



mainroads
WESTERN AUSTRALIA

EPBC 2017/7880

Annual Compliance

Report

Marble Bar Road Coongan Gorge Realignment
and MO30 Material Pit Expansion: Pilbara
Region, WA.

14 October 2020

Contents

1	INTRODUCTION	1
2	APPROVAL UNDER THE ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999	1
3	PURPOSE OF THIS REPORT	1
4	COMPLIANCE	2
	Attachment 1: Letter Notifying of Commencement of Action	3
	Attachment 2: Map of Rehabilitated Areas	4
	Attachment 3: Map of Artificial Rock Mounds	6
	Attachment 4: Northern Quoll Monitoring Report.....	8

1 INTRODUCTION

Marble Bar Road is a critical access road for a number of mining operations and local communities between Newman, Nullagine, Marble Bar, Port Hedland and several aboriginal communities including Jigalong and Punmu in the north west of Western Australia. The road is also important for both the agricultural and tourism industries within the East Pilbara Region.

Extending 433 kilometres, Marble Bar Road links Newman to Great Northern Highway, east of Port Hedland. The four (4) km section of road through Coongan Gorge was a narrow and winding road with steep descents. This resulted in reduced sight distances and created a difficult environment for larger commercial vehicles to safely and efficiently operate with other vehicles on this section of road.

The Coongan Gorge Realignment and M030 Material Pit Expansion Project provides a safer route through the gorge, especially for large vehicles.

The scope for the project included:

- Realignment and reconstruction of approximately 5 km of Marble Bar Road between 318.4-323.5 SLK. Road formation width varies significantly due to varying batter slope distances (at the narrowest road formation will be 10 metres (m) wide, and in isolated areas road formation will be up to 170 m wide);
- Associated works including significant road batter construction, minor floodways, culverts and off road drainage;
- Development and use of a side track to divert traffic during stages of construction; and
- Extraction of base course material from M030 material pit if excess cut material is not suitable for road base. The M030 material pit is located on the Marble Bar Rd at 356 SLK.

The construction of the Project was completed on 24 July 2019.

2 APPROVAL UNDER THE ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999

Coongan Gorge Realignment and M030 Material Pit Expansion Project was referred to the Department of the Environment and Energy (DotEE) for assessment under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The DotEE issued approval (with conditions) for these works to proceed on 15 May 2018 (EPBC 2017/7880).

3 PURPOSE OF THIS REPORT

Construction of the Project commenced on 20 July 2018. This compliance report has been produced as required by Condition 5 of EPBC approval 2017/7880. Table 1 of this report outlines the compliance with each approval condition for the period between 20 July 2019 to 19 July 2020.

4 COMPLIANCE

Table 1: Conditions compliance status

Condition No.	Condition	Status	Comment
1	For the protection of the Northern Quoll, the approval holder must not clear more than 51.41 hectares within the project area.	Compliant	A total of 44.7 ha was cleared within the project area.
2	To mitigate and manage impacts to the Northern Quoll, the approval holder must:		
2a	Only undertake clearing during the period of 1 April to 1 August of any year.	Compliant	Clearing commenced from 20 July 2018 and was completed by 1 August 2018.
2b	Engage a fauna specialist to undertake a pre-clearance trapping and relocation survey for Northern Quolls within three (3) days prior to the commencement of clearing; clearing at any given location may only take place if there was a pre-clearance trapping and relocation survey undertaken within the last three (3) days. The fauna specialist must relocate any Northern Quolls identified within the Project Area during the Pre-clearance trapping and relocation survey.	Compliant	A fauna specialist was engaged to undertake a pre-clearance trapping and relocation survey for Northern Quolls within three (3) days prior to the commencement of clearing. A total of four (4) Northern Quolls were captured as part of the pre-clearance trapping and relocated – two (2) females and two (2) males. The Northern Quoll Relocation – Coongan Gorge Report August 2018, provided in the previous Annual Compliance Report, details of the Northern Quoll trapping and relocation survey.
2c	Engage a fauna spotter to traverse the project area ahead of clearing machinery at all times during clearing - the fauna spotter must relocate any Northern Quolls identified within the Project Area during clearing.	Compliant	A fauna spotter was engaged to traverse the project area ahead of clearing machinery at all times during clearing. The fauna spotter relocated four (4) Northern Quolls identified within the Project Area during clearing.
2d	Install a minimum of eight box culverts during the construction of the road which are suitable for use by the Northern Quolls as fauna underpasses.	Compliant	Eight culverts suitable for use by the Northern Quolls as fauna underpasses were installed during the construction of the road. The locations of the culverts are shown in Attachment 3.
2e	Use remote-sensor cameras to undertake monitoring of all of the culverts for two 14-day periods annually during Northern Quoll breeding season, for a period of three years post construction.	Compliant	Culvert monitoring was undertaken with the use of remote-sensor cameras during the 2020 Northern Quoll breeding season (from 16 May 2020 to 12 August 2021).
2f	Within one (1) year post-construction, create a minimum of 15 artificial rock habitat mounds within the M030 material pit 356 SLK and/or along the decommissioned roads and side tracks. The positioning of the mounds must be within 2km of existing Northern Quoll denning habitat.	Compliant	23 artificial rock habitat mounds were created within 2km and within the M030 material pit 356 SLK and/or along the decommissioned roads and side tracks. A map showing the locations of the artificial mounds is attached (Attachment 3).
2g	Rehabilitate the decommissioned roads and side tracks to minimise any barrier for movement for Northern Quolls.	Compliant	Decommissioned roads and side tracks were rehabilitated to minimise any barriers to the movement of Northern Quolls. A map showing the areas that were rehabilitated is attached (refer to Attachment 2).
3	Within 30 days after the commencement of the action, the approval holder must advise the Department in writing of the actual date of commencement.	Compliant	A letter was sent by Main Roads WA to the DotEE on 3 August 2018 advising of the actual date of the commencement of the action being the 20 July 2108 (refer to Attachment 1).
4	The approval holder must maintain accurate records substantiating all activities associated with or relevant to the conditions of approval, and make them available upon request to the Department. Such records may be subject to audit by the Department or an independent auditor in accordance with Section 458 of the EPBC Act, or used to verify compliance with the conditions of approval. Summaries of audits will be posted on the Department's website. The results of audits may also be publicised through the general media.	Compliant	Main Roads WA has maintained accurate records in accordance with this condition and their legal obligations, under the <i>State Records Act 2000</i> (Western Australia).
5	Within three months of every 12 month anniversary of the commencement of the action, for five (5) years, the approval holder must publish a report on their website addressing compliance with each of the conditions of this approval. Documentary evidence providing proof of the date of publication and non-compliance with any of the conditions of this approval must be provided to the Department at the same time as the compliance report is published. The compliance report must include, but is not limited to:	Compliant	The 12 month anniversary of the commencement of the action is on 20 October 2018. This report has been published on the MRWA website. Documentary evidence will provided to the Department prior to 20 October 2020.
5a	the number of Northern Quolls trapped and relocated under Condition 2 (b) and (c)	Compliant	A total of four (4) Northern Quolls were captured as part of the pre-clearance trapping and relocated – two (2) females and two (2) males.
5b	the location of any relocated Northern Quolls	Compliant	The trapped individuals were relocated to one of two suitable habitats 23 km and 30 km west of Coongan Gorge. <ul style="list-style-type: none"> Two females and one male: Zone 50 S768062, E7692892 (23 km west of Coongan Gorge). One male: Zone 50 S768385, E7695037 (30 km west of Coongan Gorge).
5c	the location of culverts and mounds referred to in Condition 2 (d) and 2 (f)	Compliant	Eight culverts suitable for use by the Northern Quolls as fauna underpasses were installed during the construction of the road. The locations of the culverts are shown in Attachment 3.
5d	the results of the remote camera monitoring of culvert use referred to in Condition 2 (e)	Compliant	The results of remote camera monitoring of culvert use are detailed in attachment 4.
6	Upon direction of the Minister, the approval holder must ensure that an independent audit of compliance with the conditions of approval is conducted and a report submitted to the Minister. The independent auditor must be approved by the Minister prior to the commencement of the audit. Audit criteria must be agreed to by the Minister and the audit report must address the criteria to the satisfaction of the Minister.	Compliant	No direction to undertake an audit by the Minister was received during the reporting period.
7	If, at any time after five (5) years from the date of this approval, the approval holder has not substantially commenced the action, then the approval holder must not substantially commence the action without written agreement of the Minister.	Compliant	The action was substantially commenced on 20 July 2018.

Attachment 1: Letter Notifying of Commencement of Action



mainroads
WESTERN AUSTRALIA

Enquiries: Fiona van Rijnswoud
Our Ref: 18/2978
Your Ref: EPBC 2017/7880

03 August 2018

EPBC Monitoring
Department of the Environment and Energy
GPO Box 787
Canberra ACT 2601

Dear Sir/Madam

Marble Bar Road Coongan Gorge Realignment – EPBC 2017/7880 Commencement of Action

In accordance with Condition 3 of EPBC 2017/7880, Main Roads Western Australia (Main Roads) as the approval holder, is required to advise the Department of the Environment and Energy (DotEE) in writing of the actual date of commencement of action within 30 days of commencement.

DotEE is advised that the action commenced on 20 July 2018. The commencement was in the form of clearing native vegetation on the main alignment. In accordance with Condition 2 of EPBC 2017/7880, the necessary pre-clearance trapping and relocation survey for Northern Quoll was undertaken by a fauna specialist prior to the commencement of clearing.

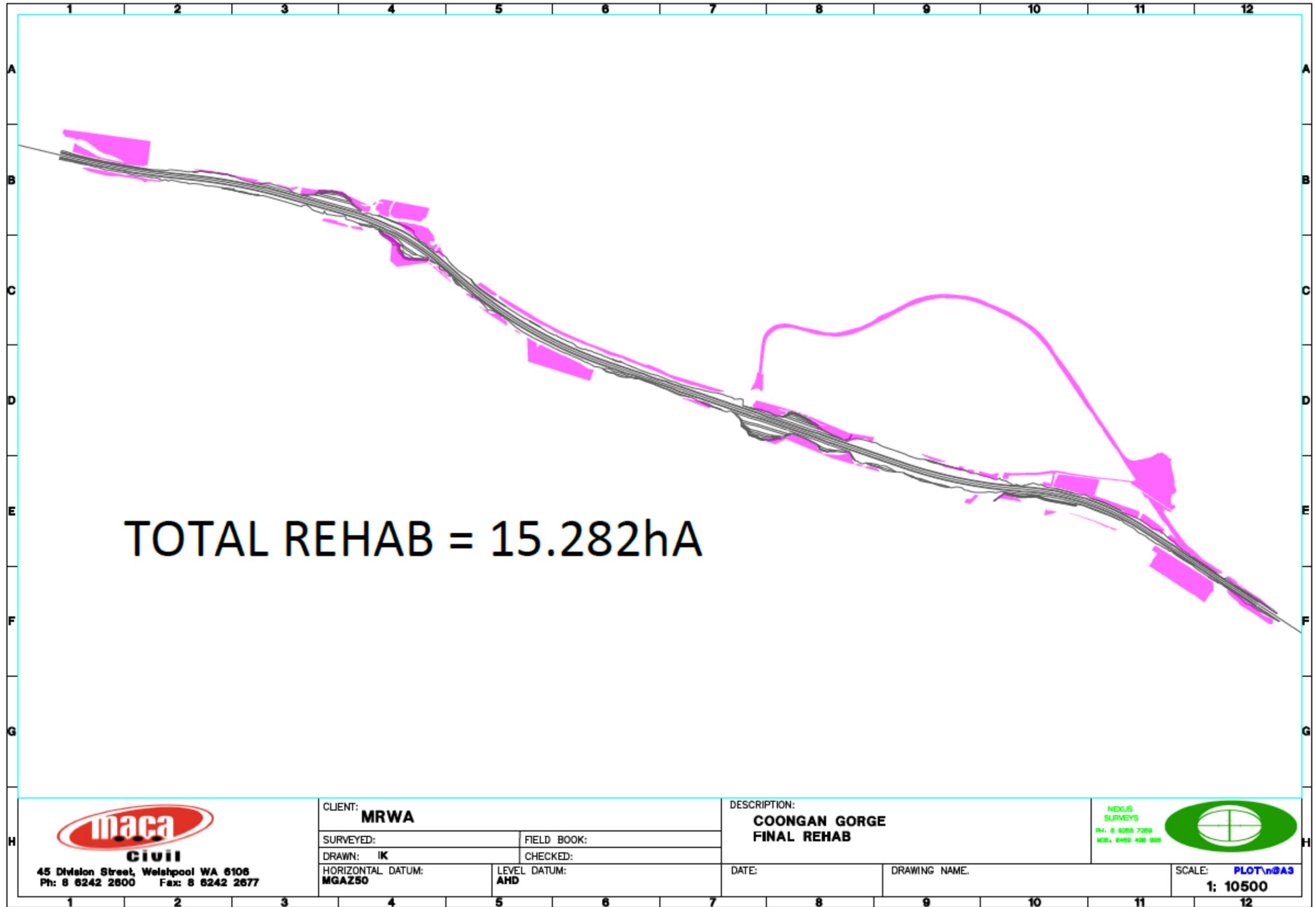
If you have any questions regarding the commencement of EPBC 2017/7880 please contact Fiona van Rijnswoud on (08) 9323 4584 or by email at fiona.vanrijnswoud@mainroads.wa.gov.au.

Yours sincerely



Chris Raykos
Project Director

Attachment 2: Map of Rehabilitated Areas



45 Division Street, Welshpool WA 6106
 Ph: 8 8242 2600 Fax: 8 8242 2677

CLIENT: **MRWA**

SURVEYED:

FIELD BOOK:

DRAWN: **IK**

CHECKED:

HORIZONTAL DATUM:
MGAZ50

LEVEL DATUM:
AHD

DESCRIPTION:
**COONGAN GORGE
FINAL REHAB**

NEXUS
SURVEYS
PH. 8 9288 7288
MOB. 8488 488 028

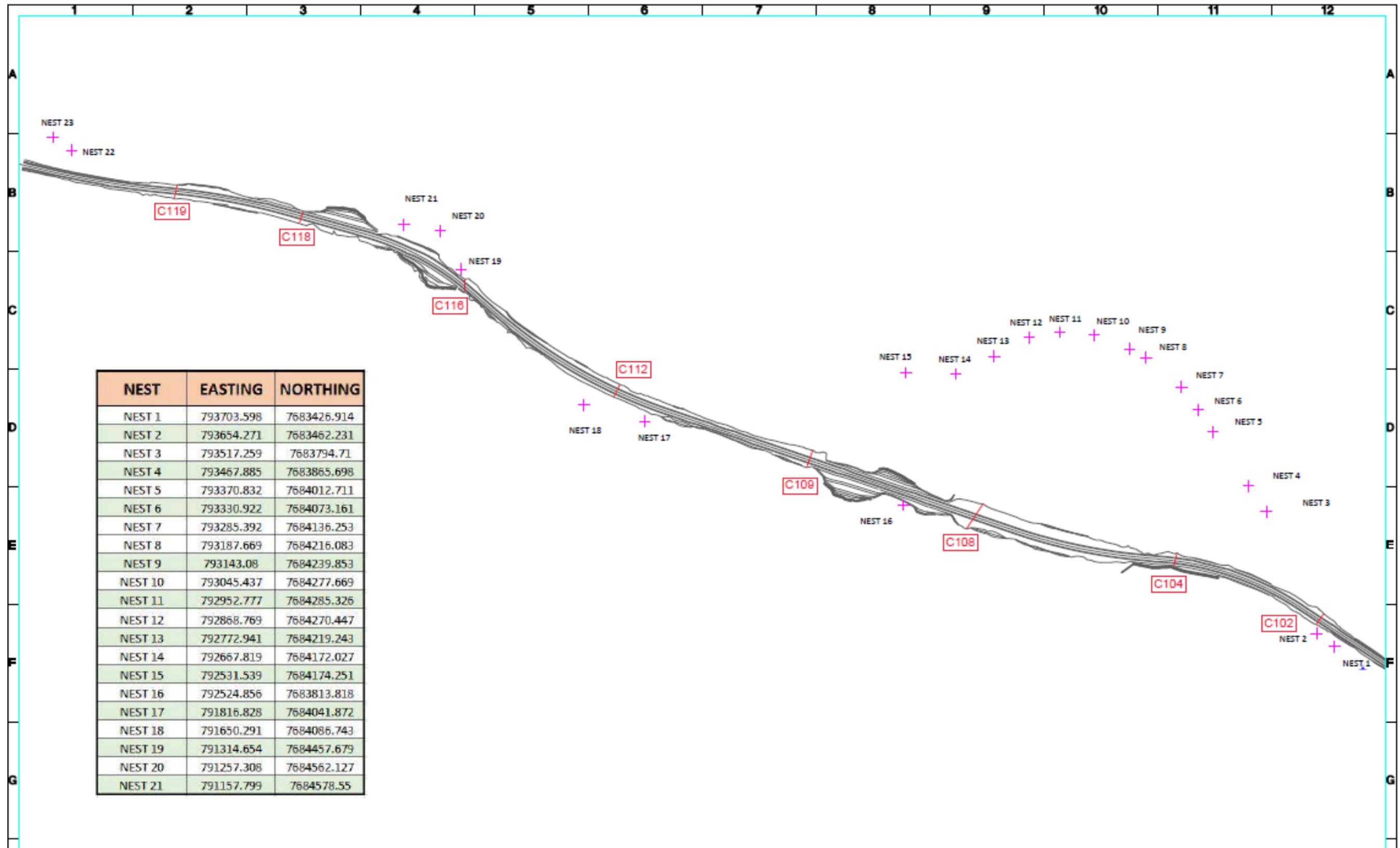


DATE:

DRAWING NAME:

SCALE: **PLOT\m@A3**
1: 10500

Attachment 3: Map of Artificial Rock Mounds



NEST	EASTING	NORTHING
NEST 1	793703.598	7683426.914
NEST 2	793654.271	7683462.231
NEST 3	793517.259	7683794.71
NEST 4	793467.885	7683865.698
NEST 5	793370.832	7684012.711
NEST 6	793330.922	7684073.161
NEST 7	793285.392	7684136.253
NEST 8	793187.669	7684216.083
NEST 9	793143.08	7684239.853
NEST 10	793045.437	7684277.669
NEST 11	792952.777	7684285.326
NEST 12	792868.769	7684270.447
NEST 13	792772.941	7684219.243
NEST 14	792667.819	7684172.027
NEST 15	792531.539	7684174.251
NEST 16	792524.856	7683813.818
NEST 17	791816.828	7684041.872
NEST 18	791650.291	7684086.743
NEST 19	791314.654	7684457.679
NEST 20	791257.308	7684562.127
NEST 21	791157.799	7684578.55

 45 Division Street, Welshpool WA 6106 Ph: 8 6242 2800 Fax: 8 6242 2677	CLIENT: MRWA		DESCRIPTION: COONGAN GORGE QUOLL NEST LOCATIONS		 NEXUS SURVEYS Ph: 8 6250 7200 Mob: 8450 400 900
	SURVEYED: _____ FIELD BOOK: _____				
	DRAWN: IK CHECKED: _____		DATE: _____ DRAWING NAME: _____		
	HORIZONTAL DATUM: MGAZ50		LEVEL DATUM: AHD		SCALE: 1: 9500

Attachment 4: Northern Quoll Monitoring Report

Northern Quoll Camera Trap Monitoring Program (2020)



Marble Bar Road
(SLK ~318.46 to SLK ~322.80)

Coongan Gorge Realignment

September 2020

V1

On behalf of:

Main Roads Western Australia
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TABLE OF CONTENTS

SUMMARY

1.	INTRODUCTION	1
2.	SCOPE OF WORKS.....	1
3.	METHODS.....	2
4.	RESULTS	5
5.	CONCLUSION AND RECOMMENDATIONS.....	7
6.	REFERENCES	9

FIGURES

FIGURE 1:	Culvert Locations
FIGURE 2:	Number of Quoll Detections (16 May – 6 Sept 2020)

PLATES

PLATE 1:	Number of Northern Quolls Recorded/Day
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TABLES

TABLE 1:	Summary of the Northern Quoll Monitoring Program
TABLE 2:	Summary of Camera Trap Deployment at Culverts
TABLE 3:	Summary of Fauna Recorded (mammals only)
TABLE 4:	Summary of Northern Quoll Movements
TABLE 5:	Summary of Northern Quoll Movements by Culvert Type

APPENDICES

APPENDIX A:	Camera Trap Data (mammals only)
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SUMMARY

This report details the results of the first year of a three year northern quoll (*Dasyurus hallucatus*) camera trap monitoring program along a ~4.4km section of the at the Marble Bar Road (SLK ~318.46 to SLK ~322.80) (survey area) carried out on behalf of Main Roads Western Australia (MRWA).

The Marble Bar Road in the vicinity of Coongan Gorge was realigned in 2019 to improve traffic safety. As part of the approval process a northern quoll management plan was formulated and implemented with the primary aims of minimising, mitigating and managing potential impacts to the local northern quoll population.

The approved Northern Quoll Management Plan (Astron 2017) required, among other management measures, the installation of culverts under the new road alignment to act as fauna underpasses. The management plan requires bi-annual monitoring of the use of these culverts by northern quolls over a three year period, post construction.

Culverts were installed at 20 locations along the new road realignment. Twelve sites utilised pipe culverts and eight, box culverts (Figure 1). The number of actual culverts at each site ranges for one to five as determined by anticipated hydraulic requirements.

The broad objective of the monitoring plan is to monitor and measure the effectiveness of management actions in protecting the local northern quoll population, specifically the use of the culverts by northern quolls.

Cameras were initially deployed on the 16 May 2020 however due to travel disruptions caused by Covid 19 restrictions great difficulty arose with respect to obtaining required flights to facilitate their pickup after the minimum two week deployment. As a consequence, the cameras were left in place until the 12 August 2020 (88 days).

On the 12 August 2020, batteries within the cameras were replaced and pictures downloaded. Cameras were then left in place until the 6 September 2020 (25 days) giving a total continuous deployment period of 113 days for most cameras.

Thirty two cameras were initially deployed on the 12 May 2020. An additional four cameras were deployed on the 12 August 2020.

Key Findings

- A total of 263 unique fauna detections (mammals only) were made during the 113 day monitoring period.
- Northern quolls were recorded 130 times on 65 of the 113 days of monitoring. Records were made at 10 of the 12 culverts subject to monitoring. In 84 cases (~65% of records) the individual was deemed to have passed through the culvert either heading to the north or the south (based on being photographed on either side of the culvert in a short space of time or where the individual was photographed entering the

culvert and not returning). In 46 cases (~35% of records) it could not be determined if the culvert had been used.

- The results strongly suggest that box culverts are being favoured compared to pipe culverts though it should be acknowledged that more box culverts were monitored than pipe culverts (eight compared to four) and in some cases for a longer period.
- Northern quolls were consistently recorded from the commencement of monitoring (16 May 2010) until the 11 June 2020 from which point records became relatively intermittent. From about the 8 August 2020 records increased in frequency with a peak around the 16 August 2020.
- The only feral predators recorded were cats (*Felis catus*). Cats were recorded on 65 unique occasions at 11 of the 12 culverts subject to monitoring. About half of the records indicated use of the culverts by individual cats to pass under the road. No actual cat/northern quoll interactions were recorded.
- The level of culvert used by northern quolls (~65% of records) does not breach the performance indicators detailed in the approved management plan (<40% recorded northern quolls using culverts - Astron 2017). Based on this criterion the management approach (i.e. installing culverts) can be deemed successful in minimising impacts on northern quoll and as such no contingency responses as detailed in the management plan are considered warranted. Based on this criterion and the level of culvert use it is also assumed that the presence of cats is not contributing to a significant decline in northern quolls or their use of culverts.
- Based on the results obtained the following recommendations are provided for implementation during the 2021 camera trap monitoring program.
 - It is recommended that some additional pipe culverts in the area of greatest northern quoll activity (between culverts 109 to 118) be monitored (i.e. 111, 113, 114 and 117) during the 2021 monitoring program.
 - It is recommended that consideration be given to running the camera trap monitoring program over a similar period as undertaken in 2020 (i.e. continuously from sometime in April/May to sometime in July/August with a visit mid survey to check units and replace batteries if required).

Due to logistical difficulties caused by Covid-19 travel restrictions the 2020 monitoring program was run continuously from mid May to early September. This resulted in the accumulation of 130 northern quoll records which provided good data for analysis. If the monitoring program was actually run for two weeks in April/May and two weeks in July/August, as originally planned the number of records obtained is likely to have been less than half this figure which may not have provided sufficient information for a robust analysis. This proposal can be undertaken with no additional budgetary requirements.

1. INTRODUCTION

This report details the results of the first year of a three year northern quoll (*Dasyurus hallucatus*) camera trap monitoring program along a ~4.4km section of the at the Marble Bar Road (SLK ~318.46 to SLK ~322.80) (survey area) carried out on behalf of Main Roads Western Australia (MRWA).

The Marble Bar Road in the vicinity of Coongan Gorge was realigned in 2019 to improve traffic safety. The project was deemed a controlled action under the *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)* (EPBC Ref: 2017/7880) by the federal Department of Agriculture Water and Environment (DAWE) as it was considered likely to have a significant impact on the *EPBC Act* listed (endangered) northern quoll (*Dasyurus hallucatus*).

To facilitate the DAWE and Department of Water and Environment Regulation's (DWER) approval of the project, a northern quoll management plan was formulated and implemented with the primary aims of minimising, mitigating and managing potential impacts to the local northern quoll population.

The approved Northern Quoll Management Plan (Astron 2017) required, among other management measures, the installation of culverts under the new road alignment to act as fauna underpasses. The management plan requires bi-annual monitoring of the use of these culverts by northern quolls over a three year period, post construction.

Culverts were installed at 20 locations along the new road realignment. Twelve sites utilised pipe culverts and eight, box culverts (Figure 1). The number of actual culverts at each site ranges for one to five as determined by anticipated hydraulic requirements.

The broad objective of the monitoring plan is to monitor and measure the effectiveness of management actions in protecting the local northern quoll population, specifically the use of the culverts by northern quolls. One possible outcome will also be to determine whether the box culverts are preferred by northern quolls for dispersal (compared to pipe culverts) and if they provide protection from predation.

2. SCOPE OF WORKS

The scope of works was to carry out a camera trap monitoring survey to determine the use of road culverts by northern quoll (*Dasyurus hallucatus*) along the Marble Bar Road between SLK ~318.46 and SLK ~322.80.

The surveys are to be carried out bi-annually for three years post construction with cameras to be placed out for a minimum two 14-day periods each year.

The department of Biodiversity, Conservation and Attractions (DBCA) have indicated that one survey should be carried out in April-May, to optimise determining the use of the culverts by sub-adult quolls from the previous breeding season. A second survey should

be carried out over a two week period in July-August, to optimise determining the use of the culverts by adult males in the population before they die off after the mating season.

A report is required detailing methods and results at the end of each of the first two years, with the final report summarising all three years data. The monitoring report includes reporting of monitoring trends against performance indicators, any exceedance of these performance indicators and recommendations for review and revision of management actions if required.

Table 1: Summary of the Northern Quoll Monitoring Program

Monitoring Parameter	Methodology	Annual Monitoring Effort	Timing, Frequency and Duration	Performance Indicators
Use of box culverts by northern quolls	Remote cameras	Four cameras placed at the ends (two cameras at each end) of a minimum of four box and four pipe culverts (32 cameras in total)	Annually for three years post construction. Cameras will be placed out for two 14-day periods during the breeding season.	>60% of all northern quolls captured at the entrance of the culvert are deemed to have not passed through, where a biometrically significant amount of NQ activity is actually captured on camera

The report presented here covers the first bi-annual monitoring period being part of the overall three year monitoring schedule as detailed below:

- April-May 2020 (reported on here);
- July-August 2020 (reported on here);
- April-May 2021;
- July-August 2021;
- April-May 2022; and
- July-August 2022.

3. METHODS

Cameras were initially deployed on the 16 May 2020 however due to travel disruptions caused by Covid 19 restrictions great difficulty arose with respect to obtaining required flights to facilitate their pickup after the minimum two week deployment. As a consequence, the cameras were left in place until the 12 August 2020 (88 days). On the 12 August 2020, batteries within the cameras were replaced and pictures downloaded. Malfunctioning cameras were replaced and some additional cameras were also deployed.

Cameras were then left in place until the 6 September 2020 (25 days) giving a total continuous deployment period of 113 days for most cameras.

Thirty two cameras were initially deployed on the 12 May 2020. An additional four cameras were deployed on the 12 August 2020. Table 2 details each culvert along the realignment, its type and the number and dates of camera trap deployment.

As a minimum it was initially proposed to install four infra-red motion sensing cameras (two at each end) at eight culverts (32 cameras in total) to record the movement of fauna. Some of the sites were however found to have only a single culvert and it was therefore decided to only deploy a single camera at some of these locations as camera coverage would be adequate (i.e.no blind spots). This allowed for the monitoring of 10 culverts during the first phase (16 May 2020 – 12 August 2020). An additional two culverts were monitored during the second phase (12 August 2020 to 6 September 2020).

Cameras deployed included Little Acorn Ltl-5210a, Campark T40 and Campark T70 models. Cameras were set to take three photos in succession when triggered with a five second pause between any subsequent trigger event. Cameras were tied to small metal stakes several metres in front of the culverts being monitored.

Upon collection photos on each camera were analysed to obtain the following measure (performance indicator):

- Northern quoll usage of culverts - the direction of the animal on the image and time stamps on the cameras were used to calculate the proportion of northern quolls captured at an entrance of a culvert that are deemed to have passed through to the other side.
- Any images of feral predators (and other fauna, mammals only) were recorded and stored for possible future data analysis. If any performance indicators for northern quolls are exceeded, then the data for feral predator abundance can be reviewed to determine if this is contributing to the decline in quolls or their use of culverts.

Table 2: Summary of Camera Trap Deployment at Culverts

Culvert ID	MGA 94			Culvert Type (& Number)	Monitored (Year 1)	Camera Deployment	Days Deployed	Number of Cameras	Camera Numbers
	Zone	mE	mN						
101	50K	793852	7683377	Pipe (1)	No	N/A	0	0	N/A
102	50K	793660	7683501	Box (5)	Yes	16 May to 6 Sept 2020	113	4	GH 17/GH 64 - GH 21/GH 83
103	50K	793567	7683562	Pipe (1)	Yes	16 May to 6 Sept 2020	113	2	GH 15/GH 88
104	50K	793265	7683661	Box (1)	Yes	16 May to 6 Sept 2020	113	2	GH 20/GH 34 (GH 35)
105	50K	793132	7683674	Pipe (1)	No	N/A	0	0	N/A
106	50K	793060	7683684	Pipe (2)	Yes	12 August to 6 Sept 2020	25	2	GH 10/GH 28
107	50K	793000	7683696	Pipe (1)	No	N/A	0	0	N/A
108	50K	792717	7683784	Box (5)	Yes	16 May to 6 Sept 2020	113	4	GH 26/GH 86 - GH 46 (GH 22)/GH 62
109	50K	792264	7683937	Box (2)	Yes	16 May to 6 Sept 2020	113	4	GH 42/GH 89 - GH 47/GH 65
110	50K	791846	7684081	Pipe (1)	Yes	12 August to 6 Sept 2020	25	2	GH 06 - GH 46
111	50K	791816	7684091	Pipe (1)	No	N/A	0	0	N/A
112	50K	791738	7684125	Box (1)	Yes	16 May to 6 Sept 2020	113	4	GH 29/GH 60 - GH 31/GH 80
113	50K	791682	7684151	Pipe (1)	No	N/A	0	0	N/A
114	50K	791614	7684191	Pipe (1)	No	N/A	0	0	N/A
115	50K	791412	7684333	Pipe (3)	Yes	16 May to 6 Sept 2020	113	2	GH 13/GH 87
116	50K	791323	7684405	Box (1)	Yes	16 May to 6 Sept 2020	113	2	GH 24/GH 43
117	50K	791096	7684538	Pipe (5)	No	N/A	0	0	N/A
118	50K	790875	7684604	Box (1)	Yes	16 May to 6 Sept 2020	113	4	GH 19/GH 63 - GH 25/GH 67
119	50K	790534	7684669	Box (5)	Yes	16 May to 6 Sept 2020	113	4	GH 09/GH 61 - GH 16/GH 85
120	50K	790452	7684676	Pipe (2)	No	N/A	0	0	N/A

Note: Camera numbers in brackets represent replacements for malfunctioning cameras initially deployed.

4. RESULTS

As previously indicated, camera traps were deployed continuously and for a much longer period than originally planned due to logistical difficulties. This has however resulted in the accumulation of additional data that will be used for the purpose of this current assessment.

A total of 263 unique fauna detections (mammals only) were made during the 113 day monitoring period. A summary of the species detected is shown in Table 3.

Table 3: Summary of Fauna Recorded (mammals only)

Common Name	Species	Number of Unique Records
Northern Quoll	<i>Dasyurus hallucatus</i>	130
Cat	<i>Felis catus</i>	65
Dingo/Dog	<i>Canus lupus</i>	11
Euro	<i>Macropus robustus</i>	43
Rothschild's Rock-wallaby	<i>Petrogale rothschildi</i>	14

Table 4 and Figure 2 provide a summary of the total number of northern quolls recorded at each culvert during the monitoring period. Northern quolls were recorded 130 times on 65 of the 113 days of monitoring. Records were made at 10 of the 12 culverts subject to monitoring. In 84 cases (~65% of records) the individual was deemed to have passed through the culvert either heading to the north or the south (based on being photographed on either side of the culvert in a short space of time or where the individual was photographed entering the culvert and not returning). In 46 cases (~35% of records) it could not be determined if the culvert had been used.

Table 4: Summary of Northern Quoll Movements

Culvert Number	Culvert Type (Number)	Quoll Detections	Culvert Used	Culvert Not Used/Unknown
102	Box (5)	1	0	1
103	Pipe (1)	1	1	0
104	Box (1)	7	6	1
106	Pipe (2)	0	0	0
108	Box (5)	3	2	1
109	Box (2)	25	22	3
110	Pipe (1)	0	0	0
112	Box (1)	27	7	20
115	Pipe (3)	1	0	1
116	Box (1)	35	27	8
118	Box (1)	27	16	11
119	Box (5)	3	3	0
Totals		130	84	46

A summary of northern quoll movements based on culvert type is provided in Table 5. The results strongly suggest that box culverts are being favoured compared to pipe culverts though it should be acknowledged that more box culverts were monitored than pipe culverts (eight compared to four) and in some cases for a longer period.

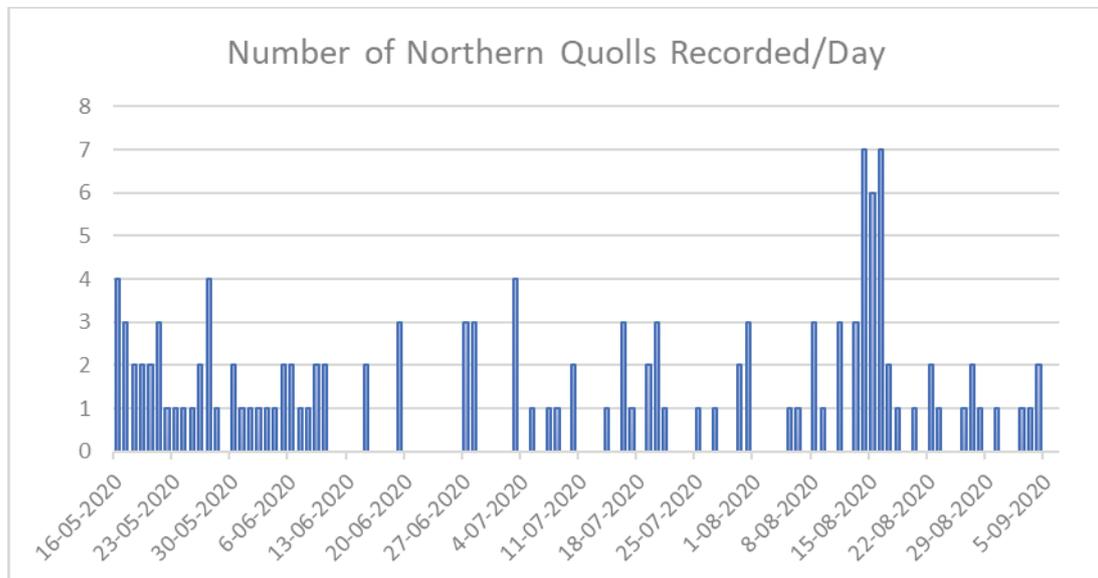
The location of the culverts within the survey area could also have an influence on how many northern quolls frequent any one particular culvert. Most northern quoll activity was detected between culverts 109 to 118 (see Table 4/Figure 2). In this zone there are four box culverts being monitored but only two pipe culverts, though as the results suggest pipe culverts even in this area appear to be extremely underutilised despite the relative high frequency of northern quoll detections at nearby box culverts.

Table 5: Summary of Northern Quoll Movements by Culvert Type

Culvert Type	Quoll Detections	Culvert Used	Culvert Not Used/Unknown
Box	128	83	45
Pipe	2	1	1
Total	130	84	46

A previously mentioned northern quolls were recorded on 65 of the 113 days of monitoring. The specific days and number of northern quolls recorded are shown in Plate 1.

Plate 1: Number of Northern Quolls Recorded/Day



Northern quolls were consistently recorded from the commencement of monitoring (16 May 2010) until the 11 June 2020 from which point records became relatively intermittent. From about the 8 August 2020 records increased in frequency with a peak around the 16 August 2020. Given that specific individuals cannot generally be identified from camera trap pictures the changes in the number of records obtained cannot be attributed to either an increase in the number of individuals or greater activity of single individuals

The only feral predators recorded were cats (*Felis catus*). Cats were recorded on 65 unique occasions at 11 of the 12 culverts subject to monitoring. About half of the records indicated use of the culverts by individual cats to pass under the road. No actual cat/northern quoll interactions were recorded.

The records of northern quoll activity obtained during the 2020 survey period suggests that performance indicators detailed in the approved management plan for northern quolls have not been exceeded (i.e. data obtained did not show >60% of the northern quolls recorded did not use the culvert), and based on this criterion it is assumed that the presence of cats is not contributing to a significant decline in northern quolls or their use of culverts.

5. CONCLUSION AND RECOMMENDATIONS

The camera trap monitoring program detailed in this report was carried out to monitor and measure the effectiveness of management actions in protecting the local northern quoll population, in particular the use of under road culverts by northern quolls along the recently realigned section of the Marble Bar Road at Coongan Gorge.

The results of the 2020 monitoring program clearly indicate that a significant proportion of northern quolls recorded by camera traps are utilising the culverts as a means of moving from one side of the road to the other. The results obtained to date also strongly suggest that box culverts are being used for this purpose in preference to pipe culverts.

The level of culvert used by northern quolls (~65% of records) does not breach the performance indicators detailed in the approved management plan (<40% recorded northern quolls using culverts - Astron 2017). Based on this criterion the management approach (i.e. installing culverts) can be deemed successful in minimising impacts on northern quoll and as such no contingency responses as detailed in the management plan are considered warranted. Based on this criterion and the level of culvert use it is also assumed that the presence of cats is not contributing to a significant decline in northern quolls or their use of culvert.

Based on the results obtained the following recommendations are provided for implementation during the 2021 camera trap monitoring program.

- It is recommended that some additional pipe culverts in the area of greatest northern quoll activity (between culverts 109 to 118) be monitored (i.e. 111, 113, 114 and 117) during the 2021 monitoring program.
- It is recommended that consideration be given to running the camera trap monitoring program over a similar period as undertaken in 2020 (i.e. continuously from sometime in April/May to sometime in July/August with a visit mid survey to check units and replace batteries if required).

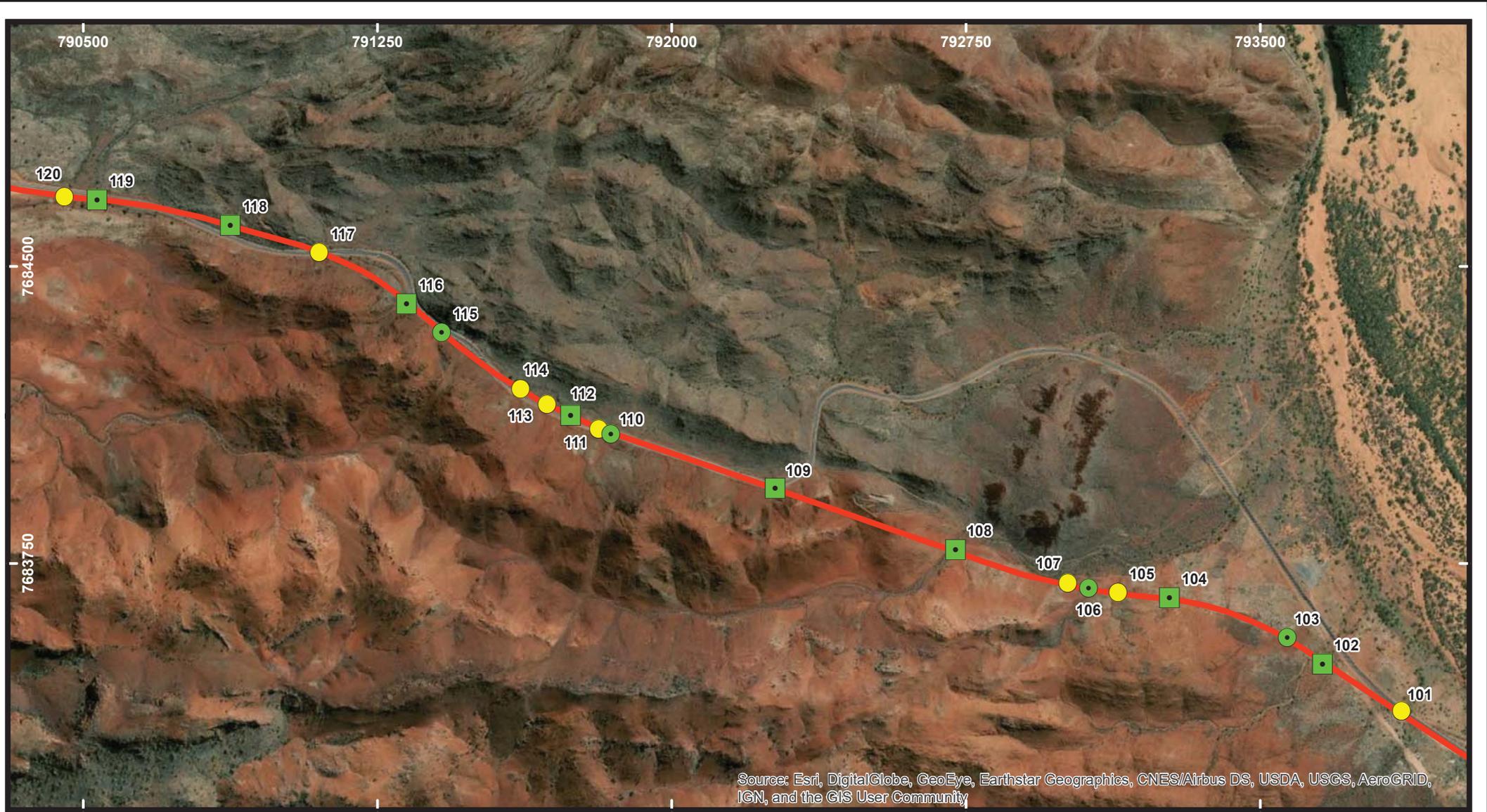
Due to logistical difficulties caused by Covid-19 travel restrictions the 2020 monitoring program was run continuously from mid May to early September. This

resulted in the accumulation of 130 northern quoll records which provided good data for analysis. If the monitoring program was actually run for two weeks in April/May and two weeks in July/August as originally planned the number of records obtained is likely to have been less than half this figure which may not have provided sufficient information for a robust analysis. This proposal can be undertaken with no additional budgetary requirements.

6. REFERENCES

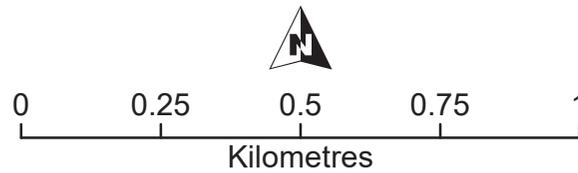
Astron Environmental Services Pty Ltd (2017). Marble Bar Road (M030) Coongan Gorge Realignment - Northern Quoll Management Plan. Unpublished report for main Road Western Australia. May 2017.

FIGURES



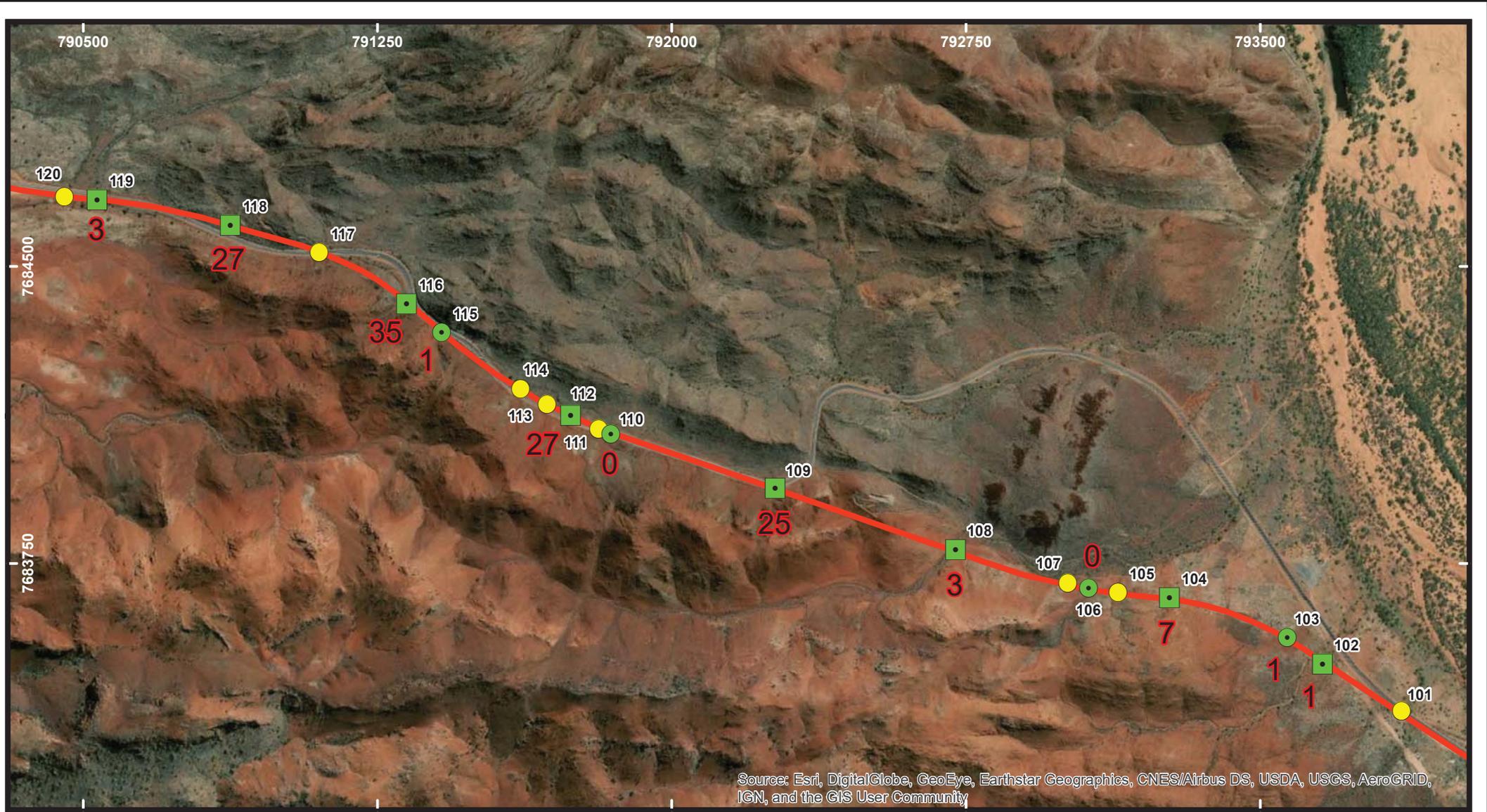
Legend

- Road Alignment
- Box Culvert (Monitored)
- Pipe Culvert (Monitored)
- Pipe Culvert (Not Monitored)



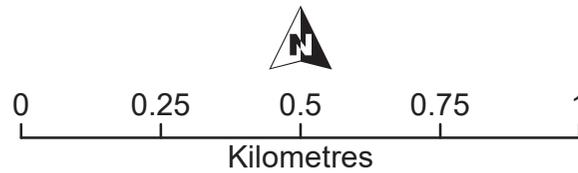
 Fauna Survey
Drawn: G Harewood
Date: Sept 2020
Scale: 1: 250,000
Projection/Coordinate System: UTM/MGA Zone 50

Marble Bar Road Coongan Gorge Realignment Culvert Locations
Figure: 1



Legend

- Road Alignment
- Box Culvert (Monitored)
- Pipe Culvert (Monitored)
- Pipe Culvert (Not Monitored)



Fauna Survey
 Drawn: G Harewood
 Date: Sept 2020
 Scale: 1: 250,000
 Projection/Coordinate System: UTM/MGA Zone 50

**Marble Bar Road
 Coongan Gorge Realignment**
**Number of Quoll
 Detections**
 (16 May - 6 Sept 2020)

APPENDIX A

CAMERA TRAP RECORDS (MAMMALS ONLY)

Camera Trap Results

16 May - 6 September 2020

Marble Bar Road (SLK ~318.46 to SLK ~322.80)

Culvert Number	Culvert Type	Camera Numbers	Camera	Common Name	Species	Date	Time	Direction of Travel	Number	Setup
C 102	Box Culvert (5)	GH 17/GH 64 - GH 21/GH 83	GH 83	Northern Quoll	Dasyurus hallucatus	17-05-2020	9:11:00 PM	Unknown	1	Dual Cameras either end
C 102	Box Culvert (5)	GH 17/GH 64 - GH 21/GH 83	GH 17	Cat	Felis catus	26-05-2020	2:39:00 AM	Unknown	1	Dual Cameras either end
C 102	Box Culvert (5)	GH 17/GH 64 - GH 21/GH 83	GH 64	Cat	Felis catus	26-05-2020	8:40:00 PM	Unknown	1	Dual Cameras either end
C 102	Box Culvert (5)	GH 17/GH 64 - GH 21/GH 83	GH 64	Dingo/Dog	Canus lupus	29-07-2020	1:34:00 AM	Unknown	1	Dual Cameras either end
C 102	Box Culvert (5)	GH 17/GH 64 - GH 21/GH 83	GH 64	Cat	Felis catus	02-08-2020	8:14:00 PM	North	1	Dual Cameras either end
C 102	Box Culvert (5)	GH 17/GH 64 - GH 21/GH 83	GH 64, GH 83	Cat	Felis catus	05-09-2020	9:44:00 PM	North	1	Dual Cameras either end
C 103	Pipe Culvert (1)	GH 15/GH 88	GH 15	Northern Quoll	Dasyurus hallucatus	16-05-2020	10:48:00 PM	North	1	Single cameras either end
C 104	Box Culvert (1)	GH 20/GH 34	GH 20	Euro	Macropus robustus	17-05-2020	1:31:00 AM	South	1	Single cameras either end
C 104	Box Culvert (1)	GH 20/GH 34	GH 20	Cat	Felis catus	28-06-2020	5:39:00 PM	North	1	Single cameras either end
C 104	Box Culvert (1)	GH 20/GH 34	GH 20	Northern Quoll	Dasyurus hallucatus	03-07-2020	6:28:00 PM	North	1	Single cameras either end
C 104	Box Culvert (1)	GH 20/GH 34	GH 20	Cat	Felis catus	07-07-2020	11:11:00 PM	North	1	Single cameras either end
C 104	Box Culvert (1)	GH 20/GH 34	GH 20	Cat	Felis catus	10-07-2020	3:43:00 AM	North	1	Single cameras either end
C 104	Box Culvert (1)	GH 20/GH 34	GH 20	Northern Quoll	Dasyurus hallucatus	10-07-2020	7:36:00 PM	North	1	Single cameras either end
C 104	Box Culvert (1)	GH 20/GH 34	GH 20	Cat	Felis catus	16-07-2020	6:11:00 AM	South	1	Single cameras either end
C 104	Box Culvert (1)	GH 20/GH 34	GH 20	Cat	Felis catus	16-07-2020	7:23:00 PM	Unknown	1	Single cameras either end
C 104	Box Culvert (1)	GH 20/GH 34	GH 20	Cat	Felis catus	21-07-2020	12:26:00 AM	North	1	Single cameras either end
C 104	Box Culvert (1)	GH 20/GH 35	GH 35	Northern Quoll	Dasyurus hallucatus	27-08-2020	3:17:00 AM	South	1	Single cameras either end
C 104	Box Culvert (1)	GH 20/GH 35	GH 35	Northern Quoll	Dasyurus hallucatus	28-08-2020	1:01:00 AM	Unknown	1	Single cameras either end
C 104	Box Culvert (1)	GH 20/GH 35	GH 35	Northern Quoll	Dasyurus hallucatus	02-09-2020	4:58:00 AM	South	1	Single cameras either end
C 104	Box Culvert (1)	GH 20/GH 35	GH 20	Cat	Felis catus	02-09-2020	8:48:00 PM	North	1	Single cameras either end
C 104	Box Culvert (1)	GH 20/GH 35	GH 20	Cat	Felis catus	02-09-2020	11:58:00 PM	North	1	Single cameras either end
C 104	Box Culvert (1)	GH 20/GH 35	GH 35	Northern Quoll	Dasyurus hallucatus	03-09-2020	3:58:00 AM	South	1	Single cameras either end
C 104	Box Culvert (1)	GH 20/GH 35	GH 35	Northern Quoll	Dasyurus hallucatus	04-09-2020	8:00:00 PM	South	1	Single cameras either end
C 106	Pipe Culvert (2)	GH 10/GH 28	GH 28	Euro	Macropus robustus	18-08-2020	4:47:00 PM	Unknown	1	Single cameras either end
C 106	Pipe Culvert (2)	GH 10/GH 28	GH 28	Euro	Macropus robustus	01-09-2020	1:21:00 AM	Unknown	1	Single cameras either end
C 106	Pipe Culvert (2)	GH 10/GH 28	GH 28	Euro	Macropus robustus	01-09-2020	2:00:00 AM	Unknown	1	Single cameras either end
C 106	Pipe Culvert (2)	GH 10/GH 28	GH 10	Cat	Felis catus	01-09-2020	4:43:00 PM	Unknown	1	Single cameras either end
C 106	Pipe Culvert (2)	GH 10/GH 28	GH 10	Cat	Felis catus	02-09-2020	8:30:00 PM	Unknown	1	Single cameras either end
C 108	Box Culvert (5)	GH 26/GH 86 - GH 46/GH 62	GH 46	Euro	Macropus robustus	18-05-2020	11:11:00 PM	Unknown	1	Dual Cameras either end
C 108	Box Culvert (5)	GH 26/GH 86 - GH 46/GH 62	GH 86	Euro	Macropus robustus	02-06-2020	8:20:00 PM	Unknown	1	Dual Cameras either end
C 108	Box Culvert (5)	GH 26/GH 86 - GH 46/GH 62	GH 26	Euro	Macropus robustus	06-06-2020	4:14:00 AM	Unknown	1	Dual Cameras either end
C 108	Box Culvert (5)	GH 26/GH 86 - GH 46/GH 62	GH 86	Cat	Felis catus	10-06-2020	6:22:00 AM	Unknown	1	Dual Cameras either end
C 108	Box Culvert (5)	GH 26/GH 86 - GH 46/GH 62	GH 86	Cat	Felis catus	10-06-2020	6:16:00 PM	Unknown	1	Dual Cameras either end
C 108	Box Culvert (5)	GH 26/GH 86 - GH 46/GH 62	GH 62	Dingo/Dog	Canus lupus	16-06-2020	5:08:00 AM	Unknown	1	Dual Cameras either end
C 108	Box Culvert (5)	GH 26/GH 86 - GH 46/GH 62	GH 26	Euro	Macropus robustus	21-06-2020	6:51:00 AM	Unknown	1	Dual Cameras either end
C 108	Box Culvert (5)	GH 26/GH 86 - GH 46/GH 62	GH 86	Northern Quoll	Dasyurus hallucatus	03-07-2020	10:27:00 PM	Unknown	1	Dual Cameras either end
C 108	Box Culvert (5)	GH 26/GH 86 - GH 46/GH 62	GH 86	Euro	Macropus robustus	04-07-2020	5:32:00 PM	North	1	Dual Cameras either end
C 108	Box Culvert (5)	GH 26/GH 86 - GH 46/GH 62	GH 26	Cat	Felis catus	05-07-2020	5:09:00 AM	South	1	Dual Cameras either end
C 108	Box Culvert (5)	GH 26/GH 86 - GH 46/GH 62	GH 62	Cat	Felis catus	07-07-2020	5:55:00 PM	Unknown	1	Dual Cameras either end
C 108	Box Culvert (5)	GH 26/GH 86 - GH 46/GH 62	GH 46	Cat	Felis catus	11-07-2020	3:24:00 AM	Unknown	1	Dual Cameras either end
C 108	Box Culvert (5)	GH 26/GH 86 - GH 46/GH 62	GH 26	Euro	Macropus robustus	02-08-2020	3:39:00 AM	South	1	Dual Cameras either end
C 108	Box Culvert (5)	GH 26/GH 86 - GH 46/GH 62	GH 62	Northern Quoll	Dasyurus hallucatus	06-08-2020	11:57:00 PM	South	1	Dual Cameras either end

Culvert Number	Culvert Type	Camera Numbers	Camera	Common Name	Species	Date	Time	Direction of Travel	Number	Setup
C 108	Box Culvert (5)	GH 26/GH 86 - GH 46/GH 62	GH 26	Cat	Felis catus	12-08-2020	2:11:00 AM	Unknown	1	Dual Cameras either end
C 108	Box Culvert (5)	GH 26/GH 86 - GH 46/GH 62	GH 22	Northern Quoll	Dasyurus hallucatus	15-08-2020	8:44:00 PM	South	1	Dual Cameras either end
C 108	Box Culvert (5)	GH 26/GH 86 - GH 46/GH 62	GH 43	Cat	Felis catus	28-08-2020	4:12:00 AM	Unknown	1	Dual Cameras either end
C 109	Box Culvert (2)	GH 42/GH 89 - GH 47/GH 65	GH 89	Northern Quoll	Dasyurus hallucatus	18-05-2020	11:11:00 PM	Unknown	1	Dual Cameras either end
C 109	Box Culvert (2)	GH 42/GH 89 - GH 47/GH 65	GH 89	Northern Quoll	Dasyurus hallucatus	19-05-2020	12:04:00 AM	South	1	Dual Cameras either end
C 109	Box Culvert (2)	GH 42/GH 89 - GH 47/GH 65	GH 89	Northern Quoll	Dasyurus hallucatus	20-05-2020	2:04:00 AM	South	1	Dual Cameras either end
C 109	Box Culvert (2)	GH 42/GH 89 - GH 47/GH 65	GH 47	Northern Quoll	Dasyurus hallucatus	21-05-2020	11:23:00 PM	South	1	Dual Cameras either end
C 109	Box Culvert (2)	GH 42/GH 89 - GH 47/GH 65	GH 65	Northern Quoll	Dasyurus hallucatus	21-05-2020	11:42:00 PM	South	1	Dual Cameras either end
C 109	Box Culvert (2)	GH 42/GH 89 - GH 47/GH 65	GH 47	Northern Quoll	Dasyurus hallucatus	22-05-2020	1:33:00 AM	South	1	Dual Cameras either end
C 109	Box Culvert (2)	GH 42/GH 89 - GH 47/GH 65	GH 65	Cat	Felis catus	24-05-2020	1:36:00 AM	North	1	Dual Cameras either end
C 109	Box Culvert (2)	GH 42/GH 89 - GH 47/GH 65	GH 65	Cat	Felis catus	25-05-2020	6:55:00 PM	Unknown	1	Dual Cameras either end
C 109	Box Culvert (2)	GH 42/GH 89 - GH 47/GH 65	GH 89	Cat	Felis catus	25-05-2020	7:01:00 PM	South	1	Dual Cameras either end
C 109	Box Culvert (2)	GH 42/GH 89 - GH 47/GH 65	GH 65	Northern Quoll	Dasyurus hallucatus	27-05-2020	1:51:00 AM	North	1	Dual Cameras either end
C 109	Box Culvert (2)	GH 42/GH 89 - GH 47/GH 65	GH 47	Northern Quoll	Dasyurus hallucatus	27-05-2020	1:53:00 AM	South	1	Dual Cameras either end
C 109	Box Culvert (2)	GH 42/GH 89 - GH 47/GH 65	GH 89	Northern Quoll	Dasyurus hallucatus	27-05-2020	1:57:00 AM	Unknown	1	Dual Cameras either end
C 109	Box Culvert (2)	GH 42/GH 89 - GH 47/GH 65	GH 89	Northern Quoll	Dasyurus hallucatus	31-05-2020	8:45:00 PM	South	1	Dual Cameras either end
C 109	Box Culvert (2)	GH 42/GH 89 - GH 47/GH 65	GH 89	Euro	Macropus robustus	05-06-2020	12:00:00 AM	Unknown	1	Dual Cameras either end
C 109	Box Culvert (2)	GH 42/GH 89 - GH 47/GH 65	GH 47	Northern Quoll	Dasyurus hallucatus	06-06-2020	11:20:00 PM	South	1	Dual Cameras either end
C 109	Box Culvert (2)	GH 42/GH 89 - GH 47/GH 65	GH 89	Northern Quoll	Dasyurus hallucatus	06-06-2020	11:21:00 PM	North	1	Dual Cameras either end
C 109	Box Culvert (2)	GH 42/GH 89 - GH 47/GH 65	GH 89, GH 65	Northern Quoll	Dasyurus hallucatus	15-06-2020	6:57:00 PM	South	1	Dual Cameras either end
C 109	Box Culvert (2)	GH 42/GH 89 - GH 47/GH 65	GH 89, GH 65	Northern Quoll	Dasyurus hallucatus	19-06-2020	9:03:00 PM	North	1	Dual Cameras either end
C 109	Box Culvert (2)	GH 42/GH 89 - GH 47/GH 65	GH 47, GH 65	Northern Quoll	Dasyurus hallucatus	27-06-2020	1:22:00 AM	North	1	Dual Cameras either end
C 109	Box Culvert (2)	GH 42/GH 89 - GH 47/GH 65	GH 65, GH 89	Northern Quoll	Dasyurus hallucatus	27-06-2020	11:55:00 PM	North	1	Dual Cameras either end
C 109	Box Culvert (2)	GH 42/GH 89 - GH 47/GH 65	GH 47, GH 65	Northern Quoll	Dasyurus hallucatus	28-06-2020	1:06:00 AM	South	1	Dual Cameras either end
C 109	Box Culvert (2)	GH 42/GH 89 - GH 47/GH 65	GH 47, GH 65	Northern Quoll	Dasyurus hallucatus	28-06-2020	1:34:00 AM	South	1	Dual Cameras either end
C 109	Box Culvert (2)	GH 42/GH 89 - GH 47/GH 65	GH 47	Northern Quoll	Dasyurus hallucatus	07-07-2020	10:38:00 PM	Unknown	1	Dual Cameras either end
C 109	Box Culvert (2)	GH 42/GH 89 - GH 47/GH 65	GH 65	Northern Quoll	Dasyurus hallucatus	14-07-2020	10:50:00 PM	South	1	Dual Cameras either end
C 109	Box Culvert (2)	GH 42/GH 89 - GH 47/GH 65	GH 65	Northern Quoll	Dasyurus hallucatus	20-07-2020	12:19:00 AM	North	1	Dual Cameras either end
C 109	Box Culvert (2)	GH 42/GH 89 - GH 47/GH 65	GH 65	Cat	Felis catus	24-07-2020	2:30:00 AM	Unknown	1	Dual Cameras either end
C 109	Box Culvert (2)	GH 42/GH 89 - GH 47/GH 65	GH 65	Cat	Felis catus	29-07-2020	10:03:00 PM	Unknown	1	Dual Cameras either end
C 109	Box Culvert (2)	GH 42/GH 89 - GH 47/GH 65	GH 47, GH 65	Cat	Felis catus	02-08-2020	4:46:00 AM	Unknown	1	Dual Cameras either end
C 109	Box Culvert (2)	GH 42/GH 89 - GH 47/GH 65	GH 42	Northern Quoll	Dasyurus hallucatus	16-08-2020	10:19:00 AM	North	1	Dual Cameras either end
C 109	Box Culvert (2)	GH 42/GH 89 - GH 47/GH 65	GH 89	Northern Quoll	Dasyurus hallucatus	18-08-2020	5:05:00 AM	South	1	Dual Cameras either end
C 109	Box Culvert (2)	GH 42/GH 89 - GH 47/GH 65	GH 42	Northern Quoll	Dasyurus hallucatus	22-08-2020	2:02:00 AM	North	1	Dual Cameras either end
C 109	Box Culvert (2)	GH 42/GH 89 - GH 47/GH 65	GH 42, GH47	Cat	Felis catus	29-08-2020	7:53:00 AM	North	1	Dual Cameras either end
C 109	Box Culvert (2)	GH 42/GH 89 - GH 47/GH 65	GH 42, GH47	Cat	Felis catus	29-08-2020	8:19:00 AM	South	1	Dual Cameras either end
C 109	Box Culvert (2)	GH 42/GH 89 - GH 47/GH 65	GH 47	Northern Quoll	Dasyurus hallucatus	30-08-2020	12:57:00 AM	South	1	Dual Cameras either end
C 110	Pipe Culvert (1)	GH 06 - GH 46	GH 46	Cat	Felis catus	24-08-2020	4:11:00 AM	Unknown	1	Single cameras either end
C 110	Pipe Culvert (1)	GH 06 - GH 46	GH 46	Cat	Felis catus	24-08-2020	11:51:00 PM	South	1	Single cameras either end
C 110	Pipe Culvert (1)	GH 06 - GH 46	GH 46	Cat	Felis catus	27-08-2020	5:30:00 AM	Unknown	1	Single cameras either end
C 110	Pipe Culvert (1)	GH 06 - GH 46	GH 46	Euro	Macropus robustus	01-09-2020	11:11:00 PM	Unknown	1	Single cameras either end
C 110	Pipe Culvert (1)	GH 06 - GH 46	GH 46	Euro	Macropus robustus	01-09-2020	11:59:00 PM	Unknown	1	Single cameras either end
C 112	Box Culvert (1)	GH 29/GH 60 - GH 31/GH 80	GH 31	Northern Quoll	Dasyurus hallucatus	16-05-2020	7:22:00 PM	Unknown	1	Dual Cameras either end
C 112	Box Culvert (1)	GH 29/GH 60 - GH 31/GH 80	GH 31	Northern Quoll	Dasyurus hallucatus	17-05-2020	7:09:00 PM	Unknown	1	Dual Cameras either end
C 112	Box Culvert (1)	GH 29/GH 60 - GH 31/GH 80	GH 31	Northern Quoll	Dasyurus hallucatus	18-05-2020	7:15:00 PM	Unknown	1	Dual Cameras either end

Culvert Number	Culvert Type	Camera Numbers	Camera	Common Name	Species	Date	Time	Direction of Travel	Number	Setup
C 112	Box Culvert (1)	GH 29/GH 60 - GH 31/GH 80	GH 31	Northern Quoll	Dasyurus hallucatus	20-05-2020	3:33:00 AM	Unknown	1	Dual Cameras either end
C 112	Box Culvert (1)	GH 29/GH 60 - GH 31/GH 80	GH 60	Cat	Felis catus	21-05-2020	10:18:00 PM	Unknown	1	Dual Cameras either end
C 112	Box Culvert (1)	GH 29/GH 60 - GH 31/GH 80	GH 43	Cat	Felis catus	24-05-2020	10:45:00 PM	Unknown	1	Dual Cameras either end
C 112	Box Culvert (1)	GH 29/GH 60 - GH 31/GH 80	GH 31	Cat	Felis catus	25-05-2020	7:21:00 PM	Unknown	1	Dual Cameras either end
C 112	Box Culvert (1)	GH 29/GH 60 - GH 31/GH 80	GH 31	Northern Quoll	Dasyurus hallucatus	26-05-2020	3:40:00 AM	Unknown	1	Dual Cameras either end
C 112	Box Culvert (1)	GH 29/GH 60 - GH 31/GH 80	GH 31, GH 80	Northern Quoll	Dasyurus hallucatus	26-05-2020	8:04:00 PM	Unknown	1	Dual Cameras either end
C 112	Box Culvert (1)	GH 29/GH 60 - GH 31/GH 80	GH 29	Cat	Felis catus	28-05-2020	2:25:00 AM	Unknown	1	Dual Cameras either end
C 112	Box Culvert (1)	GH 29/GH 60 - GH 31/GH 80	GH 29	Northern Quoll	Dasyurus hallucatus	28-05-2020	7:36:00 PM	North	1	Dual Cameras either end
C 112	Box Culvert (1)	GH 29/GH 60 - GH 31/GH 80	GH 31	Northern Quoll	Dasyurus hallucatus	30-05-2020	10:22:00 PM	Unknown	1	Dual Cameras either end
C 112	Box Culvert (1)	GH 29/GH 60 - GH 31/GH 80	GH 29, GH 31	Northern Quoll	Dasyurus hallucatus	02-06-2020	3:06:00 AM	South	1	Dual Cameras either end
C 112	Box Culvert (1)	GH 29/GH 60 - GH 31/GH 80	GH 31	Northern Quoll	Dasyurus hallucatus	05-06-2020	4:09:00 AM	Unknown	1	Dual Cameras either end
C 112	Box Culvert (1)	GH 29/GH 60 - GH 31/GH 80	GH 29, GH 80	Northern Quoll	Dasyurus hallucatus	05-06-2020	6:24:00 PM	South	1	Dual Cameras either end
C 112	Box Culvert (1)	GH 29/GH 60 - GH 31/GH 80	GH 29	Northern Quoll	Dasyurus hallucatus	09-06-2020	6:06:00 PM	South	1	Dual Cameras either end
C 112	Box Culvert (1)	GH 29/GH 60 - GH 31/GH 80	GH 31	Northern Quoll	Dasyurus hallucatus	08-07-2020	8:12:00 PM	Unknown	1	Dual Cameras either end
C 112	Box Culvert (1)	GH 29/GH 60 - GH 31/GH 80	GH 31	Northern Quoll	Dasyurus hallucatus	10-07-2020	6:28:00 PM	Unknown	1	Dual Cameras either end
C 112	Box Culvert (1)	GH 29/GH 60 - GH 31/GH 80	GH 31	Dingo/Dog	Canus lupus	14-07-2020	7:05:00 PM	Unknown	1	Dual Cameras either end
C 112	Box Culvert (1)	GH 29/GH 60 - GH 31/GH 80	GH 80	Dingo/Dog	Canus lupus	14-07-2020	7:25:00 PM	Unknown	1	Dual Cameras either end
C 112	Box Culvert (1)	GH 29/GH 60 - GH 31/GH 80	GH 31	Northern Quoll	Dasyurus hallucatus	16-07-2020	12:00:00 AM	Unknown	1	Dual Cameras either end
C 112	Box Culvert (1)	GH 29/GH 60 - GH 31/GH 80	GH 31	Northern Quoll	Dasyurus hallucatus	16-07-2020	7:54:00 PM	Unknown	1	Dual Cameras either end
C 112	Box Culvert (1)	GH 29/GH 60 - GH 31/GH 80	GH 31	Northern Quoll	Dasyurus hallucatus	17-07-2020	1:12:00 AM	Unknown	1	Dual Cameras either end
C 112	Box Culvert (1)	GH 29/GH 60 - GH 31/GH 80	GH 31	Northern Quoll	Dasyurus hallucatus	19-07-2020	2:53:00 AM	Unknown	1	Dual Cameras either end
C 112	Box Culvert (1)	GH 29/GH 60 - GH 31/GH 80	GH 31	Northern Quoll	Dasyurus hallucatus	19-07-2020	7:21:00 PM	Unknown	1	Dual Cameras either end
C 112	Box Culvert (1)	GH 29/GH 60 - GH 31/GH 80	GH 31	Northern Quoll	Dasyurus hallucatus	20-07-2020	1:17:00 AM	Unknown	1	Dual Cameras either end
C 112	Box Culvert (1)	GH 29/GH 60 - GH 31/GH 80	GH 29	Northern Quoll	Dasyurus hallucatus	20-07-2020	8:11:00 PM	Unknown	1	Dual Cameras either end
C 112	Box Culvert (1)	GH 29/GH 60 - GH 31/GH 80	GH 31	Dingo/Dog	Canus lupus	29-07-2020	2:01:00 AM	Unknown	1	Dual Cameras either end
C 112	Box Culvert (1)	GH 29/GH 60 - GH 31/GH 80	GH 29	Northern Quoll	Dasyurus hallucatus	08-08-2020	7:01:00 PM	North	1	Dual Cameras either end
C 112	Box Culvert (1)	GH 29/GH 60 - GH 31/GH 80	GH 31	Northern Quoll	Dasyurus hallucatus	09-08-2020	8:17:00 PM	Unknown	1	Dual Cameras either end
C 112	Box Culvert (1)	GH 29/GH 60 - GH 31/GH 80	GH 80	Dingo/Dog	Canus lupus	15-08-2020	4:48:00 AM	Unknown	1	Dual Cameras either end
C 112	Box Culvert (1)	GH 29/GH 60 - GH 31/GH 80	GH 31	Northern Quoll	Dasyurus hallucatus	16-08-2020	8:50:00 PM	Unknown	1	Dual Cameras either end
C 112	Box Culvert (1)	GH 29/GH 60 - GH 31/GH 80	GH 31	Northern Quoll	Dasyurus hallucatus	16-08-2020	9:16:00 PM	South	1	Dual Cameras either end
C 112	Box Culvert (1)	GH 29/GH 60 - GH 31/GH 80	GH 60	Cat	Felis catus	17-08-2020	2:19:00 AM	Unknown	1	Dual Cameras either end
C 112	Box Culvert (1)	GH 29/GH 60 - GH 31/GH 80	GH 29	Cat	Felis catus	17-08-2020	2:20:00 AM	Unknown	1	Dual Cameras either end
C 112	Box Culvert (1)	GH 29/GH 60 - GH 31/GH 80	GH 60, GH80, GH 31	Cat	Felis catus	17-08-2020	4:25:00 AM	North	1	Dual Cameras either end
C 112	Box Culvert (1)	GH 29/GH 60 - GH 31/GH 80	GH 60, GH80, GH 31	Cat	Felis catus	18-08-2020	3:01:00 AM	South	1	Dual Cameras either end
C 112	Box Culvert (1)	GH 29/GH 60 - GH 31/GH 80	GH 80	Cat	Felis catus	18-08-2020	9:19:00 PM	Unknown	1	Dual Cameras either end
C 112	Box Culvert (1)	GH 29/GH 60 - GH 31/GH 80	GH 29	Northern Quoll	Dasyurus hallucatus	22-08-2020	1:51:00 AM	Unknown	1	Dual Cameras either end
C 112	Box Culvert (1)	GH 29/GH 60 - GH 31/GH 80	GH 60	Cat	Felis catus	24-08-2020	1:36:00 AM	Unknown	1	Dual Cameras either end
C 112	Box Culvert (1)	GH 29/GH 60 - GH 31/GH 80	GH 80, GH 31	Cat	Felis catus	24-08-2020	3:55:00 AM	Unknown	1	Dual Cameras either end
C 112	Box Culvert (1)	GH 29/GH 60 - GH 31/GH 80	GH 80	Cat	Felis catus	25-08-2020	2:20:00 AM	Unknown	1	Dual Cameras either end
C 112	Box Culvert (1)	GH 29/GH 60 - GH 31/GH 80	GH 29	Cat	Felis catus	27-08-2020	2:11:00 AM	Unknown	1	Dual Cameras either end
C 112	Box Culvert (1)	GH 29/GH 60 - GH 31/GH 80	GH 80	Northern Quoll	Dasyurus hallucatus	04-09-2020	10:56:00 PM	North	1	Dual Cameras either end
C 112	Box Culvert (1)	GH 29/GH 60 - GH 31/GH 80	GH 31	Cat	Felis catus	14?07/2020	1:39:00 AM	Unknown	1	Dual Cameras either end
C 115	Pipe Culvert (3)	GH 13/GH 87	GH 13	Cat	Felis catus	02-02-2016	5:03:00 PM	Unknown	1	Single cameras either end
C 115	Pipe Culvert (3)	GH 13/GH 87	GH 13	Rothschild's Rock-wallaby	Petrogale rothschildi	24-02-2016	3:49:00 PM	Unknown	1	Single cameras either end
C 115	Pipe Culvert (3)	GH 13/GH 87	GH 13	Rothschild's Rock-wallaby	Petrogale rothschildi	29-02-2016	3:55:00 PM	South	1	Single cameras either end

Culvert Number	Culvert Type	Camera Numbers	Camera	Common Name	Species	Date	Time	Direction of Travel	Number	Setup
C 115	Pipe Culvert (3)	GH 13/GH 87	GH 87	Rothschild's Rock-wallaby	Petrogale rothschildi	23-05-2020	4:48:00 PM	North	1	Single cameras either end
C 115	Pipe Culvert (3)	GH 13/GH 87	GH 87	Rothschild's Rock-wallaby	Petrogale rothschildi	05-07-2020	8:32:00 PM	Unknown	1	Single cameras either end
C 115	Pipe Culvert (3)	GH 13/GH 87	GH 87	Rothschild's Rock-wallaby	Petrogale rothschildi	10-07-2020	8:38:00 PM	Unknown	1	Single cameras either end
C 115	Pipe Culvert (3)	GH 13/GH 87	GH 87	Rothschild's Rock-wallaby	Petrogale rothschildi	13-07-2020	10:00:00 PM	Unknown	1	Single cameras either end
C 115	Pipe Culvert (3)	GH 13/GH 87	GH 87	Rothschild's Rock-wallaby	Petrogale rothschildi	15-07-2020	6:26:00 PM	Unknown	1	Single cameras either end
C 115	Pipe Culvert (3)	GH 13/GH 87	GH 87	Rothschild's Rock-wallaby	Petrogale rothschildi	16-07-2020	5:38:00 AM	Unknown	1	Single cameras either end
C 115	Pipe Culvert (3)	GH 13/GH 87	GH 87	Rothschild's Rock-wallaby	Petrogale rothschildi	18-07-2020	6:33:00 PM	North	1	Single cameras either end
C 115	Pipe Culvert (3)	GH 13/GH 87	GH 87	Rothschild's Rock-wallaby	Petrogale rothschildi	19-07-2020	9:08:00 PM	Unknown	1	Single cameras either end
C 115	Pipe Culvert (3)	GH 13/GH 87	GH 87	Northern Quoll	Dasyurus hallucatus	26-08-2020	1:10:00 AM	Unknown	1	Single cameras either end
C 115	Pipe Culvert (3)	GH 13/GH 87	GH 87	Rothschild's Rock-wallaby	Petrogale rothschildi	30-08-2020	12:28:00 AM	Unknown	1	Single cameras either end
C 116	Box Culvert (1)	GH 24/GH 43	GH 24	Northern Quoll	Dasyurus hallucatus	16-05-2020	8:23:00 PM	Unknown	1	Single cameras either end
C 116	Box Culvert (1)	GH 24/GH 43	GH 24	Northern Quoll	Dasyurus hallucatus	16-05-2020	8:55:00 PM	North	1	Single cameras either end
C 116	Box Culvert (1)	GH 24/GH 43	GH 24, GH 43	Northern Quoll	Dasyurus hallucatus	17-05-2020	5:55:00 PM	South	1	Single cameras either end
C 116	Box Culvert (1)	GH 24/GH 43	GH 43	Northern Quoll	Dasyurus hallucatus	19-05-2020	8:44:00 PM	Unknown	1	Single cameras either end
C 116	Box Culvert (1)	GH 24/GH 43	GH 24, GH 43	Rothschild's Rock-wallaby	Petrogale rothschildi	20-05-2020	6:29:00 PM	North	1	Single cameras either end
C 116	Box Culvert (1)	GH 24/GH 43	GH 43	Northern Quoll	Dasyurus hallucatus	21-05-2020	5:49:00 PM	North	1	Single cameras either end
C 116	Box Culvert (1)	GH 24/GH 43	GH 43	Northern Quoll	Dasyurus hallucatus	23-05-2020	6:39:00 PM	South	1	Single cameras either end
C 116	Box Culvert (1)	GH 24/GH 43	GH 43	Northern Quoll	Dasyurus hallucatus	24-05-2020	5:59:00 AM	North	1	Single cameras either end
C 116	Box Culvert (1)	GH 24/GH 43	GH 24	Cat	Felis catus	27-05-2020	3:39:00 AM	Unknown	1	Single cameras either end
C 116	Box Culvert (1)	GH 24/GH 43	GH 43	Northern Quoll	Dasyurus hallucatus	27-05-2020	4:25:00 AM	Unknown	1	Single cameras either end
C 116	Box Culvert (1)	GH 24/GH 43	GH 24, GH 43	Rothschild's Rock-wallaby	Petrogale rothschildi	29-05-2020	6:04:00 PM	North	1	Single cameras either end
C 116	Box Culvert (1)	GH 24/GH 43	GH 43	Northern Quoll	Dasyurus hallucatus	30-05-2020	6:49:00 PM	Unknown	1	Single cameras either end
C 116	Box Culvert (1)	GH 24/GH 43	GH 43	Northern Quoll	Dasyurus hallucatus	01-06-2020	3:22:00 AM	South	1	Single cameras either end
C 116	Box Culvert (1)	GH 24/GH 43	GH 43	Northern Quoll	Dasyurus hallucatus	03-06-2020	10:14:00 PM	South	1	Single cameras either end
C 116	Box Culvert (1)	GH 24/GH 43	GH 43	Northern Quoll	Dasyurus hallucatus	04-06-2020	6:50:00 PM	Unknown	1	Single cameras either end
C 116	Box Culvert (1)	GH 24/GH 43	GH 43	Northern Quoll	Dasyurus hallucatus	07-06-2020	7:16:00 PM	South	1	Single cameras either end
C 116	Box Culvert (1)	GH 24/GH 43	GH 43	Northern Quoll	Dasyurus hallucatus	08-06-2020	5:09:00 AM	Unknown	1	Single cameras either end
C 116	Box Culvert (1)	GH 24/GH 43	GH 24	Northern Quoll	Dasyurus hallucatus	09-06-2020	7:13:00 PM	North	1	Single cameras either end
C 116	Box Culvert (1)	GH 24/GH 43	GH 43	Northern Quoll	Dasyurus hallucatus	10-06-2020	6:04:00 PM	South	1	Single cameras either end
C 116	Box Culvert (1)	GH 24/GH 43	GH 43	Northern Quoll	Dasyurus hallucatus	15-06-2020	11:48:00 PM	South	1	Single cameras either end
C 116	Box Culvert (1)	GH 24/GH 43	GH 24	Northern Quoll	Dasyurus hallucatus	19-06-2020	5:43:00 AM	North	1	Single cameras either end
C 116	Box Culvert (1)	GH 24/GH 43	GH 43	Dingo/Dog	Canus lupus	22-06-2020	3:23:00 AM	Unknown	1	Single cameras either end
C 116	Box Culvert (1)	GH 24/GH 43	GH 43	Northern Quoll	Dasyurus hallucatus	27-06-2020	6:08:00 PM	Unknown	1	Single cameras either end
C 116	Box Culvert (1)	GH 24/GH 43	GH 43	Northern Quoll	Dasyurus hallucatus	03-07-2020	4:12:00 AM	South	1	Single cameras either end
C 116	Box Culvert (1)	GH 24/GH 43	GH 24	Northern Quoll	Dasyurus hallucatus	03-07-2020	6:34:00 PM	North	1	Single cameras either end
C 116	Box Culvert (1)	GH 24/GH 43	GH 24	Northern Quoll	Dasyurus hallucatus	05-07-2020	1:34:00 AM	Unknown	1	Single cameras either end
C 116	Box Culvert (1)	GH 24/GH 43	GH 24, GH 43	Rothschild's Rock-wallaby	Petrogale rothschildi	14-07-2020	10:34:00 PM	North	1	Single cameras either end
C 116	Box Culvert (1)	GH 24/GH 43	GH 43	Dingo/Dog	Canus lupus	25-07-2020	11:34:00 PM	Unknown	1	Single cameras either end
C 116	Box Culvert (1)	GH 24/GH 43	GH 43	Euro	Macropus robustus	28-07-2020	7:31:00 PM	Unknown	1	Single cameras either end
C 116	Box Culvert (1)	GH 24/GH 43	GH 43	Northern Quoll	Dasyurus hallucatus	30-07-2020	6:06:00 PM	South	1	Single cameras either end
C 116	Box Culvert (1)	GH 24/GH 43	GH 43	Northern Quoll	Dasyurus hallucatus	11-08-2020	6:34:00 PM	South	1	Single Camera Facing South
C 116	Box Culvert (1)	GH 24/GH 43	GH 24, GH 43	Northern Quoll	Dasyurus hallucatus	13-08-2020	10:23:00 PM	South	1	Single Camera Facing South
C 116	Box Culvert (1)	GH 24/GH 43	GH 24, GH 43	Northern Quoll	Dasyurus hallucatus	14-08-2020	2:45:00 AM	South	1	Single Camera Facing South
C 116	Box Culvert (1)	GH 24/GH 43	GH 24, GH 43	Northern Quoll	Dasyurus hallucatus	14-08-2020	3:43:00 PM	South	1	Single Camera Facing South
C 116	Box Culvert (1)	GH 24/GH 43	GH 24, GH 43	Northern Quoll	Dasyurus hallucatus	14-08-2020	7:32:00 PM	North	1	Single Camera Facing South

Culvert Number	Culvert Type	Camera Numbers	Camera	Common Name	Species	Date	Time	Direction of Travel	Number	Setup
C 116	Box Culvert (1)	GH 24/GH 43	GH 24, GH 43	Northern Quoll	Dasyurus hallucatus	14-08-2020	8:51:00 PM	South	1	Single Camera Facing South
C 116	Box Culvert (1)	GH 24/GH 43	GH 24, GH 43	Northern Quoll	Dasyurus hallucatus	14-08-2020	10:01:00 PM	South	1	Single Camera Facing South
C 116	Box Culvert (1)	GH 24/GH 43	GH 24, GH 43	Northern Quoll	Dasyurus hallucatus	14-08-2020	10:35:00 PM	South	1	Single Camera Facing South
C 116	Box Culvert (1)	GH 24/GH 43	GH 24, GH 43	Northern Quoll	Dasyurus hallucatus	15-08-2020	2:14:00 AM	South	1	Single Camera Facing South
C 116	Box Culvert (1)	GH 24/GH 43	GH 24, GH 43	Northern Quoll	Dasyurus hallucatus	15-08-2020	3:43:00 AM	South	1	Single Camera Facing South
C 116	Box Culvert (1)	GH 24/GH 43	GH 24, GH 43	Northern Quoll	Dasyurus hallucatus	16-08-2020	5:42:00 AM	South	1	Single Camera Facing South
C 116	Box Culvert (1)	GH 24/GH 43	GH 24, GH 43	Northern Quoll	Dasyurus hallucatus	16-08-2020	7:00:00 PM	South	1	Single Camera Facing South
C 116	Box Culvert (1)	GH 24/GH 43	GH 24	Cat	Felis catus	27-08-2020	11:03:00 PM	Unknown	1	Single Camera Facing South
C 118	Box Culvert (1)	GH 19/GH 63 - GH 25/GH 67	GH 25, GH 67	Euro	Macropus robustus	26-05-2020	7:17:00 PM	Unknown	1	Dual Cameras either end
C 118	Box Culvert (1)	GH 19/GH 63 - GH 25/GH 67	GH 63, GH 67	Euro	Macropus robustus	27-05-2020	8:37:00 PM	South	1	Dual Cameras either end
C 118	Box Culvert (1)	GH 19/GH 63 - GH 25/GH 67	GH 19, GH 63, GH 25, GH 67	Euro	Macropus robustus	30-05-2020	5:30:00 PM	South	1	Dual Cameras either end
C 118	Box Culvert (1)	GH 19/GH 63 - GH 25/GH 67	GH 19, GH 63	Cat	Felis catus	30-05-2020	8:10:00 PM	North	1	Dual Cameras either end
C 118	Box Culvert (1)	GH 19/GH 63 - GH 25/GH 67	GH 25, GH 67	Euro	Macropus robustus	04-06-2020	4:10:00 AM	South	1	Dual Cameras either end
C 118	Box Culvert (1)	GH 19/GH 63 - GH 25/GH 67	GH 25	Northern Quoll	Dasyurus hallucatus	10-06-2020	7:44:00 PM	South	1	Dual Cameras either end
C 118	Box Culvert (1)	GH 19/GH 63 - GH 25/GH 67	GH 63, GH 25, GH 67	Euro	Macropus robustus	11-06-2020	7:39:00 AM	South	1	Dual Cameras either end
C 118	Box Culvert (1)	GH 19/GH 63 - GH 25/GH 67	GH 25, GH 67	Euro	Macropus robustus	16-06-2020	1:21:00 AM	Unknown	1	Dual Cameras either end
C 118	Box Culvert (1)	GH 19/GH 63 - GH 25/GH 67	GH 67	Northern Quoll	Dasyurus hallucatus	19-06-2020	10:37:00 PM	South	1	Dual Cameras either end
C 118	Box Culvert (1)	GH 19/GH 63 - GH 25/GH 67	GH 63	Cat	Felis catus	20-06-2020	10:53:00 PM	South	1	Dual Cameras either end
C 118	Box Culvert (1)	GH 19/GH 63 - GH 25/GH 67	GH 19, GH 63	Euro	Macropus robustus	27-06-2020	6:00:00 PM	North	1	Dual Cameras either end
C 118	Box Culvert (1)	GH 19/GH 63 - GH 25/GH 67	GH 19, GH 63	Northern Quoll	Dasyurus hallucatus	28-06-2020	8:16:00 PM	Unknown	1	Dual Cameras either end
C 118	Box Culvert (1)	GH 19/GH 63 - GH 25/GH 67	GH 19, GH 63	Dingo/Dog	Canus lupus	16-07-2020	5:10:00 AM	Unknown	1	Dual Cameras either end
C 118	Box Culvert (1)	GH 19/GH 63 - GH 25/GH 67	GH 67	Northern Quoll	Dasyurus hallucatus	21-07-2020	2:34:00 AM	South	1	Dual Cameras either end
C 118	Box Culvert (1)	GH 19/GH 63 - GH 25/GH 67	GH 63	Cat	Felis catus	21-07-2020	5:22:00 AM	South	1	Dual Cameras either end
C 118	Box Culvert (1)	GH 19/GH 63 - GH 25/GH 67	GH 63	Northern Quoll	Dasyurus hallucatus	25-07-2020	8:45:00 PM	North	1	Dual Cameras either end
C 118	Box Culvert (1)	GH 19/GH 63 - GH 25/GH 67	GH 25, GH 67	Euro	Macropus robustus	26-07-2020	10:35:00 PM	Unknown	1	Dual Cameras either end
C 118	Box Culvert (1)	GH 19/GH 63 - GH 25/GH 67	GH 63	Northern Quoll	Dasyurus hallucatus	27-07-2020	4:29:00 AM	Unknown	1	Dual Cameras either end
C 118	Box Culvert (1)	GH 19/GH 63 - GH 25/GH 67	GH 19, GH 63, GH 67	Cat	Felis catus	28-07-2020	5:34:00 PM	South	1	Dual Cameras either end
C 118	Box Culvert (1)	GH 19/GH 63 - GH 25/GH 67	GH 25, GH 67	Northern Quoll	Dasyurus hallucatus	30-07-2020	9:09:00 PM	South	1	Dual Cameras either end
C 118	Box Culvert (1)	GH 19/GH 63 - GH 25/GH 67	GH 25	Northern Quoll	Dasyurus hallucatus	31-07-2020	12:15:00 AM	Unknown	1	Dual Cameras either end
C 118	Box Culvert (1)	GH 19/GH 63 - GH 25/GH 67	GH 63	Northern Quoll	Dasyurus hallucatus	31-07-2020	4:44:00 AM	Unknown	1	Dual Cameras either end
C 118	Box Culvert (1)	GH 19/GH 63 - GH 25/GH 67	GH 19, GH 63, GH 25, GH 67	Euro	Macropus robustus	02-08-2020	2:01:00 AM	South	1	Dual Cameras either end
C 118	Box Culvert (1)	GH 19/GH 63 - GH 25/GH 67	GH 63, GH 67	Northern Quoll	Dasyurus hallucatus	05-08-2020	5:51:00 AM	South	1	Dual Cameras either end
C 118	Box Culvert (1)	GH 19/GH 63 - GH 25/GH 67	GH 63	Northern Quoll	Dasyurus hallucatus	08-08-2020	1:30:00 AM	North	1	Dual Cameras either end
C 118	Box Culvert (1)	GH 19/GH 63 - GH 25/GH 67	GH 25	Northern Quoll	Dasyurus hallucatus	08-08-2020	8:54:00 PM	Unknown	1	Dual Cameras either end
C 118	Box Culvert (1)	GH 19/GH 63 - GH 25/GH 67	GH 67	Cat	Felis catus	09-08-2020	9:30:00 PM	Unknown	1	Dual Cameras either end
C 118	Box Culvert (1)	GH 19/GH 63 - GH 25/GH 67	GH 63	Northern Quoll	Dasyurus hallucatus	11-08-2020	12:37:00 AM	North	1	Dual Cameras either end
C 118	Box Culvert (1)	GH 19/GH 63 - GH 25/GH 67	GH 63	Northern Quoll	Dasyurus hallucatus	11-08-2020	7:40:00 PM	Unknown	1	Dual Cameras either end
C 118	Box Culvert (1)	GH 19/GH 63 - GH 25/GH 67	GH 19, GH 63, GH 67	Euro	Macropus robustus	12-08-2020	3:11:00 AM	South	1	Dual Cameras either end
C 118	Box Culvert (1)	GH 19/GH 63 - GH 25/GH 67	GH19, GH 63,	Northern Quoll	Dasyurus hallucatus	13-08-2020	4:11:00 AM		1	Dual Cameras either end
C 118	Box Culvert (1)	GH 19/GH 63 - GH 25/GH 67	GH 63	Northern Quoll	Dasyurus hallucatus	13-08-2020	6:57:00 PM		1	Dual Cameras either end
C 118	Box Culvert (1)	GH 19/GH 63 - GH 25/GH 67	GH 67	Northern Quoll	Dasyurus hallucatus	14-08-2020	3:24:00 AM	North	1	Dual Cameras either end
C 118	Box Culvert (1)	GH 19/GH 63 - GH 25/GH 67	GH 67, GH 25	Northern Quoll	Dasyurus hallucatus	15-08-2020	4:07:00 AM		1	Dual Cameras either end
C 118	Box Culvert (1)	GH 19/GH 63 - GH 25/GH 67	GH 63, GH 67	Northern Quoll	Dasyurus hallucatus	15-08-2020	6:43:00 PM	North	1	Dual Cameras either end
C 118	Box Culvert (1)	GH 19/GH 63 - GH 25/GH 67	GH 25	Northern Quoll	Dasyurus hallucatus	15-08-2020	7:43:00 PM	South	1	Dual Cameras either end
C 118	Box Culvert (1)	GH 19/GH 63 - GH 25/GH 67	GH 67, GH 25	Northern Quoll	Dasyurus hallucatus	16-08-2020	2:45:00 AM	South	1	Dual Cameras either end

Culvert Number	Culvert Type	Camera Numbers	Camera	Common Name	Species	Date	Time	Direction of Travel	Number	Setup
C 118	Box Culvert (1)	GH 19/GH 63 - GH 25/GH 67	GH 63	Northern Quoll	Dasyurus hallucatus	16-08-2020	5:20:00 AM	North	1	Dual Cameras either end
C 118	Box Culvert (1)	GH 19/GH 63 - GH 25/GH 67	GH 25	Northern Quoll	Dasyurus hallucatus	17-08-2020	6:30:00 PM	North	1	Dual Cameras either end
C 118	Box Culvert (1)	GH 19/GH 63 - GH 25/GH 67	GH 67	Northern Quoll	Dasyurus hallucatus	17-08-2020	11:57:00 PM	Unknown	1	Dual Cameras either end
C 118	Box Culvert (1)	GH 19/GH 63 - GH 25/GH 67	GH 25	Northern Quoll	Dasyurus hallucatus	20-08-2020	6:20:00 PM	South	1	Dual Cameras either end
C 118	Box Culvert (1)	GH 19/GH 63 - GH 25/GH 67	GH 25	Northern Quoll	Dasyurus hallucatus	23-08-2020	6:42:00 PM	South	1	Dual Cameras either end
C 118	Box Culvert (1)	GH 19/GH 63 - GH 25/GH 67	GH 63	Northern Quoll	Dasyurus hallucatus	27-08-2020	12:47:00 AM		1	Dual Cameras either end
C 119	Box Culvert (5)	GH 09/GH 61 - GH 16/GH 85	GH 61	Euro	Macropus robustus	17-05-2020	6:08:00 PM	North	1	Dual Cameras either end
C 119	Box Culvert (5)	GH 09/GH 61 - GH 16/GH 85	GH 09, GH 85	Euro	Macropus robustus	18-05-2020	8:55:00 PM	South	1	Dual Cameras either end
C 119	Box Culvert (5)	GH 09/GH 61 - GH 16/GH 85	GH 85	Euro	Macropus robustus	19-05-2020	8:57:00 PM	South	1	Dual Cameras either end
C 119	Box Culvert (5)	GH 09/GH 61 - GH 16/GH 85	GH 09	Northern Quoll	Dasyurus hallucatus	25-05-2020	10:37:00 PM	North	1	Dual Cameras either end
C 119	Box Culvert (5)	GH 09/GH 61 - GH 16/GH 85	GH 09	Euro	Macropus robustus	27-05-2020	11:49:00 PM	North	1	Dual Cameras either end
C 119	Box Culvert (5)	GH 09/GH 61 - GH 16/GH 85	GH 61, GH 16	Euro	Macropus robustus	30-05-2020	6:17:00 PM	North	1	Dual Cameras either end
C 119	Box Culvert (5)	GH 09/GH 61 - GH 16/GH 85	GH 61	Cat	Felis catus	06-06-2020	7:32:00 PM	North	1	Dual Cameras either end
C 119	Box Culvert (5)	GH 09/GH 61 - GH 16/GH 85	GH 61	Cat	Felis catus	07-06-2020	7:52:00 PM	North	1	Dual Cameras either end
C 119	Box Culvert (5)	GH 09/GH 61 - GH 16/GH 85	GH 61	Euro	Macropus robustus	08-06-2020	11:26:00 AM	South	1	Dual Cameras either end
C 119	Box Culvert (5)	GH 09/GH 61 - GH 16/GH 85	GH 09, GH 85	Cat	Felis catus	08-06-2020	7:13:00 PM	North	1	Dual Cameras either end
C 119	Box Culvert (5)	GH 09/GH 61 - GH 16/GH 85	GH 61, GH 16	Euro	Macropus robustus	10-06-2020	6:00:00 PM	North	1	Dual Cameras either end
C 119	Box Culvert (5)	GH 09/GH 61 - GH 16/GH 85	GH 61	Euro	Macropus robustus	13-06-2020	5:23:00 AM	South	1	Dual Cameras either end
C 119	Box Culvert (5)	GH 09/GH 61 - GH 16/GH 85	GH 09	Cat	Felis catus	13-06-2020	7:47:00 PM	South	1	Dual Cameras either end
C 119	Box Culvert (5)	GH 09/GH 61 - GH 16/GH 85	GH 16	Euro	Macropus robustus	18-06-2020	2:00:00 AM	Unknown	1	Dual Cameras either end
C 119	Box Culvert (5)	GH 09/GH 61 - GH 16/GH 85	GH 61	Dingo/Dog	Canus lupus	23-06-2020	12:37:00 AM	Unknown	1	Dual Cameras either end
C 119	Box Culvert (5)	GH 09/GH 61 - GH 16/GH 85	GH 16, GH 85	Dingo/Dog	Canus lupus	23-06-2020	12:40:00 AM	Unknown	1	Dual Cameras either end
C 119	Box Culvert (5)	GH 09/GH 61 - GH 16/GH 85	GH 85	Euro	Macropus robustus	01-07-2020	9:30:00 PM	South	1	Dual Cameras either end
C 119	Box Culvert (5)	GH 09/GH 61 - GH 16/GH 85	GH 61, GH 09	Northern Quoll	Dasyurus hallucatus	16-07-2020	12:29:00 AM	North	1	Dual Cameras either end
C 119	Box Culvert (5)	GH 09/GH 61 - GH 16/GH 85	GH 61	Cat	Felis catus	18-07-2020	7:19:00 PM	South	1	Dual Cameras either end
C 119	Box Culvert (5)	GH 09/GH 61 - GH 16/GH 85	GH 61	Cat	Felis catus	20-07-2020	3:43:00 AM	South	1	Dual Cameras either end
C 119	Box Culvert (5)	GH 09/GH 61 - GH 16/GH 85	GH 09, GH 85	Euro	Macropus robustus	24-07-2020	7:13:00 PM	South	1	Dual Cameras either end
C 119	Box Culvert (5)	GH 09/GH 61 - GH 16/GH 85	GH 61	Cat	Felis catus	29-07-2020	7:20:00 PM	South	1	Dual Cameras either end
C 119	Box Culvert (5)	GH 09/GH 61 - GH 16/GH 85	GH 61	Northern Quoll	Dasyurus hallucatus	31-07-2020	4:35:00 AM	South	1	Dual Cameras either end
C 119	Box Culvert (5)	GH 09/GH 61 - GH 16/GH 85	GH 85	Euro	Macropus robustus	01-08-2020	10:57:00 PM	South	1	Dual Cameras either end
C 119	Box Culvert (5)	GH 09/GH 61 - GH 16/GH 85	GH 85	Cat	Felis catus	03-08-2020	8:23:00 PM	South	1	Dual Cameras either end
C 119	Box Culvert (5)	GH 09/GH 61 - GH 16/GH 85	GH 16	Euro	Macropus robustus	04-08-2020	12:02:00 AM	Unknown	1	Dual Cameras either end
C 119	Box Culvert (5)	GH 09/GH 61 - GH 16/GH 85	GH 85	Cat	Felis catus	05-08-2020	3:43:00 AM	South	1	Dual Cameras either end
C 119	Box Culvert (5)	GH 09/GH 61 - GH 16/GH 85	GH 61, GH 09	Euro	Macropus robustus	08-08-2020	10:07:00 PM	South	1	Dual Cameras either end
C 119	Box Culvert (5)	GH 09/GH 61 - GH 16/GH 85	GH 09	Cat	Felis catus	09-08-2020	10:39:00 PM	North	1	Dual Cameras either end
C 119	Box Culvert (5)	GH 09/GH 61 - GH 16/GH 85	GH 61	Euro	Macropus robustus	18-08-2020	7:58:00 PM	South	1	Dual Cameras either end
C 119	Box Culvert (5)	GH 09/GH 61 - GH 16/GH 85	GH 61, GH 16	Cat	Felis catus	21-08-2020	9:16:00 PM	South	1	Dual Cameras either end
C 119	Box Culvert (5)	GH 09/GH 61 - GH 16/GH 85	GH 61	Euro	Macropus robustus	26-08-2020	3:54:00 AM	Unknown	1	Dual Cameras either end
C 119	Box Culvert (5)	GH 09/GH 61 - GH 16/GH 85	GH 09	Euro	Macropus robustus	03-09-2020	8:33:00 PM	Unknown	1	Dual Cameras either end
C 119	Box Culvert (5)	GH 09/GH 61 - GH 16/GH 85	GH 09, GH 61, GH 16, GH 85	Euro	Macropus robustus	03-09-2020	8:33:00 PM	North	1	Dual Cameras either end
C 119	Box Culvert (5)	GH 09/GH 61 - GH 16/GH 85	GH 85	Euro	Macropus robustus	03-09-2020	9:50:00 PM	Unknown	1	Dual Cameras either end

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The conclusions are based upon field data and the environmental monitoring and/or testing carried out over a limited period of time and are therefore merely indicative of the environmental condition of the site at the time of preparing the report. Also it should be recognised that site conditions, can change with time.

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