



Biodiversity Offset Area –  
Land Management Action Plan 2020-21

Orica Mining Services – Kurri Kurri NSW – July 2020

This Land Management Action Plan was produced for Orica Mining Services in July 2020 to outline the management works undertaken during 2019/2020 period and planning the ongoing requirements for the Kurri Kurri Site Biodiversity Offset area for the period 2020-21.

SUBMITTED	DATE	REVISION
Ryan Bremmell	21/07/2020	Draft 1
Ryan Bremmell	22/07/2020	Final



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21/07/2020

\_\_\_\_\_

DATE

Daniel Lewer (Senior Consultant– Managing Director) – HUNTER LAND MANAGEMENT PTY LTD



Box 776 | Maitland | NSW 2320  
 P 02 4932 1550 | F 02 4932 1558  
[mail@hlmaus.com.au](mailto:mail@hlmaus.com.au)  
[www.hlmaus.com.au](http://www.hlmaus.com.au)

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## **1. Introduction**

For the past 8 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 and 2020. The creation of the 2013-14, 2014-15, 2016-2017, 2017-2018, 2018-2019 and 2019-2020 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 2020-21 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 2019-20

The two main land management actions which were undertaken on site during 2019/2020 period focusing on weed and pest control. A weed control campaign was undertaken in the high priority area during June 2020 (See Appendix 2 for Daily Work Records) along with a vertebrate pest control (1080 baiting) program was undertaken in May/June 2020. Details of these programs can be found below.

### 2.1 Weeds

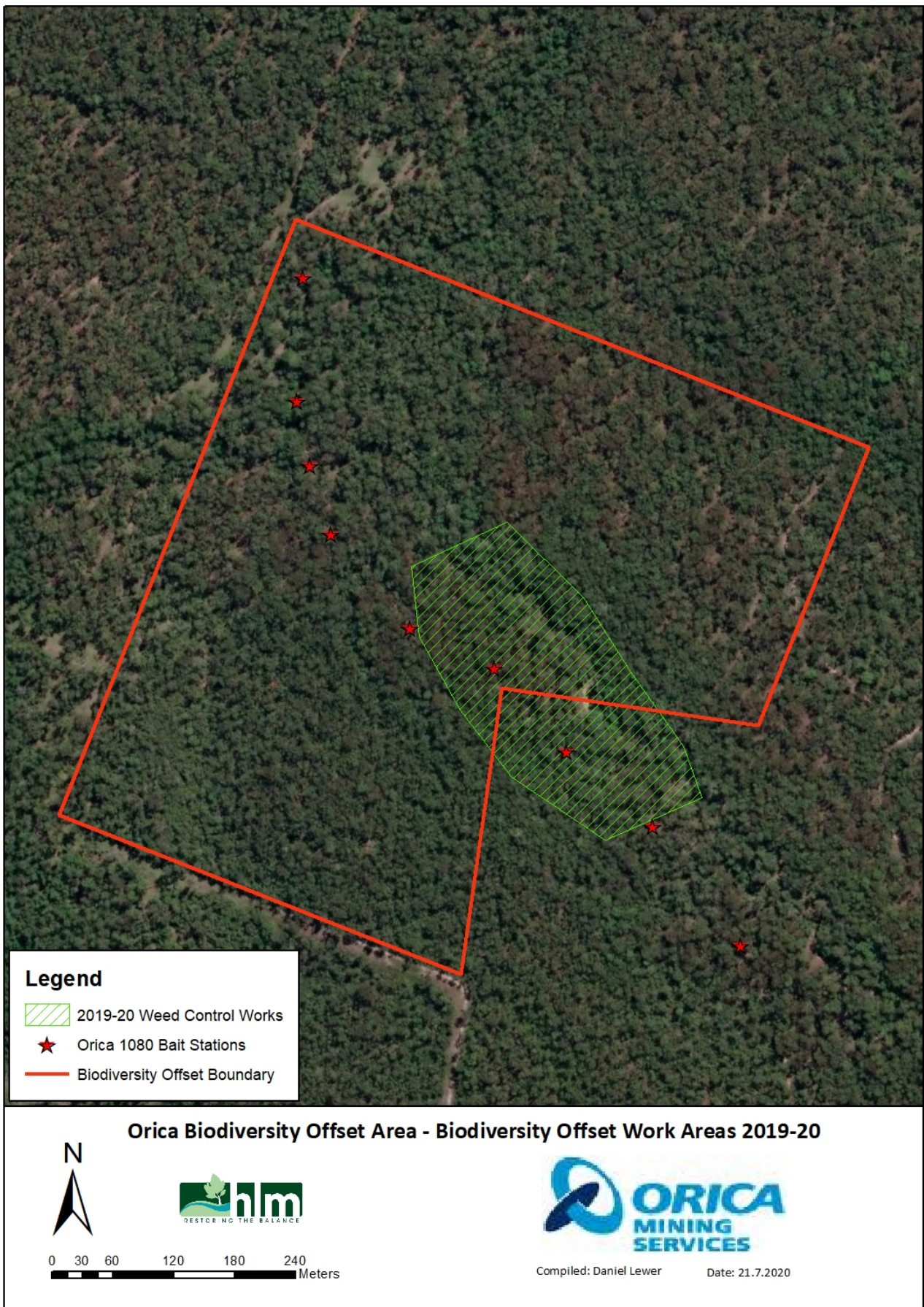
Weed control at the site has been effective over the 2012-2020 control period with a large reduction in density and species present. Primary control has seen a major reduction in large volumes of major weeds on site with this years focus moved to upstream and border areas. Weeds controlled during this recent control period are listed below:



**Plate 1: Lantana regrowth as controlled in the 2019-2020 area as shown in Figure 1**

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 June 2020. 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: Orca Biodiversity Offset Area – Biodiversity Offset Work Areas 2019-2020**

## 2.2 Vertebrate Pest Control – 1080 Baiting

A 1080 baiting program was undertaken from 12<sup>th</sup> May 2020 through to 7<sup>th</sup> June 2020 at the locations described in Figure 1.

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	12-05-20	22-05-20	Wild Dog	29-05-20	Fox	05-06-20	Fox	12-06-20	Fox
BS 2	12-05-20	22-05-20	Fox	29-05-20	Fox	05-06-20	No Sign	12-06-20	No Sign
BS 3	12-05-20	22-05-20	No Sign	29-05-20	Fox	05-06-20	Fox	12-06-20	Fox
BS 4	12-05-20	22-05-20	No sign	29-05-20	Fox	05-06-20	No Sign	12-06-20	No Sign
BS 5	12-05-20	22-05-20	No Sign	29-05-20	Wild Dog	05-06-20	No Sign	12-06-20	No Sign
BS 6	12-05-20	22-05-20	Fox	29-05-20	Fox	05-06-20	Fox	12-06-20	Fox
BS 7	12-05-20	22-05-20	Fox	29-05-20	Wild Dog	05-06-20	No Sign	12-06-20	No Sign
BS 8	12-05-20	22-05-20	No Sign	29-05-20	Fox	05-06-20	Fox	12-06-20	Fox
BS 9	12-05-20	22-05-20	No Sign	29-05-20	No Sign	05-06-20	No Sign	12-06-20	No Sign

### 3. Land Management Actions 2020-21

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 2020-2021 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 2020-2021 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.

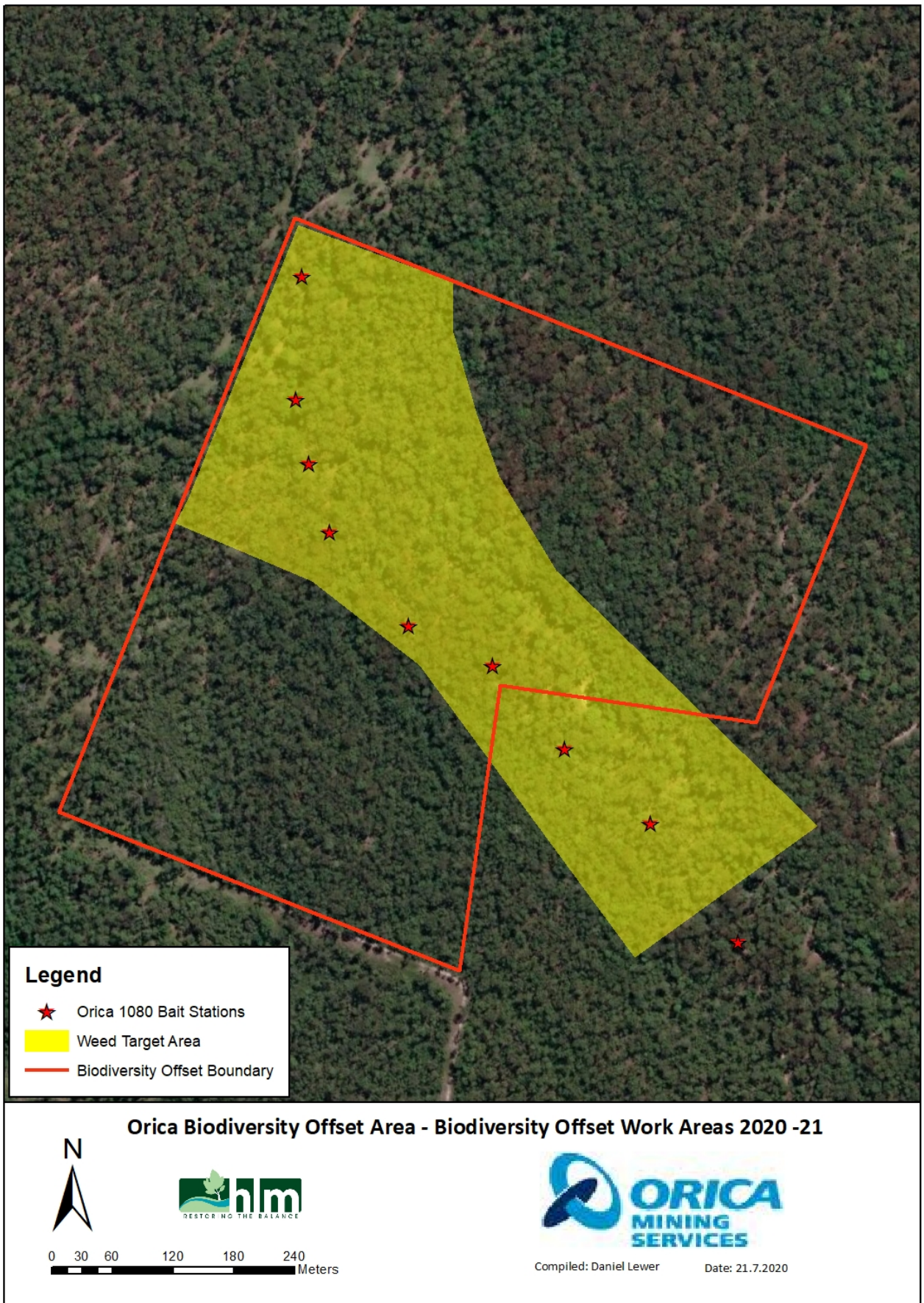
###### *Splatter Gun*

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 2020-2021 period.**



**Figure 2: Orca Biodiversity Offset Area – Biodiversity Offset Work Areas 2020-2021**

Orca Biodiversity Offset Area – LMAP 2020-2021

### **3.2 Monitoring Cameras**

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

**ACTION – Purchase, install and 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 2020-21. 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 main stream 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.
	Jul – Sep 2020	Oct – Dec 2020	Jan- Mar 2021	Apr - Jun 2021	
Weed Control					\$6,000.00
Install and Maintain Monitoring Cameras					\$3,500.00
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 2020- 21 management plan					\$3,750.00
TOTAL (approx.)					\$51,7250.00

\*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 June 2021. This inspection forms the basis for ongoing weed monitoring at the site and assessment of effective control established throughout the 2020-21 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.



PO Box 776, Maitland NSW 2320  
 Phone: (02) 4932 1550  
 Mobile: (0412) 404499  
 Fax: (02) 4932 1558

## DAILY REPORT SHEET

0001



Date:	Site: <input type="checkbox"/> Mine Site	Supervisor:	Project Manager:
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Job numbers	Times		Hours			
	Start Time	Finish Time	Normal Time	Time and a half	Double time	Total

**Equipment/Plant used (tick if used)**

Ute <input type="checkbox"/> Unit No:	Quikspray <input type="checkbox"/> Unit No:	Tractor <input type="checkbox"/> Make:	Mine radio: <input type="checkbox"/>	Other: (describe) <input type="checkbox"/>
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:
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**Chemical Use Record**

Property/Holding: (residential address)

Applicator's Full Name:

Sensitive Areas (including distances, buffers): <div style="text-align:center"> <table border="1" style="margin:auto"> <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> </div>		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:	Water Rate @ L/ha:		
Permit No.:	Expiry Date:	Additives/Wetters:		
Total L/kg:	Applicators Initials:	Water quality(pH or description):		
Equipment type:	Nozzle Type:	Nozzle Angle:	Pressure:	Date Last Calibrated:

Weather    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	Relative Humidity (%)	Wind Speed	Direction	Variability (e.g. gusting)
Start					
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:
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Job Completed     Job Ongoing     Other Works  .....

## **Appendix 2. Daily Weed Control Records 2019-20**

### **HLM Work Record**

Date work was completed : 2020-06-22

Site name : Orica Kurri Kurri

Job No : 1147

Staff on site : Kai Kristensen Tom Ferguson

Onsite start time : 7.30

Onsite finish time : 4.00

Primary weeding (Approx. m2) : 0

Secondary weeding (Approx. m2) : 0

Maintenance weeding (Approx. m2) : 0

Site preparation (Approx. m2) : 0

Planting (No.) : 0

Spraying (approx. m2) : 6000

Greenwaste/ rubbish removed (approx. m3) : 0

Track maintenance (approx. m) : 0

Water & planting maintenance (approx. m2 or numbers) :

Fencing Works (m completed) : 0

Chemical Used : Glyphosate @ 1L/100L

Qty Chemical Used (Litres) : 800mL

2nd Chemical Used :

Qty 2nd Chemical Used (Litres) :

1080 baits laid in a day (1-100) :

Pindone quantity laid in a day (kg) :

Equipment used : Other

Temperature (c) am : 9.4

Temperature (c) pm : 14.0

Humidity am : 79

Humidity pm : 60

Orica Biodiversity Offset Area – LMAP 2020-2021

Weather conditions : Overcast

Wind speed (am) : Slight

Wind speed (pm) : West

Wind direction (am) : North West

Wind direction (pm) : West

Temperature (c) pm : [Temperaturepm]

Rainfall severity before : None

Rainfall severity after :None

Sensitive sites nearby? (Y/N) : No

Target pest 1 : Lantana

Target density : Medium

Target pest 2 :

Target density : Unknown

Target pest 3 :

Target density : Unknown

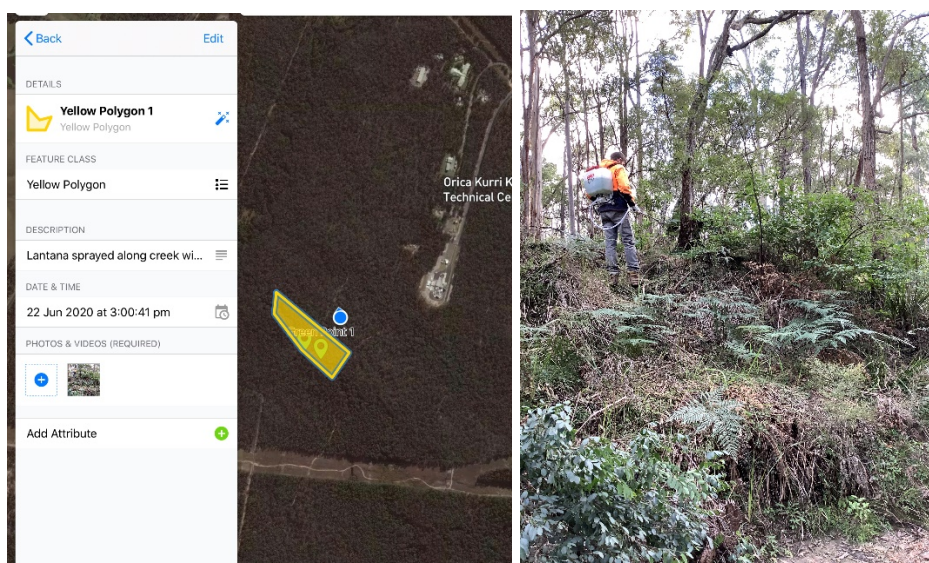
Target pest 4 :

Target density : Unknown

Target pest 5 :

Target density : Unknown

Comment : Travelled to site and spoke with Ryan Bremmell. Got escorted across the site to the work area. Back pack sprayed medium density of lantana growing in and along the creek line.



Orica Biodiversity Offset Area – LMAP 2020-2021

## HLM Work Record

Date work was completed : 2020-06-23 Risk Assessment on Site (required) : yes

Site name : Orica Kurri All Staff Fit for Work (required) : yes

Job No : 1147 Incident / Near Misses :

Staff on site : Tom Ferguson Pre-Start Inspection (required) : yes

Kai Kristensen

Onsite start time : 0700

Onsite finish time : 1600

Email for Client Records :

Primary weeding (Approx. m2) : 0

Secondary weeding (Approx. m2) : 0

Maintenance weeding (Approx. m2) : 0

Site preparation (Approx. m2) : 0

Planting (No.) : 0

Spraying (approx. m2) : 8000

Greenwaste/ rubbish removed (approx. m3) : 0

Track maintenance (approx. m) : 0

Water & planting maintenance (approx. m2 or numbers) :

Fencing Works (m completed) : 0

1st - Target Pest : test1

1st - Target Density : High

1st - Chemical Used : Roundup biactive

1st Rate (Litres) : 1:100

1st Permit Required :

1st Qty Chemical Used (Litres) : 10L

2nd - Target Pest : [SpeciesFM2]

2nd - Target Density : Unknown

2nd - Chemical Used :

2nd Rate (Litres) :

2nd Permit Required :

2nd Qty Chemical Used (Litres) :

3rd - Target Pest : [SpeciesFM3]

3rd - Target Density : Unknown

3rd - Chemical Used :

3rd Rate (Litres) :

3rd Permit Required :

3rd Qty Chemical Used (Litres) :

1080 baits laid in a day (1-100) :

Pindone quantity laid in a day (kg) :

Equipment used : Vehicle mounted spray rig

Temperature (c) am : 8

Temperature (c) pm : 14

Humidity am : 90

Humidity pm : 58

Weather conditions : Fine & sunny

Wind speed (am) : Slight

Wind speed (pm) : North West

Wind direction (am) : West

Wind direction (pm) : North West

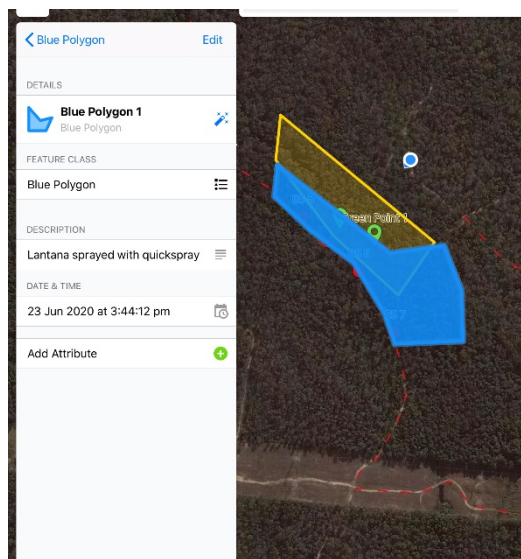
Temperature (c) pm : [Temperaturepm]

Rainfall severity before :

Rainfall severity after :

Sensitive sites nearby? (Y/N) : Unknown

Comment : Found an old track and reversed down in case we got bogged. Made it close enough to get to offset track on the other side of creek. Sprayed 2 tanks out on the lantana with a few blackberry seedlings found.



**HLM Work Record**

Date work was completed : 2020-06-24

Site name : Orica Kurri

Job No : 1147

Staff on site : Tom Ferguson

Kai Kristensen

Onsite start time : 0800

Onsite finish time : 1540

Email for Client Records :

Primary weeding (Approx. m2) : 0

Secondary weeding (Approx. m2) : 0

Maintenance weeding (Approx. m2) : 0

Site preparation (Approx. m2) : 0

Planting (No.) : 0

Spraying (approx. m2) : 5000

Greenwaste/ rubbish removed (approx. m3) : 0

Track maintenance (approx. m) : 0

Water & planting maintenance (approx. m2 or numbers) :

Fencing Works (m completed) : 0

1st - Target Pest : test1

1st - Target Density : High

Orica Biodiversity Offset Area – LMAP 2020-2021

1st - Chemical Used : Roundup biactive

1st Rate (Litres) : 1:100

1st Permit Required :

1st Qty Chemical Used (Litres) : 10L

2nd - Target Pest : [SpeciesFM2]

2nd - Target Density : Unknown

2nd - Chemical Used :

2nd Rate (Litres) :

2nd Permit Required :

2nd Qty Chemical Used (Litres) :

3rd - Target Pest : [SpeciesFM3]

3rd - Target Density : Unknown

3rd - Chemical Used :

3rd Rate (Litres) :

3rd Permit Required :

3rd Qty Chemical Used (Litres) :

1080 baits laid in a day (1-100) :

Pindone quantity laid in a day (kg) :

Equipment used : Vehicle mounted spray rig

Temperature (c) am : 11

Temperature (c) pm : 16

Humidity am : 72

Humidity pm : 52

Weather conditions : Fine & sunny

Wind speed (am) : Moderate

Wind speed (pm) : North West

Wind direction (am) : North West

Wind direction (pm) : North West

Temperature (c) pm : [Temperaturepm]

Rainfall severity before :

Rainfall severity after :

Sensitive sites nearby? (Y/N) : Unknown

Comment : Filled up tank and water trailer and headed for site. Was organised to get escort onsite at 8am but escort didn't arrive until after 830. Got through yellow gate with key and headed down a track to the creek and lantana infestation. Creek crossing is washed out as is every other option we could find to get across. We could reach every thing we needed to from track. Sprayed out 2x500L tanks on remaining lantana.

