BS 8	16-05-22	23-05-22	Fox	30-05-22	No Sign	06-06-22	Fox	13-06-22	Fox
BS 9	16-05-22	23-05-22	No Sign	30-05-22	No Sign	06-06-22	No Sign	13-06-22	No Sign

3. Land Management Actions 2022-23

This section provides actions to address ongoing issues outlined in the previous section and in the “Orica Richmond Vale Biodiversity Monitoring Report – 2018” Umwelt, August 2018. The more holistic approach will help to significantly increase the biodiversity value of the BOA. Table one provides the suggested schedule for action in accordance with this plan.

3.1 Weeds

Weeds to be targeted in 2022-2023 include;

- Lantana (*Lantana camara*)
- Paddy’s Lucerne (*Sida rhombifolia*)
- Cobblers Pegs (*Bidens pilosa*)
- Flatweed (*Hypochaeris radicata*) and
- Fireweed (*Senecio madagascariensis*).

The control methods to be used for weed management in 2022-2023 should include:

Hand Removal Methods

Digging out plants: Plants with bulbs, tubers and corms must be completely removed from the soil by digging out. Often these plants will reproduce from broken off pieces.

Crowning: This technique is useful for weeds such as asparagus fern, which have their growing points below the surface of the soil. (Corms, rhizomes or tufted fibrous root systems).

Hand pulling: Hold the plant stem as close as possible to the base of the plant. Gently tug the plant. This will loosen the soil and allow the plant to come free. The plant may be hung up off the ground or piled in a heap.

Winding up: This process is suitable for plants with surface or climbing runners such as moth vine.

Herbicide Control Methods

Foliar Spraying (High Volume Spray, Low pressure back pack type)

This method requires spot spraying foliage of plants using knock down or selective herbicides.

Splatter Gun

This involves using gas powered splatter guns to distribute high concentration herbicide onto plant foliage.

Cut, Scrape and Paint (Cut Stump)

This is suitable for coppicing and suckering woody weeds such as Privet and Green Cestrum, or any weeds which are too large for hand-pulling or have long taproots. This method provides for no soil disturbance and weed eradication is successful. The cut surface is treated with a systemic herbicide immediately after cutting.

ACTION - Continue weed control focusing on border and upstream weed areas in Figure 2 using methods outlined above during the 2022-2023 period.

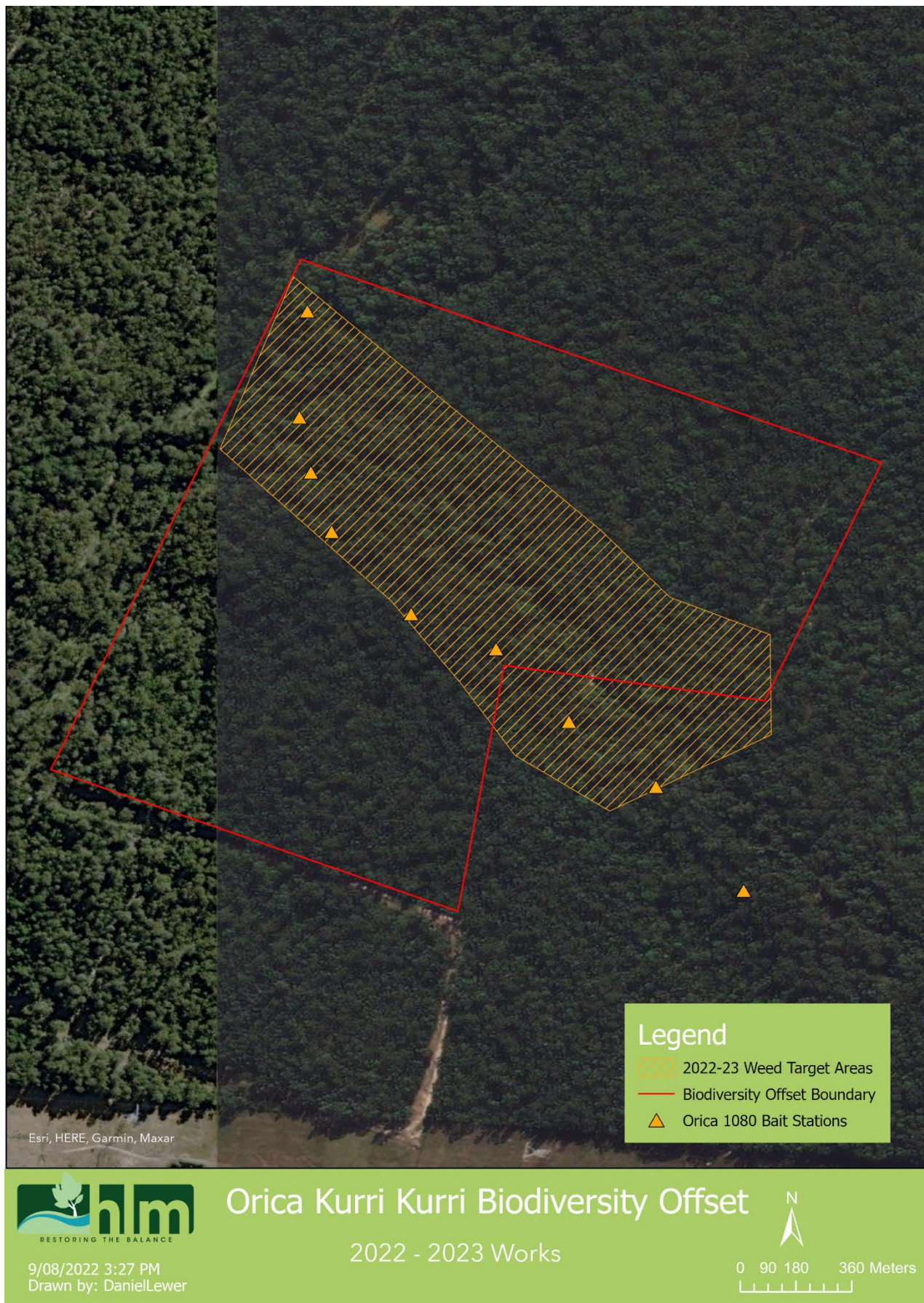


Figure 2: Orica Biodiversity Offset Area – Biodiversity Offset Work Areas 2022-2023

3.2 Monitoring Cameras

Continue to maintain 2 motion sensor cameras on the site along track access to monitor both illegal access and pest animal presence.

ACTION – Continue to maintain 2 motion sensor cameras to be checked and downloaded every 3/6 months

3.3 Vertebrate Pest Control

A 1080 baiting and/or soft jaw leg hold/cage trapping program should be undertaken on site to reduce feral predators preying on native animals in 2022-23. Pig Trapping should also be considered if feral pig activity remains during the management period. Motion sensor cameras should also be used through the program. Program should focus control on foxes and feral cats as per DPI guidelines.

ACTION - Conduct a 1080 baiting program targeting foxes and feral dogs. Undertake pig/dog trapping program if required from camera monitoring program.

3.4 Creek Erosion

Implementation of the stream remediation plan is to be continued to be investigated during this period as outlined previously in these annual reports. Its construction will halt the sources of the along with ongoing monitoring. The plan built upon the bed level survey completed during 2013-2014 and accurately assessed the requirements for remediation at the site. Plate 2 shows an actively eroding nick point at one of the tributaries of the main creek line to be addressed by the plan however this site is on the neighbouring State Managed land. This is a result of ongoing bed lowering erosion of the main creek line, resulting 'hanging tributaries' (e.g. a waterfall is a hanging tributary). In the light soils of the site erosion easily occurs moving upstream to try and match the same bed level of the stream into which it is flowing. Hence if the mainstream continues to erode the tributaries will also continue to erode.



Plate 2: Active erosion point on tributary to main creek

ACTION – Continue to investigate the stream remediation plan for the creek line during 2020-2021 including consultation with neighbours

3.5 Track Improvement and Access Maintenance

Use Earthmoving machinery to improve track access through the site for weed and pest management, firefighting and ongoing monitoring works. Machinery and gravel to be imported where required. An assessment of accessibility of the site inclusive of the biodiversity offset area and if required additional gates, fencing or rock barrier will be installed at access points.

ACTION – Employ earthmoving machinery to repair and upgrade track access into BOA

Table 1: Schedule of works.

	Timing				Budget Est.
	Oct – Dec 2022	Jan- Mar 2023	April -June 2023	Jul – Sep 2023	
Weed Control					\$6,000.00
Maintain Monitoring Cameras					\$1,500.00
Vertebrate Pest Control (1080 baiting and possible pig trapping)					\$2,500 (Baiting) \$3,000 (Trapping)
Creek Erosion					\$20-25,000
Track Improvement and Access Maintenance					\$8,000.00
Monitor and evaluate – progress reports and 2022-23 management plan					\$3,750.00
TOTAL (approx.)					\$49,7250.00

*HLM Rates Subject to review each financial year.

**Totals are estimates only and may vary slightly subject to factors such as amount of herbicide used etc.

4. Monitoring and Evaluation

Monitoring is a key component of this Management Plan. The main monitoring tool for this site will be the annual inspections conducted after 12 months in August 2023. This inspection forms the basis for ongoing weed monitoring at the site and assessment of effective control established throughout the 2021-22 management period. Weed control data will continue to be collected in the field using GPS technology, which provides the basis for mapping of control areas and planning for future works.

In addition to this all use of herbicide is managed in strict accordance with the label and conditions for spray such as wind, humidity and temperature. The 'Herbicide Application Record Sheet' (Appendix 1) is used to record all weather data throughout the day as well as the herbicide usage.

In addition to the annual monitoring inspections site monitoring will be conducted twice throughout the 12-month management period and a brief report provided outlining works completed, still to be done and any additional works which are not identified in the plan. This may include the control of new weeds, further waste, erosion and other issues which may or may not have been raised in this management plan.

Appendix 1. Herbicide Application Record Sheet

All chemical applications will require the detailed filling of this record sheet.



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DAILY REPORT SHEET

0001

Date:	Site: ☐ Mine Site	Supervisor:	Project Manager:
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Job Details						
Job numbers	Times		Hours			
	Start Time	Finish Time	Normal Time	Time and a half	Double time	Total

Equipment/Plant used (tick if used)					
Ute ☐ Unit No:	Quikspray ☐ Unit No:	Tractor ☐ Make:	Mine radio: ☐	Other: (describe) ☐	
Drivers/Operators:			Work Request Number		

Daily Breakdown				
Time left depot:	Time arrived on site:	Crib break start/finish time:	Lunch break start/finish time:	Time left site:

Chemical Use Record										
Property/Holding: (residential address)										
Applicator's Full Name:										
Sensitive Areas (including distances, buffers): <table border="1" style="margin: 10px auto; width: 150px; text-align: center;"> <tr><td> </td><td>N</td><td> </td></tr> <tr><td>W</td><td>Treated Area</td><td>E</td></tr> <tr><td> </td><td>S</td><td> </td></tr> </table>		N		W	Treated Area	E		S		Comments (including risk control measures for sensitive areas):
	N									
W	Treated Area	E								
	S									

Application Data	
Full Label Product Name:	Rate/Dose:
Permit No.:	Expiry Date:
Total L/kg:	Applicators Initials:
Equipment type:	Nozzle Type:
Nozzle Angle:	Pressure:
Weather	Date Last Calibrated:
Showers ☐ Overcast ☐ Light Cloud ☐ Clear sky ☐	
Rainfall (24 hours before and after)	
Before: mm	During: mm
After: mm	
Time (show time in this column)	Temperature °C
Start	Relative Humidity (%)
	Wind Speed
	Direction
	Variability (e.g. gusting)
Finish	

Description of day's work completed/issues encountered:	Materials Used:
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HLM Staff Members Used		O/N Allowance
Name:	Sign:	
Name:	Sign:	
Name:	Sign:	
Name:	Sign:	
Name:	Sign:	

Comment from / by Client	
Client sign:	Client Name:

Job Completed ☐ Job Ongoing ☐ Other Works ☐ _____