Earl Grey Lithium Project

Environmental Protection and Biodiversity Conservation Act 1999

EPBC Decision 2017/7950 Approval

Annual Compliance Report (2022)

JBS&G Australia Pty Ltd | 65335 | 153,269 (Rev 0)

1 October 2023

JBS&G

We acknowledge the Traditional Custodians of Country throughout Australia and their connections to land, sea and community.

We pay respect to Elders past and present and in the spirit of reconciliation, we commit to working together for our shared future.



Caring for Country The Journey of JBS&G
Artist: Patrick Caruso, Eastern Arrernte

Declaration of accuracy

In making this declaration, I am aware that sections 490 and 491 of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) make it an offence in certain circumstances to knowingly provide false or misleading information or documents. The offence is punishable on conviction by imprisonment or a fine, or both. I declare that all the information and documentation supporting this compliance report is true and correct in every particular. I am authorised to bind the approval holder to this declaration and that I have no knowledge of that authorisation being revoked at the time of making this declaration.

Signed DocuSigned by: Anthea Pate FDBBFDD8035F44E...

Full name (please print) Anthea Pate

Position (please print) Manager Environment and Approvals

Organisation (please print including ABN/ACN if applicable) Covalent Lithium Pty L

Date 1/10/2023

©JBS&G Australia Pty Ltd

Table of Contents

1. Introduction 4

1.1 Project Background 4

1.2 Environmental Approval to Implement the Project 6

1.2.1 Approval under the EPBC Act 6

1.2.2 Variations to Approval 6

2. Current Status 6

3. Audit Methodology 6

3.1 Audit Plan 6

3.1.1 Purpose & Scope 6

3.1.2 Methodology 7

3.1.3 Terminology 7

4. Audit Results 8

4.1 Summary of Compliance 8

4.1.1 EPBC Decision 2017/7950 Approval 8

4.1.2 Terrestrial Fauna Management Plan 8

4.1.3 Ironcaps Banksia Conservation Plan 8

4.1.4 Fauna Offset Management Plan 8

4.2 Non-compliances 8

5. New Environmental Risks 14

6. Monitoring 14

7. Limitations 15

8. References 16

List of Tables

Table 3.1: Key Personnel Consulted for the Audit 7

Table 3.2: Terminology used for the Audit (DCCEEW 2019) 7

Table 4.1: Audit Table of Compliance with EPBC Decision 2017/7950 9

Table D.1: Terrestrial Fauna Management Plan Audit Table 1

Table E.1: Ironcaps Banksia Conservation Plan Audit Plan 1

Table F.1: Fauna Offset Management Plan Audit Table 5

List of Figures

Figure 1.1: Earl Grey Lithium Project (the Action) 5

Appendices

Appendix A **EPBC 2017/7950**

Appendix B **Notice of Variation to EPBC 2017/7950 (1)**

Appendix C **Notice of Variation to EPBC 2017/7950 (2)**

©JBS&G Australia Pty Ltd

Appendix D	**Terrestrial Fauna Management Plan Compliance Assessment**
Appendix E	**Ironcaps Banksia Conservation Plan Compliance Assessment**
Appendix F	**Fauna Offset Management Plan Compliance Assessment**
Appendix G	**Malleefowl Monitoring 2021-22**
Appendix H	**Chuditch Monitoring 2022**
Appendix I	**Vegetation Condition Monitoring Autumn**
Appendix J	**Vegetation Condition Monitoring Spring**
Appendix K	**Introduced Predator Monitoring**
Appendix L	**Fauna Pre-clearance Survey**
Appendix M	**Dieback Assessment 2022**
Appendix N	**Introduced Flora (Weed) Survey**
Appendix O	**Dust Report**

©JBS&G Australia Pty Ltd

1. Introduction

The Earl Grey Lithium Project (the 'Action') was referred to the Department of Climate Change, Energy, the Environment and Water (DCCEEW) (formerly the Department of Agriculture, Water and the Environment) under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) in May 2017 for environmental assessment. Following the environmental assessment, the Project was approved with conditions in February 2020 through the EPBC Decision 2017/7950 approval (DCCEEW 2020a; Appendix A).

The approval holder of the EPBC Decision 2017/7950 approval is Covalent Lithium Pty Ltd ('Covalent Lithium'). Covalent Lithium is a joint venture between Wesfarmers Limited and Sociedad Química y Minera de Chile.

Following the Action's approval (DCCEEW 2020a; Appendix A), two (2) EPBC Decision 2017/7950 variations in December 2020 (DCCEEW 2020b; Appendix B) and March 2022 (DCCEEW 2022; Appendix C).

In accordance with Condition 12 of EPBC Decision 2017/7950 approval, the 'Approval Holder' is required to submit a Compliance Report that addresses the status of the implementation of and level of compliance with the conditions of EPBC 2017/7950 for each 12-month period.

This Compliance Report summarises the results of the audit undertaken by JBS&G Australia Pty Ltd (JBS&G) to assess the Approval Holder's level of compliance against the EPBC Decision 2017/7950 approval conditions for the 2022 reporting period (1 January 2022 to 31 December 2022).

1.1 Project Background

The Action is located at the previously abandoned Mt. Holland Mine Site, approximately 100 km south of the Southern Cross township in Western Australia (WA) (Figure 1.1). The Action comprises open-cut mining and processing of a pegmatite-hosted lithium deposit within a 2,347 ha Development Envelope, within which up to 442 ha of native vegetation/fauna habitat clearing has been authorised.

©JBS&G Australia Pty Ltd

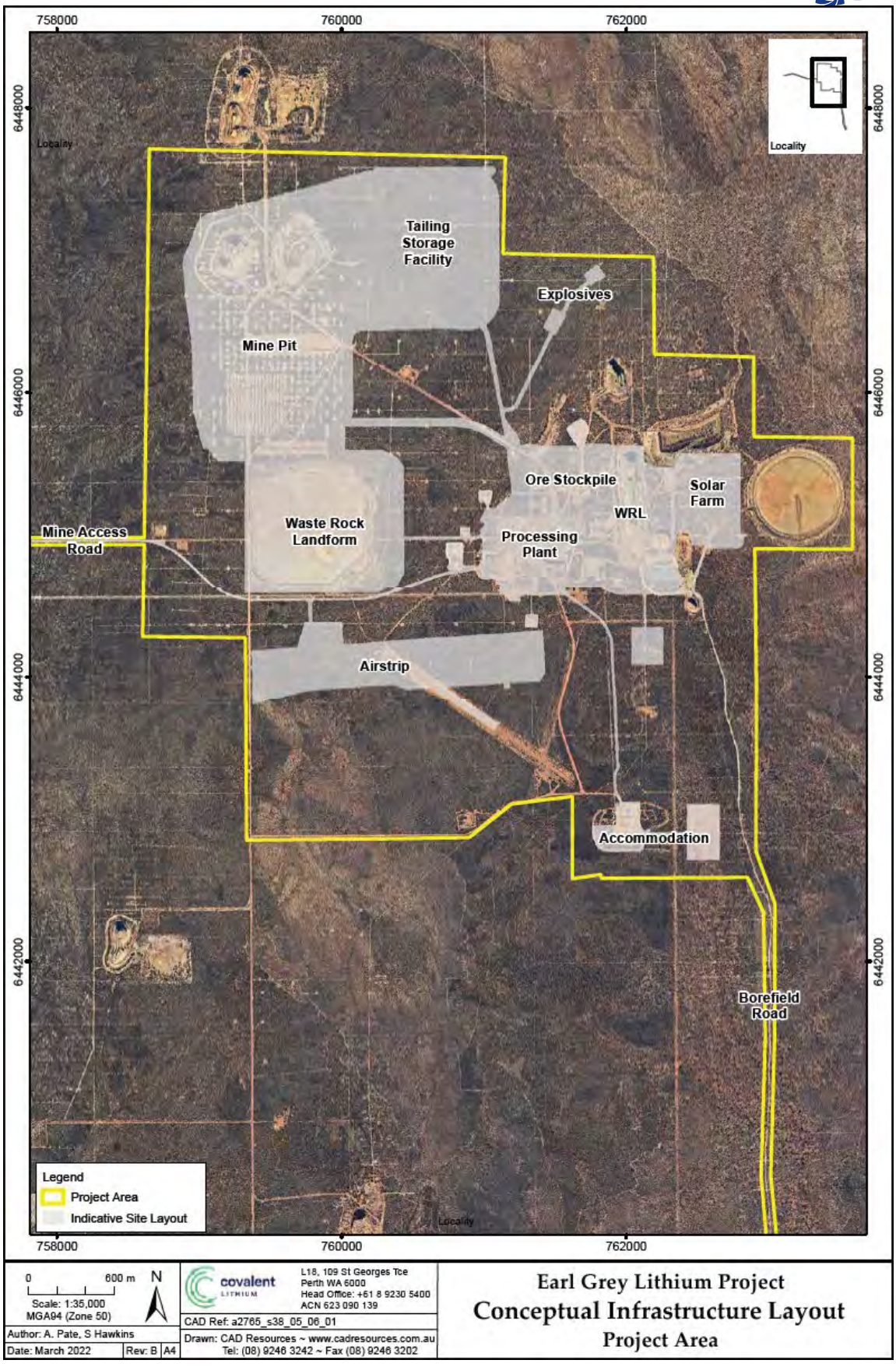


Figure 1.1: Earl Grey Lithium Project (the Action)

©JBS&G Australia Pty Ltd

1.2 Environmental Approval to Implement the Project

1.2.1 Approval under the EPBC Act

The Action was referred under the state of WA's *Environmental Protection Act 1986* (EP Act) and the Commonwealth's EPBC Act in May 2017. Upon referral, the Action was assessed via the accredited assessment process under the EPBC Act.

The Action was determined to be a 'Controlled Action' due to the potential for significant effects on the following Matters of National Environmental Significance (MNES), including:

- Ironcaps Banksia (*Banksia dolichostyla*)[1] (Vulnerable);
- Malleefowl (*Leipoa ocellata*) (Vulnerable); and
- Chuditch (*Dasyurus geoffroii*) (Vulnerable).

The Action was approved under the EPBC Act in February 2020 through the EPBC Decision 2017/7950 approval (DCCEEW 2020a; Appendix A).

1.2.2 Variations to Approval

Following the Action's approval in February 2020, variations to the conditions of EPBC Decision 2017/7950 approval have been approved in December 2020 (DCCEEW 2020b; Appendix B) and March 2022 (DCCEEW 2022; Appendix C).

2. Current Status

Covalent Lithium commenced the implementation of the Action in April 2021. Significant activities undertaken during the 2022 reporting period included:

- The first lithium ore was mined by Covalent Lithium;
- Malleefowl and Chuditch monitoring survey(s); and
- Vegetation condition monitoring survey(s).

3. Audit Methodology

3.1 Audit Plan

3.1.1 Purpose & Scope

This Compliance Report has been prepared for the reporting period from 1 January 2022 to 31 December 2022 to fulfil the requirements of Condition 12.

Condition 12 requires the approval holder (Covalent Lithium) to publish an report on a 12-month basis, addressing compliance against conditions in EPBC Decision 2017/7950 approval (DCCEEW 2020a; Appendix A).

[1] *Banksia dolichostyla* was previously assessed as *Banksia sphaerocarpa* var. *dolichostyla*.

©JBS&G Australia Pty Ltd

Condition 12 states:

> *"The approval holder must prepare a **compliance report** for each 12-month period following the date of **commencement of the action**, or otherwise in accordance with an annual date that has been agreed to in writing by the **Minister**. The approval holder must:*
>
> *a. Publish each **compliance report** on the **website** within 60 **business days** following the relevant 12 month period;*
> *b. Notify the **Department** by email that a **compliance report** has been published on the website and provide the web link for the **compliance report** within five **business days** of the date of publication;*
> *c. Keep all **compliance reports** publicly available on the **website** until this approval expires;*
> *d. Exclude or redact **sensitive ecological data** from **compliance reports** published on the **website**; and*
> *e. Where any **sensitive ecological data** has been excluded from the version published, submit the full **compliance report** to the **Department** within 5 **business days** of publication."*

3.1.2 Methodology

An independent desktop audit (the 'Audit') was undertaken by JBS&G in July 2023, the outcome of which was used to inform this Compliance Report. The audit primarily involved consultation with the key persons associated with the Action and review of relevant documentation to assess the level of compliance against the approval conditions of the EPBC Decision 2017/7950 approval. The key persons consulted during the audit are listed below in Table 3.1.

Table 3.1: Key Personnel Consulted for the Audit

Personnel	Position
Anthea Pate	Manager for Environment, Approvals & Safety Manager
Brigitta Longbottom	Environmental Superintendent

3.1.3 Terminology

The 'Status' field of audit table (refer to Section 4.1) describes the level of compliance against the approval conditions. In 2019, the DCCEEW issued the *Independent Audit and Audit Report Guidelines for controlled actions which have been approved under Chapter 4 of the Environment Protection and Biodiversity Conservation Act 1999* (DCCEEW 2019). Terminology from this guidance has been applied in the audit and is listed below in Table 3.2.

Table 3.2: Terminology used for the Audit (DCCEEW 2019)

Term	Definition
Compliant	A rating of 'compliance' is given when the auditee has complied with a condition, element of a condition or measure required by a management plan, report or program, *etc.*
Potentially non-compliant	A rating of 'non-compliance' is given when the auditee has not met the condition, element of a condition, or measure required by a management plan, report or program, *etc.*
Not applicable	A rating of 'not applicable at the time of the audit' is given when the condition of element of a condition falls outside the scope if the audit, *e.g.*, if any activity has not commenced.
Conformant	All the requirements of a key management action detailed within a subsidiary plan or program have been satisfactorily met.
Potentially non-conformant	All the requirements of a key management actions detailed within a subsidiary plan or program have not been met satisfactorily.
Not applicable	The requirements of a management action fall outside of the scope of the current reporting period. For example, a condition which applies to an activity that has not yet commenced.

©JBS&G Australia Pty Ltd

4. Audit Results

4.1 Summary of Compliance

4.1.1 EPBC Decision 2017/7950 Approval

A total of twenty (20) conditions are contained within the latest EPBC Decision 2017/7950 variation. In the latest variation, Condition 4C was revoked, and will not be reported hereon. The results of the audit are outlined below in Table 4.1. The following audit results were determined:

- **11** conditions were found to be 'Compliant' including two conditions 'Compliant (complete)'
- **2** conditions were found to be 'Potentially non-compliant' and
- **7** conditions were found to be 'Not applicable'

4.1.2 Terrestrial Fauna Management Plan

A total of 78 conditions are contained within the Terrestrial Fauna Management Plan (Revision 3) approved as of 31 December 2022. The following audit results were determined:

- **76** conditions were found to be 'Conformant'
- **No** conditions were found to be 'Potentially non-conformant' and
- **2** conditions were found to be 'Not applicable'

4.1.3 Ironcaps Banksia Conservation Plan

A total of 39 conditions are contained within the Ironcaps Banksia Conservation Plan (Revision 2) approved as of 31 December 2022. The following audit results were determined:

- **24** conditions were found to be 'Conformant' including two conditions 'Conformant (complete)'
- **No** conditions were found to be 'Potentially non-conformant' and
- **20** conditions were found to be 'Not applicable'

4.1.4 Fauna Offset Management Plan

A total of 39 conditions are contained within the Fauna Offset Management Plan (Revision 0) approved as of 31 December 2022. The following audit results were determined:

- **2** conditions were found to be 'Conformant'
- **No** conditions were found to be 'Potentially non-conformat' and
- **37** conditions were found to be 'Not applicable'

4.2 Non-compliances

The potential non-compliances identified during the audit were determined to be an administrative omission; with null environmental effect to matters protected under the EPBC Act:

- Covalent were late in notifying DAWE of the date of commencement of the action as required by EPBC Decision 2017/7950 Condition 6
- Covalent Lithium did not submit a Compliance Report to the DCCEEW for the 2021 reporting period as required by EPBC Decision 2017/7950 Condition 12 and were late submitting the 2022 report.

No potential non-conformances were identified for the compliance assessment of the Terrestrial Fauna Management Plan, Ironcaps Banksia Conservation Plan and Fauna Offset Management Plan.

©JBS&G Australia Pty Ltd

Table 4.1: Audit Table of Compliance with EPBC Decision 2017/7950

Condition	Date	Evidence	Determination Assessment	Compliance Status
Part A – Conditions Specific to the Action				
EPBC Decision 2017/7950 Condition 1:		To minimise impacts to the Malleefowl (*Leipoa ocellata*) and Chuditch (*Dasyurus geoffroii*), the approval holder must not clear more than 442 ha of native vegetation within the 1,984 ha development envelope shown at **Attachment A**.		
1	29 March 2023	R001 – Terrestrial Fauna Management Plan (Covalent Lithium 2022a) S001 – Covalent Lithium | ClearingFootprint.shp S002 – Covalent Lithium | ClearingToDate.shp	As of 31 December 2022, records provided by Covalent Lithium indicated 365 ha of native vegetation had been cleared within the Development Envelope; being below the 442 ha limit. JBS&G notes that previously disturbed/cleared areas (cleared as part of the abandoned Mt. Holland Mine Site) have been excluded from the calculations.	Compliant
EPBC Decision 2017/7950 Condition 2:		To minimise impacts to Ironcaps Banksia (*Banksia sphaerocarpa* var. *dolichostyla*), the approval holder must not clear more than two (2) Ironcaps Banksia plants.		
2	29 March 2023	R002 – Flora and Vegetation Management Plan (Covalent Lithium 2022b) R003 – Ironcaps Banksia Conservation Plan (Covalent Lithium 2021a) S001 – ClearingFootprint.shp S002 – ClearingToDate2022.shp S003 – IroncapsBanksiaLocations.shp	As of 31 December 2022, records provided by Covalent Lithium indicated that no Ironcaps Banksia (*Banksia dolichostyla*) individuals had been cleared within the Development Envelope.	Compliant
EPBC Decision 2017/7950 Condition 3:		To minimise impacts to the Malleefowl (*Leipoa ocellata*) and Chuditch (*Dasyurus geoffroii*), the approval holder must comply with Condition 7 of the Western Australia approval, where relevant to Malleefowl (*Leipoa ocellata*) and Chuditch (*Dasyurus geoffroii*).		
3	23 December 2023	C001 – Ministerial Statement 1199 - Terrestrial Fauna Environmental Management Plan Revision 5 – Approved (DWER 2023) R001 – Terrestrial Fauna Management Plan (Covalent Lithium 2022a) R004 – Threatened Fauna Offset Management Plan (Covalent Lithium 2021b) R006 – 2023 ACR Appendix D	The Action was approved under the EP Act in November 2019 through MS 1118, wherein Condition 7 stipulates the implementation of a Terrestrial Fauna Management Plan. This was submitted to the DWER on 21 September 2020 and approved on 30 September 2020. Following the Action's approval in November 2020 variations to the condition have been approved in December 2020 (MS 1167) and November 2022 (MS 1199). The latest revision of the Terrestrial Fauna Management Plan (Revision 5) was submitted to DWER on 12 December 2022 and approved on 9 March 2023. Implementation that has occurred since the commencement of the Action has included annual population monitoring; pre-clearance surveys; mortality monitoring; introduced predator monitoring; clearing monitoring; and fauna habitat monitoring. Monitoring of both Malleefowl and Chuditch was undertaken this reporting period. Based on the reported results of monitoring, the Action had no direct or indirect effect on Malleefowl and/or Chuditch (*e.g.*, Malleefowl mounds had not been disturbed; and no observable decline in Malleefowl and/or Chuditch populations; and/or no increase to introduced predator populations, *etc.*). A compliance assessment of the Threatened Fauna Management Plan is presented in Appendix D. No management triggers occurred during this reporting period; therefore, no notification was submitted to the DWER (as per MS 1199) or the DCCEEW. **Note:** Condition 7 referred to in Condition 3 of the EPBC Decision 2017/7950 approval is Condition 3 in MS 1199.	Compliant

©JBS&G Australia Pty Ltd

Condition	Date	Evidence	Determination Assessment	Compliance Status
EPBC Decision 2017/7950 Condition 4:		To compensate for residual significant impacts to the Malleefowl (*Leipoa ocellata*) and Chuditch (*Dasyurus geoffroii*), the approval holder must: a. Acquire, manage and protect for enduring conservation offset area(s) that comprise Malleefowl and Chuditch foraging and breeding habitat and that collectively offset the residual significant impacts of the action to the Malleefowl(*Leipoa ocellata*) and Chuditch (*Dasyurus geoffroii*) in accordance with the **EPBC Act Environmental Offsets Policy** to the satisfaction of the **Minister**; b. Submit for the **Minister's** written approval a Fauna Offset Management Plan in respect of each offset area required to meet Condition 4A; and c. Implement each approved Fauna Offset Management Plan at least until the end date of the period of effect of the approval.		
4	29 March 2023	R004 – Threatened Fauna Offset Management Plan (Covalent Lithium 2021b) S004 – OffsetProperty.shp R006 – 2023 ACR Appendix F	As of 31 December 2022, Covalent Lithium has identified an offset property containing foraging and breeding habitat for the Malleefowl (*Leipoa ocellata*) and the Chuditch (*Dasyurus geoffroii*). The offset property is located in Skeleton Rock, within the Shire of Yilgarn in WA. The property itself is 1,788 ha, consisting of 1,510 ha of woodland and shrubland fauna habitat and 135 ha of granite habitat. The remaining 143 ha of area is cleared land which Covalent Lithium will utilise for fencing and firebreaks. The Fauna Offset Management Plan was submitted on 26 March 2021 and approved by the DCCEEW on 31 March 2021. Covalent Lithium is currently awaiting approval from the WA Minster for Environment; therefore, the managing and monitoring components of the Fauna Offset Management Plan have not commenced at this stage. Current compliance status with the Fauna Offset Management Plan is included in Appendix F. JBS&G note that an additional (or amended) Threatened Fauna Offset Management Plan is proposed by Covalent Lithium to be prepared and submitted to both the EPA and DCCEEW to offset an additional 56 ha of fauna habitat clearing that was authorised under and the latest EPBC Decision 2017/7950 variation.	Compliant
EPBC Decision 2017/7950 Condition 4A:		Each Fauna Offset Management Plan required under Condition 4 must be prepared in accordance with the environmental management plan guidelines, and include the following: a. The residual significant impacts to the Malleefowl (*Leipoa ocellata*) and Chuditch (*Dasyurus geoffroii*), quantified as the area of **clearing** of native vegetation within the **development envelope**, that will be offset by implementing the plan; b. The environmental values of the proposed offset area, including results from field validation surveys, quantifiable ecological data on habitat quality and how the offset area will provide habitat connectivity with adjacent vegetation communities and biodiversity corridors; c. The size of the offset area in hectares, and maps that define the location and boundaries of the offset area; d. Measurable ecological outcomes for habitat quality, when these will be achieved and the period for which these will be maintained; e. Offset completion criteria to demonstrate attainment of the ecological outcomes and an explanation of how the proposed offset completion criteria will be achieved; f. Management measures (including timing, frequency, duration and method of outcome measurement) that will be implemented to achieve the ecological outcomes for Malleefowl (*Leipoa ocellata*) and Chuditch (*Dasyurus geoffroii*); g. Evidence that the management measures are consistent with relevant conservation advice, recovery plans and threat abatement plans; h. An analysis of potential risks of the plan, if implemented, failing to attain and/or maintain the offset completion criteria; i. Criteria for triggering corrective actions should risks be realised, and a monitoring program designed to detect the criteria and track progress against offset completion criteria; j. The activities and land uses that will be prohibited in the offset area, including, for example, mining, exploration or grazing; k. A schedule for evaluating and reporting, at least annually, on the effectiveness of management measures and progress against offset completion criteria; l. The nature and timing of the proposed legal mechanism for securing the offset area, and contingency measures if the specified legal mechanism is not established in a timely manner; m. An explanation of how the offset area and offset area management addresses the principles of the EPBC Act Environmental Offsets Policy; and n. The role of the approval holder in controlling and managing the offset area and the identity and offset management role(s) of any other involved party. Each Fauna Offset Management Plan required under Condition 4 must be submitted to the **Department** within twelve (12) months of the **clearing** of native vegetation within the **development envelope** that, in accordance with Condition 4A a., it offsets. Each Fauna Offset Management Plan submitted in accordance with Condition 4B. must be accompanied by **shapefiles** that define the location and boundaries of the offset area, the offset attributes (including physical address of the offset area(s), coordinates of the boundary points in decimal degrees, the **EPBC Act Listed threatened species** that the environmental offset area(s) compensate for, and the size of the offset area(s) in hectares.		
4A	29 March 2023	C002 – EPBC 2017/7950: Fauna Offset Management Plan (DCCEEW 2021a) R004 – Threatened Fauna Offset Management Plan (Covalent Lithium 2021b) S004 – OffsetProperty.shp	<u>Please refer to Condition 4 above</u> The Fauna Offset Management Plan was prepared in accordance with the EPBC Offsets Assessment Guide (DCCEEW 2012) and the Environmental Management Plan Guidelines (DCCEEW 2014). The Fauna Offset Management Plan was submitted on 26 March 2021 and approved the by DCCEEW on 31 March 2021; being within 12-months of the clearing of native vegetation/fauna habitat within the Development Envelope.	Compliant (complete)

©JBS&G Australia Pty Ltd

Condition	Date	Evidence	Determination Assessment	Compliance Status
EPBC Decision 2017/7950 Condition 4B:		The approval holder must not commence the action until a Fauna Offset Management Plan is approved by the Minister in writing.		
4B	23 December 2023	C002 – EPBC 2017/7950: Fauna Offset Management Plan (DCCEEW 2021a)	The Threatened Fauna Offset Management Plan was submitted on 26 March 2021 and approved by the DCCEEW on 31 March 2021. The Action officially commenced in April 2021.	Compliant (complete)
EPBC Decision 2017/7950 Condition 4C:		The approval holder must not **clear** more than the area of **clearing** within the **development envelope** specified (in accordance with Condition 4A(a)) in all approved Fauna Offset Management Plans.		
4C	29 March 2023	*This condition has been revoked*		
EPBC Decision 2017/7950 Condition 5:		To mitigate significant impacts to the Ironcaps Banksia (*Banksia phaerocarpa* var. *dolichostyla*), the approval holder must prevent impacts to Ironcaps Banksia other than as permitted under Condition 2 and, within ten (10) years from **commencement of the action**, establish at least 69 Ironcaps Banksia plants within the **development envelope**. The approval holder must submit for the **Minister's** written approval an Ironcaps Banksia Conservation Plan (the Plan) to specify how it will achieve these requirements. The Plan must be prepared consistent with the **environmental management plan guidelines**, and must: a. Show how the approval holder will prevent impacts to Ironcaps Banksia, other than as permitted under Condition 2: b. Include maps that clearly show the location of Ironcaps Banksia within the **development envelope** and in relation to native vegetation to be **cleared** or otherwise disturbed; i. Specify the total number and location of Ironcaps Banksia plants within the **development envelope**; ii. Identify potential impacts to Ironcaps Banksia from the action, and describe management measures to avoid and/or mitigate those impacts and corrective actions to be implemented if impacts are detected; iii. Include management triggers for detecting potential impacts to Ironcaps Banksia from the action; iv. Demonstrate that management measures are consistent with relevant **approved conservation advice, recovery plans and threat abatement plans**; c. Show how the approval holder will, within 10 years from commencement of the action, establish at least 69 Ironcaps Banksia plants within the **development envelope**: i. Specify a portion of the development envelope, that is contained within an exclusion zone specified in Condition 6-1 of the Western Australia approval, in which Ironcaps Banksia can be established and protected; ii. Include shapefiles to clearly define the location and boundaries of the Ironcaps Banksia establishment site(s), coordinates of the boundary points in decimal degrees, and the area of the establishment site(s) in hectares; iii. Include establishment criteria for Ironcaps Banksia plants; iv. Include an analysis of the potential risks that may prevent Ironcaps Banksia plants being established and self-sustaining at the proposed establishment site(s); v. Describe management measures to achieve the establishment criteria, and corrective actions to be implemented if establishment criteria have not been, or are unlikely to be, achieved or maintained; vi. Describe how establishment criteria will be maintained for the period of approval; d. Include a program that monitors the health of Ironcaps Banksia plants and is designed to detect management triggers and attainment of establishment criteria; e. Contain a schedule for evaluating and reporting, at least annually, on the health of Ironcaps Banksia plants, the detection of management triggers, progress against establishment criteria, and the effectiveness of management measures; and f. Include timeframes for implementing corrective actions. The approval holder must **not commence the action** until the Plan is approved by the **Minister** in writing. The Plan must be implemented at least until the end date of the period of effect of the approval.		
5	23 December 2023	C003 – EPBC 2017/7950: Ironcaps Banksia Conservation Plan (DCCEEW 2021b) R002 – Flora and Vegetation Management Plan (Covalent Lithium 2022b) R003 – Ironcaps Banksia Conservation Plan (Covalent Lithium 2021a) R006 – 2023 ACR Appendix E	The Covalent Lithium Ironcaps Banksia Conservation Plan was submitted on 3 February 2021 and approved by the DCCEEW on 12 February 2021. The management plan encompasses all elements required under Condtion 5 (a) to (e). Compliance with the implementation of the Ironcaps Banksia Conservation Plan is included in Appendix E.	Compliant
Part B – Standard Administrative Conditions				
Notification of Date of Commencement of the Action				
EPBC Decision 2017/7950 Condition 6:		The approval holder must notify the **Department** in writing of the date of **commencement of the action** within ten (10) **business days** after the date of **commencement of the action**.		
6	21 February 2020	C004 – Notice to the Department (13072023)	The Action commenced in April 2021. Covalent Lithium notified the DCCEEW of the commencement of the Action on 13 July 2023. Note the date of notification of subject to a potential non-compliance	Potentially non-compliant
Compliance Records				
EPBC Decision 2017/7950 Condition 7:		The approval holder must maintain accurate and complete **compliance records**.		
7	21 February 2020	R005 – EPBC Decision 2017/7950 Compliance Report (JBS&G 2023) (*this document*)	Covalent Lithium have maintained an accurate and complete archive of compliance records, including reports, correspondence and spatial data. These records have been used to inform this Compliance Report to assess Covalent Lithium's level of compliance against the EPBC Decision 2017/7950 approval conditions.	Compliant

©JBS&G Australia Pty Ltd

Condition	Date	Evidence	Determination Assessment	Compliance Status
EPBC Decision 2017/7950 Condition 8:		If the **Department** makes a request in writing, the approval holder must provide electronic copies of **compliance records** to the **Department** within the timeframe specified in the request. **Note: Compliance records** may be subject to audit by the Department or an independent auditor in accordance with Section 458 of the EPBC Act, and or used to verify compliance with the conditions. Summaries of the result of an audit may be published on the **Department's** website or through the general media.		
8	21 February 2020	Not required	The DCCEEW have not requested compliance records from Covalent Lithium since the commencement of the Action in April 2021.	Not applicable
Preparation & Publication of Plans				
EPBC Decision 2017/7950 Condition 9:		The approval holder may, at any time, apply to the **Minister** for a variation to an action management plan approved by the **Minister**, or as subsequently revised in accordance with these conditions, by submitting an application in accordance with the requirements of Section 143A of the **EPBC Act**. If the **Minister** approves a Revised Action Management Plan (RAMP) then, from the date specified, the approval holder must implement the RAMP in place of the previous action management plan.		
9	21 February 2020	Not required	No Revised Action Management Plans have been submitted by Covalent Lithium to the DCCEEW in the reporting period.	Not applicable
EPBC Decision 2017/7950 Condition 10:		The approval holder must: a. Submit plans electronically to the Department for approval by the Minister; b. Publish each plan on the website within twenty (20) business days of the date the plan is approved by the Minister or of the date a revised action management plan is submitted to the Minister or the Department, unless otherwise agreed to in writing by the Minister; c. Exclude or redact sensitive ecological data from plans published on the website or provided to a member of the public; and d. Keep plans published on the website until the end date of this approval.		
10	21 February 2020	E02_Sustainability Website Screenshot	Please refer to Condition 9 above The Ironcaps Banksia Management Plan was originally approved 12 February 2021 and is available on the website: https://www.covalentlithium.com/sustainability No revised action management plans were submitted in the reporting period.	Compliant
EPBC Decision 2017/7950 Condition 11:		The approval holder must ensure that any monitoring data (including **sensitive ecological data**), surveys, maps, and other spatial and metadata required under a plan, is prepared in accordance with the **Department's** *Guidelines for biological survey and mapped data* (2018) and submitted electronically to the **Department** in accordance with the requirements of the plan.		
11	21 February 2020	Not required	Monitoring data (including sensitive ecological data), surveys, maps, and other spatial and metadata required as per the Terrestrial Fauna Management Plan and Ironcaps Banksia Conservation Plan were prepared in accordance with the Guidelines for biological survey and mapped data (DCCEEW 2018) and have been submitted to the DCCEEW in Section 6 of this report.	Compliant
EPBC Decision 2017/7950 Condition 12:		The approval holder must prepare a **compliance report** for each 12-month period following the date of **commencement of the action**, or otherwise in accordance with an annual date that has been agreed to in writing by the **Minister**. The approval holder must: a. Publish each **compliance report** on the **website** within sixty (60) **business days** following the relevant 12-month period; b. Notify the **Department** by email that a **compliance report** has been published on the website and provide the web link for the **compliance report** within five (5) **business days** of the date of publication; c. Keep all **compliance reports** publicly available on the **website** until this approval expires; d. Exclude or redact **sensitive ecological data** from **compliance reports** published on the **website**; and e. Where **any sensitive ecological data** has been excluded from the version published, submit the full **compliance report** to the **Department** within five (5) **business days** of publication. **Note: Compliance reports** may be published on the **Department's** website.		
12	21 February 2020	C004 – Notice to the Department (13072023)	This Compliance Report summarises the results of the audit undertaken to assess Covalent Lithium's level of compliance against the EPBC Decision 2017/7950 approval conditions for the 2022 period (1 January 2022 to 31 December 2022). JBS&G note that Covalent Lithium did not submit a Compliance Report to the DCCEEW for the 2021 reporting period as required by Condition 12; however, this non-compliance matter is an administrative omissions; with null environmental effect to matters protected under the EPBC Act.	Potentially non-compliant

©JBS&G Australia Pty Ltd

Condition	Date	Evidence	Determination Assessment	Compliance Status
EPBC Decision 2017/7950 Condition 13:		The approval holder must notify the **Department** in writing of any: **incident**; non-compliance with the conditions; or non-compliance with the commitments made in **plans**. The notification must be given as soon as practicable, and no later than two (2) business days after becoming aware of the incident or non-compliance. The notification must specify: a. Any condition which is or may be in breach; b. A short description of the **incident** and/or non-compliance; and c. The location (including co-ordinates), date, and time of the **incident** and/or non-compliance. In the event the exact information cannot be provided, provide the best information available.		
13	21 February 2020	C004 – Notice to the Department (13072023)	Covalent Lithium notified the DCCEEW of the non-compliance with Condition 6 and Condition 12 of EPBC Decision 2017/7950 approval on 13 July 2023. No further incidents and/or non-compliances have been reported by Covalent Lithium.	Compliant
EPBC Decision 2017/7950 Condition 14:		The approval holder must provide to the **Department** the details of any **incident** or non-compliance with the conditions or commitments made in **plans** as soon as practicable and no later than 10 **business days** after becoming aware of the **incident** or non-compliance, specifying: a. Any corrective action or investigation which the approval holder has already taken or intends to take in the immediate future; b. The potential impacts of the **incident** or non-compliance; and c. The method and timing of any remedial action that will be undertaken by the approval holder.		
14	21 February 2020	Not required	No incidents and/or non-compliances with the conditions or commitments made in any of the environmental management plans have occurred since the commencement of the Action in April 2021.	Not applicable
EPBC Decision 2017/7950 Condition 15:		The approval holder must ensure that **independent audits** of compliance with the conditions are conducted as requested in writing by the **Minister**.		
15	21 February 2020	Not required	No independent audit of compliance with conditions have been requested by the Minister since the commencement of the Action in April 2021.	Not applicable
EPBC Decision 2017/7950 Condition 16:		For each **independent audit**, the approval holder must: a. Provide the name and qualifications of the independent auditor and the draft audit criteria to the **Department**; b. Only commence the **independent audit** once the audit criteria have been approved in writing by the **Department**; and c. Submit an audit report to the **Department** within the timeframe specified in the approved audit criteria.		
16	21 February 2020	Not required	Please refer to Condition 15 above	Not applicable
EPBC Decision 2017/7950 Condition 17:		The approval holder must publish the audit report on the **website** within ten (10) **business days** of receiving the **Department's** approval of the audit report and keep the audit report published on the **website** until the end date of this approval.		
17	21 February 2020	Not required	Please refer to Condition 15 above	Not applicable
EPBC Decision 2017/7950 Condition 18:		Within thirty (30) days after the **completion of the action**, the approval holder must notify the **Department** in writing and provide **completion data**.		
18	21 February 2020	Not required	As of 31 December 2022, the Action has not been completed.	Not applicable

©JBS&G Australia Pty Ltd

5. New Environmental Risks

Since Covalent Lithium commenced the implementation of the Action in April 2021, there have been no new environmental risks identified, for example no new MNES have been identified that may potentially be impacted by the Action.

6. Monitoring

Any monitoring data (including sensitive ecological data), surveys, maps, and other spatial and metadata required under a plan, is required to be submitted electronically to the Department in accordance with the requirements of the plan. The following monitoring reports have been included with this ACR:

- Appendix G - Mallefowl Monitoring 2021-2022 (As required under the TFMP)
- Appendix H - Chuditch Monitoring 2022 (As required under the TFMP)
- Appendix I - Vegetation Condition Monitoring Autumn (As required under the TFMP & IBCP)
- Appendix J - Vegetation Condition Monitoring Spring (As required under the TFMP & IBCP)
- Appendix K - Introduced Predator Monitoring (As required under the TFMP)
- Appendix L - Fauna Pre-clearance Survey (As required under the TFMP)
- Appendix M - Dieback Assessment 2022 (As required under the IBCP)
- Appendix N - Introduced Flora (Weed) Survey (As required under the IBCP)
- Appendix O - Dust Report (As required under the IBCP)

©JBS&G Australia Pty Ltd

7. Limitations

Scope of Services

This report ('the report') has been prepared by JBS&G in accordance with the scope of services set out in the contract, or as otherwise agreed, between the Client and JBS&G. In some circumstances, a range of factors such as time, budget, access and/or site disturbance constraints may have limited the scope of services. This report is strictly limited to the matters stated in it and is not to be read as extending, by implication, to any other matter in connection with the matters addressed in it.

Reliance on Data

In preparing the report, JBS&G has relied upon data and other information provided by the Client and other individuals and organisations, most of which are referred to in the report ('the data'). Except as otherwise expressly stated in the report, JBS&G has not verified the accuracy or completeness of the data. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in the report ('conclusions') are based in whole or part on the data, those conclusions are contingent upon the accuracy and completeness of the data. JBS&G has also not attempted to determine whether any material matter has been omitted from the data. JBS&G will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to JBS&G. The making of any assumption does not imply that JBS&G has made any enquiry to verify the correctness of that assumption.

The report is based on conditions encountered and information received at the time of preparation of this report or the time that site investigations were carried out. JBS&G disclaims responsibility for any changes that may have occurred after this time. This report and any legal issues arising from it are governed by and construed in accordance with the law as at the date of this report.

Environmental Conclusions

Within the limitations imposed by the scope of services, the preparation of this report has been undertaken and performed in a professional manner, in accordance with generally accepted environmental consulting practices. No other warranty, whether express or implied, is made.

The advice herein relates only to this project and all results conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, before being used for any other purpose.

JBS&G accepts no liability for use or interpretation by any person or body other than the client who commissioned the works. This report should not be reproduced without prior approval by the client or amended in any way without prior approval by JBS&G, and should not be relied upon by other parties, who should make their own enquiries.

©JBS&G Australia Pty Ltd

8. References

Covalent Lithium Pty Ltd (2021a) *Covalent Lithium Earl Grey Lithium Project Conservation Plan for Ironcaps Banksia Banksia sphaerocarpa var. dolichostyla EPBC Approval 2017/7950*.

Covalent Lithium Pty Ltd (2021b) *Covalent Lithium Earl Grey Lithium Project Threatened Fauna Offset Management Plan*.

Covalent Lithium Pty Ltd (2022a) *Covalent Lithium Earl Grey Lithium Project Terrestrial Fauna Management Plan*.

Covalent Lithium Pty Ltd (2022b) *Covalent Lithium Earl Grey Lithium Project Flora and Vegetation Management Plan*.

Department of Climate Change, Energy, the Environment and Water (2012) *EPBC Offsets Assessment Guide*. Prepared by the DCCEEW (formerly as the Department of Sustainability, Environment, Water, Population and Communities). Commonwealth of Australia.

Department of Climate Change, Energy, the Environment and Water (2014) Environmental Management Plan Guidelines. Prepared by the DCCEEW (formerly as the Department of the Environment). Commonwealth of Australia.

Department of Climate Change, Energy, the Environment and Water (2019) *Independent Audit and Audit Report Guidelines for controlled actions which have been approved under Chapter 4 of the Environment Protection and Biodiversity Conservation Act 1999*. Report prepared by the DCCEEW (formerly as the Department of Energy and the Environment). Commonwealth of Australia.

Department of Climate Change, Energy, the Environment and Water (2020a) *Approval - Earl Grey Lithium Project (EPBC 2017/7950)*. Prepared by the DCCEEW (formerly as the Department of Water, Agriculture and Environment). Commonwealth of Australia.

Department of Climate Change, Energy, the Environment and Water (2020b) *Variation of Conditions Attached to Approval - Earl Grey Lithium Project (EPBC 2017/7950)*. Prepared by the DCCEEW (formerly as the Department of Water, Agriculture and Environment). Commonwealth of Australia.

Department of Climate Change, Energy, the Environment and Water (2022) *Earl Grey Lithium Project (EPBC 2017/7950): Variation of Conditions Attached to Approval*. Prepared by the DCCEEW (formerly as the Department of Water, Agriculture and Environment). Commonwealth of Australia.

Department of Climate Change, Energy, the Environment and Water (2021a) *EPBC 2017/7950: Earl Grey Lithium Project – Fauna Offset Management Plan*. Prepared by the DCCEEW (formerly as the Department of Water, Agriculture and Environment). Commonwealth of Australia.

Department of Climate Change, Energy, the Environment and Water (2021b) *EPBC 2017/7950: Earl Grey Lithium Project, WA – Ironcaps Banksia Conservation Plan*. Prepared by the DCCEEW (formerly as the Department of Water, Agriculture and Environment). Commonwealth of Australia.

Department of the Environment (2014) *Annual Compliance Report Guidelines*, Commonwealth of Australia, Canberra.

Department of Water and Environment Regulation (2023) *Ministerial Statement 1199 – Earl Grey Lithium (Revised Proposal) – Earl Grey Lithium Project Terrestrial Fauna Environmental Management Plan Revision 5 – Approved*. Prepared by the DWER. Government of Western Australia.

©JBS&G Australia Pty Ltd

Appendix A EPBC 2017/7950

©JBS&G Australia Pty Ltd

Australian Government

Department of Agriculture, Water and the Environment

APPROVAL

Earl Grey Lithium Project (EPBC 2017/7950)

This decision is made under sections 130(1) and 133(1) of the *Environment Protection and Biodiversity Conservation Act 1999 (Cth).* Note that section 134(1A) of the **EPBC Act** applies to this approval, which provides in general terms that if the approval holder authorises another person to undertake any part of the action, the approval holder must take all reasonable steps to ensure that the other person is informed of any conditions attached to this approval, and that the other person complies with any such condition.

Details

Person to whom the approval is granted (approval holder)	Covalent Lithium Pty Ltd
ACN or ABN of approval holder	ACN: 623 090 139
Action	To clear native vegetation to undertake open cut mining and processing of lithium ore, at the abandoned Mt Holland Mine Site, WA, with transport of a lithium concentrate to an existing Western Australian port for export to overseas markets, subject to the variations of the action accepted by the Minister under section 156 B on 11 February 2018 and 14 November 2019.

Proposed Approval decision

My decision on whether or not to approve the taking of the action for the purposes of the controlling provision for the action is as follows.

Controlling Provisions

Listed Threatened Species and Communities	
Section 18	Approve
Section 18A	Approve

Period for which the approval has effect

This approval has effect until 31 December 2069

Decision-maker

Name and position	Declan O'Connor-Cox A/g Assistant Secretary, Environment Approvals Division Department of Agriculture, Water and the Environment
Signature	
Date of decision	21/2/2020

Conditions of approval

This approval is subject to the conditions under the EPBC Act as set out in ANNEXURE A.

ANNEXURE A – CONDITIONS OF APPROVAL

Part A – Conditions specific to the action

1. To minimise impacts to the Malleefowl (*Leipoa ocellata*) and Chuditch (*Dasyurus geoffroii*) the approval holder must not **clear** more than 386 ha of native vegetation within the 1,984 ha development envelope shown at **Attachment A**.
2. To minimise impacts to Ironcaps Banksia (*Banksia sphaerocarpa var. dolichostyla*), the approval holder must not **clear** more than 69 Ironcaps Banksia individuals.
3. To minimise impacts to **EPBC Act listed threatened species**, the approval holder must comply with Condition 6 (Flora and Vegetation Environmental Management Plan) and Condition 7 (Terrestrial Fauna Environmental Management Plan) of the **Western Australia approval**, where relevant to **EPBC Act listed threatened species.**
4. To compensate for the residual significant impacts to the Malleefowl and Chuditch, the approval holder must submit for the **Minister's** written approval a Fauna Offset Plan. The Fauna Offset Plan must include the following:
   a) Identification of the specific offset area(s) to be acquired and protected for enduring conservation that comprise existing Malleefowl and Chuditch foraging and breeding habitat.
   b) Identification of the environmental values of the offset area(s) including:
      a. relevant baseline information regarding the offset area(s), including results from field validation surveys, and quantifiable ecological data on **habitat quality** for the Malleefowl and Chuditch currently in the offset areas,
      b. how the offset area(s) will provide connectivity with other habitats and biodiversity corridors and/or will contribute to a larger strategic offset for the **total quantum of impact**,
      c. a description and maps (including **shapefiles**) to clearly define the location and boundaries of the offset area(s), accompanied by the offset attributes (including physical address of the offset area(s), coordinates of the boundary points in decimal degrees, the **EPBC Act Listed threatened species** that the environmental offset area(s) compensate for, and the size of the environmental offset area(s) in hectares, and
      d. evidence of how the proposed offset site will meet the requirements of the **EPBC Act Environmental Offsets Policy.**
   c) Commitment to measureable, defined ecological outcomes to protect the baseline **habitat quality** for the Malleefowl and Chuditch for which the offset area(s) are being provided and the period for which these will be achieved.
   d) Offset completion criteria and an explanation of how the proposed ecological outcomes will be achieved.
   e) The management measures (including timing, frequency, duration and method of outcome measurement) that will be implemented to achieve the following:
      a. the ecological outcomes for the protection of the Malleefowl and Chuditch for which the offset area(s) is(are) being provided, and
      b. the protection of the **habitat quality scores** for the Malleefowl and Chuditch.
   f) The management measures and land uses that will be prohibited in the offset area(s), including, for example, mining/exploration, grazing or development.

g) Evidence that the management measures proposed are consistent with **environmental management plan guidelines** and relevant **conservation advices**, **recovery plans** and **threat abatement plans**.

h) Criteria for triggering corrective actions and the proposed time-bound corrective actions or process for determining these.

i) A monitoring program designed to detect triggers and track progress against performance criteria in a timely manner.

j) A risk analysis of the potential risks to the offset area(s) that may prevent them from achieving the performance and completion criteria, including for if the offset area(s) fail to achieve and maintain the completion criteria.

k) A schedule for evaluating and reporting, at least annually, on the effectiveness of management measures and progress against completion criteria.

l) The proposed legal mechanism(s) for securing the offset area(s), the timing for implementation of the legal mechanism(s) and contingency measures in the event the specified legal mechanisms can not proceed in a timely manner.

m) The role of the approval holder in relation to the management and ownership of the offset area(s) and the identity and role(s) of any other involved party.

The approval holder must not **commence** the action until the Fauna Offset Plan is approved by the **Minister** in writing. The approved Fauna Offset Plan must be implemented at least until the end date of the period of effect of the approval.

5. To compensate for the residual significant impacts to the Ironcaps Banksia, the approval holder must submit for the **Minister's** written approval a Flora Offset Plan. The Flora Offset Plan must include the following:

a) Identification of offset area(s) to be protected, managed and/or rehabilitated for enduring conservation that contains Ironcaps Banksia.

b) Identification of the environmental values of the offset area(s), including:

   a. relevant baseline information regarding the offset area(s), including results from field validation surveys, and quantifiable ecological data on **habitat quality** and the number of Ironcaps Banksia individuals currently in the offset areas,

   b. how the offset area(s) will provide connectivity with other habitats and biodiversity corridors and/or will contribute to a larger strategic offset for the **total quantum of impact**, and

   c. a description and maps (including **shapefiles**) to clearly define the location and boundaries of the offset area(s), accompanied by the offset attributes (including physical address of the offset area(s), coordinates of the boundary points in decimal degrees, the **EPBC Act Listed threatened species** that the environmental offset area(s) compensate for, and the size of the environmental offset area(s) in hectares, and

   d. evidence of how the proposed offset site will meet the requirements of the **EPBC Act Environmental Offsets Policy.**

c) Commitment to measureable, defined ecological outcomes to protect the baseline **habitat quality** and number of Ironcaps Banksia individuals for which the offset area(s) are being provided and the period for which these will be achieved.

d) Offset completion criteria and an explanation of how the proposed ecological outcomes will be achieved.

e) The management and/or rehabilitation measures (including timing, frequency, duration and method of outcome measurement) that will be implemented to achieve the following:

   a. the ecological outcomes for the protection of the Ironcaps Banksia for which the offset area(s) is(are) being provided, and

f) The management measures and land uses that will be prohibited in the offset area(s), including, for example, mining/exploration, grazing or development.

g) Evidence that the management measures proposed are consistent with **environmental management plan guidelines** and relevant **conservation advices**, **recovery plans** and **threat abatement plans**.

h) Criteria for triggering corrective actions and the proposed time-bound corrective actions or process for determining these.

i) A monitoring program designed to detect triggers and track progress against completion criteria in a timely manner.

j) A risk analysis of the potential risks to the offset area(s) that may prevent them from achieving the performance and completion criteria, including for if the offset area(s) fail to achieve and maintain the completion criteria.

k) A schedule for evaluating and reporting, at least annually, on the effectiveness of management measures and progress against completion criteria.

l) The proposed legal mechanism(s) for securing the offset area(s), the timing for implementation of the legal mechanism(s) and contingency measures in the event the specified legal mechanisms can not proceed in a timely manner.

m) The role of the approval holder in relation to the management and ownership of the offset area(s) and the identity and role(s) of any other involved party, and

n) Detail any funding arrangements and timing of funding for conservation activities.

The approval holder must not **commence** the action until the Flora Offset Plan is approved by the **Minister** in writing. The Flora Offset Plan must be implemented at least until the end date of the period of effect of the approval.

Part B – Standard administrative conditions

Notification of date of commencement of the action

6. The approval holder must notify the **Department** in writing of the date of **commencement of the action** within 10 **business days** after the date of **commencement of the action**.

Compliance records

7. The approval holder must maintain accurate and complete **compliance records**.

8. If the **Department** makes a request in writing, the approval holder must provide electronic copies of **compliance records** to the **Department** within the timeframe specified in the request.

Note: **Compliance records** may be subject to audit by the **Department** or an independent auditor in accordance with section 458 of the **EPBC Act**, and or used to verify compliance with the conditions. Summaries of the result of an audit may be published on the **Department**'s website or through the general media.

Preparation and publication of plans

9. The approval holder may, at any time, apply to the **Minister** for a variation to an action management plan approved by the **Minister**, or as subsequently revised in accordance with these conditions, by submitting an application in accordance with the requirements of section 143A of the **EPBC Act**. If the **Minister** approves a revised action management plan (RAMP) then, from the

date specified, the approval holder must implement the RAMP in place of the previous action management plan.

10. The approval holder must:

    a. submit **plans** electronically to the **Department** for approval by the **Minister**;

    b. publish each **plan** on the **website** within 20 **business days** of the date the **plan** is approved by the **Minister** or of the date a revised action management plan is submitted to the **Minister** or the **Department**, unless otherwise agreed to in writing by the **Minister**;

    c. exclude or redact **sensitive ecological data** from **plans** published on the **website** or provided to a member of the public; and

    d. keep **plans** published on the **website** until the end date of this approval.

11. The approval holder must ensure that any **monitoring data** (including **sensitive ecological data**), surveys, maps, and other spatial and metadata required under a plan, is prepared in accordance with the **Department's** *Guidelines for biological survey and mapped data* (2018) and submitted electronically to the **Department** in accordance with the requirements of the plan.

Annual compliance reporting

12. The approval holder must prepare a **compliance report** for each 12 month period following the date of **commencement of the action**, or otherwise in accordance with an annual date that has been agreed to in writing by the **Minister**. The approval holder must:

    a. publish each **compliance report** on the **website** within 60 **business days** following the relevant 12 month period;

    b. notify the **Department** by email that a **compliance report** has been published on the **website** and provide the weblink for the **compliance report** within five **business days** of the date of publication;

    c. keep all **compliance reports** publicly available on the **website** until this approval expires;

    d. exclude or redact **sensitive ecological data** from **compliance reports** published on the **website**; and

    e. where any **sensitive ecological data** has been excluded from the version published, submit the full **compliance report** to the **Department** within 5 **business days** of publication.

Note: **Compliance reports** may be published on the **Department**'s website.

Reporting non-compliance

13. The approval holder must notify the **Department** in writing of any: **incident;** non-compliance with the conditions; or non-compliance with the commitments made in **plans**. The notification must be given as soon as practicable, and no later than two **business days** after becoming aware of the **incident** or non-compliance. The notification must specify:

    a. any condition which is or may be in breach;

    b. a short description of the **incident** and/or non-compliance; and

    c. the location (including co-ordinates), date, and time of the **incident** and/or non-compliance. In the event the exact information cannot be provided, provide the best information available.

14. The approval holder must provide to the **Department** the details of any **incident** or non-compliance with the conditions or commitments made in **plans** as soon as practicable and no later than 10 **business days** after becoming aware of the **incident** or non-compliance, specifying:

    a. any corrective action or investigation which the approval holder has already taken or intends to take in the immediate future;

b. the potential impacts of the **incident** or non-compliance; and

c. the method and timing of any remedial action that will be undertaken by the approval holder.

Independent audit

15. The approval holder must ensure that **independent audits** of compliance with the conditions are conducted as requested in writing by the **Minister**.

16. For each **independent audit**, the approval holder must:

    a. provide the name and qualifications of the independent auditor and the draft audit criteria to the **Department**;

    b. only commence the **independent audit** once the audit criteria have been approved in writing by the **Department**; and

    c. submit an audit report to the **Department** within the timeframe specified in the approved audit criteria.

17. The approval holder must publish the audit report on the **website** within 10 **business days** of receiving the **Department's** approval of the audit report and keep the audit report published on the **website** until the end date of this approval.

Completion of the action

18. Within 30 days after the **completion of the action**, the approval holder must notify the **Department** in writing and provide **completion data**.

Part C - Definitions

19. In these conditions, except where contrary intention is expressed, the following definitions are used:

    Approved conservation advice means a conservation advice approved by the **Minister** under section 266B(2) of the **EPBC Act**. Where relevant, this includes the approved Conservation Advice for *Banksia sphaerocarpa* var. *dolichostyla* (Ironcaps Banksia).

    Business day means a day that is not a Saturday, a Sunday or a public holiday in the state or territory of the action.

    Clear / Clearing means the cutting down, felling, thinning, logging, removing, killing, destroying, poisoning, ringbarking, uprooting or burning of vegetation (but not including weeds – see the *Australian weeds strategy 2017 to 2027* for further guidance).

    Commencement of the action means the first instance of any specified activity associated with the action including **clearing** and **construction**. **Commencement of the action** does not include minor physical disturbance necessary to:

    i. undertake pre-clearance surveys or monitoring programs;

    ii. install signage and /or temporary fencing to prevent unapproved use of the project area;

    iii. protect environmental and property assets from fire, weeds and pests, including **use** of existing surface access tracks; and

    iv. install temporary site facilities for persons undertaking pre-commencement activities so long as these are located where they have no impact on the **EPBC Act Listed threatened species**.

    Completion data means an environmental report and spatial data clearly detailing how the conditions of this approval have been met. The **Department**'s preferred spatial data format is **shapefile**.

Completion of the action means all specified activities associated with the action have permanently ceased.

Compliance records means all documentation or other material in whatever form required to demonstrate compliance with the conditions of approval in the approval holder's possession or that are within the approval holder's power to obtain lawfully.

Compliance reports means written reports:

i. providing accurate and complete details of compliance, **incidents**, and non-compliance with the conditions and the **plans**;

ii. consistent with the **Department's** *Annual Compliance Report Guidelines* (2014);

iii. include a **shapefile** of any clearance of any **protected matters**, or their habitat, undertaken within the relevant 12 month period; and

iv. annexing a schedule of all **plans** prepared and in existence in relation to the conditions during the relevant 12 month period.

Construction means the erection of a building or structure that is or is to be fixed to the ground and wholly or partially fabricated on-site; the alteration, maintenance, repair or demolition of any building or structure; preliminary site preparation work which involves breaking of the ground (including pile driving); the laying of pipes and other prefabricated materials in the ground, and any associated excavation work; but excluding the installation of temporary fences and signage.

Department means the Australian Government agency responsible for administering the **EPBC Act**.

EPBC Act means the *Environment Protection and Biodiversity Conservation Act 1999* (Cth).

EPBC Act Environmental Offsets Policy is the *Environment Protection and Biodiversity Conservation Act* 1999 *Environmental Offsets Policy (October 2012),* or subsequent revision, including the Offsets Assessment Guide. Available at: https:llwww.environment.gov.au/system/files/resources/12630bb4-2c10-4c8e-815f-2d7862bf87e7/files/offsets-policy 2.pdf

EPBC Act Listed threatened species means the **EPBC Act** listed Malleefowl (*Leipoa ocellata*), Chuditch (*Dasyurus geoffroii*) and Ironcaps Banksia (*Banksia sphaerocarpa var. dolichostyla*).

Habitat quality means the baseline condition of suitable habitat for **EPBC Act Listed threatened species** determined from ecological surveys and with consideration of relevant **Departmental** documents including, but not be limited to, the **EPBC Act Environmental Offsets Policy**, **EPBC Act** referral guidelines, listing advices, **approved conservation advices** and **recovery plans**.

Incident means any event which has the potential to, or does, impact on one or more **protected matter(s)**.

Independent audit: means an audit conducted by an independent and **suitably qualified person** as detailed in the *Environment Protection and Biodiversity Conservation Act 1999 Independent Audit and Audit Report Guidelines* (2019).

Minister means the Australian Government Minister administering the **EPBC Act** including any delegate thereof.

Plan(s) means any of the documents required to be prepared, approved by the **Minister**, published on the **website** and/or implemented by the approval holder in accordance with these conditions (includes action management plans and/or strategies).

Protected matter means a matter protected under a controlling provision in Part 3 of the **EPBC Act** for which this approval has effect.

Recovery Plan means a recovery plan made or adopted by the **Minister** under the **EPBC Act**, including the *National Recovery Plan for Malleefowl Leipoa ocellata* and the *Chuditch (Dasyurus geoffroii) Recovery Plan*.

Sensitive ecological data means data as defined in the Australian Government Department of the Environment (2016) *Sensitive Ecological Data – Access and Management Policy V1.0.*

Shapefile means location and attribute information of the action provided in an Esri shapefile format. Shapefiles must contain '.shp', '.shx' , '.dbf' files and a '.prj' file that specifies the projection/geographic coordinate system used. Shapefiles must also include an '.xml' metadata file that describes the shapefile for discovery and identification purposes.

Suitably qualified person means a person who has professional qualifications, training, skills and/or experience related to the nominated subject matter and can give authoritative independent assessment, advice and analysis on performance relative to the subject matter using the relevant protocols, standards, methods and/or literature.

Threat abatement plan means a threat abatement plan made or adopted by the **Minister** under the **EPBC Act**.

Total quantum of impact has the same meaning as in the Offset Assessment Guide of the **EPBC Act Environmental Offsets Policy**. It is a measure of the adjusted hectares based on an assessment of the maximum impact area specified in Conditions 1 and 2, measured against the of **habitat quality** for that area.

Website means a set of related web pages located under a single domain name attributed to the approval holder and available to the public.

Western Australia approval means the WA Ministerial statement issued under the *Environmental Protection Act* 1986 - Statement No. 1118 published on 21 November 2019.

Attachment A – Development Envelope



Appendix B Notice of Variation to EPBC 2017/7950 (1)

©JBS&G Australia Pty Ltd

CORRECTION NOTIFICATION

EPBC No 2017/7950 – Earl Grey Lithium Project

Correction notice - Condition 5 attached to the approval dated 21 February 2020

Subcondition 5 e) of the conditions attached to the approval notice signed on 21 February 2020 appears to be missing subconditions after 5 e) a. because it is followed by the word 'and'.

This notice is published to confirm that there is no subcondition of 5 e), such as a 5 e) b., after 5 e) a.

Subcondition 5 e) should read as follows:

5 e) The management and/or rehabilitation measures (including timing, frequency, duration and method of outcome measurement) that will be implemented to achieve the ecological outcomes for the protection of the Ironcaps Banksia for which the offset area(s) is (are) being provided.

Person making correction

Name and position	Dwaine McMaugh A/g Director Post Approvals Section
Date of correction	23 July 2020

Appendix C Notice of Variation to EPBC 2017/7950 (2)

©JBS&G Australia Pty Ltd

Australian Government

Department of Agriculture, Water and the Environment

Variation of Conditions Attached to Approval

Earl Grey Lithium Project (EPBC 2017/7950)

This decision to vary conditions of approval is made under section 143 of the *Environment Protection and Biodiversity Conservation Act 1999*.

Approved action

Person to whom the approval is granted	Covalent Lithium Pty Ltd ACN: 623 090 139
Approved action	To clear native vegetation to undertake open cut mining and processing of lithium ore, at the abandoned Mt Holland Mine Site, WA, with transport of a lithium concentrate to an existing Western Australian port for export to overseas markets, subject to the variations of the action accepted by the Minister under section 156 B on 11 February 2018 and 14 November 2019.

Variation

Variation of conditions of approval	The variation is: Delete conditions 2, 3, 4 and 5 of the approval and replace with conditions 2, 3, 4, 4A, 4B, 4C and 5 specified below. Add the definitions of **development envelope** and **environmental management plan guidelines** specified below.
Date of effect	This variation has effect on the date the instrument is signed

Person authorised to make decision

Name and position	Declan O'Connor-Cox Acting Assistant Secretary Environment Assessments (Vic, Tas) and Post Approvals Branch
Signature	
Date of decision	23 December 2020

Conditions attached to the approval:

2. To minimise impacts to Ironcaps Banksia (*Banksia sphaerocarpa var. dolichostyla*), the approval holder must not **clear** more than 2 Ironcaps Banksia plants.

3. To minimise impacts to the Malleefowl (*Leipoa ocellate*) and Chuditch (*Dasyurus geoffroii*), the approval holder must comply with Condition 7 (Terrestrial Fauna Environmental Management Plan) of the **Western Australia approval**, where relevant to Malleefowl (*Leipoa ocellate*) and Chuditch (*Dasyurus geoffroii*).

4. To compensate for residual significant impacts to the Malleefowl (*Leipoa ocellate*) and Chuditch (*Dasyurus geoffroii)*, the approval holder must:

a) acquire, manage and protect for enduring conservation offset area(s) that comprise existing Malleefowl and Chuditch foraging and breeding habitat and that collectively offset the residual significant impacts to the Malleefowl (*Leipoa ocellate*) and Chuditch (*Dasyurus geoffroii)* of the action in accordance with the **EPBC Act Environmental Offsets Policy**;

b) submit for the **Minister's** written approval a Fauna Offset Management Plan in respect of each offset area required to meet Condition 4(a); and

c) implement each approved Fauna Offset Management Plan(s) at least until the end date of the period of effect of the approval.

4A. Each Fauna Offset Management Plan required under Condition 4 must be prepared in accordance with the **environmental management plan guidelines**, and include the following:

a) the residual significant impacts to the Malleefowl (*Leipoa ocellate*) and Chuditch (*Dasyurus geoffroii)* quantified as the area of **clearing** of native vegetation within the **development envelope**) that will be offset by implementing the plan;

b) the environmental values of the proposed offset area, including results from field validation surveys, quantifiable ecological data on **habitat quality** and how the offset area will provide habitat connectivity with adjacent vegetation communities and biodiversity corridors,

c) the size of the offset area in hectares, and maps that define the location and boundaries of the offset area;

d) measurable ecological outcomes for **habitat quality**, when these will be achieved and the period for which these will be maintained;

e) offset completion criteria to demonstrate attainment of the ecological outcomes and an explanation of how the proposed offset completion criteria will be achieved;

f) management measures (including timing, frequency, duration and method of outcome measurement) that will be implemented to achieve the ecological outcomes for Malleefowl (*Leipoa ocellate*) and Chuditch (*Dasyurus geoffroii)*;

g) evidence that the management measures are consistent with relevant **conservation advices**, **recovery plans** and **threat abatement plans**;

h) an analysis of potential risks of the plan, if implemented, failing to attain and/or maintain the offset completion criteria;

i) criteria for triggering corrective actions should risks be realised, and a monitoring program designed to detect the criteria and track progress against offset completion criteria;

j) the activities and land uses that will be prohibited in the offset area, including, for example, mining, exploration or grazing;

k) a schedule for evaluating and reporting, at least annually, on the effectiveness of management measures and progress against offset completion criteria;

l) the nature and timing of the proposed legal mechanism for securing the offset area, and contingency measures if the specified legal mechanism is not established in a timely manner;

m) an explanation of how the offset area and offset area management addresses the principles of the **EPBC Act Environmental Offsets Policy**; and

n) the role of the approval holder in controlling and managing the offset area and the identity and offset management role(s) of any other involved party.

Each Fauna Offset Management Plan submitted in accordance with Condition 4(b) must be accompanied by **shapefiles** that define the location and boundaries of the offset area, the offset attributes (including physical address of the offset area(s), coordinates of the boundary points in decimal degrees, the **EPBC Act Listed threatened species** that the environmental offset area(s) compensate for, and the size of the offset area(s) in hectares

4B. The approval holder must not **commence** the action until a Fauna Offset Management Plan is approved by the **Minister** in writing.

4C. The approval holder must not **clear** more than the area of **clearing** within the **development envelope** specified (in accordance with Condition 4A(a)) in all approved Fauna Offset Management Plans.

5. To mitigate significant impacts to the Ironcaps Banksia (*Banksia sphaerocarpa var. dolichostyla*), the approval holder must prevent impacts to Ironcaps Banksia other than as permitted under Condition 2 and, within 10 years from **commencement of the action**, establish at least 69 Ironcaps Banksia plants within the **development envelope**.

The approval holder must submit for the **Minister's** written approval an Ironcaps Banksia Conservation Plan (the Plan) to specify how it will achieve these requirements. The Plan must be prepared consistent with the **environmental management plan guidelines**, and must:

a) show how the approval holder will prevent impacts to Ironcaps Banksia, other than as permitted under Condition 2:

i. include maps that clearly show the location of Ironcaps Banksia within the **development envelope** and in relation to native vegetation to be **cleared** or otherwise disturbed;

ii. specify the total number and location of Ironcaps Banksia plants within the **development envelope**;

iii. identify potential impacts to Ironcaps Banksia from the action, and describe management measures to avoid and/or mitigate those impacts and corrective actions to be implemented if impacts are detected;

iv. include management triggers for detecting potential impacts to Ironcaps Banksia from the action;

v. demonstrate that management measures are consistent with relevant **approved conservation advices**, **recovery plans** and **threat abatement plans;**

b) show how the approval holder will, within 10 years from **commencement of the action**, establish at least 69 Ironcaps Banksia plants within the **development envelope**:

   i. specify a portion of the **development envelope,** that is contained within an exclusion zone specified in Condition 6-1 of the **Western Australia approval,** in which Ironcaps Banksia can be established and protected;

   ii. include **shapefiles** to clearly define the location and boundaries of the Ironcaps Banksia establishment site(s), coordinates of the boundary points in decimal degrees, and the area of the establishment site(s) in hectares;

   iii. include establishment criteria for Ironcaps Banksia plants;

   iv. include an analysis of the potential risks that may prevent Ironcaps Banksia plants being established and self-sustaining at the proposed establishment site(s);

   v. describe management measures to achieve the establishment criteria, and corrective actions to be implemented if establishment criteria have not been, or are unlikely to be, achieved or maintained;

   vi. describe how establishment criteria will be maintained for the period of approval;

c) include a program that monitors the health of Ironcaps Banksia plants and is designed to detect management triggers and attainment of establishment criteria;

d) contain a schedule for evaluating and reporting, at least annually, on the health of Ironcaps Banksia plants, the detection of management triggers, progress against establishment criteria, and the effectiveness of management measures; and

e) include timeframes for implementing corrective actions.

The approval holder must not **commence the action** until the Plan is approved by the **Minister** in writing. The Plan must be implemented at least until the end date of the period of effect of the approval.

Definition attached to the approval:

Development envelope means the area enclosed by the blue line designated as 'Development Envelope' in the map at **Attachment A**.

Environmental management plan guidelines means the Environmental Management Plan Guidelines, Commonwealth of Australia 2014, available at http://www.environment.gov.au/system/files/resources/21b0925f-ea74-4b9e-942e-a097391a77fd/files/environmental-management-plan-guidelines.pdf.

Appendix D Terrestrial Fauna Management Plan Compliance Assessment

Table D.1: Terrestrial Fauna Management Plan Audit Table

Commitment	Reference	Requirement	Timing	Evidence	Assessment	Status
Management Actions						
TFMP 1		Avoid removal of any active Malleefowl mounds.	Ongoing	Refer to TFEMP 1	Refer to Condition 1	Conformant
TFMP 2		Minimise mortality of Malleefowl or Chuditch from clearing activity, entrapment, vehicle strike or mining related fire.	Ongoing	*Management advice (24 April 2023)* R05_Covalent Lithium TFEMP C08_Injured_Deceased Malleefowl DBCA Notification	The TFEMP is implemented to minimise mortality of Malleefowl or Chuditch from clearing activity, entrapment, vehicle strike or mining related fire. There was one incident involving mortality of one Malleefowl by vehicle strike in the audit period. Impact does not breach trigger or threshold criteria.	Conformant
TFMP 3		Minimise decline in population due to predation from introduced predators.	Ongoing	R17_IntroducedPredatorMonitoring E07_EGLP Malleefowl Monitoring 2021-2022 E08_EGLP Chuditch Monitoring 2022	Monitoring has not indicated a change in Malleefowl or Chuditch population. Introduced predator monitoring indicates that numbers of predators are not increasing. Covalent plan to implement a control program in 2023.	Conformant
TFMP 4		Minimise decline in population due to dust, noise, light, vibration and displacement.	Ongoing	E07_EGLP Malleefowl Monitoring 2021-2022 E08_EGLP Chuditch Monitoring 2022	Monitoring has not indicated a change in Malleefowl or Chuditch population.	Conformant
TFMP 5		Minimise decline in fauna habitat condition due to change in fire regime.	Ongoing	*Management advice (24 April 2023)*	There were no fires in the development envelope in the audit period.	Conformant
TFMP 6		Conduct internal audit of recorded Malleefowl mounds against areas of clearing.	Ongoing	G03_2022 CAR Malleefowl Disturbance Audit	No clearing of active Malleefowl mounds occurred during the reporting period.	Conformant
TFMP 7		Undertake monitoring of incident reports for over clearing light and noise disturbance and fire.	Ongoing	*Management advice (24 April 2023)*	No incidents of over clearing, light or noise disturbance or fire.	Conformant
TFMP 8		Undertake pre-clearance monitoring	Prior to clearing	E05_Fauna Pre-clearance Survey	Pre-clearance monitoring being undertaken.	Conformant
TFMP 9		Annual monitoring of Malleefowl activity using motion sensor cameras	Ongoing	E07_EGLP Malleefowl Monitoring 2021-2022	Annual monitoring with motion sensor cameras undertaken in the reporting period.	Conformant
TFMP 10		Annual monitoring of Malleefowl as per the National Malleefowl Recover Team (2019) guidelines	Ongoing	Refer to TFEMP 14	Refer to TFEMP 14	Conformant
TFMP 11		Annual monitoring of Chuditch using cage trapping	Ongoing	E08_EGLP Chuditch Monitoring 2022	Annual monitoring of Chuditch using cage trapping undertaken in the reporting period.	Conformant
TFMP 12		Suitably qualified fauna personnel will be present during all clearing activities. Personnel will hold a permit to handle and move conservation-significant fauna under the Biodiversity Conservation Act 2016 and have access facilities that can be used to rehabilitate injured fauna and a procedure in place developed in consultation with the Department of Biodiversity, Conservation and Attractions.	Ongoing	*Management advice (24 April 2023)*	Fauna pre-clearance surveys were completed by licence fauna handlers from Ecoscape during the reporting period.	Conformant
Management actions to minimise incidental mortality of Malleefowl from clearing activities, entrapment, and/or vehicle strike.						
TFMP 13		Malleefowl Management Actions Implement an internal clearing permit procedure, including onsite demarcation and notification procedures, that limits access to the Malleefowl Mound Exclusion Zones by foot only or only by car where there is an existing track.	Ongoing	E03_Ground Disturbance Permit Procedure E04_GDP0066 Example - Primero Road Construction	Implementation of GDP Procedure requires demarcation and notification and limits access to MMEZ.	Conformant
TFMP 14		Malleefowl Management Actions Delineate Malleefowl Mound Exclusion Zones within close proximity to operational areas with bunting and/or signage or to alert all personnel of their location.	Ongoing	P02_Exclusion Signage 2	MMEZ is delineated by signage and tape to prevent unauthorised access.	Conformant
TFMP 15		Malleefowl Management Actions Induct all site personnel to include information on the location of Malleefowl Mound Exclusion Zones, management targets, measures and expectations.	Ongoing	R006_Covalent Mt Holland Induction	Slide 79 of the induction covers exclusion zones and requirements to avoid them. Slide 81 covers unlawful clearing and the requirement to adhere to permit conditions.	Conformant

©JBS&G Australia Pty Ltd

Commitment	Reference	Requirement	Timing	Evidence	Assessment	Status
TFMP 16		Malleefowl Management Actions Undertake progressive clearing, minimising the amount of active disturbance present.	Ongoing	E03_Ground Disturbance Permit Procedure E04_GDP0066 Example - Primero Road Construction	Item 28 of the GDP66 v5 covers conducting activities to minimise harm to fauna.	Conformant
TFMP 17		Malleefowl Management Actions Progressively rehabilitate areas as appropriate.	Ongoing	*Management advice (24 April 2023)*	No areas ready for rehabilitation.	Not applicable
TFMP 18		Malleefowl Management Actions Undertake preferential clearing outside of the egg incubation season (September to February) and potentially the mound building season (June to August).	Ongoing	*Management advice (24 April 2023)*	Clearing has been undertaken during periods operationally suitable. Where possible this is outside the windows.	Conformant
TFMP 19		Malleefowl Management Actions Clearing of the approved eight (8) mounds will occur between March to May, outside of the breeding, incubation and mound building season(s).	Ongoing	*Management advice (24 April 2023)* E07_EGLP Malleefowl Monitoring 2021-2022	The vegetation clearing is undertaken under the supervision of the Project Fauna Specialist (Ecoscape) who checked the mounds prior to clearing. Seven mounds were removed.	Conformant
TFMP 20		Malleefowl Management Actions All Malleefowl sightings, active and inactive mounds will be recorded including date, observer, status of mound and/or Malleefowl and a location description.	Ongoing	E14_Mt Holland Fauna Register	The fauna register includes Malleefowl sightings. OFI The fauna register does not include observer name. If this is not relevant, amend the TFEMP.	Conformant
TFMP 21		Malleefowl Management Actions Pre-clearance surveys will only be undertaken during the incubation period when mounds are likely to be active from September to February and occur a minimum of two (2) weeks prior to clearing, to identify any Malleefowl mounds and determine their status. Outside of this incubation period, annual and five (5) year population monitoring will be adequate to determine the presence and status of mounds.	Ongoing	E05_Fauna Pre-clearance Survey E07_EGLP Malleefowl Monitoring 2021-2022	Pre-clearance surveys and annual surveys are being undertaken. Five year population monitoring is not due yet.	Conformant
TFMP 22		Malleefowl Management Actions LiDAR survey(s) of areas planned for clearing will be undertaken to inform pre-clearance surveys annually for the first year during the construction period and any potential mounds checked to determine if they are active, and monitoring term defined. **Note:** Pre-clearance surveys will be conducted in accordance with the National Malleefowl Mound Monitoring Manual 2019.	Ongoing	E05_Fauna Pre-clearance Survey E07_EGLP Malleefowl Monitoring 2021-2022	Monitoring post initial LiDAR survey is being undertaken.	Conformant
TFMP 23		Malleefowl Management Actions Following the initial one-year period, the LiDAR survey(s) will be undertaken as required depending on the size and scale of the clearing area. **Note:** If it is more practical and effective to search an area on foot as opposed to LiDAR, 10 m wide transects across the entire area will be employed to determine the presence of mounds and their status.	Ongoing	E05_Fauna Pre-clearance Survey	Pre-clearance survey employs LiDAR.	Conformant
TFMP 24		Malleefowl Management Actions Pre-clearance surveys will be undertaken as described in Section 2.4.2 of the Terrestrial Fauna Management Plan.	Ongoing	E05_Fauna Pre-clearance Survey E07_EGLP Malleefowl Monitoring 2021-2022	Pre-clearance survey was undertaken in accordance with Section 2.4.2.	Conformant
TFMP 25		Malleefowl Management Actions Pre-clearance walkthroughs will be undertaken to identify and displace fauna prior to clearing. Pre-clearance walkthroughs will be undertaken the morning before clearing/disturbance to displace individuals and will include searching and checking refugia sites. **Note:** In the event Malleefowl are found in the area to be cleared and there are no new active mounds, fauna specialists will implement a displacement method to allow the Malleefowl to egress but remain within their home range.	Ongoing	E05_Fauna Pre-clearance Survey	Pre-clearance walk throughs undertaken in conjunction with Chuditch trapping when fauna traps are collected at first daylight in the morning and a walk through of the clearing area undertaken prior to approval being given for clearing to commence.	Conformant
TFMP 26		Malleefowl Management Actions Active mounds will be avoided, and a 100 m exclusion radius will be applied to active mounds to be flagged in the field as Malleefowl Mound Exclusion Zones.	Ongoing	*Management advice (24 April 2023)*	No active mounds were cleared.	Conformant

©JBS&G Australia Pty Ltd

Commitment	Reference	Requirement	Timing	Evidence	Assessment	Status
TFMP 27		Chuditch Management Actions Clearing will be avoided between the months of September to November where possible to mitigate impacts to denning female.	Ongoing	*Management advice (24 April 2023)*	Clearing has been undertaken during periods operationally suitable. Where possible this is outside the windows.	Conformant
TFMP 28		Chuditch Management Actions Vegetation clearing will only be undertaken during the daytime, when Chuditch are less active.	Ongoing	*Management advice (24 April 2023)*	Ground disturbance clearing activities are undertaken during dayshift hours only. Fauna traps are collected at first daylight in the morning and a walk through of the clearing area undertaken prior to approval being given for clearing to commence.	Conformant
TFMP 29		Chuditch Management Actions Pre-clearance surveys will be undertaken as described in Section 2.4.2 of the Threatened Fauna Management Plan to record the presence/absence of Chuditch in the area that is proposed to be cleared.	Ongoing	E05_Fauna Pre-clearance Survey	The results of the pre-clearance fauna trapping are collated at the end of each clearance event and a copy of the report is saved against the GDP. An example of a pre-clearance survey is attached as E05.	Conformant
TFMP 30		Chuditch Management Actions Pre-clearance walkthroughs will be undertaken in the morning prior to clearing/disturbance to displace individuals. This will include searching and checking refugia sites and trapping for Chuditch the night immediately prior to clearing and holding the Chuditch for no more than one night. Chuditch will be released into a nearby area from where it was caught following the completion of daytime clearing activities.	Ongoing	*Management advice (24 April 2023)*	Fauna traps are set in the evening and collected at first daylight in the morning. A walk through of the clearing area is undertaken prior to approval being given for clearing to commence. Chuditch are released into nearby area following the completion of daytime clearing activities.	Conformant
TFMP 31		Chuditch Management Actions In the event clearing is undertaken between September and November, the pre-clearance survey procedure will be modified to further mitigate the risk to breeding and denning females. In the event a female is captured between September and November, it will be held during the day and released during the evening with a radio collar. The radio-collared female will be tracked to identify the location of the den. Trail cameras will be installed to monitor den activity and an exclusion radius of 100 m applied for clearing activity.	Ongoing	E05_Fauna Pre-clearance Survey	The requirement to apply a radio collar and create a 100 m exclusion zone is documented on the fauna clearance survey record.	Conformant
TFMP 32		Avoid accidental disturbance to fauna and habitat by enforcing strict traffic management rules.	Ongoing	R006_Covalent Mt Holland Induction	Slide 83 of the induction outlines keeping to designated tracks, limited driving between dusk and dawn, driving to road and weather conditions and limiting speeds to protect conservation significant fauna.	Conformant
TFMP 33		All sightings and interactions with Malleefowl and Chuditch to be reported to Covalent Lithium environment personnel.	Ongoing	E14_Mt Holland Fauna Register	There is a fauna register which would include Chuditch sightings if there were some.	Conformant
TFMP 34		Identify and establish working relationships with local wildlife carers/veterinarians for injured Malleefowl and Chuditch.	Ongoing	*Management advice (24 April 2023)*	Covalent liaises with the Parnana Pikurtu Wildlife Sanctuary located at the Nulla Nulla Farm Retreat approximately 130km drive North-West of the Mt Holland Project.	Conformant
TFMP 35		During construction, any materials and/or structures stored onsite overnight, will be inspected thoroughly for wildlife by a qualified fauna specialist/properly trained onsite personnel before being buried, capped, moved or used.	Ongoing	E15_Fauna Trench Clearing Procedure E16_Fauna Trench Clearing Example - Primero	The fauna trench clearing procedure outlines the requirements for inspection by personnel before the pipe is buried, capped, used, or moved.	Conformant
TFMP 36		If inspection(s) indicates the presence of conservation-significant species inside stored materials or equipment, work on those materials will cease until a suitably qualified fauna specialist determines the appropriate course of action.	Ongoing	E15_Fauna Trench Clearing Procedure	The fauna trench clearing procedure outlines in Section 3.7 the requirements for conservation significant fauna.	Conformant
TFMP 37		As part of closure, a pit lake ramp will be put in place to enable fauna to exit the pit lake and avoid entrapment.	Ongoing	*Management advice (24 April 2023)*	Site is not under closure.	Not applicable

©JBS&G Australia Pty Ltd

Commitment	Reference	Requirement	Timing	Evidence	Assessment	Status
TFMP 38		To prevent entrapment of animals, all excavations, steep-walled holes or trenches more than one meter deep will be secured against animal entry at the close of each day, where possible. Any of the following measures may be employed, depending on the size of the hole and method feasibility: • Construction holes and trenches will be securely covered (no gaps) with plywood or similar materials at the close of each working day, or any time the opening will be left unattended for more than one hour. • In the absence of covers, the excavation will be provided with escape ramps constructed of earth or untreated wood, sloped no steeper than 2 : 1, and located no farther than 100 m apart. • In situations where escape ramps are unfeasible, the hole or trench will be surrounded by filter fabric fencing or a similar barrier with the bottom edge buried to prevent entry as appropriate; or • If a trench with a greater distance than 100 m is required to be left open for more than one day, trench inspections shall be undertaken to identify any entrapped fauna and relocation completed. The requirement and specifics (frequency and timing) for trench inspections will be determined by environmental personnel, however inspections after sunrise, before sunset and prior to backfilling may be required.	Ongoing	E15_Fauna Trench Clearing Procedure E16_Fauna Trench Clearing Example - Primero P08_Fauna Egress 1 P09_Fauna Egress 2	Steep walled holes and trenches are secured against animal entry.	Conformant
TFMP 39		Domestic waste facilities will be fenced, and putrescible waste receptacles will be covered.	Ongoing	*Management advice (24 April 2023)*	All waste is currently collected and processed offsite, until the Mt Holland putrescible landfill is constructed.	Conformant
TFMP 40		Containers will have doors that are closed securely when not in use.	Ongoing	P10_Waste Management Bins	Skip bins are closed when not in use.	Conformant
TFMP 41		Permanent water sources (*e.g.*, dams, ponds and tanks, *etc.*) will be fenced and/or have fauna egress mats installed.	Ongoing	P08_Fauna Egress 1 P09_Fauna Egress 2	Permanent water sources (tanks, ponds and dams) to be fenced and / or have fauna egress mats installed.	Conformant
Management actions to minimise the decline in population due to predation from introduced predators.						
TFMP 42		Introduced predators identified will be reported to environment personnel and recorded to monitor occurrences.	Ongoing	E14_Mt Holland Fauna Register	In traduced predators are recorded on the fauna register.	Conformant
TFMP 43		Avoid attraction of introduced predators to the Development Envelope by implementing domestic waste management procedures (*e.g.*, fencing of landfills, regularly covering putrescible waste, securing lids on bins, *etc.*).	Ongoing	*Management advice (24 April 2023)* P10_Waste Management Bins	All waste is currently collected and processed offsite, until the Mt Holland putrescible landfill is constructed. Putrescible waste is covered with secure lids on bins.	Conformant
TFMP 44		Introduced predator control will be undertaken on site in cooperation with regional control programs.	Ongoing	*Management advice (24 April 2023)*	Details of Introduced Predator sightings were captured during the 2022 audit period that will inform a feral animal control program to commence during the 2023 reporting period.	Conformant
TFMP 45		Induct personnel on waste management and introduced predator control measures.	Ongoing	R006_Covalent Mt Holland Induction	Slide 88 of the induction covers waste management.	Conformant
TFMP 46		Introduced predator monitoring to be undertaken in accordance with methodology outlined in Section 2.4.1 of the Threatened Fauna Management Plan	Ongoing	R17_IntroducedPredatorMonitoring E07_EGLP Malleefowl Monitoring 2021-2022 E08_EGLP Chuditch Monitoring 2022	Monitoring has not indicated a change in Malleefowl or Chuditch population. Introduced predator monitoring indicates that numbers of predators are not increasing. Covalent plan to implement a control program in 2023.	Conformant
TFMP 47		Predator density by monitoring activity will be monitored and any causal factors identified to ensure appropriate management measures are undertaken. **Note:** Consideration shall be given to local and regional baiting or a review of food sources at camp or the landfill.	Ongoing	*Management advice (24 April 2023)* R17_IntroducedPredatorMonitoring E07_EGLP Malleefowl Monitoring 2021-2022 E08_EGLP Chuditch Monitoring 2022	Monitoring has not indicated a change in Malleefowl or Chuditch population. Introduced predator monitoring indicates that numbers of predators are not increasing. Covalent plan to implement a control program in 2023.	Conformant
Minimise decline in populations due to dust, light, noise, vibration and displacement.						
TFMP 48		Dust suppression measures that include good housekeeping practices for active stockpiles, cleared areas and vehicles.	Ongoing	R006_Covalent Mt Holland Induction	Traffic control measures are implemented to reduce the speed of traffic.	Conformant
TFMP 49		Dust suppression measures such as the use of watercarts will be used during dry and windy conditions, as required.	Ongoing	Not applicable	Dust suppression of cleared unsealed roads and laydown areas was undertaken by water carts in the audit period.	Conformant
TFMP 50		Machinery and equipment will be fitted with noise attenuation measures to meet personnel safety requirements.	Ongoing	*Management advice (24 April 2023)*	Machinery and equipment meets health and safety requirements for noise and vibration.	Conformant

©JBS&G Australia Pty Ltd

Commitment	Reference	Requirement	Timing	Evidence	Assessment	Status
TFMP 51		lighting will be installed to minimise light spill into adjacent vegetated areas.	Ongoing	*Management advice (24 April 2023)*	Lighting towers both fixed and temporary are utilised in operational areas of the Mine and Concentrator only, lighting is only directed on operational areas and not into adjacent vegetated areas.	Conformant
TFMP 52		Equipment design will specify compliance with Australian Standard noise limits.	Ongoing	*Management advice (24 April 2023)*	All equipment and machinery is designed and tested to comply with Australian Noise Limit Standards. Periodical Occupational Noise and Dust exposure monitoring is conducted by Occupational Hygiene Consultants.	Conformant
TFMP 53		Fire management procedures (*e.g.*, Emergency Response Plan Hot Work Permit system, firefighting training, and inspection and maintenance of fire breaks, *etc.*) will be implemented.	Ongoing	*Management advice (24 April 2023)* E12_Mt Holland Hot Works Procedure R16_Mt Holland Emergency Management Plan	Section 4.1 of the hot works procedure outlines that no or minimal flammable and combustible materials are to be kept in designated hot works areas. Section 9 addresses training.	Conformant
TFMP 54		Firefighting equipment will be located on site and in vehicles.	Ongoing	*Management advice (24 April 2023)* R16_Mt Holland Emergency Management Plan P05_Fire Extinguisher	Firefighting equipment is located on site and in vehicles.	Conformant
TFMP 55		Lightning protection equipment will be installed as part of Action's design where necessary.	Ongoing	*Management advice (24 April 2023)*	Lightning protection infrastructure is installed on buildings and concentrator infrastructure to redirect and minimise potential lightning caused fires.	Conformant
TFMP 56		Vehicles will not be permitted to leave access tracks or cleared areas.	Ongoing	R006_Covalent Mt Holland Induction Management advice 24/04/2023	The induction outlines staying on access tracks and cleared areas. There were no incidents of vehicles leaving access tracks or cleared areas.	Conformant
TFMP 57		Coordination with the Department of Biodiversity, Conservation and Attractions and Department of Fire and Emergency Services and other to undertake prescribed burns.	Ongoing	*Management advice (24 April 2023)*	No prescribed burns were undertaken during the audit period.	Conformant
TFMP 58		Covalent Lithium will require all personnel, both during construction and operation of the mine, to attend awareness training/environmental inductions covering the following topics. • Malleefowl and Chuditch; • Information on other potential conservation-significant fauna; • Information on introduced predators and their impact(s) on Malleefowl and Chuditch; and • Prevention and management of fires.	Ongoing	R006_Covalent Mt Holland Induction	Slide 82 and 83 of the induction cover conservation significant fauna.	Conformant
Management of environmental incidents						
TFMP 59		Environmental incidents are defined as breaches or non-adherences to objectives and procedures as outlined in the Threatened Fauna Management Plan. Environmental incidents are to be reported to the Covalent Lithium Environmental Manager by the person responsible for the incident or the first person at the site of an incident.	Ongoing	*Management advice (24 April 2023)*	There were no breaches or non adherences to objectives and procedures.	Conformant
TFMP 60		The Covalent Lithium Environment Manager will assess the type and severity of the incident in accordance with internal procedures. Relevant personnel shall be notified and consulted whether the incident requires notification to regulatory agencies.	Ongoing	Refer to TFEMP 67	Refer to TFEMP 67	Conformant
Monitoring Actions						
TFMP 61	Section 2.4.1	Annual Population monitoring of Malleefowl and Chuditch as per Section 2.4.1 of the Terrestrial Fauna Management Plan.	Annual	E07_EGLP Malleefowl Monitoring 2021-2022 E08_EGLP Chuditch Monitoring 2022	Annual monitoring is undertaken in accordance with Section 2.4.1.	Conformant
TFMP 62		<u>Mortality Monitoring</u> Monitoring of incident reports for Malleefowl and Chuditch predation, vehicle strike, speeding and night driving.	Ongoing and annual review	*Management advice (24 April 2023)* C08_Injured_Deceased Malleefowl DBCA Notification	Light vehicle impact with Malleefowl reported.	Conformant

©JBS&G Australia Pty Ltd

Commitment	Reference	Requirement	Timing	Evidence	Assessment	Status
TFMP 63		Introduced Predator Monitoring Monitor existing introduced predator populations to provide a baseline for comparison of introduced predator populations over the Life-of-Mine and guide any introduced predator control programs implemented in the Development Envelope.	Ongoing and annual review	R17_IntroducedPredatorMonitoring	Introduced predator monitoring has been undertaken.	Conformant
TFMP 64		Clearing Monitoring • Monitoring of clearing register for compliance with approval conditions; and • Review clearing footprint to determine clearing proximity to active Malleefowl mounds.	Ongoing and annual review	G01_EGLP_VegetationClearing E17_Internal Inspection of Primero G03_2022 CAR Malleefowl Disturbance Audit	Monitoring of clearing is being undertaken.	Conformant
TFMP 65		Clearing Monitoring Internal audit and inspection of areas of clearing, areas of potential entrapment, speeding and night driving.	Ongoing and annual review	E17_Internal Inspection of Primero E18_Internal Inspection of WWTP + NRW	Internal auditing being undertaken (sections 42 to 44 cover ground disturbance).	Conformant
TFMP 66		Fauna Habitat Monitoring Monitor vegetation condition as an indicator of fauna habitat quality on an annual basis.	As FVEMP	R10_ 2022 Vegetation Condition Monitoring Autumn R11_ 2022 Vegetation Condition Monitoring Spring	Vegetation health is reported in the vegetation monitoring reports.	Conformant
Trigger Criteria & Reporting						
TFMP 67		In the event a management or monitoring action is not implemented, the relevant regulatory authority/authorities will be notified within seven (7) days of identification of the exceedance, including information on remediation actions that have been or will be implemented.	Ongoing	*Management advice (24 April 2023)*	No management target has been exceeded	Conformant
TFMP 68		If a trigger criteria is exceeded, an internal incident investigation will be reported to prevent a recurrence and reduce the exceedance below trigger criteria.	At time of event	*Management advice (24 April 2023)*	No trigger was exceeded	Conformant
TFMP 69		If conservation-significant fauna are injured or abandoned, the relevant regulatory authorities will be notified within the annual compliance report.	Annually	R01_Covalent Lithium 2022 ACR (Rev 0) C08_Injured_Deceased Malleefowl DBCA Notification	A Malleefowl was hit by a light vehicle on 02/03/2022. It was transported to WA Wildlife but died in transit.	Conformant
TFMP 70		If there is mortality of conservation-significant fauna, the relevant regulatory authorities will be notified annually within the compliance report. Any fauna found deceased, accidentally killed or euthanised due to injury will be offered to the Western Australian Museum as specimens.	Annually	*Management advice (24 April 2023)* R01_Covalent Lithium 2022 ACR (Rev 0)	An offer for the specimen was provided to the WA Museum and/or DNA Zoo Project.	Conformant
If there is a 25% increase in Malleefowl or Chuditch sightings within or adjacent to mining activity areas over two (2) consecutive years.						
TFMP 71	Table 3.1	Report internally that early response trigger has been met in accordance with internal procedures.	Ongoing	E07_EGLP Malleefowl Monitoring 2021-2022 E08_EGLP Chuditch Monitoring 2022	Trigger not met.	Conformant
TFMP 72	Table 3.1	Undertake due diligence checks and updates to ensure the following are adequate: • Internal audit of waste management facilities; • Review of traffic management controls to determine management action amendments; and • Refresher training on Malleefowl, Chuditch and associated controls and injured animal management.	Ongoing	E07_EGLP Malleefowl Monitoring 2021-2022 E08_EGLP Chuditch Monitoring 2022	Trigger not met.	Conformant

©JBS&G Australia Pty Ltd

Commitment	Reference	Requirement	Timing	Evidence	Assessment	Status
TFMP 73	Table 3.1	Early response trigger contingency actions may include but are not limited to: • Avoid clearing September to November to mitigate any potential risk to breeding and denning female Chuditch; • Near-miss of all faunas on roads or during clearing and mining activities reported; • Warning signs erected in areas of increased Malleefowl or Chuditch records; • Increase in frequency of internal audits and inspections of vehicle speeds; • Increased presence of Malleefowl or Chuditch on site discussed in personnel induction programs; • Personnel training and awareness to provide information on Malleefowl (*e.g.*, how to identify adults, chicks and mounds, conservation status, the importance of minimising impacts on the species, adherence to speed limits, reporting to environment personnel, *etc.*). • Personnel training and awareness to include information on fire prevention and management; • Domestic waste facilities will be fenced, and putrescible wastes will be regularly covered; and • Containers to have ingresses closed securely when not in use.	Ongoing	E07_EGLP Malleefowl Monitoring 2021-2022 E08_EGLP Chuditch Monitoring 2022	Trigger not met.	Conformant
If there is a 25% increase in introduced predator sightings (opportunistic sightings and remote camera) over two (2) consecutive years						
TFMP 74	Table 3.1	Report internally that early response trigger(s) have been met in accordance with internal procedures.	Ongoing	E07_EGLP Malleefowl Monitoring 2021-2022	Monitoring identified slight reduction in feral cat activity compared to previous monitoring event.	Conformant
TFMP 75	Table 3.1	Review introduced predators control programme and amended as required.	Ongoing	Refer to TFEMP 86	Refer to TFEMP 86	Conformant
TFMP 76	Table 3.1	Trigger contingency actions may include but are not limited to the following: • A proportionate increase in baiting/trapping intensity for introduced predators in areas where increased sightings have occurred; • If after the two (2) consecutive monitoring events, a threshold exceedance has not been identified, resume standard monitoring; • Installation of signage; • Review and refine remote camera monitoring for introduced predators across the Development Envelope should it be required; and • Personnel training and awareness to include information on feral species (*e.g.*, impact of feral animals on Malleefowl and Chuditch populations, no feeding of feral species, reducing availability of food waste to feral animals and all sightings of feral species to be reported, *etc.*).	Ongoing	Refer to TFEMP 86	Refer to TFEMP 86	Conformant
If there is a 25% decrease in Malleefowl or Chuditch (camera sightings or trapping results) that are statistically different from previous monitoring results but do not breach trigger criteria as it has not been consecutive for two (2) years.						
TFMP 77	Table 3.1	Review monitoring program for adequacy and determine whether the changes observed in the impact sites are comparable to the observations in the reference sites.	Ongoing	E07_EGLP Malleefowl Monitoring 2021-2022 E08_EGLP Chuditch Monitoring 2022	Trigger not met.	Conformant
TFMP 78	Table 3.1	Investigate potential causes for population decrease: Factors that may affect populations of conservation-significant fauna are varied and it is difficult to determine the exact factors as a decline in sightings could be associated with the following: • Seasonal conditions; • Changes in mound usage patterns by Malleefowl (*i.e.*, use of mounds that have not been surveyed) • Effectiveness of introduced predator control • Spatial variation (near-impact areas) versus sites located further from impact); • Reliability of the results obtained from the fauna sightings register; and • Attributable to clearing, construction, operation activities.	Ongoing	E07_EGLP Malleefowl Monitoring 2021-2022 E08_EGLP Chuditch Monitoring 2022	Trigger not met.	Conformant

©JBS&G Australia Pty Ltd

Appendix E Ironcaps Banksia Conservation Plan Compliance Assessment

Table E.2: Ironcaps Banksia Conservation Plan Audit Plan

Condition	Reference	Requirement	Timing	Evidence	Assessment	Status
Management Actions						
IBCP 1	Section 1.2	Clear no more than the approved two (2) *Banksia dolichostyla* individuals.	Clearing	S001 – ClearingFootprint.shp S002 – ClearingToDate2022.shp S003 – IroncapsBanksiaLocations.shp	Spatial data provided by Covalent Lithium illustrating clearing to date indicates that no *Banksia dolichostyla* individuals have been cleared within the Development Envelope at this stage.	Conformant
IBCP 2	Table 3.1	Delineate Vegetation Exclusion Zones within the Development Envelope.	Clearing	R006 – Earl Grey Lithium Project Induction (Covalent Lithium 2022) P001 – Exclusion Signage 1 P002 – Exclusion Signage 2 P003 – Exclusion Signage 3 P004 – Exclusion Tape	Vegetation Exclusion Zones are delineated via bunting and signage within the Development Envelope. Slide 79 of the Earl Grey Lithium Project induction highlights the Vegetation Exclusion Zones.	Conformant
IBCP 3	Table 3.1	No unauthorized clearing within the Development Envelope or Vegetation Exclusion Zones.	Clearing	*Management advice (24 April 2023)*	No unauthorized clearing within the Development Envelope or Vegetation Exclusion Zones occurred this reporting period.	Conformant
IBCP 4	Table 3.1	Implement an internal clearing permit procedure.	Ongoing	E001 – Internal Ground Disturbance Procedure E002 – Primero Road Construction (GDP0066)	Vegetation clearing for the development of Primero Road was undertaken in accordance with the Covalent Lithium Ground Disturbance Procedure (GDP0066).	Conformant
IBCP 5	Table 3.1	No unauthorized access to a Vegetation Exclusion Zones.	Ongoing	R006 – Earl Grey Lithium Project Induction (Covalent Lithium 2022	Slide 79 of the Earl Grey Lithium Project induction highlights the Vegetation Exclusion Zones.	Conformant
IBCP 6	Table 3.1	Dust deposition (present as insoluble solids) at any gauge in excess of 10 g/m^2 per month.	Monthly	*Management advice (24 April 2023)* E003 – Dust Events Register E004 – Dust Monitoring Equipment Readings R15_2022 Maxy Engineering Dust Report	Monitoring indicates that dust deposition has been reduced to as low as reasonably practicable. The events register indicates five breaches of the early response trigger this reporting period. While results indicate breaches of early response trigger levels, the overall objective to minimize dust emissions and their environmental effects to Vegetation Exclusion Zones has been achieved, as vegetation condition health below the 20% trigger.	Conformant
IBCP 7	Table 3.1	Install hygiene station(s) at entry points to the Site.	Construction	R008_CEMP Weed and Pathogen Management	Hygiene stations for equipment, machinery and vehicle washdown exist at every egress point to/from the Development Envelope.	Conformant
IBCP 8	Table 3.1	Implement an internal vehicle hygiene procedure.	Ongoing	*Management advice (24 April 2023)* E005 – Earl Grey Lithium Project Hygiene Register (2022) R008_CEMP Weed and Pathogen Management	All equipment, machinery and vehicles are inspected and washed down upon entry to and exit from the Development Envelope. Other management controls for introduced flora (weeds) and soil-borne pathogens such as *Phytophthora* sp. (Dieback) are detailed within the Covalent Lithium Environmental Management Plan.	Conformant
IBCP 9	Table 3.1	Minimize the introduction/spread of introduced flora (weeds) within and in proximity to the Development Envelope and Vegetation Exclusion Zones	Quarterly	R008_CEMP Weed and Pathogen Management R13_Mattiske Introduced Flora (Weed) survey R10_ 2022 Vegetation Condition Monitoring Autumn R11_ 2022 Vegetation Condition Monitoring Spring	Refer to Condition 8 The annual monitoring requirement to monitor vegetation condition on a quarterly basis for the presence of weeds was completed this reporting period. The introduction/spread of introduced flora within and in proximity to the Development Envelope remain 'Low' therefore management actions are considered sufficient to reduce the risk of weed impacts.	Conformant

©JBS&G Australia Pty Ltd

Condition	Reference	Requirement	Timing	Evidence	Assessment	Status
IBCP 10	Table 3.1	Prevent the introduction/spread of *Phytophthora* spp. (Dieback) within and in proximity to the Development Envelope and Vegetation Exclusion Zones.	Quarterly	R008_CEMP Weed and Pathogen Management R10_ 2022 Vegetation Condition Monitoring Autumn R11_ 2022 Vegetation Condition Monitoring Spring R12_2022_GlevanConsulting_EGLP_DiebackAssessment	Refer to Condition 8 *Phytophthora* sp. (Dieback) baseline monitoring was undertaken and completed by Glevan Consulting (2019). *Phytophthora* spp. were determined to be present. Covalent Lithium monitor the presence of Dieback as a part of their vegetation monitoring. No further introduction and/or spread of *Phytophthora* spp. have been observed since the commencement of the Action; therefore, management actions are considered sufficient to reduce the risk of *Phytophthora* spp. impacts.	Conformant
IBCP 11	Table 3.1	Ensure firefighting equipment is located onsite, within vehicles and automatic fire extinguishers are installed on equipment and machinery.	At all times	R16_Mt Holland Emergency Management Plan	Section 7 of the Emergency Management Plan outlines the procedure in response to a fire event. Management advised that at least one (1) fire extinguisher is located within each building and outfitted in each light vehicle. The equipment and machinery such as the Heavy Mobile Plant have an Aqueous Film-forming Foam (AFFF) Extinguisher installed that can be activated by the operator in the event of a fire. Furthermore, lightning protection equipment is installed on buildings and concentrator infrastructure to redirect and minimize lightning-caused fires.	Conformant
IBCP 12	Table 3.1	Implement an internal fire management procedure, including an Emergency Response Plan and Hot Work Permit System.	Ongoing	R16_Mt Holland Emergency Management Plan E12_Mt Holland Hot Works Procedure	Management controls for fire events are detailed within the Covalent Lithium Emergency Management Plan. Further to this, Covalent Lithium have a Hot Work Procedure, of which Section 4.1 stipulates that no (or minimal) combustible material is to enter or be stored within or in proximity to designated 'hot work' areas.	Conformant
IBCP 13	Table 3.1	Undertake prescribed burns in consutlation with the Department of Biodiversity, Conservation and Attractions, the Department of Fires and Emergency Services, the Shire of Yilgarn and other relevant stakeholders to minimize the likelihood of uncontrolled fires impacting conservation values.	As required	Not required	No prescribed burns within or in proximity to the Development Envelope occurred this reporting period.	Not applicable
IBCP 14	Table 3.1	Prevent fires attributed to mining and associated activities.	Quarterly	*Management advice (24 April 2023)*	No fire events have occurred as a result of the Action this reporting period. Further to this, no fire events have occurred since the commencement of the Action in 2021, with the exception of prescribed burns.	Conformant
IBCP 15	Table 3.1	Install drainage infrastructure	Construction	*Management advice (24 April 2023)* P005 – Surface Water Drainage Infrastructure 1 P006 – Surface Water Drainage Infrastructure 2	Management advised that drainage measures have been designed and constructed to prevent alterations to surface water hydrology and/or water quality within and/or in proximity to the Development Envelope. Infrastructure includes basins, contours, culverts, diversion drains and sediment traps.	Conformant
IBCP 16	Table 3.1	Prevent alterations to surface hydrology attributed to mining and associated activities.	Quarterly	*Management advice (24 April 2023)*	Refer to Condition 16 No adverse effects to surface hydrology have been attributed to mining and/or associated activities; therefore, management actions are considered sufficient to reduce the risk of alterations to local hydrological regimes.	Conformant
IBCP 17	Table 5.1	All personnel (including employees, contractors, and/or subcontractors) must be inducted/reinducted on the key requirements of the Ironcaps Banksia Conservation Management Plan prior to commencement of work onsite.	Annual	R006 – Earl Grey Lithium Project Induction (Covalent Lithium 2022)	All new personnel (*e.g.*, employees, contractors, and/or subcontractors, *etc.*) are provided with the Earl Grey Lithium Project Induction material prior to work onsite. Existing personnel are also reinducted on a regular basis. The induction material summarizes the key requirements of the Ironcap Banksia Conservation Plan (as well as other management plans).	Conformant
Restoration Actions						
IBCP 18	Section 4.3.1	Collect 1,340 *Banksia dolichostyla* seeds from more than 50 individuals to ensure genetic representation/variation.	As required	*Management advice (24 April 2023)*	No seed collection events have occurred since the commencement of the Action.	Not applicable

©JBS&G Australia Pty Ltd

Condition	Reference	Requirement	Timing	Evidence	Assessment	Status
IBCP 19	Section 4.3.1	Germinate 400 *Banksia dolichostyla* seeds to plant 1-year after collection at a designated nursery.	As required	Not required	Refer to Condition 19	Not applicable
IBCP 20	Section 4.3.1	Store 940 *Banksia dolichostyla* seeds to be broadcast 1-year after collection.	As required	Not required	Refer to Condition 19	Not applicable
IBCP 21	Section 4.3.2	Remove the airstrip hardstand.	As required	*Management advice (24 April 2023)*	As per the Ironcaps Banksia Conservation Plan, land that is currently a part of the abandoned Mt. Holland Mine Site airstrip will become a 'restoration site' for *Banksia dolichostyla*. The removal of the airstrip hardstand has not commenced at this stage; therefore, no restoration actions have been implemented.	Not applicable
IBCP 22	Section 4.3.2	Deep rip subsoil using a 'crosshatch' methodology following the removal of the airstrip hardstand to reduce subsoil compaction and facilitate water infiltration.	Removal of airstrip hardstand	Not required	Refer to Condition 22	Not applicable
IBCP 23	Section 4.3.2	Import and spread topsoil-subsoil mix from recently cleared areas (no stockpiling) to provide a growth medium and initial seed store for seeds and seedlings.	Removal of airstrip hardstand	Not required	Refer to Condition 22	Not applicable
IBCP 24	Section 4.3.2	Install and operate an irrigation system.	Removal of airstrip hardstand	Not required	Refer to Condition 22	Not applicable
IBCP 25	Section 4.3.2	Install fencing and signage to minimize the risk of inadvertent access into restoration site(s) by personnel, equipment, machinery and/or vehicles.	Removal of airstrip hardstand	Not required	Refer to Condition 22	Not applicable
IBCP 26	Section 4.3.3	Install guards around seedlings to prevent grazing	Planting	Not required	Refer to Condition 22	Not applicable
IBCP 27	Section 4.3.4	Irrigate seeds and seedlings for a period of 2-year period following planting, after which irrigation will cease.	As required for 2-years	Not required	Refer to Condition 22	Not applicable
IBCP 28	Table 4.2	Establish at least 69 individuals of *Banksia dolichostyla* within the Development Envelope within ten (10) years of the implementation of the Action. Establishment criteria of the *Banksia dolichostyla* are as follows: • The health of vegetation is 'Good' (or higher) for at least two (2) consecutive years after irrigation has ceased; and • Reproductive capability is observed.	Ongoing	Not required	Refer to Condition 22	Not applicable
Monitoring Actions						
IBCP 29	Section 3.6.1	Undertake quarterly plant condition monitoring within Vegetation Exclusion Zones for 12-months following the commencement of the Action.	Quarterly	Not required	The Action commenced in April 2021. Covalent Lithium notified the DCCEEW of the commencement of the Action on 13 July 2023. Plant condition monitoring of Vegetation Exclusion Zones were undertaken on a quarterly basis for 12 months following the commencement of the Action. The results of the monitoring program informed the future plant condition monitoring requirements, which are presented below in Condition 30 (B).	Conformant (complete)
IBCP 30	Section 3.6.1	Review the dataset after 12-months to inform future plant condition monitoring requirements within Vegetation Exclusion Zones.	As required	R10_ 2022 Vegetation Condition Monitoring Autumn R11_ 2022 Vegetation Condition Monitoring Spring	The dataset wes reviewed and plant condition monitoring has been reduced to autumn and spring.	Conformant (complete)
IBCP 31	Section 3.6.2	Undertake quarterly plant health monitoring within Vegetation Exclusion Zones for 24-months following the commencement of the Action.	Quarterly	R008_CEMP Weed and Pathogen Management R13_Mattiske Introduced Flora (Weed) survey R10_ 2022 Vegetation Condition Monitoring Autumn R11_ 2022 Vegetation Condition Monitoring Spring	Plant health monitoring of Vegetation Exclusion Zones within and in proximity to the Development Envelope are currently being undertaken on a quarterly basis. Covalent Lithium are approximately halfway through the monitoring program at the time of the reporting period.	Conformant
IBCP 32	Section 3.6.2	Review the dataset after 24-months to inform future plant health monitoring requirements within Vegetation Exclusion Zones.	As required	Not required	Refer to Condition 31	Not applicable

©JBS&G Australia Pty Ltd

Condition	Reference	Requirement	Timing	Evidence	Assessment	Status
IBCP 33	Section 3.6.3	Undertake dust deposition monitoring on a monthly basis for 24-months following the commencement of the Action.	Monthly	E003 – Dust Events Register E004 – Dust Monitoring Equipment Readings	Dust deposition monitoring is currently being undertaken on a monthly basis. Covalent Lithium are approximately halfway through the monitoring program at the time of the reporting period.	Conformant
IBCP 34	Section 3.6.3	Review the dataset after 24-months to inform future dust deposition monitoring requirements.	As required	Not required	Refer to Condition 33	Not applicable
IBCP 35	Section 4.4	Inspect and control introduced flora (weed) cover and density.	As required	*Management advice (24 April 2023)* E005 – Earl Grey Lithium Project Hygiene Register (2022) R008_CEMP Weed and Pathogen Management	Refer to Condition 9 Management advised that the provision of weed control occurs on an ad-hoc basis so that any potential infestations of existing and/or new introduced species that establish can be eradicated as soon as possible (*i.e.*, prior to flowering and pollinating).	Conformant
IBCP 36	Section 4.4	Inspect and maintain fences and signage.	As required	*Management advice (24 April 2023)*	Management advised that fences and/or signage that has been damaged, degraded or removed are reported and repaired/replaced as soon as reasonably practicable to ensure Vegetation Exclusion Zones remain delineated to prevent unauthorized access/clearing.	Conformant
IBCP 37	Section 4.4	Inspect and maintain irrigation system.	As required	Not required	Refer to Condition 21	Not applicable
Reporting						
IBCP 38	Section 5.3	Environmental Management Report the implementation status of management actions.	Annual	R017 – Compliance Report EPBC Decision 2017/7950 (JBS&G 2023)	As part of this annual compliance report to the DCCEEW under EPBC Decision 2017/7950, this table documents the implementation status of management actions in relation to the Ironcaps Banksia Conservation Plan.	Conformant
IBCP 39	Section 5.3	Environmental Management Report the results of the environmental monitoring.	Annual	R10_ 2022 Vegetation Condition Monitoring Autumn R11_ 2022 Vegetation Condition Monitoring Spring R12_2022_GlevanConsulting_EGLP_DiebackAssessment R13_Mattiske Introduced Flora (Weed) survey R15_2022 Maxy Engineering Dust Report R017 – Compliance Report EPBC Decision 2017/7950 (JBS&G 2023)	As part of this annual compliance report to the DCCEEW under EPBC Decision 2017/7950, this table documents the results of the environmental monitoring undertaken this reporting period in relation to the Ironcaps Banksia Conservation Plan.	Conformant
IBCP 40	Section 5.3	Environmental Management Report the implementation of the outcomes of any contingency actions (if required).	As required	Not required	No contingency actions were required to be implemented this reporting period.	Not applicable
IBCP 41	Section 5.3	Restoration Management Report the implementation of restoration actions.	Annual	Not required	Refer to Condition 19 No restoration actions (*i.e.*, seed collection events) have occurred since the commencement of the Action.	Not applicable
IBCP 42	Section 5.3	Restoration Management Report the results of the environmental monitoring.	Annual	Not required	Refer to Condition 40	Not applicable
IBCP 43	Section 5.3	Restoration Management Report the implementation of the outcomes of any contingency actions (if required).	As required	Not required	Refer to Condition 40	Not applicable
IBCP 44	Section 5.3	Report any potential/non-compliances or incidents to the DCCEEW within two (2) business days, with further details provided within ten (10) business days as required under Condition 14 of the EPBC Decision 2017/7950 approval.	Annual	Not required	No potential/non-compliances or incidents related to the Ironcaps Banksia Conservation Plan occurred within the reporting period.	Not applicable

©JBS&G Australia Pty Ltd

Appendix F Fauna Offset Management Plan Compliance Assessment

Table F.3: Fauna Offset Management Plan Audit Table

Condition	Reference	Requirement	Timing	Evidence	Assessment	Status
Management Actions						
FOMP 1	Section 1.2	Clear no more than the approved 386 ha of remnant native vegetation/fauna habitat within the Development Envelope.	Clearing	S001 – ClearingFootprint.shp S002 – ClearingToDate2022.shp	Spatial data provided by Covalent Lithium illustrating clearing to-date indicates that 365 ha of native vegetation had been cleared within the Development Envelope at this stage. JBS&G notes that previously disturbed/cleared areas (cleared as part of the abandoned Mt. Holland Mine Site) have been excluded from the calculations.	Conformant
FOMP 2	Table 2.2	Retain and improve habitat critical to the survival of the Chuditch in-line with the '*Chuditch (Dasyurus geoffroii) National Recovery Plan*.'	Ongoing	Not required	The Fauna Offset Management Plan was submitted to the DCCEEW on 26 March 2021 and approved on 31 March 2021. As of 31 December 2022, Covalent Lithium are awaiting approval of the Fauna Offset Management Plan from the WA Minster for Environment; therefore, the management and monitoring components of the Fauna Offset Management Plan have not commenced at this stage. Offset strategies have been submitted but are yet to be approved.	Not applicable
FOMP 3	Table 2.2	Retain and improve habitat critical to the survival of the Malleefowl in-line with the '*National Recovery Plan for Malleefowl (Leipoa ocellata)*.'	Ongoing	Not required	Refer to Condition 2	Not applicable
FOMP 4	Table 2.2	Undertake European Red Fox (*Vulpes vulpes*) control activities in-line with the '*Threat Abatement Plan for predation by the European red fox*.'	Ongoing	Not required	Refer to Condition 2	Not applicable
FOMP 5	Table 2.2	Undertake feral cat (*Felis catus*) control activities in-line with the *'Threat Abatement Plan for predation by feral cats*.'	Ongoing	Not required	Refer to Condition 2	Not applicable
FOMP 6	Section 3.2.1	Acquire and manage a 1,645 ha offset area(s) that consists of Chuditch and Malleefowl foraging and breeding habitat to offset the residual significant impacts of the Action.	Pre-clearing	Not required	Refer to Condition 2	Not applicable
FOMP 7	Table 3.2	Detect Chuditch within the acquired offset area(s), between May and July, each year over three (3) consecutive years. Performance and completion criteria include: • In 0 to 5 years, Chuditch are detected in two (2) annual monitoring events; • In 5 to 10 years, Chuditch are in two (2) consecutive annual monitoring events; and • In 10 to 15 years, Chuditch are detected in three (3) consecutive annual monitoring events.	Annual	Not required	Refer to Condition 2	Not applicable
FOMP 8	Table 3.2	Detect Malleefowl within the acquired offset area(s), each year, over three (3) consecutive years. Performance and completion criteria include: • In 0 to 5 years, Malleefowl are detected in two (2) annual monitoring events; • In 5 to 10 years, Malleefowl are detected in over two (2) consecutive annual monitoring events; and • In 10 to 15 years, Malleefowl are detected in over three (3) consecutive annual monitoring events.	Annual	Not required	Refer to Condition 2	Not applicable
FOMP 9	Table 3.2	Detect a recently active (1 to 2 year-old) Malleefowl mound within the acquired offset area(s). Performance and completion criteria include: • In 0 to 5 years, a recently active Malleefowl mound is detected; and • In 5 to 10 and 10 to 15 years, a recently active Malleefowl mound is detected onsite during at least two (2) monitoring events during each five (5) year period.	Annual	Not required	Refer to Condition 2	Not applicable
FOMP 10	Table 3.2	Detect Chuditch and Malleefowl within 5 km of the acquired offset area(s). Performance and completion criteria include: • Chuditch and Malleefowl are detected within 5 km, in each five-year period.	Annual	Not required	Refer to Condition 2	Not applicable

©JBS&G Australia Pty Ltd

Condition	Reference	Requirement	Timing	Evidence	Assessment	Status
FOMP 11	Table 3.2	Vegetation condition within the acquired offset area(s) are classified as 'Very Good' or higher as per the Keighery Scale. Performance and completion criteria include: • In 0 to 5 years, vegetation condition is averaged as 'Good' across all baseline assessment locations; and • In 5 to 10 and 10 to 15 years, vegetation condition is averaged as 'Very Good' or higher across all baseline assessment locations. **Note:** In the event that baselines assessments determine vegetation condition is currently 'Very Good' or higher, completion criteria will be amended to reflect an increase to 'Excellent' or higher as per the Keighery Scale.	Annual	Not required	Refer to Condition 2	Not applicable
FOMP 12	Table 3.2	Record hollow fallen trees within the acquired offset area(s). Performance and completion criteria include: • In 0 to 5 years, suitable hollow fallen trees are recorded at four (4) or more baseline habitat assessment locations; and • In 5 to 10 and 10 to 15 years, suitable hollow fallen trees are recorded at eight (8) or more baseline habitat assessment locations.	Annual	Not required	Refer to Condition 2	Not applicable
FOMP 13	Table 3.2	Record the presence of prey species of the Chuditch within the acquired offset area(s). Performance and completion criteria include: • In 0 to 5 years, Chuditch prey species are recorded at greater than six (6) baseline habitat assessment locations; and • In 5 to 10 and 10 to 15 years, Chuditch prey species are recorded at eight (8) or more baseline habitat assessment locations.	Annual	Not required	Refer to Condition 2	Not applicable
FOMP 14	Table 3.2	Record sufficient leaf litter to be utilised by the Malleefowl to build a mound within the acquired offset area(s). Performance and completion criteria include: • In 0 to 5 years, sufficient leaf litter to build a mound is recorded at four (4) or more habitat assessment locations; and • In 5 to 10 and 10 to 15 years, sufficient leaf litter to build a mound is recorded at eight (8) or more habitat assessment locations.	Annual	Not required	Refer to Condition 2	Not applicable
FOMP 15	Table 3.2	Record the presence of foraging resources of the Malleefowl within the acquired offset area(s). Performance and completion criteria include: • In 0 to 5 years, Malleefowl foraging resources are recorded at six (6) or more baseline habitat assessment locations; and • In 5 to 10 and 10 to 15 years, Malleefowl foraging resources are recorded at eight (8) or more baseline habitat assessment locations.	Annual	Not required	Refer to Condition 2	Not applicable
FOMP 16	Section 3.2.4	Achieve all completion criteria within twenty (20) years from the approval of the Fauna Offset Management Plan.	Ongoing	Not required	Refer to Condition 2	Not applicable
FOMP 17	Table 3.5	Install firebreaks within and around the acquired offset area(s) to minimise likelihood of uncontrolled fires impacting on conservation values.	As required	Not required	Refer to Condition 2	Not applicable
FOMP 18	Table 3.5	Install perimeter fencing around the acquired offset area(s) to prevent the unauthorised access of pedestrians and/or vehicles and exclude livestock grazing.	As required	Not required	Refer to Condition 2	Not applicable
FOMP 19	Table 3.5	Undertake prescribed burning in consultation with the Department of Biodiversity, Conservation and Attractions and other relevant stakeholders to minimise likelihood of uncontrolled fires impacting on conservation values.	As required	Not required	Refer to Condition 2	Not applicable
FOMP 20	Table 3.5	Remove waste and unwanted infrastructure.	As required	Not required	Refer to Condition 2	Not applicable
FOMP 21	Table 3.5	Undertake predator control in consultation with the Department of Biodiversity, Conservation and Attractions and other relevant stakeholders to reduce predation on	As required	Not required	Refer to Condition 2	Not applicable
FOMP 22	Section 3.3.4	Undertake introduced flora control in consultation with the Department of Biodiversity, Conservation and Attractions and other relevant stakeholders for the purpose of improving habitat condition to 'Very Good' as per the Keighery Scale.	As required	Not required	Refer to Condition 2	Not applicable
FOMP 23	Table 6.1	All personnel (employees, contractors, and/or subcontractors) must be inducted/reinducted on the key requirements of the Fauna Offset Management Plan prior to commencement of work onsite.	Annual	Not required	Refer to Condition 2	Not applicable

©JBS&G Australia Pty Ltd

Condition	Reference	Requirement	Timing	Evidence	Assessment	Status
Monitoring Actions						
FOMP 24	Section 5.1	Inspect and, if required, maintain perimeter fencing of the acquired offset area(s)	As required	Not required	Refer to Condition 2	Not applicable
FOMP 25	Section 5.1	Inspect and, if required, control introduced flora (weed) cover and density within the acquired offset area(s)	As required	Not required	Refer to Condition 2	Not applicable
FOMP 26	Section 5.1	Inspect and, if required, control feral animal occurrences and frequency within the acquired offset area(s)	As required	Not required	Refer to Condition 2	Not applicable
FOMP 27	Section 5.1	Inspect and, if required, maintain firebreaks of the acquired offset area(s)	As required	Not required	Refer to Condition 2	Not applicable
FOMP 28	Section 5.1	Inspect and, if required, control any unauthorised access incidents and/or livestock grazing within the acquired offset area(s)	As required	Not required	Refer to Condition 2	Not applicable
FOMP 29	Section 5.2	Undertake vegetation monitoring within the acquired offset area(s) to determine the following: • Dominant three (3) vascular flora species in each strata; • Percent cover of native vegetation in each strata; • Percent cover of bare ground in each strata; • Percent cover of leaf litter; • Percent cover of introduced flora species • Flora species composition in each strata; • Condition/health of each strata; and • Disturbances (if any), disturbance type and their estimated frequency;	Annual	Not required	Refer to Condition 2	Not applicable
FOMP 30	Section 5.3	Undertake fauna habitat assessments within the acquired offset area(s) to determine the following: • Number of hollow fallen trees; • Presence of prey species of the Chuditch; • Sufficient leaf litter to be utilised by Malleefowl to build a mound; and • Presence of foraging resources of the Malleefowl.	Annual	Not required	Refer to Condition 2	Not applicable
FOMP 31	Section 5.4	Undertake Chuditch presence monitoring within the acquired offset area(s) as follows: • Monitor in Chuditch breeding season (May to July); • Use cameras at static locations with a minimum of two arrays of 20 cameras with 200 m between cameras as per Rayner *et al*. (2011); and • Record opportunistic evidence of Chuditch, including tracks, scats, scratching and/or sightings.	Annual	Not required	Refer to Condition 2	Not applicable
FOMP 32	Section 5.4	Undertake Malleefowl presence monitoring within the acquired offset area(s) as follows: • Monitor in Malleefowl mound-building season (September to December); • Use LiDAR imagery to identify potential mounds with field verification or field verification of previously identified mounds; • Record opportunistic evidence of Malleefowl, including additional mounds, feathers, tracks, scats, scratching and/or sightings; • Align fauna monitoring with the with the '*National Malleefowl Monitoring Manual*' (2019) including mound activity status; and • Submit data via a cyber-tracker software program to the National Malleefowl Monitoring Database for population trend analysis, as well as the National Malleefowl Recovery Plan.	Annual	Not required	Refer to Condition 2	Not applicable
FOMP 33	Section 5.4	Provide an estimate of local population numbers for Chuditch, Malleefowl and feral animals based on evidence collated and temporal analysis.	Annual	Not required	Refer to Condition 2	Not applicable
Reporting						
FOMP 34	Section 7.1	Report the progress of the acquisition of the offset area(s).	Annual	S004 – OffsetProperty.shp	As of 31 December 2022, Covalent Lithium has identified and acquired of an offset property containing foraging and breeding habitat for the Malleefowl (*Leipoa ocellata*) and the Chuditch (*Dasyurus geoffroii*). The offset property is located in Skeleton Rock, within the Shire of Yilgarn in WA. The property itself is 1,788 ha, consisting of 1,510 ha of woodland and shrubland fauna habitat and 135 ha of granite habitat.	Conformant

©JBS&G Australia Pty Ltd

Condition	Reference	Requirement	Timing	Evidence	Assessment	Status
					The remaining 143 ha of area is cleared land which Covalent Lithium will utilise for fencing and firebreaks.	
FOMP 35	Section 7.1	Report the progress of the transfer of the offset area(s) to a conservation reserve system for management by the Department of Biodiversity, Conservation and Attractions.	Annual	Not required	Refer to Condition 2	Not applicable
FOMP 36	Section 7.1	Report the implementation status of management actions.	Annual	Not required	Refer to Condition 2	Not applicable
FOMP 37	Section 7.1	Report the results of the environmental monitoring.	Annual	Not required	Refer to Condition 2	Not applicable
FOMP 38	Section 7.1	Report the implementation of the outcomes of any contingency actions (if required).	As required	Not required	Refer to Condition 2	Not applicable
FOMP 39	Section 7.1	Report any potential/non-compliances or incidents to the DCCEEW within two (2) business days, with further details provided within ten (10) business days as required under Condition 14 of the EPBC Decision 2017/7950 approval.	Annual	Not required	No potential/non-compliances or incidents related to the Fauna Offset Management Plan occurred within the reporting period.	Not applicable

©JBS&G Australia Pty Ltd

Appendix G Malleefowl Monitoring 2021-22

©JBS&G Australia Pty Ltd

2021 MALLEEFOWL MONITORING

Covalent Lithium

ecoscape



COPYRIGHT STATEMENT FOR:
2021-22 Malleefowl Monitoring
Our Reference: 4644-21 Final 2021-22 Malleefowl Monitoring
Copyright © 1987-2022
Ecoscape (Australia) Pty Ltd
ABN 70 070 128 675
Except as permitted under the Copyright Act 1968 (Cth), the whole or any part of this document may not be reproduced by any process, electronic or otherwise, without the specific written permission of the copyright owner, Ecoscape (Australia) Pty Ltd. This includes microcopying, photocopying or recording of any parts of the report.

Revision	Author	QA Reviewer	Approved	Date
Final	Louisa Carlsson	BT	BT	22/06/2022

Direct all inquiries to:
Ecoscape (Australia) Pty Ltd
9 Stirling Highway • PO Box 50 NORTH FREMANTLE WA 6159
Ph: (08) 9430 8955
Prepared for Covalent Lithium

TABLE OF CONTENTS

Acknowledgements **1**

Summary **2**

1 Introduction **3**

1.1 Project Scope 3

1.2 Survey Area 3

1.2.1 Regional Location 3

1.3 Statutory and Technical Framework 4

1.3.1 Commonwealth Environment Protection and Biodiversity Conservation Act 1999 4

1.3.2 Western Australian Environmental Protection Act 1986 4

1.3.3 Western Australian Biodiversity Conservation Act 2016 4

1.3.4 Western Australian Priority Fauna 5

1.3.5 DBCA Wildlife Licences 5

2 Method **6**

2.1.1 Malleefowl Monitoring 6

2.1.2 Trail Camera Monitoring 6

2.1.3 LiDAR Data 7

3 Results **9**

3.1 Malleefowl Mound Monitoring 9

3.2 Trail Camera Image Review 9

3.2.1 Malleefowl 10

3.2.2 Other Species 12

3.2.3 Introduced Predators 13

3.3 Acitivty Analysis 14

3.3.1 2019-20 Analysis 15

3.3.2 2020-21 Analysis 16

3.3.3 2021-22 Analysis 17

3.4 LiDAR Ground truthing 18

4 Discussion and Recommendations **19**

4.1 Malleefowl Monitoring 19

4.1.1 Malleefowl Mound Monitoring 19

4.1.2 Activity Analysis 19

4.1.3 Introduced Predators 19

4.2 Recommendations 19

References **21**

Appendix One Maps **22**

Appendix Two Monitoring Results **27**

Appendix Three LiDAR Method 31

FIGURES

Figure 1: Malleefowl activity heat map based on number of events recorded 2019-20 at camera monitored mounds 15

Figure 2: Malleefowl activity heat map based on number of events recorded in 2020-21 at camera monitored mounds 16

Figure 3: Malleefowl activity heat map based on number of events recorded in 2021-22 at camera monitored mounds 17

TABLES

Table 1: Malleefowl mounds excluded in 2021-22 monitoring period 6

Table 2: Malleefowl mounds trail camera monitored 2021-22 9

Table 3: Malleefowl mounds trail camera monitored 2020-21 9

Table 4: Malleefowl mounds that recorded activity 10

Table 5: Malleefowl mounds visited and monitored during the 2021/2022 survey (nc denotes no camera; highlight indicates ACTIVE mound) 27

Table 6: Species recorded by trail camera (* denotes introduced species) 28

Table 7: Malleefowl mounds for 2022-23 monitoring program / recommendations 29

MAPS

Map 1: Malleefowl mounds monitored 23

Map 2: Active mounds and mounds that recorded Malleefowl 24

Map 3: Malleefowl mounds monitored by camera 25

Map 4: Malleefowl mounds ground truthed from LiDAR data 26

IMAGES

Image 1: Monitored mound showing location of post and camera 7

Image 2: Mound MM70 recorded as Active 11

Image 3: Malleefowl at mound MM53 11

Image 4: Malleefowl chick at mound MM53 12

Image 5: dead Malleefowl Chick at mound MM24 12

Image 6: Western Brush Wallaby at mound MM43 13

Image 7: Feral Cat recorded at mound MM63 14

Image 8: European Red Fox at mound MM4 14

ACKNOWLEDGEMENTS

Ecoscape would like to acknowledge the assistance and support we received from the Covalent staff on-site who made us welcome and provided logistical support where needed. We look forward to returning for the next years monitoring.

SUMMARY

Ecoscape was engaged by Covalent Lithium in early 2021 to provide the following services for the project:

- undertake National Malleefowl Recovery Team (NMRT) Malleefowl mound monitoring for the 2021-22 monitoring period
- collate images of fauna species and activity from Malleefowl mounds.

The results of the Malleefowl mound monitoring and review of the recorded images of Malleefowl at mounds provides ongoing data that can be used for temporal comparisons of Malleefowl activity for the Covalent Earl Grey Lithium Project site.

Selected LiDAR data points were ground truthed to determine the mound status. Fifteen new Malleefowl mounds were identified from LiDAR results and added to the list of known Malleefowl mounds.

The 2021-22 monitoring recorded information on mounds classified as ANNUAL only, as this was the first year which excluded the 5 YR mounds, which will be monitored again in 2025. The 2021-22 monitoring period recorded one active mound within the development envelope (DE) and three active mounds outside the DE. There are 15 mounds that recorded Malleefowl activity during the 2021-22 monitoring period in comparison to 14 mounds with recorded Malleefowl activity in 2020-21.

An activity analysis indicates that there is potentially four distinct breeding pairs within the monitoring area. One breeding pair within the DE and another three close by (< than 900 m from the DE boundary). Activity patterns are compared over the years that indicate an ongoing increase in activity during 2021-22 from previous monitoring.

Trail cameras deployed at mounds identified seven different Malleefowl mounds that were visited by Feral Cats. This included both active and inactive Malleefowl mounds. European Red Fox was recorded at two mounds identified as being inactive, this is the first record of Fox since monitoring commenced in 2019.

To provide Malleefowl population health and abundance data the following aspects are recommended to be monitored annually:

- trail camera monitoring during the egg incubation season (September to January) of all Malleefowl mounds that have been identified as annual, within and adjacent to the development envelope
- maintain database of Malleefowl and other fauna species sightings within a fauna register and report annually on number and location of active mounds
- collate image data and report on status of all monitored mounds
- collate and report on records of sightings of feral predators captured on cameras at the monitored mounds
- complete ground truthing of LiDAR data within the development envelope opportunistically.

1 INTRODUCTION

Covalent Lithium is developing the Earl Grey Lithium Project (EGLP) located at Mt Holland which will include the construction and operation of a fully integrated mine, concentrator, and refinery in Western Australia. The project is centred on the Earl Grey hard-rock lithium deposit 105 km south of Southern Cross in Western Australia and approximately 500 km east of Perth. It is owned by a 50-50 joint venture (JV) between subsidiaries of Wesfarmers Pty Ltd (WES:ASX) and Sociedad Química y Minera de Chile S.A. (SQM: NYSE). Covalent is the manager for the JV and is responsible for the development and operation of the project.

The survey area includes the habitats of two conservation significant fauna species, the Malleefowl (*Leipoa ocellata*) and the Chuditch (*Dasyurus geoffroii*). Both species are listed as vulnerable (VU) under both the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and the Western Australian *Biodiversity Conservation Act 2016* and are considered as Matters of National Environmental Significance (MNES).

Monitoring of Malleefowl mounds was undertaken during the mound building and egg laying summer season in 2021-22. Mounds identified as Annual monitoring were revisited and remeasured. Trail cameras were deployed on mounds to capture activity of Malleefowl and other fauna species including feral predators.

1.1 PROJECT SCOPE

Ecoscape was engaged to provide the following:

- monitoring of known Malleefowl mounds
- ground truthing of LiDAR results for potential Malleefowl mounds.

The requirements of the field survey were as follows:

- be conducted in accordance with current statutory and technical requirements and guidance
- be conducted by personnel complying with regulatory expectations, in relation to years of experience, to ground truth the desktop findings through a comprehensive and targeted survey
- identify, map and measure Malleefowl mounds to NMRT standards
- install and deploy trail cameras on mounds considered for annual and five year monitoring.

1.2 SURVEY AREA

1.2.1 REGIONAL LOCATION

The survey area is in the Shire of Yilgarn in the Goldfields region of Western Australia, about 100km south of Southern Cross. The development envelope (DE) is within the Great Western Woodlands (GWW) and is approximately 1,984 ha in extent (**Map 1**). The GWW is a 16 million hectare area extending from the wheatbelt to the edge of the deserts and is the largest intact area of Mediterranean Woodland on earth (DEC 2010). The GWW includes open eucalypt woodlands (63%), Mallee eucalypt woodlands, shrublands and grasslands (Fox et al. 2016). Less common habitats in the GWW include granite outcrops, banded ironstone formations, salt lakes and freshwater wetlands (Fox et al. 2016).

The DE is in the Southern Cross Subregion of the Coolgardie Bioregion of the Interim Biogeographic Regionalism for Australia (IBRA) classification system (Government & Energy 2017). The dominant land-uses in this bioregion are Crown Reserves and Unallocated Crown Land (66.7%), grazing on native pastures (17%), conservation (11.5%) and dryland agriculture (2.3%) (Cowan, Graham & McKenzie 2001). The greenstone hills, alluvial valleys and broad plains of calcareous earths support diverse eucalypt woodlands. The uplands support Mallee woodlands and scrub-heaths on sandplains, gravelly sandplains and lateritic breakaways, chains of salt lakes with dwarf shrublands of samphire occur in the valleys (Cowan, Graham & McKenzie 2001).

1.3 STATUTORY AND TECHNICAL FRAMEWORK

This environmental assessment was conducted in accordance with Commonwealth and State legislation and guidelines:

- Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)
- Western Australian Environmental Protection Act 1986 (EP Act)
- Western Australian Biodiversity Conservation Act 2016 (BC Act)
- Department of Environment Water Heritage and the Arts *Matters of National Environmental Significance. Significant impact guidelines 1.1 - Environment Protection and Biodiversity Conservation Act 1999* (DEWHA 2009).

In addition, the Minister for the Environment has published lists of fauna species in need of special protection because they are considered rare, likely to become extinct, or are presumed extinct. The current listings were published in the Government Gazette on 11 September 2018 (Government of Western Australia 2018) and was taken into account.

As well as those listed above, the assessment complied with EPA requirements for environmental survey and reporting in Western Australia, as outlined in:

- EPA Technical Guidance – Terrestrial vertebrate fauna surveys for environmental impact assessment (2020).

1.3.1 COMMONWEALTH ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999

At a Commonwealth level, threatened taxa (flora and fauna) are protected under the EPBC Act, which lists species that are considered Critically Endangered, Endangered, Vulnerable, Conservation Dependant, Extinct, or Extinct in the Wild.

1.3.2 WESTERN AUSTRALIAN ENVIRONMENTAL PROTECTION ACT 1986

The Western Australian EP Act was created to provide for an Environmental Protection Authority (EPA) that has the responsibility for:

- prevention, control and abatement of pollution and environmental harm
- conservation, preservation, protection, enhancement, and management of the environment
- matters incidental to or connected with the above.

The EPA is responsible for providing the guidance and policy under which environmental assessments are conducted. It conducts environmental impact assessments (based on the information included in environmental assessments and provided by the proponent), initiates measures to protect the environment and provides advice to the Minister responsible for environmental matters.

1.3.3 WESTERN AUSTRALIAN BIODIVERSITY CONSERVATION ACT 2016

The Western Australian BC Act provides for the conservation, protection and ecologically sustainable use of biodiversity and biodiversity components in Western Australia. It commenced on 1 January 2019.

Threatened species (both flora and fauna) and ecological communities that meet the categories listed within the BC Act are highly protected and require authorisation by the Minister to take or disturb. These are known as Threatened Flora, Threatened Fauna and Threatened Ecological Communities. The conservation categories of Critically Endangered, Endangered and Vulnerable have been aligned with those detailed in the EPBC Act.

Flora and fauna species may be listed as being of special conservation interest if they have a naturally low population, restricted natural range, are subject to or recovering from a significant population decline or reduction of range or are of special interest, and the Minister considers that taking may result in depletion of the species. Migratory species and those subject to international agreements are also listed under the Act. These are known as specially protected species in the BC Act.

The most recent flora and fauna listings were published in the Government Gazette on 11 September 2018 (Government of Western Australia 2018).

1.3.4 WESTERN AUSTRALIAN PRIORITY FAUNA

Conservation significant fauna species are listed by the DBCA as Priority Fauna where populations are geographically restricted or threatened by local processes, or where there is insufficient information to formally assign them to threatened fauna categories. Whilst Priority Fauna are not specifically listed in the BC Act, these have a greater level of significance than other native species.

1.3.5 DBCA WILDLIFE LICENCES

The field survey for the 2020 Malleefowl monitoring program was undertaken by Ecoscape Principal Zoologist Bruce Turner and Zoologist Louisa Carlsson under DBCA Wildlife Licensing Fauna License No. BA27000085-3 and Threatened Fauna Authority TFA 2020-0070.

2 METHOD

The purpose of the 2021-22 Malleefowl monitoring was to collect monitoring data on all Malleefowl mounds within and outside the DE, classified as ANNUAL, as on-going monitoring of Malleefowl presence and, to deploy trail cameras on selected mounds. This is the third season of monitoring which commenced in the mound building season of 2019-20.

The 2021-22 Malleefowl monitoring was undertaken by Ecoscape zoologists Bruce Turner and Louisa Carlsson under DBCA Wildlife License No. BA27000085-3 between 4-10 October 2021.

2.1.1 MALLEEFOWL MONITORING

Malleefowl mounds previously identified as ANNUAL (Ecoscape (Australia) Pty Ltd 2019) were revisited, remeasured and assessed to determine current activity status. LiDAR results were also ground truthed for accuracy and new mounds were added to the mound database and measured to NMRT standards.

At each Malleefowl mound measured a series of criteria was addressed as stated in section three of the NMRT Monitoring Manual. Each mound was recorded as either active or inactive and given a mound profile. A series of measurements and observations were recorded. Mounds were marked with a numbered star picket, photographed and cross sticks were left in place over the mound for future monitoring events. A 20 m radius was searched around active mounds only for any signs of predation.

There were four mounds that had been excluded to the birds in preparation for removal, these mounds were not monitored. These mounds are located within the DE clearing approval area and were excluded to prevent Malleefowl from nesting on them which may have led to a potentially fatal impact. The list of excluded mounds is shown in **Table 1**.

Table 1: Malleefowl mounds excluded in 2021-22 monitoring period

Mound No.	Easting	Northing	Status
3	759133.710	6446066.500	ANNUAL
5	759571.050	6446334.560	ANNUAL
23	760393.670	6447381.410	ANNUAL
62	762197.180	6443821.820	ANNUAL

2.1.2 TRAIL CAMERA MONITORING

Trail cameras were mounted at mounds which were assessed as ANNUAL within and adjacent to the DE. Cameras were mounted on brackets attached to star pickets installed close to the mound and high enough off the ground to view the interior of the mound.



Image 1: Monitored mound showing location of post and camera

The cameras were deployed from late October 2021 to March 2022. Images from the trail cameras were downloaded for review and collation of species recorded.

Recorded images of Malleefowl were reviewed to determine areas of Malleefowl activity. This was achieved by logging the number of activity events recorded at each mound. An activity event is defined as an image, or group of images, separated by at least two hours between images. The results were then analysed using a GIS heat map based on the number of events recorded for each mound.

2.1.3 LIDAR DATA

Ground truthing of LiDAR results was undertaken to the north of the Covalent Development Envelope during a fauna survey (Ecoscape (Australia) Pty Ltd 2021) and one mound was confirmed during the monitoring event. LiDAR points determined to be Malleefowl mounds, either recent or historical, were added to the mound database and measured to NMRT standards.

As outlined within Anditi (2021, **Appendix Three**) Aerial LiDAR data covering the DE and surrounds was captured by McMullen Nolan Group Pty Ltd (MNG Survey) in July/August 2019. The LiDAR data consisted of aerial LiDAR at a nominally 120 m aircraft flight line spacing to record a minimum of 5 detection points per square meter.

Spatial analytics company Anditi Pty Ltd then analysed the MNG Survey data to identify potential Malleefowl nest mounds through automation via the 'Anditi Engine'; being the proprietary software developed by Anditi data scientists for smart point cloud and image processing. In this process, the ground is defined through classification algorithms and then Malleefowl mound detection algorithms are applied to the ground surface to detect ground features in the point cloud that best approximate a typical Malleefowl nest mound shape. Based on the algorithm match to shape, and manual checks of aerial imagery, a mound is classed from Class 1 to Class 4, being:

Class 1 - Very closely matches a typical Malleefowl nest mound shape and is highly likely to be a Malleefowl nest mound

Class 2 - Is similar to a Malleefowl nest mound shape and could be a Malleefowl nest mound

Class 3 - Is a nest mound shape that is approximately within the parameters of size for a Malleefowl nest mound but isn't very similar to a typical Malleefowl nest mound. This could be an old Malleefowl nest mound, a mound of earth around living or dead tree/vegetation, or natural hummocks around waterways

Class 4 - Is a nest mound shape that is approximately within the parameters of size for a Malleefowl nest mound but isn't very similar to a typical Malleefowl mound. This could be a broken Malleefowl nest mound, a mound of earth around living or dead tree/vegetation, natural hummocks around waterways, or tussock vegetation, with manual aerial imagery checking.

A digital elevation model (DEM) is created and contoured to highlight ground features. This is overlaid with the 3D LIDAR point cloud in the Anditi Editor so that manual editors can review the data from all angles. In some cases, the point cloud is coloured from the RGB colour orthophoto. All these options enhance the quality of the resulting rated mounds, removing vegetation and other false positives. All Class 1 and Class 2, and some Class 3 mounds, were checked manually by Anditi using all available methods (e.g., aerial imagery) and where false positives were detected, these were moved to Class 4.

All potential Malleefowl nest mounds identified by LiDAR as Class 1, Class 2 and Class 3 within the Indicative Site Layout (disturbance footprint) for proposed mining operations were ground-truthed by Ecoscape to determine if the locations contained a Malleefowl nest mound (or not). Points identified as Class 4 were not ground-truthed as these locations were considered unlikely to contain a Malleefowl nest mound.

Further detail on the LiDAR data collection and processing is contained within Anditi (2021) provided at **Appendix Three**.

3 RESULTS

3.1 MALLEEFOWL MOUND MONITORING

The 2021-22 monitoring focussed on ANNUAL mounds only. A total of 26 Malleefowl mounds classified as annual mounds were measured to NMRT standards and monitored by trail camera (**Table 5 Appendix Two**). One new mound identified from LiDAR data was ground truthed and measured to NMRT standards during the 2021-22 monitoring event. Eleven of these are within the DE and 15 are outside the DE (**Map 1**). Four mounds were recorded as ACTIVE (mound building and egg laying recorded), mound MM53 inside the DE, and mounds MM64, MM24 and, MM70 outside the DE (**Map 2**). Of the 26 measured mounds, 23 were monitored by trail camera (**Map 3**,**Table 2**).

Table 2: Malleefowl mounds trail camera monitored 2021-22

Monitoring Frequency	Mound Location	
	Inside DE	Outside DE
ANNUAL	11	12

Table 3 lists the results for the previous year's monitoring of 2020-21. The number of mounds between years differ in that 5YR mounds were not revisited in 2021-22 and four annual mounds within the DE have been excluded from monitoring (**Table 1**). The new mound identified from LiDAR data was not monitored by a trail camera and does not appear in the table summary.

Table 3: Malleefowl mounds trail camera monitored 2020-21

Monitoring Frequency	Mound Location	
	Inside DE	Outside DE
ANNUAL	15	12
5 YR	11	3
Total	**26**	**15**

Of the 23 trail camera monitored mounds one mound (MM53) was recorded as active (i.e., recorded mound building and egg laying activity) within the DE and three mounds (MM24, MM64 and MM70) were recorded as active outside the DE. The remaining 19 mounds, within and outside the DE, were inactive (i.e., no recorded mound building or egg laying activity) (**Table 5** in **Appendix Two**).

Eleven mounds, six inside the DE and five outside the DE, recorded Malleefowl visiting the mounds with no mound building or egg laying activity being recorded (**Table 4**). In comparison to the 2020-21 monitoring event there has been a two-fold increase in active mounds recorded and a slight increase in Malleefowl mounds which recorded general activity (not necessarily mound building and/or egg lying activity).

3.2 TRAIL CAMERA IMAGE REVIEW

A total of 23 trail cameras were placed at active mounds and mounds which had been active approximately within the past five years, 11 of these are located within the DE and 12 are located outside the DE (**Map 3**). **Table 5** in **Appendix Two** lists the locations for all Malleefowl mounds monitored during the survey and the mounds at which trail cameras were placed (**Map 3**).

All the cameras were revisited in November 2021 to have batteries replaced and image data downloaded and were then subsequently collected in March 2022. Cameras mounted at active mounds were serviced by Covalent staff every couple of weeks to replace batteries and download image data. The downloaded data was collated into folders for each monitored mound and then reviewed. The review process involved removing images with no fauna present (e.g., wind moving shrubs) and then sorting images with fauna present into species subfolders. Malleefowl visit events were collated and tabulated for GIS analysis.

Table 6 (**Appendix Two**) lists all species recorded by the trail cameras at the monitored mounds. Varanid species, Feral Cat and Fox were recorded on mounds indicating predators of Malleefowl eggs were active at the time of survey.

3.2.1 MALLEEFOWL

Images of Malleefowl were reviewed for behaviour, e.g., scratching or egg laying, with the number of activity events tabulated. Results are discussed with respect to possible abundance based on timing of image capture.

Fifteen (seven inside DE; eight outside DE) camera monitored Malleefowl mounds recorded Malleefowl and were mapped to indicate their spatial relationship to each other. One active mound (MM53) was inside the DE, and three active mounds (MM24, MM64 and MM70) were recorded outside the DE (**Map 2**).

Table 4: Malleefowl mounds that recorded activity

Mound ID	Number of recorded activity events	Monitoring Frequency	Inside DE (yes/no)	Feral Predators
MM02	1	ANNUAL	Yes	
MM17	2	ANNUAL	No	Yes
MM24 ACTIVE	Constant (>100)	ANNUAL	No	Yes
MM38	2	ANNUAL	Yes	
MM42	4	ANNUAL	Yes	
MM43	3	ANNUAL	Yes	Yes
MM53 ACTIVE	Constant (>100)	ANNUAL	Yes	Yes
MM56	5	ANNUAL	Yes	
MM60	1	ANNUAL	Yes	
MM63	9	ANNUAL	No	Yes
MM64 ACTIVE	Constant (>100)	ANNUAL	No	
MM65	3	ANNUAL	No	
MM66	21	ANNUAL	No	Yes
MM68	1	ANNUAL	No	
MM70 ACTIVE	Constant (>100)	ANNUAL	No	

The four mounds identified as active **Table 4** recorded constant images of pairs of Malleefowl scratching and laying (



Image 2 and **Image 3**). Mound 53 and Mound 64 are identified as being active for the second consecutive year.



Image 2: Mound MM70 recorded as Active



Image 3: Malleefowl at mound MM53

The review of trail camera footage identified that at least six chicks have hatched from MM 53 (**Image 4**). One deceased chick was identified at MM 24 (**Image 5**), on review of all imagery it appears likely that the chick has died within the mound and has not been predated upon.



Image 4: Malleefowl chick at mound MM53



Image 5: dead Malleefowl Chick at mound MM24

3.2.2 OTHER SPECIES

Western Brush Wallaby (**Image 6**), Sand Goanna, other small reptiles and a suite of small woodland bird species were recorded visiting active and inactive Malleefowl mounds. **Table 6** (**Appendix Two**) lists all species recorded visiting the trail camera monitored mounds during the 2021-2022 monitoring event.



Image 6: Western Brush Wallaby at mound MM43

3.2.3 INTRODUCED PREDATORS

Feral Cats were recorded by trail cameras (**Image 7**) at seven Malleefowl mounds (MM17, MM24, MM34, MM43, MM 53, MM63, and MM66). Five of these mounds (MM17, MM24, MM34, MM63, and M66) are outside the DE and, excluding MM66 to the northwest of the Earl Grey and Jasmine Pits, are within 1500 m of each other and did record feral cat activity during the previous monitoring event in 2020 (**Map 1**). Feral cats were recorded at active and inactive Malleefowl Mounds (**Table 4** and **Map 2**). Feral cats were also recorded within the Covalent DE at MM43 and MM53, which are in close proximity to one another south of the Covalent Airstrip. The 2021-2022 monitoring results identified feral cat activity at seven mounds indicating a slight reduction in feral cat activity compared to the previous monitoring event.

European Red Fox (**Image 8**) was recorded at MM4 (inside DE) and MM63 (outside DE), which are approximately 1900 m of each other. Both mounds were recorded to be inactive during this monitoring event, but the trail camera at MM63 recorded individual and isolated visits of Malleefowl.



Image 7: Feral Cat recorded at mound MM63



Image 8: European Red Fox at mound MM4

3.3 ACITIVTY ANALYSIS

An analysis was performed using the recorded events of activity at each mound to determine areas of Malleefowl activity. Tabulated event numbers for each mound that recorded activity by Malleefowl was analysed in GIS to produce a heat map of activity based on the number of events recorded for each mound by trail camera images.

Data for the three monitoring events (**Figure 1**, **Figure 2** and **Figure 3**) was subjected to the same GIS analysis to provide comparison between years.

3.3.1 2019-20 ANALYSIS

Malleefowl mound MM17 was the only mound active for the length of the 2019-20 monitoring period (**Figure 1**). Mound MM23 was recorded as active and then subsequently abandoned approximately halfway through the monitoring period, most likely due to a feral cat visit (Ecoscape (Australia) Pty Ltd 2019).

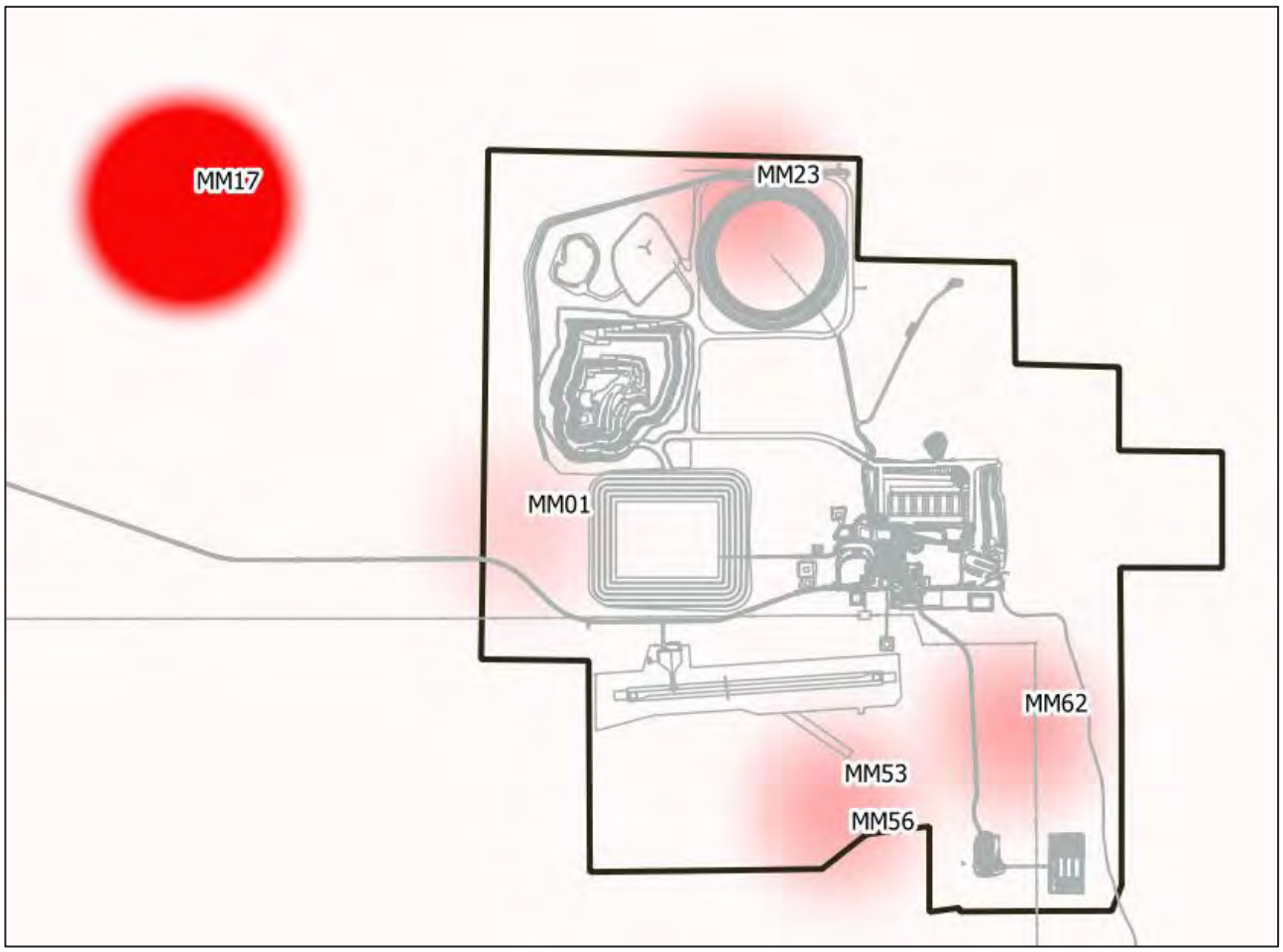


Figure 1: Malleefowl activity heat map based on number of events recorded 2019-20 at camera monitored mounds

3.3.2 2020-21 ANALYSIS

The activity pattern for 2020-21 is similar to 2019-20 in that Malleefowl activity was recorded around mounds located in the same areas with the exception of MM28 and MM64 (**Figure 2**). The obvious difference is the increase in activity during 2020-21 and this was supported by the increase in the number of sightings of Malleefowl being recorded on site since February 2021.

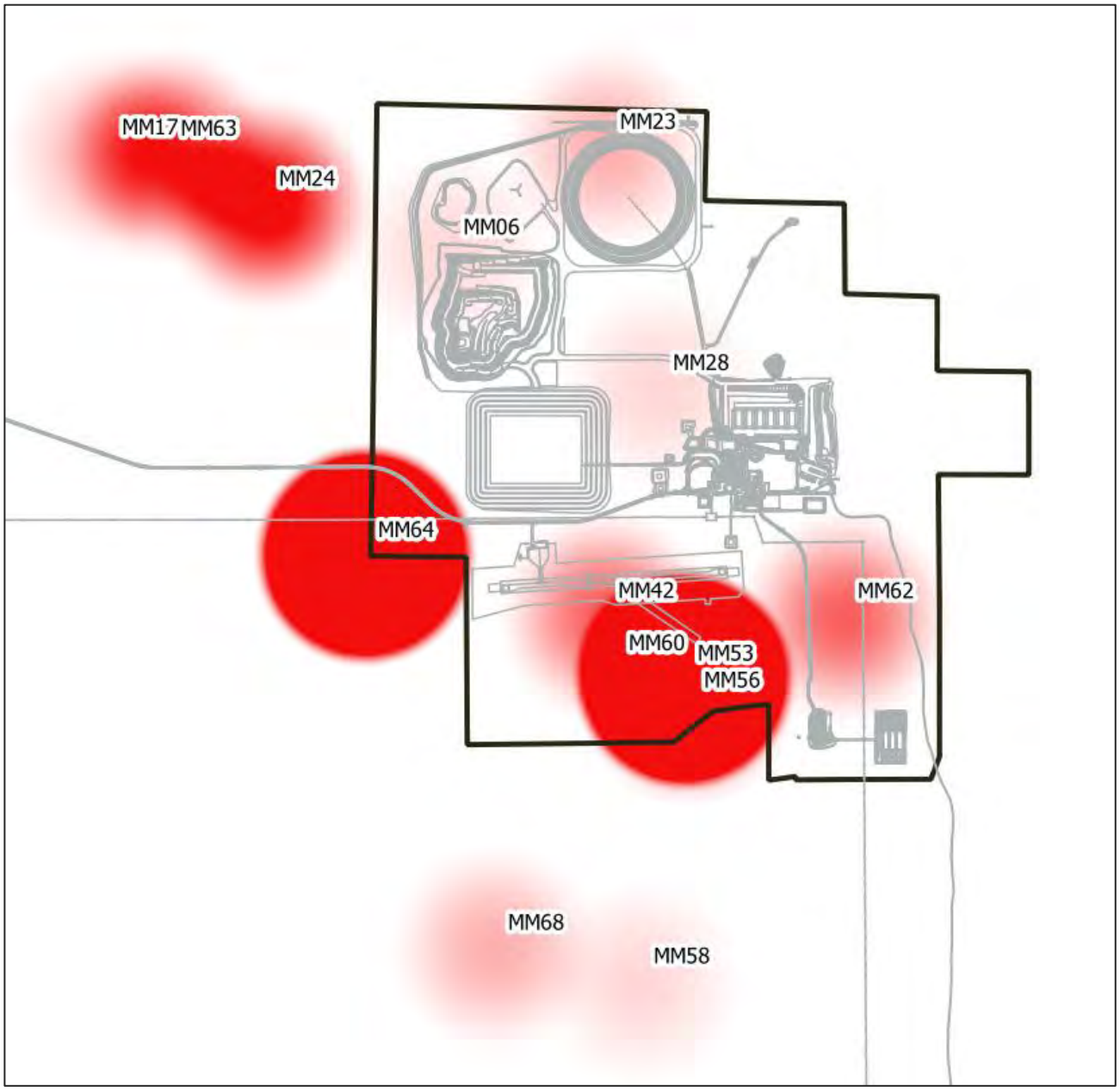


Figure 2: Malleefowl activity heat map based on number of events recorded in 2020-21 at camera monitored mounds

3.3.3 2021-22 ANALYSIS

The analysis determined that there are potentially four breeding pairs of Malleefowl within the area of the monitored mounds. **Figure 3** shows that Malleefowl activity is highest around the four active mounds MM53, MM24, MM70, and MM64. The activity around mounds MM63, MM66, MM65, MM42 and MM68 is not attributed to mound building or egg laying however these mounds were visited many times and most likely by the same birds that are nesting at the active mounds. Malleefowl activity was similar in the location of active mounds with the 2020-21 monitoring with the addition of one new active mound at MM66.

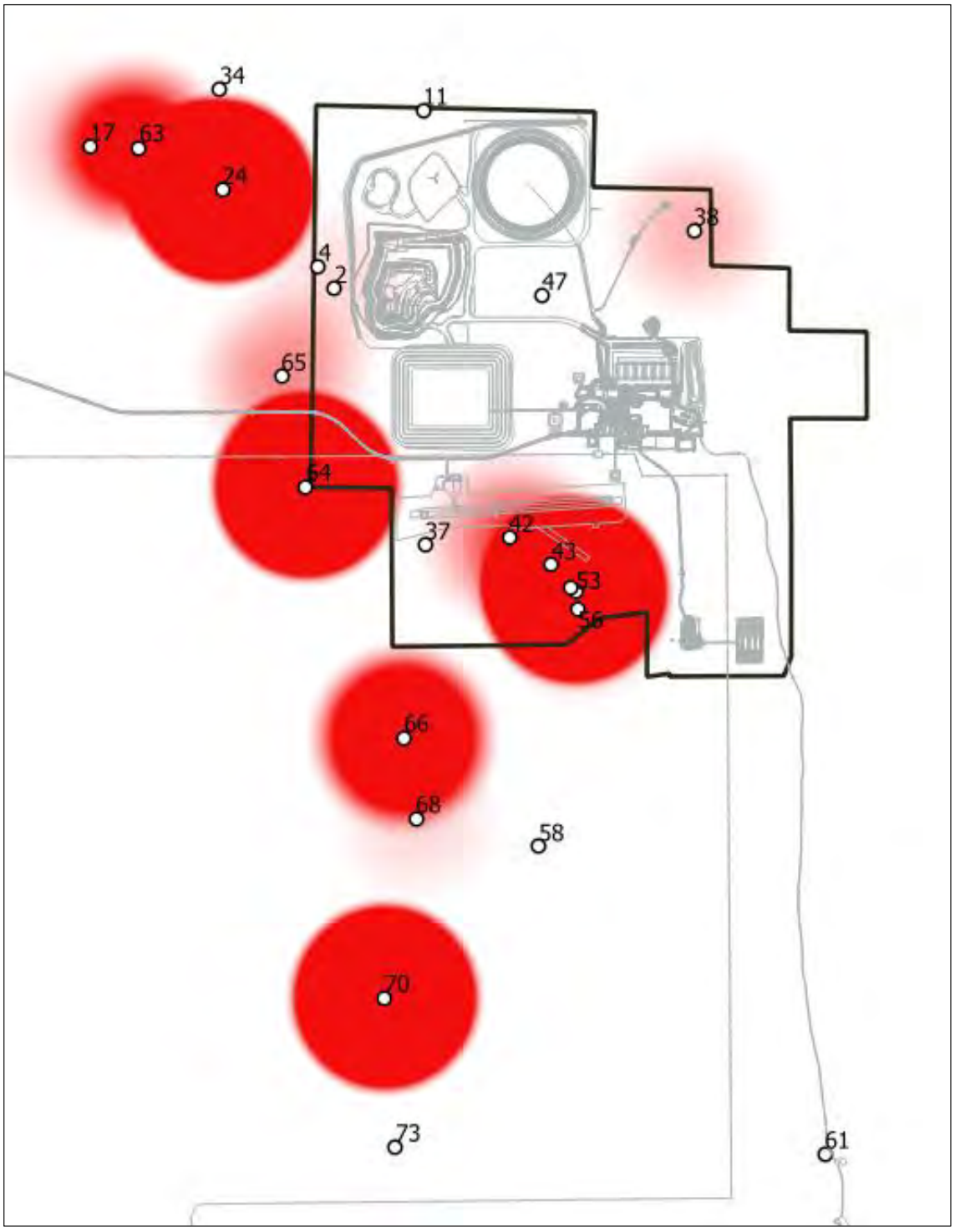


Figure 3: Malleefowl activity heat map based on number of events recorded in 2021-22 at camera monitored mounds.

3.4 LIDAR GROUND TRUTHING

Ground truthing of LiDAR results was undertaken during a fauna survey earlier in the year (Ecoscape 2021) and the actual monitoring event.

Fifteen new Malleefowl mounds were identified from LiDAR results and added to the list of known Malleefowl mounds (**Map 4**). None of the identified mounds were recorded as LiDAR Class 1. Eight were classified as LiDAR class 2, three as class 3 and four as class 4 (**Map 4**), which indicates that ground truthing is necessary to determine actual Malleefowl mound presence. LiDAR class definitions are summarised as:

Class 1 –highly likely to be a Malleefowl nest mound.
Class 2 –could be a Malleefowl nest mound.
Class 3 –isn't very similar to a typical Malleefowl mound.
Class 4 –isn't very similar to a typical Malleefowl mound and less so than Class 3.

4 DISCUSSION AND RECOMMENDATIONS

4.1 MALLEEFOWL MONITORING

4.1.1 MALLEEFOWL MOUND MONITORING

Four active mounds were recorded during the 2021-2022 monitoring period. Mounds MM 64 (outside DE) and MM 53 (inside DE) were also recorded as active during the 2020-21 monitoring event. Another two mounds (MM 24 and MM 70) located outside the DE were recorded as active. A total of 15 mounds recorded Malleefowl activity in 2021-22 compared to 14 mounds in 2020-21 indicating a slight increase in recorded Malleefowl activity.

Figure 2 and **Figure** 3 show the slight increase and shift between mounds of general Malleefowl activity in 2021-22 compared to the previous monitoring event. The four active mounds (MM 24, MM 53, MM 64, and MM 70) recording mound building and egg laying behaviour constantly through the monitoring period.

The results indicate that there were potentially four discrete breeding pairs of Malleefowl maintaining mounds during the 2021-22 monitoring period. It is likely there are two additional breeding pairs of Malleefowl around MM 63 and MM 66.

The 2022-2023 monitoring event will compromise all mounds listed as annual **Table 7** (**Appendix Two**). All mounds classified as 5 year will again be monitored in 2025.

4.1.2 ACTIVITY ANALYSIS

The analysis of images to produce activity patterns at the monitored mounds and the resulting heat maps indicate four areas of high activity for 2021-22 (**Figure 3**), with MM66 having potential to become an active mound in future breeding seasons and adding a fifth area of high activity. The activity patterns are similar to those observed during the previous 2020-2021 (**Figure 2**) and 2019-2020 (**Figure 1**) monitoring event. With activity intensifying in the north-west corner outside the DE and with new activity arising south of the DE.

The results indicate that potentially at least four Malleefowl pairs are known to be active within the monitoring area.

4.1.3 INTRODUCED PREDATORS

Over the 2021-22 period of trail camera monitoring seven different mounds recorded visits by Feral Cats. Four of these mounds (MM17, MM24, MM34, MM63) are all outside the DE to the northwest of the Earl Grey and Jasmine Pits and are within 1500 m of each other. The images recorded show distinguishing stripe patterns suitable to confirm that the animal seen on trail camera images in this area are likely to be the same individual, this is consistent with the results from the 2020-2021 monitoring event. Feral cats were also recorded at mounds MM43, MM53, and MM66 which are within 2000 m of one another surrounding the southern border of the DE. Image review suggests that this is likely to be the same individual.

During the 2021-2022 monitoring event a European Red Fox was recorded visiting mounds MM4 and MM63, both identified as being inactive. This is the first time that a European Red Fox has been recorded during the Malleefowl monitoring. Mounds MM4 and MM63 are within 1900 m of each other so it is likely that the Fox recorded is the same individual.

4.2 RECOMMENDATIONS

These recommendations are made without knowledge of the possible conditions of approval and pertain to monitoring of the likely Malleefowl population within the overall project area and are aligned with the guidelines of the NMRT Monitoring Manual.

Monitoring of mounds both within and outside of the DE may provide insight on the number of birds breeding and foraging that may be impacted by potential clearing activity.

To provide Malleefowl population health and abundance data the following aspects are recommended to be monitored annually:

- Trail camera monitoring during the egg incubation season for 2022-23 (September to January) of all Malleefowl mounds that have been identified as ANNUAL, within and adjacent to the DE.
- Maintain database of Malleefowl sightings within a fauna register and report annually on number and location of active mounds.
- Collate image data and report on status of all monitored mounds.
- Collate and report on records of sightings of feral predators and images captured on cameras at the monitored mounds.
- Complete ground truthing of LiDAR data within the DE.

REFERENCES

Anditi Pty Ltd (2021), Covalent Lithium Malleefowl Mound Detection via LiDAR Metadata and Methodology Report. Report prepared by Evans G of Anditi Pty Ltd for Covalent Lithium Pty Ltd. November 2021.

Commonwealth of Australia (1999), *Environment Protection and Biodiversity Conservation Act 1999*. Available from: http://www.austlii.edu.au/au/legis/cth/consol_act/epabca1999588/.

Cowan, M, Graham, G & McKenzie, N 2001, ‘‘Coolgardie 2 (COO 2 – Southern Cross Subregion).’’ in *A Biodiversity Audit of Western Australia’s 53 Biogeographical Subregions in 2002* , eds.JE May & NL McKenzie, Department of Conservation and Land Management, Department of Conservation and Land Management.

Department of Environment and Conservation 2010, *A Biodiversity and Cultural Conservation Strategy for the Great Western Woodlands*. Available from: http://www.dpaw.wa.gov.au/images/documents/conservation-management/off-road-conservation/gww/gww-strategy.pdf.

Department of the Environment Water Heritage and the Arts; Commonwealth of Australia 2009, *Matters of National Environmental Significance. Significant impact guidelines 1.1 - Environment Protection and Biodiversity Conservation Act 1999*.

Ecoscape (Australia) Pty Ltd 2019, *2019 Mt Holland Malleefowl Monitoring unpublished report for Covalent Lithium*.

Ecoscape (Australia) Pty Ltd 2021, *Earl Grey Lithium Project - Detailed Terrestrial Vertebrate Fauna Survey unpublished Report for Covalent Lithium*.

Environmental Protection Authority 2020, *Technical Guidance - Terrestrial vertebrate fauna surveys for environmental impact assessment*, EPA, Perth, Western Australia. Available from: https://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/EPA-Technical-Guidance-Vertebrate-Fauna-Surveys.pdf.

Fox, E, Mcnee, S, Douglas, T & BirdLife Australia, M 2016, *Birds of the Great Western Woodlands. Report for The Nature Conservancy*.

Government, A & Energy, D of the E and 2017, *Australia’s bioregions (IBRA)*. .

Government of Western Australia (1986), *Environmental Protection Act 1986*. Available from: http://www.slp.wa.gov.au/legislation/statutes.nsf/main_mrtitle_1384_homepage.html.

Government of Western Australia (2016), *Biodiversity Conservation Act 2016*. Available from: https://www.legislation.wa.gov.au/legislation/statutes.nsf/main_mrtitle_13811_homepage.html.

Government of Western Australia 2018, *Government Gazette No. 135, 11 September 2018*. Available from: https://www.slp.wa.gov.au/gazette/gazette.nsf/searchgazette/EF556EEFA23C70FA482583040013E0FC/$file/Gg135.pdf.

APPENDIX ONE MAPS

Map 1: Malleefowl mounds monitored

Map 2: Active mounds and mounds that recorded Malleefowl

Map 3: Malleefowl mounds monitored by camera

Map 4: Malleefowl mounds ground truthed from LiDAR data

APPENDIX TWO MONITORING RESULTS

Table 5: Malleefowl mounds visited and monitored during the 2021/2022 survey (nc denotes no camera; highlight indicates ACTIVE mound)

Mound No.	Date on	Camera No.	Easting	Northing	Action
2	06/10/2021	94	758814.450	6446062.100	ANNUAL
4	06/10/2021	86	758671.410	6446261.450	ANNUAL
11	05/10/2021	29	759608.780	6447663.710	ANNUAL
17	05/10/2021	7	756616.660	6447339.360	ANNUAL
24	05/10/2021	68	757807.780	6446949.680	ANNUAL
34	05/10/2021	24	757784.400	6447850.350	ANNUAL
37	06/10/2021	81A	759627.840	6443759.560	ANNUAL
38	06/10/2021	80	762041.070	6446580.550	ANNUAL
42	06/10/2021	47	760380.820	6443823.550	ANNUAL
43	06/10/2021	10	760762.250	6443581.310	ANNUAL
47	06/10/2021	87	760678.550	6446002.240	ANNUAL
53	06/10/2021	79	760983.090	6443348.360	ANNUAL
56	06/10/2021	17	761001.850	6443190.010	ANNUAL
58	05/10/2021	6	760649.570	6441052.370	ANNUAL
60	06/10/2021	65	760934.210	6443386.150	ANNUAL
61	05/10/2021	19	763216.780	6438292.680	ANNUAL
63	05/10/2021	11	757062.490	6447330.290	ANNUAL
64	06/10/2021	58	758558.640	6444285.370	ANNUAL
65	06/10/2021	84	758336.650	6445274.990	ANNUAL
66	06/10/2021	64	759437.293	6442033.674	ANNUAL
68	05/10/2021	81	759545.240	6441306.261	ANNUAL
70	05/10/2021	82	759262.392	6439696.610	ANNUAL
73	05/10/2021	99	759363.117	6438355.697	ANNUAL
75 new	09/10/2021	nc	758733.83	6442566.13	ANNUAL

Table 6: Species recorded by trail camera (* denotes introduced species)

Species	Common Name
Acanthiza chrysorrhoa	Yellow-rumped Thornbill
Calamanthus cautus	Shy Heathwren
Cinclosoma clarum	Western Chestnut Quail-thrush
Coturnix ypsilophora	Brown Quail
Cracticus torquatus	Grey Butcherbird
Ctenophorus caudicinctus	Ringtail Dragon
Ctenophorus cristatus	Bicycle Dragon
Ctenophorus isolepis	Central Military Dragon
Drymodes brunneopygia	Southern Scrub Robin
**Felis catus*	Cat
Gavicalis virescens	Singing Honeyeater
Gliciphila melanops	Tawny-crowned Honeyeater
Leipoa ocellata	Malleefowl
Lichenostomus cratitius	Purple-gaped Honeyeater
Lichenostomus leucotis novaenorciae	White-eared Honeyeater
Macropus fuliginosus melanops	Western Grey Kangaroo
Malurus pulcherrimus	Blue-breasted Fairy-wren
Notamacropus irma	Western Brush Wallaby
Notomys mitchellii	Mitchell's Hopping Mouse
Oreoica gutturalis	Crested Bellbird
Phaps chalcoptera	Common Bronzewing
Phaps elegans	Brush Bronzewing
Pogona minor minor	Western Bearded Dragon
Pomatostomus superciliosus	White-browed Babbler
Pseudechis australis	King Brown Snake
Tiliqua occipitalis	Western Bluetongue
Tiliqua rugosa rugosa	Bobtail
Varanus gouldii	Sand Goanna
**Vulpes vulpes*	European Red Fox

Table 7: Malleefowl mounds for 2022-23 monitoring program / recommendations

Mound No.	Easting	Northing	Action
2	758814.450	6446062.100	5-year
4	758671.410	6446261.450	5-year
11	759608.780	6447663.710	5-year
17	756616.660	6447339.360	ANNUAL
24	757807.780	6446949.680	ANNUAL
34	757784.400	6447850.350	ANNUAL
37	759627.840	6443759.560	5-year
38	762041.070	6446580.550	5-year
42	760380.820	6443823.550	5-year
43	760762.250	6443581.310	5-year
47	760678.550	6446002.240	5-year
53	760983.090	6443348.360	ANNUAL
56	761001.850	6443190.010	ANNUAL
58	760649.570	6441052.370	5-year
60	760934.210	6443386.150	5-year
61	763216.780	6438292.680	5-year
63	757062.490	6447330.290	5-year
64	758558.640	6444285.370	ANNUAL
65	758336.650	6445274.990	5-year
66	759437.293	6442033.674	5-year
68	759545.240	6441306.261	5-year
70	759262.392	6439696.610	ANNUAL
73	759363.117	6438355.697	ANNUAL
75	758733.83	6442566.13	5-year

APPENDIX THREE LIDAR METHOD

Appendix H Chuditch Monitoring 2022

©JBS&G Australia Pty Ltd

2022 MT HOLLAND CHUDITCH MONITORING

Covalent Lithium

ecoscape



COPYRIGHT STATEMENT FOR:
2022 Mt Holland Chuditch Monitoring
Our Reference: 4743-22 2022 Mt Holland Chuditch Monitoring
Copyright © 1987-2022
Ecoscape (Australia) Pty Ltd
ABN 70 070 128 675
Except as permitted under the Copyright Act 1968 (Cth), the whole or any part of this document may not be reproduced by any process, electronic or otherwise, without the specific written permission of the copyright owner, Ecoscape (Australia) Pty Ltd. This includes microcopying, photocopying or recording of any parts of the report.

Revision	Author	QA Reviewer	Approved	Date
Final	Robert Hemsworth	BT	BT	9/12/2022

Direct all inquiries to:
Ecoscape (Australia) Pty Ltd
Lvl 1 38 Adelaide Street Fremantle (Walyalup) WA 6160
Whadjuk Boodja
Ph: (08) 9430 8955
Prepared for Covalent Lithium

This document should be cited as 'Ecoscape (Australia) Pty Ltd (2022) 2022 Mt Holland Chuditch Monitoring, prepared for Covalent Lithium

TABLE OF CONTENTS

Acknowledgements **1**

Summary **2**

1 Introduction **3**

1.1 Project Purpose 3

1.1.1 Project Scope 3

1.2 Survey Area 3

1.2.1 Regional Location 3

1.3 Statutory and Technical Framework 5

1.3.1 Commonwealth Environment Protection and Biodiversity Conservation Act 1999 5

1.3.2 Western Australian Environmental Protection Act 1986 5

1.3.3 Western Australian Biodiversity Conservation Act 2016 5

1.3.4 Western Australian Priority Fauna 6

2 Method **7**

2.1 Field Survey 7

2.1.1 Survey Design 7

2.1.2 Site Selection 7

2.2 Data Analysis 7

3 Results **10**

3.1 Monitoring Sites 10

3.2 Chuditch Captures 10

3.2.1 camera Records 10

3.2.2 Other Species 12

3.3 Data Analysis 12

4 Discussion and Recommendations **13**

4.1 Chuditch Population 13

4.2 Recommendations Adopted from 2021 Chuditch Monitoring 13

4.3 Recommendations for 2023 Monitoring 13

References **14**

Appendix One Definitions and Criteria **15**

Appendix Two Trapping Site Details **18**

FIGURES

Figure 1: Project Location 4

TABLES

Table 1: Nontarget fauna species captures in traps 12

Table 2: Nontarget fauna species recorded on trail cameras 12

Table 3: EPBC Act categories for flora and fauna 15

Table 4: Conservation codes for Western Australian flora and fauna (DBCA 2019) 16

Table 5: Locations of impact trap sites 18

Table 6: Locations of control trap sites 19

MAPS

Map 1: Location of impact site traps 8

Map 2: location of control site traps 9

IMAGES

Image 1: Chuditch image captured on a trail camera. 11

Image 2: Habitat at site of camera record. 11

ACKNOWLEDGEMENTS

Ecoscape would like to acknowledge the assistance and support we received from the Covalent staff, who made us welcome and provided logistical support where needed. We look forward to continuing our ongoing relationship.

SUMMARY

Ecoscape was engaged to provide the following services for the project:

- undertake and complete Chuditch monitoring, specifically:
  - establish and monitor three control sites more than five kilometres outside of the development envelope
  - establish and monitor three impact sites within the development envelope
- record all Chuditch captures in a monitoring database including morphometrics; location of capture; health status and breeding status (e.g. number of pouch young; lactation)
- undertake monitoring within the Chuditch breeding season (May to July).

The results of the 2022 Mt Holland Chuditch monitoring has provided data that can be used to compare future monitoring results for the Covalent Lithium EGLP Project site.

One Chuditch (*Dasyurus geoffroii*), of unknown sex, was recorded on a trail camera in the control site during the 2022 monitoring period. Mitchell's Hopping-mouse (*Notomys mitchellii*), Ash-grey Mouse (*Pseudomys albocinereus*), Gilbert's Dunnart (*Sminthopsis gilberti*), White-tailed Dunnart (*Sminthopsis granulipes*), Southern Scrub Robin (*Drymodes brunneopygia*), Australian Raven *Corvus coronoides,* and White-browed Babbler (*Pomatostomus superciliosus*) were also recorded from both the control and impact sites.

The 2022 Chuditch monitoring was the fourth annual monitoring survey undertaken during the Chuditch breeding season.

Ecoscape recommends that ongoing monitoring of the Chuditch population, within and outside of the development envelope, should continue in June 2023.

1 INTRODUCTION

1.1 PROJECT PURPOSE

Covalent Lithium is developing the Earl Grey Lithium Project (EGLP) which will include the construction and operation of a fully integrated mine, concentrator, and refinery in Western Australia. The project is centred on the Earl Grey hard-rock lithium deposit 105 km south of Southern Cross in Western Australia and approximately 500 km east of Perth (**Figure 1**).

The survey area intersects with habitat of two conservation significant fauna species, the Malleefowl *(Leipoa ocellata*) and the Chuditch (*Dasyurus geoffroii*). Both species are listed as vulnerable (VU) under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and the Western Australian *Biodiversity Conservation Act 2016* and are considered Matters of National Environmental Significance (MNES).

The purpose of the project is to continue Chuditch monitoring prior to, during, and post construction of the mine and associated infrastructure, to determine Chuditch population density or abundance and determine their distribution in the local region.

1.1.1 PROJECT SCOPE

The project scope was to undertake a monitoring program for the Chuditch using a before-after control-impact (BACI) design adapted to Chuditch ecology through consultation with the Department of Biodiversity Conservation and Attractions (DBCA).

Ecoscape was engaged to provide the following services for the project:

- undertake and complete Chuditch monitoring for 2022, specifically:
  - establish and monitor three control sites more than five kilometres outside of the development envelope
  - establish and monitor three impact sites within the development envelope
- record all Chuditch captures in a monitoring database including morphometrics; location of capture; health status and breeding status (e.g. number of pouch young; lactation)
- undertake monitoring within the Chuditch breeding season (May to July).

1.2 SURVEY AREA

1.2.1 REGIONAL LOCATION

The survey area is in the Shire of Yilgarn in the Goldfields region of Western Australia, about 100 km south of Southern Cross. The survey area consists of the impact sites within the development envelope and the control site five kilometres outside the development envelope. The development envelope is within the Great Western Woodlands (GWW) and is approximately 1,984 ha in extent (**Figure 1**). The GWW is a 16 million ha area extending from the wheatbelt to the edge of the deserts and is the largest intact area of Mediterranean Woodland on earth (DEC 2010). The GWW includes open eucalypt woodlands (63%), Mallee eucalypt woodlands, shrublands and grasslands (Fox *et al*. 2016). Less common habitats in the GWW include granite outcrops, banded ironstone formations, salt lakes and freshwater wetlands (Fox *et al*. 2016).

The survey area is in the Southern Cross Subregion of the Coolgardie Bioregion of the Interim Biogeographic Regionalism for Australia (IBRA) classification system (Department of Agriculture Water and the Environment 2020). The dominant land-uses in this bioregion are Crown Reserves and Unallocated Crown Land (66.7%), grazing on native pastures (17%), conservation (11.5%) and dryland agriculture (2.3%) (Cowan *et al*. 2001; Cowan 2001). The greenstone hills, alluvial valleys and broad plains of calcareous earths support diverse eucalypt woodlands. The uplands support Mallee woodlands and scrub-heaths on sandplains, gravelly sandplains, and lateritic breakaways. Chains of salt lakes with dwarf shrublands of samphire occur in the valleys (Cowan *et al*. 2001).

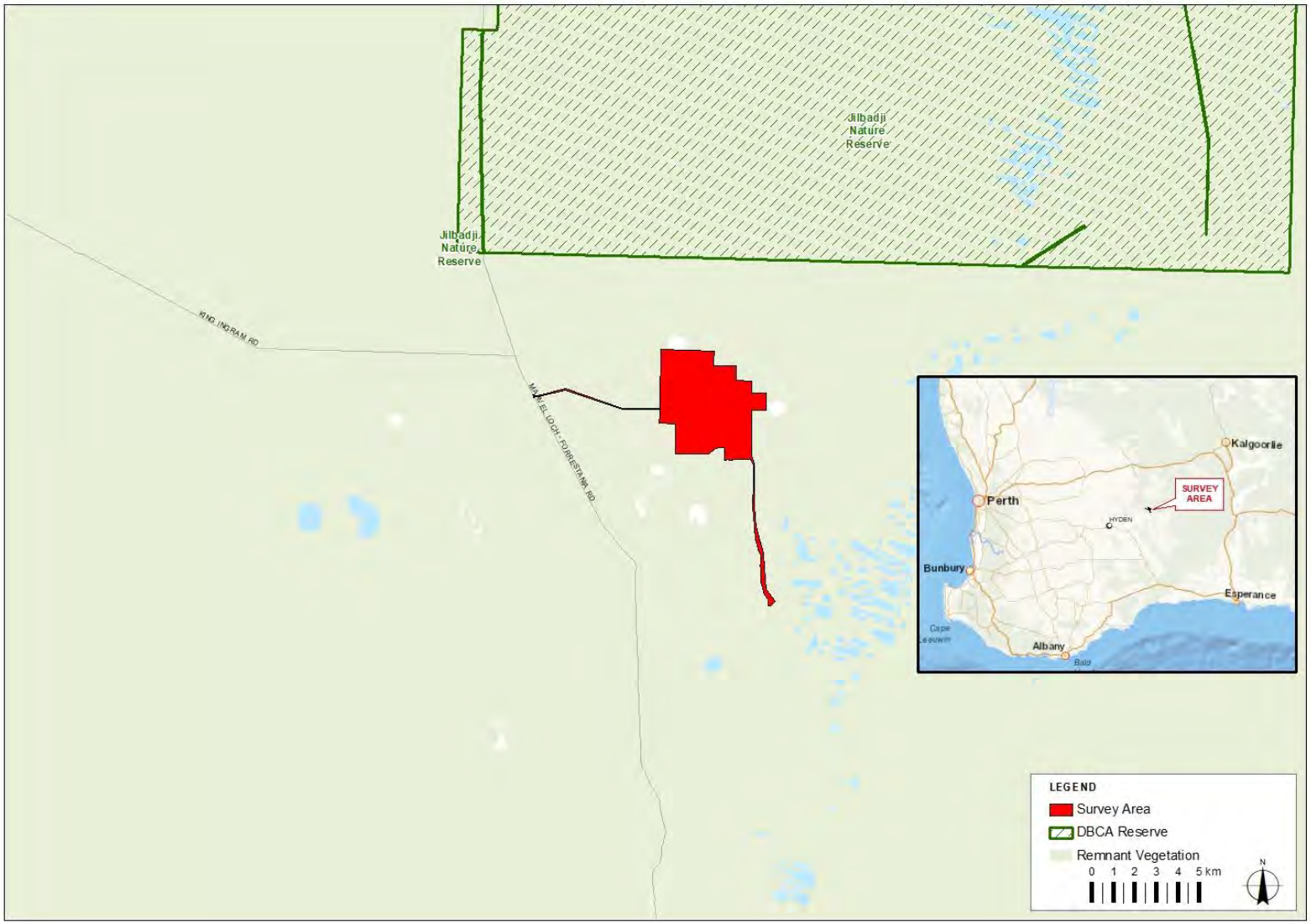


Figure 1: Project Location

1.3 STATUTORY AND TECHNICAL FRAMEWORK

The requirements of the monitoring program were as follows:

- To be conducted in accordance with current statutory and technical guidance;
  - Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
  - Department of Sustainability Environment Water Population and Communities (DSEWPaC 2011) *Survey guidelines for Australia's threatened mammals*
  - Western Australian *Environmental Protection Act 1986* (EP Act)
  - Western Australian *Biodiversity Conservation Act 2016* (BC Act)
  - Environmental Protection Authority (EPA) - *Technical Guidance - Terrestrial vertebrate fauna surveys for environmental impact assessment* (EPA 2020)
- Department of Environment Water Heritage and the Arts *Matters of National Environmental Significance. Significant impact guidelines 1.1 - Environment Protection and Biodiversity Conservation Act 1999* (DEWHA 2009).
- Follow DBCA Standard Operating Procedures;
  - cage traps for live capture of terrestrial vertebrates (DBCA 2018)
  - Permanent marking of vertebrates using microchips (DEC 2009)
- To be conducted by personnel complying with regulatory expectations in relation to holding the necessary DBCA Fauna License and years of experience.

1.3.1 COMMONWEALTH ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999

At a Commonwealth level, threatened taxa (flora and fauna) are protected under the *EPBC Act* (1999), which lists species that are considered Critically Endangered, Endangered, Vulnerable, Conservation Dependant, Extinct, or Extinct in the Wild (detailed in **Table 3**).

1.3.2 WESTERN AUSTRALIAN ENVIRONMENTAL PROTECTION ACT 1986

The Western Australian *EP Act* (1986) was created to provide for an EPA that has the responsibility for:

- prevention, control and abatement of pollution and environmental harm
- conservation, preservation, protection, enhancement, and management of the environment
- matters incidental to or connected with the above.

The EPA is responsible for providing the guidance and policy under which environmental assessments are conducted. It conducts environmental impact assessments (based on the information included in environmental assessments and provided by the proponent), initiates measures to protect the environment and provides advice to the Minister responsible for environmental matters.

1.3.3 WESTERN AUSTRALIAN BIODIVERSITY CONSERVATION ACT 2016

The Western Australian *BC Act* (2016) provides for the conservation, protection and ecologically sustainable use of biodiversity and biodiversity components in Western Australia. It commenced on 1 January 2019.

Threatened species (both flora and fauna) and ecological communities that meet the categories listed within the BC Act are highly protected and require authorisation by the Minister to take or disturb. These are known as Threatened Flora, Threatened Fauna and Threatened Ecological Communities. The conservation categories of Critically Endangered, Endangered and Vulnerable have been aligned with those detailed in the EPBC Act and are detailed in **Table 4** in **Appendix One**.

Flora and fauna species may be listed as being of special conservation interest if they have a naturally low population, restricted natural range, are subject to or recovering from a significant population decline or reduction of range or are of special interest, and the Minister considers that taking may result in depletion of the species. Migratory species and those subject to international agreements are also listed under the Act. These are known as specially protected species in the BC Act.

The most recent list of species of conservation interest were published in the Government Gazette on 11 September 2018 (Government of Western Australia 2018).

1.3.4 WESTERN AUSTRALIAN PRIORITY FAUNA

Conservation significant fauna species are listed by the DBCA as Priority Fauna where populations are geographically restricted or threatened by local processes, or where there is insufficient information to formally assign them to threatened fauna categories. Whilst Priority Fauna are not specifically listed in the BC Act, these have a greater level of significance than other native species. The categories covering Priority Fauna species are outlined in **Table 4** in **Appendix One**.

2 METHOD

2.1 FIELD SURVEY

The field survey for the 2022 Chuditch monitoring program was undertaken by Ecoscape zoologists Robert Hemsworth and Louisa Carlsson under DBCA Wildlife Licensing Fauna License No. BA27000085-3 and Threatened Species Authority TFA_2020-0070_Turner_Monitoring_Authorisation. The survey was conducted from 13 to 20 June 2022.

2.1.1 SURVEY DESIGN

The design of the survey was developed in conjunction with DBCA expert Dr Keith Morris and included the following elements:

- monitoring to have a BACI design element to enable potential impacts to be measured
- two sites to be established: control site and impact site
  - control site to be more than 5 km from development envelope boundary and close to 2017 capture sites if possible
  - impact site to be within the development envelope and outside of the infrastructure footprint
- each site is to consist of three grids or transects of 10 traps each with traps to be spaced 200 m apart within a grid
- traps to be in operation for a minimum of four nights
- trap effort for each of the control and impact sites will be 10 traps x 3 grids x 4 nights = 120 trap nights.

This design has since been adapted to increase the success of capture, with the following changes:

- Trapping grids extended to form transects to cover a greater area
- Trapping effort increased to 6 nights, giving 180 trap nights per site
- The use of 30 trail cameras per site, at 200 m intervals between the cage traps, to help determine the presence/absence of Chuditch.

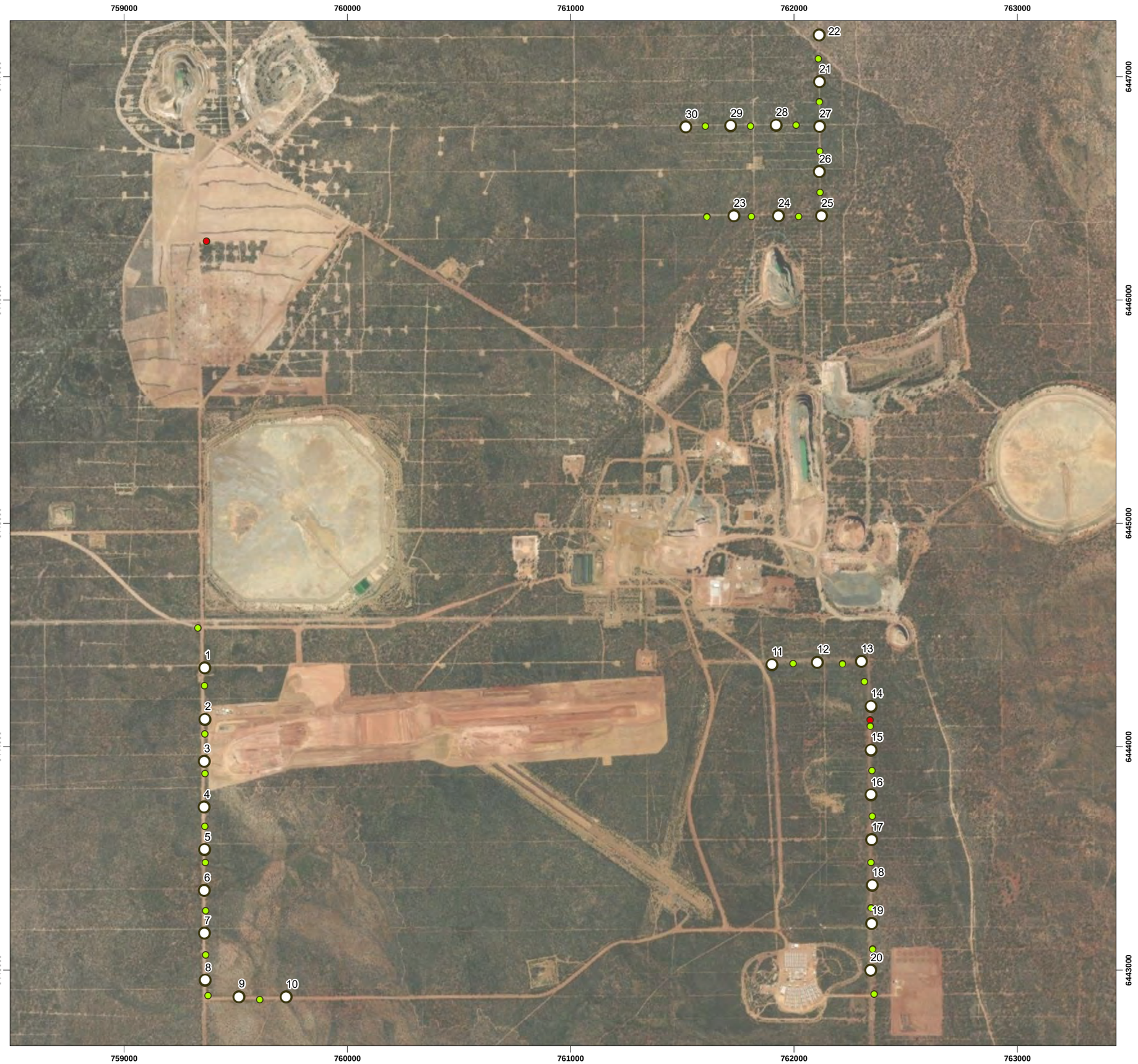
2.1.2 SITE SELECTION

The impact site was restricted to areas within the development envelope that were not planned to be cleared for the proposed mine and associated infrastructure and in areas where Chuditch were captured in 2017. Three areas were selected in 2019 by desktop investigation and have been replicated in 2020, 2021 and 2022 (**Map 1**).

The control site was also preselected by desktop investigation using the 2017 trapped Chuditch locations and placing a 5 km buffer around the development envelope. The location of the control site was relocated after the 2019 survey to be closer to the original 2017 transect approximately five km north of the Jasmine mine pit. This control site has since been used for the 2020, 2021 and 2022 monitoring surveys (**Map 2**).

2.2 DATA ANALYSIS

The intention is to analyse capture date to provide a population density estimate using a standard mark and recapture method as that performed by Rayner *et al* (2011). Data collected in the field is entered into the MARK software (White 2014) that completes an iteration process to provide an estimate of population density based on information entered by the user.



LEGEND

- Impact Trap Sites
- Trail Camera Locations
- previous Chuditch sightings / captures



DATA SOURCES:
SOURCE DATA: TRAP AND CAMERA SITES (ECOSCAPE, 2022)
AERIAL: ESRI WORLD IMAGERY (2021)
SERVICE LAYERS: SOURCE: ESRI, MAXAR, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY

ecoscape

IMPACT SITE
COVALENT FAUNA MONITORING 2022

COVALENT LITHIUM

COORDINATE SYSTEM: GDA 1994 MGA ZONE 50
PROJECTION: TRANSVERSE MERCATOR
DATUM: GDA 1994
UNITS: METER

N

SCALE: 1:17,000 @ A3

0 140 280 420 560 700 m

PROJECT NO: 4743-22

REV	AUTHOR	APPROVED	DATE
00	LC	BT	10/11/2022

MAP
01



LEGEND

- Control Trap Sites
- Trail Camera Locations
- Chuditch sighting
- previous Chuditch sightings / captures
- DBCA Reserve



DATASOURCES :
SOURCE DATA: TRAP AND CAMERA SITES (ECOSCAPE, 2022)
AERIAL: ESRI WORLD IMAGERY (2021)
SERVICE LAYERS: SOURCE: ESRI, MAXAR, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY

ecoscape

CONTROL SITE
COVALENT FAUNA MONITORING 2022

COVALENT LITHIUM

COORDINATE SYSTEM: GDA 1994 MGA ZONE 50
PROJECTION: TRANSVERSE MERCATOR
DATUM: GDA 1994
UNITS: METER

N

SCALE: 1:20,951 @ A3

0 180 360 540 720 900 m

PROJECT NO: 4743-22

REV	AUTHOR	APPROVED	DATE
00	LC	BT	20/11/2022

MAP
02

3 RESULTS

3.1 MONITORING SITES

The field team revisited two monitoring sites to capture and record data on the target species Chuditch (*Dasyurus geoffroii*). Traps and cameras were set at the impact site (**Map 1**), within the development envelope, and at the control site, approximately five km to the northwest of the impact site (**Map 2**).

Monitoring sites were comprised of three lines of 10 wire cage traps totalling 30 traps spaced at 200 m intervals at the impact site and one line of 30 traps spaced at 200 m intervals at the Control site. In 2020 trap layout was modified from a grid pattern to extending the traps out into longer lines to cover more area, this layout has been used since. Traps were set for a total of six nights giving a total of 180 trap nights/site. Traps were baited with a universal bait mix with added sardines to attract Chuditch. Traps were checked each morning within three hours of sunrise. Trap locations are listed in **Table 5** and **Table 6** in **Appendix Two**.

As an additional effort to record Chuditch, trail cameras were placed at 200 m intervals, with a camera located between each trap. 60 cameras were deployed in total, 30 at the impact site and 30 at the control site.

Weather conditions were cold mornings and cool days with early morning fog, there was one night of rain showers. Traps were covered with hessian bags to provide shelter.

3.2 CHUDITCH CAPTURES

No captures in traps were recorded at the impact site for the entire monitoring event.

No captures in traps were recorded at the control site for the entire monitoring event.

3.2.1 CAMERA RECORDS

One Chuditch of undetermined sex was recorded on a trail camera in the control site (**Image 1, Map 2**). This record indicates that Chuditch were present during the survey but not captured in traps. Records from 2020, 2021 and 2022 are indicated on **Map 1** and **Map 2**, showing the distribution of records across the survey area. The 2022 Chuditch was recorded in a Mallee woodland habitat that is regenerating from a fire disturbance which took place approximately 4-5 years ago (**Image 2)**. Chuditch habitat is typically older woodlands with an abundance fallen, hollow logs, therefore, this habitat is non-typical for Chuditch and may be utilised as foraging habitat only or the image may be of a dispersing juvenile animal.



Image 1: Chuditch (far left) image captured on a trail camera.



Image 2: Habitat at site of camera record.

3.2.2 OTHER SPECIES

The non-target species list is shown in **Table 1** and **Table 2.** The records of Mitchell's Hopping-mouse, Ash-grey Mouse and the dunnart species suggests a low abundance of predators such as Fox and Feral Cat, however, one cat was recorded on the trail cameras.

Table 1: Non-target fauna species captures in traps

Species	Common name	Site ID	Trap ID	Date
Notomys mitchellii	Mitchell's Hopping-mouse	Control	48	18/06/2022
Drymodes brunneopygia	Southern Scrub Robin	Impact	12	19/06/2022
Corvus coronoides	Australian Raven	Impact	3	19/06/2022
Notomys mitchellii	Mitchell's Hopping-mouse	Control	35	20/06/2022
Notomys mitchellii	Mitchell's Hopping-mouse	Control	56	20/06/2022

Table 2: Non-target fauna species recorded on trail cameras

Species	Common name
Pomatostomus superciliosus	White-browed Babbler
Drymodes brunneopygia	Southern Scrub Robin
Notomys mitchellii	Mitchell's Hopping-mouse
Sminthopsis gilberti	Gilbert's Dunnart
Sminthopsis granulipes	White-tailed Dunnart
Pseudomys albocinereus	Ash-grey Mouse
Felis catus	Feral Cat

Habitat quality within the development envelope was considered to be in very good condition with the impact sites trapping grids being located across all habitat types present. Habitat quality at the control sites varied from very good to moderate, the moderate sites were regenerating from fire disturbance approximately 4-5 years previous.

3.3 DATA ANALYSIS

No analysis was able to be performed as there was only a single Chuditch recorded. Results for 2019, 2020 and 2021 are one animal captured for each respective monitoring period.

4 DISCUSSION AND RECOMMENDATIONS

4.1 CHUDITCH POPULATION

The results of the 2022 EGLP Chuditch monitoring has provided data that can be used to compare future monitoring results for the Covalent Lithium EGLP site. It is not possible to estimate a population abundance with one capture in the 12 months from 2021 to 2022.

The timing of the 2022 monitoring was optimal to monitor for the breeding adult population. However, the increase in collection area by extending the impact site grids in longer lines hasn't resulted in an increase in captures. The six nights (180 trap nights/site) is considered an adequate number of trapping nights, however, the number of Chuditch recorded did not change from previous years. The use of trail cameras was successful, not only in identifying the presence of Chuditch but also confirms the presence of introduced predators, i.e., cat, in the survey area, which may influence the presence/absence of Chuditch.

A single recorded Chuditch is consistent with previous years, however, previous years have resulted in captures in traps rather on trail cameras.

4.2 RECOMMENDATIONS ADOPTED FROM 2021 CHUDITCH MONITORING

With the conclusion of the 2021 monitoring, the following recommendations were adopted for the 2022 Chuditch monitoring:

- Continued monitoring was undertaken in June 2022
- Deployment of trail cameras between traps (30 each site) to increase probability of recording Chuditch.

4.3 RECOMMENDATIONS FOR 2023 MONITORING

For the 2023 monitoring, to potentially increase the number of Chuditch captures the following recommendations are made:

- Continue with camera and trap array that was used in 2022
- Increase the number of trap nights from six to eight at each site, this will increase the number of trap nights from 180 trap nights /site to 240 trap nights/site
- Investigate the use of alternate baits and/or attractants.

REFERENCES

Australian Government. *Environment Protection and Biodiversity Conservation Act 1999.*

Cowan, M. 2001, "Coolgardie 3 (COO3 - Eastern Goldfields subregion).," Department of Conservation and Land Management.

Cowan, M., Graham, G., & McKenzie, N. 2001, "Coolgardie 2 (COO 2 – Southern Cross Subregion).," in *A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions in 2002*, J. E. May & N. L. McKenzie eds., Department of Conservation and Land Management.

Department of Agriculture Water and the Environment. 2020. *Australia's bioregions (IBRA)*. Available from: http://www.environment.gov.au/land/nrs/science/ibra.

Department of Biodiversity Conservation and Attractions 2018, *Standard Operating Procedure: Cage Traps for Live Capture of Terrestrial Vertebrates*, Department of Biodiversity, Conservation and Attractions, Perth, WA.

Department of Environment and Conservation. 2009. SOP 12.1 Permanent marking of vertebrates using microchips.

Department of Environment and Conservation. 2010. *A Biodiversity and Cultural Conservation Strategy for the Great Western Woodlands*. Available from: http://www.dpaw.wa.gov.au/images/documents/conservation-management/off-road-conservation/gww/gww-strategy.pdf.

Department of the Environment Water Heritage and the Arts; Commonwealth of Australia 2009, *Matters of National Environmental Significance. Significant impact guidelines 1.1 - Environment Protection and Biodiversity Conservation Act 1999*.

Department of Sustainability Environment Water Population and Communities. 2011. *Survey guidelines for Australia's threatened mammals: Guidelines for detecting mammals listed as threatened under the Environment Protection and Biodiversity Conservation Act 1999*. Available from: http://www.environment.gov.au/epbc/publications/pubs/survey-guidelines-mammals.pdf.

Environmental Protection Authority. 2020. *Technical Guidance - Terrestrial vertebrate fauna surveys for environmental impact assessment*. Available from: https://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/EPA-Technical-Guidance-Vertebrate-Fauna-Surveys.pdf.

Fox, E., Mcnee, S., & Douglas, T. 2016, *Birds of the Great Western Woodlands. Report for The Nature Conservancy*, BirdLife Australia, Melbourne.

Government of Western Australia. *Environmental Protection Act 1986.*

Government of Western Australia. *Biodiversity Conservation Act 2016.*

Government of Western Australia. 2018. *Government Gazette No. 135, 11 September 2018*. Available from: https://www.slp.wa.gov.au/gazette/gazette.nsf/searchgazette/EF556EEFA23C70FA482583040013E0FC/$file/Gg135.pdf.

Rayner, K., Chambers, B., Johnson, B., Morris, K., & Mills, H.R. 2011. Spatial and dietary requirements of the chuditch (*Dasyurus geoffroii*) in a semiarid climatic zone. *Australian Mammalogy*

White, G. 2014. MARK. Colorado State University.

APPENDIX ONE DEFINITIONS AND CRITERIA

Table 3: EPBC Act categories for flora and fauna

EPBC ACT 1999 category	Definition
Extinct	A native species is eligible to be included in the extinct category at a particular time if, at that time, there is no reasonable doubt that the last member of the species has died.
Extinct in the wild	A native species is eligible to be included in the extinct in the wild category at a particular time if, at that time: (a) it is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or (b) it has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.
Critically Endangered (CE)	A native species is eligible to be included in the critically endangered category at a particular time if, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.
Endangered (EN)	A native species is eligible to be included in the endangered category at a particular time if, at that time: (a) it is not critically endangered; and (b) it is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.
Vulnerable (VU)	A native species is eligible to be included in the vulnerable category at a particular time if, at that time: (a) it is not critically endangered or endangered; and (b) it is facing a high risk of extinction in the wild in the medium term future, as determined in accordance with the prescribed criteria.
Conservation Dependent	A native species is eligible to be included in the conservation dependent category at a particular time if, at that time: (a) the species is the focus of a specific conservation program the cessation of which would result in the species becoming vulnerable, endangered or critically endangered; or (b) the following subparagraphs are satisfied: (i) the species is a species of fish; (ii) the species is the focus of a plan of management that provides for management actions necessary to stop the decline of, and support the recovery of, the species so that its chances of long term survival in nature are maximised; (iii) the plan of management is in force under a law of the Commonwealth or of a State or Territory; (iv) cessation of the plan of management would adversely affect the conservation status of the species.

Table 4: Conservation codes for Western Australian flora and fauna (DBCA 2019)

Conservation Codes for Western Australian Flora and Fauna	
Threatened, Extinct and Specially Protected fauna or flora[1] are species[2] which have been adequately searched for and are deemed to be, in the wild, threatened, extinct or in need of special protection, and have been gazetted as such. **The *Wildlife Conservation (Specially Protected Fauna) Notice 2018* and the *Wildlife Conservation (Rare Flora) Notice 2018* have been transitioned under regulations 170, 171 and 172 of the *Biodiversity Conservation Regulations 2018* to be the lists of Threatened, Extinct and Specially Protected species under Part 2 of the *Biodiversity Conservation Act 2016.*** Categories of Threatened, Extinct and Specially Protected fauna and flora are:	
T	**Threatened species** Listed by order of the Minister as Threatened in the category of critically endangered, endangered or vulnerable under section 19(1), or is a rediscovered species to be regarded as threatened species under section 26(2) of the *Biodiversity Conservation Act 2016* (BC Act). Threatened fauna is that subset of 'Specially Protected Fauna' listed under schedules 1 to 3of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for Threatened Fauna. Threatened flora is that subset of 'Rare Flora' listed under schedules 1 to 3of the *Wildlife Conservation (Rare Flora) Notice 2018* for Threatened Flora. The assessment of the conservation status of these species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria as detailed below.
CR	**Critically endangered species** Threatened species considered to be "*facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines*". Listed as critically endangered undersection 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines. Published under schedule 1 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for critically endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for critically endangered flora.
EN	**Endangered species** Threatened species considered to be "*facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines*". Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines. Published under schedule 2 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for endangered flora.
VU	**Vulnerable species** Threatened species considered to be "*facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines*". Listed as vulnerable undersection 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines. Published under schedule 3of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for vulnerable fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for vulnerable flora.
Extinct species Listed by order of the Minister as extinct under section 23(1) of the BC Act as extinct or extinct in the wild.	
EX	**Extinct species** Species where "*there is no reasonable doubt that the last member of the species has died*", and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act). Published as presumed extinct under schedule 4of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for extinct fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for extinct flora.
EW	Extinct in the wild species Species that "*is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form*", and listing is otherwise in accordance with the ministerial guidelines (section 25of the BC Act). Currently there are no threatened fauna or threatened flora species listed as extinct in the wild. If listing of a species as extinct in the wild occurs, then a schedule will be added to the applicable notice.
Specially protected species Listed by order of the Minister as specially protected under section 13(1) of the BC Act. Meeting one or more of the following categories: species of special conservation interest; migratory species; cetaceans; species subject to international agreement; or species otherwise in need of special protection. Species that are listed as threatened species (critically endangered, endangered or vulnerable) or extinct species under the BC Act cannot also be listed as Specially Protected species.	

Conservation Codes for Western Australian Flora and Fauna	
MI	**Migratory species** Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; and listing is otherwise in accordance with the ministerial guidelines (section 15of the BC Act). Includes birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and fauna subject to the *Convention on the Conservation of Migratory Species of Wild Animals* (Bonn Convention), an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species. Published as migratory birds protected under an international agreement under schedule 5 of the Wildlife Conservation (Specially Protected Fauna) Notice 2018.
CD	**Species of special conservation interest (conservation dependent fauna)** Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened, and listing is otherwise in accordance with the ministerial guidelines (section 14of the BC Act). Published as conservation dependent fauna under schedule 6 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.
OS	**Other specially protected species** Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18of the BC Act). Published as other specially protected fauna under schedule 7of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.
P	**Priority species** Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened fauna or flora. Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been recently removed from the threatened species or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring. Assessment of Priority codes is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations.
1	**Priority 1: Poorly-known species** Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.
2	**Priority 2: Poorly-known species** Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.
3	**Priority 3: Poorly-known species** Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.
4	**Priority 4: Rare, Near Threatened and other species in need of monitoring** (a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These species are usually represented on conservation lands. (b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for vulnerable but are not listed as Conservation Dependent. (c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

[1] The definition of flora includes algae, fungi and lichens.
[2] Species includes all taxa (plural of taxon - a classificatory group of any taxonomic rank, e.g. a family, genus, species or any infraspecific category i.e. subspecies or variety, or a distinct population).

APPENDIX TWO TRAPPING SITE DETAILS

Table 5: Locations of impact trap sites

Site Type	Trap Number	Easting	Northing
Impact Sites	1	759360.363	6444352.637
	2	759363.040	6444154.600
	3	759368.392	6443951.210
	4	759363.040	6443761.202
	5	759368.392	6443552.460
	6	759368.392	6443359.776
	7	759363.040	6443151.034
	8	759368.392	6442950.321
	9	759541.005	6442885.424
	10	759741.718	6442882.748
	11	761901.391	6444368.025
	12	762104.780	6444378.729
	13	762302.817	6444381.405
	14	762345.636	6444180.692
	15	762345.636	6443985.332
	16	762345.636	6443784.618
	17	762348.312	6443583.905
	18	762350.988	6443380.516
	19	762348.312	6443209.241
	20	762554.378	6443206.565
	21	761331.366	6446371.141
	22	761532.079	6446372.479
	23	761731.454	6446376.494
	24	761930.829	6446376.494
	25	762123.514	6446376.494
	26	762114.147	6446574.530
	27	762115.485	6446776.582
	28	761920.124	6446783.272
	29	761716.735	6446780.596
	30	761516.022	6446775.244

Table 6: Locations of control trap sites

Site Type	Trap Number	Easting	Northing
Control Sites	31	757750.215	6452023.916
	32	758103.354	6451823.234
	33	758038.015	6451933.687
	34	757912.005	6451983.468
	35	752554.257	6452154.593
	36	752753.384	6452148.370
	37	752958.733	6452135.924
	38	753157.859	6452135.924
	39	753556.113	6452123.479
	40	753356.986	6452123.479
	41	753755.239	6452123.479
	42	753954.366	6452123.479
	43	754153.492	6452117.256
	44	754358.841	6452117.256
	45	754551.745	6452098.588
	46	754757.094	6452098.588
	47	754956.221	6452092.366
	48	755155.348	6452086.143
	49	755354.474	6452086.143
	50	755553.601	6452079.920
	51	755758.950	6452067.475
	52	755958.076	6452061.252
	53	756157.203	6452061.252
	54	756356.329	6452067.475
	55	756555.456	6452055.029
	56	756754.583	6452048.807
	57	756953.709	6452036.361
	58	757159.058	6452030.138
	59	757351.962	6452030.138
	60	757557.311	6452023.916

Appendix I Vegetation Condition Monitoring Autumn

©JBS&G Australia Pty Ltd

EARL GREY LITHIUM PROJECT

VEGETATION CONDITION MONITORING

Autumn 2022

Prepared By

Mattiske Consulting Pty Ltd

Prepared For

Covalent Lithium Pty Ltd

July 2022



DOCUMENT STATUS				
DOCUMENT REFERENCE: CLL2101/020/21				
VERSION	TYPE	AUTHOR/S	REVIEWER/S	DATE DISTRIBUTED
V1	Internal review	Ashley Pereira	D. Angus	22/7/2022
V2	Draft for client	Ashley Pereira	L. Mattiske	26/7/2022
FINAL	Final report			

(ACN 063 507 175, ABN 39 063 507 175)

PO Box 437
Kalamunda WA 6926
Phone: +61 8 9257 1625
Email: admin@mattiske.com.au

COPYRIGHT AND DISCLAIMER

Copyright
The information contained in this report is the property of Mattiske Consulting Pty Ltd. The use or copying of the whole or any part of this report without the written permission of Mattiske Consulting Pty Ltd is not permitted.

Disclaimer
This report has been prepared on behalf of and for the exclusive use of Covalent Lithium Pty Ltd and is subject to and issued in accordance with the agreement between Covalent Lithium Pty Ltd and Mattiske Consulting Pty Ltd. This report is based on the scope of services defined by Covalent Lithium Pty Ltd, the budgetary and time constraints imposed by Covalent Lithium Pty Ltd, and the methods consistent with the preceding.

Mattiske Consulting Pty Ltd has utilised information and data supplied by Covalent Lithium Pty Ltd (and its agents), and sourced from government databases, literature, departments and agencies in the preparation of this report. Mattiske Consulting Pty Ltd has compiled this report on the basis that any supplied or sourced information and data was accurate at the time of publication. Mattiske Consulting Pty Ltd accepts no liability or responsibility whatsoever for the use of, or reliance upon, the whole or any part of this report by any third party.

TABLE OF CONTENTS

Page

EXECUTIVE SUMMARY 1

1. INTRODUCTION 2

1.1 Scope of plant condition monitoring 2
1.2 Potential impacts to flora and vegetation 4
1.3 Climate 4

2. METHODS 5

2.1. Plant condition monitoring transect location and design 5
2.2. Survey data collection 5
2.2.1. Transect location and photographic record 5
2.2.2. Plant species data 7
2.2.3. Tagged plant species 7
2.2.4. Vegetation disturbance scale 9
2.3. Vegetation condition triggers 9

3. RESULTS 10

3.1. Survey limitations 10
3.2. Flora 10
3.3. Species richness 12
3.4. Species projected foliage cover 12
3.5. Tagged species 13
3.6. Comparison of March 2021 and March 2022 data 15
3.7. Photographic records 15

4. DISCUSSION 16

4.1. Flora and Vegetation 16
4.2. Plant health 16

5. RECOMMENDATION 17

6. CONCLUSION 17

7. PERSONNEL 18

8. REFERENCES 19

TABLES

1: Summary of all baseline plant condition monitoring surveys

2: Plant condition scoring

3: Attributes scale

4: Vegetation condition scale

5: Potential survey limitations for the establishment of plant condition monitoring transects

6: Plant species richness per transect, March 2022

FIGURES

1: Earl Grey Lithium Project: Locality

2: Rainfall and temperature data for Narembeen

3: Plant condition monitoring transect locations

4: Sum of alive and dead projected foliage cover at plant condition monitoring transects, March 2022

5: Average canopy health scores for 20 tagged plants at each plant condition monitoring transect, March 2022

6: Control-Impact paired transect differential health scores, March 2022

7: Percentage difference in average canopy health scores for 20 tagged plants, between March 2021 (last survey) and March 2022 (this survey) at each vegetation health monitoring transect.

APPENDICES

A: Vascular plant species recorded within plant condition monitoring transects, March 2022

B: Vascular plant species recorded at each plant condition monitoring transect, March 2022

C: Health scores for individually tagged plants at plant condition monitoring transects, March 2022

D: Photographic record of plant condition monitoring transects, March 2022

E: Photographic record of tagged species at plant condition monitoring transects, March 2022

LIST OF ABBREVIATIONS

BC Act:	*Biodiversity Conservation Act 2016* (WA)
BOM:	Bureau of Meteorology
Covalent:	Covalent Lithium Pty Ltd
DBCA:	Department of Biodiversity, Conservation and Attractions
EGLP:	Earl Grey Lithium Project
EPA:	Environmental Protection Authority
EPBC Act:	*Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth)
FVMP:	Flora and Vegetation Management Plan
Mattiske Consulting:	Mattiske Consulting Pty Ltd
MS1118	Ministerial Statement 1118
PEA:	Plant pigment efficiency analyser
TSF:	Tailings Storage Facility
WAH:	Western Australian Herbarium (PERTH)
Wescef	Wesfarmers Chemicals, Energy and Fertilisers Limited
WRD	Waste Rock Dump
VEZ	Vegetation exclusion zone (as defined in MS1118)

EXECUTIVE SUMMARY

The Earl Grey Lithium Project is owned by Covalent Lithium Pty Ltd. Ministerial approval for the implementation of the development of the Earl Grey Lithium Project was provided under Ministerial Statement 1118 in November of 2019. In order to meet Condition 6 of Ministerial Statement 1118, Covalent Lithium Pty Ltd has developed a Flora and Vegetation Management Plan (FVMP), which is intended to meet the key environmental outcome of condition 6-1(1) of Ministerial Statement 1118, which states:

- The proponent shall ensure there is no proposal-related direct or adverse indirect impacts to flora and vegetation within the exclusion zones as shown on Figure 3 and delineated by coordinates in Schedule 2.

The FVMP involves the monitoring of plant condition, dust deposition and weed monitoring in order to:

- determine if there are any changes occurring to flora and vegetation condition and health in the vegetation exclusion zones;
- assess whether any changes in flora and vegetation are due to the project or external/natural factors; and,
- provide a methodology for ongoing monitoring to enable time-based comparisons.

The plant condition monitoring program, designed to provide an assessment of the vegetation condition, will be undertaken at permanent representative sites within vegetation exclusion zones and at control sites away from any proposal related indirect effects. The FVMP provides for two mechanisms to assess plant condition:

- A visual (qualitative) assessment of a range of parameters (vegetation condition, leaf die-off, new tip growth, epicormic growth, reproductive state and insect damage); and
- A quantitative assessment, using a plant pigment efficiency analyser, to measure chlorophyll fluorescence.

A total of 19 plant condition monitoring transects were established, comprising nine control and ten impact transects. Of these 19, five were established in October of 2019. The remaining 14 transects were established in October 2020 over the course of two separate field visits. Earlier this year, prior to monitoring, Transect 6 was cleared for mine expansion and hence was not monitored in March 2022.

Construction of the Earl Grey Lithium Project commenced in July 2021, representing the commencement of the vegetation disturbance monitoring. Given that construction of the EGLP commenced nine months prior to this survey in March 2022, disturbances surrounding all impact transects are still minimal.

The intent of the present survey is ensuring that pre-construction baseline data is gathered across seasons and years to enable any changes to plant conditions to meaningfully be assessed over the longer operational phases.

The vegetation condition in impact transects, best represented by the mean canopy health score, were all less than 20% different to the corresponding control transects and thereby complying with the threshold as defined in the FVMP (Covalent 2020). The changes in vegetation condition observed between this survey and the last spring survey in October 2020 can most likely be attributed to the variation in different observers' qualitative canopy health scores, and variation in rainfall. Future surveys aim to minimise this variation with the use of quantitative plant pigment efficiency analyser (PEA) measurements of plant health.

1. INTRODUCTION

The Earl Grey Lithium Project (EGLP) is owned by Covalent Lithium Pty Ltd (Covalent). Covalent is a joint venture between Wesfarmers Chemicals, Energy and Fertilisers Limited (Wescef) and Sociedad Quimica y Minera de Chile.

Ministerial approval for the implementation of the development of the EGLP was provided under Ministerial Statement 1118 (MS1118) in November of 2019. In order to meet Condition 6 of MS1118, Covalent have developed a Flora and Vegetation Management Plan (FVMP). The Covalent FVMP (2020) aims to meet the key environmental outcome of condition 6-1(1) of MS1118, which states:

- The proponent shall ensure there is no proposal-related direct or adverse indirect impacts to flora and vegetation within the exclusion zones as shown on Figure 3 and delineated by coordinates in Schedule 2.

Construction of the EGLP commenced in July 2021 following the receival of all critical approvals (Wesfarmers Limited 2021). Mattiske Consulting undertook this spring survey of the vegetation disturbance monitoring transects between 21th and 25th March 2022.

1.1 Scope of plant condition monitoring

The EGLP lies within the Eremaean Botanical Province (Beard 1990). The EGLP, which is located approximately 105 km southeast of the town of Southern Cross, is situated on the abandoned Bounty Gold Mine (Figure 1).

The FVMP (Covalent 2020) involves the monitoring of plant condition, dust deposition and weed monitoring in order to:

- determine if there are any changes occurring to flora and vegetation condition and health in the vegetation exclusion zones (VEZs);
- assess whether any changes in flora and vegetation are due to the Project or external/natural factors; and,
- provide a methodology for ongoing monitoring to enable time-based comparisons.

The plant condition monitoring program, designed to provide an assessment of the vegetation condition, will be undertaken at permanent representative sites within the VEZs and control sites away from any proposal related indirect effects (Covalent 2020, Mattiske Consulting 2021a, Mattiske Consulting 2021b). Each monitoring transect consists of a quadrat 10 m by 40 m arranged linearly with four sub-quadrats of 10m x 10m (Mattiske Consulting 2021a). The FVMP (Covalent 2020) provides for two mechanisms to assess plant condition:

- A visual (qualitative) assessment of a range of parameters (vegetation condition, leaf die-off, new tip growth, epicormic growth, reproductive state and insect damage); and,
- A quantitative assessment, using a plant pigment efficiency analyser, to measure chlorophyll fluorescence.

To date, only qualitative assessments have been made of the plant condition at each transect, at the request of Covalent. Dust deposition monitoring, at this time, will be addressed directly by Covalent. Weed monitoring was initially undertaken in the winter/spring of 2019 / 2020. This consisted of broad scale weed surveys across the EGLP project area to ascertain the range and locations of weed species present within the project area (principally existing cleared areas, exploration drill tracks and drill pads). A report summarising the findings of these surveys has been prepared (Mattiske Consulting 2020). Ongoing weed monitoring will consist of monitoring in transects which form the plant condition monitoring transects, monitoring of areas where weeds are currently established, together with routine surveys across the project area to ascertain if any new weed infestations occur within the project area.



N

0 5 10 km

Scale: 1:750,000
MGA94 (Zone 50)

CAD Ref: a2445_f33_01

Date: February 2021 | Rev: A | A4

Mattiske Consulting Pty Ltd

28 Central Road, Kalamunda WA 6076 ~ Tel: 9257 1625 ~ Fax: 9257 1640

Author: E M Matttiske | MCPL Ref: CLL2008/32/20

Drawn: CAD Resources ~ www.cadresources.com.au
Tel: (08) 9246 3242 ~ Fax (08) 9246 3202

Covalent Lithium Pty Ltd

Earl Grey Lithium Project

Locality

Figure: **1**

1.2 Potential impacts to flora and vegetation

Given that construction commenced nine months prior to the current survey, the September 2021 survey (this report) can be considered the fourth and part of baseline data recording prior to commencement of construction. Baseline plant condition monitoring consists of three baseline monitoring events undertaken in the spring (Mattiske Consulting 2021a, this report), and one post-summer survey (Mattiske Consulting 2021b), prior to commencement of construction (Table 1). This is to provide data in the post-winter and dry summer periods to establish typical plant responses to the annual weather cycle. Mine construction and subsequent operation could potentially impact the flora and vegetation adversely through a range of potential impacts, including:

- the clearing of native vegetation;
- altered local hydrology as a result of changes to surface water flow patterns, water table draw down, including the associated potential to cause erosion;
- the potential use or release of local, hypersaline water within the project area;
- dust deposition from vehicles, mining operations, stockpiles and cleared areas on adjacent native vegetation;
- the potential for vehicles to bring introduced plant species on-site, particularly given that vehicles transiting on/off site pass through the adjacent Wheatbelt agricultural areas;
- introduction of pathogens, such as die-back (e.g., *Phytophthora* sp.);
- failure to adhere to clearing boundaries within the project area;
- unauthorised vehicle access to areas of native vegetation; and
- release of contaminated water or solvents from operational facilities, including but not limited to waste landforms, tailings storage facility (TSF) and processing plants areas.

Table 1: Summary of all baseline plant condition monitoring surveys

SURVEY TIMING	SURVEY DESCRIPTION	REFERENCE
Spring 2019	Establishment and survey of five of 19 transects	Mattiske Consulting 2021a
Spring 2020	Establishment and survey of 14 transects and reassess the five transects established in 2019	Mattiske Consulting 2021a
Autumn 2021	Reassess all 19 transects	Mattiske Consulting 2021b
Spring 2021	Reassess all 19 transects	Mattiske Consulting 2021c
Autumn 2022	Reassess all 18 transects (Transect 6 removed due to site being cleared).	This report

1.3 Climate

Beard (1990) described the climate of the wider region containing the EGLP as Mediterranean, with a pronounced winter maximum and long dry summer, and annual precipitation of just over 332.1mm, consistent with descriptions of a characteristically arid to semi-arid climate with 200-300 mm of precipitation (Beard 1990, Cowan *et al.*, 2001). Narembeen, which is located approximately 130 km west of the EGLP has an average annual rainfall of 334.7 mm (Bureau of Meteorology, BOM 2022). Rainfall and temperature data for Narembeen is illustrated in Figure 2.

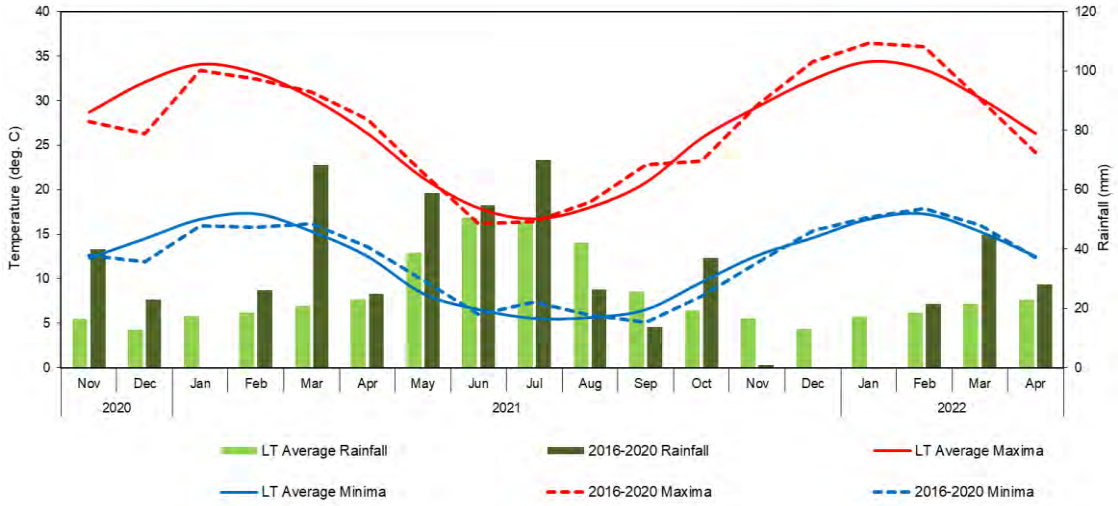


Figure 2: Rainfall and temperature data for Narembeen (Station No. 10612)
Long term average rainfall and temperature data, together with monthly rainfall data for the period November 2020 to April 2022 (BOM 2022).

2. METHODS

2.1. Plant condition monitoring transect location and design

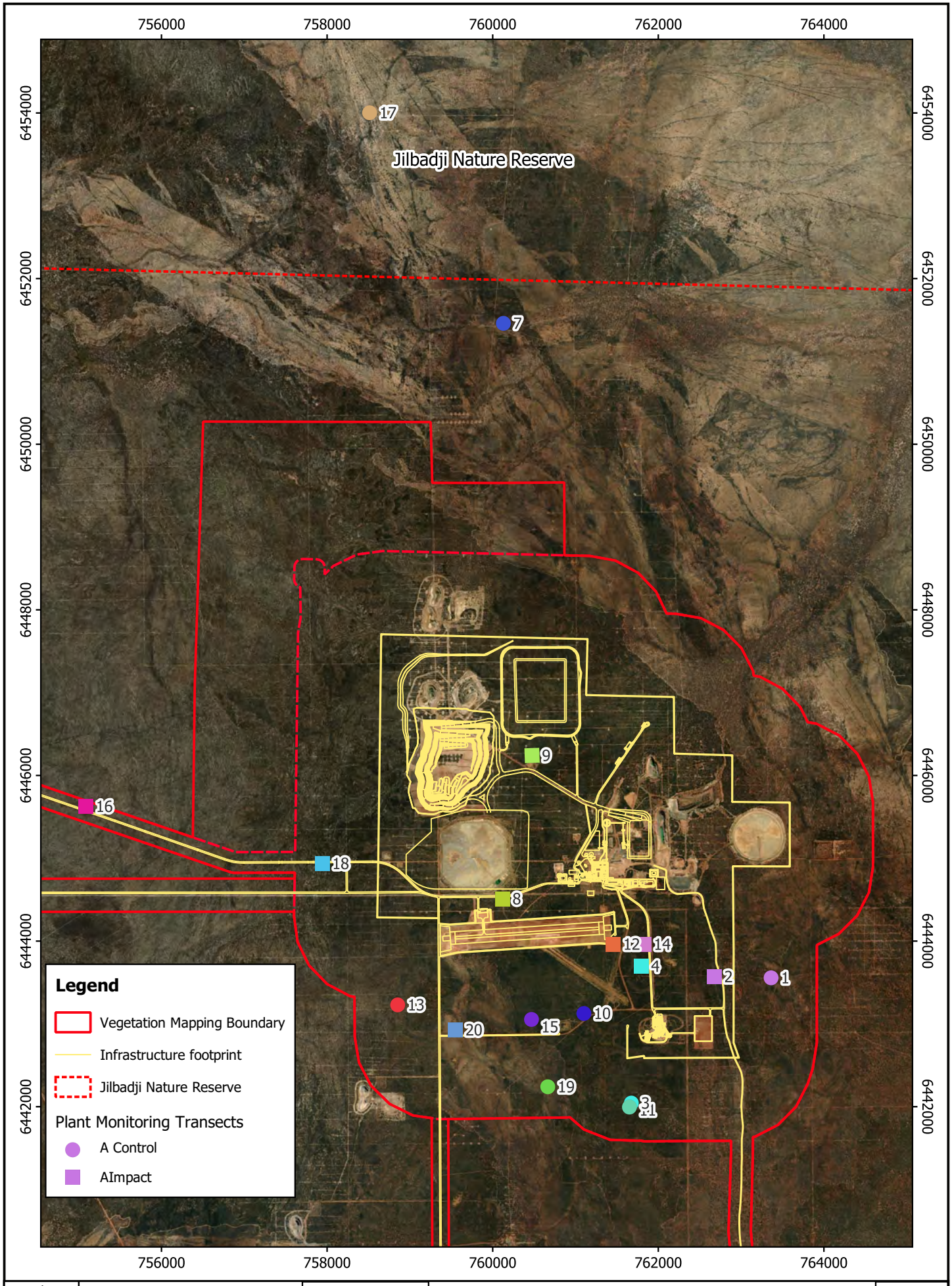
Plant condition monitoring transect sites were selected based a number of factors set out by Mattiske Consulting (2021a). Principally, plant condition monitoring transects were established in vegetation communities and conservation significant flora populations representative of those within the EGLP development envelope. Plant condition monitoring transect locations are illustrated in Figure 3.

Permanent plant condition monitoring transects cover an area equivalent to a 20 m x 20 m quadrat in size, to conform to the recommended survey quadrat size for the bioregion (Environmental Protection Authority Technical Guidance, EPA 2016). Each transect comprises four 10 m x 10 m sub-quadrats arranged as a belt transect. In the case of impact transects, one end of the transect is located within 10 m of an impact area, with the remaining three transects being aligned adjacent to and perpendicular to the impact area. This arrangement will provide scope to assess plant condition with respect to distance from the impact area (Mattiske Consulting 2021a).

2.2. Survey data collection

2.2.1. Transect location and photographic record

At each transect the geographic coordinates of the north-west and south-west corners of the transect were recorded. A photograph was taken from the north-west corner of each of the four sub-quadrats facing in the direction of the south-east corner of the sub-quadrat, to provide long term temporal imagery of the transect.



N
MGA 94
Zone 50

0 1 2 km
Scale 1:60,000
Author: A. Pereira 23rd July 2022

Mattiske
28 Central Rd
Kalamunda WA 6076
Tel: 92571625

Covalent Lithium Pty Ltd
Earl Grey Lithium Project
Location of Vegetation Monitoring Transects

Figure:
3

2.2.2. Plant species data

Within each sub-quadrat, the following data was recorded:

- all plant species, both native and introduced;
- the average height of each species present; and,
- the estimated percentage projected foliage cover (dead/alive) for each species;

Population counts for each plant species were not recorded during this this survey as they were during the transect establishment.

All plant specimens collected during the field survey were dried and processed in accordance with the requirements of the Western Australia Herbarium (WAH). All plant specimens were identified through comparisons with pressed specimens housed at the Mattiske Consulting herbarium and the WAH. Where appropriate, plant taxonomists with specialist skills were consulted. Nomenclature of the species recorded is in accordance with the WAH (1998-).

2.2.3. Tagged plant species

When each of the plant condition monitoring transects were established in 2019 and 2020, five (dominant/keystone) species were tagged in each sub-quadrat of each transect. Wherever possible the same five species were tagged in each sub-quadrat of each transect to provide for replication (Mattiske Consulting 2021a). The visual assessment of a range of parameters to assist in determining plant health score, was based on a stem classification system which has been used by Mattiske Consulting on numerous projects, together with a modification of the method of Souter *et al*. (2009), to provide for visual assessments of a range of other characters. The range of visual characters used to assess plants has been designed to reduce inter-operator error when making assessments in the field.

Plant condition was primarily measured by determining the extent and density of the foliage on the plant, or the crown cover of a tree (Table 2). In addition, a range of attributes were scored to standardise the visual assessment process. Some of the attributes are positive, in terms of plant health – signs of reproduction or new foliage growth. Some of the attributes are negative, in terms of plant health – increasing levels of leaf discolouration and death, insect damage. The attributes scored were:

- leaf die-off
- new tip growth
- reproductive state
- epicormic growth
- insect damage

These attributes were assessed using the scale set out in Table 3. A photograph of each tagged plant was taken to provide for a visual temporal record.

Table 2: Plant condition scoring

CONDITION	FACTORS
Healthy (score = 4)	• > 90% of foliage present • canopy is intact • if a tree or mallee, then no epicormic growth present • none or little indication of leaf discolouration or loss • none to minor evidence of insect damage, no fungal or other pathogen attack
Slightly stressed (score = 3)	• 75% - 90% of foliage present • some minor canopy loss • if a tree or mallee, then no epicormic growth present • minor evidence of leaf discolouration; potentially some dead leaves on branch tips • minor evidence of insect damage, fungal or other pathogen attack
Stressed (score = 2)	• 50% - 75% of foliage present • moderate canopy loss • if a tree or mallee, then none to some epicormic growth present • evidence of leaf discolouration; evident damage to leaves significant • evidence of insect, fungal or other pathogen attack obvious
Very stressed (score = 1)	• < 50% of foliage present • major canopy loss • if a tree or mallee, then epicormic growth likely • leaf discolouration significant; evident damage to leaves significant • evidence of insect, fungal or other pathogen attack obvious
Dead (score = 0)	• plant dead • foliage may present, but IS brown and desiccated. If a tree then the bark is still attached (DR – dead recent) • foliage is absent, fine twigs still present. If a tree, bark may be present (DM – dead moderate) • foliage and fine twigs absent. If a tree, the barks is also absent (DO- dead old)

Table 3: Attribute scale

SCORE	DESCRIPTION
0	Absent - effect is not present
1	Scarce - effect is not obvious in a cursory examination, but is present.
2	Common - effect is clearly visible
3	Abundant - effect dominates the appearance of the shrub / tree

2.2.4. Vegetation disturbance scale

The overall condition of the vegetation at each transect was assessed, based on the vegetation condition scale of Trudgen (1988), for assessment of disturbance within the Eremaean and Northern Botanical Provinces. The disturbance scale is set out in Table 4.

Table 4: Vegetation condition scale (adapted from Trudgen, 1988)

VEGETATION CONDITION	DESCRIPTION
Excellent (Ex)	Pristine or nearly so, no obvious signs of damage caused by human activities since European settlement.
Very Good (VG)	Some relatively slight signs of damage caused by human activities since European settlement. For example, some signs of damage to tree trunks caused by repeated fire, the presence of some relatively non-aggressive weeds, or occasional vehicle tracks.
Good (G)	More obvious signs of damage caused by human activity since European settlement, including some obvious impact on the vegetation structure such as that caused by low levels of grazing or slightly aggressive weeds.
Poor (P)	Still retains basic vegetation structure or ability to regenerate it after very obvious impacts of human activities since European settlement, such as grazing, partial clearing, frequent fires or aggressive weeds.
Degraded (D)	Severely impacted by grazing, very frequent fires, clearing or a combination of these activities. Scope for some regeneration but not to a state approaching good condition without intensive management. Usually with a number of weed species present including very aggressive species.
Completely Degraded (CD)	Areas that are completely or almost completely without native species in the structure of their vegetation; i.e. areas that are cleared or 'parkland cleared' with their flora comprising weed or crop species with isolated native trees or shrubs.

2.3. Vegetation condition triggers

Section 2 of the FVMP (Covalent 2020) specifies threshold criteria in terms of changes (declines) in plant health condition scores which will trigger investigations to determine if the changes are attributable to the Project, and if so, what management measures are required to be put in place to meet the defined environmental outcomes. The defined environmental outcome is that no proposal related indirect impacts will occur within a VEZ. The threshold level for a statistically significant reduction in mean vegetation condition rating is a 20% decline in vegetation health within a VEZ in comparison to the relevant control transect.

Section 2 of the FVMP (Covalent 2020) also specifies that, where a plant pigment efficiency analyser (PEA) is used to derive quantitative plant health data based on the index of chlorophyll fluorescence (Fv/Fm), a Fv/Fm value of <0.6 will be used as an indicator of stress. The PEA records a score of between 0.0 to 1 for Fv/Fm with most plant taxa being considered healthy within a range of 0.7 to 0.8 (Kalaji *et al.* 2014). When plants are experiencing stress, the ratio may decline and potentially represent a reduction in physiological function or healthy function of the plant. To date, it has generally been accepted that a Fv/Fm score of <0.6 in most regions is an indicator a plant is stressed (Kalaji *et al.* 2014).

3. RESULTS

During this survey only 18 of the 19 transects were monitored. This is due to the clearance of Transect 6 for mine expansion, located 100 m north-west of the power substation. Transect 6 was set up as an Impact site to monitor (Microcorys sp. Mt Holland broad-leaf) and previously did not have a Control site to measure and compare possible vegetation condition impacts.

3.1. Survey limitations

A general assessment was made of the current survey against a range of factors that may have limited the outcomes and conclusions of this report (Table 5). The survey was not constrained by factors which would adversely affect the outcomes of the survey nor the conclusions formed from the results of the survey.

3.2. Flora

A total of 222 species, representative of 91 genera and 32 families were recorded across the 18 transects surveyed. The most commonly represented families were Myrtaceae (64 taxa), Proteaceae (34 taxa), and Fabaceae (25 taxa). The taxa recorded during the survey are set out in Appendix A. A list of plant taxa recorded at each transect is set out in Appendix B. Several species collected could not be identified to species level (Appendix A). This was primarily due to the specimens being from juvenile or sterile plants. No introduced (exotic) species were recorded at any of the transects surveyed.

One threatened plant taxon pursuant to subsection (1), section 19 of the *Biodiversity Conservation Act 2016* (BC Act) and as listed by the WAH (1998-) was recorded during the survey. This taxon was *Banksia sphaerocarpa* var. *dolichostyla* (T). This taxon is also listed as vulnerable under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act; Department of Agriculture, Water and the Environment 2021). Fourteen priority plant taxa, as listed by the WAH (1998-), were recorded during the survey (Appendix A).

Table 5: Potential survey limitations for the establishment of plant condition monitoring transects

POTENTIAL SURVEY LIMITATION	IMPACT ON CURRENT SURVEY
Availability of contextual information at a regional and local scale	Not a constraint. Detailed local information on the flora and vegetation of the Mt Holland area in and surrounding the EGLP has been established (Mattiske 2021a, 2021b, 2021c). This formed the basis for selection of locations for siting of vegetation health monitoring transects, and informed the identification of plant species present during this survey.
Competency/experience of team carrying out survey; experience in the bioregion surveyed	Not a constraint. The survey team comprised personnel with extensive experience of the project area and its flora and vegetation. Mattiske Consulting has undertaken regular flora and vegetation surveys associated with the EGLP since 2016.
Proportion of flora collected and identification issues	Not a constraint. All flora within the vegetation health monitoring transects were identified and/or collected.
Effort and extent of survey	Not a constraint. Transects were established as proscribed within MS1118, with the exception of a transect associate with one VEZ, located at the southern end of the proposed mine pit. This transect may be established at a future date once the mine footprint is finalised. The 19 monitoring transects have now been assessed three or four times (depending on the year of establishment) across two seasons prior to the construction phase of the project This is deemed sufficient as baseline data for future comparison, as proscribed by the FVMP. All 19 monitoring transects were reassessed during this survey.
Access restrictions within survey area	Minor constraint. Access to all transects, particularly control transect locations, is via existing tracks. A minor constraint exists, in terms of the tenement stakeholders other than those under Covalent control, which would otherwise have provided for preferential control transect locations.
Survey timing, rainfall, season of survey	Not a constraint. Transects establishment and subsequent surveys have and will be timed to occur during the spring and post-summer period to gain an understanding of annual variation in vegetation health with respect to seasonal influences. Rainfall in the three months preceding this survey was above average.
Disturbances (fire/flood/clearing)	Minor constraint. Four of the 18 transects established are located in either previously disturbed lands, or in areas which were subject to fire approximately five years ago. In the case of the former, this was a deliberate choice to enable monitoring of indirect impacts on a population of *Microcorys* sp. Mt Holland broad-leaf (G. Barrett s.n. PERTH 04104927) (P1), which is located near the planned processing plant area. In the case of fire burnt areas, a matched pair of control/impact transects were placed in a fire burnt woodland to provide a fire burnt area monitoring site. One fire burnt area, comprising W4 vegetation located within the Jilbadji Nature Reserve was chosen as a control transect location due to the lack of suitable control transect locations areas within Covalent controlled tenements. None of the 19 transects had been disturbed since the establishment survey in October 2019.
Data and statistical analysis	Not a constraint. The 20% threshold figure determined to represent a statistically significant reduction in vegetation condition precludes the need for statistical analysis of the data. Basic data analysis was undertaken using Microsoft Excel.

3.3. Species richness

Plant species richness per transect is set out in Table 6. The most species rich transects were transects 19 and 20 (control/impact pair J), which were situated in woodland which had been burnt approximately five years previously. Transects 13 and 16 (control/impact pair H) were also similarly species rich. These transects were sited in a narrow band of S3 vegetation (Table 5) which abuts W5 vegetation. The least species rich transects were transects 3 and 4 (control/impact pair B) which is situated in the H1 vegetation community, which is the most restricted type of vegetation recorded within the EGLP (Mattiske 2021c). The H1 vegetation was the least species rich community recorded in 2017 (Mattiske 2021c).

3.4. Species projected foliage cover

The sum of projected dead and alive foliage cover for each transect is shown graphically in Figure 4. There are large differences in the sum of projected foliage cover between the control and impact paired transects associated with pair I (transects 17 and 18). This is somewhat reflected in the species richness data (Table 6) for the corresponding transects, also. The sum of projected foliage cover is lowest in the transects 19 and 20 (control/impact pair J) which were burnt approximately 6 years previously, but had amongst the highest number of species present (Table 6).

Table 6: Plant species richness per transect, March 2022

TRANSECT	TYPE[1]		NUMBER OF TAXA	NUMBER OF CONSERVATION SIGNIFICANT TAXA
1	impact	A	15	1
2	control	A	33	1
3	control	B	19	3
4	impact	B	17	2
7	control	D	25	1
8	impact	D	28	1
9	impact	E	22	2
10	control	E	34	5
11	control	F	14	1
12	impact	G	39	5
13	control	H	49	6
14	impact	F	10	0
15	control	G	32	2
16	impact	H	55	4
17	control	I	23	1
18	impact	I	23	1
19	control	J	43	6
20	impact	J	59	6

1. Letter codes (A, B, etc.) indicate control/impact transect pairs

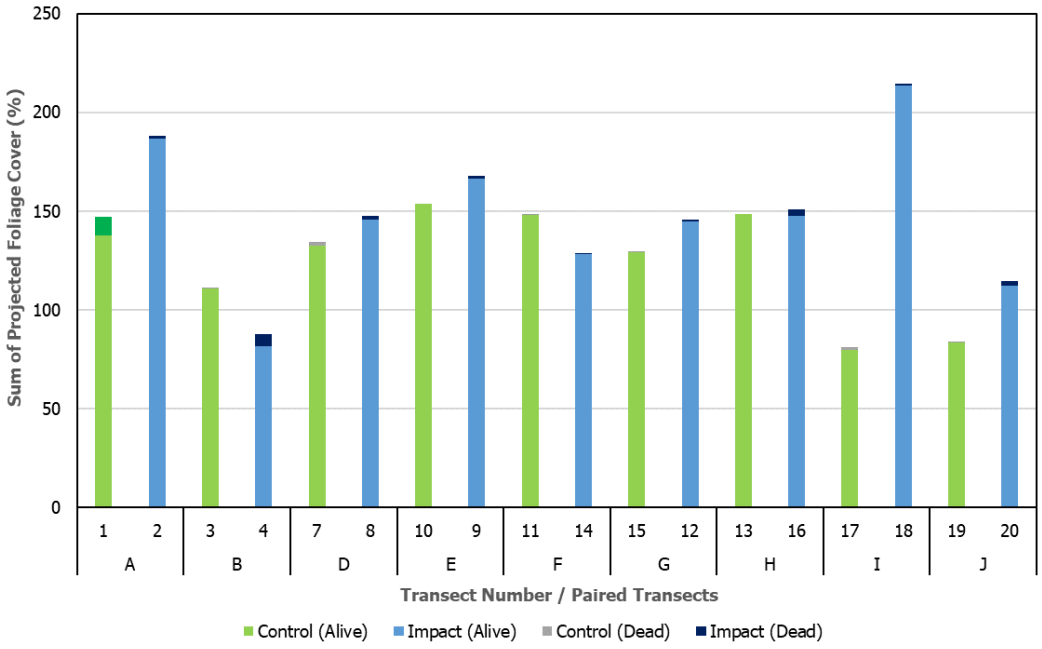


Figure 4: Sum of alive and dead projected foliage cover at plant condition monitoring transects, March 2022
Paired control/impact transects are indicated by the letters A through J.

3.5. Tagged species

A total of twenty individual pants were tagged at each transect for more detailed plant condition assessment (refer Section 2.3.3). The assessment of individual plants comprised positive and negative plant condition trajectory attributes. These attributes were:

Positive trajectory attributes

- canopy percentage
- epicormic growth
- new tip growth
- reproductive state

Negative trajectory attributes

- leaf die-off
- insect leaf damage

The raw individual plant condition assessment data is set out in Appendix C. The average canopy health scores are shown in Figure 5. Figure 6 shows the differences in canopy health scores for each transect pair. All paired transects have a less than 18% difference between their control and impact transects, which falls below the 20% trigger value, specified within the FVMP (Covalent 2020).

None of the other positive (epicormic growth, new tip growth, reproductive state) or negative (leaf die-off, insect leaf damage) attributes measured (Appendix C) were demonstrably correlated with the canopy health.

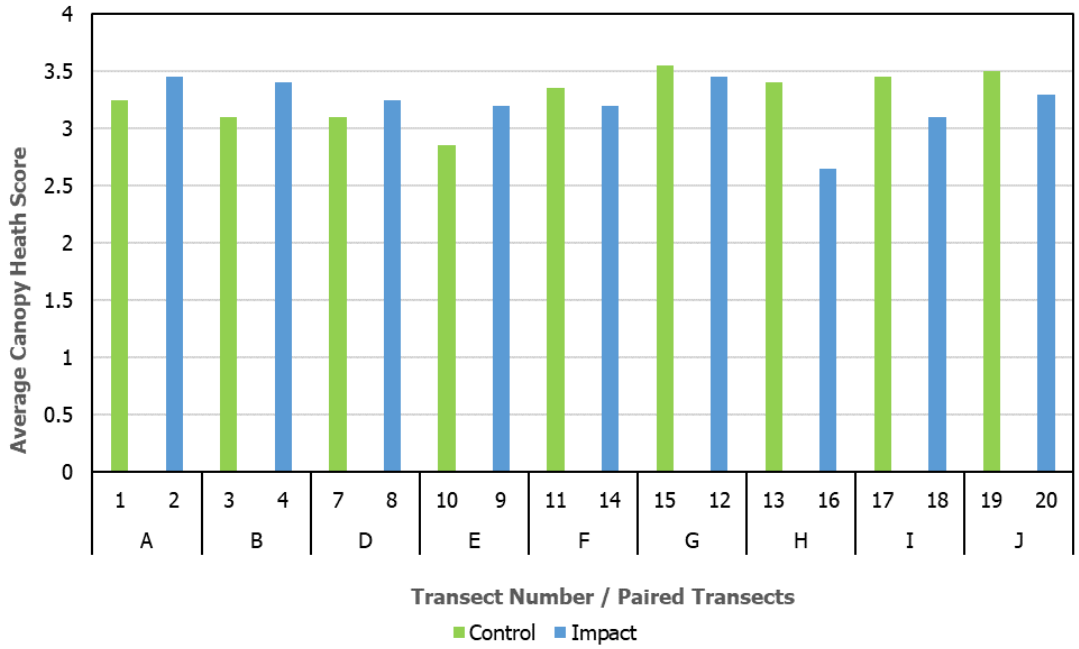


Figure 5: Average canopy health scores for 20 tagged plants at each plant condition monitoring transect, March 2022
Paired control/impact transects are indicated by the letters A through J. Canopy health scores: 0 dead; 1 very stressed; 2 stressed; 3 slightly stressed; 4 healthy. Refer to Table 1 for a detailed description of each health score.

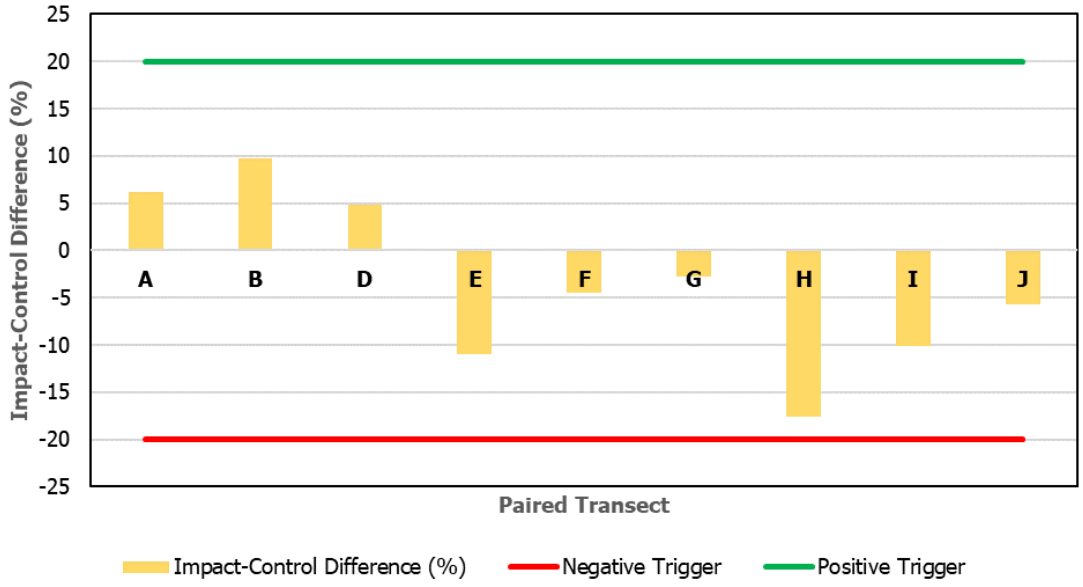


Figure 6: Control-Impact paired transect differential health scores, March 2022
The percentage difference between the control, and impact transects are shown, together with positive and negative trigger values.

3.6. Comparison of March 2021 and March 2022 data

Figure 7 shows the percentage difference in mean canopy health score between March 2021 (the last spring survey) and March 2022 (this survey). The largest decrease in average canopy health scores were observed at impact transect 12 (-9.21%). The largest increases in average canopy health scores were observed at impact transect 4 (13.33%). Overall, the mean change in canopy health scores across all transects was low, 0.84%.

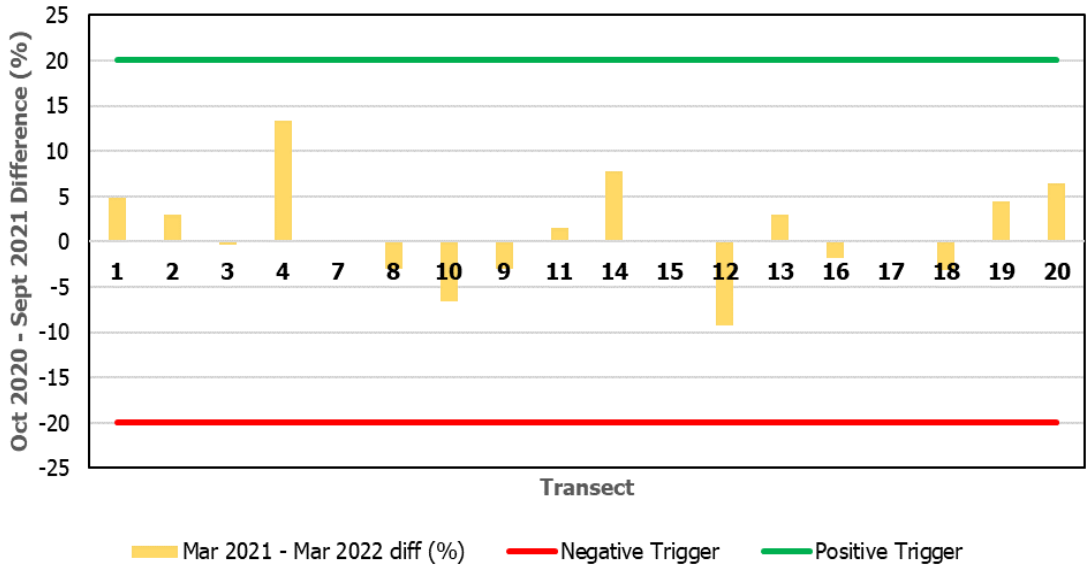


Figure 7: Percentage difference in average canopy health scores for 20 tagged plants, between March 2021 (last spring survey) and March 2022 (this survey) at each vegetation health monitoring transect

3.7. Photographic records

Appendix D comprises the photograph of each transects north-west corner recorded in March 2021 and March 2022. Appendix E contains a photograph of each tagged plant species at each transect in March 2021 and March 2022.

4. DISCUSSION

4.1. Flora and Vegetation

During the March 2022 assessment only 18 of the 19 transects were monitored. This reduction is related to the clearance of Transect 6 for mine expansion activities. Transect 6 was set up as an Impact site to monitor (Microcorys sp. Mt Holland broad-leaf) and previously did not have a Control site to measure and compare possible vegetation condition impacts.

In March 2022, 224 species, representative of 92 genera and 32 families were recorded across the 18-plant health monitoring transects. During the vegetation mapping of the EGLP (Mattiske 2021c), 435 vascular plant taxa which were representative of 145 genera and 50 families were recorded across 375 survey quadrats. Consequently, the plant health monitoring transects represent approximately 40% of all plant species recorded within the EGLP, and thus provide a good representation of the flora present, and can be considered to be representative of the vegetation within the EGLP.

In terms of species richness and foliage cover, when paired control/impact transects are compared (Table 5, Figure 6), there is a notable difference between the species richness and foliage cover for transects 17 and 18 (group I). These differences noted on transects 17 and 18 appear to related to difference in fire events, where the control transect location (transect 17) was burnt approximately 7 years ago, whereas the impact transect area is unburnt. The location of transect 17 was based on the presence of *Acacia lachnocarpa* (P1). This taxon is currently only known from two areas in the Mt Holland area. A location for the control transect, in unburnt W4 type vegetation, was not possible due to it being within a tenement outside Covalent control. The low levels of foliage cover in transects 19 and 20 (group J) is a result of both transects being situated in areas burnt by fire approximately 6 years ago.

4.2. Plant health

Twenty plants within each transect (five per 10m x 10m sub-quadrat) were tagged for long term individual assessment. Six attributes were scored for each plant. These were: canopy percentage, epicormic growth, new tip growth, reproductive state, leaf die-off, and insect leaf damage. The first four of these attributes are classed as positive indicators of plant health, whereas the latter two are classed as negative indicators of plant health (Souter *et al*. 2009).

The most immediately useful measure of plant condition was the qualitative assessment of plant canopy health (Figures 5, 6, and 7). The differences in mean plant canopy health scores between control and impact transects pairs (Figure 6) was less than 20%. The largest difference between control and impact transect pairs was observed at pair H (transects 13 and 16). This 17.65% difference (Figure 6, Appendix C) was contributed to by the death of one tagged *Baeckea* sp. Forrestania (K.R. Newbey 1105) (P1) individual in sub-quadrat A. At the time of the last survey, September 2021, this individual was recorded as slightly stressed. No other decreases in canopy health score, or deaths, were recorded at transect 16. Given that (i) this dead *Baeckea* sp. Forrestania (K.R. Newbey 1105) (P1) was recorded in sub-quadrat A, the sub-quadrat furthest from the road; (ii) no other stressed, very stressed, or dead plants were observed. An alternative *Baeckea* sp. Forrestania (K.R. Newbey 1105) (P1) was tagged within sub-quadrat A for ongoing monitoring.

Section 2 of the FVMP (Covalent 2020) sets out a range of outcome-based and management based provisions with respect to environmental management within the EGLP. Specifically, the FVMP, as it relates to plant condition monitoring, states that there should be no proposal related indirect impact to flora and vegetation within a VEZ resulting in an adverse impact. The threshold and trigger criteria associated with this which would mandate a response actions are:

- Trigger criteria – a statistically significant reduction in mean condition ratings (more than 20% difference for both qualitative and quantitative) of vegetation health within a VEZ in comparison to control sites and a mean Fv/Fm (index of Chlorophyll florescence) of <0.6.

- Threshold criteria - Flora and vegetation within a VEZ experiences a statistically significant higher mortality rate than that of control sites (where that mortality is not attributed to direct impacts).

The intent of the present survey is ensuring that data is gathered to enable any changes to plant conditions to meaningfully be assessed. To date, health monitoring transects have been monitored at least three times, with five transects established in 2019 being monitored four times. Given that construction of the EGLP commenced nine months prior to this survey in March 2022, disturbances surrounding all impact transects are still minimal as the overall 0.84% decrease in mean canopy health score is likely the result of the variations in the qualitative assessment of the plants Changes in vegetation health observed between surveys (Figure 7) are therefore likely to be either climate or observer related. Quantitative measurements of vegetation health using the PEA (see section 2.2), which are planned for future surveys, aim to minimise qualitative variation between observers.

The other measures of plant health did not show a correlation trend, particularly with the canopy health score. In the case of the negative health attributes described, it will be necessary to obtain data from multiple survey periods to determine the level of correlation between leaf die-off or insect leaf damage and its relationship to the canopy health score, and thus the usefulness of recording such attributes. Positive health attributes, such as leaf tip growth and reproductive state may also tend to reflect seasonal variation, and hence a number of surveys may be required to establish any trend in relation to overall plant condition. In the short term, plant canopy health, as described in Table 1, is likely to be the most useful measure.

Changes in canopy health score for all control and impact health monitoring transects are below the 20% trigger set out in the FVMP (Covalent 2020).

5. RECOMMENDATION

Due to the removal of Transect 6 earlier this year, located 100 m north-west of the power substation, it is recommended that two new transects be set up (Impact and Control) to provide a qualitative assessment of the vegetation condition that includes *Microcorys* sp. Mt Holland broad-leaf (G. Barrett s.n. PERTH 04104927), if an appropriate site can be located. This may prove difficult as this taxon, based on current evidence, is a disturbance opportunist. It's presence in mature vegetation is both sparse and in very low abundance and therefore the site selection should be based on areas that are more likely to support this species.

It would also be recommended to initiate the use of plant pigment efficiency analyser (PEA) as it is an increasingly accepted method of determining plant health and function within the mining, forestry and agricultural industries. When plants are experiencing stress, the ratio may decline and potentially represent a reduction in physiological function or healthy function of the plant. The (PEA) will help minimise qualitative variation between observers and assist in statistical analysis used to determine if a significant difference is apparent.

6. CONCLUSION

The survey results presented in this report represent the first to monitor the impacts of disturbance associated with the construction of the EGLP. The vegetation condition in impact transects, best represented by the mean canopy health score, were all less than 20% different to the corresponding control transects, as stipulated by the FVMP (Covalent 2020). The changes observed between this survey and the last spring survey in September 2021 can likely be attributed to the variation in different observers' qualitative canopy health scores. Future surveys aim to minimise this variation with the use of quantitative PEA measurements of plant health to minimise the variation in qualitative and estimated measures of plant health.

7. PERSONNEL

The following Mattiske Consulting Pty Ltd personnel were involved in this project:

NAME	POSITION	PROJECT INVOLVEMENT	FLORA COLLECTION PERMITS
Dr E. M. Mattiske	Managing Director & Principal Ecologist	Planning & reporting	N/A
Mr D. Angus	Senior Botanist	Review of report	N/A
Mr A. Pereira	Experienced Botanist	Planning, , plant identifications, data analysis, reporting	FB62000145-2
Mr Z. Sims	Experienced Botanist	Planning, Fieldwork	FB62000025-2 TFL167-2021

8. REFERENCES

Beard, JS (1990)

Plant life of Western Australia, Kangaroo Press, Kenthurst, NSW.

Biodiversity Conservation Act 2016 (WA)

Bureau of Meteorology (2022)

Climate averages for specific sites. Accessed 20th July 2022. <http://www.bom.gov.au/climate/data/ >

Covalent Lithium Pty Ltd (2020)

Earl Grey Lithium Project Flora and Vegetation Environmental Management Plan (Rev2).

Cowan, M., Graham, G. and McKenzie, N. (2001)

Coolgardie 2 (COO2 – Southern Cross Bioregion). In: A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions in 2002. Western Australian Government Department of Environment and Conservation, Perth, Western Australia.

Department of Agriculture, Water and the Environment (2022)

Environment Protection and Biodiversity Conservation Act 1999 List of Threatened Flora. Accessed 20th June 2022.

<http://www.environment.gov.au/cgi-bin/sprat/public/publicthreatenedlist.pl?wanted=flora>

Environmental Protection Authority (2016)

Technical Guidance – Flora and vegetation surveys for environmental impact assessment, Environmental Protection Authority, Western Australia.

Environment Protection and Biodiversity Conservation Act 1999

Kalaji, H.M., *et al.* (2014)

Frequently asked questions about in vivo chlorophyll fluorescence: practical issues. Photosynth Res 2014 122: 121-158

Mattiske Consulting Pty Ltd (2020)

Earl Grey Lithium Project introduced flora (weed) survey. Unpublished report prepared for Covalent Lithium Pty Ltd, October 2020.

Mattiske Consulting Pty Ltd (2021a)

Earl Grey Lithium Project Vegetation Condition Monitoring Transect Establishment. Unpublished report prepared for Covalent Lithium Pty Ltd, January 2021.

Mattiske Consulting Pty Ltd (2021b)

Earl Grey Lithium Project Vegetation Condition Monitoring. Unpublished report prepared for Covalent Lithium Pty Ltd, June 2021.

Mattiske Consulting Pty Ltd (2021c)

Earl Grey Lithium Project Flora and Vegetation Assessment. Unpublished report prepared for Covalent Lithium Pty Ltd, February 2021.

Souter, N.J., Watts, R.A., White, M.G., George, A.K. and McNicol, K.J. (2009)

Method manual for the visual assessment of lower River Murray floodplain trees. Technical Note 2009/25. Government of South Australia, Department of Water, Land and Biodiversity Conservation.

Trudgen, M.E. (1988)

A report on the flora and vegetation of the Port Kennedy area. Unpublished report prepared for Bowman Bishaw and Associates, West Perth

Wesfarmers Limited (2022)

Mt Holland lithium project – Ministerial approval. Wesfarmers Press Statement. Accessed 23rd July 2022. <https://www.wesfarmers.com.au/docs/default-source/asx-announcements/mt-holland-lithium-project---ministerial-approval.pdf?sfvrsn=4a3e0cbb_0>

Western Australian Herbarium (1998-)

FloraBase - the Western Australian Flora. Department of Parks and Wildlife. Accessed 28th September 2021. <https://florabase.dpaw.wa.gov.au/>

APPENDIX A: VASCULAR PLANT SPECIES RECORDED WITHIN THE PLANT CONDITION MONITORING TRANSECTS, MARCH 2022

Note: P1 to P4 denotes priority taxon (DBCA 2021a, WAH 1998-); T denotes threatened taxon (DBCA 2021b)

FAMILY	SPECIES
Apiaceae	*Platysace maxwellii*
Asparagaceae	*Chaemexeros macrantha*
	Chamaexeros fimbriata
	Thysanotus sp. *Twining Wheatbelt* (N.H. Brittan 81/29)
Asteraceae	*Millotia tenuifolia var. tenuifolia*
	Olearia muelleri
	Olearia ramosissima
	Rhodanthe laevis
Boraginaceae	*Halgania integerrima*
Casuarinaceae	*Allocasuarina acutivalvis subsp. acutivalvis*
	Allocasuarina campestris
	Allocasuarina sp. (juvenile)
	Allocasuarina spinosissima
Casuarinaceae	*Casuarina* sp.
	Casuarinaceae sp.
Celastraceae	*Psammomoya choretroides*
	Stackhousia sp.
Convolvulaceae	*Wilsonia humilis*
Cupressaceae	*Callitris columellaris*
	Callitris preissii
Cyperaceae	*Isolepis marginata*
	Lepidosperma sanguinolentum sens .lat.
Cyperaceae	*Lepidosperma* sp.
	Lepidosperma sp. 1
	Lepidosperma sp. 2
Dilleniaceae	*Hibbertia ancistrophylla*
	Hibbertia exasperata
	Hibbertia psilocarpa

APPENDIX A: VASCULAR PLANT SPECIES RECORDED WITHIN THE PLANT CONDITION MONITORING TRANSECTS, MARCH 2022

Note: P1 to P4 denotes priority taxon (DBCA 2021a, WAH 1998-); T denotes threatened taxon (DBCA 2021b)

FAMILY	SPECIES
Dilleniaceae	*Hibbertia rostellata*
	Hibbertia rupicola
	Hibbertia sp.
	Hibbertia stowardii
	Hibbertia tuberculata (P1)
Droseraceae	*Drosera ?moorei*
	Drosera glanduligera
	Drosera sp. (climbing)
Ericaceae	*Acrotriche lancifolia*
	Leucopogon sp. Forrestania (G.F. Craig 2386)
	Leucopogon sp. outer wheatbelt (M. Hislop 30)
	Lysinema ciliatum
	Styphelia exserta
	Styphelia serratifolia
Euphorbiaceae	*Beyeria minor*
	Beyeria sulcata var. *gracilis*
	Beyeria sulcata var. *sulcata*
	Monotaxis grandiflora
	Monotaxis grandiflora var. *obtusifolia*
Fabaceae	*Acacia assimilis subsp. assimilis*
	Acacia camptoclada
	Acacia lachnocarpa (P1)
	Acacia merrallii
	Acacia resinimarginea
	Acacia sphacelata subsp. sphacelata
	Acacia steedmanii subsp. steedmanii
	Acacia sulcata var. platyphylla
	Acacia tetraptera
	Acacia undosa (P3)
	Acacia yorkrakinensis
	Acacia yorkrakinensis subsp. acrita
	*Chorizema circinale (*P3)
	Daviesia aphylla
	Daviesia argillacea
	Daviesia cardiophylla
	Daviesia sarissa subsp. redacta (P2)

APPENDIX A: VASCULAR PLANT SPECIES RECORDED WITHIN THE PLANT CONDITION MONITORING TRANSECTS, MARCH 2022

Note: P1 to P4 denotes priority taxon (DBCA 2021a, WAH 1998-); T denotes threatened taxon (DBCA 2021b)

FAMILY	SPECIES
Fabaceae	*Daviesia scoparia*
	Eutaxia lasiocalyx (P2)
	Gastrolobium floribundum
	Gastrolobium melanocarpum
	Gastrolobium spinosum
	Gompholobium hendersonii
	Gompholobium obcordatum
	Jacksonia nematoclada
Goodeniaceae	*Dampiera sp.*
	Dampiera obliqua
	Goodenia cycnopotamica
	Goodenia sp. (juvenile)
Haloragaceae	*Glischrocaryon aureum*
Lamiaceae	*Cyanostegia angustifolia*
	Hemigenia westringioides
	Microcorys elatoides (P1)
	Microcorys sp. Mt Holland broad-leaf (G. Barrett s.n. PERTH 04104927) (P1)
	Pityrodia loricata
	Westringia cephalantha
	Westringia rigida
Lauraceae	*Cassytha aurea var. hirta*
	Cassytha sp.
Malvaceae	*Lasiopetalum ferraricollinum*
Myrtaceae	?*Verticordia* sp.
	Baeckea grandibracteata s. lat.
	Baeckea sp. *Forrestania* (K.R. Newbey 1105) (P1)
	Beaufortia interstans
	Beaufortia orbifolia
	Beaufortia puberula
	Beaufortia schaueri
	Calothamnus gilesii
	Calytrix breviseta subsp. *stipulosa*
	Calytrix tetragona
	Chamelaucium ciliatum
	Chamelaucium sp. *Parker Range* (B.H. Smith 1255) (P1)

APPENDIX A: VASCULAR PLANT SPECIES RECORDED WITHIN THE PLANT CONDITION MONITORING TRANSECTS, MARCH 2022

Note: P1 to P4 denotes priority taxon (DBCA 2021a, WAH 1998-); T denotes threatened taxon (DBCA 2021b)

FAMILY	SPECIES
Myrtaceae	*Chamelaucium virgatum*
	Cyathostemon sp.
	Ericomyrtus serpyllifolia
	Eucalyptus ?capillosa
	Eucalyptus burracoppinensis
	Eucalyptus calycogona subsp. *calycogona*
	Eucalyptus capillosa
	Eucalyptus capillosa subsp. *polyclada*
	Eucalyptus eremophila
	Eucalyptus flocktoniae subsp. *flocktoniae*
	Eucalyptus horistes
	Eucalyptus protensa
	Eucalyptus rigidula
	Eucalyptus salubris
	Eucalyptus sp.
	Eucalyptus sp. 1
	Eucalyptus sp. 2
	Eucalyptus urna
	Eucalyptus cylindriflora
	Euryomyrtus maidenii
	Homalocalyx pulcherrimus
	Leptospermum erubescens
	Leptospermum roei
	Leptospermum spinescens
	Melaleuca ?acuminata subsp. acuminata
	Melaleuca ?calyptroides
	Melaleuca acuminata subsp. acuminata
	Melaleuca calyptroides
	Melaleuca cliffortioides
	Melaleuca condylosa
	Melaleuca cordata
	Melaleuca cucullata
	Melaleuca depauperata
	Melaleuca eleuterostachya
	Melaleuca halmaturorum
	Melaleuca lateriflora
	Melaleuca laxiflora
	Melaleuca pauperiflora subsp. pauperiflora
	Melaleuca phoidophylla
	Melaleuca pungens

APPENDIX A: VASCULAR PLANT SPECIES RECORDED WITHIN THE PLANT CONDITION MONITORING TRANSECTS, MARCH 2022

Note: P1 to P4 denotes priority taxon (DBCA 2021a, WAH 1998-); T denotes threatened taxon (DBCA 2021b)

FAMILY	SPECIES
Myrtaceae	*Melaleuca scalena*
	Melaleuca sp.
	Melaleuca sparsiflora
	Micromyrtus erichsenii
	Rinzia carnosa
	Rinzia medifila (P1)
	Rinzia sessilis
	Thryptomene kochii
	Verticordia chrysantha
	Verticordia stenopetala (P3)
	Myrtaceae sp.
	Melaleuca societatis
Orchidaceae	*Caladenia hirta*
	Caladenia paradoxa
	Orchidaceae sp.
	Pterostylis mutica
	Pterostylis sp.
Poaceae	Poaceae sp.
Polygalaceae	*Comesperma volubile*
Proteaceae	Adenanthos argyreus
	Banksia laevigata subsp. fuscolutea
	Banksia purdieana
	Banksia sphaerocarpa var. dolichostyla (T)
	Grevillea ?*biformis*
	Grevillea ?*oncogyne*
	Grevillea acuaria
	Grevillea acuaria sens. lat.
	Grevillea acuaria sens. lat. (shiny leaf form)
	Grevillea hookeriana subsp. apiciloba
	Grevillea huegelii
	Grevillea lissopleura (P1)
	Grevillea marriottii (P1)
	Grevillea oncogyne
	Grevillea pterosperma
	Grevillea shuttleworthiana subsp. *obovata*

APPENDIX A: VASCULAR PLANT SPECIES RECORDED WITHIN THE PLANT CONDITION MONITORING TRANSECTS, MARCH 2022

Note: P1 to P4 denotes priority taxon (DBCA 2021a, WAH 1998-); T denotes threatened taxon (DBCA 2021b)

FAMILY	SPECIES
Proteaceae	*Grevillea* sp.
	Hakea ?subsulcata
	Hakea cygnus subsp. cygnus
	Hakea erecta
	Hakea meisneriana
	Hakea pendens (P3)
	Hakea scoparia subsp. *scoparia*
	Hakea subsulcata
	Isopogon gardneri
	Isopogon scabriusculus subsp. *pubifloris*
	Persoonia ?saundersiana
	Persoonia coriacea
	Persoonia saundersiana
	Persoonia ?quinquenervis
	Petrophile stricta
	Persoonia ?quinquinervis
	Hakea multilineata Meisn.
	Persoonia sp.
Rhamnaceae	*Cryptandra ?distigma*
	Cryptandra sp.
	Stenanthemum stipulosum
	Trymalium myrtillus
	Trymalium myrtillus subsp. myrtillus
Rutaceae	*Boronia ternata var. promiscua* (P3)
	Drummondita hassellii
	Microcybe ambigua
	Microcybe multiflora subsp. multiflora
	Phebalium filifolium
	Phebalium megaphyllum
	Phebalium obovatum
	Phebalium sp.
	Philotheca rhomboidea
	Phebalium tuberculosum
Santalaceae	*Exocarpos aphyllus*
	Exocarpos sparteus
	Leptomeria preissiana
	Santalum acuminatum
Santalaceae	*Santalum sp.*

APPENDIX A: VASCULAR PLANT SPECIES RECORDED WITHIN THE PLANT CONDITION MONITORING TRANSECTS, MARCH 2022

Note: P1 to P4 denotes priority taxon (DBCA 2021a, WAH 1998-); T denotes threatened taxon (DBCA 2021b)

FAMILY	SPECIES
Sapindaceae	*Dodonaea bursariifolia*
	Dodonaea microzyga var. acrolobata
	Dodonaea stenozyga
Scrophulariaceae	*Eremophila dempsteri*
	Eremophila sp.
Stylidiaceae	*Stylidium involucratum*
	Stylidium sp.
Thymelaeaceae	*Pimelea sulphurea*
	Pimelea sp.
Violaceae	Hybanthus floribundus

APPENDIX B: VASCULAR PLANT SPECIES RECORDED AT EACH PLANT CONDITION MONITORING TRANSECT, MARCH 2022

Note: P1 to P4 denotes prioirty taxa (DBCA 2021a, WAH 1998-); T denotes threatened taxon (DBCA 2021b)

SPECIES	Transect Pair	A		B		D		E		F		G		H		I		F	
	Transect Type	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact
	Transect Number	1	2	3	4	7	8	10	9	11	14	15	12	13	16	17	18	19	20
Acacia assimilis subsp. assimilis								x	x		x	x		x	x			x	
Acacia camptoclada							x												
Acacia lachnocarpa (P1)																x	x		
Acacia merrallii						x				x									
Acacia resinimarginea															x				
Acacia sphacelata subsp. sphacelata															x				
Acacia steedmanii subsp. steedmanii																x			
Acacia sulcata var. platyphylla				x															
Acacia tetraptera																	x		
Acacia undosa (P3)						x	x												
Acacia yorkrakinensis		x																	x
Acacia yorkrakinensis subsp. acrita								x	x		x	x		x		x			
Acrotriche lancifolia		x														x			x
Adenanthos argyreus									x		x	x						x	
Allocasuarina acutivalvis subsp. acutivalvis		x	x					x	x		x	x		x	x	x	x	x	x
Allocasuarina campestris				x	x														
Allocasuarina sp. (juvenile)																			
Allocasuarina spinosissima		x	x								x				x				x
Baeckea grandibracteata s. lat.																			
Baeckea sp. Forrestania (K.R. Newbey 1105) (P1)											x	x			x				
Banksia laevigata subsp. fuscolutea									x						x				
Banksia purdieana								x	x		x	x		x	x			x	
Banksia sphaerocarpa var. dolichostyla (T)								x	x		x	x			x			x	
Beaufortia interstans						x						x							
Beaufortia orbifolia								x	x		x	x		x	x			x	
Beaufortia puberula															x				

APPENDIX B: VASCULAR PLANT SPECIES RECORDED AT EACH PLANT CONDITION MONITORING TRANSECT, MARCH 2022

Note: P1 to P4 denotes prioirty taxa (DBCA 2021a, WAH 1998-); T denotes threatened taxon (DBCA 2021b)

SPECIES	Transect Pair	A		B		D		E		F		G		H		I		F	
	Transect Type	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact
	Transect Number	1	2	3	4	7	8	10	9	11	14	15	12	13	16	17	18	19	20
Beaufortia schaueri									x		x	x		x	x				
Beyeria minor																		x	
Beyeria sulcata var. gracilis			x																
Beyeria sulcata var. sulcata																			
Boronia ternata var. promiscua (P3)									x		x			x				x	
Caladenia hirta			x	x	x		x		x		x			x				x	
Caladenia paradoxa			x	x	x														
Callitris columellaris		x														x	x		x
Callitris preissii			x				x												
Calothamnus gilesii		x																	x
Calytrix breviseta subsp. stipulosa												x			x			x	
Calytrix tetragona					x														
Cassytha aurea var. hirta								x	x										
Cassytha sp.		x	x	x							x	x		x	x		x	x	x
Casuarina sp.																		x	
Casuarinaceae sp.																		x	
Chaemexeros macrantha																			
Chamaexeros fimbriata																			
Chamelaucium ciliatum							x					x							
Chamelaucium sp. Parker Range (B.H. Smith 1255) (P1)									x		x	x						x	
Chamelaucium virgatum												x			x				
Chorizema circinale (P3)															x				
Comesperma volubile		x	x	x	x											x	x		x
Cryptandra ?distigma						x													
Cryptandra ?distigma (recollect next trip)						x													
Cryptandra sp.			x																

APPENDIX B: VASCULAR PLANT SPECIES RECORDED AT EACH PLANT CONDITION MONITORING TRANSECT, MARCH 2022

Note: P1 to P4 denotes prioirty taxa (DBCA 2021a, WAH 1998-); T denotes threatened taxon (DBCA 2021b)

SPECIES	Transect Pair	A		B		D		E		F		G		H		I		F	
	Transect Type	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact
	Transect Number	1	2	3	4	7	8	10	9	11	14	15	12	13	16	17	18	19	20
Cyanostegia angustifolia																		x	
Cyathostemon sp.																x			
Dampiera obliqua																x		x	
Dampiera sp.																x			
Daviesia aphylla																	x		
Daviesia argillacea			x			x				x									
Daviesia cardiophylla															x				
Daviesia sarissa subsp. redacta (P2)									x			x						x	
Daviesia scoparia																	x		
Dodonaea bursariifolia			x			x											x		
Dodonaea microzyga var. acrolobata				x	x														
Dodonaea stenozyga										x			x						
Drosera ?moorei		x	x	x	x		x		x					x					x
Drosera glanduligera							x												
Drosera sp. (climbing)				x											x				
Drummondita hassellii									x		x	x		x	x			x	
Eremophila dempsteri													x						
Eremophila sp.						x													
Ericomyrtus serpyllifolia			x																
Eucalyptus ?capillosa		x																	x
Eucalyptus burracoppinensis								x	x		x	x		x	x				
Eucalyptus calycogona subsp. calycogona						x													
Eucalyptus capillosa																x	x		
Eucalyptus capillosa subsp. polyclada																x			
Eucalyptus eremophila			x			x	x										x		
Eucalyptus flocktoniae subsp. flocktoniae			x														x		

APPENDIX B: VASCULAR PLANT SPECIES RECORDED AT EACH PLANT CONDITION MONITORING TRANSECT, MARCH 2022

Note: P1 to P4 denotes prioirty taxa (DBCA 2021a, WAH 1998-); T denotes threatened taxon (DBCA 2021b)

SPECIES	Transect Pair	A		B		D		E		F		G		H		I		F	
	Transect Type	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact
	Transect Number	1	2	3	4	7	8	10	9	11	14	15	12	13	16	17	18	19	20
Eucalyptus horistes											x								
Eucalyptus protensa										x			x						
Eucalyptus rigidula																			
Eucalyptus salubris										x			x				x		
Eucalyptus sp.			x											x			x	x	
Eucalyptus sp. 1			x																
Eucalyptus sp. 2			x																
Eucalyptus urna										x			x						
Eucalyptus cylindriflora						x	x												
Euryomyrtus maidenii												x			x				
Eutaxia lasiocalyx (P2)										x									
Exocarpos aphyllus		x								x			x				x		x
Exocarpos sparteus																			
Gastrolobium floribundum								x	x			x			x			x	
Gastrolobium melanocarpum																x			
Gastrolobium spinosum											x	x		x				x	
Glischrocaryon aureum																x		x	
Gompholobium hendersonii								x			x	x			x			x	
Gompholobium obcordatum												x							
Goodenia cycnopotamica							x												
Goodenia sp. (juvenile)																		x	
Grevillea ?biformis															x				
Grevillea ?oncogyne											x								
Grevillea acuaria						x													
Grevillea acuaria sens. lat.							x												
Grevillea acuaria sens. lat. (shiny leaf form)																	x		

APPENDIX B: VASCULAR PLANT SPECIES RECORDED AT EACH PLANT CONDITION MONITORING TRANSECT, MARCH 2022

Note: P1 to P4 denotes prioirty taxa (DBCA 2021a, WAH 1998-); T denotes threatened taxon (DBCA 2021b)

SPECIES	Transect Pair	A		B		D		E		F		G		H		I		F	
	Transect Type	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact
	Transect Number	1	2	3	4	7	8	10	9	11	14	15	12	13	16	17	18	19	20
Grevillea hookeriana subsp. apiciloba						x					x	x		x				x	
Grevillea huegelii						x													
Grevillea lissopleura (P1)				x	x														
Grevillea marriottii (P1)																			
Grevillea oncogyne																	x		
Grevillea pterosperma														x					
Grevillea shuttleworthiana subsp. obovata															x				
Grevillea sp.												x			x	x			
Hakea ?subsulcata																		x	
Hakea cygnus subsp. cygnus									x										
Hakea erecta							x		x		x	x			x				
Hakea meisneriana								x	x						x				
Hakea multilineata												x		x					
Hakea multilineata group								x				x		x				x	
Hakea pendens (P3)		x	x																x
Hakea scoparia subsp. scoparia															x	x			
Hakea subsulcata			x								x	x		x					
Hakea multilineata Meisn.								x											
Halgania integerrima							x												
Hemigenia westringioides																		x	
Hibbertia ancistrophylla															x				
Hibbertia exasperata																x			
Hibbertia psilocarpa						x													
Hibbertia rostellata			x									x			x			x	
Hibbertia rupicola						x													
Hibbertia sp.																x			

APPENDIX B: VASCULAR PLANT SPECIES RECORDED AT EACH PLANT CONDITION MONITORING TRANSECT, MARCH 2022

Note: P1 to P4 denotes prioirty taxa (DBCA 2021a, WAH 1998-); T denotes threatened taxon (DBCA 2021b)

SPECIES	Transect Pair	A		B		D		E		F		G		H		I		F	
	Transect Type	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact
	Transect Number	1	2	3	4	7	8	10	9	11	14	15	12	13	16	17	18	19	20
Hibbertia stowardii								x	x		x	x		x	x			x	
Hibbertia tuberculata (P1)				x	x														
Homalocalyx pulcherrimus			x												x				
Hybanthus floribundus																			
Isolepis marginata					x														
Isopogon gardneri								x	x		x	x						x	
Isopogon scabriusculus subsp. pubifloris											x	x			x				
Jacksonia nematoclada									x		x	x		x					
Lasiopetalum ferraricollinum											x	x			x			x	
Lepidosperma sanguinolentum sens .lat.				x															
Lepidosperma sp.															x				
Lepidosperma sp. 1															x				
Lepidosperma sp. 2															x				
Leptomeria preissiana																			
Leptospermum erubescens															x				
Leptospermum roei																			
Leptospermum spinescens								x										x	
Leucopogon sp. Forrestania (G.F. Craig 2386)															x				
Leucopogon sp. outer wheatbelt (M. Hislop 30)														x					
Lysinema ciliatum															x				
Melaleuca ?acuminata subsp. acuminata (recollect next trip)							x												
Melaleuca ?calyptroides												x							
Melaleuca acuminata subsp. acuminata						x	x												
Melaleuca calyptroides									x		x	x		x	x		x		
Melaleuca cliffortioides				x	x														
Melaleuca condylosa																x	x		

APPENDIX B: VASCULAR PLANT SPECIES RECORDED AT EACH PLANT CONDITION MONITORING TRANSECT, MARCH 2022

Note: P1 to P4 denotes prioirty taxa (DBCA 2021a, WAH 1998-); T denotes threatened taxon (DBCA 2021b)

SPECIES	Transect Pair	A		B		D		E		F		G		H		I		F	
	Transect Type	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact
	Transect Number	1	2	3	4	7	8	10	9	11	14	15	12	13	16	17	18	19	20
Melaleuca cordata								x	x		x	x		x	x			x	
Melaleuca cucullata										x			x						
Melaleuca depauperata						x	x												
Melaleuca eleuterostachya						x	x										x		
Melaleuca halmaturorum																	x		
Melaleuca lateriflora						x	x												
Melaleuca laxiflora							x												
Melaleuca pauperiflora subsp. pauperiflora										x									
Melaleuca phoidophylla													x						
Melaleuca pungens									x		x				x				
Melaleuca scalena			x			x	x		x					x			x		
Melaleuca sp.																		x	
Melaleuca sparsiflora																	x		
Melaleuca societatis																	x		
Microcorys elatoides (P1)								x	x		x	x		x				x	
Microcorys sp. Mt Holland broad-leaf (G. Barrett s.n. PERTH 04104927) (P1)																		x	
Microcybe ambigua												x			x				
Microcybe multiflora subsp. multiflora										x			x						
Micromyrtus erichsenii			x					x	x		x	x		x	x			x	
Millotia tenuifolia var. tenuifolia					x		x												
Monotaxis grandiflora												x							
Monotaxis grandiflora var. obtusifolia											x	x							
Myrtaceae sp.																			
Olearia muelleri						x													
Olearia ramosissima							x												
Orchidaceae sp.			x	x	x		x								x				

APPENDIX B: VASCULAR PLANT SPECIES RECORDED AT EACH PLANT CONDITION MONITORING TRANSECT, MARCH 2022

Note: P1 to P4 denotes prioirty taxa (DBCA 2021a, WAH 1998-); T denotes threatened taxon (DBCA 2021b)

SPECIES	Transect Pair	A		B		D		E		F		G		H		I		F	
	Transect Type	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact
	Transect Number	1	2	3	4	7	8	10	9	11	14	15	12	13	16	17	18	19	20
Persoonia ?quinquinervis			x																
Persoonia ?saundersiana (recollect next trip)															x				
Persoonia coriacea								x			x	x		x				x	
Persoonia saundersiana								x											
Persoonia sp.																x			
Persoonia ?quinquenervis														x					
Petrophile stricta												x							
Phebalium filifolium															x				
Phebalium megaphyllum		x	x														x		x
Phebalium obovatum			x													x			
Phebalium sp.																x			
Phebalium tuberculosum		x																	x
Philotheca rhomboidea																			
Pimelea sp.																		x	
Pimelea sulphurea																			
Pityrodia loricata							x												
Platysace maxwellii					x		x	x				x						x	
Poaceae sp.						x	x												
Psammomoya choretroides															x				
Pterostylis mutica										x			x						
Pterostylis sp.																			
Rhodanthe laevis							x												
Rinzia carnosa																	x		
Rinzia medifila (P1)				x															
Rinzia sessilis			x	x		x									x				
Santalum acuminatum			x						x		x			x			x		

APPENDIX B: VASCULAR PLANT SPECIES RECORDED AT EACH PLANT CONDITION MONITORING TRANSECT, MARCH 2022

Note: P1 to P4 denotes prioirty taxa (DBCA 2021a, WAH 1998-); T denotes threatened taxon (DBCA 2021b)

SPECIES	Transect Pair	A		B		D		E		F		G		H		I		F	
	Transect Type	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact
	Transect Number	1	2	3	4	7	8	10	9	11	14	15	12	13	16	17	18	19	20
Santalum sp.									x	x								x	
Stackhousia sp.																		x	
Stenanthemum stipulosum			x																
Stylidium involucratum																			
Stylidium sp.											x								
Styphelia exserta				x	x														
Styphelia serratifolia		x									x				x				x
Thryptomene kochii									x		x			x	x				
Thysanotus sp. Twining Wheatbelt (N.H. Brittan 81/29)			x	x	x	x	x		x			x		x					
Trymalium myrtillus					x														
Trymalium myrtillus subsp. myrtillus				x	x														
Verticordia chrysantha												x			x				
Verticordia stenopetala (P3)												x			x				
Westringia cephalantha			x				x												
Westringia rigida						x													
Wilsonia humilis										x									

APPENDIX C: HEALTH SCORES FOR INDIVIDUALLY TAGGED PLANTS AT PLANT HEALTH MONITORING TRANSECTS, MARCH 2022

Refer to Methods for score definitions.

TAG	SPECIES	CANOPY	LEAF DIE OFF	NEW TIP GROWTH	REPRODUCTIVE STATE	INSECT LEAF DAMAGE	EPICORMIC GROWTH
Transect 1							
1	*Hakea pendens* (P3)	2	1	1	3	0	0
2	*Phebalium megaphyllum*	4	1	2	2	0	0
3	*Callitris columellaris*	4	1	3	3	0	0
4	*Allocasuarina acutivalvis* subsp. *acutivalvis*	2	1	2	0	0	0
5	*Styphelia serratifolia*	4	0	3	2	0	0
6	*Hakea pendens* (P3)	2	1	2	2	0	0
7	*Allocasuarina acutivalvis* subsp. *acutivalvis*	2	2	2	2	0	0
8	*Callitris columellaris*	4	1	3	3	0	0
9	*Phebalium tuberculosum*	4	0	2	2	0	0
10	*Callitris columellaris*	4	1	3	3	0	0
11	*Phebalium tuberculosum*	4	0	2	0	0	0
12	*Phebalium megaphyllum*	4	2	2	2	0	0
13	*Hakea pendens* (P3)	3	1	1	2	0	0
14	*Callitris columellaris*	4	1	3	3	0	0
15	*Allocasuarina acutivalvis* subsp. *acutivalvis*	3	1	2	0	0	0
16	*Allocasuarina acutivalvis* subsp. *acutivalvis*	3	1	1	1	0	0
17	*Hakea pendens* (P3)	2	1	1	0	0	0
18	*Phebalium* sp.	4	1	1	0	0	0
19	*Phebalium megaphyllum*	3	1	1	0	0	0
20	*Callitris columellaris*	3	2	1	3	0	0
Transect 2							
1	*Rinzia sessilis*	4	0	2	2	0	0
2	*Beyeria sulcata*	4	0	2	3	0	0
3	*Allocasuarina acutivalvis* subsp. *acutivalvis*	3	1	3	0	0	0
4	*Phebalium megaphyllum*	3	1	2	2	0	0
5	*Hakea pendens* (P3)	3	1	2	3	0	0
6	*Beyeria sulcata*	3	1	1	0	0	0
7	*Allocasuarina acutivalvis* subsp. *acutivalvis*	4	0	2	2	0	0
8	*Hakea pendens* (P3)	3	1	2	2	0	0
9	*Phebalium megaphyllum*	3	1	1	2	0	0
10	*Rinzia sessilis*	4	3	0	0	0	0
11	*Allocasuarina acutivalvis* subsp. *acutivalvis*	2	2	1	3	0	0
12	*Rinzia sessilis*	4	2	2	0	0	0
13	*Beyeria sulcata*	3	1	2	3	0	0
14	*Phebalium megaphyllum*	4	1	2	2	0	0
15	*Hakea pendens* (P3)	4	1	2	2	0	0
16	*Beyeria sulcata*	4	0	2	2	0	0
17	*Phebalium megaphyllum*	3	1	2	2	0	0
18	*Allocasuarina acutivalvis* subsp. *acutivalvis*	3	1	1	2	0	0
19	*Hakea pendens* (P3)	4	0	2	2	0	0
20	*Rinzia sessilis*	4	1	2	2	0	0

APPENDIX C: HEALTH SCORES FOR INDIVIDUALLY TAGGED PLANTS AT PLANT HEALTH MONITORING TRANSECTS, MARCH 2022

Refer to Methods for score definitions.

TAG	SPECIES	CANOPY	LEAF DIE OFF	NEW TIP GROWTH	REPRODUCTIVE STATE	INSECT LEAF DAMAGE	EPICORMIC GROWTH
Transect 3							
1	*Melaleuca cliffortioides*	4	0	2	2	0	0
2	*Melaleuca cliffortioides*	3	1	2	2	0	0
3	*Grevillea lissopleura* (P1)	2	1	1	1	0	0
4	*Hibbertia tuberculata* (P1)	3	1	3	2	0	0
5	*Trymalium myrtillus* subsp. *myrtillus*	3	1	1	2	0	0
6	*Melaleuca cliffortioides*	3	1	1	2	0	0
7	*Hibbertia tuberculata* (P1)	3	1	2	2	0	0
8	*Grevillea lissopleura* (P1)	3	1	2	2	0	0
9	*Trymalium myrtillus* subsp. *myrtillus*	2	1	1	2	0	0
10	*Dodonaea microzyga* var. *acrolobata*	2	1	2	3	0	0
11	*Melaleuca cliffortioides*	4	0	2	2	0	0
12	*Grevillea lissopleura* (P1)	2	1	1	2	0	0
13	*Hibbertia tuberculata* (P1)	4	0	2	2	0	0
14	*Trymalium myrtillus* subsp. *myrtillus*	3	1	2	2	0	0
15	*Dodonaea microzyga* var. *acrolobata*	3	1	2	3	0	0
16	*Melaleuca cliffortioides*	3	1	0	0	0	0
17	*Styphelia exserta*	4	0	2	2	0	0
18	*Dodonaea microzyga* var. *acrolobata*	4	0	2	3	0	0
19	*Hibbertia tuberculata* (P1)	4	0	2	2	0	0
20	*Grevillea lissopleura* (P1)	3	0	1	2	0	0
Transect 4							
1	*Grevillea lissopleura* (P1)	3	1	1	2	0	0
2	*Dodonaea microzyga* var. *acrolobata*	3	2	2	3	0	0
3	*Calytrix tetragona*	4	0	2	1	0	0
4	*Styphelia exserta*	4	0	2	2	0	0
5	*Melaleuca cliffortioides*	4	1	2	2	0	0
6	*Melaleuca cliffortioides*	4	1	1	2	0	0
7	*Grevillea lissopleura* (P1)	3	1	1	2	0	0
8	*Calytrix tetragona*	3	2	1	1	0	0
9	*Styphelia exserta*	3	1	2	2	0	0
10	*Dodonaea microzyga* var. *acrolobata*	3	2	2	3	0	0
11	*Styphelia exserta*	4	0	2	2	0	0
12	*Calytrix tetragona*	3	1	1	1	0	0
13	*Melaleuca cliffortioides*	4	1	2	3	0	0
14	*Grevillea lissopleura* (P1)	3	1	0	0	0	0
15	*Dodonaea microzyga* var. *acrolobata*	3	2	2	3	0	0
16	*Melaleuca cliffortioides*	4	2	2	2	0	0
17	*Dodonaea microzyga* var. *acrolobata*	4	0	2	2	0	0
18	*Grevillea lissopleura* (P1)	3	1	1	0	0	0
19	*Calytrix tetragona*	3	1	2	1	0	0
20	*Styphelia exserta*	3	1	1	2	0	0

APPENDIX C: HEALTH SCORES FOR INDIVIDUALLY TAGGED PLANTS AT PLANT HEALTH MONITORING TRANSECTS, MARCH 2022

Refer to Methods for score definitions.

TAG	SPECIES	CANOPY	LEAF DIE OFF	NEW TIP GROWTH	REPRODUCTIVE STATE	INSECT LEAF DAMAGE	EPICORMIC GROWTH
Transect 7							
1	*Melaleuca lateriflora*	3	1	2	0	0	3
2	*Daviesia argillacea*	4	0	1	2	0	0
3	*Acacia undosa* (P3)	0	3	0	0	0	0
4	*Eucalyptus calycogona* subsp. *calycogona*	3	1	1	0	2	0
5	*Melaleuca eleuterostachya*	4	1	2	3	0	0
6	*Acacia undosa* (P3)	3	1	1	0	0	0
7	*Grevillea acuaria*	3	1	2	2	0	0
8	*Melaleuca lateriflora*	4	1	2	0	0	1
9	*Eucalyptus calycogona* subsp. *calycogona*	2	0	1	0	1	0
10	*Melaleuca eleuterostachya*	4	0	3	0	0	3
11	*Melaleuca eleuterostachya*	3	2	2	0	1	0
12	*Acacia undosa* (P3)	3	2	0	0	0	0
13	*Daviesia argillacea*	4	0	1	2	0	0
14	*Eucalyptus calycogona* subsp. *calycogona*	3	1	1	3	0	1
15	*Acacia undosa* (P3)	3	1	1	1	0	0
16	*Acacia undosa* (P3)	3	1	1	0	0	0
17	*Hibbertia rupicola*	4	1	2	2	0	0
18	*Melaleuca depauperata*	3	1	1	0	0	0
19	*Eucalyptus calycogona* subsp. *calycogona*	2	2	1	3	2	0
20	*Melaleuca lateriflora*	4	0	2	0	0	0
Transect 8							
1	*Acacia undosa* (P3)	3	1	1	0	0	0
2	*Grevillea acuaria*	4	0	2	0	0	0
3	*Melaleuca lateriflora*	3	1	2	1	1	0
4	*Eucalyptus cylindriflora*	3	1	2	3	0	2
5	*Melaleuca eleuterostachya*	3	1	0	3	0	0
6	*Melaleuca lateriflora*	3	1	2	1	0	0
7	*Eucalyptus cylindriflora*	4	0	1	3	1	0
8	*Acacia undosa* (P3)	3	2	2	2	0	0
9	*Melaleuca eleuterostachya*	3	0	0	1	0	0
10	*Grevillea acuaria*	2	2	0	2	0	0
11	*Melaleuca eleuterostachya*	3	1	0	3	0	0
12	*Eucalyptus cylindriflora*	3	1	2	1	0	0
13	*Melaleuca lateriflora*	4	2	3	1	0	0
14	*Grevillea acuaria*	4	1	3	0	1	0
15	*Acacia undosa* (P3)	3	1	1	0	0	0
16	*Acacia undosa* (P3)	3	2	2	2	2	0
17	*Melaleuca lateriflora*	4	0	3	1	0	0
18	*Eucalyptus cylindriflora*	3	2	2	0	0	0
19	*Grevillea acuaria*	4	0	2	0	0	0
20	*Melaleuca eleuterostachya*	3	1	1	0	0	0

APPENDIX C: HEALTH SCORES FOR INDIVIDUALLY TAGGED PLANTS AT PLANT HEALTH MONITORING TRANSECTS, MARCH 2022

Refer to Methods for score definitions.

TAG	SPECIES	CANOPY	LEAF DIE OFF	NEW TIP GROWTH	REPRODUCTIVE STATE	INSECT LEAF DAMAGE	EPICORMIC GROWTH
Transect 9							
1	*Banksia sphaerocarpa* var. *dolichostyla* (T)	3	2	1	0	0	0
2	*Microcorys elatoides* (P1)	3	1	2	1	0	0
3	*Allocasuarina acutivalvis* subsp. *acutivalvis*	4	0	2	2	0	0
4	*Beaufortia orbifolia*	4	1	2	0	0	0
5	*Banksia purdieana*	3	2	2	0	0	0
6	*Banksia sphaerocarpa* var. *dolichostyla* (T)	3	2	0	0	0	0
7	*Microcorys elatoides* (P1)	3	1	2	0	0	0
8	*Allocasuarina acutivalvis* subsp. *acutivalvis*	4	0	2	2	0	0
9	*Beaufortia orbifolia*	4	1	3	0	0	0
10	*Banksia purdieana*	3	2	1	0	0	0
11	*Banksia sphaerocarpa* var. *dolichostyla* (T)	3	1	1	0	0	0
12	*Microcorys elatoides* (P1)	3	1	2	0	0	0
13	*Allocasuarina acutivalvis* subsp. *acutivalvis*	4	1	2	2	0	0
14	*Beaufortia orbifolia*	4	2	3	0	0	0
15	*Banksia purdieana*	2	2	1	0	0	0
16	*Banksia sphaerocarpa* var. *dolichostyla* (T)	4	1	2	3	0	0
17	*Microcorys elatoides* (P1)	3	1	2	0	0	0
18	*Allocasuarina acutivalvis* subsp. *acutivalvis*	4	0	2	2	0	0
19	*Banksia purdieana*	0	4	0	0	0	0
20	*Beaufortia orbifolia*	3	3	3	2	0	0
Transect 10							
1	*Allocasuarina acutivalvis* subsp. *acutivalvis*	4	1	1	2	0	0
2	*Banksia purdieana*	3	2	2	2	0	0
3	*Beaufortia orbifolia*	3	1	2	0	0	0
4	*Microcorys elatoides* (P1)	3	1	1	0	0	0
5	*Banksia sphaerocarpa* var. *dolichostyla* (T)	3	1	0	0	0	0
6	*Banksia sphaerocarpa* var. *dolichostyla* (T)	1	3	1	3	0	2
7	*Beaufortia orbifolia*	3	1	2	0	0	0
8	*Banksia purdieana*	2	2	1	0	0	0
9	*Allocasuarina acutivalvis* subsp. *acutivalvis*	3	1	2	2	0	0
10	*Microcorys elatoides* (P1)	3	1	1	0	0	0
11	*Banksia purdieana*	3	2	1	2	0	0
12	*Microcorys elatoides* (P1)	2	1	1	0	0	0
13	*Beaufortia orbifolia*	4	1	2	0	0	0
14	*Allocasuarina acutivalvis* subsp. *acutivalvis*	4	0	2	2	0	0
15	*Banksia sphaerocarpa* var. *dolichostyla* (T)	2	1	1	0	0	0
16	*Allocasuarina acutivalvis* subsp. *acutivalvis*	4	1	1	0	0	0
17	*Beaufortia orbifolia*	3	1	2	0	0	0
18	*Eucalyptus burracoppinensis*	2	1	1	1	1	2
19	*Banksia purdieana*	3	2	1	0	0	0
20	*Banksia sphaerocarpa* var. *dolichostyla* (T)	2	2	1	0	0	0

APPENDIX C: HEALTH SCORES FOR INDIVIDUALLY TAGGED PLANTS AT PLANT HEALTH MONITORING TRANSECTS, MARCH 2022

Refer to Methods for score definitions.

TAG	SPECIES	CANOPY	LEAF DIE OFF	NEW TIP GROWTH	REPRODUCTIVE STATE	INSECT LEAF DAMAGE	EPICORMIC GROWTH
Transect 11							
1	*Melaleuca cucullata*	3	1	2	3	0	0
2	*Melaleuca pauperiflora* subsp. *pauperiflora*	4	1	3	0	0	0
3	*Microcybe multiflora* subsp. *multiflora*	4	1	1	1	0	0
4	*Dodonaea stenozyga*	3	1	1	2	0	0
5	*Exocarpos aphyllus*	3	2	0	2	0	0
6	*Melaleuca pauperiflora* subsp. *pauperiflora*	4	1	3	3	0	0
7	*Dodonaea stenozyga*	3	1	2	0	0	0
8	*Melaleuca pauperiflora* subsp. *pauperiflora*	4	1	3	3	0	0
9	*Microcybe multiflora* subsp. *multiflora*	2	1	1	0	0	0
10	*Exocarpos aphyllus*	2	2	1	2	0	0
11	*Eucalyptus urna*	4	0	1	3	1	0
12	*Dodonaea stenozyga*	3	1	2	3	0	0
13	*Melaleuca pauperiflora* subsp. *pauperiflora*	4	0	3	3	0	0
14	*Melaleuca cucullata*	4	1	2	3	0	0
15	*Daviesia argillacea*	4	1	3	2	0	0
16	*Melaleuca pauperiflora* subsp. *pauperiflora*	3	1	1	0	0	0
17	*Melaleuca cucullata*	4	0	2	3	0	0
18	*Microcybe multiflora* subsp. *multiflora*	3	1	1	0	0	0
19	*Dodonaea stenozyga*	3	1	2	3	0	0
20	*Daviesia argillacea*	3	1	1	0	0	0
Transect 12							
1	*Acacia yorkrakinensis* subsp. *acrita*	4	1	2	2	1	1
2	*Melaleuca calyptroides*	3	1	2	0	0	0
3	*Hakea erecta*	3	1	1	3	0	0
4	*Microcorys elatoides* (P1)	2	2	1	0	2	0
5	*Drummondita hassellii*	4	1	2	2	0	0
6	*Hakea erecta*	3	1	1	3	1	0
7	*Acacia yorkrakinensis* subsp. *acrita*	4	1	3	2	0	0
8	*Melaleuca calyptroides*	3	1	1	0	0	0
9	*Melaleuca pungens*	4	1	1	3	0	0
10	*Drummondita hassellii*	4	1	3	2	0	0
11	*Thryptomene kochii*	4	4	1	0	0	0
12	*Melaleuca pungens*	3	1	1	3	1	0
13	*Acacia yorkrakinensis* subsp. *acrita*	3	1	1	2	0	0
14	*Chamelaucium* sp. Parker Range (B.H. Smith 1255) (P1)	3	1	1	0	2	0
15	*Isopogon gardneri*	3	1	2	1	0	0
16	*Isopogon gardneri*	4	1	2	2	0	0
17	*Acacia yorkrakinensis* subsp. *acrita*	4	0	1	0	1	0
18	*Melaleuca pungens*	4	1	1	3	0	0
19	*Microcorys elatoides* (P1)	3	1	2	0	0	0
20	*Isopogon gardneri*	4	1	2	2	0	0

APPENDIX C: HEALTH SCORES FOR INDIVIDUALLY TAGGED PLANTS AT PLANT HEALTH MONITORING TRANSECTS, MARCH 2022

Refer to Methods for score definitions.

TAG	SPECIES	CANOPY	LEAF DIE OFF	NEW TIP GROWTH	REPRODUCTIVE STATE	INSECT LEAF DAMAGE	EPICORMIC GROWTH
Transect 13							
1	*Microcorys elatoides* (P1)	3	1	0	0	1	0
2	*Chamelaucium* sp. Parker Range (B.H. Smith 1255) (P1)	3	1	2	0	0	0
3	*Baeckea* sp. Forrestania (K.R. Newbey 1105) (P1)	4	1	2	1	0	0
4	*Allocasuarina acutivalvis* subsp. *acutivalvis*	4	0	2	2	0	0
5	*Banksia sphaerocarpa* var. *dolichostyla* (T)	3	1	1	3	0	0
6	*Allocasuarina acutivalvis* subsp. *acutivalvis*	4	0	2	2	0	0
7	*Baeckea* sp. Forrestania (K.R. Newbey 1105) (P1)	4	0	1	1	0	0
8	*Hakea erecta*	4	1	2	1	0	0
9	*Chamelaucium* sp. Parker Range (B.H. Smith 1255) (P1)	3	2	2	0	0	0
10	*Banksia sphaerocarpa* var. *dolichostyla* (T)	3	1	1	3	0	1
11	*Allocasuarina acutivalvis* subsp. *acutivalvis*	4	0	2	2	0	0
12	*Banksia sphaerocarpa* var. *dolichostyla* (T)	3	1	1	0	0	0
13	*Microcorys elatoides* (P1)	3	1	2	0	0	0
14	*Chamelaucium* sp. Parker Range (B.H. Smith 1255) (P1)	3	1	2	0	1	0
15	*Baeckea* sp. Forrestania (K.R. Newbey 1105) (P1)	3	0	1	1	0	0
16	*Chamelaucium* sp. Parker Range (B.H. Smith 1255) (P1)	4	0	2	0	1	0
17	*Microcorys elatoides* (P1)	3	1	1	0	1	0
18	*Allocasuarina acutivalvis* subsp. *acutivalvis*	3	2	1	3	0	3
19	*Baeckea* sp. Forrestania (K.R. Newbey 1105) (P1)	4	3	2	1	0	0
20	*Banksia sphaerocarpa* var. *dolichostyla* (T)	3	1	1	3	0	0
Transect 14							
1	*Dodonaea stenozyga*	4	1	2	1	0	0
2	*Melaleuca cucullata*	3	1	2	3	0	0
3	*Eremophila dempsteri*	3	2	3	0	0	0
4	*Melaleuca phoidophylla*	3	1	1	2	0	0
5	*Eucalyptus urna*	3	1	1	0	0	0
6	*Dodonaea stenozyga*	4	0	2	3	0	0
7	*Eucalyptus urna*	3	1	2	3	0	0
8	*Exocarpos aphyllus*	2	2	1	2	0	0
9	*Eucalyptus salubris*	4	0	3	0	0	0
10	*Melaleuca cucullata*	4	1	3	3	0	0
11	*Dodonaea stenozyga*	1	2	0	0	0	0
12	*Melaleuca cucullata*	4	0	3	3	0	0
13	*Eucalyptus urna*	2	1	0	0	0	0
14	*Eucalyptus protensa*	4	0	1	3	0	0
15	*Dodonaea stenozyga*	1	1	1	0	0	0
16	*Melaleuca phoidophylla*	4	0	3	2	0	0
17	*Microcybe multiflora* subsp. *multiflora*	4	0	3	1	0	0
18	*Dodonaea stenozyga*	4	0	2	2	0	0
19	*Eucalyptus urna*	3	1	1	0	0	0
20	*Melaleuca cucullata*	4	0	3	3	0	0

APPENDIX C: HEALTH SCORES FOR INDIVIDUALLY TAGGED PLANTS AT PLANT HEALTH MONITORING TRANSECTS, MARCH 2022

Refer to Methods for score definitions.

TAG	SPECIES	CANOPY	LEAF DIE OFF	NEW TIP GROWTH	REPRODUCTIVE STATE	INSECT LEAF DAMAGE	EPICORMIC GROWTH
Transect 15							
1	*Drummondita hassellii*	4	0	2	2	0	0
2	*Melaleuca cordata*	3	1	0	0	0	0
3	*Beaufortia schaueri*	4	0	1	0	0	0
4	*Acacia yorkrakinensis* subsp. *acrita*	3	1	2	2	1	0
5	*Microcorys elatoides* (P1)	3	1	1	0	0	0
6	*Microcorys elatoides* (P1)	3	1	2	1	0	0
7	*Drummondita hassellii*	4	0	2	2	0	0
8	*Hakea subsulcata*	4	0	3	3	0	0
9	*Acacia yorkrakinensis* subsp. *acrita*	4	0	2	2	0	0
10	*Melaleuca cordata*	3	1	1	0	0	0
11	*Hakea subsulcata*	4	0	3	3	0	0
12	*Melaleuca cordata*	3	1	1	0	0	0
13	*Microcorys elatoides* (P1)	4	0	2	0	0	0
14	*Acacia yorkrakinensis* subsp. *acrita*	4	0	2	2	0	0
15	*Drummondita hassellii*	4	0	3	2	0	0
16	*Microcorys elatoides* (P1)	4	0	2	0	0	0
17	*Drummondita hassellii*	3	0	2	2	0	0
18	*Acacia yorkrakinensis* subsp. *acrita*	3	1	2	3	1	0
19	*Hakea subsulcata*	4	0	3	3	0	0
20	*Melaleuca cordata*	3	1	1	0	0	0
Transect 16							
1	*Banksia sphaerocarpa* var. *dolichostyla* (T)	3	1	2	2	0	2
2	*Baeckea* sp. Forrestania (K.R. Newbey 1105) (P1)	0	0	0	0	0	0
3	*Hakea erecta*	3	2	1	3	0	2
4	*Leucopogon* sp. Forrestania (G.F. Craig 2386)	3	2	0	0	0	0
5	*Allocasuarina acutivalvis* subsp. *acutivalvis*	4	0	2	3	0	0
6	*Leucopogon* sp. Forrestania (G.F. Craig 2386)	3	2	1	0	0	0
7	*Hakea erecta*	3	2	2	0	0	0
8	*Allocasuarina acutivalvis* subsp. *acutivalvis*	2	2	2	3	0	2
9	*Baeckea* sp. Forrestania (K.R. Newbey 1105) (P1)	2	0	1	0	0	0
10	*Banksia sphaerocarpa* var. *dolichostyla* (T)	3	2	1	2	0	0
11	*Leucopogon* sp. Forrestania (G.F. Craig 2386)	3	2	1	2	2	0
12	*Hakea erecta*	3	1	1	3	0	0
13	*Banksia sphaerocarpa* var. *dolichostyla* (T)	2	2	1	3	2	0
14	*Baeckea* sp. Forrestania (K.R. Newbey 1105) (P1)	2	0	1	0	0	0
15	*Allocasuarina acutivalvis* subsp. *acutivalvis*	3	1	2	3	0	0
16	*Hakea erecta*	3	2	0	3	2	0
17	*Banksia sphaerocarpa* var. *dolichostyla* (T)	3	1	2	2	0	0
18	*Leucopogon* sp. Forrestania (G.F. Craig 2386)	3	2	1	0	0	0
19	*Baeckea* sp. Forrestania (K.R. Newbey 1105) (P1)	2	0	1	0	0	0
20	*Allocasuarina acutivalvis* subsp. *acutivalvis*	3	1	3	3	0	0

APPENDIX C: HEALTH SCORES FOR INDIVIDUALLY TAGGED PLANTS AT PLANT HEALTH MONITORING TRANSECTS, MARCH 2022

Refer to Methods for score definitions.

TAG	SPECIES	CANOPY	LEAF DIE OFF	NEW TIP GROWTH	REPRODUCTIVE STATE	INSECT LEAF DAMAGE	EPICORMIC GROWTH
Transect 17							
1	*Melaleuca condylosa*	3	1	0	0	0	0
2	*Eucalyptus capillosa*	4	1	1	0	1	0
3	*Acacia lachnocarpa* (P1)	4	0	3	3	0	0
4	*Gastrolobium melanocarpum*	3	0	1	0	0	0
5	*Acrotriche lancifolia*	4	1	3	0	0	0
6	*Acrotriche lancifolia*	4	2	1	0	0	0
7	*Melaleuca condylosa*	4	1	1	0	1	0
8	*Hakea scoparia* subsp. *scoparia*	3	1	2	1	1	0
9	*Acacia lachnocarpa* (P1)	3	1	2	0	0	0
10	*Eucalyptus capillosa*	3	1	2	0	1	0
11	*Melaleuca condylosa*	3	1	1	0	0	0
12	*Gastrolobium melanocarpum*	4	1	2	1	0	0
13	*Acacia lachnocarpa* (P1)	3	1	3	0	0	0
14	*Eucalyptus capillosa*	3	1	2	0	1	0
15	*Acrotriche lancifolia*	4	3	3	0	0	0
16	*Melaleuca condylosa*	3	0	1	0	0	0
17	*Eucalyptus capillosa*	3	0	2	0	1	0
18	*Acrotriche lancifolia*	3	1	2	0	0	0
19	*Gastrolobium melanocarpum*	4	0	2	2	1	0
20	*Acacia lachnocarpa* (P1)	4	0	3	3	0	0
Transect 18							
1	*Melaleuca sparsiflora*	3	1	1	1	1	0
2	*Grevillea acuaria sens. lat. (shiny leaf form)*	3	1	0	2	0	0
3	*Acacia lachnocarpa* (P1)	0	3	0	0	0	0
4	*Callitris columellaris*	3	2	2	0	0	0
5	*Melaleuca halmaturorum*	2	2	1	3	0	0
6	*Acacia lachnocarpa* (P1)	4	2	2	2	0	0
7	*Grevillea oncogyne*	4	0	2	2	0	0
8	*Callitris columellaris*	4	1	3	3	0	0
9	*Daviesia scoparia*	3	2	1	1	0	0
10	*Melaleuca sparsiflora*	4	1	2	2	0	0
11	*Melaleuca condylosa*	3	1	3	1	0	0
12	*Phebalium megaphyllum*	3	0	1	2	0	0
13	*Acacia lachnocarpa* (P1)	3	1	2	1	0	0
14	*Allocasuarina acutivalvis* subsp. *acutivalvis*	3	2	2	0	0	0
15	*Callitris columellaris*	4	1	3	0	0	0
16	*Allocasuarina acutivalvis* subsp. *acutivalvis*	3	2	1	3	0	0
17	*Acacia lachnocarpa* (P1)	3	2	3	1	0	0
18	*Melaleuca sparsiflora*	3	1	2	2	0	0
19	*Callitris columellaris*	4	1	3	3	0	0
20	*Melaleuca scalena*	3	1	1	3	0	0

APPENDIX C: HEALTH SCORES FOR INDIVIDUALLY TAGGED PLANTS AT PLANT HEALTH MONITORING TRANSECTS, MARCH 2022

Refer to Methods for score definitions.

TAG	SPECIES	CANOPY	LEAF DIE OFF	NEW TIP GROWTH	REPRODUCTIVE STATE	INSECT LEAF DAMAGE	EPICORMIC GROWTH
Transect 19							
1	*Banksia sphaerocarpa* var. *dolichostyla* (T)	3	1	1	1	1	0
2	*Daviesia sarissa* subsp. *redacta* (P2)	3	1	0	2	0	0
3	*Microcorys* sp. Mt Holland broad-leaf (G. Barrett s.n. PERTH 04104927) (P1)	0	3	0	0	0	0
4	*Acacia assimilis* subsp. *assimilis*	3	2	2	0	0	0
5	*Microcorys elatoides* (P1)	2	2	1	3	0	0
6	*Acacia assimilis* subsp. *assimilis*	4	2	2	2	0	0
7	*Chamelaucium* sp. Parker Range (B.H. Smith 1255) (P1)	4	0	2	2	0	0
8	*Daviesia sarissa* subsp. *redacta* (P2)	4	1	3	3	0	0
9	*Microcorys elatoides* (P1)	3	2	1	1	0	0
10	*Banksia purdieana*	4	1	2	2	0	0
11	*Acacia assimilis* subsp. *assimilis*	3	1	3	1	0	0
12	*Chamelaucium* sp. Parker Range (B.H. Smith 1255) (P1)	3	0	1	2	0	0
13	*Microcorys elatoides* (P1)	3	1	2	1	0	0
14	*Banksia sphaerocarpa* var. *dolichostyla* (T)	3	2	2	0	0	0
15	*Daviesia sarissa* subsp. *redacta* (P2)	4	1	3	0	0	0
16	*Daviesia sarissa* subsp. *redacta* (P2)	3	2	1	3	0	0
17	*Banksia sphaerocarpa* var. *dolichostyla* (T)	3	2	3	1	0	0
18	*Acacia assimilis* subsp. *assimilis*	3	1	2	2	0	0
19	*Chamelaucium* sp. Parker Range (B.H. Smith 1255) (P1)	4	1	3	3	0	0
20	*Microcorys elatoides* (P1)	3	1	1	3	0	0
Transect 20							
1	*Acacia assimilis* subsp. *assimilis*	4	0	1	0	0	0
2	*Baeckea* sp. Forrestania (K.R. Newbey 1105) (P1)	4	0	2	0	0	0
3	*Grevillea marriottii* (P1)	3	1	1	2	0	0
4	*Daviesia sarissa* subsp. *redacta* (P2)	4	1	1	2	0	0
5	*Persoonia coriacea*	3	1	1	0	1	0
6	*Daviesia sarissa* subsp. *redacta* (P2)	4	0	3	2	0	0
7	*Grevillea marriottii* (P1)	3	1	1	2	0	0
8	*Persoonia coriacea*	3	1	1	0	2	0
9	*Baeckea* sp. Forrestania (K.R. Newbey 1105) (P1)	4	1	1	0	0	0
10	*Acacia assimilis* subsp. *assimilis*	4	0	1	0	0	0
11	*Grevillea marriottii* (P1)	3	1	1	2	0	0
12	*Melaleuca ?calyptroides*	3	1	2	0	0	0
13	*Acacia assimilis* subsp. *assimilis*	4	0	2	0	0	0
14	*Persoonia coriacea*	3	2	0	0	0	0
15	*Daviesia sarissa* subsp. *redacta* (P2)	3	2	2	2	0	0
16	*Melaleuca ?calyptroides*	3	1	1	0	0	0
17	*Grevillea marriottii* (P1)	3	1	1	0	0	0
18	*Persoonia coriacea*	3	1	0	0	1	0
19	*Acacia assimilis* subsp. *assimilis*	3	1	1	0	0	0
20	*Daviesia sarissa* subsp. *redacta* (P2)	2	2	0	0	0	0

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 1a, March 2021



Quadrat 1a, March 2022



Quadrat 1b, March 2021



Quadrat 1b, March 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 1c, March 2021



Quadrat 1c, March 2022



Quadrat 1d, March 2021



Quadrat 1d, March 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 2a, March 2021



Quadrat 2a, March 2022



Quadrat 2b, March 2021



Quadrat 2b, March 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 2c, March 2021



Quadrat 2c, March 2022



Quadrat 2d, March 2021



Quadrat 2d, March 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 3a, March 2021



Quadrat 3a, March 2022



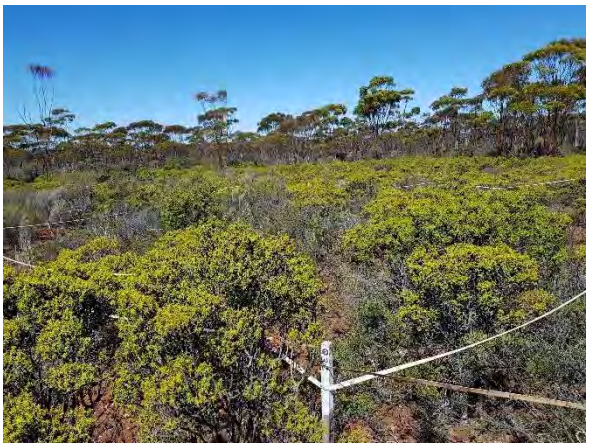
Quadrat 3b, March 2021



Quadrat 3b, March 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 3c, March 2021



Quadrat 3c, March 2022



Quadrat 3d, March 2021



Quadrat 3d, March 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



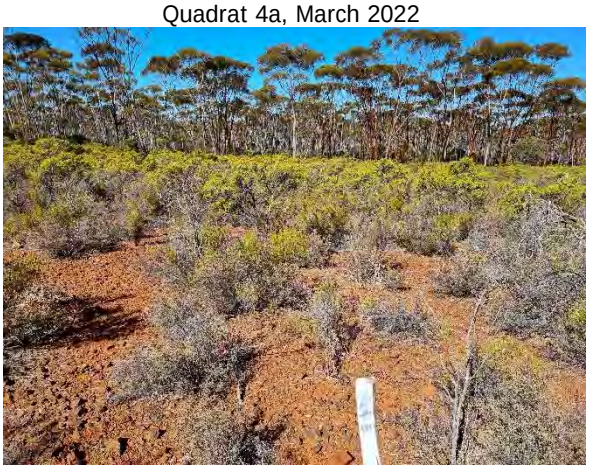
Quadrat 4a, March 2021



Quadrat 4a, March 2022



Quadrat 4b, March 2021



Quadrat 4b, March 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 4c, March 2021



Quadrat 4c, March 2022



Quadrat 4d, March 2021



Quadrat 4d, March 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 6a, March 2021



Quadrat 6, March 2022



Quadrat 6b, March 2021



APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)





Quadrat 6c, March 2021





Quadrat 6d, March 2021

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

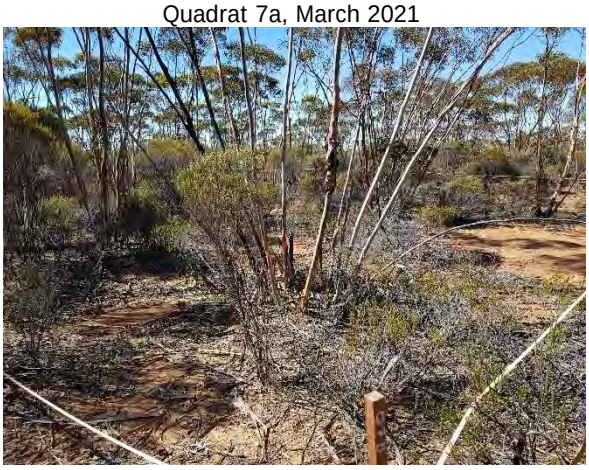
Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 7a, March 2021



Quadrat 7a, March 2022



Quadrat 7b, March 2021



Quadrat 7b, March 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 7c, March 2021



Quadrat 7c, March 2022



Quadrat 7d, March 2021



Quadrat 7d, March 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 8a, March 2021



Quadrat 8a, March 2022



Quadrat 8b, March 2021



Quadrat 8b, March 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 8c, March 2021



Quadrat 8c, March 2022



Quadrat 8d, March 2021



Quadrat 8d, March 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 9a, March 2021



Quadrat 9a, March 2022



Quadrat 9b, March 2021



Quadrat 9b, March 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 9c, March 2021



Quadrat 9c, March 2022



Quadrat 9d, March 2021



Quadrat 9d, March 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 10a, March 2021



Quadrat 10a, March 2022



Quadrat 10b, March 2021



Quadrat 10b, March 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)





Quadrat 10c, March 2021



Quadrat 10d, March 2021



Quadrat 10d, March 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 11a, March 2021



Quadrat 11a, March 2022



Quadrat 11b, March 2021



Quadrat 11b, March 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 11c, March 2021



Quadrat 11c, March 2022



Quadrat 11d, March 2021



Quadrat 11d, March 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 12a, March 2021



Quadrat 12a, March 2022



Quadrat 12b, March 2021



Quadrat 12a, March 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 12c, March 2021



Quadrat 12c, March 2022



Quadrat 12d, March 2021



Quadrat 12d, March 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 13a, March 2021



Quadrat 13a, March 2022



Quadrat 13b, March 2021



Quadrat 13b, March 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 13c, March 2021



Quadrat 13c, March 2022



Quadrat 13d, March 2021



Quadrat 13d, March 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 14a, March 2021



Quadrat 14a, March 2022



Quadrat 14b, March 2021



Quadrat 14b, March 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 14c, March 2021



Quadrat 14d, March 2021



Quadrat 14d, March 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 15a, March 2021



Quadrat 15a, March 2022



Quadrat 15b, March 2021



Quadrat 15b, March 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 15c, March 2021



Quadrat 15c, March 2022



Quadrat 15d, March 2021



Quadrat 15d, March 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 16a, March 2021



Quadrat 16a, March 2022



Quadrat 16b, March 2021



Quadrat 16b, March 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 16c, March 2021



Quadrat 16c, March 2022



Quadrat 16d, March 2021



Quadrat 16d, March 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 17a, March 2021



Quadrat 17a, March 2022



Quadrat 17b, March 2021



Quadrat 17b, March 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 17c, March 2021



Quadrat 17c, March 2022



Quadrat 17d, March 2021



Quadrat 17d, March 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 18a, March 2021



Quadrat 18a, March 2022



Quadrat 18b, March 2021



Quadrat 18b, March 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 18c, March 2021



Quadrat 18c, March 2022



Quadrat 18d, March 2021



Quadrat 18d, March 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 19a, March 2021



Quadrat 19a, March 2022



Quadrat 19b, March 2021



Quadrat 19b, March 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 19c, March 2021



Quadrat 19c, March 2022



Quadrat 19d, March 2021



Quadrat 19d, March 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 20a, March 2021



Quadrat 20a, March 2022



Quadrat 20b, March 2021



Quadrat 20b, March 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 20c, March 2021



Quadrat 20c, March 2022



Quadrat 20d, March 2021



Quadrat 20d, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



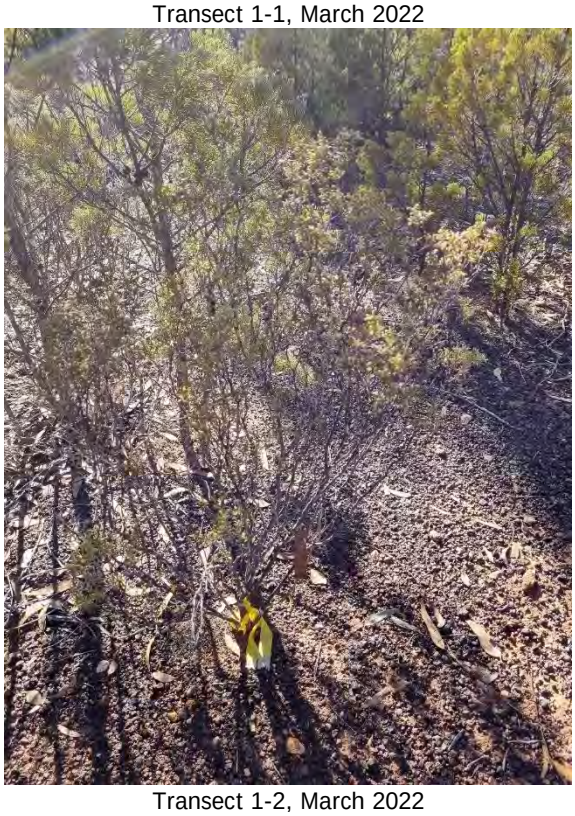
Transect 1-1, March 2021



Transect 1-1, March 2022



Transect 1-2, March 2021



Transect 1-2, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 1-3, March 2021



Transect 1-3, March 2022



Transect 1-4, March 2021



Transect 1-4, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 1-5, March 2021



Transect 1-5, March 2022



Transect 1-6, March 2021



Transect 1-6, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 1-7, March 2021



Transect 1-6, March 2022



Transect 1-8, March 2021



Transect 1-8, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 1-9, March 2021



Transect 1-9, March 2021



Transect 1-10, March 2021



Transect 1-10, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 1-11, March 2021



Transect 1-11, March 2022



Transect 1-12, March 2021



Transect 1-12, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 1-13, March 2021



Transect 1-13, March 2022



Transect 1-14, March 2021



Transect 1-14, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 1-15, March 2021



Transect 1-15, March 2022



Transect 1-16, March 2021



Transect 1-16, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 1-17, March 2021



Transect 1-17, March 2022



Transect 1-18, March 2021



Transect 1-18, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 1-19, March 2021



Transect 1-19, March 2022



Transect 1-20, March 2021



Transect 1-20, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 2-1, March 2021



Transect 2-1, March 2022



Transect 2-2, March 2021



Transect 2-2, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



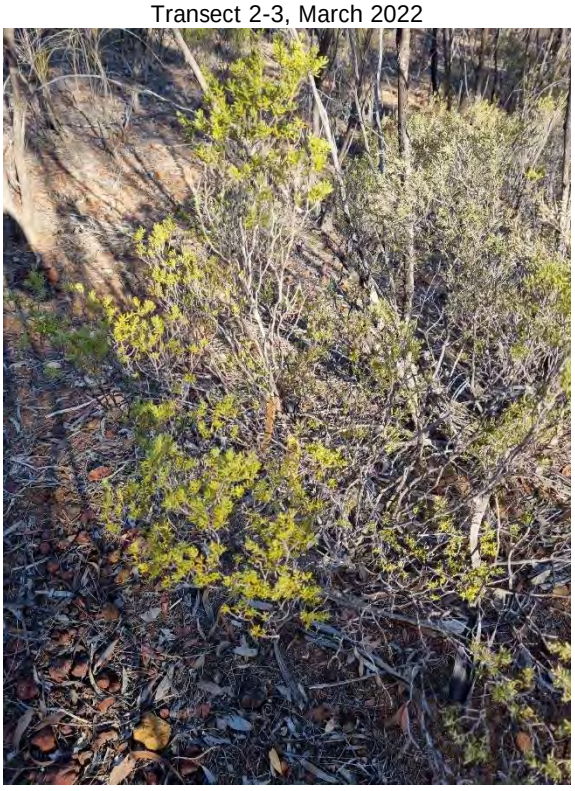
Transect 2-3, March 2021



Transect 2-3, March 2022



Transect 2-4, March 2021



Transect 2-4, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 2-5, March 2021



Transect 2-5, March 2022



Transect 2-6, March 2021



Transect 2-6, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 2-7, March 2021



Transect 2-7, March 2022



Transect 2-8, March 2021



Transect 2-8, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 2-9, March 2021



Transect 2-9, March 2022



Transect 2-10, March 2021



Transect 2-10, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 2-11, March 2021



Transect 2-11, March 2022



Transect 2-12, March 2021



Transect 2-12, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



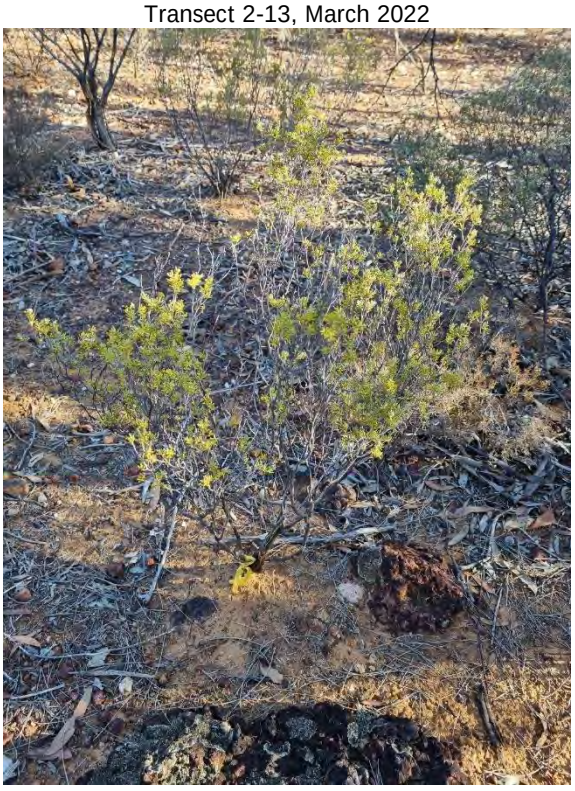
Transect 2-13, March 2021



Transect 2-13, March 2022



Transect 2-14, March 2021



Transect 2-14, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 2-15, March 2021



Transect 2-15, March 2022



Transect 2-16, March 2021



Transect 2-16, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 2-17, March 2021



Transect 2-17, March 2022



Transect 2-18, March 2021



Transect 2-18, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 2-19, March 2021



Transect 2-19, March 2022



Transect 2-20, March 2021



Transect 2-20, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



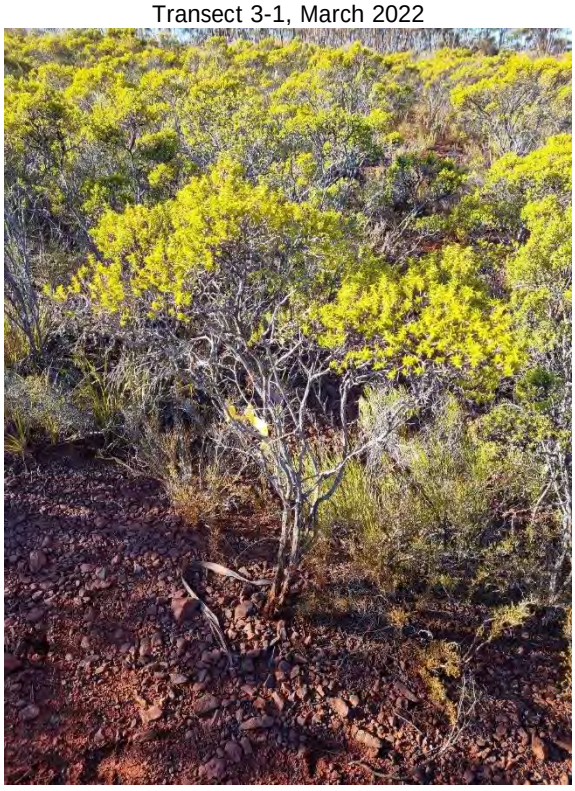
Transect 3-1, March 2021



Transect 3-1, March 2022



Transect 3-2, March 2021



Transect 3-2, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 3-3, March 2021



Transect 3-3, March 2022



Transect 3-4, March 2021



Transect 3-4, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 3-5, March 2021



Transect 3-5, March 2022



Transect 3-6, March 2021



Transect 3-6, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 3-7, March 2021



Transect 3-7, March 2022



Transect 3-8, March 2021



Transect 3-8, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 3-9, March 2021



Transect 3-9, March 2022



Transect 3-10, March 2021



Transect 3-10, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



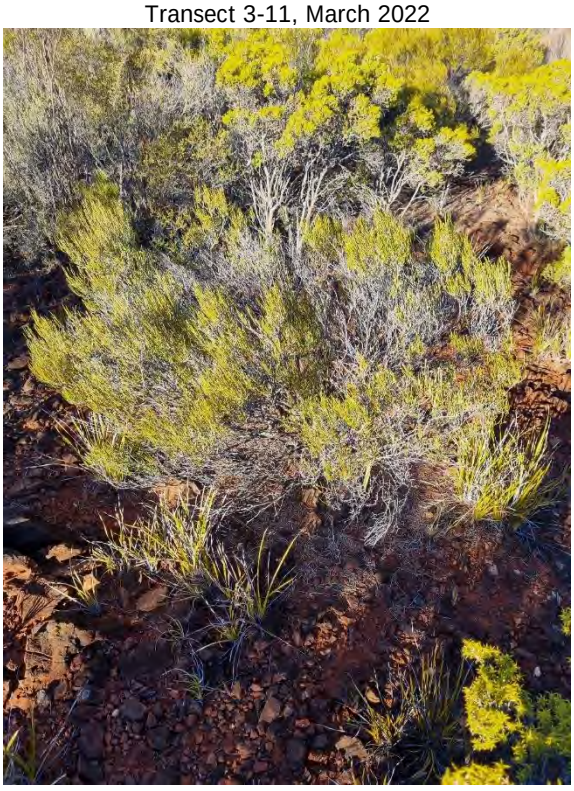
Transect 3-11, March 2021



Transect 3-11, March 2022



Transect 3-12, March 2021



Transect 3-12, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 3-13, March 2021



Transect 3-13, March 2022



Transect 3-14, March 2021



Transect 3-14, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



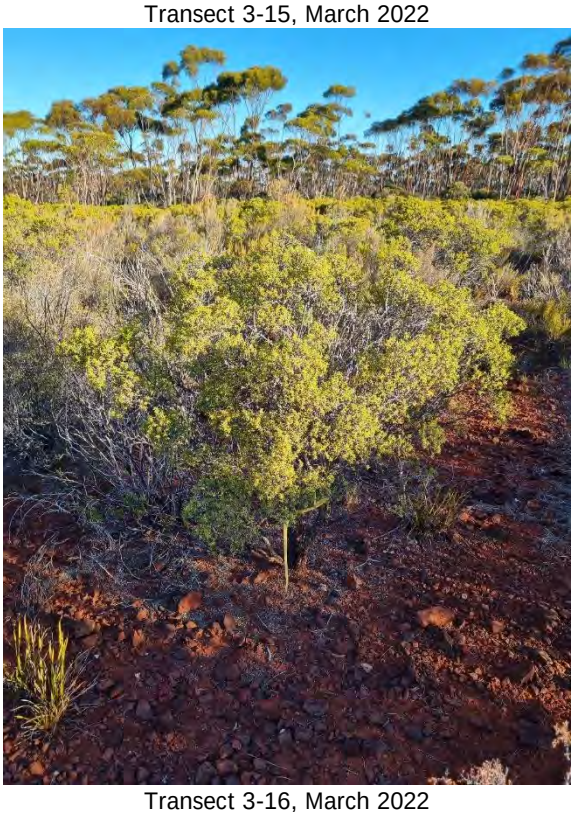
Transect 3-15, March 2021



Transect 3-15, March 2022



Transect 3-16, March 2021



Transect 3-16, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 3-17, March 2021



Transect 3-17, March 2022



Transect 3-18, March 2021



Transect 3-18, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 3-19, March 2021



Transect 3-19, March 2022



Transect 3-20, March 2021



Transect 3-20, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 4-1, March 2021



Transect 4-1, March 2022



Transect 4-2, March 2021



Transect 4-2, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 4-3, March 2021



Transect 4-3, March 2022



Transect 4-4, March 2021



Transect 4-4, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

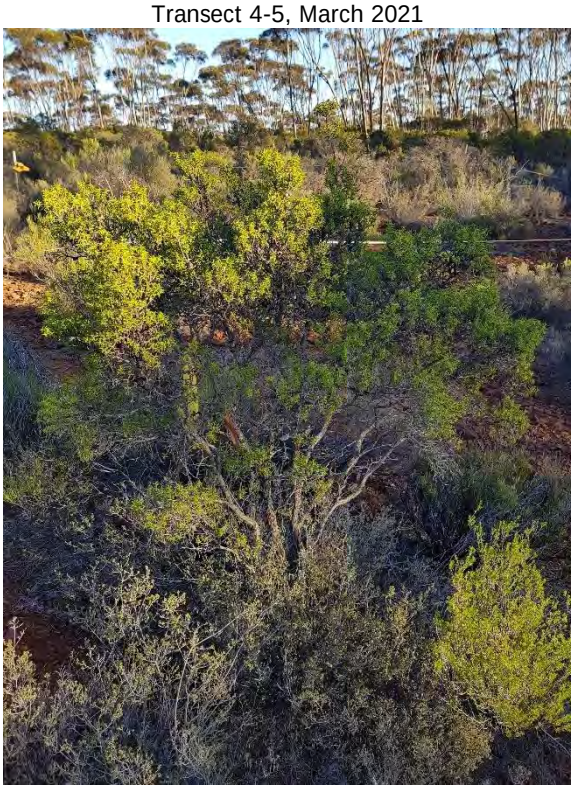
Photographs are labelled in sequence by transect and tagged plant number.



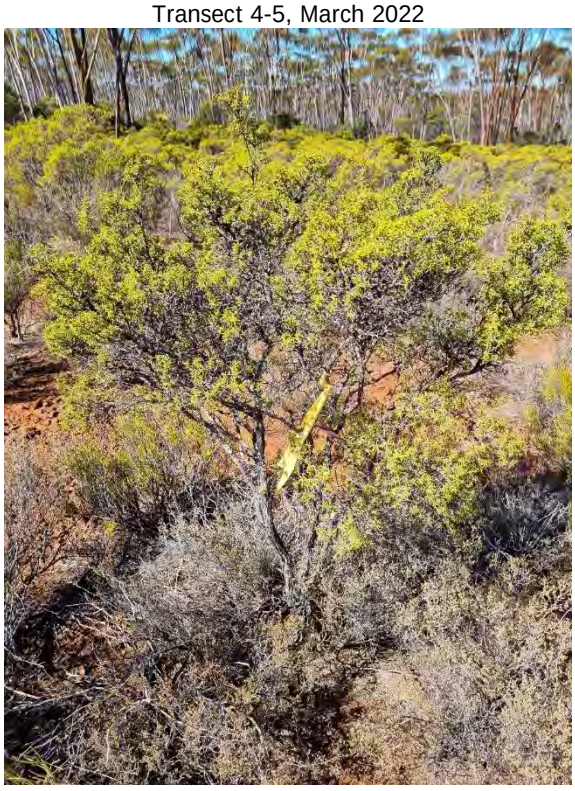
Transect 4-5, March 2021



Transect 4-5, March 2022



Transect 4-6, March 2021



Transect 4-6, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 4-7, March 2021



Transect 4-7, March 2022



Transect 4-8, March 2021



Transect 4-8, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 4-9, March 2021



Transect 4-9, March 2022



Transect 4-10, March 2021



Transect 4-10, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 4-11, March 2021



Transect 4-11, March 2022



Transect 4-12, March 2021



Transect 4-12, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 4-13, March 2021



Transect 4-13, March 2022



Transect 4-14, March 2021



Transect 4-14, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 4-15, March 2021



Transect 4-15, March 2022



Transect 4-16, March 2021



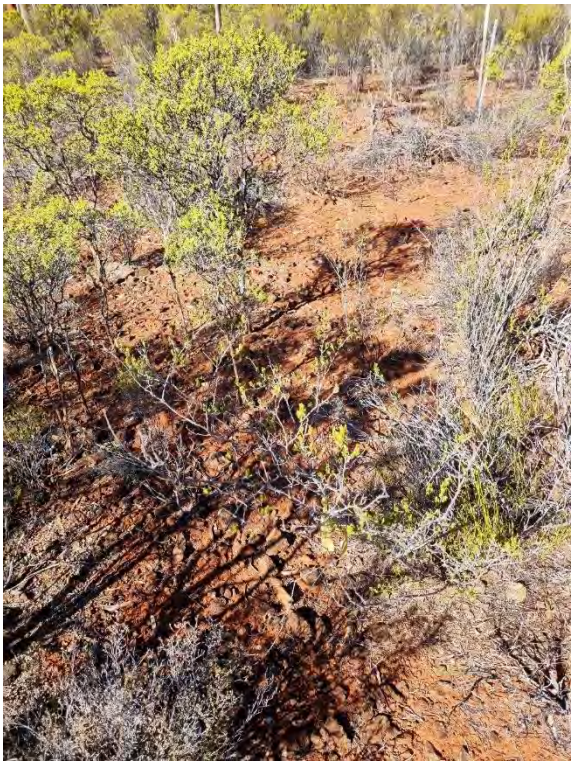
Transect 4-16, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 4-17, March 2021



Transect 4-17, March 2022



Transect 4-18, March 2021



Transect 4-18, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



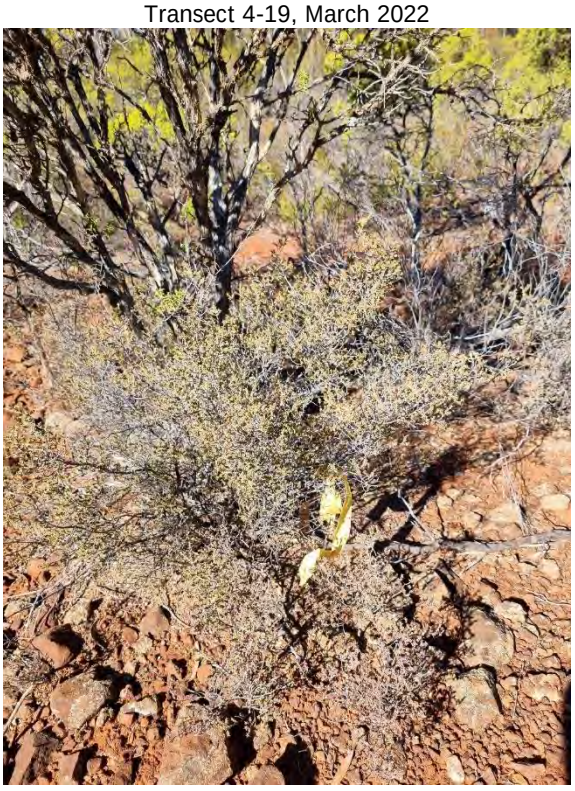
Transect 4-19, March 2021



Transect 4-19, March 2022



Transect 4-20, March 2021



Transect 4-20, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 6-1, March 2021



Transect 6-2, March 2021

Transect destroyed

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 6-3, March 2021



Transect 6-4, March 2021

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 6-5, March 2021



Transect 6-6, March 2021

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 6-7, March 2021



Transect 6-8, March 2021

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 6-9, March 2021



Transect 6-10, March 2021

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 6-11, March 2021



Transect 6-12, March 2021

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 6-13, March 2021



Transect 6-14, March 2021

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 6-15, March 2021



Transect 6-16, March 2021

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 6-17, March 2021



Transect 6-18, March 2021

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 6-19, March 2021



Transect 6-20, March 2021

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 7-1, March 2021



Transect 7-1, March 2022



Transect 7-2, March 2021



Transect 7-2, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 7-3, March 2021



Transect 7-3, March 2022



Transect 7-4, March 2021



Transect 7-4, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 7-5, March 2021



Transect 7-5, March 2022



Transect 7-6, March 2021



Transect 7-6, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 7-7, March 2021



Transect 7-7, March 2022



Transect 7-8, March 2021



Transect 7-8, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 7-9, March 2021



Transect 7-9, March 2022



Transect 7-10, March 2021



Transect 7-10, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 7-11, March 2021



Transect 7-11, March 2022



Transect 7-12, March 2021



Transect 7-12, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 7-13, March 2021



Transect 7-13, March 2022



Transect 7-14, March 2021



Transect 7-14, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 7-15, March 2021



Transect 7-15, March 2022



Transect 7-16, March 2021



Transect 7-16, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 7-17, March 2021



Transect 7-17, March 2022



Transect 7-18, March 2021



Transect 7-18, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 7-19, March 2021



Transect 7-19, March 2022



Transect 7-20, March 2021



Transect 7-20, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 8-1, March 2021



Transect 8-1, March 2022



Transect 8-2, March 2021



Transect 8-2, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 8-3, March 2021



Transect 8-3, March 2022



Transect 8-4, March 2021



Transect 8-4, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 8-5, March 2021



Transect 8-5, March 2022



Transect 8-6, March 2021



Transect 8-6, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 8-7, March 2021



Transect 8-7, March 2022



Transect 8-8, March 2021



Transect 8-8, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 8-9, March 2021



Transect 8-9, March 2022



Transect 8-10, March 2021



Transect 8-10, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 8-11, March 2021



Transect 8-11, March 2022



Transect 8-12, March 2021



Transect 8-12, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 8-13, March 2021



Transect 8-13, March 2022



Transect 8-14, March 2021



Transect 8-14, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 8-15, March 2021



Transect 8-15, March 2022



Transect 8-16, March 2021



Transect 8-16, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 8-17, March 2021



Transect 8-17, March 2022



Transect 8-18, March 2021



Transect 8-18, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 8-19, March 2021



Transect 8-19, March 2022



Transect 8-20, March 2021



Transect 8-20, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 9-1, March 2021



Transect 9-1, March 2022



Transect 9-2, March 2021



Transect 9-2, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 9-3, March 2021



Transect 9-3, March 2022



Transect 9-4, March 2021



Transect 9-4, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 9-5, March 2021



Transect 9-5, March 2022



Transect 9-6, March 2021



Transect 9-6, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 9-7, March 2021



Transect 9-7, March 2022



Transect 9-8, March 2021



Transect 9-8, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 9-9, March 2021



Transect 9-9, March 2022



Transect 9-10, March 2021



Transect 9-10, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 9-11, March 2021



Transect 9-11, March 2022



Transect 9-12, March 2021



Transect 9-12, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 9-13, March 2021



Transect 9-13, March 2022



Transect 9-14, March 2021



Transect 9-14, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 9-15, March 2021



Transect 9-15, March 2022



Transect 9-16, March 2021



Transect 9-16, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 9-17, March 2021



Transect 9-17, March 2022



Transect 9-18, March 2021



Transect 9-18, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 9-19, March 2021



Transect 9-19, March 2022



Transect 9-20, March 2021



Transect 9-20, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 10-1, March 2021



Transect 10-1, March 2022



Transect 10-2, March 2021



Transect 10-2, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 10-3, March 2021



Transect 10-3, March 2022



Transect 10-4, March 2021



Transect 10-4, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 10-5, March 2021



Transect 10-5, March 2022



Transect 10-6, March 2021



Transect 10-6, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 10-7, March 2021



Transect 10-7, March 2022



Transect 10-8, March 2021



Transect 10-8, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 10-9, March 2021



Transect 10-9, March 2022



Transect 10-10, March 2021



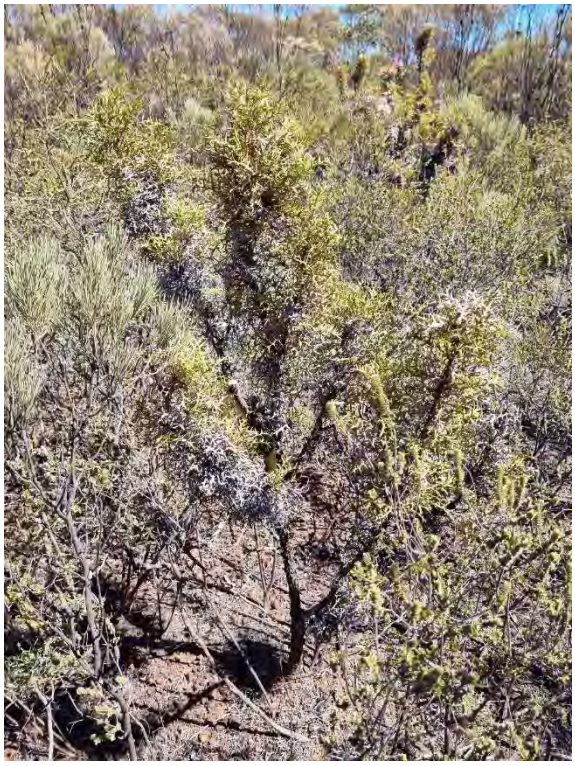
Transect 10-10, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 10-11, March 2021



Transect 10-11, March 2022



Transect 10-12, March 2021



Transect 10-12, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 10-13, March 2021



Transect 10-13, March 2022



Transect 10-14, March 2021



Transect 10-14, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 10-15, March 2021



Transect 10-15, March 2022



Transect 10-16, March 2021



Transect 10-16, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 10-17, March 2021



Transect 10-17, March 2022



Transect 10-18, March 2021



Transect 10-18, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 10-19, March 2021



Transect 10-19, March 2022



Transect 10-20, March 2021



Transect 10-20, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 11-1, March 2021



Transect 11-1, March 2022



Transect 11-2, March 2021



Transect 11-2, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 11-3, March 2021



Transect 11-3, March 2022



Transect 11-4, March 2021



Transect 11-4, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 11-5, March 2021



Transect 11-5, March 2022



Transect 11-6, March 2021



Transect 11-6, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 11-7, March 2021



Transect 11-7, March 2022



Transect 11-8, March 2021



Transect 11-8, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 11-9, March 2021



Transect 11-9, March 2022



Transect 11-10, March 2021



Transect 11-10, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 11-11, March 2021



Transect 11-11, March 2022



Transect 11-12, March 2021



Transect 11-12, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 11-13, March 2021



Transect 11-13, March 2022



Transect 11-14, March 2021



Transect 11-14, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 11-15, March 2021



Transect 11-15, March 2022



Transect 11-16, March 2021



Transect 11-16, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 11-17, March 2021



Transect 11-17, March 2022



Transect 11-18, March 2021



Transect 11-18, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 11-19, March 2021



Transect 11-19, March 2022



Transect 11-20, March 2021



Transect 11-20, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 12-1, March 2021



Transect 12-1, March 2022



Transect 12-2, March 2021



Transect 12-2, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 12-3, March 2021



Transect 12-3, March 2022



Transect 12-4, March 2021



Transect 12-4, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 12-5, March 2021



Transect 12-5, March 2022



Transect 12-6, March 2021

no photo available

Transect 12-6, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 12-7, March 2021



Transect 12-7, March 2022



Transect 12-8, March 2021



Transect 12-8, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 12-9, March 2021



Transect 12-9, March 2022



Transect 12-10, March 2021



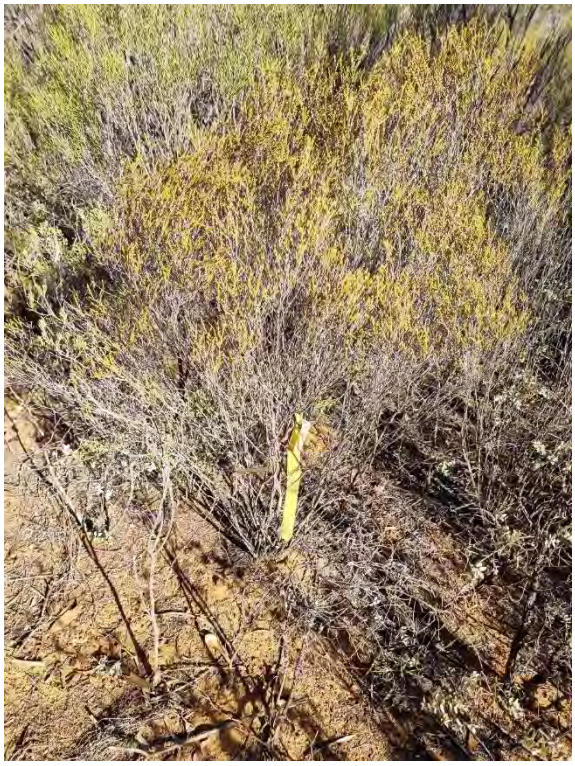
Transect 12-10, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 12-11, March 2021



Transect 12-11, March 2022



Transect 12-12, March 2021



Transect 12-12, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 12-13, March 2021



Transect 12-13, March 2022



Transect 12-14, March 2021



Transect 12-14, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 12-15, March 2021



Transect 12-15, March 2022



Transect 12-16, March 2021



Transect 12-16, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 12-17, March 2021



Transect 12-17, March 2022



Transect 12-18, March 2021



Transect 12-18, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 12-19, March 2021



Transect 12-19, March 2022



Transect 12-20, March 2021



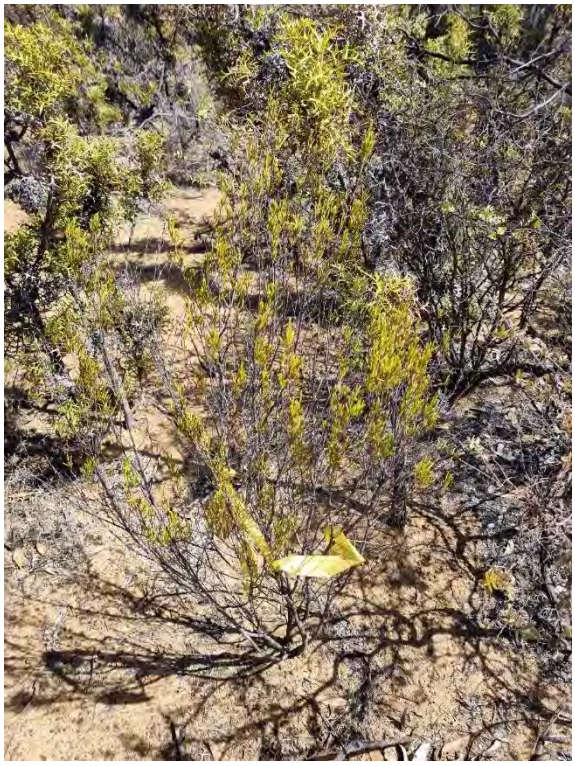
Transect 12-20, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 13-1, March 2021



Transect 13-1, March 2022



Transect 13-2, March 2021



Transect 13-2, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 13-3, March 2021



Transect 13-3, March 2022



Transect 13-4, March 2021



Transect 13-4, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 13-5, March 2021



Transect 13-5, March 2022



Transect 13-6, March 2021



Transect 13-6, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 13-7, March 2021



Transect 13-7, March 2022



Transect 13-8, March 2021



Transect 13-8, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 13-9, March 2021



Transect 13-9, March 2022



Transect 13-10, March 2021



Transect 13-10, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 13-11, March 2021



Transect 13-11, March 2022



Transect 13-12, March 2021

no photo available

Transect 13-12, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 13-13, March 2021



Transect 13-13, March 2022



Transect 13-14, March 2021



Transect 13-14, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 13-15, March 2021

no photo available

Transect 13-15, March 2022



Transect 13-16, March 2021

no photo available

Transect 13-16, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 13-17, March 2021



Transect 13-17, March 2022



Transect 13-18, March 2021



Transect 13-18, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 13-19, March 2021

no photo available



Transect 13-20, March 2021

Transect 13-16, March 2022



Transect 13-20, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 14-1, March 2021



Transect 14-1, March 2022



Transect 14-2, March 2021



Transect 14-2, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 14-3, March 2021



Transect 14-3, March 2022



Transect 14-4, March 2021



Transect 14-4, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 14-5, March 2021



Transect 14-5, March 2022



Transect 14-6, March 2021



Transect 14-6, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 14-7, March 2021



Transect 14-7, March 2022



Transect 14-8, March 2021



Transect 14-8, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 14-9, March 2021



Transect 14-9, March 2022



Transect 14-10, March 2021



Transect 14-10, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 14-11, March 2021



Transect 14-11, March 2022



Transect 14-12, March 2021



Transect 14-12, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 14-13, March 2021



Transect 14-13, March 2022



Transect 14-14, March 2021



Transect 14-14, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 14-15, March 2021



Transect 14-15, March 2022



Transect 14-16, March 2021



Transect 14-16, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 14-17, March 2021



Transect 14-17, March 2022



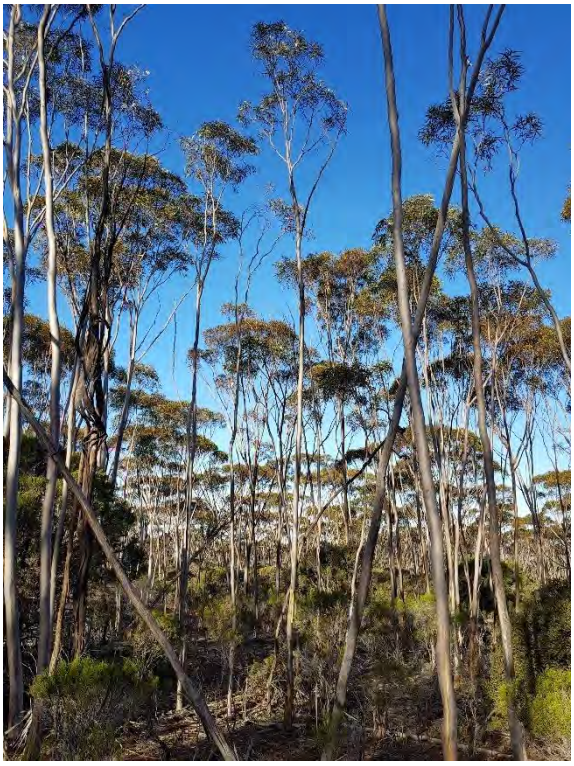
Transect 14-18, March 2021



Transect 14-18, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 14-19, March 2021



Transect 14-19, March 2022



Transect 14-20, March 2021



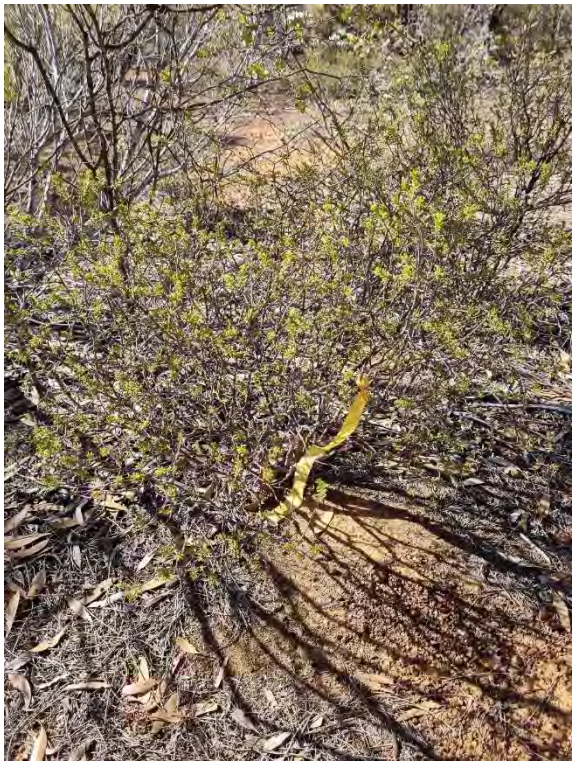
Transect 14-20, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 15-1, March 2021



Transect 15-1, March 2022



Transect 15-2, March 2021



Transect 15-2, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 15-3, March 2021



Transect 15-3, March 2022



Transect 15-4, March 2021



Transect 15-4, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.

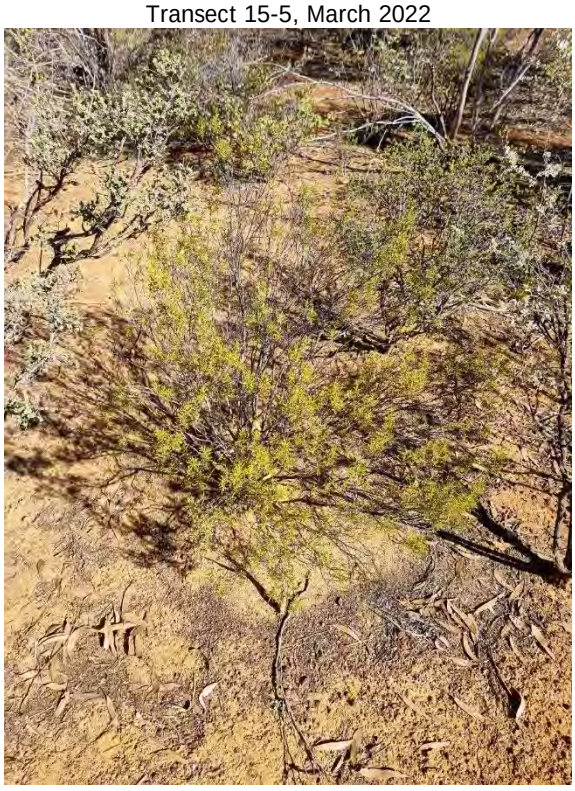


Transect 15-5, March 2021



Transect 15-5, March 2022

no photo available



Transect 15-6, March 2021

Transect 15-6, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 15-7, March 2021



Transect 15-7, March 2022



Transect 15-8, March 2021



Transect 15-8, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 15-9, March 2021



Transect 15-9, March 2022



Transect 15-10, March 2021



Transect 15-10, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 15-11, March 2021



Transect 15-11, March 2022



Transect 15-12, March 2021



Transect 15-12, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 15-13, March 2021



Transect 15-13, March 2022



Transect 15-14, March 2021



Transect 15-14, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 15-15, March 2021



Transect 15-15, March 2022



Transect 15-16, March 2021



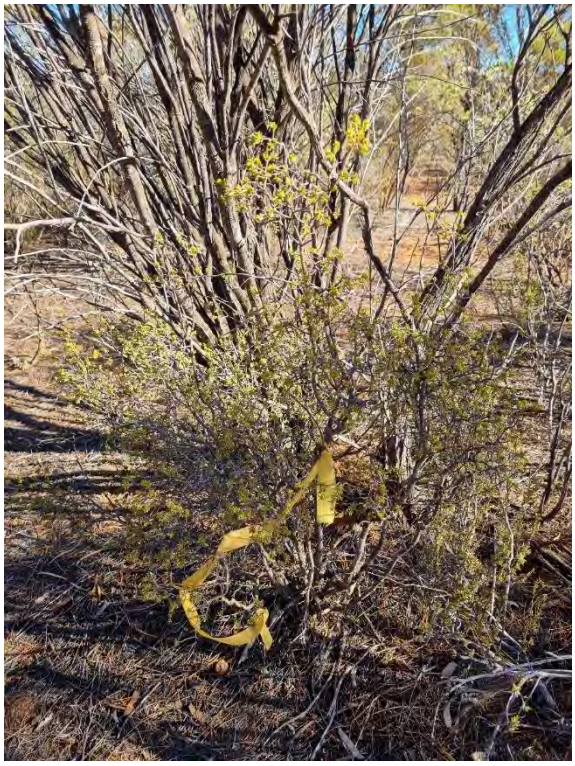
Transect 15-16, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 15-17, March 2021



Transect 15-17, March 2022



Transect 15-18, March 2021



Transect 15-18, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 15-19, March 2021



Transect 15-19, March 2022



Transect 15-20, March 2021



Transect 15-20, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 16-1, March 2021



Transect 16-1, March 2022



Transect 16-2, March 2021



Transect 16-2, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 16-2 (new), March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 16-3, March 2021



Transect 16-3, March 2022



Transect 16-4, March 2021



Transect 16-4, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 16-5, March 2021



Transect 16-5, March 2022



Transect 16-6, March 2021



Transect 16-6, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 16-7, March 2021



Transect 16-7, March 2022



Transect 16-8, March 2021



Transect 16-8, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



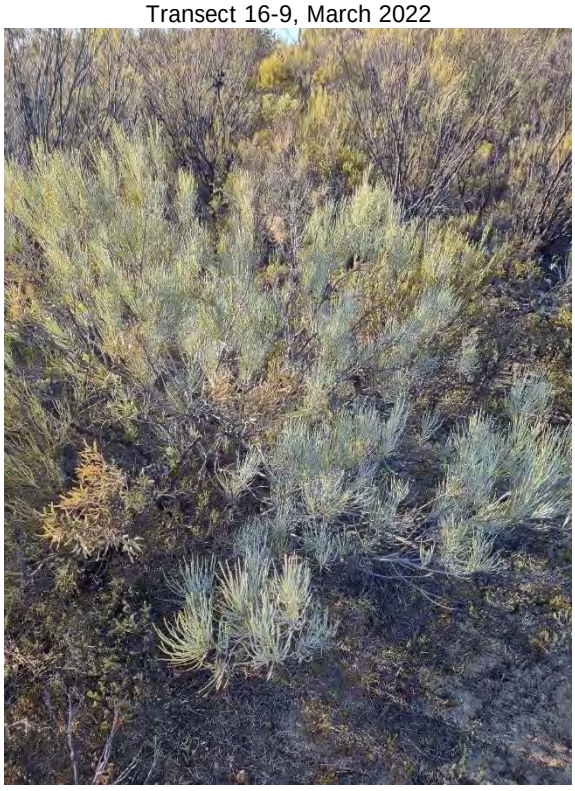
Transect 16-9, March 2021



Transect 16-9, March 2022



Transect 16-10, March 2021



Transect 16-10, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 16-11, March 2021



Transect 16-11, March 2022



Transect 16-12, March 2021



Transect 16-12, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 16-13, March 2021



Transect 16-13, March 2022



Transect 16-14, March 2021



Transect 16-14, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 16-15, March 2021



Transect 16-15, March 2022



Transect 16-16, March 2021



Transect 16-16, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 16-17, March 2021



Transect 16-17, March 2022



Transect 16-18, March 2021



Transect 16-18, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 16-19, March 2021



Transect 16-19, March 2022



Transect 16-20, March 2021



Transect 16-20, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 17-1, March 2021



Transect 17-1, March 2022



Transect 17-2, March 2021



Transect 17-2, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 17-3, March 2021



Transect 17-3, March 2022



Transect 17-4, March 2021



Transect 17-4, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 17-5, March 2021



Transect 17-5, March 2022



Transect 17-6, March 2021



Transect 17-6, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 17-7, March 2021



Transect 17-7, March 2022



Transect 17-8, March 2021



Transect 17-8, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 17-9, March 2021



Transect 17-9, March 2022



Transect 17-10, March 2021



Transect 17-10, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 17-11, March 2021



Transect 17-11, March 2022



Transect 17-12, March 2021



Transect 17-12, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 17-13, March 2021



Transect 17-13, March 2022



Transect 17-14, March 2021



Transect 17-14, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 17-15, March 2021



Transect 17-15, March 2022



Transect 17-16, March 2021



Transect 17-16, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 17-17, March 2021



Transect 17-17, March 2022



Transect 17-18, March 2021



Transect 17-18, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 17-19, March 2021



Transect 17-19, March 2022



Transect 17-20, March 2021



Transect 17-20, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 18-1, March 2021



Transect 18-1, March 2022



Transect 18-2, March 2021



Transect 18-2, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 18-3, March 2021



Transect 18-3, March 2022



Transect 18-4, March 2021



Transect 18-4, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 18-5, March 2021



Transect 18-5, March 2022



Transect 18-6, March 2021



Transect 18-6, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 18-7, March 2021



Transect 18-7, March 2022



Transect 18-8, March 2021



Transect 18-8, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 18-9, March 2021



Transect 18-9, March 2022



Transect 18-10, March 2021



Transect 18-10, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 18-11, March 2021



Transect 18-11, March 2022



Transect 18-12, March 2021



Transect 18-12, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 18-13, March 2021



Transect 18-13, March 2022



Transect 18-14, March 2021



Transect 18-14, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 18-15, March 2021



Transect 18-15, March 2022



Transect 18-16, March 2021



Transect 18-16, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 18-17, March 2021



Transect 18-17, March 2022



Transect 18-18, March 2021



Transect 18-18, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 18-19, March 2021



Transect 18-19, March 2022



Transect 18-20, March 2021



Transect 18-20, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 19-1, March 2021



Transect 19-1, March 2022



Transect 19-2, March 2021



Transect 19-2, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 19-3, March 2021



Transect 19-3, March 2022



Transect 19-4, March 2021



Transect 19-4, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 19-5, March 2021



Transect 19-5, March 2022



Transect 19-6, March 2021



Transect 19-6, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 19-7, March 2021



Transect 19-7, March 2022



Transect 19-8, March 2021



Transect 19-8, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 19-9, March 2021



Transect 19-9, March 2022



Transect 19-10, March 2021



Transect 19-10, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 19-11, March 2021



Transect 19-11, March 2022



Transect 19-12, March 2021



Transect 19-12, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 19-13, March 2021



Transect 19-13, March 2022



Transect 19-14, March 2021



Transect 19-14, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 19-15, March 2021



Transect 19-15, March 2022



Transect 19-16, March 2021



Transect 19-16, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 19-17, March 2021



Transect 19-17, March 2022



Transect 19-18, March 2021

no photo available

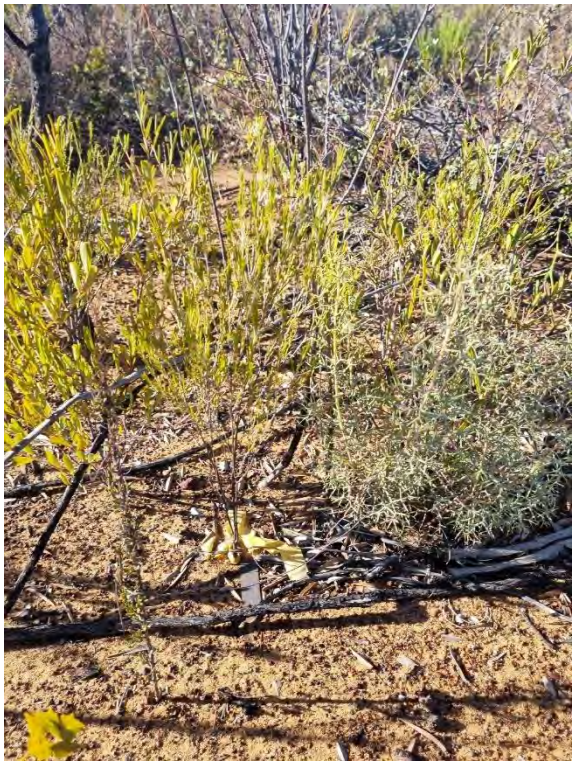
Transect 19-18, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 19-19, March 2021



Transect 19-19, March 2022



Transect 19-20, March 2021



Transect 19-20, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 20-1, March 2021



Transect 20-1, March 2022



Transect 20-2, March 2021



Transect 20-2, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 20-3, March 2021



Transect 20-3, March 2022



Transect 20-4, March 2021



Transect 20-4, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 20-5, March 2021



Transect 20-5, March 2022



Transect 20-6, March 2021



Transect 20-6, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 20-7, March 2021



Transect 20-7, March 2022



Transect 20-8, March 2021



Transect 20-8, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 20-9, March 2021



Transect 20-9, March 2022



Transect 20-10, March 2021



Transect 20-10, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 20-11, March 2021



Transect 20-11, March 2022



Transect 20-12, March 2021



Transect 20-12, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 20-13, March 2021



Transect 20-13, March 2022



Transect 20-14, March 2021



Transect 20-14, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 20-15, March 2021



Transect 20-15, March 2022



Transect 20-16, March 2021



Transect 20-16, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 20-17, March 2021



Transect 20-17, March 2022



Transect 20-18, March 2021



Transect 20-18, March 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 20-19, March 2021



Transect 20-19, March 2022



Transect 20-20, March 2021



Transect 20-20, March 2022

Appendix J Vegetation Condition Monitoring Spring

©JBS&G Australia Pty Ltd

EARL GREY LITHIUM PROJECT

VEGETATION CONDITION MONITORING

Spring 2022

Prepared By

Mattiske Consulting Pty Ltd

Prepared For

Covalent Lithium Pty Ltd

January 2023



DOCUMENT STATUS				
DOCUMENT REFERENCE: CLL2204/002/23				
VERSION	TYPE	AUTHOR/S	REVIEWER/S	DATE DISTRIBUTED
V1	Internal review	Ashley Pereira	Zac Sims	
V2	Draft for client	Ashley Pereira	L. Mattiske	19/01/2023
FINAL	Final report			

(ACN 063 507 175, ABN 39 063 507 175)

PO Box 437
Kalamunda WA 6926
Phone: +61 8 9257 1625
Email: admin@mattiske.com.au

COPYRIGHT AND DISCLAIMER

Copyright

The information contained in this report is the property of Mattiske Consulting Pty Ltd. The use or copying of the whole or any part of this report without the written permission of Mattiske Consulting Pty Ltd is not permitted.

Disclaimer

This report has been prepared on behalf of and for the exclusive use of Covalent Lithium Pty Ltd and is subject to and issued in accordance with the agreement between Covalent Lithium Pty Ltd and Mattiske Consulting Pty Ltd. This report is based on the scope of services defined by Covalent Lithium Pty Ltd, the budgetary and time constraints imposed by Covalent Lithium Pty Ltd, and the methods consistent with the preceding.

Mattiske Consulting Pty Ltd has utilised information and data supplied by Covalent Lithium Pty Ltd (and its agents), and sourced from government databases, literature, departments and agencies in the preparation of this report. Mattiske Consulting Pty Ltd has compiled this report on the basis that any supplied or sourced information and data was accurate at the time of publication. Mattiske Consulting Pty Ltd accepts no liability or responsibility whatsoever for the use of, or reliance upon, the whole or any part of this report by any third party.

TABLE OF CONTENTS

Page

EXECUTIVE SUMMARY 1

1. INTRODUCTION 2

1.1 Scope of plant condition monitoring 2
1.2 Potential impacts to flora and vegetation 4
1.3 Climate 4

2. METHODS 5

2.1. Plant condition monitoring transect location and design 5
2.2. Survey data collection 5
2.2.1. Transect location and photographic record 5
2.2.2. Plant species data 7
2.2.3. Tagged plant species 7
2.2.4. Vegetation disturbance scale 9
2.3. Vegetation condition triggers 9

3. RESULTS 10

3.1. Survey limitations 10
3.2. Flora 10
3.3. Species richness 12
3.4. Species projected foliage cover 12
3.5. Tagged species 13
3.6. Comparison of September 2021 and September 2022 data 15
3.7. Photographic records 15

4. DISCUSSION 16

4.1. Flora and Vegetation 16
4.2. Plant health 16

5. RECOMMENDATION 17

6. CONCLUSION 17

7. PERSONNEL 18

8. REFERENCES 19

TABLES

1: Summary of all baseline plant condition monitoring surveys

2: Plant condition scoring

3: Attributes scale

4: Vegetation condition scale

5: Potential survey limitations for the establishment of plant condition monitoring transects

6: Plant species richness per transect, September 2022

FIGURES

1: Earl Grey Lithium Project: Locality

2: Rainfall and temperature data for Narembeen

3: Plant condition monitoring transect locations

4: Sum of alive and dead projected foliage cover at plant condition monitoring transects, September 2022

5: Average canopy health scores for 20 tagged plants at each plant condition monitoring transect, September 2022

6: Control-Impact paired transect differential health scores, September 2022

7: Percentage difference in average canopy health scores for 20 tagged plants, between September 2021 (last survey) and September 2022 (this survey) at each vegetation health monitoring transect.

APPENDICES

A: Vascular plant species recorded within plant condition monitoring transects, September 2022

B: Vascular plant species recorded at each plant condition monitoring transect, September 2022

C: Health scores for individually tagged plants at plant condition monitoring transects, September 2022

D: Photographic record of plant condition monitoring transects, September 2022

E: Photographic record of tagged species at plant condition monitoring transects, September 2022

LIST OF ABBREVIATIONS

BC Act:	*Biodiversity Conservation Act 2016* (WA)
BOM:	Bureau of Meteorology
Covalent:	Covalent Lithium Pty Ltd
DBCA:	Department of Biodiversity, Conservation and Attractions
EGLP:	Earl Grey Lithium Project
EPA:	Environmental Protection Authority
EPBC Act:	*Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth)
FVMP:	Flora and Vegetation Management Plan
Mattiske Consulting:	Mattiske Consulting Pty Ltd
MS1118	Ministerial Statement 1118
PEA:	Plant pigment efficiency analyser
TSF:	Tailings Storage Facility
WAH:	Western Australian Herbarium (PERTH)
Wescef	Wesfarmers Chemicals, Energy and Fertilisers Limited
WRD	Waste Rock Dump
VEZ	Vegetation exclusion zone (as defined in MS1118)

EXECUTIVE SUMMARY

The Earl Grey Lithium Project is owned by Covalent Lithium Pty Ltd. Ministerial approval for the implementation of the development of the Earl Grey Lithium Project was provided under Ministerial Statement 1118 in November of 2019. In order to meet Condition 6 of Ministerial Statement 1118, Covalent Lithium Pty Ltd has developed a Flora and Vegetation Management Plan (FVMP), which is intended to meet the key environmental outcome of condition 6-1(1) of Ministerial Statement 1118, which states:

- The proponent shall ensure there is no proposal-related direct or adverse indirect impacts to flora and vegetation within the exclusion zones as shown on Figure 3 and delineated by coordinates in Schedule 2.

The FVMP involves the monitoring of plant condition, dust deposition and weed monitoring in order to:

- determine if there are any changes occurring to flora and vegetation condition and health in the vegetation exclusion zones;
- assess whether any changes in flora and vegetation are due to the project or external/natural factors; and,
- provide a methodology for ongoing monitoring to enable time-based comparisons.

The plant condition monitoring program, designed to provide an assessment of the vegetation condition, will be undertaken at permanent representative sites within vegetation exclusion zones and at control sites away from any proposal related indirect effects. The FVMP provides for two mechanisms to assess plant condition:

- A visual (qualitative) assessment of a range of parameters (vegetation condition, leaf die-off, new tip growth, epicormic growth, reproductive state and insect damage); and
- A quantitative assessment, using a plant pigment efficiency analyser, to measure chlorophyll fluorescence.

A total of 19 plant condition monitoring transects were established, comprising nine control and ten impact transects. Of these 19, five were established in October of 2019. The remaining 14 transects were established in October 2020 over the course of two separate field visits. Earlier this year, prior to monitoring, Transect 6 was cleared for mine expansion and hence was not monitored in September 2022.

Construction of the Earl Grey Lithium Project commenced in July 2021, representing the commencement of the vegetation disturbance monitoring. Given that construction of the EGLP commenced approximately a year prior to this survey in March 2022, disturbances surrounding all impact transects are still minimal.

The intent of the present survey is ensuring that pre-construction baseline data is gathered across seasons and years to enable any changes to plant conditions to meaningfully be assessed over the longer operational phases.

The vegetation condition in impact transects, best represented by the mean canopy health score, were all less than 20% different to the corresponding control transects and thereby complying with the threshold as defined in the FVMP (Covalent 2020). The changes in vegetation condition observed between this survey and the last spring survey in October 2020 can most likely be attributed to the variation in different observers' qualitative canopy health scores, and variation in rainfall. Future surveys aim to minimise this variation with the use of quantitative plant pigment efficiency analyser (PEA) measurements of plant health.

1. INTRODUCTION

The Earl Grey Lithium Project (EGLP) is owned by Covalent Lithium Pty Ltd (Covalent). Covalent is a joint venture between Wesfarmers Chemicals, Energy and Fertilisers Limited (Wescef) and Sociedad Quimica y Minera de Chile.

Ministerial approval for the implementation of the development of the EGLP was provided under Ministerial Statement 1118 (MS1118) in November of 2019. In order to meet Condition 6 of MS1118, Covalent have developed a Flora and Vegetation Management Plan (FVMP). The Covalent FVMP (2020) aims to meet the key environmental outcome of condition 6-1(1) of MS1118, which states:

- The proponent shall ensure there is no proposal-related direct or adverse indirect impacts to flora and vegetation within the exclusion zones as shown on Figure 3 and delineated by coordinates in Schedule 2.

Construction of the EGLP commenced in July 2021 following the receival of all critical approvals (Wesfarmers Limited 2021). Mattiske Consulting undertook this spring survey of the vegetation disturbance monitoring transects between 4th and 9th September 2022.

1.1 Scope of plant condition monitoring

The EGLP lies within the Eremaean Botanical Province (Beard 1990). The EGLP, which is located approximately 105 km southeast of the town of Southern Cross, is situated on the abandoned Bounty Gold Mine (Figure 1).

The FVMP (Covalent 2020) involves the monitoring of plant condition, dust deposition and weed monitoring in order to:

- determine if there are any changes occurring to flora and vegetation condition and health in the vegetation exclusion zones (VEZs);
- assess whether any changes in flora and vegetation are due to the Project or external/natural factors; and,
- provide a methodology for ongoing monitoring to enable time-based comparisons.

The plant condition monitoring program, designed to provide an assessment of the vegetation condition, will be undertaken at permanent representative sites within the VEZs and control sites away from any proposal related indirect effects (Covalent 2020, Mattiske Consulting 2021a). Each monitoring transect consists of a quadrat 10 m by 40 m arranged linearly with four sub-quadrats of 10m x 10m (Mattiske Consulting 2021a). The FVMP (Covalent 2020) provides for two mechanisms to assess plant condition:

- A visual (qualitative) assessment of a range of parameters (vegetation condition, leaf die-off, new tip growth, epicormic growth, reproductive state and insect damage); and,
- A quantitative assessment, using a plant pigment efficiency analyser, to measure chlorophyll fluorescence.

To date, only qualitative assessments have been made of the plant condition at each transect, at the request of Covalent. Dust deposition monitoring, at this time, will be addressed directly by Covalent. Weed monitoring was initially undertaken in the winter/spring of 2019 / 2020. This consisted of broad scale weed surveys across the EGLP project area to ascertain the range and locations of weed species present within the project area (principally existing cleared areas, exploration drill tracks and drill pads). A report summarising the findings of these surveys has been prepared (Mattiske Consulting 2020). Ongoing weed monitoring will consist of monitoring in transects which form the plant condition monitoring transects, monitoring of areas where weeds are currently established, together with routine surveys across the project area to ascertain if any new weed infestations occur within the project area.



N

0 5 10 km

Scale: 1:750,000
MGA94 (Zone 50)

CAD Ref: a2445_f33_01

Date: February 2021 | Rev: A | A4

Mattiske Consulting Pty Ltd

28 Central Road, Kalamunda WA 6076 ~ Tel: 9257 1625 ~ Fax: 9257 1640

Author: E M Matttiske | MCPL Ref: CLL2008/32/20

Drawn: CAD Resources ~ www.cadresources.com.au
Tel: (08) 9246 3242 ~ Fax (08) 9246 3202

Covalent Lithium Pty Ltd

Earl Grey Lithium Project

Locality

Figure: **1**

1.2 Potential impacts to flora and vegetation

Given that construction commenced nine months prior to the current survey, the September 2021 survey (this report) can be considered the fourth and part of baseline data recording prior to commencement of construction. Baseline plant condition monitoring consists of three baseline monitoring events undertaken in the spring (Mattiske Consulting 2021a, this report), and one post-summer survey (Mattiske Consulting 2021b), prior to commencement of construction (Table 1). This is to provide data in the post-winter and dry summer periods to establish typical plant responses to the annual weather cycle. Mine construction and subsequent operation could potentially impact the flora and vegetation adversely through a range of potential impacts, including:

- the clearing of native vegetation;
- altered local hydrology as a result of changes to surface water flow patterns, water table draw down, including the associated potential to cause erosion;
- the potential use or release of local, hypersaline water within the project area;
- dust deposition from vehicles, mining operations, stockpiles and cleared areas on adjacent native vegetation;
- the potential for vehicles to bring introduced plant species on-site, particularly given that vehicles transiting on/off site pass through the adjacent Wheatbelt agricultural areas;
- introduction of pathogens, such as die-back (e.g., *Phytophthora* sp.);
- failure to adhere to clearing boundaries within the project area;
- unauthorised vehicle access to areas of native vegetation; and
- release of contaminated water or solvents from operational facilities, including but not limited to waste landforms, tailings storage facility (TSF) and processing plants areas.

Table 1: Summary of all baseline plant condition monitoring surveys

SURVEY TIMING	SURVEY DESCRIPTION	REFERENCE
Spring 2019	Establishment and survey of five of 19 transects	Mattiske Consulting 2021a
Spring 2020	Establishment and survey of 14 transects and reassess the five transects established in 2019	Mattiske Consulting 2021a
Autumn 2021	Reassess all 19 transects	Mattiske Consulting 2021b
Spring 2021	Reassess all 19 transects	Mattiske Consulting 2021c
Autumn 2022	Reassess all 18 transects (Transect 6 removed due to site being cleared).	Mattiske Consulting 2021d
Spring 2022	Reassess all 18 transects (Transect 6 removed due to site being cleared).	This Report

1.3 Climate

Beard (1990) described the climate of the wider region containing the EGLP as Mediterranean, with a pronounced winter maximum and long dry summer, and annual precipitation of just over 335.3mm, consistent with descriptions of a characteristically arid to semi-arid climate with 200-300 mm of precipitation (Beard 1990, Cowan *et al.*, 2001). Narembeen, which is located approximately 130 km west of the EGLP has an average annual rainfall of 334.7 mm (Bureau of Meteorology, BOM 2022). Rainfall and temperature data for Narembeen is illustrated in Figure 2.

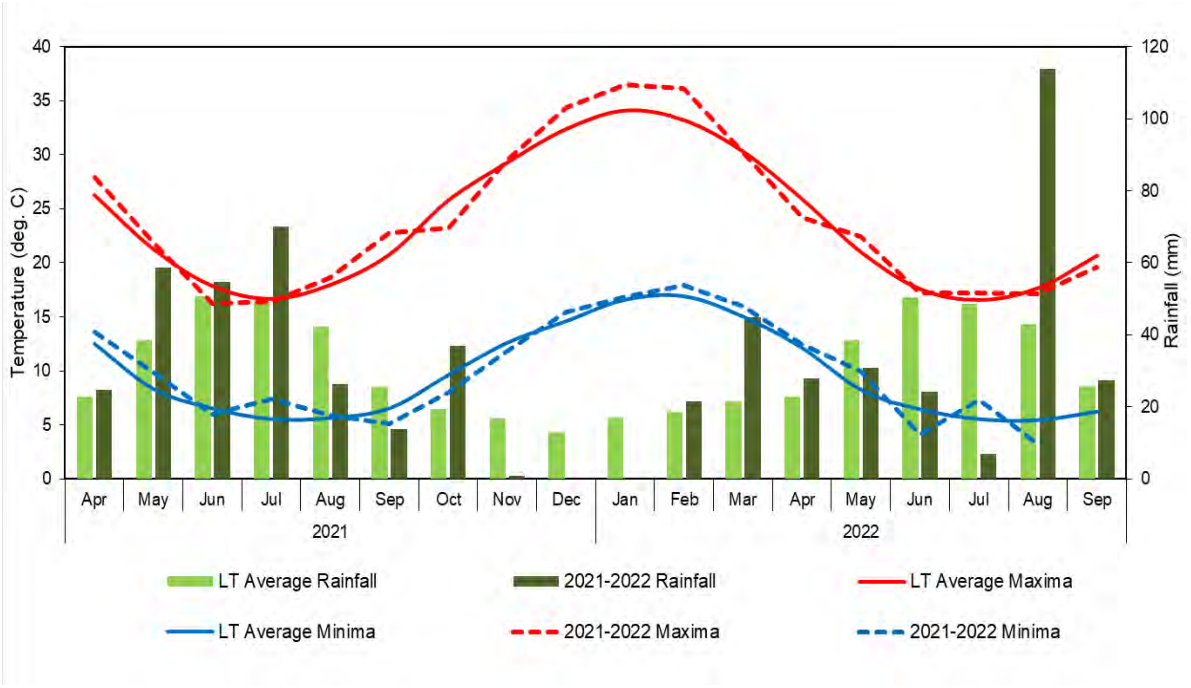


Figure 2: Rainfall and temperature data for Narembeen (Station No. 10612)
Long term average rainfall and temperature data, together with monthly rainfall data for the period April 2021 to September 2022 (BOM 2022).

2. METHODS

2.1. Plant condition monitoring transect location and design

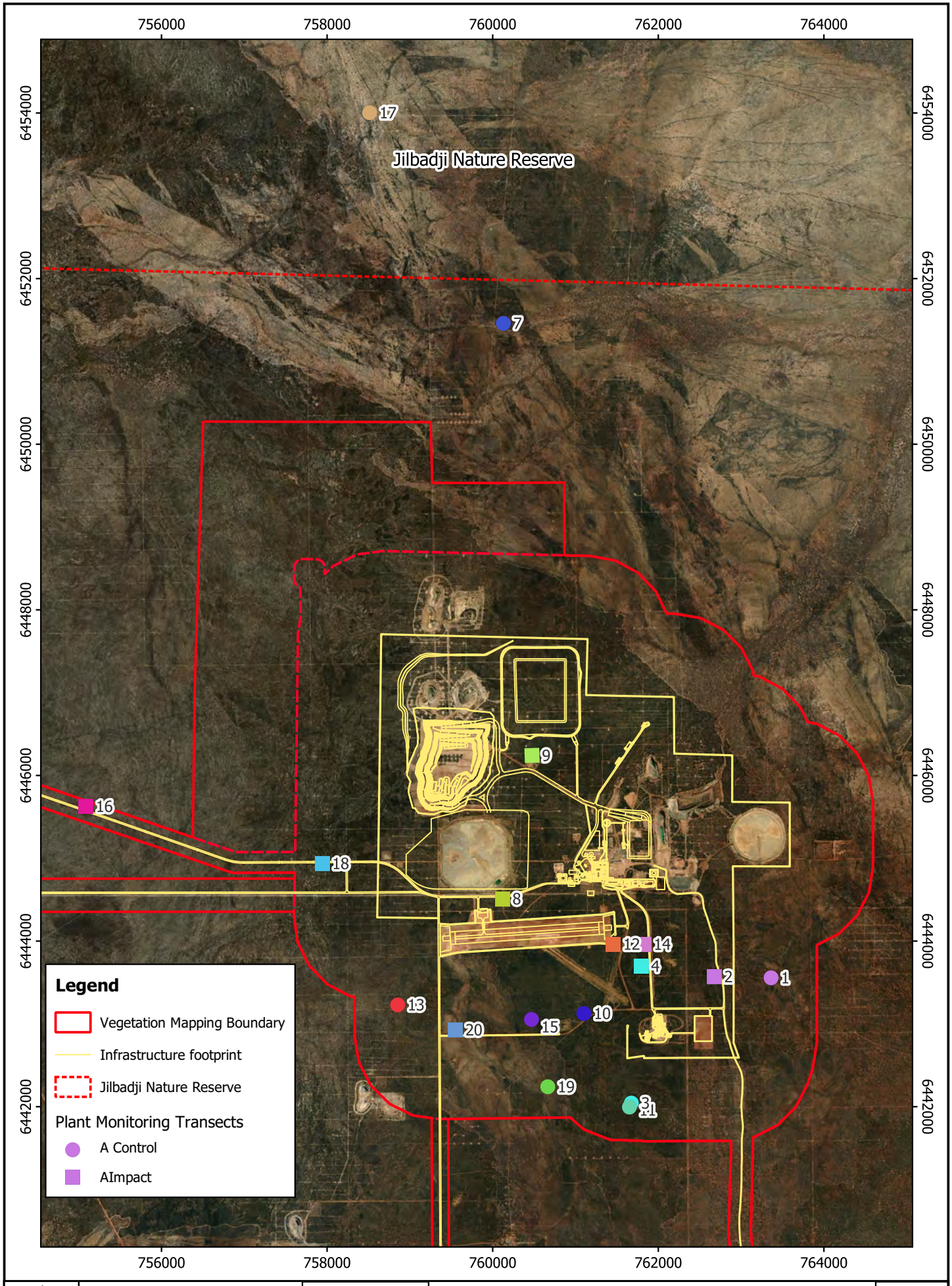
Plant condition monitoring transect sites were selected based a number of factors set out by Mattiske Consulting (2021a). Principally, plant condition monitoring transects were established in vegetation communities and conservation significant flora populations representative of those within the EGLP development envelope. Plant condition monitoring transect locations are illustrated in Figure 3.

Permanent plant condition monitoring transects cover an area equivalent to a 20 m x 20 m quadrat in size, to conform to the recommended survey quadrat size for the bioregion (Environmental Protection Authority Technical Guidance, EPA 2016). Each transect comprises four 10 m x 10 m sub-quadrats arranged as a belt transect. In the case of impact transects, one end of the transect is located within 10 m of an impact area, with the remaining three transects being aligned adjacent to and perpendicular to the impact area. This arrangement will provide scope to assess plant condition with respect to distance from the impact area (Mattiske Consulting 2021a).

2.2. Survey data collection

2.2.1. Transect location and photographic record

At each transect the geographic coordinates of the north-west and south-west corners of the transect were recorded. A photograph was taken from the north-west corner of each of the four sub-quadrats facing in the direction of the south-east corner of the sub-quadrat, to provide long term temporal imagery of the transect.



N
MGA 94
Zone 50

0 1 2 km
Scale 1:60,000
Author: A. Pereira 23rd July 2022

Mattiske
28 Central Rd
Kalamunda WA 6076
Tel: 92571625

Covalent Lithium Pty Ltd
Earl Grey Lithium Project
Location of Vegetation Monitoring Transects

Figure:
3

2.2.2. Plant species data

Within each sub-quadrat, the following data was recorded:

- all plant species, both native and introduced;
- the average height of each species present; and,
- the estimated percentage projected foliage cover (dead/alive) for each species;

Population counts for each plant species were not recorded during this this survey as they were during the transect establishment.

All plant specimens collected during the field survey were dried and processed in accordance with the requirements of the Western Australia Herbarium (WAH). All plant specimens were identified through comparisons with pressed specimens housed at the Mattiske Consulting herbarium and the WAH. Where appropriate, plant taxonomists with specialist skills were consulted. Nomenclature of the species recorded is in accordance with the WAH (1998-).

2.2.3. Tagged plant species

When each of the plant condition monitoring transects were established in 2019 and 2020, five (dominant/keystone) species were tagged in each sub-quadrat of each transect. Wherever possible the same five species were tagged in each sub-quadrat of each transect to provide for replication (Mattiske Consulting 2021a). The visual assessment of a range of parameters to assist in determining plant health score, was based on a stem classification system which has been used by Mattiske Consulting on numerous projects, together with a modification of the method of Souter *et al*. (2009), to provide for visual assessments of a range of other characters. The range of visual characters used to assess plants has been designed to reduce inter-operator error when making assessments in the field.

Plant condition was primarily measured by determining the extent and density of the foliage on the plant, or the crown cover of a tree (Table 2). In addition, a range of attributes were scored to standardise the visual assessment process. Some of the attributes are positive, in terms of plant health – signs of reproduction or new foliage growth. Some of the attributes are negative, in terms of plant health – increasing levels of leaf discolouration and death, insect damage. The attributes scored were:

- leaf die-off
- new tip growth
- reproductive state
- epicormic growth
- insect damage

These attributes were assessed using the scale set out in Table 3. A photograph of each tagged plant was taken to provide for a visual temporal record.

Table 2: Plant condition scoring

CONDITION	FACTORS
Healthy (score = 4)	• > 90% of foliage present • canopy is intact • if a tree or mallee, then no epicormic growth present • none or little indication of leaf discolouration or loss • none to minor evidence of insect damage, no fungal or other pathogen attack
Slightly stressed (score = 3)	• 75% - 90% of foliage present • some minor canopy loss • if a tree or mallee, then no epicormic growth present • minor evidence of leaf discolouration; potentially some dead leaves on branch tips • minor evidence of insect damage, fungal or other pathogen attack
Stressed (score = 2)	• 50% - 75% of foliage present • moderate canopy loss • if a tree or mallee, then none to some epicormic growth present • evidence of leaf discolouration; evident damage to leaves significant • evidence of insect, fungal or other pathogen attack obvious
Very stressed (score = 1)	• < 50% of foliage present • major canopy loss • if a tree or mallee, then epicormic growth likely • leaf discolouration significant; evident damage to leaves significant • evidence of insect, fungal or other pathogen attack obvious
Dead (score = 0)	• plant dead • foliage may present, but IS brown and desiccated. If a tree then the bark is still attached (DR – dead recent) • foliage is absent, fine twigs still present. If a tree, bark may be present (DM – dead moderate) • foliage and fine twigs absent. If a tree, the barks is also absent (DO- dead old)

Table 3: Attribute scale

SCORE	DESCRIPTION
0	Absent - effect is not present
1	Scarce - effect is not obvious in a cursory examination, but is present.
2	Common - effect is clearly visible
3	Abundant - effect dominates the appearance of the shrub / tree

2.2.4. Vegetation disturbance scale

The overall condition of the vegetation at each transect was assessed, based on the vegetation condition scale of Trudgen (1988), for assessment of disturbance within the Eremaean and Northern Botanical Provinces. The disturbance scale is set out in Table 4.

Table 4: Vegetation condition scale (adapted from Trudgen, 1988)

VEGETATION CONDITION	DESCRIPTION
Excellent (Ex)	Pristine or nearly so, no obvious signs of damage caused by human activities since European settlement.
Very Good (VG)	Some relatively slight signs of damage caused by human activities since European settlement. For example, some signs of damage to tree trunks caused by repeated fire, the presence of some relatively non-aggressive weeds, or occasional vehicle tracks.
Good (G)	More obvious signs of damage caused by human activity since European settlement, including some obvious impact on the vegetation structure such as that caused by low levels of grazing or slightly aggressive weeds.
Poor (P)	Still retains basic vegetation structure or ability to regenerate it after very obvious impacts of human activities since European settlement, such as grazing, partial clearing, frequent fires or aggressive weeds.
Degraded (D)	Severely impacted by grazing, very frequent fires, clearing or a combination of these activities. Scope for some regeneration but not to a state approaching good condition without intensive management. Usually with a number of weed species present including very aggressive species.
Completely Degraded (CD)	Areas that are completely or almost completely without native species in the structure of their vegetation; i.e. areas that are cleared or 'parkland cleared' with their flora comprising weed or crop species with isolated native trees or shrubs.

2.3. Vegetation condition triggers

Section 2 of the FVMP (Covalent 2020) specifies threshold criteria in terms of changes (declines) in plant health condition scores which will trigger investigations to determine if the changes are attributable to the Project, and if so, what management measures are required to be put in place to meet the defined environmental outcomes. The defined environmental outcome is that no proposal related indirect impacts will occur within a VEZ. The threshold level for a statistically significant reduction in mean vegetation condition rating is a 20% decline in vegetation health within a VEZ in comparison to the relevant control transect.

Section 2 of the FVMP (Covalent 2020) also specifies that, where a plant pigment efficiency analyser (PEA) is used to derive quantitative plant health data based on the index of chlorophyll fluorescence (Fv/Fm), a Fv/Fm value of <0.6 will be used as an indicator of stress. The PEA records a score of between 0.0 to 1 for Fv/Fm with most plant taxa being considered healthy within a range of 0.7 to 0.8 (Kalaji *et al.* 2014). When plants are experiencing stress, the ratio may decline and potentially represent a reduction in physiological function or healthy function of the plant. To date, it has generally been accepted that a Fv/Fm score of <0.6 in most regions is an indicator a plant is stressed (Kalaji *et al.* 2014).

3. RESULTS

During this survey only 18 of the 19 transects were monitored. This is due to the clearance of Transect 6 for mine expansion between the Spring 2021 and Autumn 2022 surveys. Transect 6 was set up as an Impact site to monitor (*Microcorys* sp. Mt Holland broad-leaf) and previously did not have a Control site to measure and compare possible vegetation condition impacts.

3.1. Survey limitations

A general assessment was made of the current survey against a range of factors that may have limited the outcomes and conclusions of this report (Table 5). The survey was not constrained by factors which would adversely affect the outcomes of the survey nor the conclusions formed from the results of the survey.

3.2. Flora

A total of 197 species, representative of 82 genera and 32 families were recorded across the 18 transects surveyed. The most commonly represented families were Myrtaceae (59 taxa), Proteaceae (29 taxa), and Fabaceae (23 taxa). The taxa recorded during the survey are set out in Appendix A. A list of plant taxa recorded at each transect is set out in Appendix B. Several species collected could not be identified to species level (Appendix A). This was primarily due to the specimens being from juvenile or sterile plants. No introduced (exotic) species were recorded at any of the transects surveyed.

One threatened plant taxon pursuant to subsection (1), section 19 of the *Biodiversity Conservation Act 2016* (BC Act) and as listed by the WAH (1998-) was recorded during the survey. This taxon was *Banksia sphaerocarpa* var. *dolichostyla* (T). This taxon is also listed as vulnerable under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act; Department of Agriculture, Water and the Environment 2021). Fourteen priority plant taxa, as listed by the WAH (1998-), were recorded during the survey (Appendix A).

Table 5: Potential survey limitations for the establishment of plant condition monitoring transects

POTENTIAL SURVEY LIMITATION	IMPACT ON CURRENT SURVEY
Availability of contextual information at a regional and local scale	Not a constraint. Detailed local information on the flora and vegetation of the Mt Holland area in and surrounding the EGLP has been established (Mattiske 2021a, 2021b, 2022c,2022d). This formed the basis for selection of locations for siting of vegetation health monitoring transects, and informed the identification of plant species present during this survey.
Competency/experience of team carrying out survey; experience in the bioregion surveyed	Not a constraint. The survey team comprised personnel with extensive experience of the project area and its flora and vegetation. Mattiske Consulting has undertaken regular flora and vegetation surveys associated with the EGLP since 2016.
Proportion of flora collected and identification issues	Not a constraint. All flora within the vegetation health monitoring transects were identified and/or collected.
Effort and extent of survey	Not a constraint. Transects were established as proscribed within MS1118, with the exception of a transect associate with one VEZ, located at the southern end of the proposed mine pit. This transect may be established at a future date once the mine footprint is finalised. The 18 monitoring transects have now been assessed three or four times (depending on the year of establishment) across two seasons prior to the construction phase of the project This is deemed sufficient as baseline data for future comparison, as proscribed by the FVMP. All 18 monitoring transects were reassessed during this survey.
Access restrictions within survey area	Minor constraint. Access to all transects, particularly control transect locations, is via existing tracks. A minor constraint exists, in terms of the tenement stakeholders other than those under Covalent control, which would otherwise have provided for preferential control transect locations.
Survey timing, rainfall, season of survey	Not a constraint. Transects establishment and subsequent surveys have and will be timed to occur during the spring and post-summer period to gain an understanding of annual variation in vegetation health with respect to seasonal influences. Rainfall in the three months preceding this survey was above average.
Disturbances (fire/flood/clearing)	Minor constraint. Four of the 18 transects established are located in either previously disturbed lands, or in areas which were subject to fire approximately five years ago. In the case of the former, this was a deliberate choice to enable monitoring of indirect impacts on a population of *Microcorys* sp. Mt Holland broad-leaf (G. Barrett s.n. PERTH 04104927) (P1), which is located near the planned processing plant area. In the case of fire burnt areas, a matched pair of control/impact transects were placed in a fire burnt woodland to provide a fire burnt area monitoring site. One fire burnt area, comprising W4 vegetation located within the Jilbadji Nature Reserve was chosen as a control transect location due to the lack of suitable control transect locations areas within Covalent controlled tenements. Only one of the 19 transects has been disturbed since the establishment survey in October 2019. The latter loss of transect was related to clearing activities.
Data and statistical analysis	Not a constraint. The 20% threshold figure determined to represent a statistically significant reduction in vegetation condition precludes the need for statistical analysis of the data. Basic data analysis was undertaken using Microsoft Excel.

3.3. Species richness

Plant species richness per transect is set out in Table 6. The most species rich transects were transects 19 and 20 (control/impact pair J), which were situated in woodland which had been burnt approximately five years previously. Transects 13 and 16 (control/impact pair H) were also similarly species rich. These transects were sited in a narrow band of S3 vegetation (Table 5) which abuts W5 vegetation. The least species rich transects were transects 3 and 4 (control/impact pair B) which is situated in the H1 vegetation community, which is the most restricted type of vegetation recorded within the EGLP (Mattiske 2021c). The H1 vegetation was the least species rich community recorded in 2017 (Mattiske 2021c).

3.4. Species projected foliage cover

The sum of projected dead and alive foliage cover for each transect is shown graphically in Figure 4. There are large differences in the sum of projected foliage cover between the control and impact paired transects associated with pair I (transects 17 and 18). This is somewhat reflected in the species richness data (Table 6) for the corresponding transects, also. The sum of projected foliage cover is lowest in the transects 19 and 20 (control/impact pair J) which were burnt approximately 6 years previously, but had amongst the highest number of species present (Table 6).

Table 6: Plant species richness per transect, September 2022

TRANSECT	TYPE[1]		NUMBER OF TAXA	NUMBER OF CONSERVATION SIGNIFICANT TAXA
1	impact	A	15	1
2	control	A	33	1
3	control	B	17	3
4	impact	B	17	2
7	control	D	22	1
8	impact	D	28	1
9	impact	E	20	3
10	control	E	32	5
11	control	F	14	1
12	impact	G	37	5
13	control	H	44	6
14	impact	F	37	0
15	control	G	44	2
16	impact	H	47	4
17	control	I	23	1
18	impact	I	26	1
19	control	J	39	6
20	impact	J	54	6

1. Letter codes (A, B, etc.) indicate control/impact transect pairs

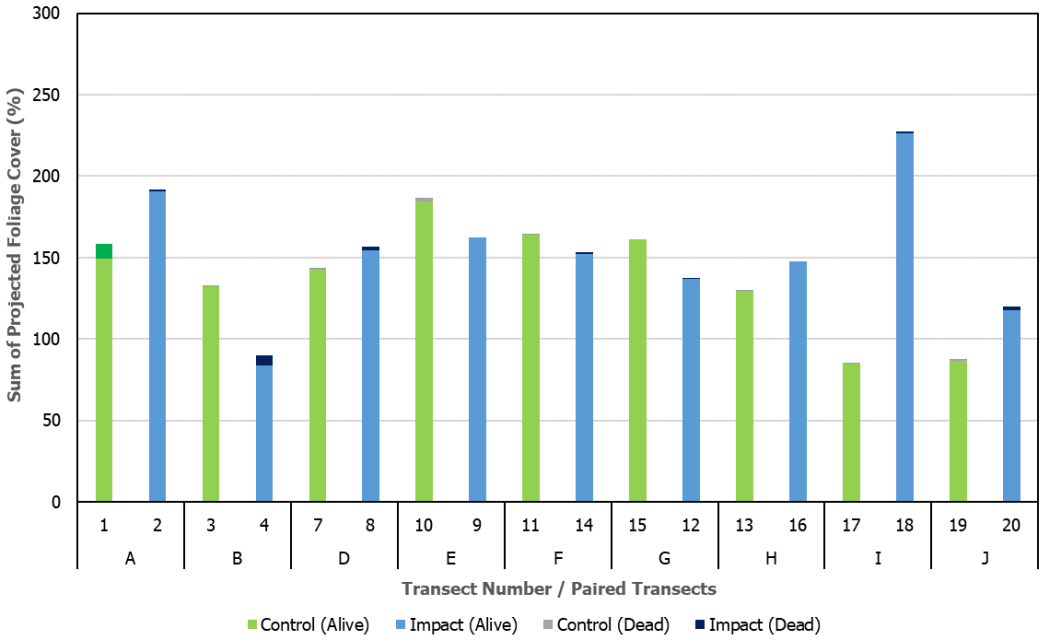


Figure 4: Sum of alive and dead projected foliage cover at plant condition monitoring transects, September 2022
Paired control/impact transects are indicated by the letters A through J.

3.5. Tagged species

A total of twenty individual pants were tagged at each transect for more detailed plant condition assessment (refer Section 2.3.3). The assessment of individual plants comprised positive and negative plant condition trajectory attributes. These attributes were:

Positive trajectory attributes

- canopy percentage
- epicormic growth
- new tip growth
- reproductive state

Negative trajectory attributes

- leaf die-off
- insect leaf damage

The raw individual plant condition assessment data is set out in Appendix C. The average canopy health scores are shown in Figure 5. Figure 6 shows the differences in canopy health scores for each transect pair. All paired transects have a less than 18% difference between their control and impact transects, which falls below the 20% trigger value, specified within the FVMP (Covalent 2020).

None of the other positive (epicormic growth, new tip growth, reproductive state) or negative (leaf die-off, insect leaf damage) attributes measured (Appendix C) were demonstrably correlated with the canopy health.

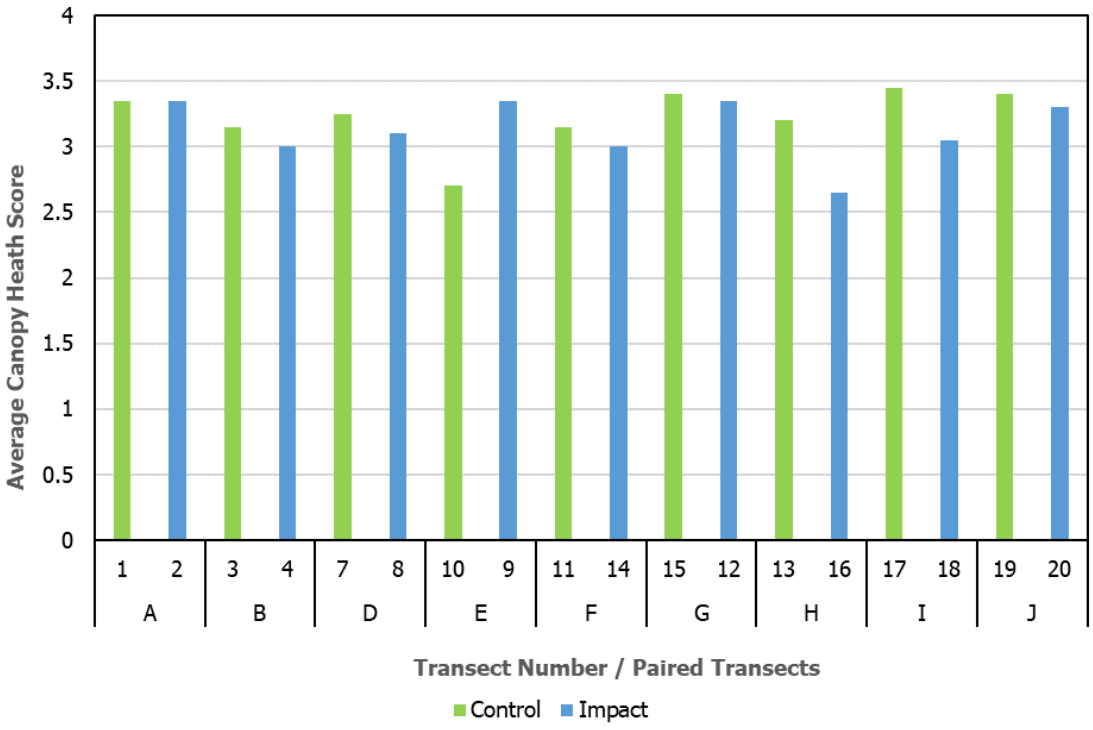


Figure 5: Average canopy health scores for 20 tagged plants at each plant condition monitoring transect, September 2022
Paired control/impact transects are indicated by the letters A through J. Canopy health scores: 0 dead; 1 very stressed; 2 stressed; 3 slightly stressed; 4 healthy. Refer to Table 1 for a detailed description of each health score.

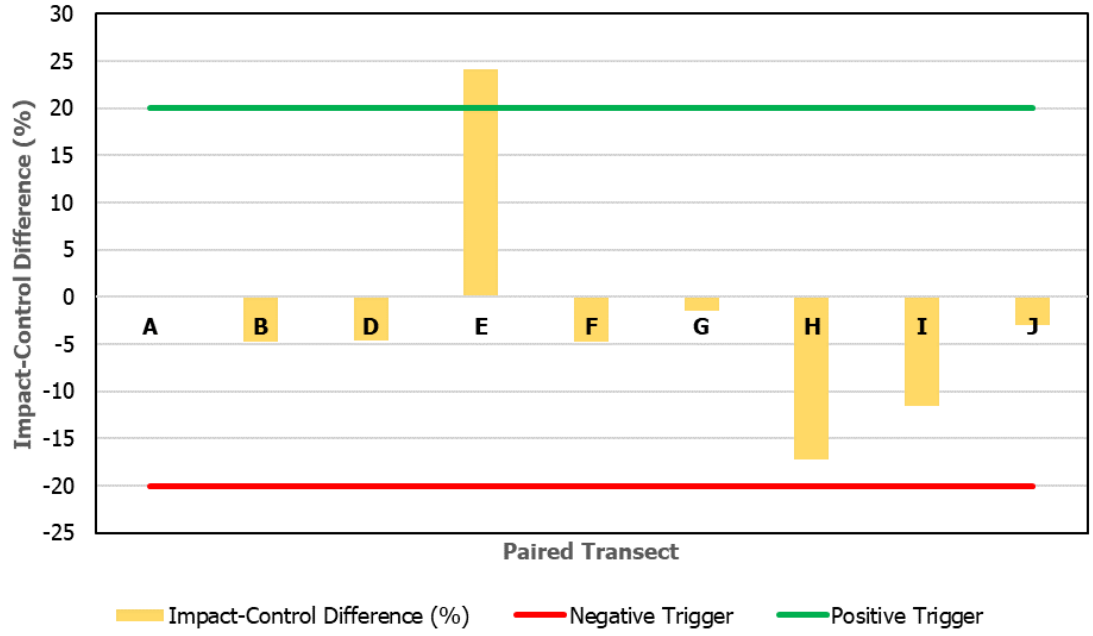


Figure 6: Control-Impact paired transect differential health scores, September 2022
The percentage difference between the control, and impact transects are shown, together with positive and negative trigger values.

3.6. Comparison of September 2021 and September 2022 data

Figure 7 shows the percentage difference in mean canopy health score between September 2021 (the last spring survey) and September 2022.562 (this survey). The largest decrease in average canopy health scores were observed at impact transect 4 (-11.76%). The largest increases in average canopy health scores were observed at impact transect 9 (4.69%). Overall, the mean change in canopy health scores across all transects was low, -2.56%.

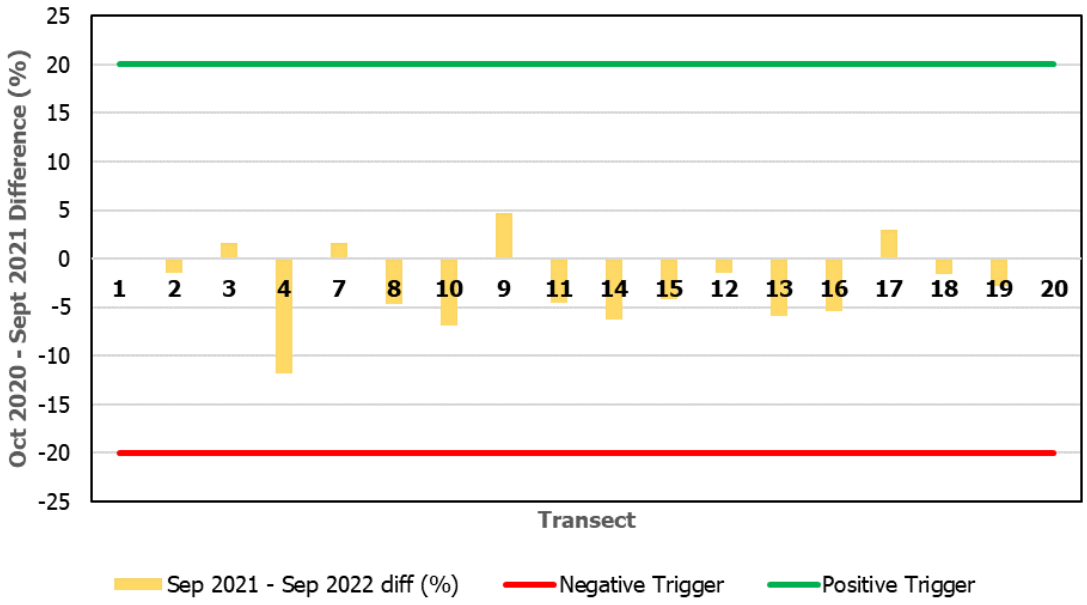


Figure 7: Percentage difference in average canopy health scores for 20 tagged plants, between September 2021 (last spring survey) and September 2022 (this survey) at each vegetation health monitoring transect

3.7. Photographic records

Appendix D comprises the photograph of each transects north-west corner recorded in September 2021 and September 2022. Appendix E contains a photograph of each tagged plant species at each transect in September 2021 and September 2022.

4. DISCUSSION

4.1. Flora and Vegetation

During the September 2022 assessment only 18 of the 19 transects were monitored. This reduction is related to the clearance of Transect 6 for mine expansion activities. Transect 6 was set up as an Impact site to monitor (*Microcorys* sp. Mt Holland broad-leaf) (P1) and previously did not have a Control site to measure and compare possible vegetation condition impacts.

In September 2022, 197 species, representative of 84 genera and 32 families were recorded across the 18-plant health monitoring transects. During the vegetation mapping of the EGLP (Mattiske 2021c), 435 vascular plant taxa which were representative of 145 genera and 50 families were recorded across 375 survey quadrats. Consequently, the plant health monitoring transects represent approximately 40% of all plant species recorded within the EGLP, and thus provide a good representation of the flora present, and can be considered to be representative of the vegetation within the EGLP.

In terms of species richness and foliage cover, when paired control/impact transects are compared (Table 5, Figure 6), there is a notable difference between the species richness and foliage cover for transects 9 and 10 (group E). These differences noted on transects 9 and 10 may be due to the above average rainfall received in August 2022 and can also be likely attributed to the variation in different observers' qualitative canopy health scores.

4.2. Plant health

Twenty plants within each transect (five per 10m x 10m sub-quadrat) were tagged for long term individual assessment. Six attributes were scored for each plant. These were: canopy percentage, epicormic growth, new tip growth, reproductive state, leaf die-off, and insect leaf damage. The first four of these attributes are classed as positive indicators of plant health, whereas the latter two are classed as negative indicators of plant health (Souter *et al*. 2009).

The most immediately useful measure of plant condition was the qualitative assessment of plant canopy health (Figures 5, 6, and 7). The differences in mean plant canopy health scores between control and impact transects pairs (Figure 6) was less than 20%.

The largest positive difference between control and impact transect pairs was observed at pair E (transects 10 and 9). The 24% Impact-Control difference (Figure 6, Appendix C) was contributed by increased canopy health in Transect 9 (Impact) and a slight decrease in transect 10 (Control).

The largest difference between control and impact transect pairs was observed at pair H (transects 13 and 16). This 17.18% difference (Figure 6, Appendix C) was contributed to by the death of one tagged *Balaustion grandibracteatum* subsp*. juncturum* (P2) individual in sub-quadrat A. At the time of the last survey, March 2022, this individual was recorded as slightly stressed. No other decreases in canopy health score, or deaths, were recorded at transect 16. Given that (i) this dead *Baeckea* sp. Forrestania (K.R. Newbey 1105) (P1) was recorded in sub-quadrat A, the sub-quadrat furthest from the road; (ii) no other stressed, very stressed, or dead plants were observed.

Section 2 of the FVMP (Covalent 2020) sets out a range of outcome-based and management based provisions with respect to environmental management within the EGLP. Specifically, the FVMP, as it relates to plant condition monitoring, states that there should be no proposal related indirect impact to flora and vegetation within a VEZ resulting in an adverse impact. The threshold and trigger criteria associated with this which would mandate a response actions are:

- Trigger criteria – a statistically significant reduction in mean condition ratings (more than 20% difference for both qualitative and quantitative) of vegetation health within a VEZ in comparison to control sites and a mean Fv/Fm (index of Chlorophyll florescence) of <0.6.

- Threshold criteria - Flora and vegetation within a VEZ experiences a statistically significant higher mortality rate than that of control sites (where that mortality is not attributed to direct impacts).

The intent of the present survey is ensuring that data is gathered to enable any changes to plant conditions to meaningfully be assessed. To date, health monitoring transects have been monitored at least three times, with five transects established in 2019 being monitored four times. Given that construction of the EGLP commenced nine months prior to this survey in September 2022, disturbances surrounding all impact transects are still minimal. As minor decrease in mean canopy health score is likely the result of the variations in the qualitative assessment of the plants Changes in vegetation health observed between surveys (Figure 7) are therefore likely to be either climate or observer related. Quantitative measurements of vegetation health using the PEA (see section 2.2), which are planned for future surveys, aim to minimise qualitative variation between observers.

The other measures of plant health did not show a correlation trend, particularly with the canopy health score. In the case of the negative health attributes described, it will be necessary to obtain data from multiple survey periods to determine the level of correlation between leaf die-off or insect leaf damage and its relationship to the canopy health score, and thus the usefulness of recording such attributes. Positive health attributes, such as leaf tip growth and reproductive state may also tend to reflect seasonal variation, and hence a number of surveys may be required to establish any trend in relation to overall plant condition. In the short term, plant canopy health, as described in Table 1, is likely to be the most useful measure.

Changes in canopy health score for all control and impact health monitoring transects are below the 20% trigger set out in the FVMP (Covalent 2020).

5. RECOMMENDATION

It would be recommended to initiate the use of plant pigment efficiency analyser (PEA) as it is an increasingly accepted method of determining plant health and function within the mining, forestry and agricultural industries. When plants are experiencing stress, the ratio may decline and potentially represent a reduction in physiological function or healthy function of the plant. The (PEA) will support minimise qualitative variation between observers and assist in statistical analysis used to determine if a significant difference is apparent.

It would also be recommended due to the removal of Transect 6 earlier this year, located 100 m north-west of the power substation, it is recommended that two new transects be set up (Impact and Control) to provide a qualitative assessment of the vegetation condition that includes *Microcorys* sp. Mt Holland broad-leaf (G. Barrett s.n. PERTH 04104927) (P1), if an appropriate site can be located. This may prove difficult as this taxon, based on current evidence, is a disturbance opportunist. It's presence in mature vegetation is both sparse and in very low abundance and therefore the site selection should be based on areas that are more likely to support this species.

6. CONCLUSION

The survey results presented in this report represent the second to monitor the impacts of disturbance associated with the construction of the EGLP. The vegetation condition in impact transects, best represented by the mean canopy health score, were all less than 20% different to the corresponding control transects, as stipulated by the FVMP (Covalent 2020). The changes observed between this survey and the last Autumn survey in March 2022 can likely be attributed to the variation in different observers' qualitative canopy health scores. Future surveys aim to minimise this variation with the use of quantitative PEA measurements of plant health to minimise the variation in qualitative and estimated measures of plant health.

7. PERSONNEL

The following Mattiske Consulting Pty Ltd personnel were involved in this project:

NAME	POSITION	PROJECT INVOLVEMENT	FLORA COLLECTION PERMITS
Dr E. M. Mattiske	Managing Director & Principal Ecologist	Planning & reporting	N/A
Mr Zac Sims	Experienced Botanist	Review of report	N/A
Mr A. Pereira	Experienced Botanist	Planning, plant identifications, data analysis, reporting	FB62000145-2
Mr J. Mooney	Botanist	Planning, Fieldwork	FB62000025-2 TFL167-2021

8. REFERENCES

Beard, JS (1990)

Plant life of Western Australia, Kangaroo Press, Kenthurst, NSW.

Biodiversity Conservation Act 2016 (WA)

Bureau of Meteorology (2022)

Climate averages for specific sites. Accessed 16th January 2023. <http://www.bom.gov.au/climate/data/ >

Covalent Lithium Pty Ltd (2020)

Earl Grey Lithium Project Flora and Vegetation Environmental Management Plan (Rev2).

Cowan, M., Graham, G. and McKenzie, N. (2001)

Coolgardie 2 (COO2 – Southern Cross Bioregion). In: A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions in 2002. Western Australian Government Department of Environment and Conservation, Perth, Western Australia.

Department of Biodiversity, Conservation and Attractions (2022a)

Conservation Codes for Western Australian Flora and Fauna. Accessed 19th January 2023.

<https://www.dpaw.wa.gov.au/images/documents/plants-animals/threatened-species/Listings/Conservation%20code%20definitions.pdf>

Department of Biodiversity, Conservation and Attractions (2022b)

Wildlife Conservation (Rare Flora Notice 2018) 11th September 2018. Accessed 19th January 2023.

<https://www.dpaw.wa.gov.au/images/documents/plants-animals/threatened-species/Listings/flora_notice.pdf >

Department of Agriculture, Water and the Environment (2023)

Environment Protection and Biodiversity Conservation Act 1999 List of Threatened Flora. Accessed 19th January 2023.

<http://www.environment.gov.au/cgi-bin/sprat/public/publicthreatenedlist.pl?wanted=flora>

Environmental Protection Authority (2016)

Technical Guidance – Flora and vegetation surveys for environmental impact assessment, Environmental Protection Authority, Western Australia.

Environment Protection and Biodiversity Conservation Act 1999

Kalaji, H.M., *et al.* (2014)

Frequently asked questions about in vivo chlorophyll fluorescence: practical issues. Photosynth Res 2014 122: 121-158

Mattiske Consulting Pty Ltd (2020)

Earl Grey Lithium Project introduced flora (weed) survey. Unpublished report prepared for Covalent Lithium Pty Ltd, October 2020.

Mattiske Consulting Pty Ltd (2021a)

Earl Grey Lithium Project Vegetation Condition Monitoring Transect Establishment. Unpublished report prepared for Covalent Lithium Pty Ltd, January 2021.

Mattiske Consulting Pty Ltd (2021b)

Earl Grey Lithium Project Vegetation Condition Monitoring. Unpublished report prepared for Covalent Lithium Pty Ltd, June 2021.

Mattiske Consulting Pty Ltd (2021c)

Earl Grey Lithium Project Flora and Vegetation Assessment. Unpublished report prepared for Covalent Lithium Pty Ltd, February 2021.

Mattiske Consulting Pty Ltd (2021d)

Earl Grey Lithium Project Flora and Vegetation Assessment. Unpublished report prepared for Covalent Lithium Pty Ltd, January 2022.

Souter, N.J., Watts, R.A., White, M.G., George, A.K. and McNicol, K.J. (2009)

Method manual for the visual assessment of lower River Murray floodplain trees. Technical Note 2009/25. Government of South Australia, Department of Water, Land and Biodiversity Conservation.

Trudgen, M.E. (1988)

A report on the flora and vegetation of the Port Kennedy area. Unpublished report prepared for Bowman Bishaw and Associates, West Perth

Wesfarmers Limited (2022)

Mt Holland lithium project – Ministerial approval. Wesfarmers Press Statement. Accessed 19th January 2023. <https://www.wesfarmers.com.au/docs/default-source/asx-announcements/mt-holland-lithium-project---ministerial-approval.pdf?sfvrsn=4a3e0cbb_0>

Western Australian Herbarium (1998-)

FloraBase - the Western Australian Flora. Department of Parks and Wildlife. Accessed 19th January 2023. <https://florabase.dpaw.wa.gov.au/>

APPENIDIX A: VASCULAR PLANT SPECIES RECORDED WITHIN THE PLANT CONDITION MONITORING TRANSECTS, SEPTEMBER 2022

Note: P1 to P4 denotes priority taxon (DBCA 2022a, WAH 1998-); T denotes threatened taxon (DBCA 2022b)

FAMILY	SPECIES
Apiaceae	*Platysace maxwellii*
Asparagaceae	*Chamaexeros fimbriata*
	Thysanotus sp. Twining Wheatbelt (N.H. Brittan 81/29)
Asteraceae	*Millotia tenuifolia* var. *tenuifolia*
	Olearia muelleri
	Olearia ramosissima
	Rhodanthe laevis
Boraginaceae	*Halgania integerrima*
Casuarinaceae	*Allocasuarina acutivalvis* subsp. *acutivalvis*
	Allocasuarina campestris
	Allocasuarina sp. (juvenile)
	Allocasuarina spinosissima
Celastraceae	*Psammomoya choretroides*
Convolvulaceae	*Wilsonia humilis*
Cupressaceae	*Callitris columellaris*
	Callitris preissii
Cyperaceae	*Isolepis marginata*
	Lepidosperma sanguinolentum sens .lat.
	Lepidosperma sp. 1
	Lepidosperma sp. 2
Dilleniaceae	*Hibbertia ancistrophylla*
	Hibbertia exasperata
	Hibbertia psilocarpa
	Hibbertia rostellata
	Hibbertia sp.
	Hibbertia stowardii
	Hibbertia tuberculata (P1)
Droseraceae	*Drosera* ?*moorei*
	Drosera glanduligera
	Drosera sp. (climbing)
	Drosera moorei

APPENIDIX A: VASCULAR PLANT SPECIES RECORDED WITHIN THE PLANT CONDITION MONITORING TRANSECTS, SEPTEMBER 2022

Note: P1 to P4 denotes priority taxon (DBCA 2022a, WAH 1998-); T denotes threatened taxon (DBCA 2022b)

FAMILY	SPECIES
Ericaceae	*Acrotriche lancifolia*
	Leucopogon sp. Forrestania (G.F. Craig 2386)
	Leucopogon sp. outer wheatbelt (M. Hislop 30)
	Lysinema ciliatum
	Styphelia exserta
	Styphelia serratifolia
Euphorbiaceae	*Beyeria minor*
	Beyeria sulcata var. *gracilis*
	Beyeria sulcata var. *sulcata*
	Monotaxis grandiflora var. *obtusifolia*
Fabaceae	*Acacia assimilis* subsp. *assimilis*
	Acacia camptoclada
	Acacia lachnocarpa (P1)
	Acacia merrallii
	Acacia resinimarginea
	Acacia sphacelata subsp. *sphacelata*
	Acacia steedmanii subsp. *steedmanii*
	Acacia sulcata var. *platyphylla*
	Acacia tetraptera
	Acacia undosa (P3)
	Acacia yorkrakinensis
	Acacia yorkrakinensis subsp. *acrita*
	Chorizema circinale (P3)
	Daviesia aphylla
	Daviesia argillacea
	Daviesia cardiophylla
	Daviesia sarissa subsp. *redacta* (P2)
	Daviesia scoparia
	Gastrolobium floribundum
	Gastrolobium melanocarpum
	Gastrolobium spinosum
	Gompholobium hendersonii
	Jacksonia nematoclada
Goodeniaceae	*Dampiera obliqua*
	Dampiera sp.
	Goodenia cycnopotamica
Haloragaceae	*Glischrocaryon aureum*

APPENIDIX A: VASCULAR PLANT SPECIES RECORDED WITHIN THE PLANT CONDITION MONITORING TRANSECTS, SEPTEMBER 2022

Note: P1 to P4 denotes priority taxon (DBCA 2022a, WAH 1998-); T denotes threatened taxon (DBCA 2022b)

FAMILY	SPECIES
Lamiaceae	*Cyanostegia angustifolia*
	Hemigenia westringioides
	Microcorys elatoides (P1)
	Microcorys sp. Mt Holland broad-leaf (G. Barrett s.n. PERTH 04104927) (P1)
	Pityrodia loricata
	Westringia cephalantha
	Westringia rigida
Lauraceae	*Cassytha aurea* var. *hirta*
	Cassytha sp.
Malvaceae	*Lasiopetalum ferraricollinum*
Myrtaceae	*Beaufortia interstans*
	Beaufortia orbifolia
	Beaufortia puberula
	Beaufortia schaueri
	Calothamnus gilesii
	Calytrix breviseta subsp. *stipulosa*
	Calytrix tetragona
	Chamelaucium ciliatum
	Chamelaucium sp. Parker Range (B.H. Smith 1255) (P1)
	Chamelaucium virgatum
	Cyathostemon sp.
	Ericomyrtus serpyllifolia
	Eucalyptus burracoppinensis
	Eucalyptus calycogona subsp. *calycogona*
	Eucalyptus capillosa
	Eucalyptus eremophila
	Eucalyptus flocktoniae subsp. *flocktoniae*
	Eucalyptus horistes
	Eucalyptus protensa
	Eucalyptus rigidula
	Eucalyptus salubris
	Eucalyptus sp.
	Eucalyptus sp. 1
	Eucalyptus sp. 2
	Eucalyptus urna
	Eucalyptus cylindriflora
	Euryomyrtus maidenii
	Homalocalyx pulcherrimus

APPENIDIX A: VASCULAR PLANT SPECIES RECORDED WITHIN THE PLANT CONDITION MONITORING TRANSECTS, SEPTEMBER 2022

Note: P1 to P4 denotes priority taxon (DBCA 2022a, WAH 1998-); T denotes threatened taxon (DBCA 2022b)

FAMILY	SPECIES
Myrtaceae	*Leptospermum erubescens*
	Leptospermum spinescens
	Melaleuca ?calyptroides
	Melaleuca acuminata subsp. *acuminata*
	Melaleuca calyptroides
	Melaleuca cliffortioides
	Melaleuca condylosa
	Melaleuca cordata
	Melaleuca cucullata
	Melaleuca depauperata
	Melaleuca eleuterostachya
	Melaleuca halmaturorum
	Melaleuca lateriflora
	Melaleuca laxiflora
	Melaleuca pauperiflora subsp. *pauperiflora*
	Melaleuca phoidophylla
	Melaleuca pungens
	Melaleuca scalena
	Melaleuca sp.
	Melaleuca sparsiflora
	Melaleuca societatis
	Micromyrtus erichsenii
	Myrtaceae sp.
	Rinzia carnosa
	Rinzia medifila (P1)
	Rinzia sessilis
	Thryptomene kochii
	Verticordia chrysantha
	Verticordia stenopetala (P3)
	Balaustion grandibracteatum subsp. *juncturum*
	Eucalyptus capillosa
Orchidaceae	*Caladenia hirta*
	Caladenia paradoxa
	Orchidaceae sp.
	Pterostylis mutica
	Pterostylis sp.
Poaceae	*Poaceae* sp.
Polygalaceae	*Comesperma volubile*

APPENIDIX A: VASCULAR PLANT SPECIES RECORDED WITHIN THE PLANT CONDITION MONITORING TRANSECTS, SEPTEMBER 2022

Note: P1 to P4 denotes priority taxon (DBCA 2022a, WAH 1998-); T denotes threatened taxon (DBCA 2022b)

FAMILY	SPECIES
Proteaceae	*Adenanthos argyreus*
	Banksia laevigata subsp. *fuscolutea*
	Banksia purdieana
	Banksia sphaerocarpa var. *dolichostyla* (T)
	Grevillea ?*biformis*
	Grevillea ?*oncogyne*
	Grevillea acuaria
	Grevillea acuaria sens. lat.
	Grevillea hookeriana subsp. *apiciloba*
	Grevillea huegelii
	Grevillea lissopleura (P1)
	Grevillea marriottii (P1)
	Grevillea oncogyne
	Grevillea pterosperma
	Hakea erecta
	Hakea meisneriana
	Hakea pendens (P3)
	Hakea scoparia subsp. *scoparia*
	Hakea subsulcata
	Hakea multilineata Meisn.
	Isopogon gardneri
	Isopogon scabriusculus subsp. *pubifloris*
	Persoonia coriacea
	Persoonia saundersiana
	Persoonia sp.
	Persoonia ?*quinquenervis*
	Petrophile stricta
	Grevillea acuaria sens. lat.
	Grevillea sp.
	Hakea ?*subsulcata*
Rhamnaceae	*Cryptandra* ?*distigma*
	Stenanthemum stipulosum
	Trymalium myrtillus
	Trymalium myrtillus subsp. *myrtillus*
Rutaceae	*Boronia ternata* var. *promiscua* (P3)
	Drummondita hassellii
	Microcybe ambigua
	Microcybe multiflora subsp. *multiflora*
	Phebalium filifolium
	Phebalium megaphyllum

APPENIDIX A: VASCULAR PLANT SPECIES RECORDED WITHIN THE PLANT CONDITION MONITORING TRANSECTS, SEPTEMBER 2022

Note: P1 to P4 denotes priority taxon (DBCA 2022a, WAH 1998-); T denotes threatened taxon (DBCA 2022b)

FAMILY	SPECIES
Rutaceae	*Phebalium obovatum*
	Phebalium tuberculosum
	Philotheca rhomboidea
Santalaceae	*Exocarpos aphyllus*
	Santalum acuminatum
	Santalum sp.
Sapindaceae	*Dodonaea bursariifolia*
	Dodonaea microzyga var. *acrolobata*
	Dodonaea stenozyga
Scrophulariaceae	*Eremophila dempsteri*
	Eremophila sp.
Stylidiaceae	*Stylidium* sp.
Thymelaeaceae	*Pimelea sulphurea*
Violaceae	*Hybanthus floribundus*

APPENDIX B: VASCULAR PLANT SPECIES RECORDED AT EACH PLANT CONDITION MONITORING TRANSECT, SEPTEMBER 2022

Note: P1 to P4 denotes prioirty taxa (DBCA 2022a, WAH 1998-); T denotes threatened taxon (DBCA 2022b)

SPECIES	Transect Pair	A		B		D		E		F		G		H		I		F	
	Transect Type	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact
	Transect Number	1	2	3	4	7	8	10	9	11	14	15	12	13	16	17	18	19	20
Acacia assimilis subsp. *assimilis*								X	X		X	X		X	X			X	X
Acacia camptoclada							X												
Acacia lachnocarpa (P1)																X	X		
Acacia merrallii						X				X									
Acacia resinimarginea															X				
Acacia sphacelata subsp. *sphacelata*															X				X
Acacia steedmanii subsp. *steedmanii*																X			
Acacia sulcata var. *platyphylla*				X															
Acacia tetraptera																	X		
Acacia undosa (P3)						X	X												
Acacia yorkrakinensis		X																	X
Acacia yorkrakinensis subsp. *acrita*									X		X	X		X		X			
Acrotriche lancifolia		X														X			
Adenanthos argyreus									X		X	X						X	X
Allocasuarina acutivalvis subsp. *acutivalvis*		X	X					X	X		X	X		X	X	X	X	X	
Allocasuarina campestris				X	X														
Allocasuarina sp. (juvenile)																			X
Allocasuarina spinosissima		X	X								X				X				
Balaustion grandibracteatum subsp. *juncturum*											X	X			X				X
Banksia laevigata subsp. *fuscolutea*									X						X				
Banksia purdieana								X	X		X	X		X	X			X	
Banksia sphaerocarpa var. *dolichostyla* (T)								X	X		X	X			X			X	

APPENDIX B: VASCULAR PLANT SPECIES RECORDED AT EACH PLANT CONDITION MONITORING TRANSECT, SEPTEMBER 2022

Note: P1 to P4 denotes prioirty taxa (DBCA 2022a, WAH 1998-); T denotes threatened taxon (DBCA 2022b)

SPECIES	Transect Pair	A		B		D		E		F		G		H		I		F	
	Transect Type	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact
	Transect Number	1	2	3	4	7	8	10	9	11	14	15	12	13	16	17	18	19	20
Beaufortia interstans												X							
Beaufortia orbifolia								X	X		X	X		X				X	
Beaufortia puberula															X				
Beaufortia schaueri									X		X	X		X	X				
Beyeria minor																		X	X
Beyeria sulcata var. *gracilis*			X																
Beyeria sulcata var. *sulcata*																			X
Boronia ternata var. *promiscua* (P3)								X	X		X			X				X	X
Caladenia hirta			X	X	X		X		X		X			X				X	X
Caladenia paradoxa			X	X	X														
Callitris columellaris		X														X	X		
Callitris preissii			X				X												X
Calothamnus gilesii		X																	
Calytrix breviseta subsp. *stipulosa*												X			X			X	
Calytrix tetragona					X														
Cassytha aurea var. *hirta*								X	X										
Cassytha sp.			X								X	X		X	X		X	X	X
Chamaexeros fimbriata																			X
Chamelaucium ciliatum							X					X							
Chamelaucium sp. Parker Range (B.H. Smith 1255) (P1)											X	X						X	X
Chamelaucium virgatum									X			X			X				
Chorizema circinale (P3)															X				

APPENDIX B: VASCULAR PLANT SPECIES RECORDED AT EACH PLANT CONDITION MONITORING TRANSECT, SEPTEMBER 2022

Note: P1 to P4 denotes prioirty taxa (DBCA 2022a, WAH 1998-); T denotes threatened taxon (DBCA 2022b)

SPECIES	Transect Pair	A		B		D		E		F		G		H		I		F	
	Transect Type	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact
	Transect Number	1	2	3	4	7	8	10	9	11	14	15	12	13	16	17	18	19	20
Comesperma volubile		X	X	X	X											X	X		
Cryptandra ?distigma						X													
Cyanostegia angustifolia																		X	
Cyathostemon sp.																X			
Dampiera obliqua																X		X	X
Dampiera sp.																X			
Daviesia aphylla																	X		
Daviesia argillacea			X			X				X									
Daviesia cardiophylla															X				
Daviesia sarissa subsp. *redacta* (P2)									X			X						X	X
Daviesia scoparia																	X		
Dodonaea bursariifolia			X			X													
Dodonaea microzyga var. *acrolobata*				X	X														
Dodonaea stenozyga										X			X						
Drosera ?moorei			X	X	X		X		X					X					
Drosera glanduligera			X				X												
Drosera moorei		X																	
Drosera sp. (climbing)				X											X			X	
Drummondita hassellii									X		X	X		X	X			X	X
Eremophila dempsteri													X						
Eremophila sp.						X													
Ericomyrtus serpyllifolia			X																

APPENDIX B: VASCULAR PLANT SPECIES RECORDED AT EACH PLANT CONDITION MONITORING TRANSECT, SEPTEMBER 2022

Note: P1 to P4 denotes prioirty taxa (DBCA 2022a, WAH 1998-); T denotes threatened taxon (DBCA 2022b)

SPECIES	Transect Pair	A		B		D		E		F		G		H		I		F	
	Transect Type	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact
	Transect Number	1	2	3	4	7	8	10	9	11	14	15	12	13	16	17	18	19	20
Eucalyptus burracoppinensis								X	X		X	X		X	X				
Eucalyptus calycogona subsp. *calycogona*						X													
Eucalyptus capillosa																X	X		
Eucalyptus capillosa		X																	
Eucalyptus eremophila			X			X	X										X		
Eucalyptus flocktoniae subsp. *flocktoniae*																	X		
Eucalyptus horistes											X								
Eucalyptus protensa										X			X						
Eucalyptus rigidula																			X
Eucalyptus salubris										X			X				X		
Eucalyptus sp.			X											X			X	X	
Eucalyptus sp. 1			X																
Eucalyptus sp. 2			X																
Eucalyptus urna										X			X						
Eucalyptus cylindriflora						X	X												
Euryomyrtus maidenii										X		X			X				X
Exocarpos aphyllus		X								X			X				X		X
Gastrolobium floribundum								X	X			X			X			X	
Gastrolobium melanocarpum																X			
Gastrolobium spinosum											X	X		X				X	X
Glischrocaryon aureum																X			X
Gompholobium hendersonii								X			X							X	X

APPENDIX B: VASCULAR PLANT SPECIES RECORDED AT EACH PLANT CONDITION MONITORING TRANSECT, SEPTEMBER 2022

Note: P1 to P4 denotes prioirty taxa (DBCA 2022a, WAH 1998-); T denotes threatened taxon (DBCA 2022b)

SPECIES	Transect Pair	A		B		D		E		F		G		H		I		F	
	Transect Type	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact
	Transect Number	1	2	3	4	7	8	10	9	11	14	15	12	13	16	17	18	19	20
Goodenia cycnopotamica							X												
Grevillea ?*biformis*															X				
Grevillea ?*oncogyne*											X								X
Grevillea acuaria						X													
Grevillea acuaria sens. lat.							X										X		
Grevillea acuaria sens. lat.																	X		
Grevillea hookeriana subsp. *apiciloba*											X	X		X				X	X
Grevillea huegelii						X													
Grevillea lissopleura (P1)				X	X														
Grevillea marriottii (P1)																			X
Grevillea oncogyne																	X		
Grevillea pterosperma														X					
Grevillea sp.																X			
Hakea ?*subsulcata*																		X	
Hakea erecta							X		X		X	X			X				X
Hakea meisneriana								X	X						X				
Hakea pendens (P3)		X	X																
Hakea scoparia subsp. *scoparia*															X	X			
Hakea subsulcata			X								X	X		X					X
Hakea multilineata Meisn.								X				X		X				X	X
Halgania integerrima																			X
Hemigenia westringioides																		X	

APPENDIX B: VASCULAR PLANT SPECIES RECORDED AT EACH PLANT CONDITION MONITORING TRANSECT, SEPTEMBER 2022

Note: P1 to P4 denotes prioirty taxa (DBCA 2022a, WAH 1998-); T denotes threatened taxon (DBCA 2022b)

SPECIES	Transect Pair	A		B		D		E		F		G		H		I		F	
	Transect Type	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact
	Transect Number	1	2	3	4	7	8	10	9	11	14	15	12	13	16	17	18	19	20
Hibbertia ancistrophylla															X				
Hibbertia exasperata																X			
Hibbertia psilocarpa						X													
Hibbertia rostellata			X									X						X	X
Hibbertia sp.																			X
Hibbertia stowardii								X	X		X	X		X				X	X
Hibbertia tuberculata (P1)				X	X														
Homalocalyx pulcherrimus															X				
Hybanthus floribundus																			X
Isolepis marginata			X		X														
Isopogon gardneri								X	X		X	X						X	
Isopogon scabriusculus subsp. *pubifloris*											X	X			X				X
Jacksonia nematoclada											X	X		X					X
Lasiopetalum ferraricollinum											X	X			X			X	
Lepidosperma sanguinolentum sens .lat.				X															
Lepidosperma sp. 1															X				
Lepidosperma sp. 2															X				
Leptospermum erubescens															X				
Leptospermum spinescens								X										X	
Leucopogon sp. Forrestania (G.F. Craig 2386)															X				
Leucopogon sp. outer wheatbelt (M. Hislop 30)														X					X
Lysinema ciliatum															X				

APPENDIX B: VASCULAR PLANT SPECIES RECORDED AT EACH PLANT CONDITION MONITORING TRANSECT, SEPTEMBER 2022

Note: P1 to P4 denotes prioirty taxa (DBCA 2022a, WAH 1998-); T denotes threatened taxon (DBCA 2022b)

SPECIES	Transect Pair	A		B		D		E		F		G		H		I		F	
	Transect Type	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact
	Transect Number	1	2	3	4	7	8	10	9	11	14	15	12	13	16	17	18	19	20
Melaleuca ?*calyptroides*												X							X
Melaleuca acuminata subsp. *acuminata*						X	X												
Melaleuca calyptroides									X		X	X		X	X				X
Melaleuca cliffortioides				X	X														
Melaleuca condylosa																X	X		
Melaleuca cordata								X	X		X	X		X	X			X	
Melaleuca cucullata										X			X						
Melaleuca depauperata						X	X												
Melaleuca eleuterostachya						X	X										X		
Melaleuca halmaturorum							X										X		
Melaleuca lateriflora						X	X												
Melaleuca laxiflora							X												
Melaleuca pauperiflora subsp. *pauperiflora*										X									
Melaleuca phoidophylla													X						
Melaleuca pungens									X		X				X				
Melaleuca scalena			X			X	X		X					X			X		
Melaleuca sp.																		X	
Melaleuca sparsiflora							X										X		
Melaleuca societatis																	X		
Microcorys elatoides (P1)								X	X		X	X		X				X	
Microcorys sp. Mt Holland broad-leaf (G. Barrett s.n. PERTH 04104927) (P1)									X									X	X
Microcybe ambigua												X			X				

APPENDIX B: VASCULAR PLANT SPECIES RECORDED AT EACH PLANT CONDITION MONITORING TRANSECT, SEPTEMBER 2022

Note: P1 to P4 denotes prioirty taxa (DBCA 2022a, WAH 1998-); T denotes threatened taxon (DBCA 2022b)

SPECIES	Transect Pair	A		B		D		E		F		G		H		I		F	
	Transect Type	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact
	Transect Number	1	2	3	4	7	8	10	9	11	14	15	12	13	16	17	18	19	20
Microcybe multiflora subsp. *multiflora*										X			X						
Micromyrtus erichsenii			X								X	X		X	X			X	X
Millotia tenuifolia var. *tenuifolia*					X		X												
Monotaxis grandiflora var. *obtusifolia*											X	X							X
Myrtaceae sp.																			
Olearia muelleri						X													
Olearia ramosissima							X												
Orchidaceae sp.			X	X	X		X								X				
Persoonia coriacea												X		X				X	X
Persoonia saundersiana								X											
Persoonia sp.																X			
Persoonia ?*quinquenervis*			X											X					
Petrophile stricta												X							
Phebalium filifolium															X				X
Phebalium megaphyllum		X	X														X		
Phebalium obovatum			X													X			
Phebalium tuberculosum		X																	
Philotheca rhomboidea																			X
Pimelea sulphurea																			X
Pityrodia loricata																			X
Platysace maxwellii					X		X	X				X						X	X
Poaceae sp.						X	X												

APPENDIX B: VASCULAR PLANT SPECIES RECORDED AT EACH PLANT CONDITION MONITORING TRANSECT, SEPTEMBER 2022

Note: P1 to P4 denotes prioirty taxa (DBCA 2022a, WAH 1998-); T denotes threatened taxon (DBCA 2022b)

SPECIES	Transect Pair	A		B		D		E		F		G		H		I		F	
	Transect Type	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact	control	impact
	Transect Number	1	2	3	4	7	8	10	9	11	14	15	12	13	16	17	18	19	20
Psammomoya choretroides															X				
Pterostylis mutica										X			X						
Pterostylis sp.								X									X		
Rhodanthe laevis		X	X				X												
Rinzia carnosa																	X		
Rinzia medifila (P1)				X															
Rinzia sessilis			X			X									X				
Santalum acuminatum			X						X		X			X			X		X
Santalum sp.									X	X								X	
Stenanthemum stipulosum			X																X
Stylidium sp.																			X
Styphelia exserta				X	X														X
Styphelia serratifolia		X									X				X				
Thryptomene kochii									X		X			X	X				X
Thysanotus sp. Twining Wheatbelt (N.H. Brittan 81/29)			X	X	X	X	X		X			X		X					
Trymalium myrtillus					X														
Trymalium myrtillus subsp. *myrtillus*				X															
Verticordia chrysantha												X			X				
Verticordia stenopetala (P3)												X			X				
Westringia cephalantha			X				X												X
Westringia rigida						X													
Wilsonia humilis										X									

APPENDIX C: HEALTH SCORES FOR INDIVIDUALLY TAGGED PLANTS AT PLANT HEALTH MONITORING TRANSECTS, SEPTEMBER 2022

Refer to Methods for score definitions.

TAG	SPECIES	CANOPY	LEAF DIE OFF	NEW TIP GROWTH	REPRODUCTIVE STATE	INSECT LEAF DAMAGE	EPICORMIC GROWTH
Transect 1							
1	*Hakea pendens* (P3)	2	1	1	2	0	0
2	*Phebalium megaphyllum*	4	1	2	0	0	0
3	*Callitris columellaris*	4	1	2	0	0	0
4	*Allocasuarina acutivalvis* subsp. *acutivalvis*	2	1	2	0	0	0
5	*Styphelia serratifolia*	4	0	2	2	0	0
6	*Hakea pendens* (P3)	2	1	2	2	0	0
7	*Allocasuarina acutivalvis* subsp. *acutivalvis*	2	0	1	2	0	0
8	*Callitris columellaris*	4	1	2	0	0	0
9	*Phebalium tuberculosum*	4	0	2	0	0	0
10	*Callitris columellaris*	4	1	2	0	0	0
11	*Phebalium tuberculosum*	4	0	2	3	0	0
12	*Phebalium megaphyllum*	4	0	2	0	0	0
13	*Hakea pendens* (P3)	3	1	2	2	0	0
14	*Callitris columellaris*	4	1	2	0	0	0
15	*Allocasuarina acutivalvis* subsp. *acutivalvis*	3	1	1	0	0	0
16	*Allocasuarina acutivalvis* subsp. *acutivalvis*	3	0	1	2	0	0
17	*Hakea pendens* (P3)	2	1	1	0	0	0
18	*Phebalium* sp.	4	0	2	2	0	0
19	*Phebalium megaphyllum*	4	1	2	0	0	0
20	*Callitris columellaris*	4	1	2	0	0	0
Transect 2							
1	*Rinzia sessilis*	4	0	2	2	0	0
2	*Beyeria sulcata*	4	0	2	3	0	0
3	*Allocasuarina acutivalvis* subsp. *acutivalvis*	3	1	3	0	0	0
4	*Phebalium megaphyllum*	3	1	2	2	0	0
5	*Hakea pendens* (P3)	3	1	2	3	0	0
6	*Beyeria sulcata*	3	1	1	0	0	0
7	*Allocasuarina acutivalvis* subsp. *acutivalvis*	4	0	2	2	0	0
8	*Hakea pendens* (P3)	3	1	2	2	0	0
9	*Phebalium megaphyllum*	3	1	1	2	0	0
10	*Rinzia sessilis*	4	3	0	0	0	0
11	*Allocasuarina acutivalvis* subsp. *acutivalvis*	2	2	1	3	0	0
12	*Rinzia sessilis*	4	2	2	0	0	0
13	*Beyeria sulcata*	3	1	2	3	0	0
14	*Phebalium megaphyllum*	4	1	2	2	0	0
15	*Hakea pendens* (P3)	4	1	2	2	0	0
16	*Beyeria sulcata*	3	1	0	0	0	0
17	*Phebalium megaphyllum*	3	1	1	0	0	0
18	*Allocasuarina acutivalvis* subsp. *acutivalvis*	3	1	0	1	0	0
19	*Hakea pendens* (P3)	4	0	0	1	0	0
20	*Rinzia sessilis*	3	1	0	0	0	0

APPENDIX C: HEALTH SCORES FOR INDIVIDUALLY TAGGED PLANTS AT PLANT HEALTH MONITORING TRANSECTS, SEPTEMBER 2022

Refer to Methods for score definitions.

TAG	SPECIES	CANOPY	LEAF DIE OFF	NEW TIP GROWTH	REPRODUCTIVE STATE	INSECT LEAF DAMAGE	EPICORMIC GROWTH
Transect 3							
1	*Melaleuca cliffortioides*	4	1	1	2	0	0
2	*Melaleuca cliffortioides*	4	0	2	2	0	0
3	*Grevillea lissopleura* (P1)	2	2	1	2	0	0
4	*Hibbertia tuberculata* (P1)	3	0	2	2	0	0
5	*Trymalium myrtillus* subsp. *myrtillus*	2	1	1	2	0	0
6	*Melaleuca cliffortioides*	3	1	3	2	0	0
7	*Hibbertia tuberculata* (P1)	3	1	1	2	0	0
8	*Grevillea lissopleura* (P1)	3	1	2	3	0	0
9	*Trymalium myrtillus* subsp. *myrtillus*	2	0	1	2	0	0
10	*Dodonaea microzyga* var. *acrolobata*	2	1	2	0	0	0
11	*Melaleuca cliffortioides*	4	0	2	2	0	0
12	*Grevillea lissopleura* (P1)	3	1	2	3	0	0
13	*Hibbertia tuberculata* (P1)	4	1	1	2	0	0
14	*Trymalium myrtillus* subsp. *myrtillus*	3	1	2	2	0	0
15	*Dodonaea microzyga* var. *acrolobata*	3	1	2	0	0	0
16	*Melaleuca cliffortioides*	3	1	3	2	0	0
17	*Styphelia exserta*	4	0	1	2	0	0
18	*Dodonaea microzyga* var. *acrolobata*	4	0	2	3	0	0
19	*Hibbertia tuberculata* (P1)	4	0	2	2	0	0
20	*Grevillea lissopleura* (P1)	3	1	1	2	0	0
Transect 4							
1	*Grevillea lissopleura* (P1)	4	0	2	2	0	0
2	*Dodonaea microzyga* var. *acrolobata*	4	0	2	0	0	0
3	*Calytrix tetragona*	2	0	1	2	0	0
4	*Styphelia exserta*	4	0	2	2	0	0
5	*Melaleuca cliffortioides*	3	1	1	3	0	0
6	*Melaleuca cliffortioides*	4	1	2	2	0	0
7	*Grevillea lissopleura* (P1)	2	1	2	0	0	0
8	*Calytrix tetragona*	3	1	1	2	1	0
9	*Styphelia exserta*	2	2	1	2	0	0
10	*Dodonaea microzyga* var. *acrolobata*	2	1	0	3	0	0
11	*Styphelia exserta*	3	1	2	2	0	0
12	*Calytrix tetragona*	3	1	1	2	0	0
13	*Melaleuca cliffortioides*	4	1	2	2	1	0
14	*Grevillea lissopleura* (P1)	3	1	2	1	0	0
15	*Dodonaea microzyga* var. *acrolobata*	2	1	2	3	0	0
16	*Melaleuca cliffortioides*	4	0	2	2	0	0
17	*Dodonaea microzyga* var. *acrolobata*	3	0	1	2	0	0
18	*Grevillea lissopleura* (P1)	2	1	2	3	0	0
19	*Calytrix tetragona*	3	1	2	0	0	0
20	*Styphelia exserta*	3	1	1	2	0	0

APPENDIX C: HEALTH SCORES FOR INDIVIDUALLY TAGGED PLANTS AT PLANT HEALTH MONITORING TRANSECTS, SEPTEMBER 2022

Refer to Methods for score definitions.

TAG	SPECIES	CANOPY	LEAF DIE OFF	NEW TIP GROWTH	REPRODUCTIVE STATE	INSECT LEAF DAMAGE	EPICORMIC GROWTH
Transect 7							
1	*Melaleuca lateriflora*	3	1	3	0	0	0
2	*Daviesia argillacea*	4	1	2	2	0	0
3	*Acacia undosa* (P3)	2	2	2	0	1	0
4	*Eucalyptus calycogona* subsp. *calycogona*	3	1	2	1	2	0
5	*Melaleuca eleuterostachya*	4	1	3	0	0	0
6	*Acacia undosa* (P3)	3	2	1	0	0	0
7	*Grevillea acuaria*	3	1	3		0	0
8	*Melaleuca lateriflora*	4	1	2	0	0	0
9	*Eucalyptus calycogona* subsp. *calycogona*	3	1	2	0	0	0
10	*Melaleuca eleuterostachya*	4	0	3	0	0	0
11	*Melaleuca eleuterostachya*	3	1	2	0	0	0
12	*Acacia undosa* (P3)	3	2	1	0	1	0
13	*Daviesia argillacea*	3	1	2	2	0	0
14	*Eucalyptus calycogona* subsp. *calycogona*	3	1	1	0	1	2
15	*Acacia undosa* (P3)	3	2	1	0	0	0
16	*Acacia undosa* (P3)	3	2	1	0	0	0
17	*Hibbertia rupicola*	4	1	2	3	0	0
18	*Melaleuca depauperata*	3	1	2	1	0	0
19	*Eucalyptus calycogona* subsp. *calycogona*	3	1	2	0	1	0
20	*Melaleuca lateriflora*	4	0	3	0	0	0
Transect 8							
1	*Acacia undosa* (P3)	3	1	2	1	0	0
2	*Grevillea acuaria*	4	0	3	2	0	0
3	*Melaleuca lateriflora*	3	1	2	1	0	0
4	*Eucalyptus cylindriflora*	3	1	2	0	0	1
5	*Melaleuca eleuterostachya*	3	1	3	0	0	0
6	*Melaleuca lateriflora*	3	0	2	1	0	0
7	*Eucalyptus cylindriflora*	4	0	3	0	0	0
8	*Acacia undosa* (P3)	3	1	1	2	0	0
9	*Melaleuca eleuterostachya*	3	1	2	0	0	0
10	*Grevillea acuaria*	2	1	1	0	0	0
11	*Melaleuca eleuterostachya*	3	1	2	0	0	0
12	*Eucalyptus cylindriflora*	3	1	2	1	0	0
13	*Melaleuca lateriflora*	4	1	2	1	0	0
14	*Grevillea acuaria*	4	0	3	2	0	0
15	*Acacia undosa* (P3)	2	1	1	2	0	0
16	*Acacia undosa* (P3)	2	2	1	0	1	0
17	*Melaleuca lateriflora*	4	1	2	1	0	0
18	*Eucalyptus cylindriflora*	2	1	2	0	0	2
19	*Grevillea acuaria*	4	0	3	2	0	0
20	*Melaleuca eleuterostachya*	3	1	2	0	0	0

APPENDIX C: HEALTH SCORES FOR INDIVIDUALLY TAGGED PLANTS AT PLANT HEALTH MONITORING TRANSECTS, SEPTEMBER 2022

Refer to Methods for score definitions.

TAG	SPECIES	CANOPY	LEAF DIE OFF	NEW TIP GROWTH	REPRODUCTIVE STATE	INSECT LEAF DAMAGE	EPICORMIC GROWTH
Transect 9							
1	*Banksia sphaerocarpa* var. *dolichostyla* (T)	3	2	1	0	0	0
2	*Microcorys elatoides* (P1)	3	0	1	2	0	0
3	*Allocasuarina acutivalvis* subsp. *acutivalvis*	3	1	2	2	0	0
4	*Beaufortia orbifolia*	4	1	2	1	0	0
5	*Banksia purdieana*	3	2	1	0	0	0
6	*Banksia sphaerocarpa* var. *dolichostyla* (T)	3	2	1	0	0	0
7	*Microcorys elatoides* (P1)	3	0	1	0	0	0
8	*Allocasuarina acutivalvis* subsp. *acutivalvis*	4	1	2	2	0	0
9	*Beaufortia orbifolia*	4	1	2	0	0	0
10	*Banksia purdieana*	3	2	1	0	0	0
11	*Banksia sphaerocarpa* var. *dolichostyla* (T)	3	1	1	0	0	0
12	*Microcorys elatoides* (P1)	3	1	1	0	0	0
13	*Allocasuarina acutivalvis* subsp. *acutivalvis*	4	1	2	2	0	0
14	*Beaufortia orbifolia*	4	0	3	0	0	0
15	*Banksia purdieana*	2	3	2	1	0	0
16	*Banksia sphaerocarpa* var. *dolichostyla* (T)	4	1	2	0	0	0
17	*Microcorys elatoides* (P1)	3	1	2	0	0	0
18	*Allocasuarina acutivalvis* subsp. *acutivalvis*	4	1	2	2	0	0
19	*Banksia purdieana*	4	2	1	0	0	0
20	*Beaufortia orbifolia*	3	1	3	0	0	0
Transect 10							
1	*Allocasuarina acutivalvis* subsp. *acutivalvis*	4	0	1	2	0	0
2	*Banksia purdieana*	3	1	1	2	0	0
3	*Beaufortia orbifolia*	3	1	0	0	0	0
4	*Microcorys elatoides* (P1)	3	2	1	0	1	0
5	*Banksia sphaerocarpa* var. *dolichostyla* (T)	3	1	1	0	0	0
6	*Banksia sphaerocarpa* var. *dolichostyla* (T)	1	2	1	0	0	2
7	*Beaufortia orbifolia*	3	2	2	3	0	0
8	*Banksia purdieana*	2	2	2	2	0	0
9	*Allocasuarina acutivalvis* subsp. *acutivalvis*	2	1	1	3	0	0
10	*Microcorys elatoides* (P1)	3	1	1	0	0	0
11	*Banksia purdieana*	3	2	1	0	0	0
12	*Microcorys elatoides* (P1)	2	1	1	0	0	0
13	*Beaufortia orbifolia*	4	1	2	3	0	0
14	*Allocasuarina acutivalvis* subsp. *acutivalvis*	3	1	2	2	0	0
15	*Banksia sphaerocarpa* var. *dolichostyla* (T)	2	2	1	0	0	0
16	*Allocasuarina acutivalvis* subsp. *acutivalvis*	4	1	1	2	0	0
17	*Beaufortia orbifolia*	3	1	2	0	0	0
18	*Eucalyptus burracoppinensis*	2	1	1	2	1	1
19	*Banksia purdieana*	2	2	1	0	0	0
20	*Banksia sphaerocarpa* var. *dolichostyla* (T)	2	1	1	0	0	0

APPENDIX C: HEALTH SCORES FOR INDIVIDUALLY TAGGED PLANTS AT PLANT HEALTH MONITORING TRANSECTS, SEPTEMBER 2022

Refer to Methods for score definitions.

TAG	SPECIES	CANOPY	LEAF DIE OFF	NEW TIP GROWTH	REPRODUCTIVE STATE	INSECT LEAF DAMAGE	EPICORMIC GROWTH
Transect 11							
1	*Melaleuca cucullata*	3	1	3	0	0	0
2	*Melaleuca pauperiflora* subsp. *pauperiflora*	4	1	1	1	0	0
3	*Microcybe multiflora* subsp. *multiflora*	4	0	1	1	0	0
4	*Dodonaea stenozyga*	2	2	0	0	0	0
5	*Exocarpos aphyllus*	2	2	1	2	0	0
6	*Melaleuca pauperiflora* subsp. *pauperiflora*	4	1	2	1	0	0
7	*Dodonaea stenozyga*	3	1	2	3	0	0
8	*Melaleuca pauperiflora* subsp. *pauperiflora*	4	1	1	1	0	0
9	*Microcybe multiflora* subsp. *multiflora*	3	1	3	0	0	0
10	*Exocarpos aphyllus*	2	2	2	2	0	0
11	*Eucalyptus urna*	4	0	2	1	0	0
12	*Dodonaea stenozyga*	2	0	2	3	0	0
13	*Melaleuca pauperiflora* subsp. *pauperiflora*	4	1	2	1	0	0
14	*Melaleuca cucullata*	3	1	3	0	0	0
15	*Daviesia argillacea*	3	1	1	0	0	0
16	*Melaleuca pauperiflora* subsp. *pauperiflora*	3	1	2	1	0	0
17	*Melaleuca cucullata*	4	0	2	0	0	0
18	*Microcybe multiflora* subsp. *multiflora*	3	1	1	1	0	0
19	*Dodonaea stenozyga*	3	1	2	3	0	0
20	*Daviesia argillacea*	3	1	1	2	0	0
Transect 12							
1	*Acacia yorkrakinensis* subsp. *acrita*	4	0	0	2	0	0
2	*Melaleuca calyptroides*	3	0	0	0	0	0
3	*Hakea erecta*	3	1	1	1	1	0
4	*Microcorys elatoides* (P1)	2	1	1	0	0	0
5	*Drummondita hassellii*	4	0	2	3	0	0
6	*Hakea erecta*	3	1	1	1	0	0
7	*Acacia yorkrakinensis* subsp. *acrita*	4	0	0	2	0	0
8	*Melaleuca calyptroides*	3	1	2	0	0	0
9	*Melaleuca pungens*	4	0	1	3	0	0
10	*Drummondita hassellii*	4	0	2	2	0	0
11	*Thryptomene kochii*	4	0	2	2	0	0
12	*Melaleuca pungens*	3	1	1	3	1	0
13	*Acacia yorkrakinensis* subsp. *acrita*	2	1	0	2	1	0
14	*Chamelaucium* sp. Parker Range (B.H. Smith 1255) (P1)	2	1	2	0	2	0
15	*Isopogon gardneri*	3	1	1	1	0	0
16	*Isopogon gardneri*	4	1	1	2	1	0
17	*Acacia yorkrakinensis* subsp. *acrita*	4	0	2	2	1	0
18	*Melaleuca pungens*	4	1	1	3	0	0
19	*Microcorys elatoides* (P1)	3	0	1	0	0	0
20	*Isopogon gardneri*	4	0	1	2	0	0

APPENDIX C: HEALTH SCORES FOR INDIVIDUALLY TAGGED PLANTS AT PLANT HEALTH MONITORING TRANSECTS, SEPTEMBER 2022

Refer to Methods for score definitions.

TAG	SPECIES	CANOPY	LEAF DIE OFF	NEW TIP GROWTH	REPRODUCTIVE STATE	INSECT LEAF DAMAGE	EPICORMIC GROWTH
Transect 13							
1	*Microcorys elatoides* (P1)	3	1	1	0	1	0
2	*Chamelaucium* sp. Parker Range (B.H. Smith 1255) (P1)	3	1	2	0	0	0
3	*Baeckea* sp. Forrestania (K.R. Newbey 1105) (P1)	3	1	1	1	0	0
4	*Allocasuarina acutivalvis* subsp. *acutivalvis*	4	0	3	2	0	0
5	*Banksia sphaerocarpa* var. *dolichostyla* (T)	3	1	2	3	0	0
6	*Allocasuarina acutivalvis* subsp. *acutivalvis*	4	1	2	2	0	0
7	*Baeckea* sp. Forrestania (K.R. Newbey 1105) (P1)	4	0	2	1	0	0
8	*Hakea erecta*	4	0	1	1	0	0
9	*Chamelaucium* sp. Parker Range (B.H. Smith 1255) (P1)	3	1	2	0	1	0
10	*Banksia sphaerocarpa* var. *dolichostyla* (T)	3	1	2	0	0	0
11	*Allocasuarina acutivalvis* subsp. *acutivalvis*	4	1	2	2	0	0
12	*Banksia sphaerocarpa* var. *dolichostyla* (T)	3	1	1	3	0	0
13	*Microcorys elatoides* (P1)	2	1	2	0	0	0
14	*Chamelaucium* sp. Parker Range (B.H. Smith 1255) (P1)	2	1	1	0	2	0
15	*Baeckea* sp. Forrestania (K.R. Newbey 1105) (P1)	3	0	1	1	0	0
16	*Chamelaucium* sp. Parker Range (B.H. Smith 1255) (P1)	3	0	2	0	0	0
17	*Microcorys elatoides* (P1)	3	1	1	0	0	0
18	*Allocasuarina acutivalvis* subsp. *acutivalvis*	3	1	1	2	0	0
19	*Baeckea* sp. Forrestania (K.R. Newbey 1105) (P1)	4	0	1	1	0	0
20	*Banksia sphaerocarpa* var. *dolichostyla* (T)	3	1	1	0	0	0
Transect 14							
1	*Dodonaea stenozyga*	4	1	2	1	0	0
2	*Melaleuca cucullata*	3	1	2	3	0	0
3	*Eremophila dempsteri*	3	2	3	0	0	0
4	*Melaleuca phoidophylla*	3	1	1	2	0	0
5	*Eucalyptus urna*	3	1	1	0	0	0
6	*Dodonaea stenozyga*	4	0	2	3	0	0
7	*Eucalyptus urna*	3	1	2	3	0	0
8	*Exocarpos aphyllus*	2	2	1	2	0	0
9	*Eucalyptus salubris*	4	0	3	0	0	0
10	*Melaleuca cucullata*	4	1	3	3	0	0
11	*Dodonaea stenozyga*	1	2	0	0	0	0
12	*Melaleuca cucullata*	4	0	3	3	0	0
13	*Eucalyptus urna*	2	1	0	0	0	0
14	*Eucalyptus protensa*	4	0	1	3	0	0
15	*Dodonaea stenozyga*	1	1	1	0	0	0
16	*Melaleuca phoidophylla*	4	0	3	2	0	0
17	*Microcybe multiflora* subsp. *multiflora*	4	0	3	1	0	0
18	*Dodonaea stenozyga*	4	0	2	2	0	0
19	*Eucalyptus urna*	3	1	1	0	0	0
20	*Melaleuca cucullata*	4	0	3	3	0	0

APPENDIX C: HEALTH SCORES FOR INDIVIDUALLY TAGGED PLANTS AT PLANT HEALTH MONITORING TRANSECTS, SEPTEMBER 2022

Refer to Methods for score definitions.

TAG	SPECIES	CANOPY	LEAF DIE OFF	NEW TIP GROWTH	REPRODUCTIVE STATE	INSECT LEAF DAMAGE	EPICORMIC GROWTH
Transect 15							
1	*Drummondita hassellii*	4	0	2	2	0	0
2	*Melaleuca cordata*	3	1	0	0	0	0
3	*Beaufortia schaueri*	4	0	1	0	0	0
4	*Acacia yorkrakinensis* subsp. *acrita*	3	1	2	2	1	0
5	*Microcorys elatoides* (P1)	3	1	1	0	0	0
6	*Microcorys elatoides* (P1)	3	1	2	1	0	0
7	*Drummondita hassellii*	4	0	2	2	0	0
8	*Hakea subsulcata*	4	0	3	3	0	0
9	*Acacia yorkrakinensis* subsp. *acrita*	4	0	2	2	0	0
10	*Melaleuca cordata*	3	1	1	0	0	0
11	*Hakea subsulcata*	4	0	3	3	0	0
12	*Melaleuca cordata*	3	1	1	0	0	0
13	*Microcorys elatoides* (P1)	4	0	2	0	0	0
14	*Acacia yorkrakinensis* subsp. *acrita*	4	0	2	2	0	0
15	*Drummondita hassellii*	4	0	3	2	0	0
16	*Microcorys elatoides* (P1)	4	0	2	0	0	0
17	*Drummondita hassellii*	3	0	2	2	0	0
18	*Acacia yorkrakinensis* subsp. *acrita*	3	1	2	3	1	0
19	*Hakea subsulcata*	4	0	3	3	0	0
20	*Melaleuca cordata*	3	1	1	0	0	0
Transect 16							
1	*Banksia sphaerocarpa* var. *dolichostyla* (T)	3	1	2	2	0	2
2	*Baeckea* sp. Forrestania (K.R. Newbey 1105) (P1)	0	0	0	0	0	0
3	*Hakea erecta*	3	2	1	3	0	2
4	*Leucopogon* sp. Forrestania (G.F. Craig 2386)	3	2	0	0	0	0
5	*Allocasuarina acutivalvis* subsp. *acutivalvis*	4	0	2	3	0	0
6	*Leucopogon* sp. Forrestania (G.F. Craig 2386)	3	2	1	0	0	0
7	*Hakea erecta*	3	2	2	0	0	0
8	*Allocasuarina acutivalvis* subsp. *acutivalvis*	2	2	2	3	0	2
9	*Baeckea* sp. Forrestania (K.R. Newbey 1105) (P1)	2	0	1	0	0	0
10	*Banksia sphaerocarpa* var. *dolichostyla* (T)	3	2	1	2	0	0
11	*Leucopogon* sp. Forrestania (G.F. Craig 2386)	3	2	1	2	2	0
12	*Hakea erecta*	3	1	1	3	0	0
13	*Banksia sphaerocarpa* var. *dolichostyla* (T)	2	2	1	3	2	0
14	*Baeckea* sp. Forrestania (K.R. Newbey 1105) (P1)	2	0	1	0	0	0
15	*Allocasuarina acutivalvis* subsp. *acutivalvis*	3	1	2	3	0	0
16	*Hakea erecta*	3	2	0	3	2	0
17	*Banksia sphaerocarpa* var. *dolichostyla* (T)	3	1	2	2	0	0
18	*Leucopogon* sp. Forrestania (G.F. Craig 2386)	3	2	1	0	0	0
19	*Baeckea* sp. Forrestania (K.R. Newbey 1105) (P1)	2	0	1	0	0	0
20	*Allocasuarina acutivalvis* subsp. *acutivalvis*	3	1	3	3	0	0

APPENDIX C: HEALTH SCORES FOR INDIVIDUALLY TAGGED PLANTS AT PLANT HEALTH MONITORING TRANSECTS, SEPTEMBER 2022

Refer to Methods for score definitions.

TAG	SPECIES	CANOPY	LEAF DIE OFF	NEW TIP GROWTH	REPRODUCTIVE STATE	INSECT LEAF DAMAGE	EPICORMIC GROWTH
Transect 17							
1	*Melaleuca condylosa*	3	1	0	0	0	0
2	*Eucalyptus capillosa*	4	1	1	0	1	0
3	*Acacia lachnocarpa* (P1)	4	0	3	3	0	0
4	*Gastrolobium melanocarpum*	3	0	1	0	0	0
5	*Acrotriche lancifolia*	4	1	3	0	0	0
6	*Acrotriche lancifolia*	4	2	1	0	0	0
7	*Melaleuca condylosa*	4	1	1	0	1	0
8	*Hakea scoparia* subsp. *scoparia*	3	1	2	1	1	0
9	*Acacia lachnocarpa* (P1)	3	1	2	0	0	0
10	*Eucalyptus capillosa*	3	1	2	0	1	0
11	*Melaleuca condylosa*	3	1	1	0	0	0
12	*Gastrolobium melanocarpum*	4	1	2	1	0	0
13	*Acacia lachnocarpa* (P1)	3	1	3	0	0	0
14	*Eucalyptus capillosa*	3	1	2	0	1	0
15	*Acrotriche lancifolia*	4	3	3	0	0	0
16	*Melaleuca condylosa*	3	0	1	0	0	0
17	*Eucalyptus capillosa*	3	0	2	0	1	0
18	*Acrotriche lancifolia*	3	1	2	0	0	0
19	*Gastrolobium melanocarpum*	4	0	2	2	1	0
20	*Acacia lachnocarpa* (P1)	4	0	3	3	0	0
Transect 18							
1	*Melaleuca sparsiflora*	3	1	1	1	1	0
2	*Grevillea acuaria sens. lat. (shiny leaf form)*	3	1	0	2	0	0
3	*Acacia lachnocarpa* (P1)	0	3	0	0	0	0
4	*Callitris columellaris*	3	2	2	0	0	0
5	*Melaleuca halmaturorum*	2	2	1	3	0	0
6	*Acacia lachnocarpa* (P1)	4	2	2	2	0	0
7	*Grevillea oncogyne*	4	0	2	2	0	0
8	*Callitris columellaris*	4	1	3	3	0	0
9	*Daviesia scoparia*	3	2	1	1	0	0
10	*Melaleuca sparsiflora*	4	1	2	2	0	0
11	*Melaleuca condylosa*	3	1	3	1	0	0
12	*Phebalium megaphyllum*	3	0	1	2	0	0
13	*Acacia lachnocarpa* (P1)	3	1	2	1	0	0
14	*Allocasuarina acutivalvis* subsp. *acutivalvis*	3	2	2	0	0	0
15	*Callitris columellaris*	4	1	3	0	0	0
16	*Allocasuarina acutivalvis* subsp. *acutivalvis*	3	2	1	3	0	0
17	*Acacia lachnocarpa* (P1)	3	2	3	1	0	0
18	*Melaleuca sparsiflora*	3	1	2	2	0	0
19	*Callitris columellaris*	4	1	3	3	0	0
20	*Melaleuca scalena*	3	1	1	3	0	0

APPENDIX C: HEALTH SCORES FOR INDIVIDUALLY TAGGED PLANTS AT PLANT HEALTH MONITORING TRANSECTS, SEPTEMBER 2022

Refer to Methods for score definitions.

TAG	SPECIES	CANOPY	LEAF DIE OFF	NEW TIP GROWTH	REPRODUCTIVE STATE	INSECT LEAF DAMAGE	EPICORMIC GROWTH
Transect 19							
1	*Banksia sphaerocarpa* var. *dolichostyla* (T)	3	1	1	1	1	0
2	*Daviesia sarissa* subsp. *redacta* (P2)	3	1	0	2	0	0
3	*Microcorys* sp. Mt Holland broad-leaf (G. Barrett s.n. PERTH 04104927) (P1)	0	3	0	0	0	0
4	*Acacia assimilis* subsp. *assimilis*	3	2	2	0	0	0
5	*Microcorys elatoides* (P1)	2	2	1	3	0	0
6	*Acacia assimilis* subsp. *assimilis*	4	2	2	2	0	0
7	*Chamelaucium* sp. Parker Range (B.H. Smith 1255) (P1)	4	0	2	2	0	0
8	*Daviesia sarissa* subsp. *redacta* (P2)	4	1	3	3	0	0
9	*Microcorys elatoides* (P1)	3	2	1	1	0	0
10	*Banksia purdieana*	4	1	2	2	0	0
11	*Acacia assimilis* subsp. *assimilis*	3	1	3	1	0	0
12	*Chamelaucium* sp. Parker Range (B.H. Smith 1255) (P1)	3	0	1	2	0	0
13	*Microcorys elatoides* (P1)	3	1	2	1	0	0
14	*Banksia sphaerocarpa* var. *dolichostyla* (T)	3	2	2	0	0	0
15	*Daviesia sarissa* subsp. *redacta* (P2)	4	1	3	0	0	0
16	*Daviesia sarissa* subsp. *redacta* (P2)	3	2	1	3	0	0
17	*Banksia sphaerocarpa* var. *dolichostyla* (T)	3	2	3	1	0	0
18	*Acacia assimilis* subsp. *assimilis*	3	1	2	2	0	0
19	*Chamelaucium* sp. Parker Range (B.H. Smith 1255) (P1)	4	1	3	3	0	0
20	*Microcorys elatoides* (P1)	3	1	1	3	0	0
Transect 20							
1	*Acacia assimilis* subsp. *assimilis*	4	0	1	0	0	0
2	*Baeckea* sp. Forrestania (K.R. Newbey 1105) (P1)	4	0	2	0	0	0
3	*Grevillea marriottii* (P1)	3	1	1	2	0	0
4	*Daviesia sarissa* subsp. *redacta* (P2)	4	1	1	2	0	0
5	*Persoonia coriacea*	3	1	1	0	1	0
6	*Daviesia sarissa* subsp. *redacta* (P2)	4	0	3	2	0	0
7	*Grevillea marriottii* (P1)	3	1	1	2	0	0
8	*Persoonia coriacea*	3	1	1	0	2	0
9	*Baeckea* sp. Forrestania (K.R. Newbey 1105) (P1)	4	1	1	0	0	0
10	*Acacia assimilis* subsp. *assimilis*	4	0	1	0	0	0
11	*Grevillea marriottii* (P1)	3	1	1	2	0	0
12	*Melaleuca ?calyptroides*	3	1	2	0	0	0
13	*Acacia assimilis* subsp. *assimilis*	4	0	2	0	0	0
14	*Persoonia coriacea*	3	2	0	0	0	0
15	*Daviesia sarissa* subsp. *redacta* (P2)	3	2	2	2	0	0
16	*Melaleuca ?calyptroides*	3	1	1	0	0	0
17	*Grevillea marriottii* (P1)	3	1	1	0	0	0
18	*Persoonia coriacea*	3	1	0	0	1	0
19	*Acacia assimilis* subsp. *assimilis*	3	1	1	0	0	0
20	*Daviesia sarissa* subsp. *redacta* (P2)	2	2	0	0	0	0

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 1a, September 2021



Quadrat 1a, September 2022



Quadrat 1b, September 2021



Quadrat 1b, September 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 1c, September 2021



Quadrat 1c, September 2022



Quadrat 1d, September 2021



Quadrat 1d, September 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 2a, September 2021



Quadrat 2a, September 2022



Quadrat 2b, September 2021



Quadrat 2b, September 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 2c, September 2021



Quadrat 2c, September 2022



Quadrat 2d, September 2021



Quadrat 2d, September 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 3a, September 2021



Quadrat 3a, September 2022



Quadrat 3b, September 2021



Quadrat 3b, September 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 3c, September 2021



Quadrat 3c, September 2022



Quadrat 3d, September 2021



Quadrat 3d, September 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 4a, September 2021



Quadrat 4a, September 2022



Quadrat 4b, September 2021



Quadrat 4b, September 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 4c, September 2021



Quadrat 4c, September 2022



Quadrat 4d, September 2021



Quadrat 4d, September 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 7a, September 2021



Quadrat 7a, September 2022



Quadrat 7b, September 2021



Quadrat 7b, September 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 7c, September 2021



Quadrat 7c, September 2022



Quadrat 7d, September 2021



Quadrat 7d, September 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 8a, September 2021



Quadrat 8a, September 2022



Quadrat 8b, September 2021



Quadrat 8b, September 2021

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 8c, September 2021

Photo not available



Quadrat 8d, September 2021

Photo not available

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 9a, September 2021



Quadrat 9a, September 2022



Quadrat 9b, September 2021



Quadrat 9b, September 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 9c, September 2021



Quadrat 9c, September 2022



Quadrat 9d, September 2021

Photo not available

Quadrat 9d, September 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 10a, September 2021



Quadrat 10a, September 2022



Quadrat 10b, September 2021



Quadrat 10b, September 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 10c, September 2021



Quadrat 10c, September 2022



Quadrat 10d, September 2021



Quadrat 10d, September 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 11a, September 2021



Quadrat 11a, September 2022



Quadrat 11b, September 2021



Quadrat 11b, September 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 11c, September 2021



Quadrat 11c, September 2022



Quadrat 11d, September 2021



Quadrat 11d, September 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 12a, September 2021



Quadrat 12a, September 2022



Quadrat 12b, September 2021



Quadrat 12b, September 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



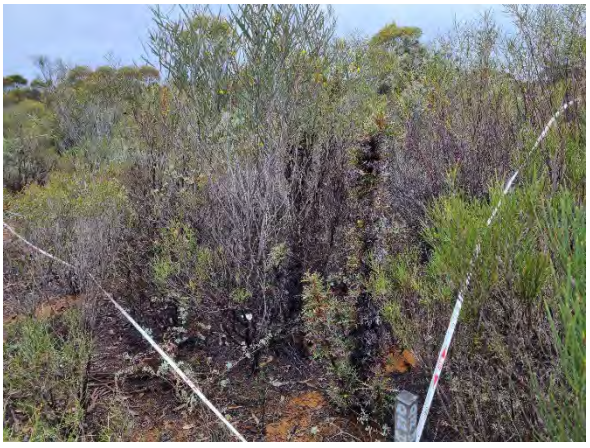
Quadrat 12c, September 2021



Quadrat 12c, September 2022



Quadrat 12d, September 2021



Quadrat 12d, September 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 13a, September 2021



Quadrat 13a, September 2022



Quadrat 13b, September 2021



Quadrat 13b, September 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 13c, September 2021



Quadrat 13c, September 2022



Quadrat 13d, September 2021



Quadrat 13d, September 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 14a, September 2021



Quadrat 14a, September 2022



Quadrat 14b, September 2021



Quadrat 14b, September 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 14c, September 2021



Quadrat 14c, September 2022



Quadrat 14d, September 2021



Quadrat 14d, September 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 15a, September 2021



Quadrat 15a, September 2022



Quadrat 15b, September 2021



Quadrat 15b, September 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 15c, September 2021



Quadrat 15c, September 2022



Quadrat 15d, September 2021



Quadrat 15d, September 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 16a, September 2021



Quadrat 16a, September 2022



Quadrat 16b, September 2021



Quadrat 16b, September 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 16c, September 2021



Quadrat 16c, September 2022



Quadrat 16d, September 2021



Quadrat 16d, September 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 17a, September 2021



Quadrat 17a, September 2022



Quadrat 17b, September 2021



Quadrat 17b, September 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 17c, September 2021



Quadrat 17c, September 2022



Quadrat 17d, September 2021



Quadrat 17d, September 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 18a, September 2021



Quadrat 18a, September 2022



Quadrat 18b, September 2021



Quadrat 18b, September 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 18c, September 2021

Photo not available



Quadrat 18d, September 2021

Photo not available

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 19a, September 2021



Quadrat 19a, September 2022



Quadrat 19b, September 2021



Quadrat 19b, September 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 19c, September 2021



Quadrat 19c, September 2022



Quadrat 19d, September 2021



Quadrat 19d, September 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 20a, September 2021



Quadrat 20a, September 2022



Quadrat 20b, September 2021



Quadrat 20b, September 2022

APPENDIX D: PHOTOGRAPHIC RECORD OF PLANT CONDITION MONITORING TRANSECTS

Each transect consisted of four 10 m x 10 m quadrats arranged as a contiguous belt. Four photographs were taken at each transect, one at the north-west corner of each 10 m x 10 m sub-quadrat (quadrats a, b, c and d)



Quadrat 20c, September 2021



Quadrat 20c, September 2022



Quadrat 20d, September 2021



Quadrat 20d, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

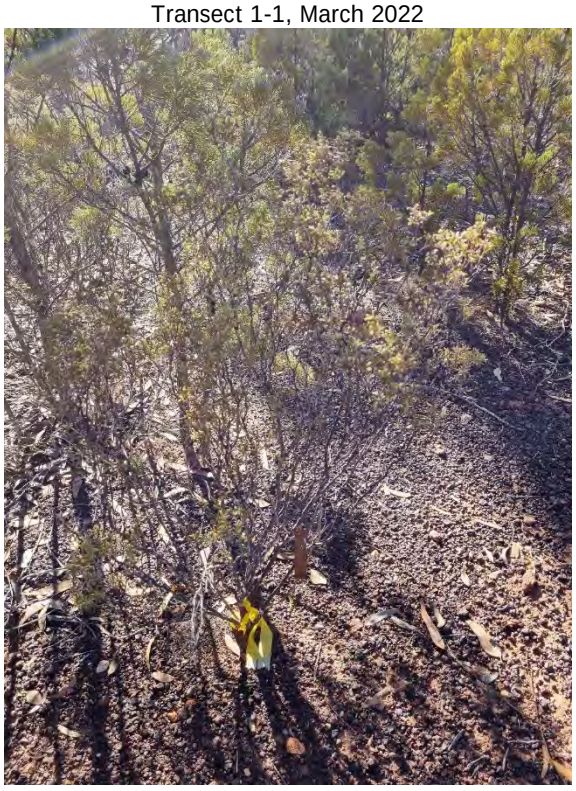
Photographs are labelled in sequence by transect and tagged plant number.



Transect 1-1, March 2022



Transect 1-1, September 2022



Transect 1-2, March 2022



Transect 1-2 September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 1-3, March 2022



Transect 1-3, September 2022



Transect 1-4, March 2022



Transect 1-4, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 1-5, March 2022



Transect 1-5, September 2022



Transect 1-6, March 2022



Transect 1-6, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 1-7, March 2022



Transect 1-6, September 2022



Transect 1-8, March 2022



Transect 1-8, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 1-9, March 2022



Transect 1-9, September 2022



Transect 1-10, March 2022



Transect 1-10, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 1-11, March 2022



Transect 1-11, September 2022



Transect 1-12, March 2022



Transect 1-12, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 1-13, March 2022



Transect 1-13, September 2022



Transect 1-14, March 2022



Transect 1-14, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 1-15, March 2022



Transect 1-15, September 2022



Transect 1-16, March 2022



Transect 1-16, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 1-17, March 2022



Transect 1-17, September 2022



Transect 1-18, March 2022



Transect 1-18, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 1-19, March 2022



Transect 1-19, September 2022



Transect 1-20, March 2022



Transect 1-20, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 2-1, March 2022



Transect 2-1, September 2022



Transect 2-2, March 2022



Transect 2-2, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

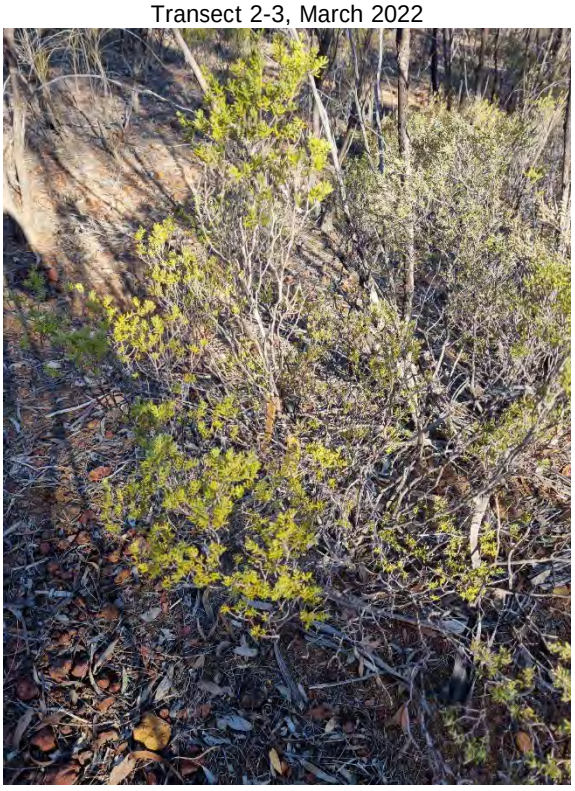
Photographs are labelled in sequence by transect and tagged plant number.



Transect 2-3, March 2022



Transect 2-3, September 2022



Transect 2-4, March 2022



Transect 2-4, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 2-5, March 2022



Transect 2-5, September 2022



Transect 2-6, March 2022



Transect 2-6, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 2-7, March 2022



Transect 2-7, September 2022



Transect 2-8, March 2022



Transect 2-8, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 2-9, March 2022



Transect 2-9, September 2022



Transect 2-10, March 2022



Transect 2-10, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 2-11, March 2022



Transect 2-11, September 2022



Transect 2-12, March 2022



Transect 2-12, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

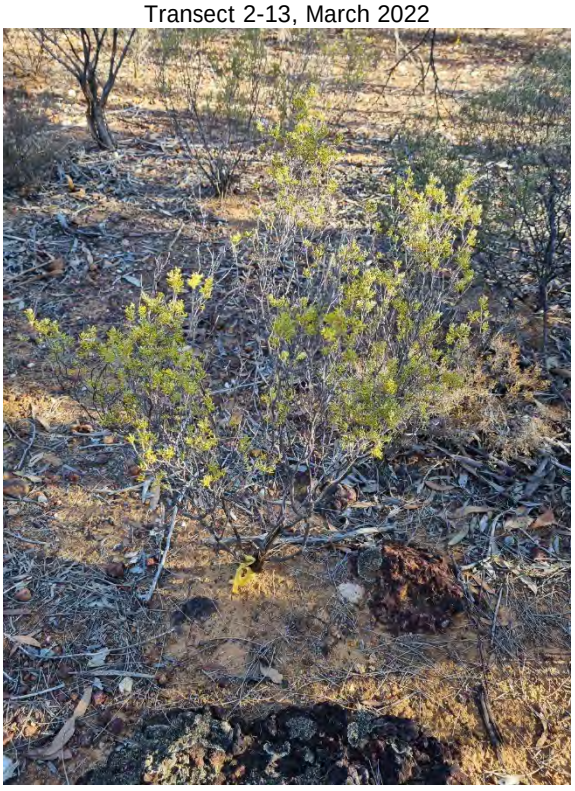
Photographs are labelled in sequence by transect and tagged plant number.



Transect 2-13, March 2022



Transect 2-13, September 2022



Transect 2-14, March 2022



Transect 2-14, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 2-15, March 2022



Transect 2-15, September 2022



Transect 2-16, March 2022



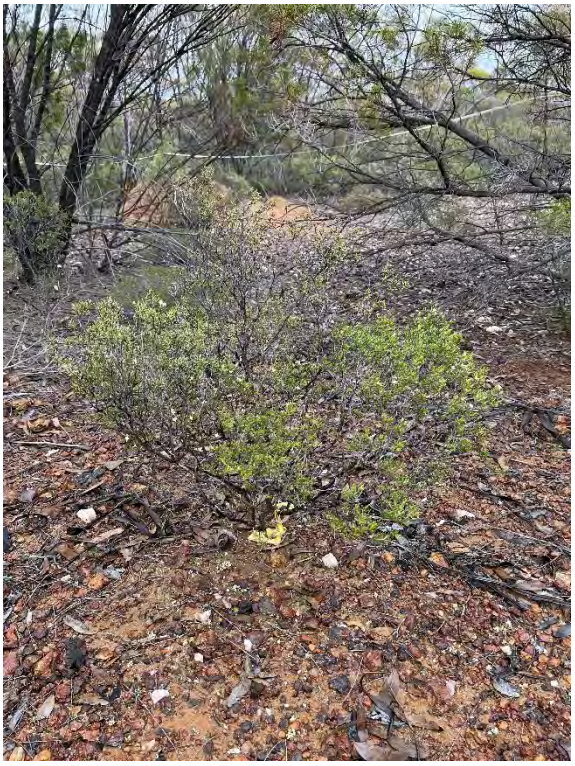
Transect 2-16, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 2-17, March 2022



Transect 2-17, September 2022



Transect 2-18, March 2022



Transect 2-18, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 2-19, March 2022



Transect 2-19, September 2022



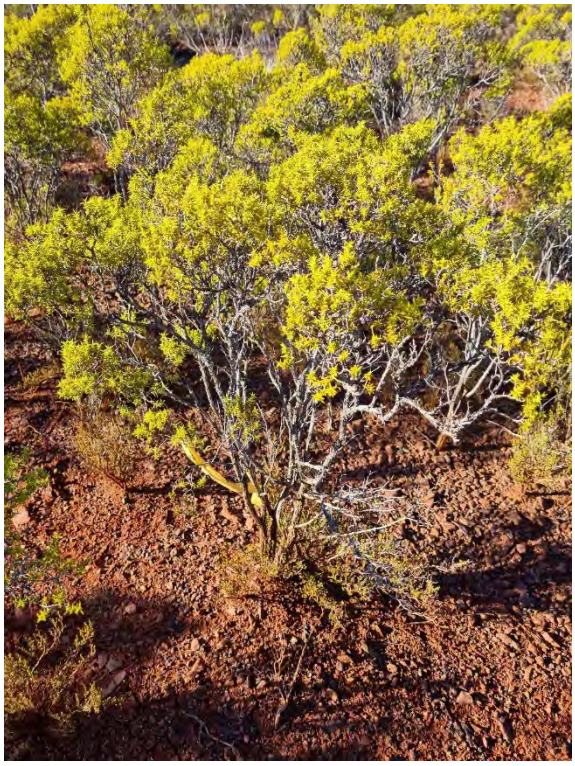
Transect 2-20, March 2022



Transect 2-20, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

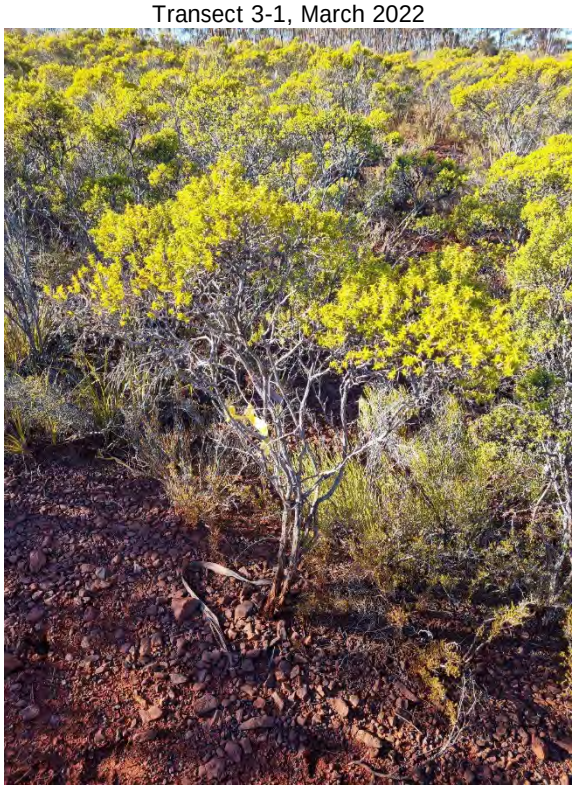
Photographs are labelled in sequence by transect and tagged plant number.



Transect 3-1, March 2022



Transect 3-1, September 2022



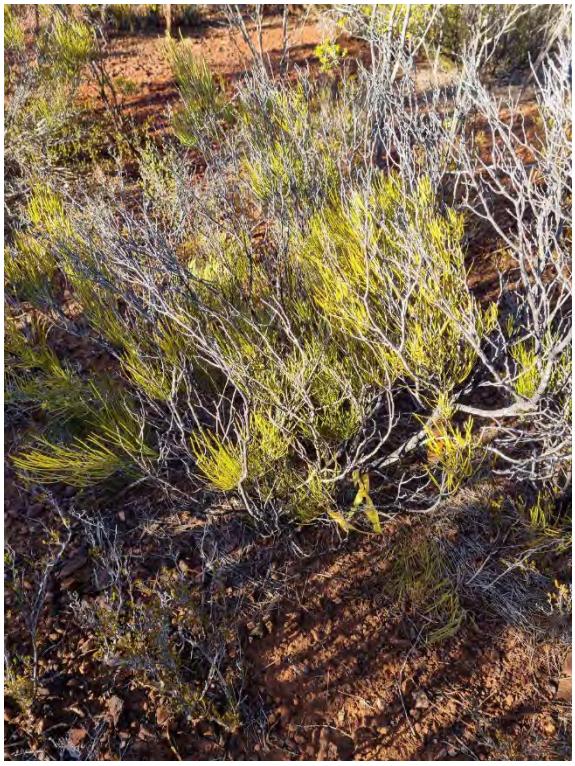
Transect 3-2, March 2022



Transect 3-2, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

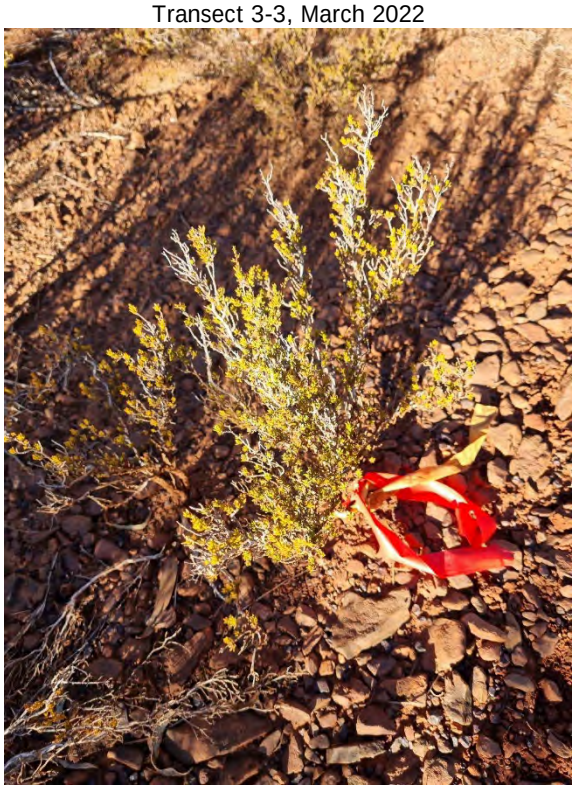
Photographs are labelled in sequence by transect and tagged plant number.



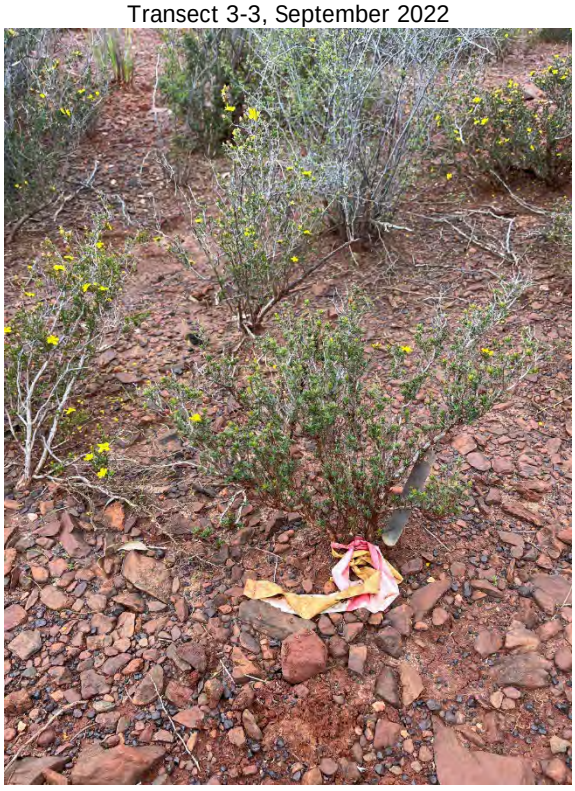
Transect 3-3, March 2022



Transect 3-3, September 2022



Transect 3-4, March 2022



Transect 3-4, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 3-5, March 2022



Transect 3-5, September 2022



Transect 3-6, March 2022



Transect 3-6, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 3-7, March 2022



Transect 3-7, September 2022



Transect 3-8, March 2022



Transect 3-8, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 3-9, March 2022



Transect 3-9, September 2022



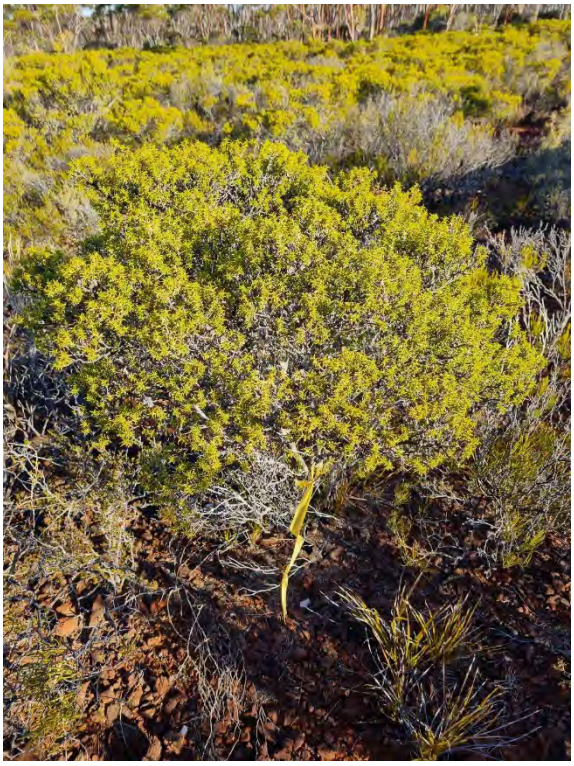
Transect 3-10, March 2022



Transect 3-10, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 3-11, March 2022



Transect 3-11, September 2022



Transect 3-12, March 2022



Transect 3-12, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 3-13, March 2022



Transect 3-13, September 2022



Transect 3-14, March 2022



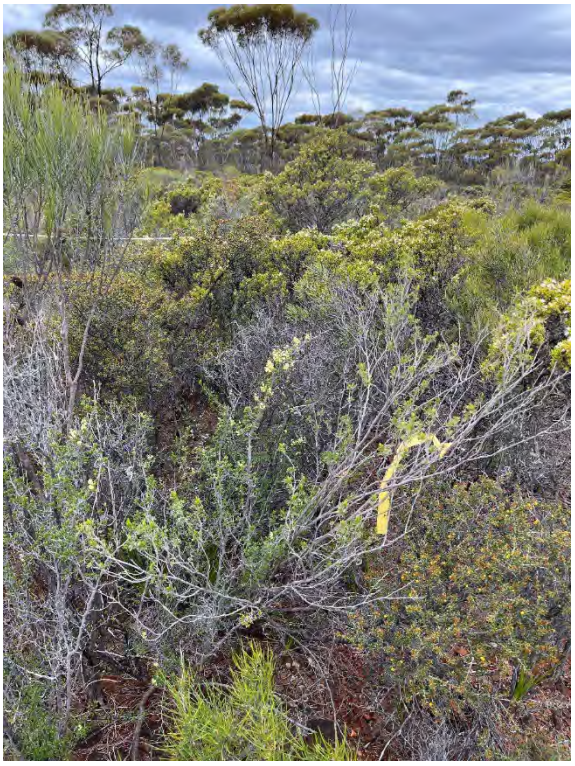
Transect 3-14, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

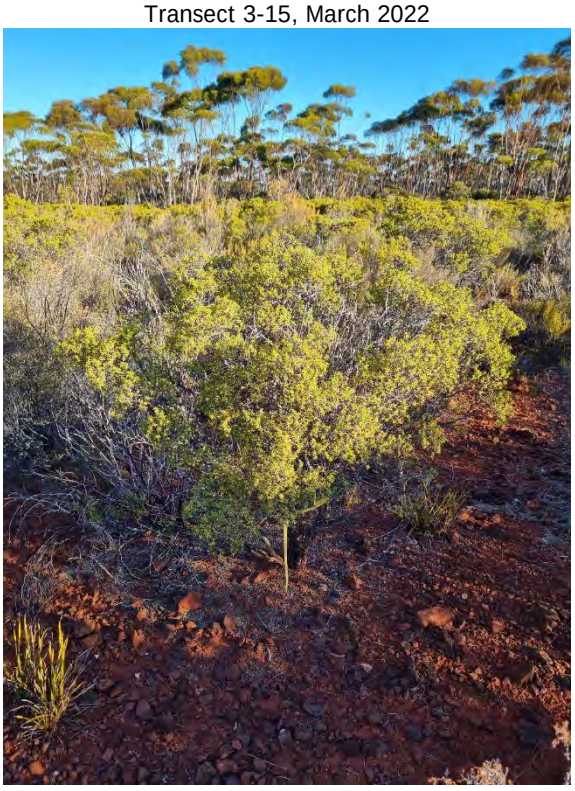
Photographs are labelled in sequence by transect and tagged plant number.



Transect 3-15, March 2022



Transect 3-15, September 2022



Transect 3-16, March 2022



Transect 3-16, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 3-17, March 2022



Transect 3-17, September 2022



Transect 3-18, March 2022



Transect 3-18, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 3-19, March 2022



Transect 3-19, September 2022



Transect 3-20, March 2022



Transect 3-20, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 4-1, March 2022



Transect 4-1, September 2022



Transect 4-2, March 2022



Transect 4-2, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

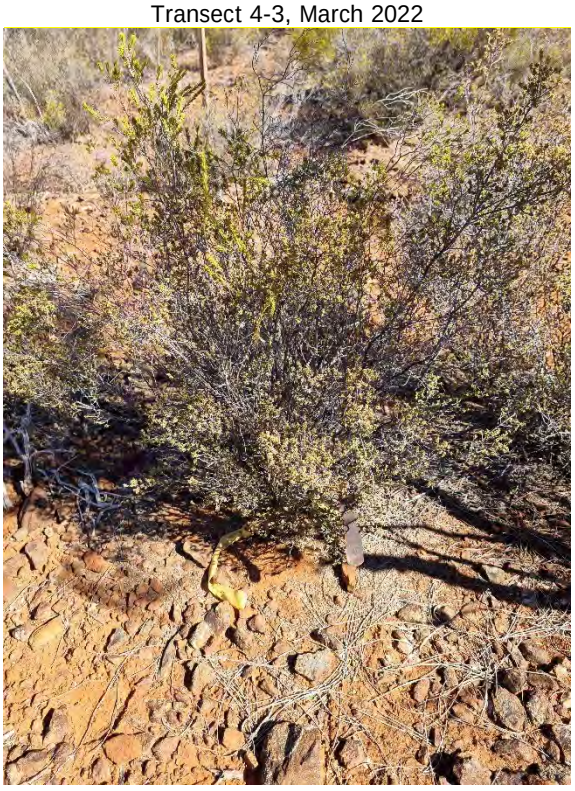
Photographs are labelled in sequence by transect and tagged plant number.



Transect 4-3, March 2022



Transect 4-3, September 2022



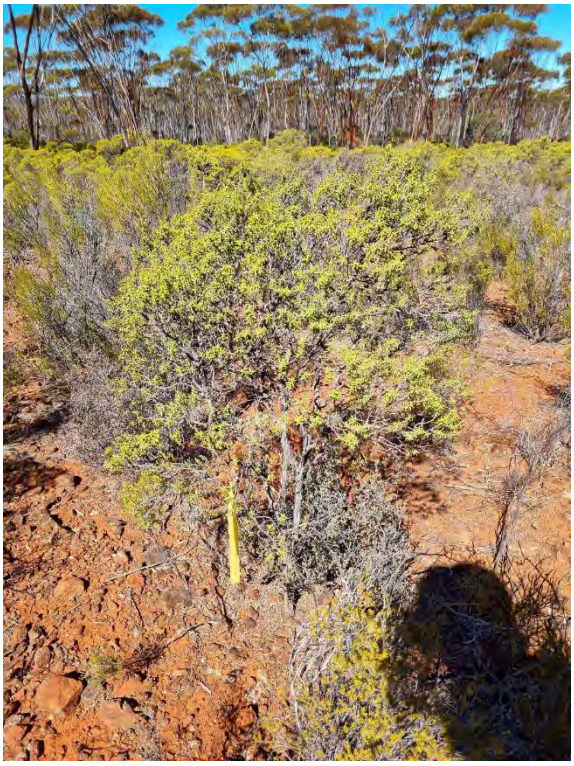
Transect 4-4, March 2022



Transect 4-4, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

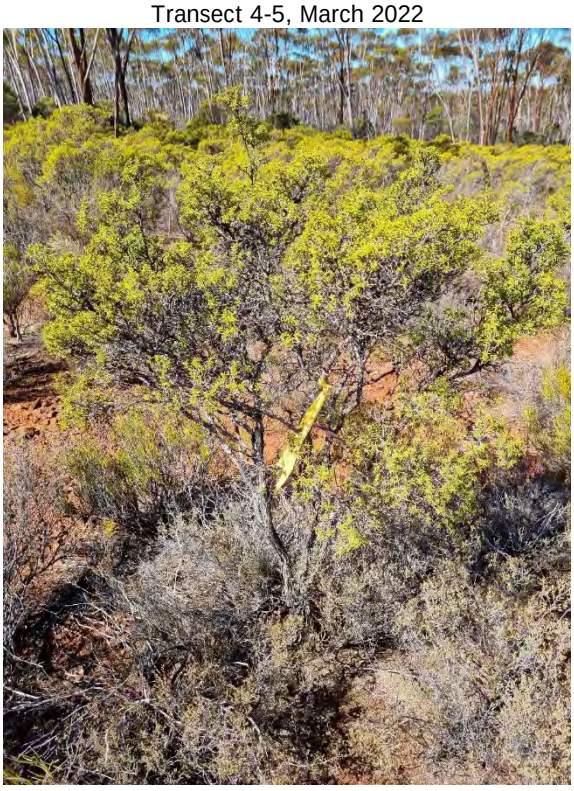
Photographs are labelled in sequence by transect and tagged plant number.



Transect 4-5, March 2022



Transect 4-5, September 2022



Transect 4-6, March 2022



Transect 4-6, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 4-7, March 2022



Transect 4-7, September 2022



Transect 4-8, March 2022



Transect 4-8, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 4-9, March 2022



Transect 4-9, September 2022



Transect 4-10, March 2022



Transect 4-10, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

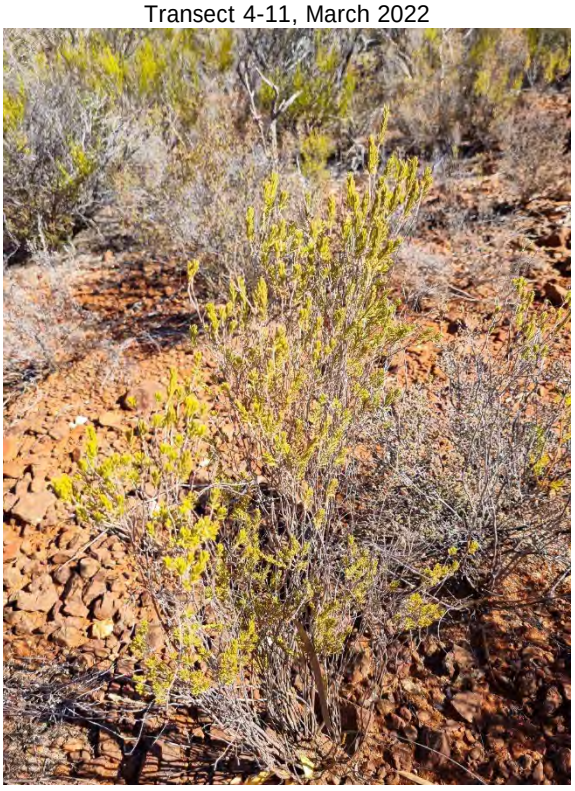
Photographs are labelled in sequence by transect and tagged plant number.



Transect 4-11, March 2022



Transect 4-11, September 2022



Transect 4-12, March 2022



Transect 4-12, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 4-13, March 2022



Transect 4-13, September 2022



Transect 4-14, March 2022



Transect 4-14, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

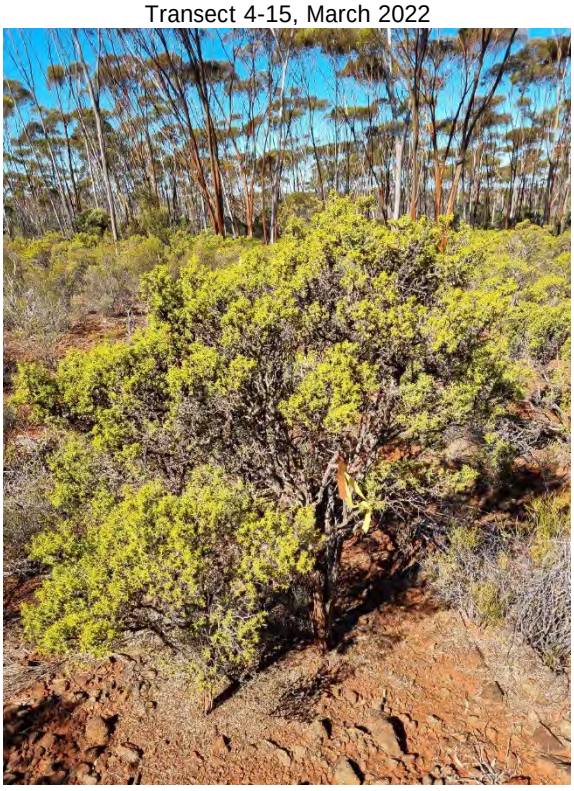
Photographs are labelled in sequence by transect and tagged plant number.



Transect 4-15, March 2022



Transect 4-15, September 2022



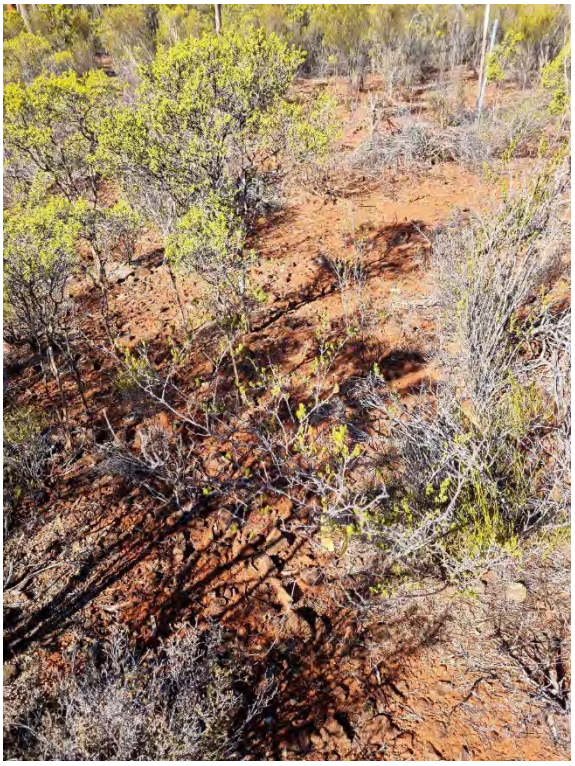
Transect 4-16, March 2022



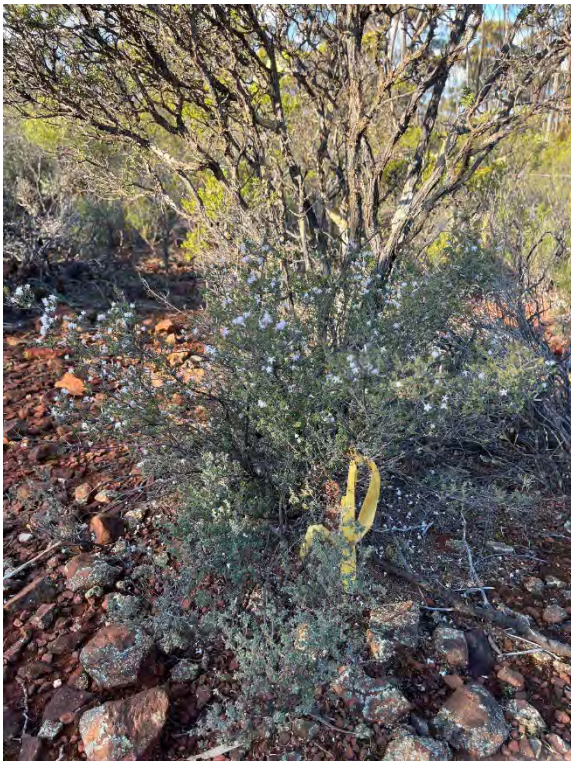
Transect 4-16, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 4-17, March 2022



Transect 4-17, September 2022



Transect 4-18, March 2022



Transect 4-18, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

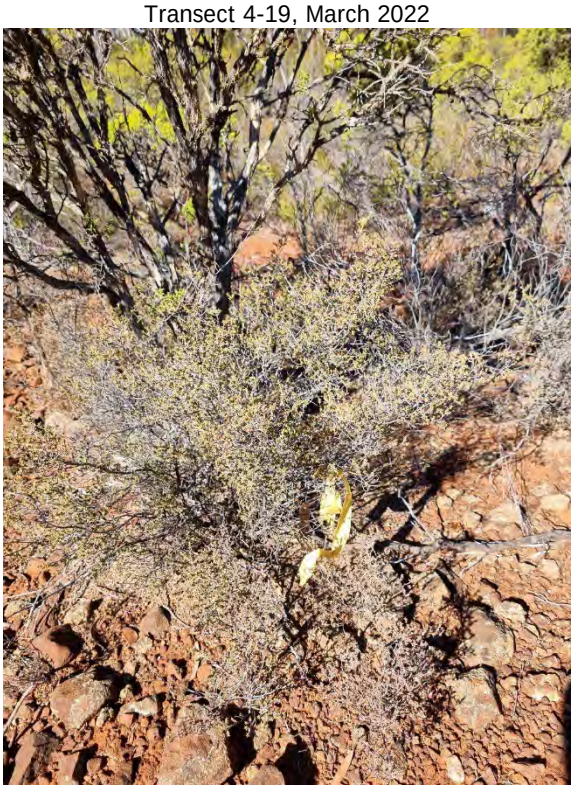
Photographs are labelled in sequence by transect and tagged plant number.



Transect 4-19, March 2022



Transect 4-19, September 2022



Transect 4-20, March 2022



Transect 4-20, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 7-1, March 2022



Transect 7-1, September 2022



Transect 7-2, March 2022



Transect 7-2, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 7-3, March 2022



Transect 7-3, September 2022



Transect 7-4, March 2022



Transect 7-4, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 7-5, March 2022



Transect 7-5, September 2022



Transect 7-6, March 2022



Transect 7-6, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 7-7, March 2022



Transect 7-7, September 2022



Transect 7-8, March 2022



Transect 7-8, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 7-9, March 2022



Transect 7-9, September 2022



Transect 7-10, March 2022



Transect 7-10, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 7-11, March 2022



Transect 7-11, September 2022



Transect 7-12, March 2022



Transect 7-12, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 7-13, March 2022



Transect 7-13, September 2022



Transect 7-14, March 2022



Transect 7-14, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 7-15, March 2022



Transect 7-15, September 2022



Transect 7-16, March 2022



Transect 7-16, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 7-17, March 2022



Transect 7-17, September 2022



Transect 7-18, March 2022



Transect 7-18, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 7-19, March 2022



Transect 7-19, September 2022



Transect 7-20, March 2022



Transect 7-20, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 8-1, March 2022



Transect 8-1, September 2022



Transect 8-2, March 2022



Transect 8-2, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 8-3, March 2022



Transect 8-3, September 2022



Transect 8-4, March 2022



Transect 8-4, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 8-5, March 2022



Transect 8-5, September 2022



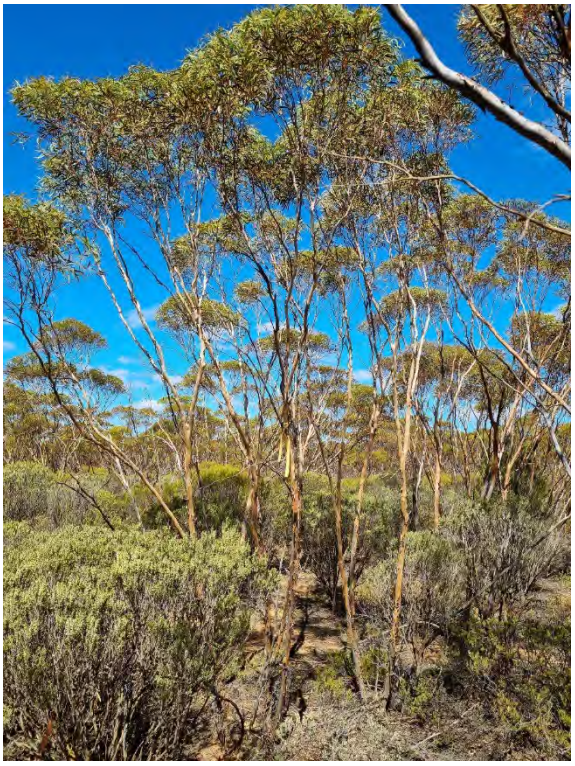
Transect 8-6, March 2022



Transect 8-6, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 8-7, March 2022



Transect 8-7, September 2022



Transect 8-8, March 2022



Transect 8-8, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 8-9, March 2022



Transect 8-9, September 2022



Transect 8-10, March 2022



Transect 8-10, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 8-11, March 2022



Transect 8-11, September 2022



Transect 8-12, March 2022



Transect 8-12, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 8-13, March 2022



Transect 8-13, September 2022



Transect 8-14, March 2022



Transect 8-14, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 8-15, March 2022



Transect 8-15, September 2022



Transect 8-16, March 2022



Transect 8-16, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

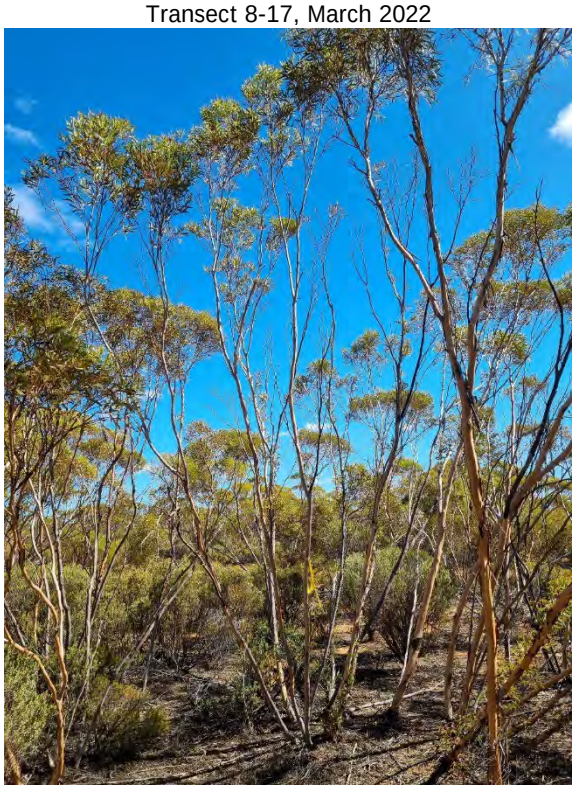
Photographs are labelled in sequence by transect and tagged plant number.



Transect 8-17, March 2022



Transect 8-17, September 2022



Transect 8-18, March 2022



Transect 8-18, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 8-19, March 2022



Transect 8-19, September 2022



Transect 8-20, March 2022



Transect 8-20, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 9-1, March 2022



Transect 9-1, September 2022



Transect 9-2, March 2022



Transect 9-2, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 9-3, March 2022



Transect 9-3, September 2022



Transect 9-4, March 2022



Transect 9-4, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 9-5, March 2022



Transect 9-5, September 2022



Transect 9-6, March 2022



Transect 9-6, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 9-7, March 2022



Transect 9-7, September 2022



Transect 9-8, March 2022



Transect 9-8, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 9-9, March 2022



Transect 9-9, September 2022



Transect 9-10, March 2022



Transect 9-10, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 9-11, March 2022



Transect 9-11, September 2022



Transect 9-12, March 2022



Transect 9-12, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

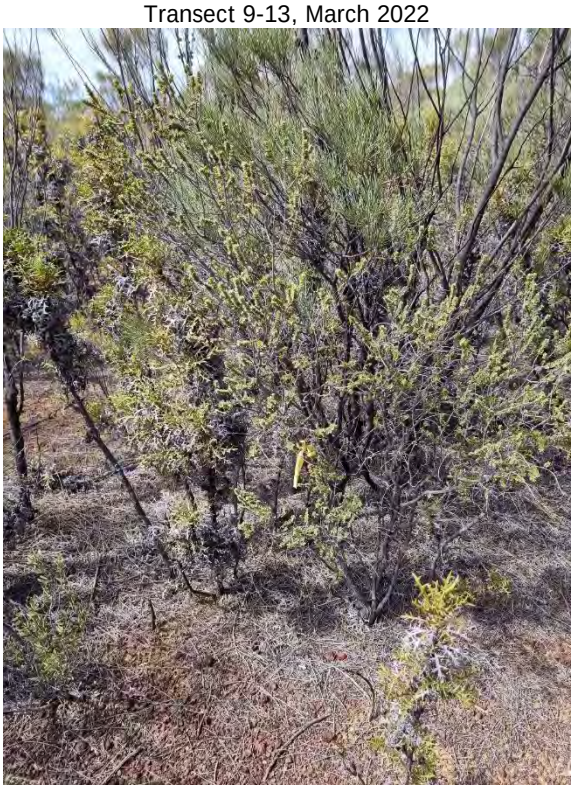
Photographs are labelled in sequence by transect and tagged plant number.



Transect 9-13, March 2022



Transect 9-13, September 2022



Transect 9-14, March 2022



Transect 9-14, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 9-15, March 2022



Transect 9-15, September 2022



Transect 9-16, March 2022



Transect 9-16, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 9-17, March 2022



Transect 9-17, September 2022



Transect 9-18, March 2022



Transect 9-18, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 9-19, March 2022



Transect 9-19, September 2022



Transect 9-20, March 2022



Transect 9-20, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 10-1, March 2022



Transect 10-1, September 2022



Transect 10-2, March 2022



Transect 10-2, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 10-3, March 2022



Transect 10-3, September 2022



Transect 10-4, March 2022



Transect 10-4, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 10-5, March 2022



Transect 10-5, September 2022



Transect 10-6, March 2022



Transect 10-6, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 10-7, March 2022



Transect 10-7, September 2022



Transect 10-8, March 2022



Transect 10-8, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 10-9, March 2022



Transect 10-9, September 2022



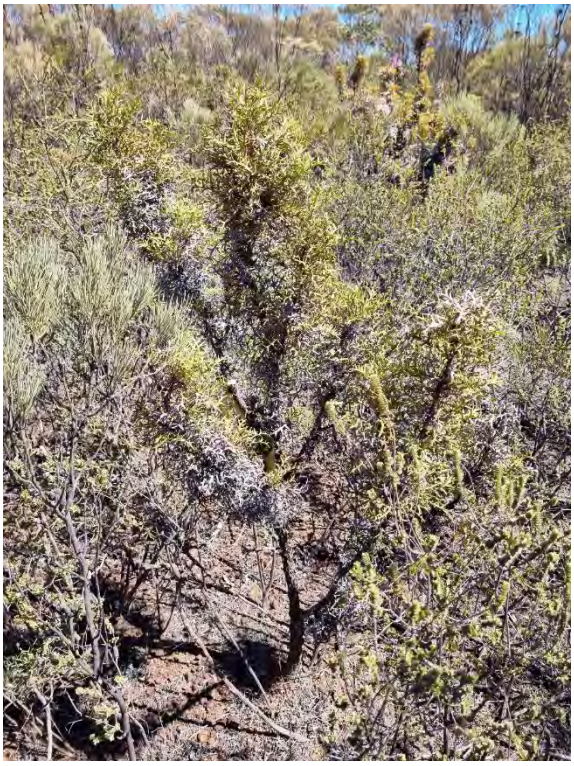
Transect 10-10, March 2022



Transect 10-10, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 10-11, March 2022



Transect 10-11, September 2022



Transect 10-12, March 2022



Transect 10-12, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 10-13, March 2022



Transect 10-13, September 2022



Transect 10-14, March 2022



Transect 10-14, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 10-15, March 2022



Transect 10-15, September 2022



Transect 10-16, March 2022



Transect 10-16, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 10-17, March 2022



Transect 10-17, September 2022



Transect 10-18, March 2022



Transect 10-18, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 10-19, March 2022



Transect 10-19, September 2022



Transect 10-20, March 2022



Transect 10-20, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 11-1, March 2022



Transect 11-1, March 2022



Transect 11-2, March 2022



Transect 11-2, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 11-3, March 2022



Transect 11-3, March 2022



Transect 11-4, March 2022



Transect 11-4, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 11-5, March 2022



Transect 11-5, March 2022



Transect 11-6, March 2022



Transect 11-6, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 11-7, March 2022



Transect 11-7, March 2022



Transect 11-8, March 2022



Transect 11-8, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 11-9, March 2022



Transect 11-9, March 2022



Transect 11-10, March 2022



Transect 11-10, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 11-11, March 2022



Transect 11-11, March 2022



Transect 11-12, March 2022



Transect 11-12, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 11-13, March 2022



Transect 11-13, March 2022



Transect 11-14, March 2022



Transect 11-14, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 11-15, March 2022



Transect 11-15, March 2022



Transect 11-16, March 2022



Transect 11-16, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 11-17, March 2022



Transect 11-17, March 2022



Transect 11-18, March 2022



Transect 11-18, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 11-19, March 2022



Transect 11-19, March 2022



Transect 11-20, March 2022



Transect 11-20, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 12-1, March 2022



Transect 12-1, March 2022



Transect 12-2, March 2022



Transect 12-2, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 12-3, March 2022



Transect 12-3, March 2022



Transect 12-4, March 2022



Transect 12-4, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 12-5, March 2022



Transect 12-5, March 2022



Transect 12-6, March 2022



Transect 12-6, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

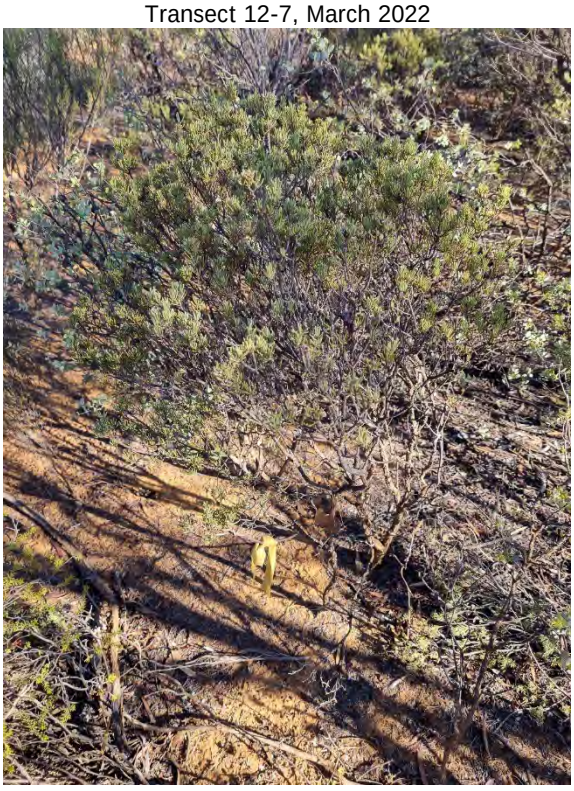
Photographs are labelled in sequence by transect and tagged plant number.



Transect 12-7, March 2022



Transect 12-7, March 2022



Transect 12-8, March 2022



Transect 12-8, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 12-9, March 2022



Transect 12-9, March 2022



Transect 12-10, March 2022



Transect 12-10, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 12-11, March 2022



Transect 12-11, March 2022



Transect 12-12, March 2022



Transect 12-12, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 12-13, March 2022



Transect 12-13, March 2022



Transect 12-14, March 2022



Transect 12-14, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 12-15, March 2022



Transect 12-15, March 2022



Transect 12-16, March 2022



Transect 12-16, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 12-17, March 2022



Transect 12-17, March 2022



Transect 12-18, March 2022



Transect 12-18, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 12-19, March 2022



Transect 12-19, March 2022



Transect 12-20, March 2022



Transect 12-20, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 13-1, March 2022



Transect 13-1, March 2022



Transect 13-2, March 2022



Transect 13-2, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 13-3, March 2022



Transect 13-3, March 2022



Transect 13-4, March 2022



Transect 13-4, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 13-5, March 2022



Transect 13-5, September 2022



Transect 13-6, March 2022



Transect 13-6, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 13-7, March 2022



Transect 13-7, September 2022



Transect 13-8, March 2022



Transect 13-8, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 13-9, March 2022



Transect 13-9, September 2022



Transect 13-10, March 2022



Transect 13-10, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 13-11, March 2022



Transect 13-11, September 2022



Transect 13-12, March 2022



Transect 13-12, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 13-13, March 2022



Transect 13-13, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 13-14, March 2022



Transect 13-14, September 2022



Transect 13-15, March 2022



Transect 13-15, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 13-16, March 2022



Transect 13-16, September 2022



Transect 13-17, March 2022



Transect 13-17, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 13-18, March 2022



Transect 13-18, September 2022



Transect 13-19, March 2022



Transect 13-16, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 13-20, March 2022



Transect 13-20, September 2022



Transect 14-1, March 2022



Transect 14-1, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 14-2, March 2022



Transect 14-2, September 2022



Transect 14-3, March 2022



Transect 14-3, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

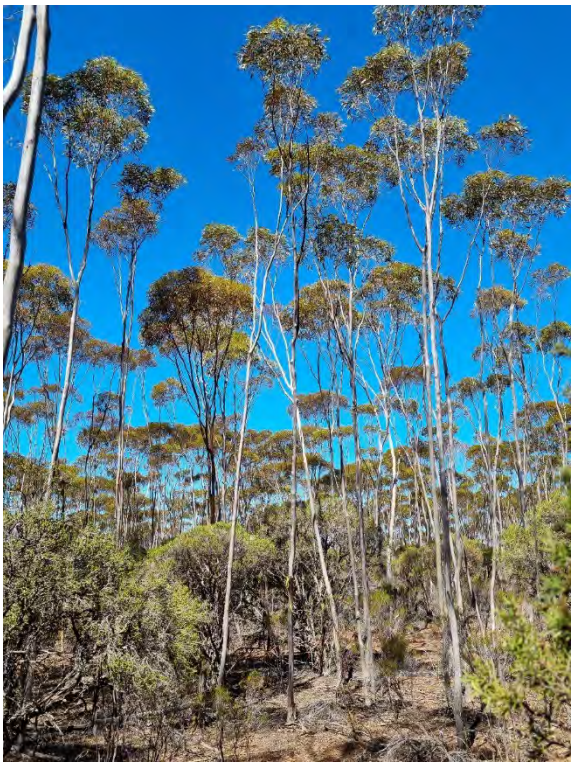
Photographs are labelled in sequence by transect and tagged plant number.



Transect 14-4, March 2022



Transect 14-4, September 2022



Transect 14-5, March 2022



Transect 14-5, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 14-6, March 2022



Transect 14-6, September 2022



Transect 14-7, March 2022



Transect 14-7, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 14-8, March 2022



Transect 14-8, September 2022



Transect 14-9, March 2022



Transect 14-9, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 14-10, March 2022



Transect 14-10, September 2022



Transect 14-11, March 2022



Transect 14-11, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

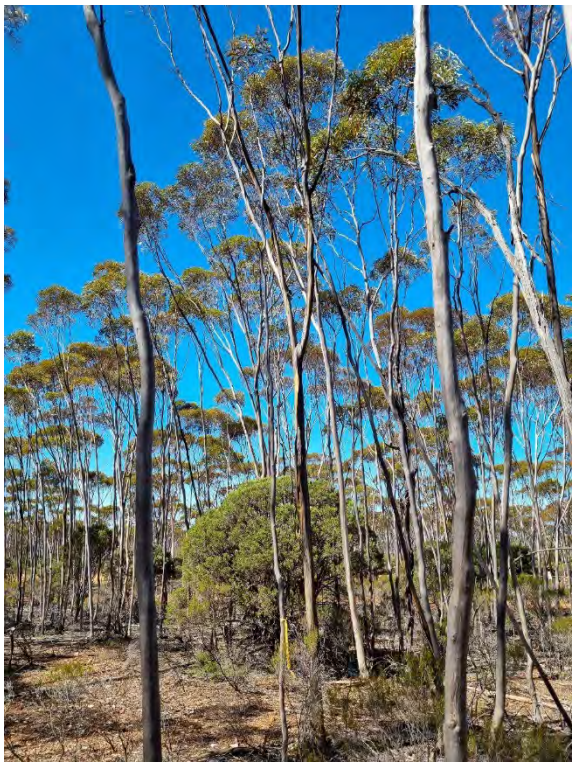
Photographs are labelled in sequence by transect and tagged plant number.



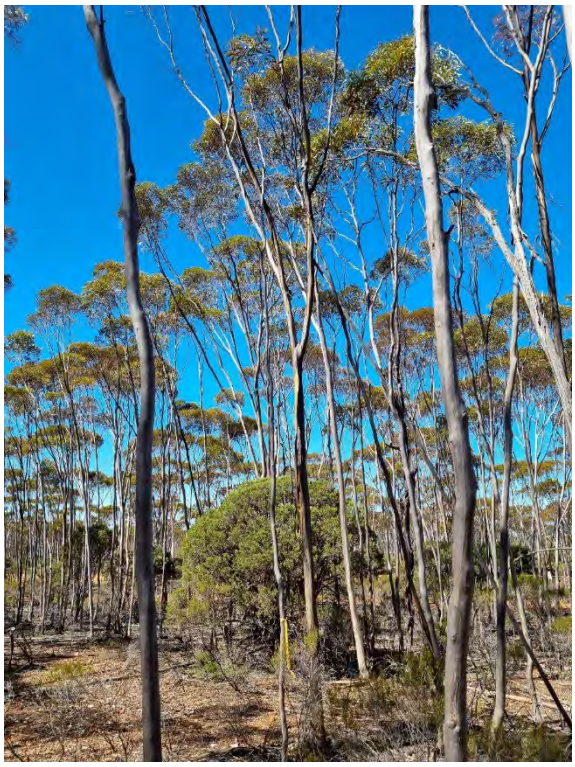
Transect 14-12, March 2022



Transect 14-12, September 2022



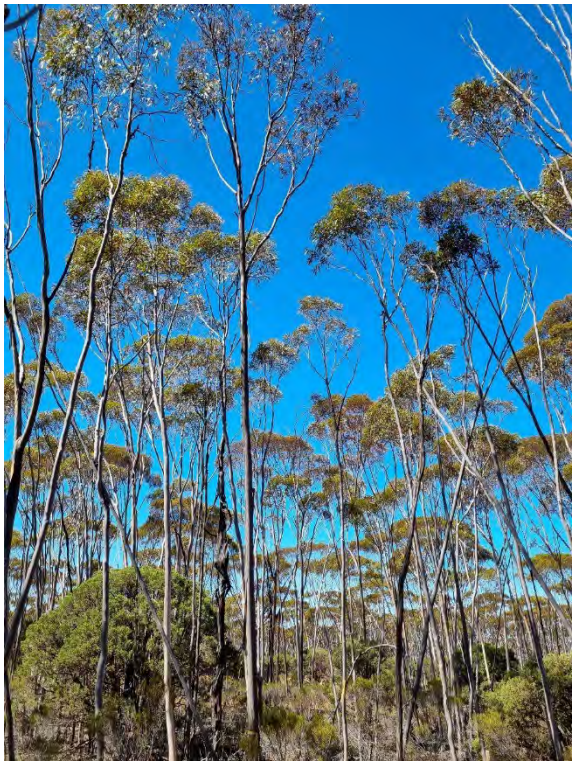
Transect 14-13, March 2022



Transect 14-13, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 14-14, March 2022



Transect 14-14, September 2022



Transect 14-15, March 2022



Transect 14-15, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 14-16, March 2022



Transect 14-16, September 2022



Transect 14-17, March 2022



Transect 14-17, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 14-18, March 2022



Transect 14-18, September 2022



Transect 14-19, March 2022



Transect 14-19, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

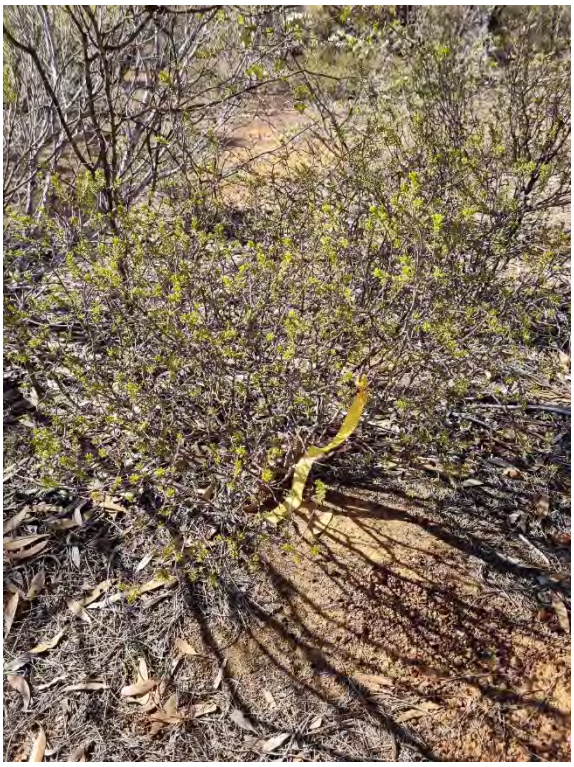
Photographs are labelled in sequence by transect and tagged plant number.



Transect 14-20, March 2022



Transect 14-20, September 2022



Transect 15-1, March 2022



Transect 15-1, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

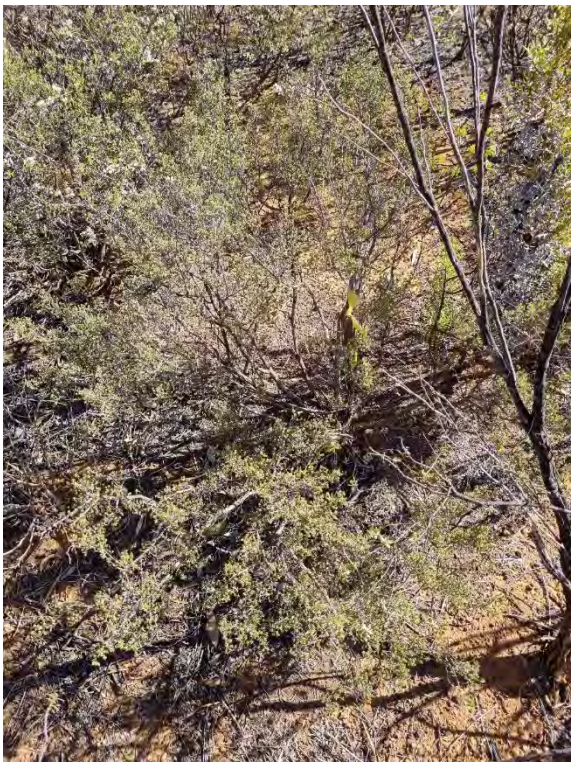
Photographs are labelled in sequence by transect and tagged plant number.



Transect 15-2, March 2022



Transect 15-2, September 2022



Transect 15-3, March 2022



Transect 15-3, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 15-4, March 2022



Transect 15-4, September 2022



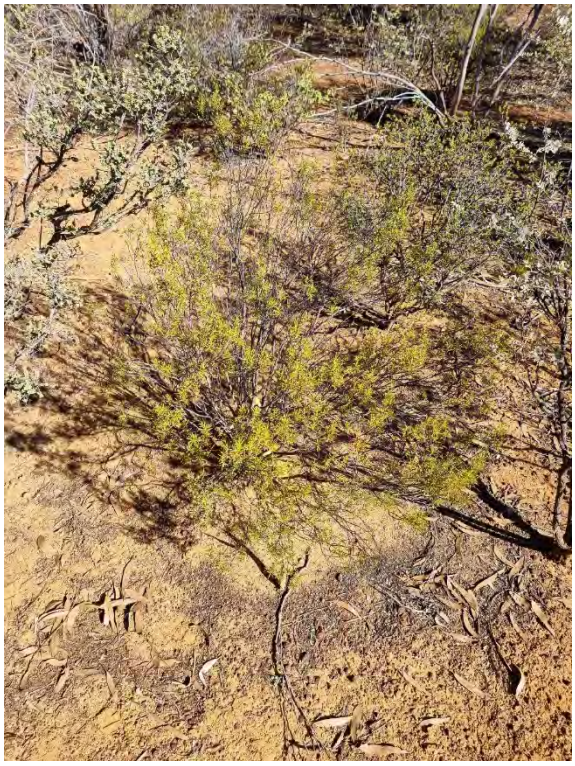
Transect 15-5, March 2022



Transect 15-5, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 15-6, March 2022



Transect 15-6, September 2022



Transect 15-7, March 2022



Transect 15-7, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 15-8, March 2022



Transect 15-8, September 2022



Transect 15-9, March 2022



Transect 15-9, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 15-10, March 2022



Transect 15-10, September 2022



Transect 15-11, March 2022



Transect 15-11, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 15-12, March 2022



Transect 15-12, September 2022



Transect 15-13, March 2022



Transect 15-13, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

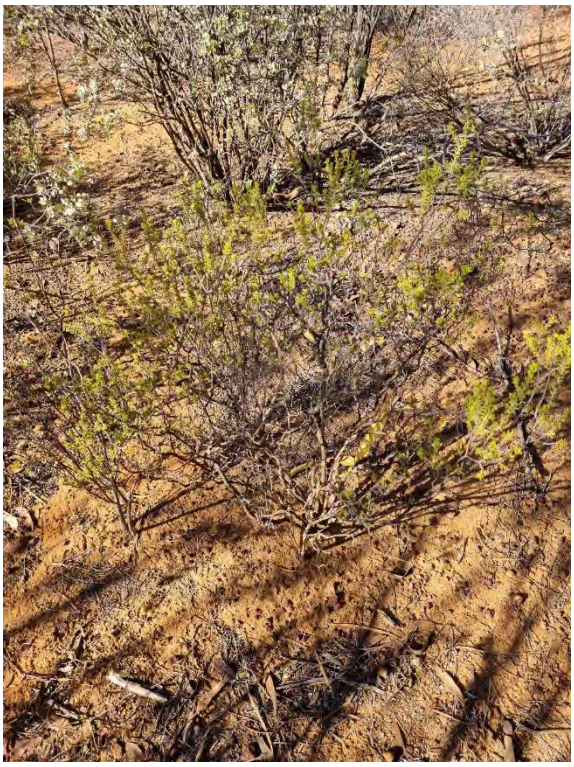
Photographs are labelled in sequence by transect and tagged plant number.



Transect 15-14, March 2022



Transect 15-14, September 2022



Transect 15-15, March 2022



Transect 15-15, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 15-16, March 2022



Transect 15-16, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 15-17, March 2022



Transect 15-17, September 2022



Transect 15-18, March 2022



Transect 15-18, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 15-19, March 2022



Transect 15-19, September 2022



Transect 15-20, March 2022



Transect 15-20, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 16-1, March 2022



Transect 16-1, September 2022



Transect 16-2, March 2022



Transect 16-2, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.

Transect 16-2 (new), September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



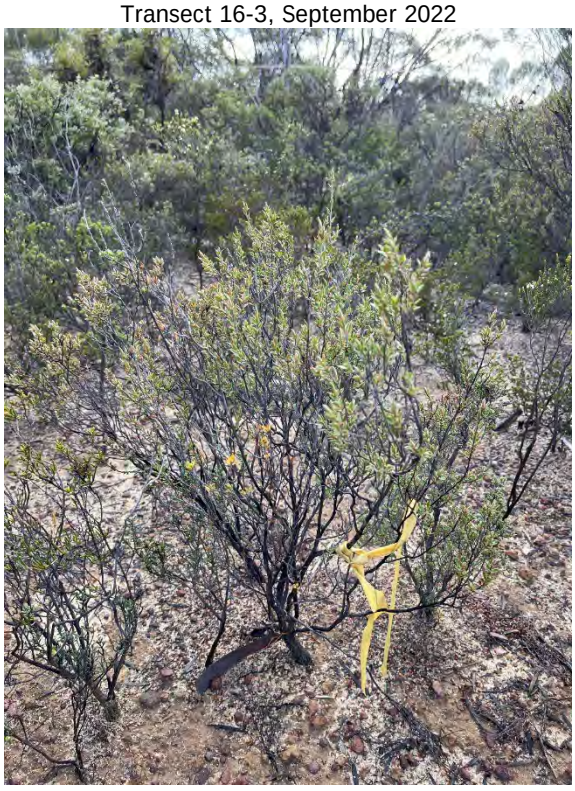
Transect 16-3, March 2022



Transect 16-3, September 2022



Transect 16-4, March 2022



Transect 16-4, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 16-5, March 2022



Transect 16-5, September 2022



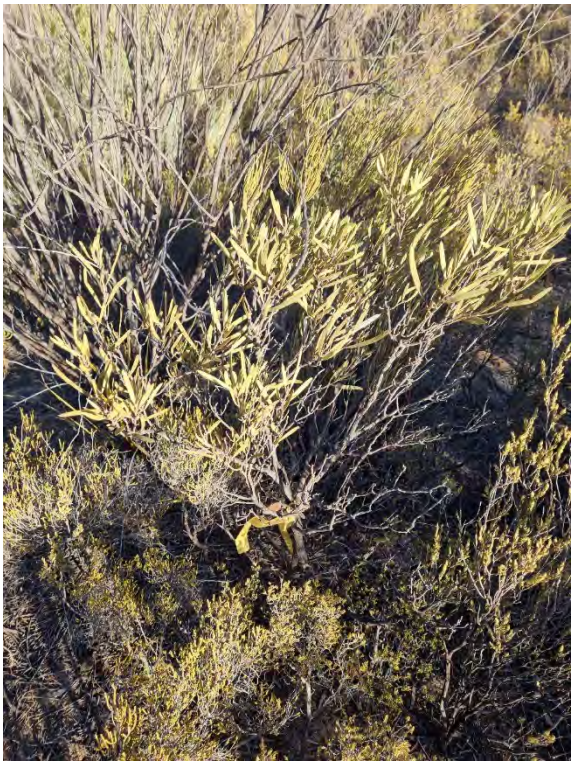
Transect 16-6, March 2022



Transect 16-6, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 16-7, March 2022



Transect 16-7, September 2022



Transect 16-8, March 2022



Transect 16-8, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 16-9, March 2022



Transect 16-9, September 2022



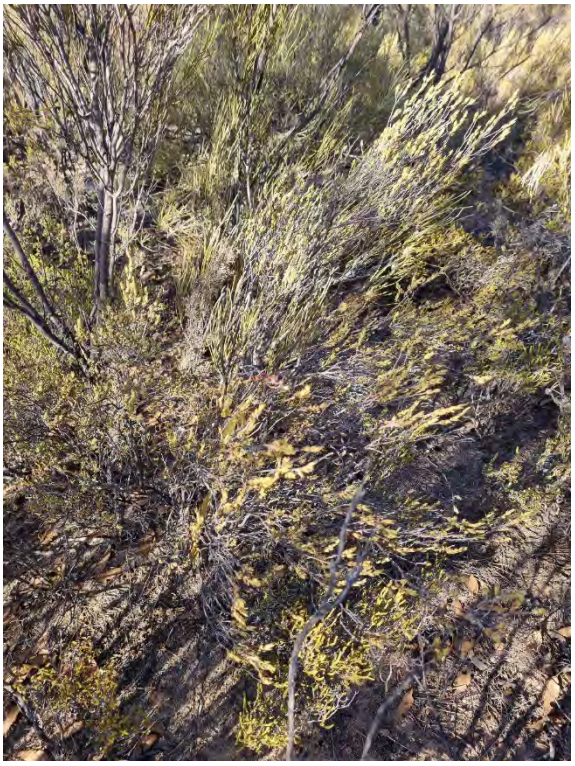
Transect 16-10, March 2022



Transect 16-10, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 16-11, March 2022



Transect 16-11, September 2022



Transect 16-12, March 2022



Transect 16-12, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 16-13, March 2022



Transect 16-13, September 2022



Transect 16-14, March 2022



Transect 16-14, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 16-15, March 2022



Transect 16-15, September 2022



Transect 16-16, March 2022



Transect 16-16, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 16-17, March 2022



Transect 16-17, September 2022



Transect 16-18, March 2022



Transect 16-18, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 16-19, March 2022



Transect 16-19, September 2022



Transect 16-20, March 2022



Transect 16-20, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 17-1, March 2022



Transect 17-1, September 2022



Transect 17-2, March 2022



Transect 17-2, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 17-3, March 2022



Transect 17-3, September 2022



Transect 17-4, March 2022



Transect 17-4, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 17-5, March 2022



Transect 17-5, September 2022



Transect 17-6, March 2022



Transect 17-6, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 17-7, March 2022



Transect 17-7, September 2022



Transect 17-8, March 2022



Transect 17-8, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 17-9, March 2022



Transect 17-9, September 2022



Transect 17-10, March 2022



Transect 17-10, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 17-11, March 2022



Transect 17-11, September 2022



Transect 17-12, March 2022



Transect 17-12, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 17-13, March 2022



Transect 17-13, September 2022



Transect 17-14, March 2022



Transect 17-14, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 17-15, March 2022



Transect 17-15, September 2022



Transect 17-16, March 2022



Transect 17-16, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 17-17, March 2022



Transect 17-17, September 2022



Transect 17-18, March 2022



Transect 17-18, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 17-19, March 2022



Transect 17-19, September 2022



Transect 17-20, March 2022



Transect 17-20, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 18-1, March 2022



Transect 18-1, September 2022



Transect 18-2, March 2022



Transect 18-2, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 18-3, March 2022



Transect 18-3, September 2022



Transect 18-4, March 2022



Transect 18-4, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 18-5, March 2022



Transect 18-5, September 2022



Transect 18-6, March 2022



Transect 18-6, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 18-7, March 2022



Transect 18-7, September 2022



Transect 18-8, March 2022



Transect 18-8, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 18-9, March 2022



Transect 18-9, September 2022



Transect 18-10, March 2022



Transect 18-10, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 18-11, March 2022



Transect 18-11, September 2022



Transect 18-12, March 2022



Transect 18-12, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 18-13, March 2022



Transect 18-13, September 2022



Transect 18-14, March 2022



Transect 18-14, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 18-15, March 2022



Transect 18-15, September 2022



Transect 18-16, March 2022



Transect 18-16, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 18-17, March 2022



Transect 18-17, September 2022



Transect 18-18, March 2022



Transect 18-18, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 18-19, March 2022



Transect 18-19, September 2022



Transect 18-20, March 2022



Transect 18-20, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 19-1, March 2022



Transect 19-1, September 2022



Transect 19-2, March 2022



Transect 19-2, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 19-3, March 2022



Transect 19-3, September 2022



Transect 19-4, March 2022



Transect 19-4, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 19-5, March 2022



Transect 19-5, September 2022



Transect 19-6, March 2022



Transect 19-6, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 19-7, March 2022



Transect 19-7, September 2022



Transect 19-8, March 2022



Transect 19-8, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 19-9, March 2022



Transect 19-9, September 2022



Transect 19-10, March 2022



Transect 19-10, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 19-11, March 2022



Transect 19-11, September 2022



Transect 19-12, March 2022



Transect 19-12, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 19-13, March 2022



Transect 19-13, September 2022



Transect 19-14, March 2022



Transect 19-14, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 19-15, March 2022



Transect 19-15, September 2022



Transect 19-16, March 2022



Transect 19-16, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 19-17, March 2022



Transect 19-17, September 2022



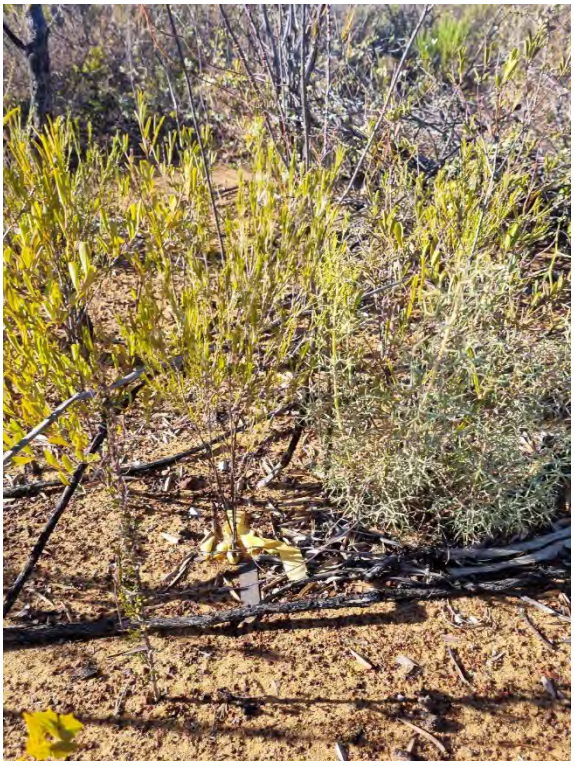
Transect 19-18, March 2022



Transect 19-18, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 19-19, March 2022



Transect 19-19, September 2022



Transect 19-20, March 2022



Transect 19-20, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 20-1, March 2022



Transect 20-1, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 20-2, March 2022



Transect 20-2, September 2022



Transect 20-3, March 2022



Transect 20-3, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 20-4, March 2022



Transect 20-4, September 2022



Transect 20-5, March 2022



Transect 20-5, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 20-6, March 2022



Transect 20-6, September 2022



Transect 20-7, March 2022



Transect 20-7, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 20-8, March 2022



Transect 20-8, September 2022



Transect 20-9, March 2022



Transect 20-9, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

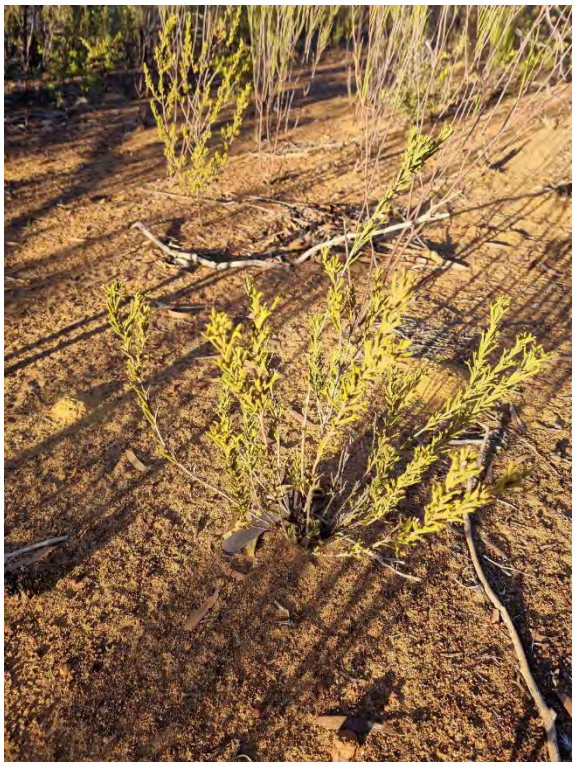
Photographs are labelled in sequence by transect and tagged plant number.



Transect 20-10, March 2022



Transect 20-10, September 2022



Transect 20-11, March 2022



Transect 20-11, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 20-12, March 2022



Transect 20-12, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 20-13, March 2022



Transect 20-13, September 2022



Transect 20-14, March 2022



Transect 20-14, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 20-15, March 2022



Transect 20-15, September 2022



Transect 20-16, March 2022



Transect 20-16, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 20-17, March 2022



Transect 20-17, September 2022



Transect 20-18, March 2022



Transect 20-18, September 2022

APPENDIX E: PHOTOGRAPHIC RECORD OF TAGGED SPECIES AT EACH PLANT CONDITION MONITORING TRANSECT

Photographs are labelled in sequence by transect and tagged plant number.



Transect 20-19, March 2022



Transect 20-19, September 2022



Transect 20-20, March 2022



Transect 20-20, September 2022

Appendix K Introduced Predator Monitoring

©JBS&G Australia Pty Ltd

2021 PREDATOR MONITORING

Covalent Lithium

ecoscape

COPYRIGHT STATEMENT FOR:
2021 Predator Monitoring
Our Reference: 4644-21 Final 2021-22 Predator Monitoring
Copyright © 1987-2022
Ecoscape (Australia) Pty Ltd
ABN 70 070 128 675
Except as permitted under the Copyright Act 1968 (Cth), the whole or any part of this document may not be reproduced by any process, electronic or otherwise, without the specific written permission of the copyright owner, Ecoscape (Australia) Pty Ltd. This includes microcopying, photocopying or recording of any parts of the report.

Revision	Author	QA Reviewer	Approved	Date
Draft	BT	LS	LS	7/06/2022
Final	BT	LS	LS	14/04/2023

Direct all inquiries to:
Ecoscape (Australia) Pty Ltd
9 Stirling Highway • PO Box 50 NORTH FREMANTLE WA 6159
Ph: (08) 9430 8955
Prepared for Covalent Lithium

TABLE OF CONTENTS

Acknowledgements **1**

Summary **2**

1 Introduction **3**

1.1 Project Scope 3

1.2 Survey Area 3

1.2.1 Regional Location 3

1.3 Statutory and Technical Framework 4

1.3.1 Commonwealth Environment Protection and Biodiversity Conservation Act 1999 4

1.3.2 Western Australian Environmental Protection Act 1986 4

1.3.3 Western Australian Biodiversity Conservation Act 2016 5

1.3.4 Western Australian Priority Fauna 5

2 Method **6**

2.1.1 Introduced Predator Monitoring 6

2.1.2 Trail Camera Monitoring 6

3 Results **7**

3.1 Introduced Predator Monitoring 7

4 Discussion and Recommendations **9**

4.1.1 Introduced Predators 9

4.2 Recommendations 9

References **10**

Appendix One **Maps** **11**

Appendix Two **Monitoring Results** **15**

FIGURES

Figure 1: Introduced Predator Recorded Images by Year 8

TABLES

Table 1: Number of introduced predator events recorded 7

Table 2: Monitoring Effort 7

Table 6: Introduced Predator Records 15

MAPS

Map 1: Introduced Predator Locations 2019 12

Map 2: Introduced Predator Locations 2020 13

Map 3: Introduced Predator Locations 2021 14

IMAGES

Image 1: Monitored mound showing location of post and camera 6

Image 2: Feral Cat recorded at mound MM63 8

Image 3: European Red Fox at mound MM4 8

ACKNOWLEDGEMENTS

Ecoscape would like to acknowledge the assistance and support we received from the Covalent staff on-site who made us welcome and provided logistical support where needed. We look forward to returning for the next years monitoring.

SUMMARY

Ecoscape was engaged by Covalent Lithium in early 2021 to provide the following services for the project:

- undertake National Malleefowl Recovery Team (NMRT) Malleefowl mound monitoring for the 2021-22 monitoring period
- collate images of introduced predator species and activity from camera monitored Malleefowl mounds.

This monitoring program was developed to be in accordance with condition 7-1 of Ministerial Statement 1118 (MS 1118).

The results of the monitoring and review of the recorded images of introduced predators at mounds between 2019 to 2021, has provided an indication of the level of introduced predator abundance within the project development envelope (DE) and adjacent undisturbed areas.

Nine Cats were recorded in 2019; five in 2020; seven in 2021 indicating a consistent level of Cat presence within and close to the DE. Fox numbers are low with no records for both 2019 and 2020 and two recorded in 2021. Similarly Dog numbers are also low with one record in each of 2019 and 2021 and no records for 2020.

To provide introduced predator abundance data, we recommend the following aspects are monitored annually:

- continue trail camera monitoring during the egg incubation season (September to January) of all Malleefowl mounds that have been identified as Annual monitored mounds, within and adjacent to the development envelope
- maintain a register of introduced predator sightings within a fauna database and report annually on number and location
- collate image data and report on status of all monitored mounds annually.

1 INTRODUCTION

Covalent Lithium is developing the Earl Grey Lithium Project (EGLP) located at Mt Holland which will include the construction and operation of a fully integrated mine, concentrator, and refinery in Western Australia. The project is centred on the Earl Grey hard-rock lithium deposit 105 km south of Southern Cross in Western Australia and approximately 500 km east of Perth. It is owned by a 50-50 joint venture (JV) between subsidiaries of Wesfarmers Pty Ltd (WES:ASX) and Sociedad Química y Minera de Chile S.A. (SQM: NYSE). Covalent is the manager for the JV and is responsible for the development and operation of the project.

The survey area includes the habitats of two conservation significant fauna species, the Malleefowl (*Leipoa ocellata*) and the Chuditch (*Dasyurus geoffroii*). Both species are listed as vulnerable (VU) under both the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and the Western Australian *Biodiversity Conservation Act 2016* and are considered as Matters of National Environmental Significance (MNES).

Monitoring of Malleefowl mounds was undertaken during the mound building and egg laying summer season in 2019-22. Trail cameras were deployed on mounds to capture activity of Malleefowl and other fauna species including introduced predators.

1.1 PROJECT SCOPE

Ecoscape was engaged to provide the following:

- provide the number and spatial location of introduced predators from the monitoring of known Malleefowl mounds
- provide a temporal spatial distribution of recorded introduced predators.

The requirements of the field survey were as follows:

- be conducted in accordance with current statutory and technical requirements and guidance
- be conducted by personnel complying with regulatory expectations, in relation to years of experience, to ground truth the desktop findings through a comprehensive and targeted survey
- install and deploy trail cameras on mounds considered for annual and five year monitoring.

1.2 SURVEY AREA

1.2.1 REGIONAL LOCATION

The survey area is in the Shire of Yilgarn in the Goldfields region of Western Australia, about 100km south of Southern Cross. The development envelope (DE) is within the Great Western Woodlands (GWW) and is approximately 1,984 ha in extent (**Map 1**). The GWW is a 16 million hectare area extending from the wheatbelt to the edge of the deserts and is the largest intact area of Mediterranean Woodland on earth (DEC 2010). The GWW includes open eucalypt woodlands (63%), Mallee eucalypt woodlands, shrublands and grasslands (Fox et al. 2016a). Less common habitats in the GWW include granite outcrops, banded ironstone formations, salt lakes and freshwater wetlands (Fox et al. 2016b).

The DE is in the Southern Cross Subregion of the Coolgardie Bioregion of the Interim Biogeographic Regionalism for Australia (IBRA) classification system (Government & Energy 2017). The dominant land-uses in this bioregion are Crown Reserves and Unallocated Crown Land (66.7%), grazing on native pastures (17%), conservation (11.5%) and dryland agriculture (2.3%) (Cowan, Graham & McKenzie 2001). The greenstone hills, alluvial valleys and broad plains of calcareous earths support diverse eucalypt woodlands. The uplands support Mallee woodlands and scrub-heaths on sandplains, gravelly sandplains and lateritic breakaways, chains of salt lakes with dwarf shrublands of samphire occur in the valleys (Cowan, Graham & McKenzie 2001).

1.3 STATUTORY AND TECHNICAL FRAMEWORK

This environmental assessment was conducted in accordance with Commonwealth and State legislation and guidelines:

- Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)
- Western Australian Environmental Protection Act 1986 (EP Act)
- Western Australian Biodiversity Conservation Act 2016 (BC Act)
- Department of Environment Water Heritage and the Arts *Matters of National Environmental Significance. Significant impact guidelines 1.1 - Environment Protection and Biodiversity Conservation Act 1999* (DEWHA 2009).

In addition, the monitoring program was developed to meet the requirements as stated in the Terrestrial Fauna Environmental Management Plan (TFEMP) with the intention to meet environmental outcomes and objectives of condition 7-1 of Ministerial Statement 1118 (MS 1118) which requires Covalent to meet the following:

- 7-1(1) The proponent shall ensure there is no proposal-related direct or indirect or adverse indirect impacts to malleefowl mounds within the exclusion areas as shown on Figure 4 and delineated by coordinates in Schedule 2.
- 7-1(2) The proponent shall ensure there is no direct proposal-related significant adverse impacts to malleefowl and chuditch within the development envelope.
- 7-1(3) The proponent shall ensure there is no removal of active malleefowl mounds within the development envelope.

This TFEMP seeks to provide a framework to ensure potential impacts on chuditch (Dasyurus geoffroii), and malleefowl (Leipoa ocellata) found to be attributable to the Earl Grey Lithium Project (EGLP) are avoided to the maximum extent practicable.

In addition, the Minister for the Environment has published lists of fauna species in need of special protection because they are considered rare, likely to become extinct, or are presumed extinct. The current listings were published in the Government Gazette on 11 September 2018 (Government of Western Australia 2018) and was taken into account.

As well as those listed above, the assessment complied with EPA requirements for environmental survey and reporting in Western Australia, as outlined in:

- EPA Technical Guidance – Terrestrial vertebrate fauna surveys for environmental impact assessment (2020)
- NMRT - National Malleefowl Monitoring Manual: Edition 2019_1 (2019).

1.3.1 COMMONWEALTH ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999

At a Commonwealth level, threatened taxa (flora and fauna) are protected under the EPBC Act, which lists species that are considered Critically Endangered, Endangered, Vulnerable, Conservation Dependant, Extinct, or Extinct in the Wild.

1.3.2 WESTERN AUSTRALIAN ENVIRONMENTAL PROTECTION ACT 1986

The Western Australian EP Act was created to provide for an Environmental Protection Authority (EPA) that has the responsibility for:

- prevention, control and abatement of pollution and environmental harm
- conservation, preservation, protection, enhancement, and management of the environment
- matters incidental to or connected with the above.

The EPA is responsible for providing the guidance and policy under which environmental assessments are conducted. It conducts environmental impact assessments (based on the information included in

environmental assessments and provided by the proponent), initiates measures to protect the environment and provides advice to the Minister responsible for environmental matters.

1.3.3 WESTERN AUSTRALIAN BIODIVERSITY CONSERVATION ACT 2016

The Western Australian BC Act provides for the conservation, protection and ecologically sustainable use of biodiversity and biodiversity components in Western Australia. It commenced on 1 January 2019.

Threatened species (both flora and fauna) and ecological communities that meet the categories listed within the BC Act are highly protected and require authorisation by the Minister to take or disturb. These are known as Threatened Flora, Threatened Fauna and Threatened Ecological Communities. The conservation categories of Critically Endangered, Endangered and Vulnerable have been aligned with those detailed in the EPBC Act.

Flora and fauna species may be listed as being of special conservation interest if they have a naturally low population, restricted natural range, are subject to or recovering from a significant population decline or reduction of range or are of special interest, and the Minister considers that taking may result in depletion of the species. Migratory species and those subject to international agreements are also listed under the Act. These are known as specially protected species in the BC Act.

The most recent flora and fauna listings were published in the Government Gazette on 11 September 2018 (Government of Western Australia 2018).

1.3.4 WESTERN AUSTRALIAN PRIORITY FAUNA

Conservation significant fauna species are listed by the DBCA as Priority Fauna where populations are geographically restricted or threatened by local processes, or where there is insufficient information to formally assign them to threatened fauna categories. Whilst Priority Fauna are not specifically listed in the BC Act, these have a greater level of significance than other native species.

2 METHOD

The purpose of the 2019-22 introduced predator monitoring was to collect presence data of introduced predators on all monitored Malleefowl mounds within and outside the DE, that were identified by the previous surveys (Western Wildlife 2017).

2.1.1 INTRODUCED PREDATOR MONITORING

Malleefowl mounds identified for monitoring (Ecoscape (Australia) Pty Ltd 2019) were revisited annually commencing in 2019, as per NMRT methodology. Each mound was monitored by deploying post mounted trail cameras to record images of fauna species visiting the mounds.

2.1.2 TRAIL CAMERA MONITORING

Trail cameras were mounted at mounds within and adjacent to the DE. Cameras were mounted on brackets attached to star pickets installed close to the mound and high enough off the ground to view the interior of the mound (**Image 1**).



Image 1: Monitored mound showing location of post and camera

The cameras were deployed annually from late October to February. Images from the trail cameras were downloaded for review and collation of species recorded.

Recorded images of introduced predators were reviewed to determine areas of activity. This was achieved by logging the number of activity events recorded at each mound. An activity event is defined as an image, or group of images, separated by at least two hours between images.

3 RESULTS

3.1 INTRODUCED PREDATOR MONITORING

The results of the introduced predator monitoring for each of the three years is summarised in **Table 1** with monitoring effort expressed as total camera nights in **Table 2**. The location of introduced predator events were recorded and mapped (**Map 1-3**). The difference in camera nights is directly related to the number of mounds being monitored, e.g. the 50 mounds in 2019 included 5 Year and Annual mounds whereas the 23 mounds in 2021 were only the Annual mounds.

Table 1: Number of introduced predator events recorded

Year	Cat	Fox	Dog	Total
2019	12	0	1	13
2020	7	0	1	8
2021	10	2	0	12

Table 2: Monitoring Effort

Year	No. of cameras	No. of nights	Total Camera nights
2019	50	92	4600
2020	41	99	4059
2021	23	113	2599

The raw data shows that 14 Malleefowl mounds recorded introduced predators between years (**Table 3 Appendix Two**). As the same mounds are monitored each year this is an expected result. This data is spatially displayed on (**Map 1-3**). The locations of all monitoring mounds is also displayed which indicates where the trail cameras were deployed and therefore able to record introduced predators.

Figure 1 shows the relationship in numbers recorded between species and year.

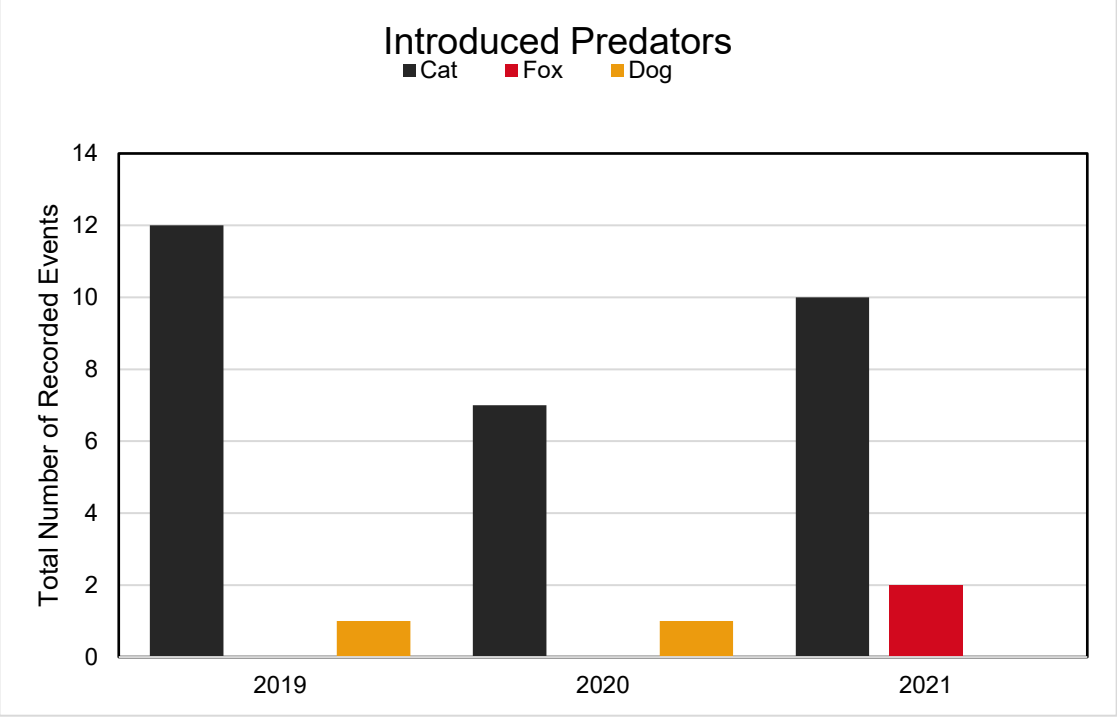


Figure 1: Introduced Predator Recorded Images by Year

Feral Cats were recorded by trail cameras at 14 Malleefowl mounds between 2019 and 2021 (**Image 2**). Fox was recorded at 2 mounds in 2021 only, being absent in 2019 and 2020 (**Image 3**). Dogs were recorded once in 2019 and once in 2020 at the same mound.



Image 2: Feral Cat recorded at mound MM63



Image 3: European Red Fox at mound MM4

4 DISCUSSION AND RECOMMENDATIONS

4.1.1 INTRODUCED PREDATORS

Over the 2021-22 period of trail camera monitoring seven different mounds recorded visits by Feral Cats. Four of these mounds (MM17, MM24, MM34, MM63) are all outside the DE to the northwest of the Earl Grey and Jasmine Pits and are within 1500 m of each other. The images recorded show distinguishing stripe patterns suitable to confirm that the animal seen on trail camera images in this area are likely to be the same individual, this is consistent with the results from the 2020-2021 monitoring event. Feral cats were also recorded at mounds MM43, MM53, and MM66 which are within 200 m of one another surrounding the southern border of the DE. Image review suggests that this is likely to be the same individual.

During the 2021-2022 monitoring event a Red Fox was recorded visiting mounds MM4 and MM63, both identified as being inactive. This is the first time that a Red Fox has been recorded during the Malleefowl monitoring. Mounds MM4 and MM63 are within 1900 m of each other so it is likely that the Fox recorded is the same individual.

4.2 RECOMMENDATIONS

These recommendations are made without knowledge of the possible conditions of approval and pertain to monitoring of the likely abundance of introduced predators within the overall project area. Monitoring of mounds both within and outside of the DE may provide insight on the number of introduced predators that are a potential impact/threat to the suite of native fauna species.

To provide introduced predator abundance data the following recommendations are made for annual monitoring:

- Trail camera monitoring during the egg incubation season for 2022-23 (September to January) of all Malleefowl mounds that have been identified as ANNUAL, within and adjacent to the DE.
- Maintain database of introduced predator sightings within a fauna register and report annually on number and location.
- Collate and report on records of sightings of feral predators and images captured on cameras at the monitored mounds.

REFERENCES

Commonwealth of Australia (1999), *Environment Protection and Biodiversity Conservation Act 1999*. Available from: http://www.austlii.edu.au/au/legis/cth/consol_act/epabca1999588/.

Cowan, M, Graham, G & McKenzie, N 2001, ‘‘Coolgardie 2 (COO 2 – Southern Cross Subregion).’’ in *A Biodiversity Audit of Western Australia’s 53 Biogeographical Subregions in 2002* , eds.JE May & NL McKenzie, Department of Conservation and Land Management, Department of Conservation and Land Management.

Department of Environment and Conservation 2010, *A Biodiversity and Cultural Conservation Strategy for the Great Western Woodlands*. Available from: http://www.dpaw.wa.gov.au/images/documents/conservation-management/off-road-conservation/gww/gww-strategy.pdf.

Department of the Environment Water Heritage and the Arts; Commonwealth of Australia 2009, *Matters of National Environmental Significance. Significant impact guidelines 1.1 - Environment Protection and Biodiversity Conservation Act 1999*.

Ecoscape (Australia) Pty Ltd 2019, *2019 Mt Holland Malleefowl Monitoring unpublished report for Covalent Lithium*.

Environmental Protection Authority 2020, *Technical Guidance - Terrestrial vertebrate fauna surveys for environmental impact assessment*, EPA, Perth, Western Australia. Available from: https://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/EPA-Technical-Guidance-Vertebrate-Fauna-Surveys.pdf.

Fox, E, Mcnee, S, Douglas, T & BirdLife Australia, M 2016a, *Birds of the Great Western Woodlands. Report for The Nature Conservancy*.

Fox, E, Mcnee, S, Douglas, T & BirdLife Australia, M 2016b, *Birds of the Great Western Woodlands. Report for The Nature Conservancy*.

Government, A & Energy, D of the E and 2017, *Australia’s bioregions (IBRA)*. Available from: http://www.environment.gov.au/land/nrs/science/ibra.

Government of Western Australia (1986), *Environmental Protection Act 1986*. Available from: http://www.slp.wa.gov.au/legislation/statutes.nsf/main_mrtitle_1384_homepage.html.

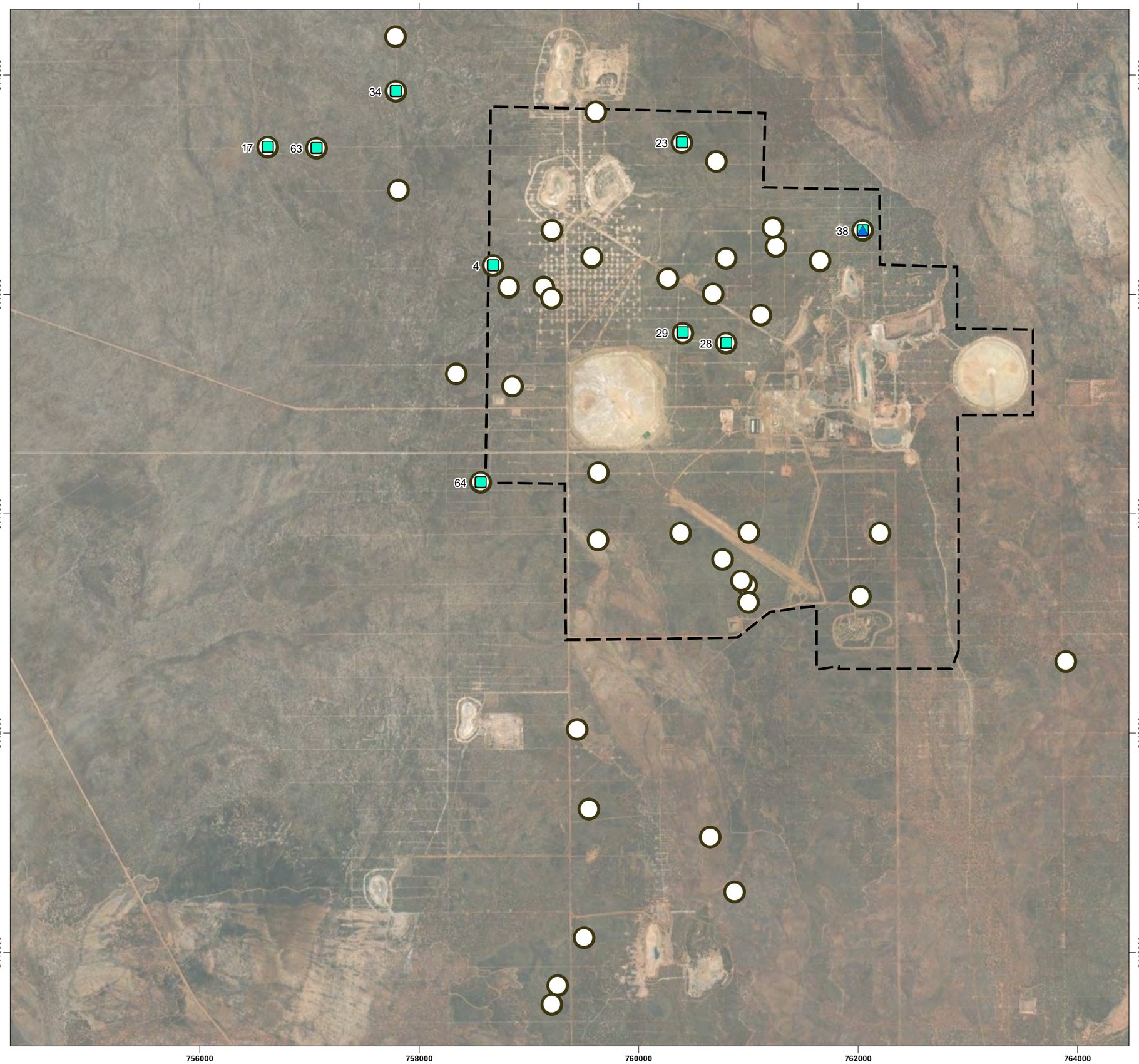
Government of Western Australia (2016), *Biodiversity Conservation Act 2016*. Available from: https://www.legislation.wa.gov.au/legislation/statutes.nsf/main_mrtitle_13811_homepage.html.

Government of Western Australia 2018, *Government Gazette No. 135, 11 September 2018*. Available from: https://www.slp.wa.gov.au/gazette/gazette.nsf/searchgazette/EF556EEFA23C70FA482583040013E0FC/$file/Gg135.pdf.

National Malleefowl Recovery Team 2019, *National Mallefowl Monitoring Manual. Edition 2019_1*.

Western Wildlife 2017, *Earl Grey Lithium Project: Level 2 vertebrate fauna survey with targeted Chuditch and Malleefowl surveys, 2016 - 2017*.

APPENDIX ONE MAPS

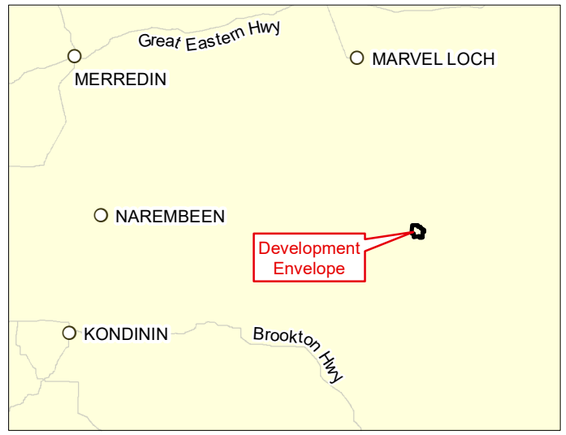


LEGEND

- Covalent Development Envelope
- Monitored Malleefowl Mounds

Predators 2019

- Cat
- Dog



DATA SOURCES :
SOURCE DATA: FAUNA DATA (ECOSCAPE 2019)
BASEMAP: GEOSCIENCE AUSTRALIA
SERVICE LAYERS: SOURCE: ESRI, MAXAR, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY

ecoscape

INTRODUCED PREDATOR LOCATIONS 2019

COVALENT FAUNA MONITORING

covalent LITHIUM

COORDINATE SYSTEM: GDA 1994 MGA ZONE 50
PROJECTION: TRANSVERSE MERCATOR
DATUM: GDA 1994
UNITS: METER

SCALE: 1:35,000 @ A3

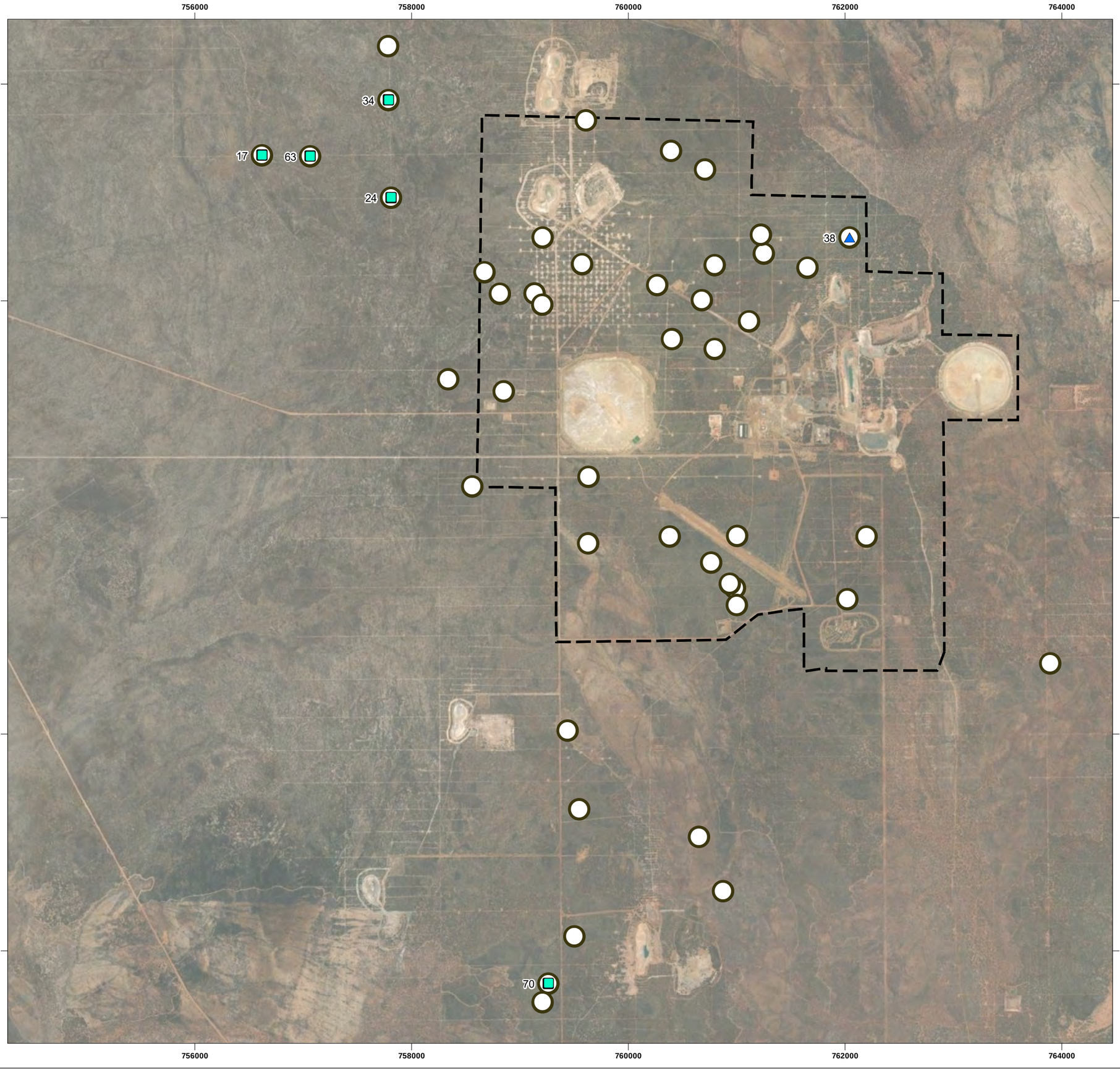
N

0 500 1,000 metres

PROJECT NO: 4644-21

REV	AUTHOR	APPROVED	DATE
00	SS	NW	25/05/2022

MAP 01

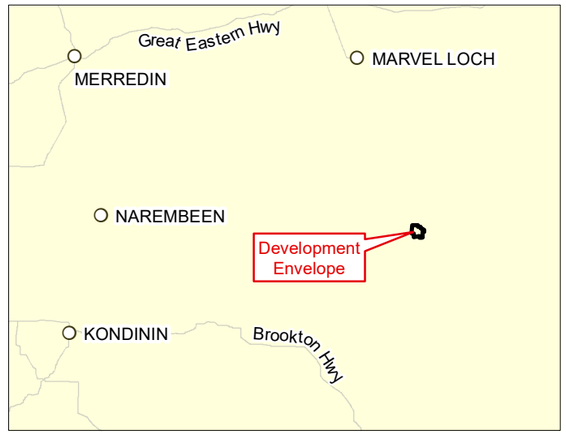


LEGEND

- Covalent Development Envelope
- Monitored Malleefowl Mounds

Predators 2020

- cat
- dog



DATA SOURCES :
SOURCE DATA: FAUNA DATA (ECOSCAPE 2020)
BASEMAP: GEOSCIENCE AUSTRALIA
SERVICE LAYERS: SOURCE: ESRI, MAXAR, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY

ecoscape

INTRODUCED PREDATOR LOCATIONS 2020

COVALENT FAUNA MONITORING

covalent LITHIUM

COORDINATE SYSTEM: GDA 1994 MGA ZONE 50
PROJECTION: TRANSVERSE MERCATOR
DATUM: GDA 1994
UNITS: METER

SCALE: 1:35,000 @ A3

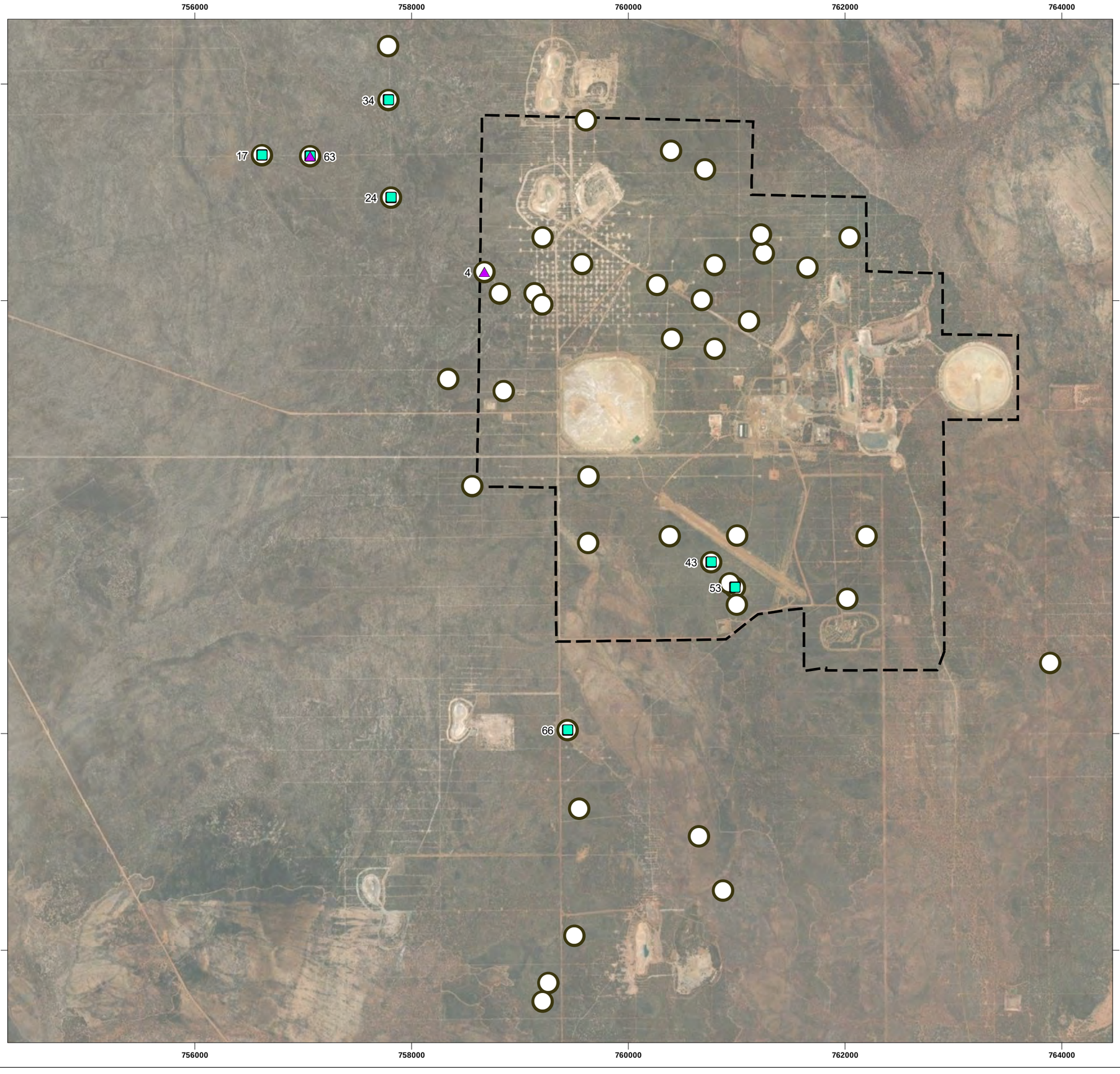
N

0 500 1,000 metres

PROJECT NO: 4644-21

REV	AUTHOR	APPROVED	DATE
00	SS	NW	25/05/2022

MAP 02



LEGEND

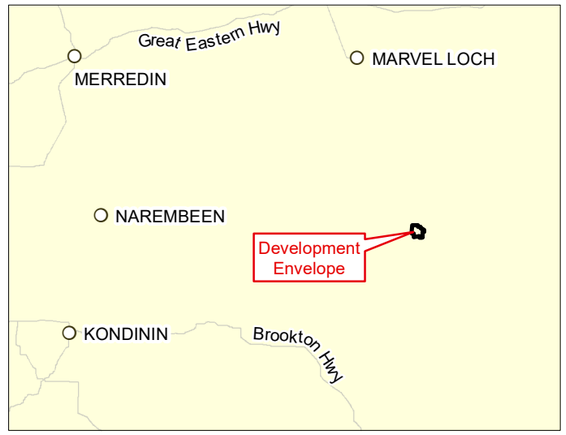
Covalent Development Envelope

Monitored Malleefowl Mounds

Predators 2021

cat

fox



DATA SOURCES :
SOURCE DATA: FAUNA DATA (ECOSCAPE 2021)
BASEMAP: GEOSCIENCE AUSTRALIA
SERVICE LAYERS: SOURCE: ESRI, MAXAR, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY

ecoscape

INTRODUCED PREDATOR LOCATIONS 2021

COVALENT FAUNA MONITORING

covalent LITHIUM

COORDINATE SYSTEM: GDA 1994 MGA ZONE 50
PROJECTION: TRANSVERSE MERCATOR
DATUM: GDA 1994
UNITS: METER

SCALE: 1:35,000 @ A3

N

0 500 1,000 metres

PROJECT NO: 4644-21

REV	AUTHOR	APPROVED	DATE
00	SS	NW	25/05/2022

MAP 03

APPENDIX TWO MONITORING RESULTS

Table 3: Introduced Predator Records at Monitored Malleefowl Mounds

Mound ID	2019			2020			2021			Easting	northing
	Cat	Fox	Dog	Cat	Fox	Dog	Cat	Fox	Dog		
4	x							x		758671.4	6446261
17	x			x			x			756616.7	6447339
23	x									760393.7	6447381
24				x			x			757807.8	6446950
28	x									760796.1	6445552
29	x									760398.4	6445650
34	x			x			x			757784.4	6447850
38	x		x			x				762041.1	6446581
43							x			760762.3	6443581
53							x			760983.1	6443348
63	x			x			x	x		757062.5	6447330
64	x									758558.6	6444285
66							x			759437.3	6442034
70				x						759262.4	6439697
Total	**9**	**0**	**1**	**5**	**0**	**1**	**7**	**2**	**0**		

Appendix L Fauna Pre-clearance Survey

©JBS&G Australia Pty Ltd

Fauna Pre-Clearance Survey Form

This form must be completed and signed off at the completion of the pre-clearance fauna survey before vegetation clearing can proceed, a requirement of the Terrestrial Fauna Environmental Management Plan. Ensure Survey area or GDP maps are attached.

GDP Details	GDP60_V3							
Area(s) Surveyed	TSF Haul Rd and Topsoil stockpile (Map 1 and 2); RoM areas (Map 3 and 4)							
Survey Details	DATE	08.02.2022	09.02.2022	10.0.2.2022	11.02.2022			
	Survey completed	Yes	Yes	Yes	Yes			
	Approx. No. Hectares	16	14	8.4	10.5			
	No. Traps deployed	55	48	31	42			
	Can clearing commence?	Yes	Yes	Yes	Yes			

Malleefowl		Yes	No	N/A
1.	Is vegetation clearing required within the Malleefowl breeding season (September – February)? *If yes, Pre-clearance survey for Malleefowl is required a minimum of two weeks prior to clearing.*	☒	☐	☐
2.	Has LiDAR data showing potential mounds been inspected to confirm classification as a Malleefowl mound?	☒	☐	☐
3.	Have any new mounds been identified during pre-clearance survey?	☐	☒	☐
4.	Are any new mounds classified as *active* and given a 100m exclusion zone?	☐	☐	☒
5.	Notes:			
Chuditch		**Yes**	**No**	**N/A**
6.	Is vegetation clearing required within the Chuditch breeding/denning season (September – November)? *If yes, additional requirements as per item 10 and 11.*	☐	☒	☐
7.	Has trapping been undertaken for one night immediately prior to vegetation clearing with at least four traps per hectare?	☒	☐	☐
8.	Were all captured Chuditch held in captivity for no more than one night and released at dusk into nearby habitat?	☐	☐	☒
9.	Were the following details recorded for any captured Chuditch? *Sex, weight, hind foot length (between base of toe to end of heel), head length, pouch status, wounds or injuries, PIT tagged (microchip), tissue samples and/or scats, and GPS coordinates of capture/release locations.*	☐	☐	☒
10.	Were any lactating females captured and released with a radio collar?	☐	☐	☒
11.	Were any Chuditch dens identified and given a 100m exclusion zone?	☐	☒	☐
12.	Notes:			
Other Fauna				
13.	One Rodent caught (red trap location on Map 2) – DNA sample taken, ID TBC			

Licenced Fauna Handler			
Name	Bruce Turner	Company	Ecoscape Australia
Signature		Date	11.02.2022



Map 1: TSF Haul Rd and Topsoil stockpile trapped on the 08.02.2022



Map 2: TSF Haul Rd and Topsoil stockpile trapped on the 09.02.2022



Map 3: RoM area trapped on the 10.02.2022



Map 4: RoM area trapped on the 11.02.2022

Appendix M Dieback Assessment 2022

©JBS&G Australia Pty Ltd

Covalent Lithium

Earl Grey Project

Phytophthora Dieback occurrence assessment – Version 0.73

GLEVAN CONSULTING

1300 453 826
mail@glevan.com.au
www.glevan.com.au

DIEBACK TREATMENT SERVICES

1300 785 311
mail@diebacktreatmentservices.com.au
www.diebacktreatmentservices.com.au



Client	*Covalent Lithium*
Report name	*Earl Grey Project*

This report has been prepared per the scope of work agreed between Covalent Lithium and Glevan Consulting and contains results and recommendations specific to the agreement; therefore, results and recommendations in this report should not be referenced for other projects without the written consent of Glevan Consulting.

Executive Summary

The Covalent Lithium Mount Holland mining and concentrator operations are located around 500 kilometres (km) to the east of Perth and 105 km south of Southern Cross in Western Australia.

The operations have long-term potential, with an expected mine life of over 40 years at the proposed production rate. The mine and concentrator are located on a brownfield area, previously the Bounty Gold Operation, and was left mainly unrehabilitated.

Covalent Lithium requested Glevan Consulting review the results of the 2019 sampling program and interpretation results, a recommendation for additional field assessment with sampling , and recommendations for management on site.

Glevan Consulting employed the following strategy to satisfy the scope:

- Assess tracks and edges of the disturbance areas in the Earl Grey Lithium Project Disturbance Footprint (Project Area) and take samples where required.
- Assess the access track from the mine site to Marvel Loch – Forrestania Road.
- Undertake strategic sampling within any area outside the Project Area considered a high risk of containing Phytophthora.

This assessment aimed to determine the impact of Phytophthora on the vegetation within the Project Area and the hygiene implications and requirements for the site.

The Project Area includes 386 hectares of proposed vegetation clearing and is situated within the Great Western Woodlands, the largest and most intact eucalypt woodland in Western Australia (Department of Environment and Conservation). It is also situated south of the Jilbadji Nature Reserve.

It is expected the Project Area would receive approximately 300mm of annual rainfall which suggests that *Phytophthora cinnamomi*, the most virulent of introduced Phytophthora species in Western Australia, would not be present. Other Phytophthora species however are known to be present in the Project Area.

Several vegetation communities have been defined and mapped across the Project Area and all contain plant species that are known to be susceptible to Phytophthora.

The Project Area was sampled in 2019, with 51 samples taken of symptomatic plants, asymptomatic plants or soil only. This sampling program proved *P. arenaria*, *P. boodjera* and *P. nicotianae* within the Project Area.

Phytophthora is a microscopic water mould that belongs to the class Oomycetes. Phytophthora Dieback is the result of interaction between three physical components forming a 'disease triangle': the pathogen (*Phytophthora species*), the environment and the host. All three components are needed for the disease to develop over time.

Phytophthora arenaria has been isolated in Western Australia (primarily) from kwongan heathland stands since the early but was misidentified as *P. citricola*. Further surveys have extended the known range of *P. arenaria.*

Phytophthora boodjera forms a species complex with *Phytophthora arenaria* and *Phytophthora alticola* and is morphologically very similar to these species.

Phytophthora nicotianae was first isolated in Indonesia from tobacco in 1896. *P. nicotianae* has a cosmopolitan distribution both within Australia and throughout the world.

Procedures and guidelines stipulated the Department of Biodiversity, Conservation and Attractions (DBCA) manual "Phytophthora Dieback Interpreters Manual for lands managed by the Department" were applied as the base methodology used by Glevan Consulting in the delivery of the services and products required by this scope of work.

In general, within the Project Area, Phytophthora Dieback is occurring in sporadic and scattered deaths. Two new sites identified during the current survey were an isolated death (Sample 12) and (atypically) a cluster of deaths of various species (Sample 20). The sites where Phytophthora was recovered during the 2019 survey were also re-visited where possible, and at each site, current disease expression was not noted.

The *P. nicotanae* site from the 2019 survey was re-sampled however no recent deaths were noticed. The sample returned a negative result, and probably emphasises the sporadic nature of the disease expression.

The site maintains a clean-on-entry rule, for weeds and plant pathogens. These policies should be maintained, but enhanced with some measures to improve compliance.

Table of Contents

1 Introduction _____ *1*

1.1 Scope _____ 1

1.2 Description of the Project Area _____ 1

1.3 Previous assessments of the Project Area _____ 4

1.4 Purpose of assessment _____ 5

2 Background _____ *8*

3 Methodology _____ *12*

3.1 The assessment area _____ 12

3.2 The assessment method _____ 12

4 Results _____ *13*

4.1 Disease symptoms and expression _____ 13

4.2 Sample results _____ 13

5 Discussion _____ *15*

6 Recommendations _____ *20*

7 Bibliography _____ *21*

8 Appendices _____ *22*

8.1 Sample summary _____ 22

8.2 Phytophthora Dieback sample location maps _____ 24

List of Figures

Figure 1 - Assessment area location 6

Figure 2 - Bureau of Meteorology weather stations 7

Figure 3 - Historic sample locations for specific species (omits '19 or '21 surveys) 11

Figure 4 - Sample 12 16

Figure 5 - Sample 12 location 16

Figure 6 - Sample 20 17

Figure 7 - Sample 20 location 18

Figure 8 - P. nicotianae site, re-sampled 19

Figure 9 - Sample 1 19

Figure 10 - 2021 Sample locations and results 25

Figure 11 - 2019 Sample locations and results 26

Figure 12 - Combined sample locations and results 27

List of Tables

Table 1 - Rainfall data, Mulgara and Lake Carmody 2

Table 2 - 2021 Sample results 14

Table 3 - 2019 Sample results 22

1 Introduction

The Covalent Lithium Mount Holland mining and concentrator operations are located around 500 kilometres (km) to the east of Perth and 105 km south of Southern Cross in Western Australia.

The operations have long-term potential, with an expected mine life of over 40 years at the proposed production rate. The mine and concentrator are located on a brownfield area, previously the Bounty Gold Operation, and was left mainly unrehabilitated.

1.1 Scope

Covalent Lithium requested Glevan Consulting review the results of the 2019 sampling program and interpretation results, a recommendation for additional field assessment with sampling, and recommendations for management on site.

Glevan Consulting employed the following strategy to satisfy the scope:

- Assess tracks and edges of the disturbance areas in the Earl Grey Lithium Project Disturbance Footprint (Project Area) and take samples where required.
- Assess the access track from the mine site to Marvel Loch – Forrestania Road.
- Undertake strategic sampling within any area outside the Project Area considered a high risk of containing Phytophthora.

1.2 Description of the Project Area

The Project Area (Figure 1) includes 386 hectares of proposed vegetation clearing.

Geographical setting

The Project Area is situated within the Great Western Woodlands, the largest and most intact eucalypt woodland in Western Australia (Department of Environment and Conservation). It is also situated south of the Jilbadji Nature Reserve.

Climate

It is expected the Project Area would receive approximately 300mm of annual rainfall. This expectation is based on data from the Mulgara weather station (50 km NNW of the Project Area) and the Lake Carmody weather station (54 km SW of the Project Area) (Figure 2). The previous 15 years of data are shown in Table 1, and spatially and graphically in Figure 2.

Table 1 - Rainfall data, Mulgara and Lake Carmody

Year	Lake Carmody (mm / annum)	Mulgara (mm / annum)
2006	373	382.9
2007	256.9	206.1
2008	356.1	346.1
2009	345.3	294.4
2010	180	167.1
2011	449.7	426
2012	(incomplete data)	240.8
2013	358.9	292.6
2014	(incomplete data)	292.6
2015	294.1	377.2
2016	(incomplete data)	369
2017	(incomplete data)	311.6
2018	285.3	367.6
2019	190.7	246
2020	(incomplete data)	281
15-year average	309	307

Physical features.

Vegetation communities have been defined and mapped across the Project Area (Mattiske Consulting Pty Ltd, 2018). The descriptions of these vegetation communities are summarised as:

- *Melaleuca, Allocasuarina, Dodonaea* mid open heathland over *Grevillea, Trymalium* low sparse shrubland on rocky red-brown sandy clay soils on slopes.
- *Allocasuarina* tall closed shrubland over *Hakea, Melaleuca, Micromyrtus* mid sparse heathland on lateritic orange-red clay soils on flats and lower slopes.

- *Allocasuarina, Eucalyptus* tall open shrubland over *Thryptomene, Persoonia, Micromyrtus* mid sparse heathland over *Cyathostemon, Hibbertia, Drummondita* low sparse shrubland on orange-brown clayey sand soils on flats.
- *Allocasuarina, Eucalyptus* tall sparse shrubland over *Banksia, Hakea, Melaleuca* mid sparse shrubland over *Micromyrtus, Persoonia* low isolated shrubs on gravelly yellow-brown to orange-brown clay to clayey sand soils on flats.
- *Eucalyptus* mid open mallee woodland over *Thryptomene, Melaleuca, Acacia* mid open shrubland over *Drummondita, Microcybe* low sparse heathland on grey-brown to orange-brown clay to clayey sand on flats.
- *Eucalyptus* mid open mallee woodland over *Allocasuarina, Callitris, Hakea* mid tall sparse shrubland over *Phebalium* low sparse shrubland on orange-brown clay soils on flats and slopes.
- *Eucalyptus* low open mallee woodland over *Melaleuca, Leptospermum* mid sparse shrubland over *Thomasia, Darwinia* low sparse shrubland on orange-brown clay in minor drainage channel.
- *Eucalyptus* low open mallee woodland over *Melaleuca, Callitris* mid-tall sparse shrubland over *Acacia, Grevillea* low isolated heath shrubs on orange-brown sandy-clay soils with ironstone or quartz pebbles on flats and slopes.
- *Eucalyptus* low open mallee woodland over *Micromyrtus, Persoonia, Hakea* mid sparse heathland over *Hibbertia* low isolated shrubs on gravelly orange-brown clayey sand soils on flats and slopes.
- *Eucalyptus, Allocasuarina* tall open mallee woodland over *Hakea, Petrophile, Banksia* mid sparse heathland over *Drummondita, Hibbertia, Psammomoya* low sparse shrubland on yellow-brown sandy soils on flats.
- *Eucalyptus* mid mallee woodland over *Santalum, Daviesia, Melaleuca* mid sparse heathland over *Acacia, Daviesia, Microcybe* low sparse shrubland on red-brown sandy clay flats.
- *Eucalyptus* low mallee woodland over *Melaleuca, Dodonaea, Daviesia* mid sparse shrubland over *Acacia, Grevillea, Microcybe* low sparse shrubland.
- *Eucalyptus* low mallee woodland over *Melaleuca, Daviesia* mid sparse shrubland over *Acacia, Grevillea, Olearia* low sparse shrubland on red clay soils on flats.
- *Eucalyptus* low mallee woodland over *Melaleuca* mid sparse shrubland over *Grevillea, Acacia, Microcybe* low sparse shrubland on orange-brown clay soils on flats.

- *Eucalyptus* low open mallee woodland over *Melaleuca, Daviesia* mid sparse shrubland over *Grevillea, Acacia* low sparse shrubland on yellow-brown to red-brown sandy clay soils on flats.
- *Callitris, Eucalyptus* low open mallee woodland over *Micromyrtus, Persoonia, Allocasuarina* mid tall sparse shrubland over *Beyeria, Drummondita* low sparse shrubland on yellow-brown to orange-brown clayey sands on flats and slopes.
- *Eucalyptus* low open mallee woodland over *Hakea, Beyeria, Santalum* mid sparse shrubland over *Rinzia, Westringia, Hibbertia* low sparse shrubland on lateritic red-brown clayey sand on slopes and ridges.
- *Eucalyptus, Callitris* low open mallee woodland over *Melaleuca, Allocasuarina, Hakea* mid sparse shrubland over *Hibbertia, Phebalium, Cyathostemon* low sparse shrubland on yellow-brown sandy soils on flats.
- *Eucalyptus* low open mallee woodland over *Daviesia, Santalum* mid sparse shrubland over *Acacia, Microcybe, Grevillea* low sparse shrubland on orange-red brown sandy clay soils on flats.
- *Eucalyptus* low open mallee woodland over *Melaleuca* over *Acacia, Dampiera, Westringia* low sparse shrubland on grey-brown clayey sand soils on flats and slopes.
- *Eucalyptus* low open mallee woodland over *Melaleuca* mid sparse shrubland over *Hibbertia, Cyathostemon, Acacia* low sparse shrubland on slightly gravelly yellow-orange brown clay soils on flats and slopes.

All vegetation types contain plant species considered susceptible to *P. arenaria* (Banksia) or *P. boodjera* (Eucalypt).

1.3 Previous assessments of the Project Area

The Project Area was sampled in 2019, with 51 samples taken of symptomatic plants, asymptomatic plants or soil only (Table 3) (Figure 11). To cover the large size of the Project Area, a grid pattern was used with at least one sample taken within each grid cell. In addition, asymptomatic plants or soil were sampled where symptomatic plants weren't observed.

This sampling program proved *P. arenaria*, *P. boodjera* and *P. nicotianae* within the Project Area.

P. arenaria and *P. boodjera* are closely related and appear to be very widespread across the drier regions of WA. They are (I think) both native, and whether they were initially co-located,

they must have been geographically isolated to speciate. Then human activity may have spread them around 'within WA' (Burgess, 2021).

P. nicotianae has definitely been introduced (to the Project Area); it is not native to Australia but is unfortunately very widespread. In Western Australia, it is found in urban parks and gardens, orchards, field crops and our forests ((Burgess, 2021).

1.4 Purpose of assessment

This assessment aimed to determine the impact of Phytophthora on the vegetation within the Project Area and the hygiene implications and requirements for the site.



Figure 1 - Assessment area location

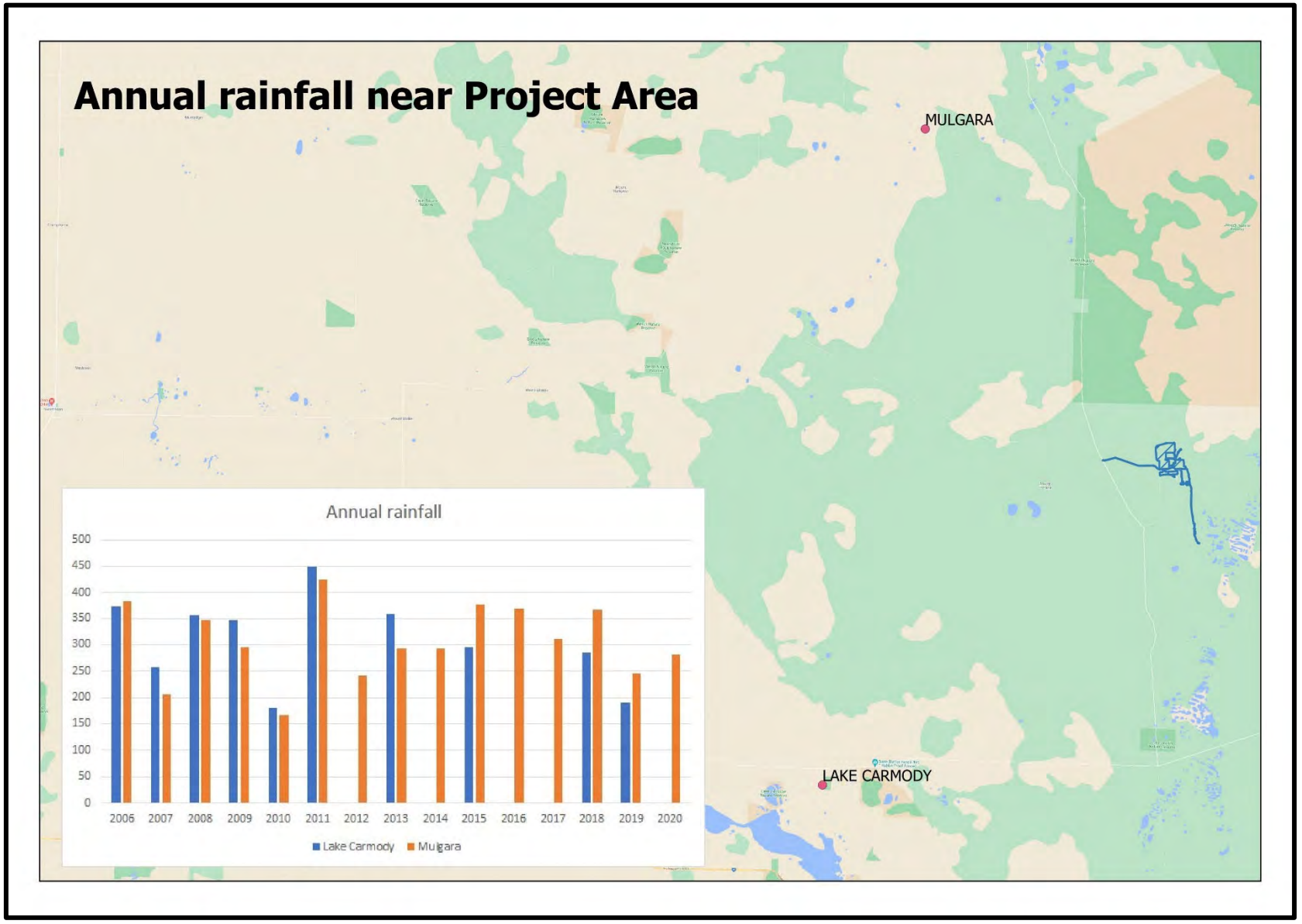


Figure 2 - Bureau of Meteorology weather stations

2 Background

Phytophthora is a microscopic water mould that belongs to the class Oomycetes. Oomycetes organisms are filamentous and absorptive and reproduce both sexually and asexually. Phytophthora'*s* are considered parasitic. It behaves largely as a necrotrophic pathogen causing damage to the host plant's root tissues because of infection and invasion. (Department of Parks and Wildlife, 2015) The pathogen infects a host when it enters at a cellular level and damages the cell structure.

Phytophthora Dieback is the result of interaction between three physical components forming a 'disease triangle': the pathogen (*Phytophthora species*), the environment and the host. All three components are needed for the disease to develop over time.

The relationship between the presence of *Phytophthora* and the development of Phytophthora Dieback disease is variable based on the susceptibility of native plant species and the different environmental characteristics, landform types and rainfall zones across bioregions.

Phytophthora arenaria has been isolated in Western Australia (primarily) from kwongan heathland stands since the early 1980s (Rea, Burgess, Hardy, Stukely, & Jung, 2011), but was misidentified as *P. citricola*. Further surveys have extended the known range of *P. arenaria*. *Phytophthora arenaria* was named based on its association with sandy soils. Most isolates were associated with dead or dying *Banksia* spp. (Proteaceae). When active, symptomatic plants are scattered in the landscape. However, the overall impact of this species within the natural environment is low due to the low rainfall in the region and the sporadic nature of the disease (Burgess, Phytophthora arenaria).

Phytophthora boodjera was named from the Noongar (local Aboriginal) name for the earth, ground, or sandplain. *Phytophthora boodjera* forms a species complex with *Phytophthora arenaria* and *Phytophthora alticola* and is morphologically very similar to these species but has a higher optimum and maximum for growth. Known hosts include *Agonis flexuosa, Eucalyptus marginata, E. polybracta, E. kochii*, *E. loxophleba, Xanthorrhoea preissii,* and *Corymbia calophylla* (Simamora AV).

Phytophthora nicotianae was first isolated in Indonesia from tobacco in 1896. *P. nicotianae* has a cosmopolitan distribution both within Australia and throughout the world. The pathogen infects plants from approximately 90 different families, and different isolates have distinct host ranges. This pathogen infects a number of important agricultural and horticultural crops, including members of the Nightshade family, cotton, citrus, several tropical fruit crops, ornamentals such as petunia and some Banksia and Eucalypt species. Although *P. nicotianae* infects native species, it is not regarded as an important ecological pathogen. It is an important pathogen in many Australian plant industries. Yield losses can be up to 15% in citrus and 6% in tobacco enterprises (Australian Plant Pathology Society, 2011).

The following Figure 3 shows, spatially, the known locations of *P. arenaria*, *P. boodjera* and *P. nicotianae* and the significant distance to the Project Area. This data more likely demonstrates the lack of surveys and sampling effort than the actual distribution of the pathogen.

The Project Area is situated in an area receiving less than 400mm of annualised rainfall. The DBCA states that 'Vulnerable areas are defined as native vegetation occurring west of the 400-millimetre rainfall isohyet, in the Southwest and Midwest corner of Western Australia. Within this zone, Phytophthora Dieback disease ranges from barely perceptible to full-scale environmental destruction' (Department of Parks and Wildlife, 2015). However, it should be noted that the afore-mentioned document is focused on Phytophthora Dieback caused by *P. cinnamomi* and very few assessments have been conducted in 'non-vulnerable' areas.

The Department of Mines and Petroleum, now the Department of Mines, Industry Regulation and Safety (DMIRS), states in their guidance document regarding the management of Dieback disease in mineral exploration 'This guide is directed to mineral explorationists - to help individuals, company staff, and contractors to define and accept standards of field operation that will help to prevent the spread of the disease. A condition will be placed on mineral exploration tenements by the Minister for State Development at the time of grant. The intent of the condition is to reduce the risk of spreading dieback during exploration activities authorised on the tenement. The condition will require explorers, when they apply to the State Mining Engineer for approval to conduct ground-disturbing activities, to present a plan of action. This plan will firstly identify those parts of the tenement where unmanaged exploration activities could spread dieback, and then specify the management procedures that will be adopted to prevent the spread. The area to which this condition will be applied is

that part of the southwest of Western Australia that receives more than 450 mm of rain per year (Department of Mines and Petroleum, 2006). At the time of the production of this document, *P. arenaria* and *P. boodjera* were unknown and incorrectly classified as *P. citricola*. These documents also highlight the non-unanimty in the Departments' expectations.

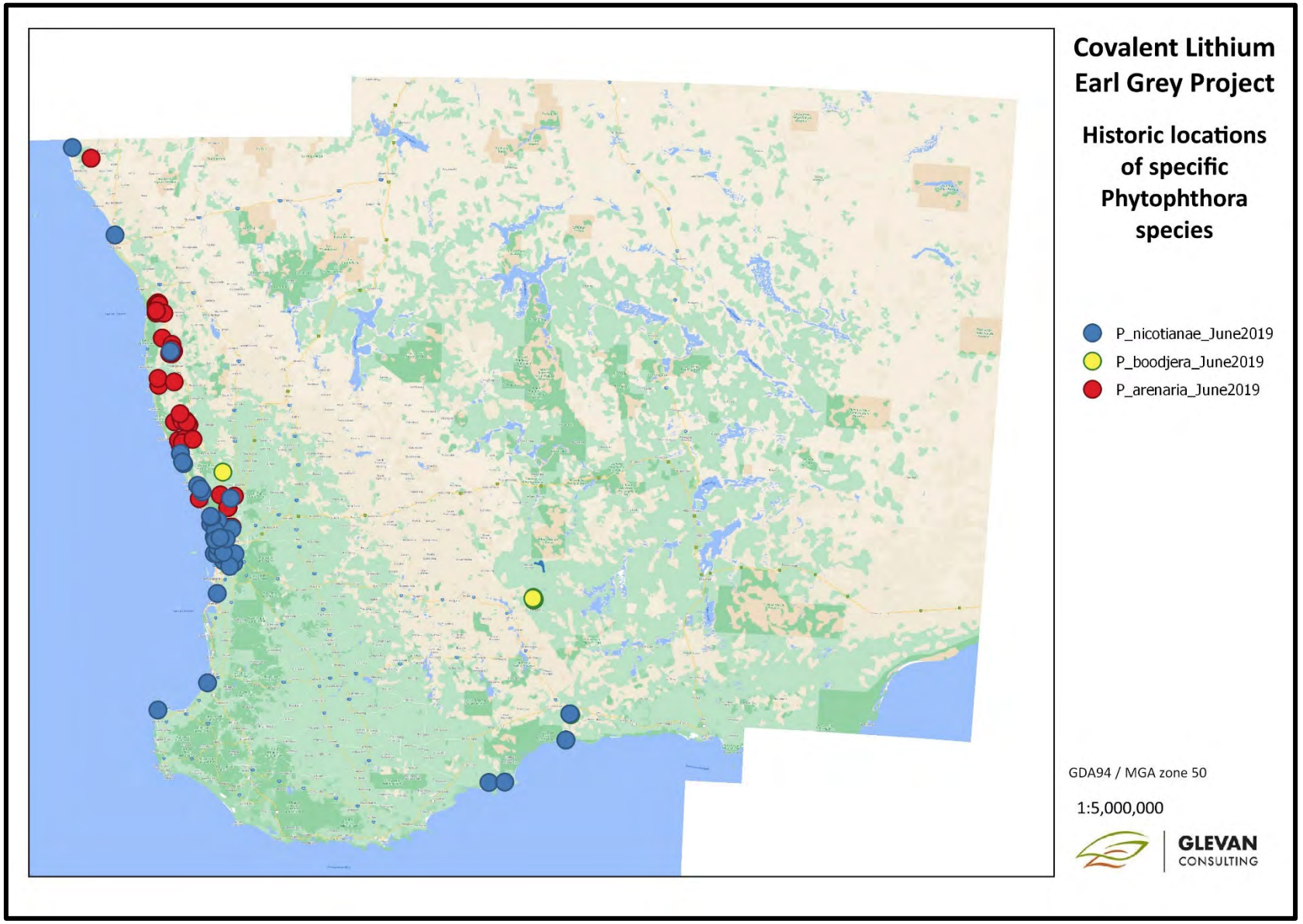


Figure 3 - Historic sample locations for specific species (prior to current survey)

3 Methodology

Procedures and guidelines stipulated in the Department of Biodiversity, Conservation and Attractions (DBCA) manual "Phytophthora Dieback Interpreters Manual for lands managed by the Department" were applied as the base methodology used by Glevan Consulting in the delivery of the services and products required by this scope of work. These guidelines and overarching peer review and quality standards ensure that all results are presented to the highest standard.

Glevan Consulting has assessed areas based on existing evidence presented at the time of assessment. The Phytophthora pathogen may live in the soil as an incipient disease. Very new centres of infestation that do not present any visible evidence may remain undetected during the assessment.

3.1 The assessment area

The Mount Holland site is located on Vacant Crown Land. The proposed disturbance area covers 776 ha, of which some is already cleared or disturbed.

3.2 The assessment method

All Phytophthora Dieback detection, diagnosis, and mapping were performed according to standards and procedures defined in the DBCA manual. These procedures are grounded on the presence in the vegetation of Indicator Species and the observance of deaths in these plants. An indicator species is a plant species that is reliably susceptible to Phytophthora. Indicator species deaths (ISDs) alone do not necessarily indicate disease presence, and it was necessary to consider all environmental and ecological factors that were present. These other factors included:

- Chronology of deaths;
- A pattern of deaths;
- Topographical position;
- Vectoring – causal agencies, and;
- Biomass and biological diversity reduction.

4 Results

4.1 Disease symptoms and expression

In general, within the Project Area, Phytophthora Dieback is occurring in sporadic and scattered deaths. The two sites identified during the current survey were an isolated death (Sample 12) and (atypically) a cluster of deaths of various species (Sample 20). The sites where Phytophthora was recovered during the 2019 survey were also re-visited, and at each site, current disease expression was not noted.

4.2 Sample results

All samples taken during the assessment were analysed by Vegetation Health Services (VHS), DBCA.

On arrival at the VHS, the material from each sample is emptied into individual plastic containers and taken to a controlled temperature room (25°C). Distilled water is poured into the containers and stirred with a sterile stick.

In the baiting stage of the process, cotyledons of *Eucalyptus sieberi* and leaves of other suitable susceptible plants are floated on the water as bait for Phytophthora zoospores. The *E. sieberi* cotyledons are purple underneath. The baits are left for ten days. If the cotyledons lose the purple colour by the fifth day, they are presumed to be infected.

For the plating stage of the process, the affected baits are placed onto agar, specifically developed to isolate Phytophthora species, in a Petri dish. The distinctive growth patterns on the agar will determine whether the sample is infected with *Phytophthora cinnamomi* or another Phytophthora species.

On the tenth day, the remaining cotyledons and other leaf baits are plated, even if they show no sign of infection.

Plated baits are left for a minimum of four days, and if Phytophthora is not evident from hyphal growth in the agar, the sample is recorded as negative.

Phytophthora cinnamomi is identified directly on the plate by the presence of its distinctive hyphal swellings. Other Phytophthora species do not have such apparent

distinguishing features and must be identified in pure culture. Morphological identification involves growing a pure culture and inducing the formation of reproductive structures such as sporangia, oogonia, antheridia and oospores, which are then observed microscopically and measured, along with other cultural characters. Pure cultures are sent to the Centre for Phytophthora Science and Management (CPSM) at Murdoch University. As Pythiums and Phytopythiums are closely related, they will grow on the selective agar and be identified by the DNA analysis.

Table 2 - 2021 Sample results

Sample	Easting	Northing	Result
1	762980	6441284	Negative
2	759247	6447233	Negative
3	759116	6447198	Negative
4	759065	6447131	Negative
5	759035	6447067	Negative
6	760331	6445773	Negative
7	760225	6445015	Negative
8	759809	6445484	Negative
9	759838	6445993	*Phytopythium mercuriale*
10	759349	6446464	Negative
11	759649	6446359	Negative
12	759464	6446882	*Phytophthora arenaria*
13	759871	6447060	*Pythium aff. anandium*
14	759918	6446934	Negative
15	760219	6444579	Negative
16	760079	6444574	Negative
17	754798	6445670	Negative
18	754556	6445753	Negative
19	754338	6445825	Negative
20	753933	6445783	*Phytophthora arenaria*

5 Discussion

Glevan Consulting employed the following strategy to satisfy the scope of this assessment:

- Assess tracks and edges of the disturbance areas in the Earl Grey Lithium Project Disturbance Footprint (Project Area) and take samples where required.
- Assess the access track from the mine site to Marvel Loch – Forrestania Road.
- Undertake strategic sampling within any area outside the Project Area considered a high risk of containing Phytophthora.

Evan Brown from Glevan Consulting assessed the required sections of the Project Area from 17th May to 21st May 2021.

As stated in this report*, P. arenaria* and *P. boodjera* are closely related and possibly native to the area. It would be expected to find both species with the extensive sampling across the site. *P. nicotianae* has been introduced to the site from some previous activity where infested material was brought to site. It does prove that non-native Phytophthora species can survive in the low-rainfall environment of the site.

All vegetation adjacent to disturbance (cleared) areas was investigated for the presence of recent deaths. In addition, as the host range of non-cinnamomi Phytophthora species is not well understood, samples were taken of any plant species. At all sites, except Sample 7 and Sample 20, individual plants were sampled.

The vegetation at Sample 7 (Figure 10), although returning a negative result, was displaying multiple deaths in *Aloecasuarina sp.* along the edge of the dam. This site may be re-sampled in the future if additional assessments are conducted.

Sample 12 was an isolated death (Figure 4) alongside a road (Figure 5). No other Phytophthora Dieback symptomatic plants were observed at the location.



Figure 4 - Sample 12

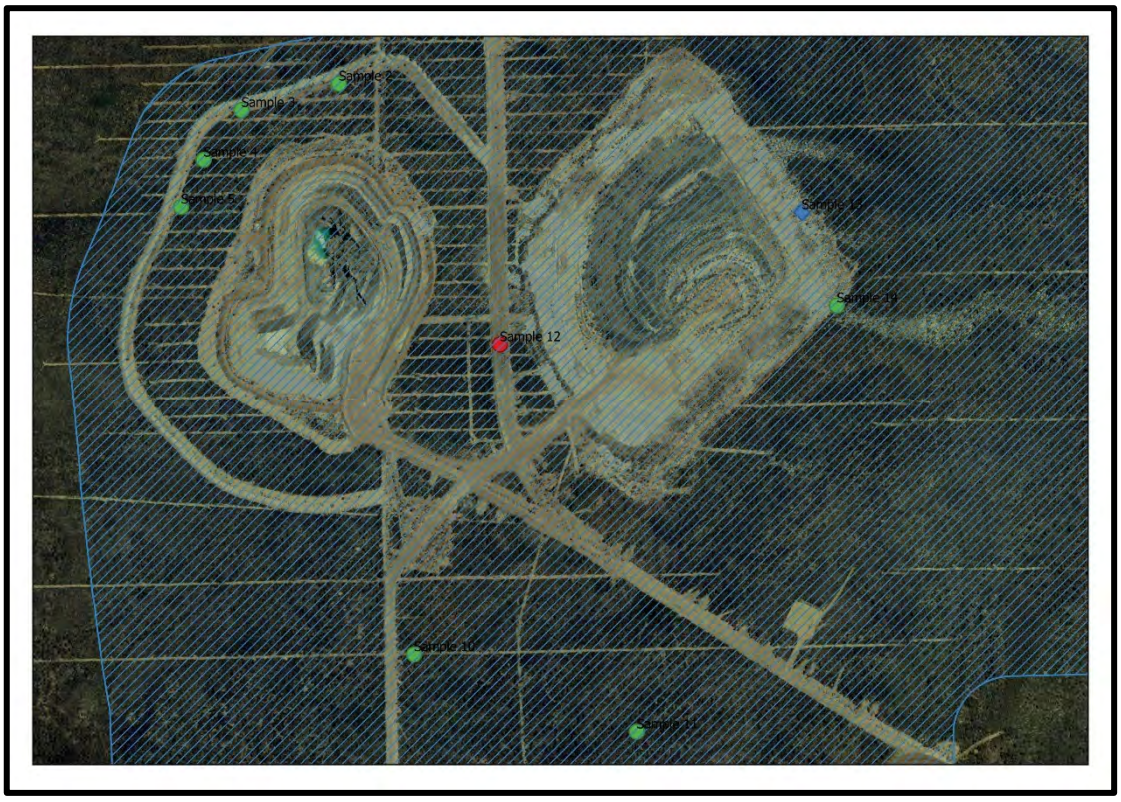


Figure 5 - Sample 12 location

Sample 20 was the only site observed, and sampled, with recent deaths in multiple species and an age range in the deaths (Figure 6). This age range suggests that the pathogen has been active at the site for some seasons. The area also shows a level of water aggregating, allowing the conditions under which the pathogen can cause disease to be lengthened above regular rainfall events. Additionally, an old track is also located at the site, the location being at the intersection of the old track and the access road (Figure 7).



Figure 6 - Sample 20



Figure 7 - Sample 20 location

The sites from the 2019 assessment which proved the presence of Phytophthora were also revisited, where possible.

The *P. nicotanae* site was re-sampled however no recent deaths were noticed (Figure 8). A yellowing Acacia was considered the most likely of the plants in the site to sample. Not surprisingly, the sample returned a negative result, and probably emphasises the sporadic nature of the disease expression.



Figure 8 - P. nicotianae site, re-sampled



Figure 9 - Sample 1

6 Recommendations

The site maintains a clean-on-entry rule, and clean-on-exit rule for weeds and plant pathogens. These policies should be maintained. These procedures can be enhanced by:

- The clean-on-entry and subsequent inspection point should be located at the intersection of the access road and Marvel Loch – Forrestania Road to ensure that any vehicle that is not suitably clean can be turned around. This is current practice at the site with all vehicles and mobile equipment entering site being required to produce evidence of a visual inspection for presence of weeds, vegetation material or soils/muds. This process also includes a check for vehicles or mobile equipment returning from a site with a confirmed dieback presence being sufficiently disinfected.
- If equipment arrives at the gate without prior inspection, it will be visually inspected for weeds, vegetation material or soils/muds and entry declined if present.
- A clean-on-exit regime is recommended to ensure vehicles and machinery are weed and pathogen free. Whilst water for washing down vehicles is limited, dry clean downs will be implemented until a wash bay is installed.
- Stipulate on the Journey Management Plan document the clean-on-entry requirements, and the requirements expected for entry into the site.
- Ensure all vehicles are restricted to tracks, and if entering vegetation must be cleaned on leaving the track. Accessing vegetation under moist-soil conditions should not be allowed as on-site vehicle cleaning equipment will be inadequate. Information regarding soil conditions should be discussed at the daily pre-start with alternative arrangements organised.

7 Bibliography

Australian Plant Pathology Society. (2011, May). *Pathogen of the Month.*

Burgess, T. (2021, 08 09).

Burgess, T. (n.d.). Phytophthora arenaria. *Forest Phytophthoras*.

Department of Environment and Conservation. (n.d.). *A Biodiversity and Cultural Conservation Strategy for the Great Western Woodlands.*

Department of Mines and Petroleum. (2006). *Management of Dieback Disease in Mineral Exploration.*

Department of Parks and Wildlife. (2015). *FEM047 Phytophthora Dieback Interpreter's Manual for lands managed by the department.* Unpublished.

Mattiske Consulting Pty Ltd. (2018). *Flora and Vegetation Assessment Earl Grey Lithium Project.* Prepared for Kidman Resources Ltd.

Rea, A., Burgess, T., Hardy, G., Stukely, M., & Jung, T. (2011). Two novel and potentially endemic species of Phytophthora associated with episodic dieback of Kwongan vegetation in the south-west of Western Australia. *Plant Pathology*, 60,1055-1068.

Simamora AV, S. M. (n.d.). Phytophthora boodjera sp. nov., a damping-off pathogen in production nurseries and from urban and natural landscapes, with an update on the status of P. alticola. *IMA Fungus*.

8 Appendices

8.1 Sample summary

Table 3 - 2019 Sample results

Sample	Easting	Northing	Result
1	761848	6443034	*Phytophthora arenaria*
2	762087	6443377	Negative
3	760966	6443033	Negative
4	761158	6443506	Negative
5	761358	6443372	*Phytophthora arenaria*
6	761635	6443584	Negative
7	753092	6445566	Negative
8	753545	6445672	Negative
9	754227	6445877	Negative
10	754866	6445633	Negative
11	755950	6445303	Negative
12	756418	6445146	Negative
13	756747	6444991	Negative
14	758603	6444955	*Phytophthora arenaria*
15	759334	6444925	Negative
16	759918	6444314	Negative
17	759827	6443384	Negative
18	760553	6443459	Negative
19	760567	6444164	Negative
20	761365	6444223	Negative
21	762097	6444168	*Phytophthora boodjera*
22	761918	6444865	Negative
23	762827	6444194	Negative
24	762666	6443770	Negative
25	762904	6444975	Negative
26	762094	6445877	*Phytophthora arenaria*
27	761632	6446388	Negative
28	762205	6446388	Negative
29	760482	6447176	Negative
30	760394	6446312	Negative
31	760648	6446260	Negative
32	760357	6445733	Negative
33	759907	6445701	Negative
34	759155	6445851	*Phytopythium sp.*
35	759354	6446246	Negative
36	759264	6447275	Negative
37	759817	6447192	Negative
38	759722	6446475	Negative
39	761317	6445601	Negative
40	761268	6445062	Negative

41	759396	6444933	Negative
42	760618	6437902	Negative
43	763593	6441268	*Phytophthora nicotianae*
44	762968	6442784	Negative
45	759298	6448545	Negative
46	761299	6443278	Negative
47	761498	6443889	Negative
48	761199	6444758	Negative
49	760391	6444601	Negative
50	761289	6445479	*Pythium mercuriale*
51	761053	6446776	Negative

8.2 Phytophthora Dieback sample location maps

The provided maps show the samples locations and results.

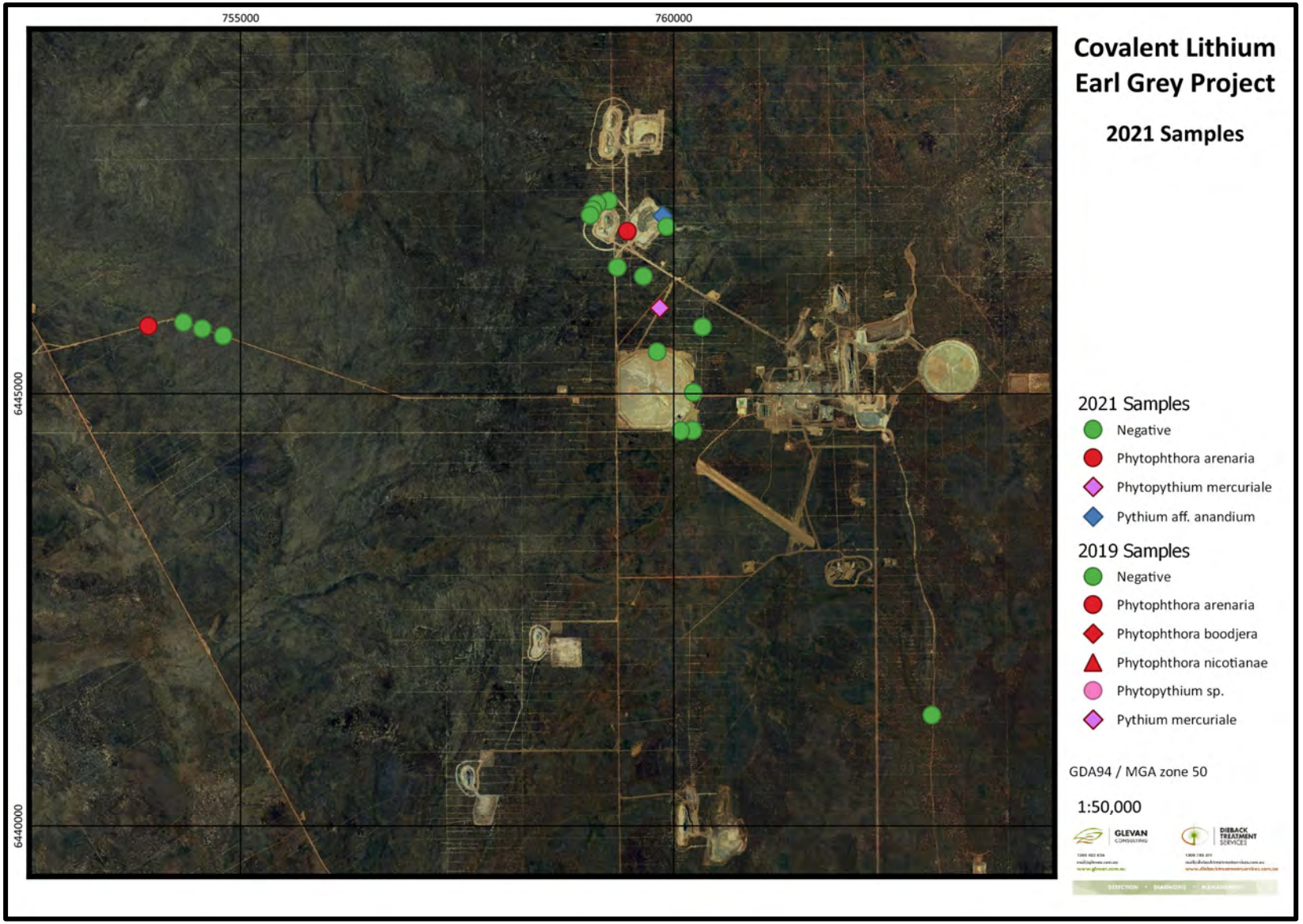


Figure 10 - 2021 Sample locations and results

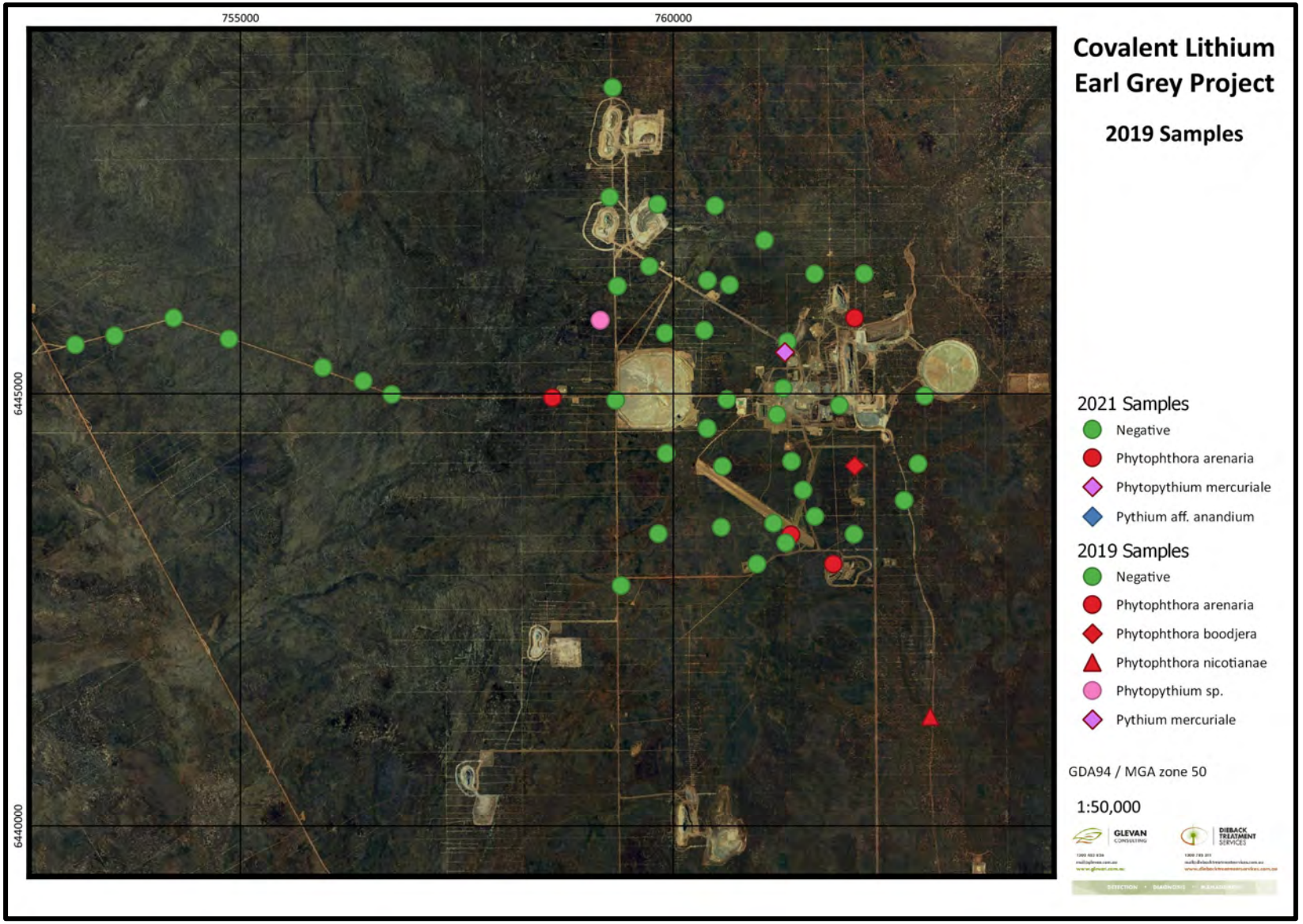


Figure 11 - 2019 Sample locations and results

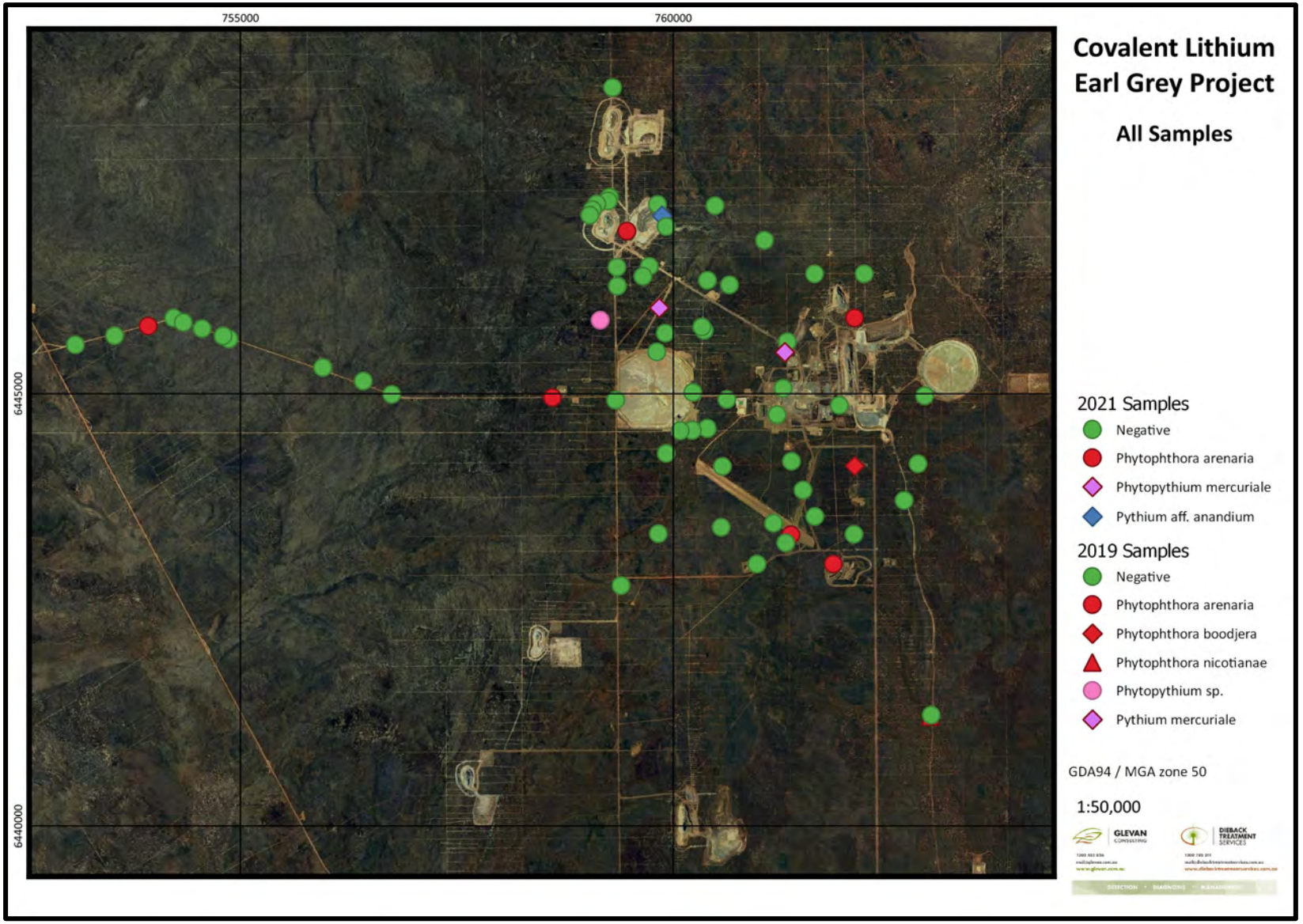


Figure 12 - Combined sample locations and results

Appendix N Introduced Flora (Weed) Survey

©JBS&G Australia Pty Ltd

ERAL GREY LITHIUM PROJECT

INTRODUCED FLORA (WEED) SURVEY

Prepared By

Mattiske Consulting Pty Ltd

Prepared For

Covalent Lithium Pty Ltd

Date

October 2020



DOCUMENT STATUS				
DOCUMENT REFERENCE: CLL2007/019/20				
/019/20	TYPE	AUTHOR/S	REVIEWER/S	DATE DISTRIBUTED
V1	Internal review	A Pereira		-
V2	Draft for client	A Pereira	E Mattiske	20/12/2019
V3	Final report, updated with 2020 survey information	Z. Sims	D. Angus	16/10/2020

(ACN 063 507 175, ABN 39 063 507 175)

PO Box 437
Kalamunda WA 6926
Phone: +61 8 9257 1625
Email: admin@mattiske.com.au

COPYRIGHT AND DISCLAIMER

Copyright
The information contained in this report is the property of Mattiske Consulting Pty Ltd. The use or copying of the whole or any part of this report without the written permission of Mattiske Consulting Pty Ltd is not permitted.

Disclaimer
This report has been prepared on behalf of and for the exclusive use of Covalent Lithium Pty Ltd and is subject to and issued in accordance with the agreement between Covalent Lithium Pty Ltd and Mattiske Consulting Pty Ltd. This report is based on the scope of services defined by Covalent Lithium Pty Ltd, the budgetary and time constraints imposed by Covalent Lithium Pty Ltd, and the methods consistent with the preceding.

Mattiske Consulting Pty Ltd has utilised information and data supplied by Covalent Lithium Pty Ltd (and its agents), and sourced from government databases, literature, departments and agencies in the preparation of this report. Mattiske Consulting Pty Ltd has compiled this report on the basis that any supplied or sourced information and data was accurate at the time of publication. Mattiske Consulting Pty Ltd accepts no liability or responsibility whatsoever for the use of, or reliance upon, the whole or any part of this report by any third party.

TABLE OF CONTENTS

Page

EXECUTIVE SUMMARY 1

1. INTRODUCTION 2

1.1 Location and Scope of Project 2
1.2 Environmental Legislation and Guidelines 2

2. OBJECTIVES 3

3. METHODS 5

3.1 Desktop Assessment 5
3.2 Field Survey 5

4. DESKTOP ASSESSMENT RESULTS 6

4.1 Climate 6
4.2 Introduced Taxa 6

5. FIELD SURVEY RESULTS 8

5.1 Survey Limitations 8
5.2 Field Survey Results 8

6. DISCUSSION 11

6.1 Weed Prioritisation 11
6.2 **Avena barbata* - Bearded Oat 13
6.3 **Bromus diandrus* - Great Brome 13
6.4 **Carrichtera annua* - Ward's Weed 14
6.5 **Centaurea melitensis* - Maltese Cockspur 14
6.6 **Mesembryanthemum nodiflorum* - Slender Iceplant 15
6.7 Weed Management 15
6.7.1 Staff Education 15
6.7.2 Personnel, Vehicle and Equipment Hygiene 15
6.8 Control Methods 16
6.8.1 Controlling Degradation Processes 16
6.8.2 Herbicide Application 16
6.8.3 Mechanical Control 16

7. CONCLUSIONS & RECOMMENDATIONS 17

8. ACKNOWLEDGEMENTS 17

9. PERSONNEL 18

10. REFERENCES 18

TABLES

1: Summary of weeds recorded within 40 km of the survey area (DPaW 2007-)

2: Potential flora and vegetation survey limitations for the weed assessment survey

3: Location and number of individuals recorded within the survey area

4: Summary of the Ecological Impact Ratings (EIR) and Invasiveness Rating (IR) as assessed for each DBCA region (DPaW 2013) for all weeds recorded within the survey area

FIGURES

1: Earl Grey Lithium Project Locality

2: Rainfall and temperature data for Narembeen (Station number 010612)

3: Weed Record Locations

PLATES

1: * *Avena barbata* inflorescence

2: * *Bromus diandrus* inflorescence and habit

3: * *Carrichtera annua* inflorescence and habit

4: * *Centaurea melitensis* inflorescence

5: * *Mesembryanthemum nodiflorum* inflorescence and habit (

APPENDICES

A: Declared Pest Categories and Definitions

LIST OF ABBREVIATIONS

BAM Act:	*Biosecurity and Agriculture Management Act 2007* (WA)
BC Act:	*Biodiversity Conservation Act 2016* (WA)
BOM:	Bureau of Meteorology
Covalent:	Covalent Lithium Pty Ltd
DAWE:	Department of Agriculture, Water and the Environment
DBCA:	Department of Biodiversity, Conservation and Attractions
DPaW:	Department of Parks and Wildlife (now under DBCA)
DPIRD:	Department of Primary Industries and Regional Development (includes Agriculture and Food)
EGLP:	Earl Grey Lithium Project
EP Act:	*Environmental Protection Act 1986* (WA)
EPA:	Environmental Protection Authority
EPBC Act:	*Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth)
IBRA:	Interim Biogeographical Regionalisation for Australia
Mattiske Consulting:	Mattiske Consulting Pty Ltd
WAH:	Western Australian Herbarium
WAOL:	Western Australian Organism List
WC Act:	*Wildlife Conservation Act 1950* (WA) (superseded by BC Act as of 2016)

EXECUTIVE SUMMARY

Covalent Lithium Pty Ltd operates the Earl Grey Lithium Project, approximately 100km south of the town of Southern Cross, near Mount Holland in Western Australia. To meet the requirements of condition 6 of Ministerial Statement 1118 for the Earl Grey Lithium Project, a flora and vegetation management plan has been developed. Section 2.4.4 of the Flora and Vegetation Management Plan states that introduced taxa monitoring be undertaken within vegetation exclusion zones and within control sites. Furthermore, annual monitoring of across the Earl Grey Lithium Project Development Envelope for the occurrence of new weeds and the spread of existing weeds will be undertaken.

Mattiske Consulting Pty Ltd was engaged by Covalent Lithium Pty Ltd to undertake a weed assessment in current areas of disturbance within the Earl Grey Lithium Project development envelope, and in particular areas currently designated as the processing plant, ROM pad and accommodation village area. Weed assessments were conducted in October 2019 and July 2020.

Weeds or Introduced species are categorized at national, state and regional levels by different government agencies under different legislation. Weeds of National Significance are defined and listed by the Department of the Environment and Energy under the *Environment Protection and Biodiversity Conservation Act 1999.* Declared pest organisms are defined and listed by the Department of Primary Industries and Regional Development under the *Biosecurity and Agriculture Management Act 2007.* Key environmental weeds in different regions of Western Australia are defined and listed by the Department of Biodiversity, Conservation and Attractions.

Overall, the vegetation within the EGLP is considered to be in excellent condition and is largely free of introduced species. The presence of introduced species was predominantly restricted to the areas of historical clearing associated with the former Bounty Mine area. The exploration drill tracks and pads associated with the Earl Grey Lithium Project were free of introduced species. A total of 16 weed species which are representative of 14 genera and seven families were recorded in the Earl Grey Lithium Project survey area. The taxa recorded with the highest number of individuals recorded were * *Carrichtera annua* and * *Mesembryanthemum nodiflorum*, with 503 and 101 individuals respectively. * *Carrichtera annua* was recorded at four locations, and was the most widely recorded taxon.

No Weeds of National Significance weeds listed under the *Environment Protection and Biodiversity Conservation Act 1999* were recorded during the weed assessment.

No Declared Weeds listed under the *Biosecurity and Agriculture Management Act 2007* were recorded during the weed assessment.

All weeds recorded during the weed assessment are permitted under section 11 of the *Biosecurity and Agriculture Management Act 2007*

Based on the findings of this weed assessment, the following weed management recommendations are made:

- Develop and implement personnel, vehicle, and equipment weed hygiene procedures, including car washing and boot cleaning;
- Develop weed identification resources for field staff;
- Monitor disturbance and high traffic areas frequently to identify any new weeds; and
- Control * *Carrichtera annua* and * *Mesembryanthemum nodiflorum* population to reduce numbers where possible, due to the high ecological and rapid invasiveness rating of these taxa.

1. INTRODUCTION

The Earl Grey Lithium Project (EGLP) is owned by Covalent Lithium Pty Ltd (Covalent). Covalent is a joint venture between Wesfarmers Chemicals, Energy and Fertilisers Limited and Sociedad Quimica y Minera de Chile. In 2016 Kidman Resources Limited discovered a pegmatite-hosted lithium deposit at its Earl Grey Prospect, south of Southern Cross, near Mt Holland in Western Australia. The proposed development will comprise open cut mining and processing of lithium ore, with transport of lithium concentrate to a refinery in Kwinana, Western Australia.

On the 21st November 2019, on advice from the Environmental Protection Authority (EPA), the Minister for the Environment issued Ministerial Statement 1118 (Government of Western Australia 2019) approving implementation of the project, subject to conditions, following a formal assessment of the project at the level of Public Environmental Review. Condition 6-5(2) of Ministerial Statement 1118 states that:

'The Flora and Vegetation Environmental Management Plan shall include actions to ensure that dust, weeds and fire are appropriately managed within the development envelope.'

Mattiske Consulting Pty Ltd (Mattiske Consulting) was engaged in March 2019 by Covalent to undertake surveys for the presence and distribution of introduced (weed) species within the EGLP Development Envelope. The searches for introduced (weed) species were undertaken in the winter and spring of 2019 and 2020.

1.1 Location and Scope of Project

The EGLP, which is located approximately 105 km southeast of the town of Southern Cross, is situated on the abandoned Mt Holland Mine Site (Figure 1). The EGLP development envelope occupies an area of 1,984 ha, 268 ha of which comprises previously disturbed or cleared areas.

To meet the requirements of condition 6 of Ministerial Statement 1118 (MS1118) for the EGLP, a flora and vegetation management plan has been prepared (Covalent 2020). Section 2.4.4 of the Flora Management Plan stipulates that introduced taxa monitoring be undertaken within vegetation exclusion zones and within control sites. Furthermore, annual monitoring of across the Earl Grey Lithium Project Development Envelope for the occurrence of new weeds and the spread of existing weeds will be undertaken.

The purpose of this survey was to gain an understanding of the current extent of weed species within the EGLP development envelope prior to commencement of construction activities, and to provide baseline data on the state of introduced species presence to inform future weed management. Disturbed and cleared areas were searched for introduced taxa, targeting the old Bounty mine area, current and future accommodation areas. Additionally, existing tracks and drill pads were routinely checked for the presence of weed species during the course of 2019 and 2020.

1.2 Environmental Legislation and Guidelines

The following key Commonwealth (federal) legislation relevant to this survey is the:

- *Environment Protection and Biodiversity Conservation Act 1999.*

The following key Western Australian (state) legislation relevant to this survey include the:

- *Biodiversity Conservation Act 2016* (BC Act);
- *Biosecurity and Agriculture Management Act 2007* (BAM Act);
- *Environmental Protection Act 1986* (EP Act); and,

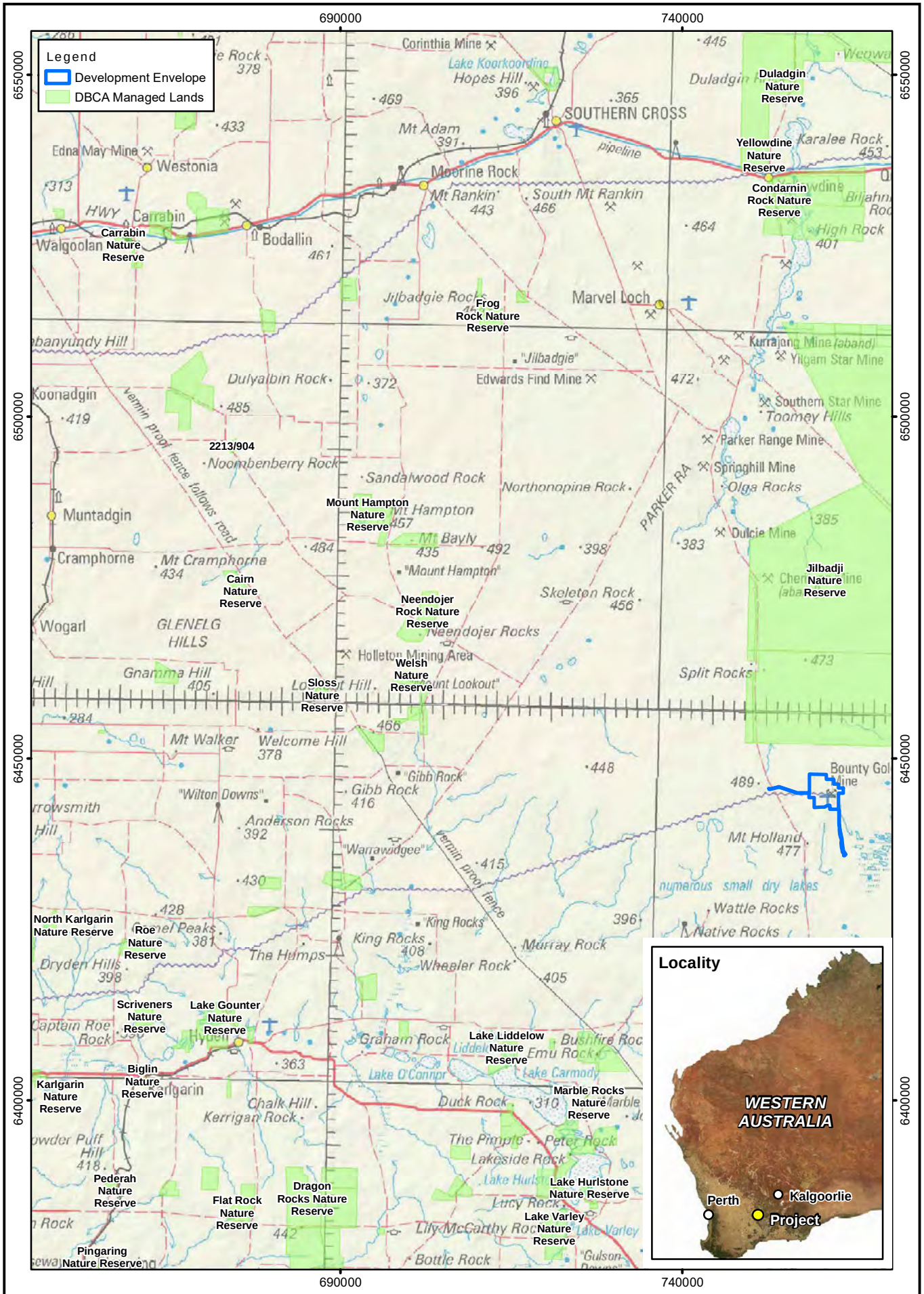
Furthermore, key Western Australian guidelines relevant to this survey are the:

- *Environmental Factor Guideline: Flora and Vegetation* (Environmental Protection Authority [EPA] 2016a); and
- *Technical Guidance – Flora and vegetation surveys for environmental impact assessment* (EPA 2016b).

2. OBJECTIVES

The aim of this assessment was to conduct a weed survey in current areas of disturbance. This included the cleared areas associated with the former Bounty Mine area, as well as newly created exploration drill tracks and pads associated with the EGLP. The disturbed areas associated with the former Bounty Mine area include the waste rock dump, tailings storage facility, processing areas, and accommodation village. These areas are hereinafter referred to as the survey area. Specifically, the objectives were to:

- Undertake a desktop study of the introduced plant taxa of the Mount Holland region;
- Review past flora and vegetation surveys of the Mount Holland region;
- Collect and identify the introduced plant species within the survey area;
- Review the status of the weed species recorded by reference to current literature and current listings by Department of Biodiversity, Conservation and Attractions [DBCA] (2007-), Department of Parks and Wildlife [DPaW] (2013), Department of Agriculture, Water and the Environment [DAWE] (2020a, 2020b), Department of Primary Industries and Regional Development [DPIRD] (2020) and the Environmental Weed Strategy for Western Australia (1999).
- Provide recommendations on future weed management measures; and
- Prepare a report summarising the findings.



N 0 5 10 km Scale: 1:750,000 MGA94 (Zone 50)	Mattiske Consulting Pty Ltd 28 Central Road, Kalamunda WA 6076 ~ Tel: 9257 1625 ~ Fax: 9257 1640 Author: E M Matttiske | MCPL Ref: CLL1903/025/19 Drawn: CAD Resources ~ www.cadresources.com.au Tel: (08) 9246 3242 ~ Fax (08) 9246 3202	Covalent Lithium Pty Ltd **Earl Grey Lithium Project** Project Area Locality	Figure: **1**
CAD Ref: a2445_f23_01 Date: December 2019 | Rev: A | A4			

3. METHODS

3.1 Desktop Assessment

The desktop assessment for the survey area was undertaken using the resources of the DBCA (2007-) and DAWE (2020a) databases. The search parameters used were a 40 km radius 'by circle' at 760778 mE, 6445372 mN (MGA94, Zone 50). These databases were utilised to identify the possible occurrence of expected weed species known to occur within the vicinity of the EGLP. Resources from the DBCA (DPaW 2013), DAWE (2020b), Western Australian Herbarium [WAH] (1998-) and Environmental Weed Strategy for Western Australia (1999) were also utilised in the desktop assessment.

3.2 Field Survey

The weed assessments were undertaken on 29th October 2019 and 25th June 2020. Cumulatively, the specific weed assessments were conducted by six different botanists over two days. In addition to the specified survey dates, the presence of introduced species on exploration drill tracks and pads throughout the EGLP development envelope was monitored during the course of the year whilst undertaking other flora and vegetation surveys (Figure 2).

This survey focused on identifying the presence of weed species within the EGLP development envelope, particularly in areas of current disturbance, to determine if any weed species are present, their ecological and invasiveness impact, and to establish the current range of weed species present.

The survey was guided predominantly by existing weed records from previous Mattiske Consulting surveys (Mattiske 2016; 2017; 2018a; 2018b; 2019) or from the knowledge of onsite environmental staff. Areas suspected to have weeds based on favourable environmental conditions were also prioritised. The survey area was traversed on foot, and all taxa suspected of being introduced were collected and recorded on the Esri iOS application, Collector for ArcGIS on Apple iPads (provided and maintained by CAD Resources). Data layers accessible in the field included the high resolution aerial imagery, previous flora records, and the EGLP development envelope.

All plant specimens collected during the field surveys were dried and processed in accordance with the requirements of the WAH. The plant species were identified based on taxonomic literature and through comparison with pressed specimens housed at the WAH. All botanists held a valid collection license to collect flora for scientific purposes, issued under the Regulation 62 of the *Biodiversity Conservation Regulations 2018*. Where appropriate, plant taxonomists with specialist skills were consulted. Nomenclature of the species recorded is in accordance with the WAH (1998-).

4. DESKTOP ASSESSMENT RESULTS

4.1 Climate

The climate of the wider region in which the survey area is situated, is described as semi-arid (dry) warm Mediterranean, consistent with descriptions of a characteristically arid to semi-arid climate with 200-300 mm of precipitation (Beard 1990, Cowan *et al.*, 2001). The town of Narambeen, located approximately 129 km to the west of the survey area was chosen as a reference weather record location due to its proximity and similar latitude to the EGLP. Narambeen has an average annual rainfall of 332 mm (Bureau of Meteorology, BOM 2020). Rainfall and temperature data for Narambeen is illustrated in Figure 2. The rainfall and temperature data displayed spans the period January 2018 to June 2020.

Rainfall in the four months preceding the October 2019 assessment was 69% of the long term average rainfall for the corresponding period. Rainfall in the four months preceding the July 2020 survey was 39% of the long term average rainfall for the corresponding period. In the case of the latter figure, data for the month of May 2020 was not available, and hence the calculation of current rainfall as a proportion of the long term average is not representative.

4.2 Introduced Taxa

A total of 20 introduced (weed) taxa which are representative of 17 genera and 10 families were recorded within 40 km radius of the survey area (DBCA 2007- ; Table 1). None of these species are declared pest organisms pursuant to section 22 of the BAM Act.

Table 1: Summary of weeds recorded within 40 km of the survey area (DBCA 2007-).

SPECIES NAME	FAMILY	No. RECORDS
Aira cupaniana (Silvery Hairgrass)	Poaceae	1
Brassica x napus	Brassicaceae	1
Bromus rubens (Red Brome)	Poaceae	1
Bupleurum semicompositum	Apiaceae	1
Centaurium erythraea (Common Centaury)	Gentianaceae	2
Centaurium tenuiflorum	Gentianaceae	1
Hypochaeris glabra (Smooth Catsear)	Asteraceae	6
Juncus bufonius (Toad Rush)	Juncaceae	1
Lysimachia arvensis (Pimpernel)	Primulaceae	4
Medicago minima (Small Burr Medic)	Fabaceae	1
Mesembryanthemum nodiflorum (Slender Iceplant)	Aizoaceae	2
Parentucellia latifolia (Common Bartsia)	Orobanchaceae	1
Pentameris airoides subsp. *airoides*	Poaceae	1
Rostraria cristata	Poaceae	2
Rostraria pumila	Poaceae	1
Schismus barbatus (Kelch Grass)	Poaceae	1
Sonchus oleraceus (Common Sowthistle)	Asteraceae	5
Ursinia anthemoides (Ursinia)	Asteraceae	2
Vulpia myuros forma *megalura*	Poaceae	1
Vulpia myuros forma *myuros*	Poaceae	6

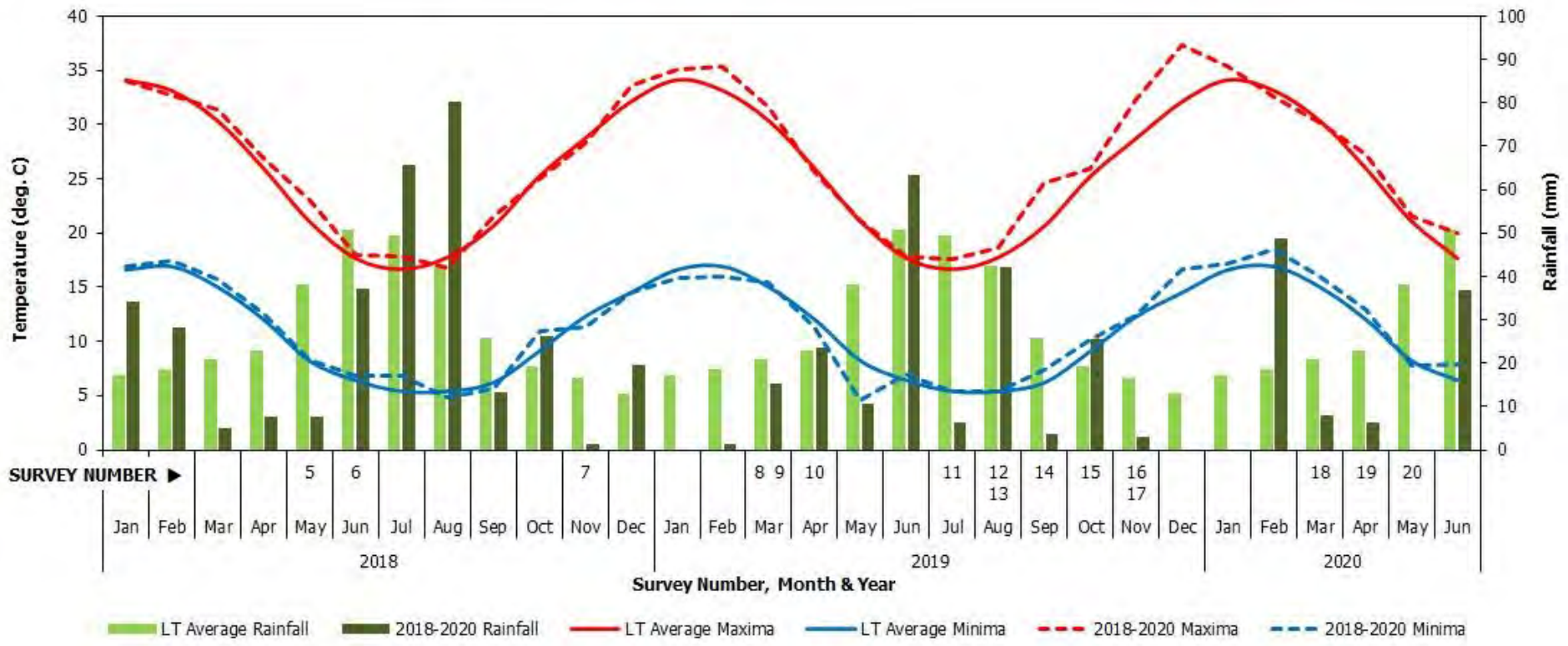


Figure 2: Rainfall and temperature data for Narembeen (Station number 010612).

Long term average rainfall and temperature data, together with monthly rainfall data for the period January 2018 to June 2019 are shown (BOM 2020). Maximum temperature data for between April and June 2020, and minimum temperature for June 2020, were not recorded due to instrument failure. The survey number represents the sequential timing of surveys completed by Mattiske Consulting at the EGLP.

5. FIELD SURVEY RESULTS

5.1 Survey Limitations

A general assessment was made of the current survey against a range of factors that may have limited the outcomes and conclusions of this report (Table 2).

Table 2: Potential flora and vegetation survey limitations for the weed assessment survey.

POTENTIAL SURVEY LIMITATION	IMPACT ON SURVEY
Sources of information and availability of contextual information (i.e. pre-existing background versus new material).	Not a constraint. Online flora and vegetation information has provided an appropriate level of information for the weed assessment. Vegetation and targeted flora survey reports associated with the EGLP were also reviewed (Mattiske 2016; 2017; 2018a; 2018b; 2019)
Scope (i.e. what life forms, etc., were sampled).	Not a constraint. Introduced vascular flora, which was the focus of the present survey of the survey areas, was sampled.
Proportion of flora collected and identified (based on sampling, timing and intensity).	Not a constraint. All field work days were conducted during winter and spring, and most annual weed taxa were flowering and fruiting. Most annual weed species germinate during this period. All taxa collected could be identified to the species level. Botanists were familiar with the flora and vegetation of the area, and were able to distinguish introduced from native species. Collections were made of all plants suspected of being introduced.
Completeness and further work which might be needed (i.e. was the relevant survey area fully surveyed).	Minor constraint. High traffic and future high traffic disturbed areas (planned processing plant area, planned ROM area, and the current accommodation village) were targeted during this survey due to their potential to sustain and spread weeds. Several other large disturbed areas in the vicinity of the EGLP (Jasmine, Darjeeling, Razorback, Blue Vein, Bush Pig, and Razorback pits) also have the potential to contain weed species which could be transferred to the EGLP. These areas were not assessed.
Timing, weather, season, cycle.	Not a constraint. Field work was conducted during winter and spring, when annual species are most likely to be present. Most weed species in the Mount Holland area are annuals, and were most likely to be present during this period.
Intensity (in retrospect, was the intensity adequate).	Not a constraint. The intensity of the survey effort was good.
Resources (i.e. were there adequate resources to complete the survey to the required standard).	Not a constraint. Resources, in terms of equipment, support and personnel were good.
Access problems (i.e. ability to access survey area).	Not a constraint. Tracks and large open cleared areas provided good access to the survey area.
Experience levels (e.g. degree of expertise in plant identification to taxon level).	Not a constraint. All botanists had extensive experience working in the Forrestania region, and particularly within the EGLP.

5.2 Field Survey Results

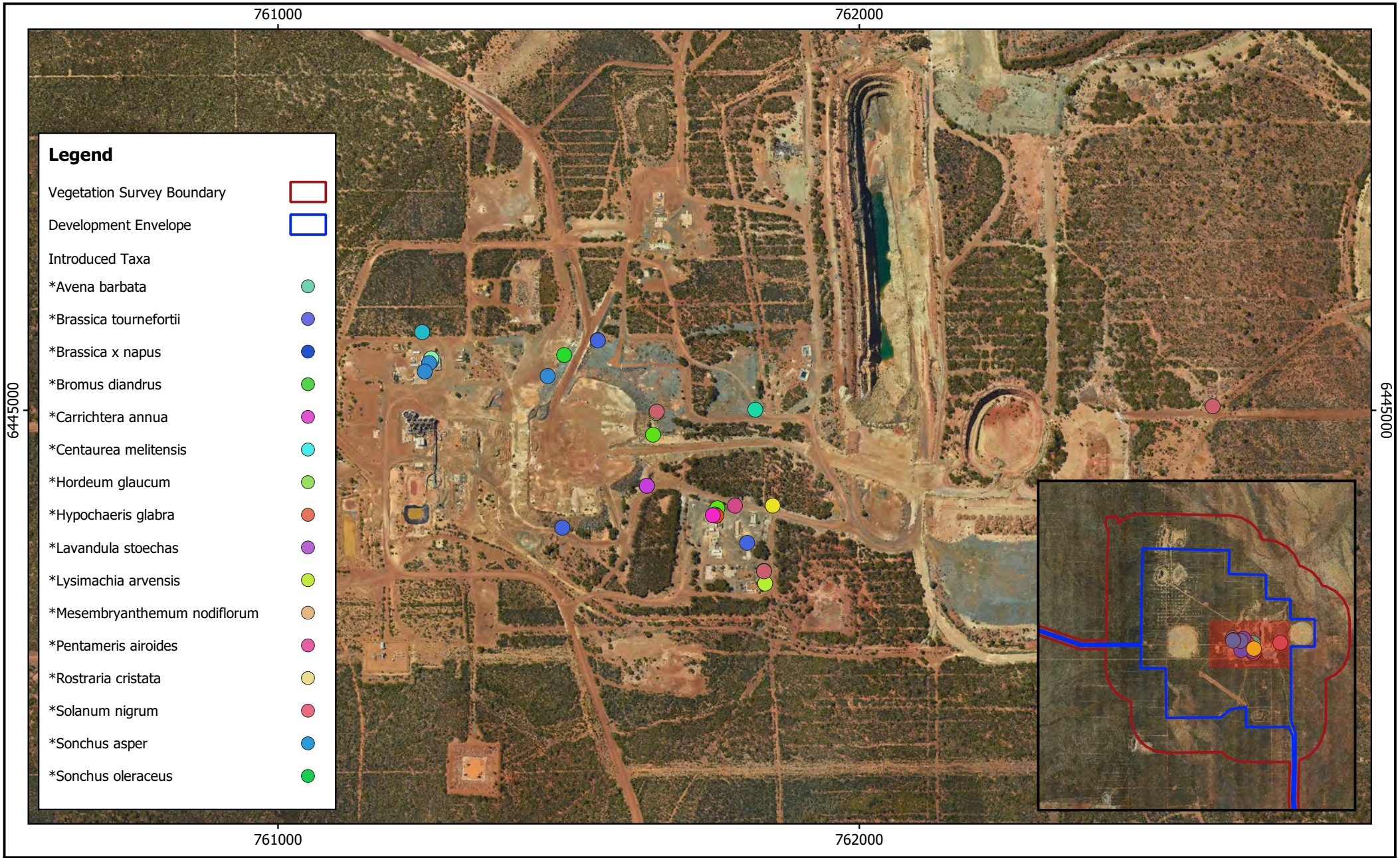
A total of 16 weed species which are representative of 14 genera and seven families were recorded within the survey area and are set out in Table 3, and illustrated in Figure 3. The majority of the plants recorded were representative of the Asteraceae (7 records) and Brassicaceae families (6 records). In terms of the number of individuals recorded at each location, representatives of the Brassicaceae and Aizoaceae were

the most abundant families (554 and 101 individuals respectively). The species with the highest number of individuals recorded were **Carrichtera annua* (503 records) and **Mesembryanthemum nodiflorum* (101 records) (Table 3).

No Weeds of National Significance (WONS) as listed by DAWE (2020b), and no Declared Weeds listed under the *BAM Act* 2007, were recorded during the weed assessment. All weeds recorded are permitted under section 11 of the Permitted (s11) pursuant to the *BAM Act 2007* according to the DPIRD (2020).

Table 3: Location and number of individuals recorded within the survey area.

SPECIES	FAMILY	NUMBER OF INDIVIDUALS RECORDED	Coordinates (GDA94, zone 50)	
			Easting (mE)	Northing (mN)
**Avena barbata*	Poaceae	1	761263	6445084
**Brassica tournefortii*	Brassicaceae	50	761248	6445134
**Brassica × napus*	Brassicaceae	1	761786	6444836
**Bromus diandrus*	Poaceae	1	761821	6445001
**Carrichtera annua*	Brassicaceae	2	761650	6444995
**Carrichtera annua*	Brassicaceae	500	761756	6444831
**Carrichtera annua*	Brassicaceae	100+	761645	6444958
**Carrichtera annua*	Brassicaceae	1	761836	6444724
**Centaurea melitensis*	Asteraceae	30	761550	6445121
**Centaurea melitensis*	Asteraceae	20	761634	6444870
**Hordeum glaucum*	Poaceae	1	761264	6445089
**Hypochaeris glabra*	Asteraceae	1	761634	6444870
**Lavandula stoechas*	Lamiaceae	1	761838	6444702
**Lysimachia arvensis*	Primulaceae	30	761651	6444998
**Lysimachia arvensis*	Primulaceae	1	761836	6444723
**Lysimachia arvensis*	Primulaceae	1	762608	6445007
**Mesembryanthemum nodiflorum*	Aizoaceae	1	761492	6445095
**Mesembryanthemum nodiflorum*	Aizoaceae	100	761752	6444821
**Pentameris airoides*	Poaceae	7	761754	6444819
**Rostraria cristata*	Poaceae	10	761748	6444819
**Solanum nigrum*	Solanaceae	1	761550	6445120
**Solanum nigrum*	Solanaceae	1	761807	6444772
**Solanum nigrum*	Solanaceae	1	761489	6444798
**Sonchus asper*	Asteraceae	1	761851	6444836
**Sonchus oleraceus*	Asteraceae	1	761464	6445059
**Sonchus oleraceus*	Asteraceae	1	761260	6445081
**Sonchus oleraceus*	Asteraceae	1	761252	6445067



N
MGA94 Zone 50

0 80 160 m
Scale: 1:5.556
Author: Z. Sims 31/8/2020

Mattiske Consulting Pty Ltd
28 Central Rd
Kalamunda WA 6076
Tel: 92571625

Earl Grey Lithium Project
Weed Assessment
Weed Record Locations

Figure:
3

6. DISCUSSION

Overall, the vegetation within the EGLP is considered to be in excellent condition (Keighery 1994) and is largely free of introduced species. The presence of introduced species was predominantly restricted to the areas of historical clearing associated with the former Bounty Mine area. The exploration drill tracks and pads associated with the EGLP were free of introduced species. Understanding the conditions that may spread the weeds currently present is critical for their ongoing management and prevention.

6.1 Weed Prioritisation

The DBCA has a weed ranking process to synthesise large amounts of weed information and develop a more useable ranking for weed species within each DBCA Region (DPaW 2013). The process assigns ratings to each weed taxon based on their invasiveness, ecological impacts, potential and current distribution and feasibility of control. Ecological impact ratings and invasiveness ratings are published by the DBCA.

Ecological Impact ratings of low, medium, high, or unknown were assigned to each weed taxon for each DBCA region. The impact attributes considered for each taxon included:

- changed fire regime;
- changed nutrient conditions;
- changed hydrological patterns;
- changed soil erosion patterns;
- changed geomorphological processes;
- changed biomass distribution;
- changed light distribution;
- loss of biodiversity;
- substantially reduces regeneration opportunities of native plants; and
- allelopathic effects.

Invasiveness ratings of slow, moderate, rapid, or unknown were assigned to each weed taxon for each DBCA region. The invasiveness of each weed taxon was rated considering factors and mechanisms of establishment, reproduction, and long distance dispersal (e.g. dispersal by wind or water). Some examples of establishment factors include:

- Ability to outcompete (light, moisture, nutrients, rapid roots growth);
- Sexual or asexual establishment; and
- Needs for disturbance to establish.

Some examples of reproduction factors include:

- Time taken to reach maturity;
- Volumes of seed produced; and
- Vegetative reproduction.

The EGLP lies within the Wheatbelt DBCA region for weed prioritisation, near its boundary with the Goldfields and South Coast regions. Weed ecological impact ratings and invasiveness ratings for all three DBCA region are set out in Table 4.

Five of the weed taxa recorded within the survey area: **Avena barbata, *Bromus diandrus, *Carrichtera annua, *Centaurea melitensis,* and **Mesembryanthemum nodiflorum*, received high ecological impact ratings and a rapid invasiveness rating in one or more of the three DBCA regions in the vicinity of the EGLP. Given these ratings these taxa are the weeds with highest likelihood of becoming detrimental and easily spread within the EGLP once ground disturbances and traffic increase during mining operations. The ecology and management of these weed taxa are set out in the following sections.

Table 4: Summary of the Ecological Impact Ratings (EIR) and Invasiveness Rating (IR) as assessed for each DBCA region (DPaW 2013) for all weeds recorded within the survey area.
Note: Some weed taxa were not assessed for all DPaW regions.

SPECIES	FAMILY	NUMBER OF INDIVIDUALS RECORDED	WHEATBELT		GOLDFIELDS		SOUTH COAST	
			EIR[1]	IR[2]	EIR[1]	IR[2]	EIR[1]	IR[2]
**Avena barbata*	Poaceae	1	H	R	U	U	M	M
**Brassica tournefortii*	Brassicaceae	50	U	R	U	R	U	U
**Brassica × napus*	Brassicaceae	1	-	-	-	-	-	-
**Bromus diandrus*	Poaceae	1	H	R	-	-	H	U
**Carrichtera annua*	Brassicaceae	502	U	M	H	R	H	M
**Centaurea melitensis*	Asteraceae	50	M	R	H	R	H	R
**Hordeum glaucum*	Poaceae	1	U	R	U	U	U	U
**Hypochaeris glabra*	Asteraceae	1	U	R	U	U	U	R
**Lavandula stoechas*	Lamiaceae	1	L	M	-	-	-	-
**Lysimachia arvensis*	Primulaceae	30	U	R	U	R	U	R
**Mesembryanthemum nodiflorum*	Aizoaceae	101	H	R	U	U	U	U
**Pentameris airoides*	Poaceae	7	U	U	U	R	U	R
**Rostraria cristata*	Poaceae	10	U	U	U	U	U	R
**Solanum nigrum*	Solanaceae	1	U	U	M	R	U	R
**Sonchus asper*	Asteraceae	1	U	R	-	-	U	R
**Sonchus oleraceus*	Asteraceae	3	U	R	U	R	U	R

Notes.
1. Ecological Impact: Low (L), Medium (M), High (H), Unknown (U)
2. Invasiveness: Slow (S), Moderate (M), Rapid (R), Unknown (U)

6.2 **Avena barbata* - Bearded Oat

**Avena barbata* is an erect annual grass growing to between 0.3 and 1 m high and flowers between August and October (Plate 1). Seeding is prolific and seeds have a persistence of six months to three years when buried. This taxon needs disturbed ground to germinate, and has been reported to be resistant to some herbicides. This species' high ecological impact rating is likely attributed to its allelopathic ability and the diverse range of habitats it grows in (WAH 1998-).

It is unlikely that **Avena barbata* could spread in to the ecologically sensitive areas within the EGLP (such as flora exclusion zones containing conservation significant flora) due to its need for disturbed ground to germinate. However, **Avena barbata* does have the potential to further spread through the disturbed areas of the EGLP.

6.3 **Bromus diandrus* - Great Brome

**Bromus diandrus* is a tufted annual grass growing to between 0.2 and 0.7 m high and flowers between August and November (Plate 2). **Bromus diandrus* is highly competitive for water, nutrients and space, and is adapted to a range of soil types from acidic to alkaline and sand to loams. **Bromus diandrus* is drought tolerant, and produces prolific seed which persists in the seedbank for up to two years (WAH 1998-).

It is unlikely that **Bromus diandrus* could spread in to the ecologically sensitive areas within the EGLP (such as flora exclusion zones containing conservation significant flora) due to its tendency to grow in disturbed areas, and occasionally in woodlands. However, **Bromus diandrus* does have the potential to further spread through the disturbed areas of the EGLP.



Plate 1:
**Avena barbata* inflorescence
(WAH 1998-)



Plate 2: **Bromus diandrus* inflorescence and habit
(WAH 1998)

6.4 **Carrichtera annua* - Ward's Weed

**Carrichtera annua* is an erect annual herb growing to between 0.05 and 0.4 m high with yellow flowers between September and November (Plate 3). Seeding is prolific and propagules compete for space with native vegetation. **Carrichtera annua* is known to be easily transported on vehicles and railways, and by native fauna and livestock. The seed of **Carrichtera annua* floats in water for dispersal in runoff water in drains and road ruts (Agriculture Victoria 2020).

It is unlikely that **Carrichtera annua* could spread in to the ecologically sensitive areas within the EGLP (such as flora exclusion zones containing conservation significant flora) due to its tendency to grow in disturbed areas, and occasionally in woodlands. However, **Carrichtera annua* does have the potential to further spread through the disturbed areas of the EGLP.

6.5 **Centaurea melitensis* - Maltese Cockspur

**Centaurea melitensis* is and erect annual or biennial herb growing to between 0.2 and 1 m high, and has yellow flowers between September and December or between January and March (Plate 4). **Centaurea melitensis* is known to primarily grow in disturbed areas, and is not known to invade undisturbed native vegetation. Seeds are unlikely to spread very far unless carried by vehicles, humans, or fauna. Seeds persist in the soil seedbank usually for up to four years, but can persist up to 10 years under optimal conditions (WAH 1998-).

It is unlikely that **Centaurea melitensis* could spread in to the ecologically sensitive areas within the EGLP (such as flora exclusion zones containing conservation significant flora) due to its tendency to grow in disturbed areas, and its poor seed dispersal mechanisms. However, **Centaurea melitensis* does have the potential to further spread through the disturbed areas of the EGLP.



Plate 3: **Carrichtera annua* inflorescence and habit (PlantNET 2020)

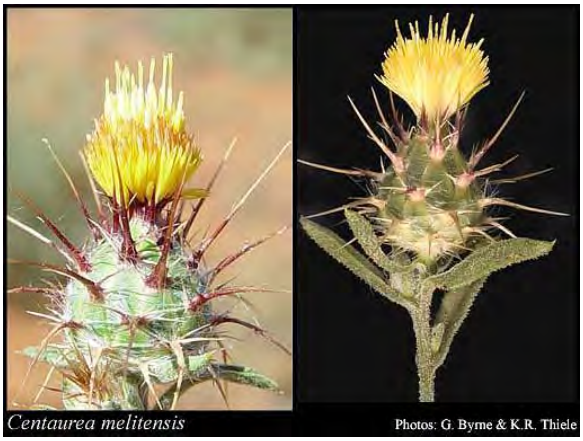


Plate 4: **Centaurea melitensis* inflorescence (WAH 1998-)

6.6 **Mesembryanthemum nodiflorum* - Slender Iceplant

**Mesembryanthemum nodiflorum* is a prostrate or erect succulent annual herb growing to between 0.02 and 0.2 m high, and has white flowers between September and November (Plate 5). **Mesembryanthemum nodiflorum* grows primarily in wet, clayey, saline areas.

It is unlikely that **Centaurea melitensis* could spread in to the ecologically sensitive areas within the EGLP (such as flora exclusion zones containing conservation significant flora) due to its tendency to grow in disturbed areas, and poor seed dispersal mechanisms. None of the ecologically sensitive areas within the EGLP are comprised of clayey flats or saline areas. However, **Centaurea melitensis* does have the potential to further spread through the disturbed areas of the EGLP.

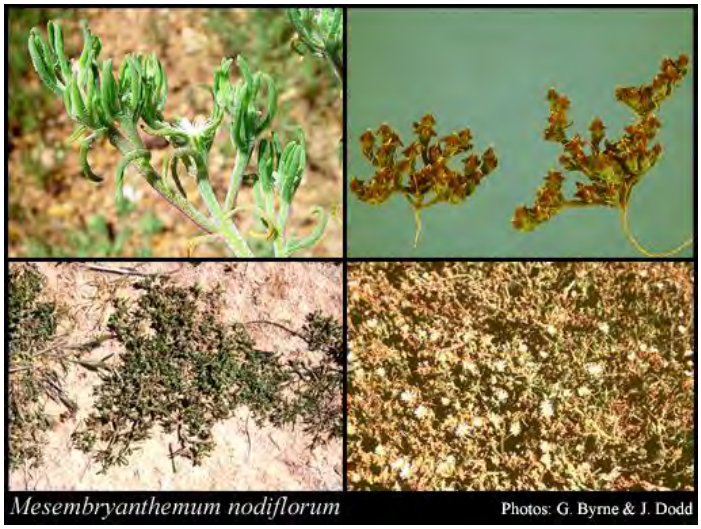


Plate 5: **Mesembryanthemum nodiflorum* inflorescence and habit (WAH 1998-)

6.7 Weed Management

Preventing the entry of new weed species is the most effective weed management procedure. The ongoing movement of light and heavy vehicles within the EGLP presents the highest risk for the introduction of new weed taxa. Vehicle hygiene practices such as wash down points and vehicle pre-start weed checks should be implemented to minimise weed introduction and spread.

Periodic weed surveys of the EGLP should be undertaken to identify infestations of weeds before the plants can flower and set seed. This should be combined with quarterly weed assessments of the flora exclusion zones to ensure a holistic approach to weed management.

6.7.1 Staff Education

Presentations in all inductions to staff and contractors on the ecological impacts of weeds and the significance of managing weeds, will help in engaging all staff in weed management. To assist site personnel, relevant information on current and potential weeds should be made available to environmental teams on site. This information could be in digital form to assist with identification in the field.

6.7.2 Personnel, Vehicle and Equipment Hygiene

One of the major concerns associated with construction/demolition activities around the EGLP is the further spread of existing weeds or the introduction of new weed species into the area. Weed species can

potentially spread between sites by a number of different vectors including, but not limited to, contaminated machinery, vehicles, equipment, clothing and footwear. The implementation of weed hygiene procedures are critical to minimising the spread and/or introduction of weeds. Appropriate weed hygiene measures will be implemented to minimise further spread and introduction of weed species. Weed hygiene measures must be followed by all site personnel, vehicles and equipment entering the Project area. Specific measures to be implemented may include the following:

- Washdown bays established at vehicle access points where vehicles and equipment are to be cleaned of mud, dirt and organic matter from underneath vehicle, in the cabin and/or load trays, followed by removal of excess material by high pressure air or water spray jets;
- Establishing contract conditions directing contractors and/or suppliers to ensure earthmoving equipment, vehicles and other stationary equipment coming onto site is cleaned and clear of any free dirt prior to arriving onsite; and
- The movement of vehicles, equipment and personnel between disturbed areas will be minimised as much as possible, to reduce the risk of spreading/introducing weeds.

6.8 Control Methods

Weeds can be controlled by direct methods such as manual methods and using herbicides. The selection and implementation of the most appropriate method or combination of methods is a vital part of any weed control program. Correct selection will ensure that weeds are dealt with in a timely manner with minimal environmental costs.

6.8.1 Controlling Degradation Processes

Controlling degradation processes that increase ecosystem vulnerability to weeds is often the most effective way to control weeds. In bushland areas procedures such as fire management, maintenance of buffer zones, fostering regeneration of indigenous species and restricting human access to managed walkways and roads all contribute to weed management. Reduction in weeds after the degradation processes are controlled may be slow and monitoring will be required to determine effectiveness and whether complementary measures such as revegetation or minor weed control are also required

6.8.2 Herbicide Application

Herbicide application is often the most cost effective method for the control of weeds. While herbicide applications can be efficient when implemented correctly, this approach requires careful consideration of:

- Human health implications;
- Increasing herbicide resistance;
- Impact on non-target flora and fauna, and
- The need for post treatment rehabilitation.

Careful consideration of the most appropriate use of herbicide control is required and over reliance on herbicides for weed control should be discouraged.

6.8.3 Mechanical Control

Manual control is often the most expensive form of weed removal but, is often the most appropriate method in many circumstances and for many weed taxa. Manual weed control may be the most appropriate form of control in vegetation exclusion zones where disturbance to individual native plants must be avoided (DPaW 2013).

7. CONCLUSIONS & RECOMMENDATIONS

Overall, the vegetation within the EGLP is considered to be in excellent condition (Keighery 1994) and is largely free of weeds. This weed assessment recorded that weeds occurred in isolated patches of cleared areas, and in disturbed vegetation. All 16 weed species recorded within the survey area were listed as "Permitted – s11" in Western Australia by DPIRD under the *BAM Act 2007,* with the most prolific weeds being **Carrichtera annua* and **Mesembryanthemum nodiflorum.* Based on the weed ranking process implemented by DBCA (DPaW 2013), **Avena barbata, *Bromus diandrus, *Carrichtera annua, *Centaurea melitensis,* and **Mesembryanthemum nodiflorum* have the highest potential to be further spread through the EGLP during its development and operation.

Based on the results of this weed assessment, the following recommendations are presented:

- Implement personnel, vehicle and equipment hygiene, procedures both before entering site, and at vehicle pre start inspections to avoid introducing new weed species, and minimise the spread of existing weed species
- Develop and maintain a weed identification book and herbarium for field staff;
- Develop a weed reporting system to maintain and preserve information on the weed species present, weed abundance, and weed distribution;
- Develop weed management, identification, and reporting aspects to site inductions for all contractors and site personnel;
- Monitor disturbance areas frequently for new weed infestations and new weed species;
- Monitor vegetation exclusion zones for weed encroachment into undisturbed vegetation;
- Undertake control measures with qualified weed control specialists to safely minimize spread of weeds;

8. ACKNOWLEDGEMENTS

The authors would like to thank Mr M. Hislop of the Western Australian Herbarium for his assistance in identifying a number of the flora collected during the course of the field survey work.

9. PERSONNEL

The following Mattiske Consulting Pty Ltd personnel were involved in this project:

NAME	POSITION	PROJECT INVOLVEMENT	FLORA COLLECTION PERMITS
Dr EM Mattiske	Managing Director & Principal Ecologist	Planning, managing, reporting	FB62000019
Mr D. Angus	Senior Botanist	Planning, fieldwork, data analysis, plant identifications, report preparation	FB62000022
Mr B. Ellery	Senior Botanist	Plant identification	FB62000024
Mr. Z. Sims	Experienced Botanist	Planning, fieldwork, data analysis, report preparation	FB62000025-2
Ms L. Taaffe	Experienced Botanist	Fieldwork	FB62000021
Mr A. Pereira	Botanist	Fieldwork, data analysis, mapping, report preparation	FB62000145
Mr. N. Watson	Botanist	Field work	FB62000146

10. REFERENCES

Agriculture Victoria 2020. *Invasiveness Assessment – Wards Weed (Carrichtera annua) in Victoria.* Available from: http://vro.agriculture.vic.gov.au/dpi/vro/vrosite.nsf/pages/invasive_wards_weed.

Beard, JS, 1990, *Plant life of Western Australia*, Kangaroo Press, Kenthurst, NSW.

Biodiversity Conservation Act 2016 (WA)

Biodiversity Conservation Regulations 2018 (WA)

Biosecurity and Agriculture Management Act 2007 (WA)

Bureau of Meteorology 2020. *Climate data online,* Commonwealth of Australia. Available from: http://www.bom.gov.au/climate/data/

Covalent Lithium Pty Ltd 2019, *Covalent Lithium Earl Grey Lithium Project: Flora Management Plan.*

Cowan, M, Graham, G and McKenzie, N. 2001. *Coolgardie 2 (C002 – Southern Cross Subregion)* in *A biodiversity audit of Western Australia's 53 biogeographical subregions in 2002,* eds. JE May & NL McKenzie, Department of Conservation and Land Management, Western Australia, pp. 143-155

Department of Agriculture, Water and the Environment 2020a. *EPBC Act: Protected matters search tool*, Commonwealth of Australia. Available from: http://www.environment.gov.au/epbc/protected-matters-search-tool.

Department of Agriculture, Water and the Environment 2020b, *Weeds of National Significance.* Available from: http://www.environment.gov.au/biodiversity/invasive/weeds/weeds/lists/wons.html.

Department of Biodiversity, Conservation and Attractions 2007-, *NatureMap: Mapping Western Australia's biodiversity*, Government of Western Australia. Available from: https://naturemap.dpaw.wa.gov.au.

Department of Parks and Wildlife 2013, *Weed prioritisation process for DPaW (formerly DEC) – "An integrated approach to weed management on DPaW-managed lands in WA", November 2013*, Government of Western Australia. Available from: https://www.dpaw.wa.gov.au/plants-and-animals/plants/weeds/156-how-does-dpaw-manage-weeds.

Department of Primary Industries and Regional Development 2020, *Western Australian Organism List*, Government of Western Australia. Available from: https://www.agric.wa.gov.au/organisms.

Environmental Protection Act 1986

Environment Protection and Biodiversity Conservation Act 1999

Environmental Protection Authority 2016a, *Environmental Factor Guideline - Flora and Vegetation,* Environmental Protection Authority, Perth, WA.

Environmental Protection Authority 2016b, *Technical Guidance – Flora and vegetation surveys for environmental impact assessment*, Environmental Protection Authority, Western Australia.

Environmental Weed Strategy for Western Australia 1999. Available from: https://www.dpaw.wa.gov.au/images/documents/plants-animals/plants/weeds/environmental_weed_strategy_wa.pdf

Government of Western Australia 2019. *Ministerial Statement 1118. Statement that a proposal may be implemented. Earl Grey Lithium Project*. 21st November 2019

Keighery, BJ, 1994, *Bushland Plant Survey. A Guide to Plant Community Survey for the Community*. Wildflower Society of WA (Inc.), Western Australia.

Mattiske Consulting Pty Ltd 2016, *Flora and Vegetation of the Van Uden Prospect*. Unpublished report prepared for Kidman resources Limited, November 2016.

Mattiske Consulting Pty Ltd 2017, *Flora and Vegetation of the Earl Grey, Irish Breakfast and prince of Wales Prospects, Mt Holland Project*. Unpublished report prepared for Kidman resources Limited, April 2017.

Mattiske Consulting Pty Ltd 2018a, *Flora and Vegetation Assessment - Earl Grey Lithium Project*. Unpublished report prepared for Kidman Resources Limited, March 2018.

Mattiske Consulting Pty Ltd 2018b, *Earl Grey Lithium Project Conservation significant flora targeted survey*. Unpublished report prepared for Covalent Lithium Pty Ltd, January 2019.

Mattiske Consulting Pty Ltd 2019, *Threatened and priority flora assessment, Earl Grey Lithium Project - Pre-clearance surveys.* Unpublished report prepared for Covalent Lithium Pty Ltd, December 2019.

PlantNET (The NSW Plant Information Network System) 2020, Royal Botanic Gardens and Domain Trust, Sydney. Available from: https://plantnet.rbgsyd.nsw.gov.au/cgi-bin/NSWfl.pl?page=nswfl&photo=27&file=44/940/Carrichtera_annua.jpg.

Western Australian Herbarium 1998-, *FloraBase - the Western Australian Flora*. Department of Biodiversity, Conservation and Attractions. Available from: https://florabase.dpaw.wa.gov.au/

APPENDIX A: DECLARED PEST CATEGORIES AND DEFINITIONS

Section 22 of Western Australia's *Biosecurity and Agriculture Management Act 2007* (BAM Act) makes provision for a plant taxon to be listed as a declared pest organism in respect to parts of, or the entire State. According to the *BAM Act*, a declared pest is defined as a prohibited organism (section 12), or an organism for which a declaration under section 22 (2) of the Act is in force (Table B1).

Under the *Biosecurity and Agriculture Management Regulations 2013* (WA), declared pest plants are placed in one of three control categories, C1 (exclusion), C2 (eradication) or C3 (management), which determines the measures of control which apply to the declared pest (Table B2). The current listing of declared pest organisms and their control category is through the Western Australian Organism List (Department of Primary Industries and Regional Development 2019).

Table A1: Plant taxon listings as defined by section 22 of the *Biosecurity and Agriculture Management Act 2007*

DECLARED LISTING	LEGAL STATUS
S12	Declared Pest, Prohibited - s12 "Prohibited organisms are declared pests by virtue of section 22(1), and may only be imported and kept subject to permits. Permit conditions applicable to some species may only be appropriate or available to research organisations or similarly secure institutions."
s22(2)	Declared Pest - s22(2) "Declared pests must satisfy any applicable import requirements when imported, and may be subject to an import permit if they are potential carriers of high-risk organisms. They may also be subject to control and keeping requirements once within Western Australia."
r73	Permitted, Requires Permit - r73 "Regulation 73 permitted organisms may only be imported subject to an import permit. These organisms may be subject to restriction under legislation other than the *Biosecurity and Agriculture Management Act 2007*. Permit conditions applicable to some species may only be appropriate or available to research organisations or similarly secure institutions."
s11	Permitted - s11 "Permitted organisms must satisfy any applicable import requirements when imported. They may be subject to an import permit if they are potential carriers of high-risk organisms."
s14	Unlisted - s14 "If you are considering importing an unlisted organism/s you will need to submit the name/s for assessment, as unlisted organisms are automatically prohibited entry into WA."

Table A2: Categories and control measures of declared pest (plant) organisms as defined by *Biosecurity and Agriculture Management Regulations 2013*.

CONTROL CATEGORY	CONTROL MEASURES
C1 (Exclusion) '(a) Category 1 (C1) — Exclusion: if in the opinion of the Minister introduction of the declared pest into an area or part of an area for which it is declared should be prevented.' Pests will be assigned to this category if they are not established in Western Australia and control measures are to be taken, including border checks, in order to prevent them entering and establishing in the State.	In relation to a category 1 declared pest, the owner or occupier of land in an area for which an organism is a declared pest or a person who is conducting an activity on the land must take such of the control measures specified in subregulation (1) as are reasonable and necessary to destroy, prevent or eradicate the declared pest.
C2 (Eradication) '(b) Category 2 (C2) — Eradication: if in the opinion of the Minister eradication of the declared pest from an area or part of an area for which it is declared is feasible.' Pests will be assigned to this category if they are present in Western Australia in low enough numbers or in sufficiently limited areas that their eradication is still a possibility.	In relation to a category 2 declared pest, the owner or occupier of land in an area for which an organism is a declared pest or a person who is conducting an activity on the land must take such of the control measures specified in subregulation (1) as are reasonable and necessary to destroy, prevent or eradicate the declared pest.
C3 (Management) '(c) Category 3 (C3) — Management: if in the opinion of the Minister eradication of the declared pest from an area or part of an area for which it is declared is not feasible but that it is necessary to: (i) alleviate the harmful impact of the declared pest in the area; or (ii) reduce the number or distribution of the declared pest in the area; or (iii) prevent or contain the spread of the declared pest in the area.' Pests will be assigned to this category if they are established in Western Australia but it is feasible, or desirable, to manage them in order to limit their damage. Control measures can prevent a C3 pest from increasing in population size or density or moving from an area in which it is established into an area which currently is free of that pest.	In relation to a category 3 declared pest, the owner or occupier of land in an area for which an organism is a declared pest or a person who is conducting an activity on the land must take such of the control measures specified in subregulation (1) as are reasonable and necessary to: (a) alleviate the harmful impact of the declared pest in the area for which it is declared; or (b) reduce the number or distribution of the declared pest in the area for which it is declared; or (c) prevent or contain the spread of the declared pest in the area for which it is declared.

Appendix O Dust Report

©JBS&G Australia Pty Ltd

MAXY Engineering
www.MAXYengineering.com.au

36/10 Geddes St, Balcatta WA6021
0478 221 776
Email: office@maxyengineering.com.au
ABN: 95 154 819 100

Covalent Lithium dust report – 2021-2022

Prepared for: Covalent Lithium

September 2022

Version 3

Prepared by:

MAXY Engineering – Razvan Vlad

MAXY Engineering
www.MAXYengineering.com.au

36/10 Geddes St, Balcatta WA6021
0478 221 776
Email: office@maxyengineering.com.au
ABN: 95 154 819 100

Scope of work

MAXY Engineering was contracted to monitor the dust concentrations at the Covalent Lithium mine site located in Western Australia. Dust monitoring is a requirement of Earl Grey Lithium Project Ministerial Statement 1118 (condition 6-5 (2)) and the associated Flora and Vegetation Environmental Management Plan.

Dust deposition gauges are considered the most appropriate means by which to measure dust fall on flora and vegetation. Dust deposition gauges were installed and monitored in accordance with Australian Standard AS/NZS 3580.10.1:2003 methods for sampling and analysis of ambient air.

The measurements were performed using two methods:

- Realtime PM10 concentration at two locations
- Realtime wind speed and wind direction measurements at one location
- Monthly dust composition at the two Realtime monitoring locations
- Monthly average dust concentrations and composition at 9 locations using dust deposition gauges

Monitoring equipment

Realtime monitors

- Light scattering devices
- Heated inlets
- PM10 inlet separators
- 2 second measurements, 5 minutes averages
- 1.8 m above ground inlet height
- Mechanical wind speed / wind direction sensor

Dust deposition gauges

- AS dust deposition gauge fitted with high-capacity bottles
- ARL method 103 metals analysis
- Modified AS/NZS 3580.10.1 total solids analysis

There were nine transects with Dust Deposition gauges deployed. Six of these sites were impact and the remaining three were control sites these are identified in the table below:

36/10 Geddes St, Balcatta WA6021
0478 221 776
Email: office@maxyengineering.com.au
ABN: 95 154 819 100

Table 1-0-1 Dust Deposition Impact and Control Sites

Transect #	Control/Impact site
Transect 2	Impact
Transect 7	Control
Transect 8	Impact
Transect 9	Impact
Transect 10	Control
Transect 11	Control
Transect 14	Impact
Transect 16	Impact
Transect 18	Impact

Impact sites are located within Flora and Vegetation Exclusion Zones around the project boundary. Control sites, particularly areas that are close to project infrastructure and activities. Control sites are located in areas that would not be impacted by the project (see image below). Due to construction of the Main Access Road, a diversion had to be made south of the Airstrip. Because of this, transect 10, a planned control site has been adjacent to the Main Access Road. Please see image 1 below for Dust Deposition Gauge locations and Flora and Vegetation Exclusion Zones.

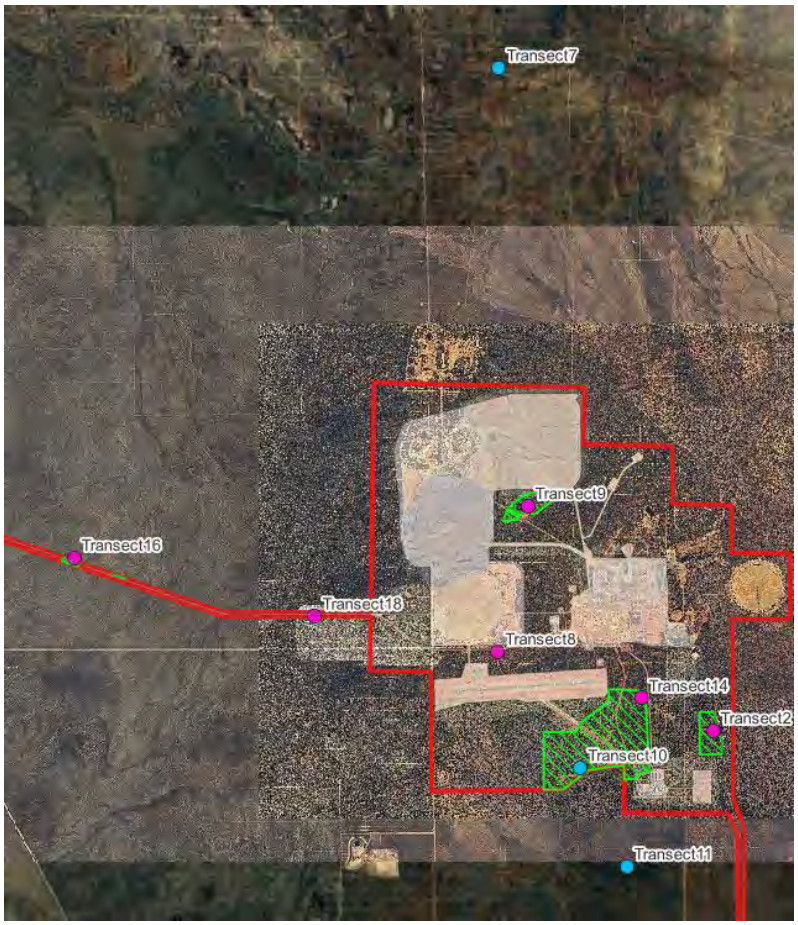


Image 1 – Dust Deposition impact (purple) and Control (blue) monitoring locations

MAXY Engineering
www.MAXYengineering.com.au
36/10 Geddes St, Balcatta WA6021
0478 221 776
Email: office@maxyengineering.com.au
ABN: 95 154 819 100

General observations

The two real time monitoring stations were installed in July 2021 and operated continuously until the end of September 2022. The Realtime monitoring station number 2 was moved on 23/2/2022 to a new location as shown on Image 2. Realtime results have therefore been split into two periods. The first period runs from 14/7/2021 to 23/2/2022, and the second period is 23/2/2022 to 30/9/2022.



Image 2 – Realtime dust monitoring locations (blue) – at installation as per 14/07/2021.

Realtime Dust 1 located west of Bounty TSF1 and east of Bounty Pit – pit backfilled to become Bounty Waste Rock Landform).

Realtime Dust 2 located east of Bounty TSF2 – capped to become South Waste Rock Landform.

36/10 Geddes St, Balcatta WA6021
0478 221 776
Email: office@maxyengineering.com.au
ABN: 95 154 819 100



Image 3 – Realtime dust monitoring locations (blue) – As per 23/02/2022

Realtime Dust 2 relocated to north of EGLP airstrip due to clearing activities adjacent to Bounty TSF2.

Due to the local conditions, it was not possible to find a location for Station 2 that fully complies to the Australian Standard for siting, however the chosen locations are the best fit possible as far as the clear sky view and vegetation proximity are concerned. Station 1 complies to the siting standard.

MAXY Engineering
www.MAXYengineering.com.au
36/10 Geddes St, Balcatta WA6021
0478 221 776
Email: office@maxyengineering.com.au
ABN: 95 154 819 100

Wind conditions

An Australian Standard weather station is not available on site and for this project a local wind vane was used to collect wind information. The sensor was located at the Station 2 site, 1.8m above ground and sampled at the same frequency as the PM10 monitor. The wind roses below show the data collected during the first period (14/7/2021 – 23/2/2022) and the second period (23/2/2022 – 30/9/2022).

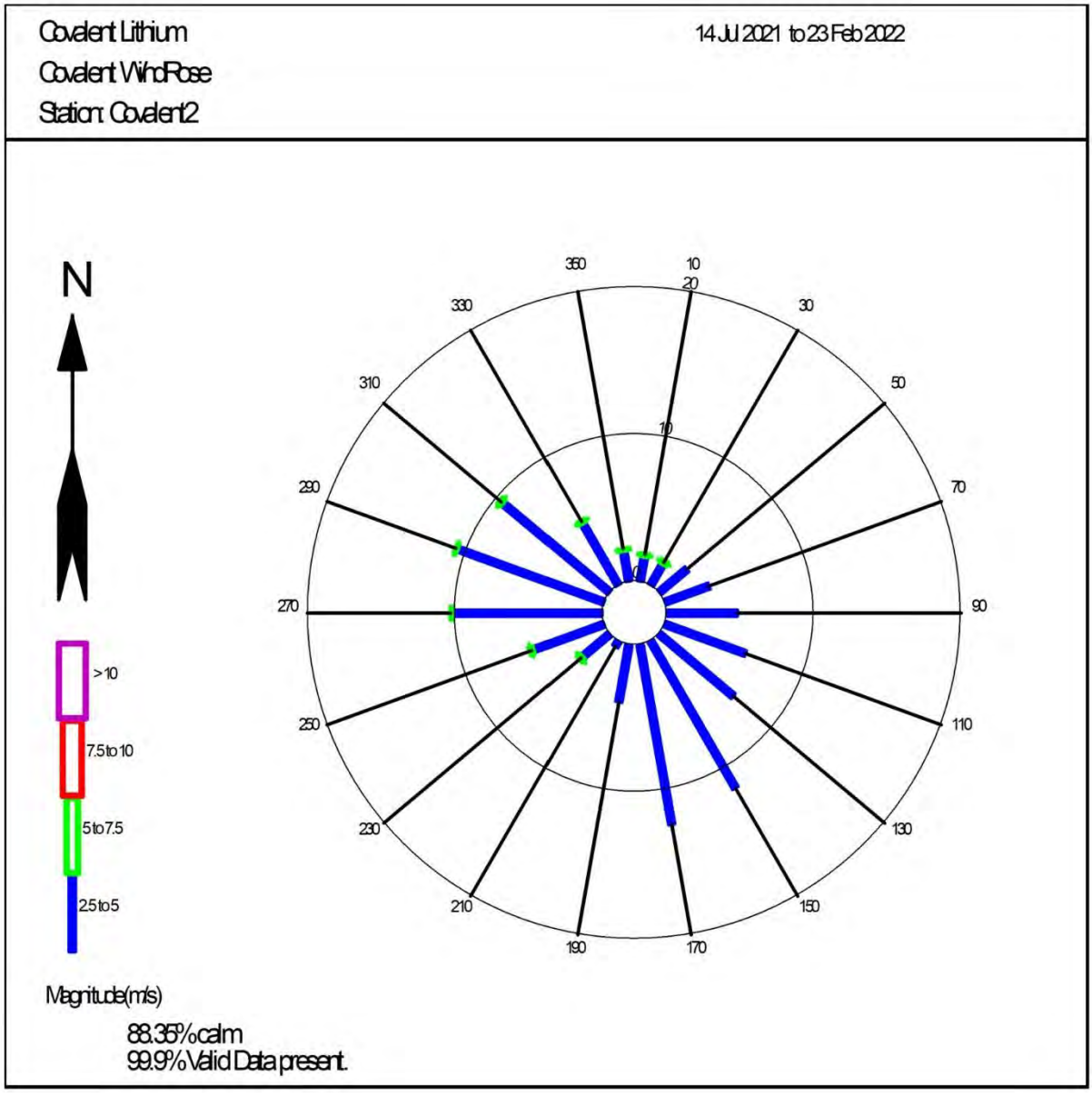


Image 4 – Wind Rose, Station 2, 14/7/2021 – 23/2/2022

MAXY Engineering
www.MAXYengineering.com.au
36/10 Geddes St, Balcatta WA6021
0478 221 776
Email: office@maxyengineering.com.au
ABN: 95 154 819 100

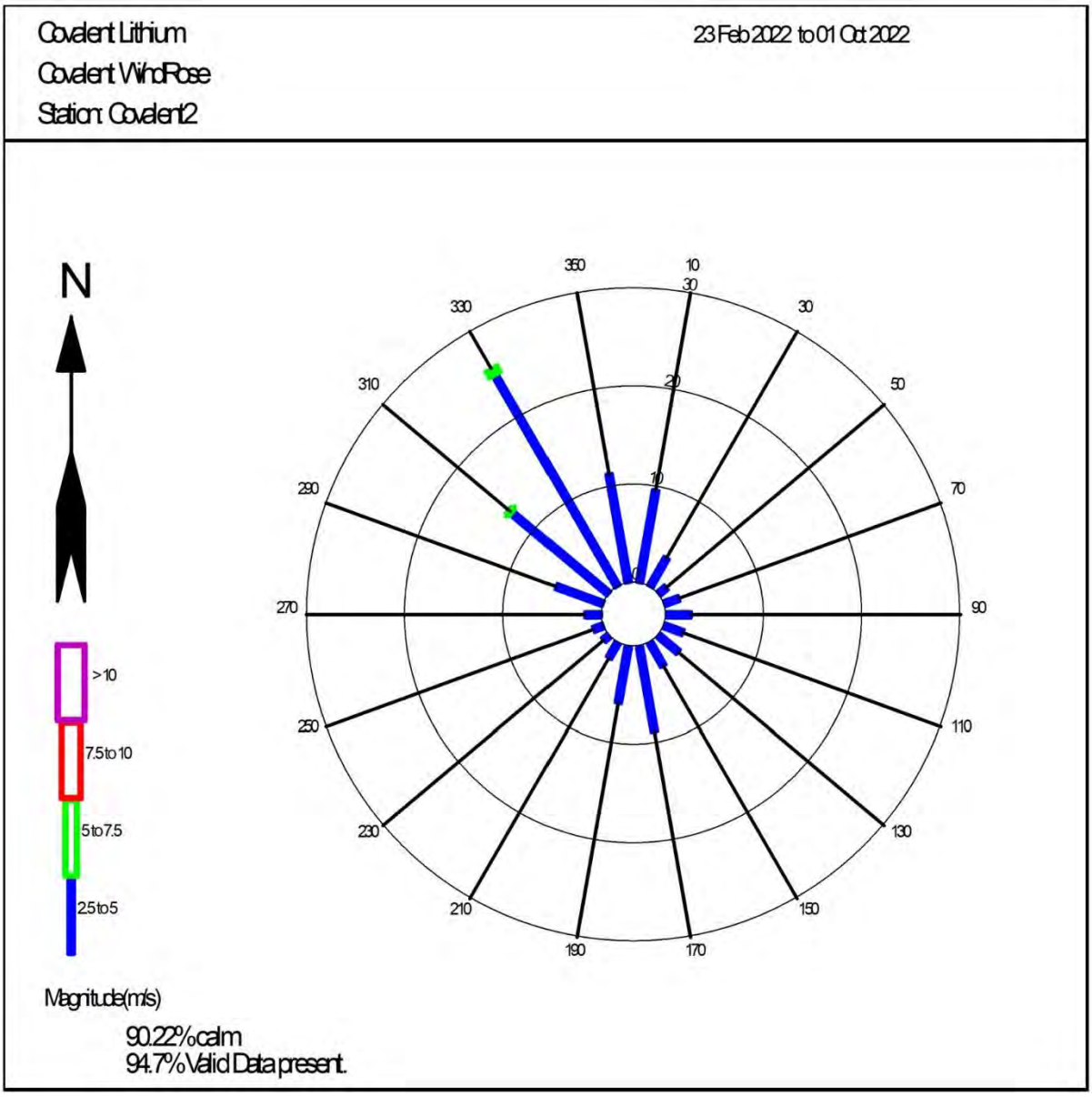


Image 5 – Wind Rose, Station 2, 23/2/2022 – 30/9/2022

36/10 Geddes St, Balcatta WA6021
0478 221 776
Email: office@maxyengineering.com.au
ABN: 95 154 819 100

PM10 Realtime measurements

Station 2 was located closer to the dust sources and recorded higher values than Station 1. The following graphs show the comparison between the 24hrs averages recorded at both stations.

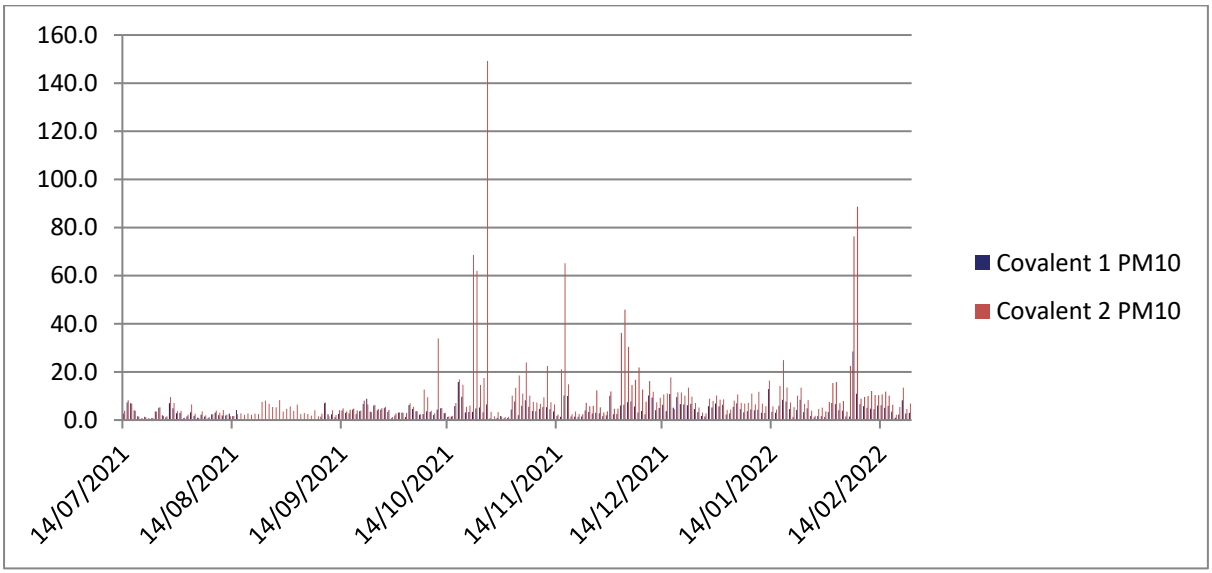


Image 6 – PM10 24 hours concentrations 14/7/2021 – 23/2/2022

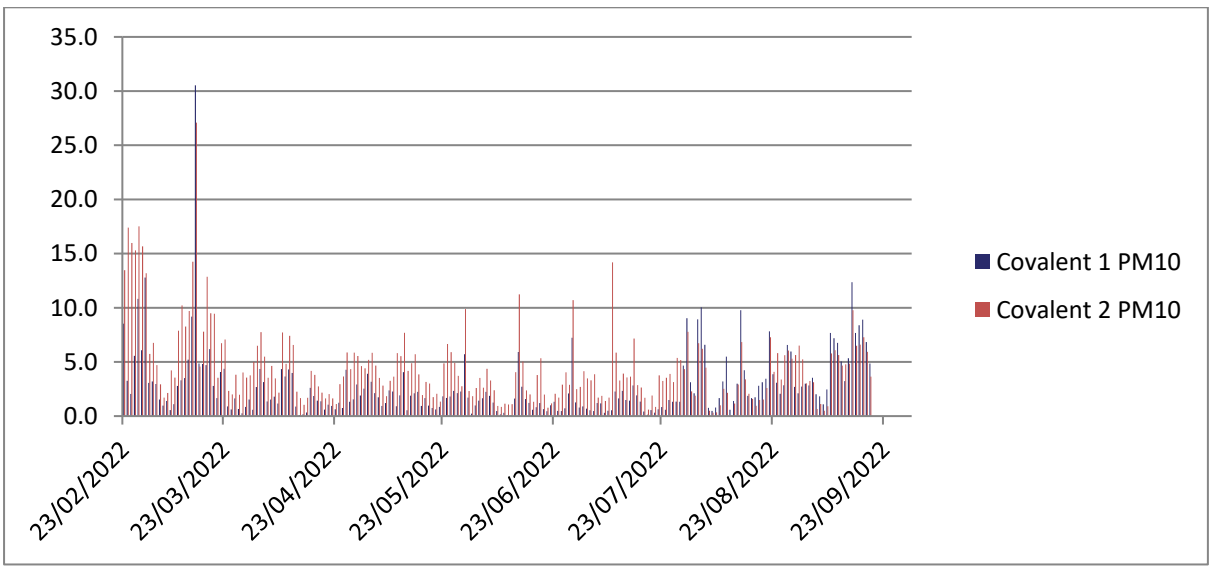


Image 7 – PM10 24 hours concentrations 23/2/2022 – 30/9/2022

MAXY Engineering
www.MAXYengineering.com.au
36/10 Geddes St, Balcatta WA6021
0478 221 776
Email: office@maxyengineering.com.au
ABN: 95 154 819 100

A dust source identification was compiled for both monitoring locations, and the results are presented below.

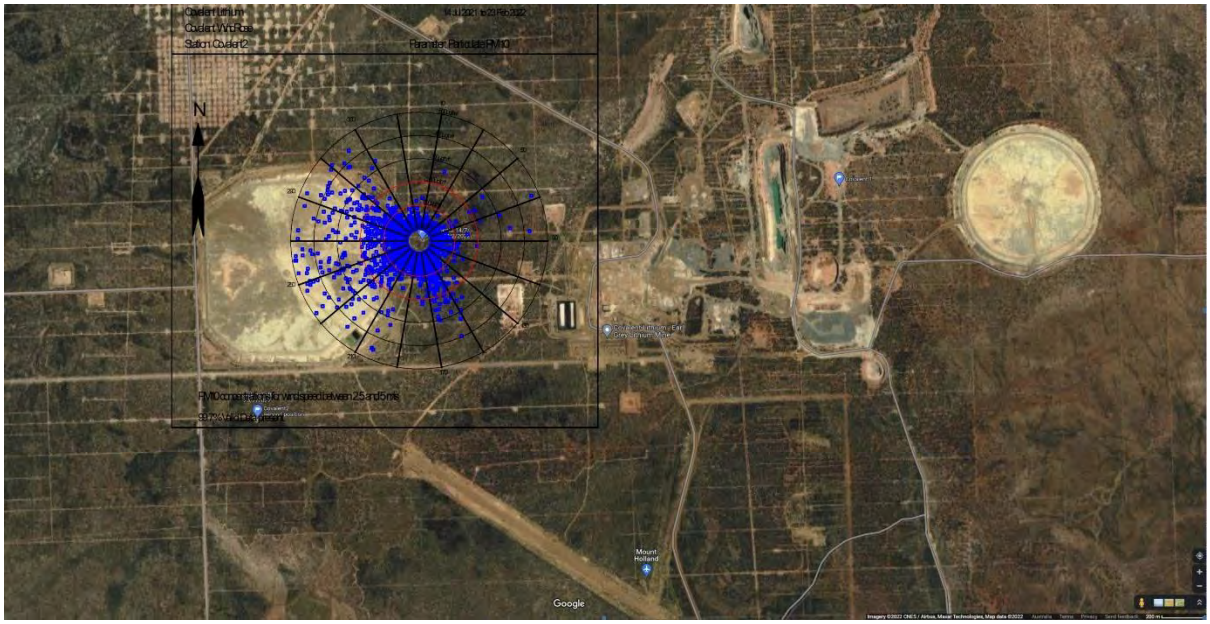


Image 8 – PM10 5 min dust sources, Station 2, 14/7/2021 – 23/2/2022



Image 9 – PM10 5 min dust sources, Station 2, 23/2/2022 – 30/9/2022

36/10 Geddes St, Balcatta WA6021
0478 221 776
Email: office@maxyengineering.com.au
ABN: 95 154 819 100



Image 10 – PM10 5 min dust sources, Station 1, 14/7/2021 – 23/2/2022



Image 11 – PM10 5 min dust sources, Station 1, 23/2/2022 – 30/9/2022

36/10 Geddes St, Balcatta WA6021
0478 221 776
Email: office@maxyengineering.com.au
ABN: 95 154 819 100

Realtime dust results analysis

The NEPM limit for PM10 dust concentrations is 50µg/m^3 for 24 hours averages. There were six exceedances of the limit during the monitoring period, all of them recorded at Station 2. Station 1 is also shown to compare PM10 concentrations at the time of Station 2 exceedances.

Table 1-2 RealTime Station 2 PM10 exceedances compared with Station 1.

Date	Station 2 PM10 concentration (µg/m^3)	Station 1 PM10 concentration (µg/m^3)
21/10/2022	68.6	3.4
22/10/2022	62.0	4.8
25/10/2022	149.2	6.5
16/11/2022	65.1	10.2
6/2/2022	76.3	28.5
7/2/2022	88.7	10.9

All instances were caused by dust sources located to the West of the first location for Station 2. Once the station was moved to the second location there were no more exceedances recorded. It is likely that the cause of these exceedances is due to proximity of the dust monitor to the historic Tailing Storage Facility (TSF)

Dust composition results analysis

A full suite of chemical analysis was performed on the dust deposition gauge samples (nine locations), in addition to the filters collected at both Realtime monitors (two locations). Seven sampling events occurred over the reporting period for each transect. Total solids, Insoluble solids and the following metals were targeted:

Aluminium, Silver, Arsenic, Boron, Barium, Beryllium, Cadmium, Cobalt, Copper, Mercury, Manganese, Molybdenum, Nickel, Lead, Selenium, Vanadium, Zinc, Chromium (Hexavalent)

Realtime Monitors

None of the PM10 Realtime monitor samples recorded any measurable metals concentrations.

Dust Deposition

All dust deposition gauge results were equal to the EQL for most of the measurements, the only exception being Aluminium which was measurable in all the samples.

MAXY Engineering
www.MAXYengineering.com.au
36/10 Geddes St, Balcatta WA6021
0478 221 776
Email: office@maxyengineering.com.au
ABN: 95 154 819 100

The February 2022 Dust Deposition samples showed measurable levels of Barium, Boron and Zinc also, and this was the period which recorded the highest Total Solids average concentrations. Sampling locations T18, T10 and T14 recorded the highest levels during this period.

Insoluble solids (g/m^2.month) exceeded the FVMP early response trigger (5 g/m^2.month) 4 times throughout the reporting period and the management target (10 g/m^2.month) 4 times through the reporting period. The early trigger warning was exceeded at transect 18 during the November-February period, transects 9 and 16 in the March-May event and transect 10 in the May-July event. The management target was exceeded at transect 10 in the Feb-March event and transects 10, 14 and 18 in the March-May event. A summary of the results and interpretation are attached as Appendix A.

MAXY Engineering
www.MAXYengineering.com.au
36/10 Geddes St, Balcatta WA6021
0478 221 776
Email: office@maxyengineering.com.au
ABN: 95 154 819 100

Appendix A – Insoluble Solids Results Summary and Interpretation.

MT HOLLAND DUST DEPOSITION MONITORING

Management Target - 10g/m2

Early Response Trigger - 5g/m2

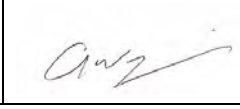
Start date	Collection Date	Analysis	Unit	Transect 2 Impact Borefield Rd	Transect 7 Control Jilbadji	Transect 8 Impact South of MAR	Transect 9 Impact FVEZ Haul Rd	Transect 10 Control FVEZ Airstrip	Transect 11 Control South of DE	Transect 14 Impact FVEZ VAR	Transect 16 Impact MAR	Transect 18 Impact MAR	Comments - Interpretation
18/09/2021	2/11/2021	Insoluble Solids	g/m^2.month	**0.6**	**0.5**	**2.5**	**0.6**	**2.3**	**0.5**	**1.1**	**0.8**	**4.3**	Two bottles incorrectly labelled as D9. One was supposed to be D7 and the other D9. Both of these samples were below the low trigger level.
2/11/2021	5/02/2022	Insoluble Solids	g/m^2.month	**1.8**	**2.2**	**4.6**	**2.6**	-	**1.4**	**4**	**3.8**	**5.9**	Dust Bottle T10 Missing. Response actions: - Reported internally - Dust monitoring program reviewed as part of Dust Consultants scope - Dust mitigation measures implemented following install of pipeline - increased dust supression. - Main access road sealed
5/02/2022	18/03/2022	Insoluble Solids	g/m^2.month	**0.8**	**0.7**	-	**2.4**	**18**	**1.1**	**3.6**	**3.7**	-	Dust bottles tampered with - D8 & D18 missing. Upon collection of the Dust bottles, Environment Team became aware that two dust bottles had been tampered with and were now missing. This was raised as an internal incident. Transect 10 is located on the adjacent to an exisiting histroical road within a vegetation exclusion zone. This road was used prior to the main access road being completed. This road was unsealed and as such significant amounts of dust was generated. As the vegetation in this area is on the roadside and the transects are in Environmental Exclusion Zones, saline water was not able to be used for dust supression. The fresh water pipeline was not constructed at this time which limited the avaliability of fresh water for dust supression activities. Groundwater at Mt Holland is classed as hypersaline. Response actions: Response actions: - Reported Internally - Dust monitoring program reviewed as part of Dust Consultants scope - Dust mitigation measures implemented following install of pipeline - increased dust supression. - Main access road sealed
18/03/2022	15/05/2022	Insoluble Solids	g/m^2.month	**1.1**	**1.5**	**1.8**	**5.1**	**15**	**2**	**13**	**8.6**	**23**	Transects 16 & 18 area located on the Main Access Road of the project. Prior to xxxx 2022 this road was unsealed and as such significant amounts of dust were generated. Transect 10 is located adjacent to an exisiting histroical road within a vegetation exclusion zone. This road was used prior to the main access road being completed. As the vegetation in these areas is on the roadside and the transects are in exclusion zones, saline water was not able to be used for dust supression. The fresh water pipeline was not constructed at this time which limited the avaliability of fresh water for dust supression activities. Groundwater at Mt Holland is classed as hypersaline. Response actions: - Reported Internally - Dust monitoring program reviewed as part of Dust Consultants scope - Dust mitigation measures implemented following install of pipeline - increased dust supression. - Main access road sealed
15/05/2022	10/07/2022	Insoluble Solids	g/m^2.month	**0.2**	**0.2**	**0.2**	**0.9**	**9.1**	**0.4**	**0.2**	**1.4**	**2.5**	Reported internally
10/07/2022	31/08/2022	Insoluble Solids	g/m^2.month	0.2	0.3	0.8	1.2	1.5	0.2	0.4	0.3	0.9	Compliant
31/08/2022	30/09/2022	Insoluble Solids	g/m^2.month	0.4	1.5	<0.1	1.1	1.2	0.7	0.8	0.3	0.4	Compliant

© JBS&G
This document is and shall remain the property of JBS&G. The document may only be used for the purposes for which it was commissioned and in accordance with the Terms of Engagement for the commission. Unauthorised use of this document in any form whatsoever is prohibited

Document Distribution

Rev No.	Copies	Recipient	Date
A	1 × Electronic	Anthea Pate	**01/10/2023**

Document Status

Rev No.	Author	Reviewer	Approved for Issue		
		Name	Name	Signature	Date
0	Ryan Tomkins	Stuart Hawkins	Andrew Winzer		01/10/2023

www.jbsg.com.au

JBS&G

Adelaide
Kaurna Country | 100 Hutt St,
Adelaide, SA 5000
T: 08 8431 7113

Brisbane
Turrbal/Yuggera Country | Level 37, 123
Eagle Street, Brisbane, QLD 4000
T: 07 3211 5350

Bunbury
Wardandi Noongar Country | 177
Spencer Street Bunbury, WA 6230
T: 08 9792 4797

Canberra
Ngunnawal Country | Level 1, The Realm
18 National Circuit Barton, ACT 2600
T: 02 6198 3278

Darwin
Larrakia Country | Suite G1, Level 1
48-50 Smith Street, Darwin NT 0800
T: 08 8943 0600

Hobart
Muwununa/Nuenon Country | Level 6,
111 Macquarie Street Hobart, TAS 7000
T: 03 6108 9054

Melbourne
Kulin Country | Level 5, 10 Queen
Street, Melbourne, VIC 3000
T: 03 9642 0599

Newcastle
Awabakal/Worimi Country | 61 / 63
Parry Street Newcastle West, NSW 2302
T: 02 8245 0300

Perth
Whadjuk Nyoongar Country | Allendale Square,
Level 9, 77 St Georges Terrace, WA 6000
T: 08 9380 3100

Sydney
Gadigal Country | Level 1, 50
Margaret Street, Sydney, NSW 2000
T: 02 8245 0300

Wollongong
Dharawal Country | Suite 1A, 280 - 286
Keira Street, Wollongong, NSW 2500
T: 02 4225 2647