

# Mernda Rail Extension Project

Matted Flax-lily Annual Summary Report, April 2021 - April 2022

12-Aug-2022

# Mernda Rail Extension Project

Matted Flax-lily Annual Summary Report, April 2021 - April 2022

Client: Department of Transport

ABN: 69981208782

Prepared by

**AECOM Australia Pty Ltd**

Level 10, Tower Two, 727 Collins Street, Melbourne VIC 3008, Australia

T +61 3 9653 1234 F +61 3 9654 7117 www.aecom.com

ABN 20 093 846 925

12-Aug-2022

Job No.: 60637387

AECOM in Australia and New Zealand is certified to ISO9001, ISO14001 and ISO45001.

© AECOM Australia Pty Ltd (AECOM). All rights reserved.

AECOM has prepared this document for the sole use of the Client and for a specific purpose, each as expressly stated in the document. No other party should rely on this document without the prior written consent of AECOM. AECOM undertakes no duty, nor accepts any responsibility, to any third party who may rely upon or use this document. This document has been prepared based on the Client's description of its requirements and AECOM's experience, having regard to assumptions that AECOM can reasonably be expected to make in accordance with sound professional principles. AECOM may also have relied upon information provided by the Client and other third parties to prepare this document, some of which may not have been verified. Subject to the above conditions, this document may be transmitted, reproduced or disseminated only in its entirety.

## Quality Information

Document Mernda Rail Extension Project


Ref 60637387

Date 12-Aug-2022

Prepared by Jasmine Bettiol

Reviewed by Dan Haysom

### Revision History

Rev	Revision Date	Details	Authorised	
			Name/Position	Signature
1	26-July-2022	Draft	Dan Haysom Principal Environmental Planner	
0	12-Aug-2022	Final	Dan Haysom Principal Environmental Planner	

## Table of Contents

Executive Summary		v
1.0	Introduction	1
	1.1 Purpose and scope of this report	1
	1.2 Assumptions and limitations	1
	1.3 Site background	1
	1.4 Method	2
2.0	Results	3
	2.1 Summary	3
	2.2 Nursery conditions	3
	2.3 Site conditions potential threats and management issues	3
	2.3.1 Quarry Hills Park	3
	2.3.2 Plenty Gorge Parklands	4
	2.4 Survivorship and growth of plants	1
	2.4.1 Total population count	1
	2.4.2 Annual growth and condition monitoring	2
	2.5 Assessment against performance benchmarks	4
	2.6 Rainfall and watering data	4
	2.7 Quarterly photo monitoring	5
3.0	Conclusion	13
4.0	Next steps	13
5.0	References	13
Appendix A		
	Figures	A
Appendix B		
	Raw field data sheets	B
Appendix C		
	Nursery Audit	D



## Executive Summary

This report documents the results of monitoring the implementation of management actions and condition of the translocated Matted Flax-lily (MFL) populations for the reporting period 4 April 2021 to 3 April 2022.

During the reporting period, three monitoring events were conducted in April 2021, July 2021, and January 2022. Monitoring activities included growth and condition quadrat monitoring, population counts at each recipient site, photo point monitoring, and general site assessments noting threats, management issues, corrective actions, and a nursery audit.

Total survivorship across both recipient sites was 494 (out of a total of 500 translocated plants), representing a 98.8% survivorship. This meets to the performance management benchmark set for the end of the third year after translocation was > 85% survivorship (minimum 412 plants).

Monitoring results and plant survivorship suggests that both populations are healthy and well managed.

## 1.0 Introduction

AECOM was initially engaged by the Level Crossing Removal Project (LXRP) to conduct monitoring and prepare an Annual Summary Report detailing the translocation, nursery, and monitoring operations of Matted Flax-lily (MFL) *Dianella amoena* as part of the Mernda Rail Extension Project (the Project). Since October 2020, the Project has formally transferred from LXRP to the Department of Transport (DoT).

The MFL were translocated to two recipient sites, Quarry Hills Park and Plenty Gorge Parklands, as a condition of approval no. 2016/7674 under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) for the Mernda Rail Extension Project. This Annual Summary Report is a requirement of the Matted Flax-lily Translocation Plan required as part of approval no. 2016/7674 (AECOM-GHD 2020a – Revision 9).

### 1.1 Purpose and scope of this report

The report documents the results of the implementation of management and monitoring actions undertaken in relation to the translocated MFL, and the condition of those populations for the period of 4 April 2021 to 3 April 2022. The scope of the report includes:

- Information on conditions at both the recipient sites and the nursery
- Discussion of the survivorship and growth of the plants
- An assessment of the status of the translocation program relative to the established performance benchmarks
- Discussion of occurring or potential threats or management issues and any maintenance or corrective actions taken or proposed
- Rainfall and watering data
- Monitoring forms for each monitoring event
- Quarterly/biannual or yearly photos taken from each established photo point.

### 1.2 Assumptions and limitations

The following assumptions and limitations apply to the operations outlined in this report:

- It is assumed from conversations with ABZECO (nursery managers) that 250 individuals were translocated into each recipient site in July/August 2019.
- The locations of MFL provided in Appendix A have accuracies of sub-1m (Quarry Hills Park) and <5m (Plenty Gorge Parklands) respectively. Quarry Hills Park required the use of a sub-1m DGPS unit due to the random nature of planting and to allow the monitoring team to re-locate any MFL that had potentially been missed. The <5m accuracy at Plenty Gorge Parklands was suitable as they are planted in clear clusters, making them easy to re-locate.

### 1.3 Site background

This section provides a brief summary of salvage, nursery and translocation operations to date. More information is provided in the Salvage, Translocation and Monitoring Report (AECOM-GHD JV 2020b) in Appendix C (MFL 2021 Nursery Audit):

- MFLs were salvaged from within the construction footprint of the Mernda Rail Extension Project with the majority of the salvage occurring between 4 and 6 April 2017, with further salvage required on 18 April 2017. The total number of salvaged plants was 121.
- During nursery operations, excess salvaged MFL material of mixed progeny was potted and cloned, resulting in a total number of 125 individual MFL (ABZECO 2020). Each plant was cloned six times, resulting in 750 plants (AECOM-GHD JV 2019). Nursery audits have been

conducted by qualified botanists in May 2017, October 2018, April 2019, April 2020 and June 2021. Further details of the 2021 audit are provided in Section 2.1 and Appendix C

- Translocation to the two recipient sites, Quarry Hills Park and Plenty Gorge Parklands, were carried out on 23 July 2019 and 30 July 2019 respectively. 250 MFL were translocated at each recipient site (500 pots in total).

## 1.4 Method

Monitoring activities followed the method set out in Section 7.4 of the Translocation Plan (AECOM-GHD JV 2020a - Revision 9). City of Whittlesea (Sophie Barker pers. comm., 2020/2021) provided information regarding management actions undertaken for both recipient sites for the reporting period.

### Monitoring schedule

During the reporting period, 4 April 2021 to 3 April 2022, three monitoring events were conducted as per the modified monitoring timeline set out in the Translocation Plan (AECOM-GHD JV, 2020a - Revision 9), and these are listed below. Raw monitoring sheets are provided in Appendix B.

- 9 April 2021
- 9 July 2021
- 11 January 2022

### Monitoring methodology

Monitoring activities followed the method set out in Section 7.4 of the Translocation Plan (AECOM-GHD JV 2020a – Revision 9). Additional notes around methodology used for the growth and condition monitoring quadrats and total population counts are provided below.

### Annual growth and condition monitoring quadrats

For the growth and condition monitoring quadrats, the following parameters were used, and modifications made to the original monitoring sheet provided in the Translocation Plan (AECOM-GHD JV 2020a – Revision 9). These are noted for consistency between future annual monitoring events:

- All measurements were taken in mm
- 'No. shoots' was removed and replaced by 'No. leaves/shoots' with a range where: 1 = 0 - <5 shoots; 2 = 5 – 10 shoots; 3 = >10 shoots
- 'Buds' were removed as it was felt that it overlapped with 'Flowering (1 - 3)'

All other parameters remain the same.

During the January 2022 quadrat monitoring, it was noted that due to the MFL at Plenty Gorge Parklands being planted in close clusters of approximately six plants, the plants over time had begun to spread and mat together, particularly Quadrat 2 (Cluster 9). Matted Flax-lily is a mat-forming perennial lily that typically forms loose clumps up to 5 m wide (Carter, 2010). The observation at Plenty Gorge Parklands reflects the natural growth habitat of the species. This made it difficult and sometimes impossible to differentiate individual plants, as is required by the assessment method. Due to this, the assessment method had to be adjusted and the extent of the mat within the quadrat has been considered rather than individual plants. This method is currently applied at Quadrat 2 (Cluster 9) and will be applied to other quadrats in the future where necessary.

### Total population count

Several measures were taken to improve the chances of re-locating MFL at each site including:

- Placing wooden stakes next to MFL that did not have one
- Using marker spray paint to mark the individual stake of each MFL to indicate which MFL had been counted
- The use of a DGPS with sub 1 m accuracy at Quarry Hills Park to mark the locations of each MFL

- Carrying paper maps with MFL locations marked in the field.

The DGPS was required at Quarry Hills Park due to the random nature of planting and allowed for individual plants to be found if they had been missed. During the total population count, each plant was marked as either 'Alive', 'Stressed', or 'Dead'.

## 2.0 Results

### 2.1 Summary

Monitoring of the translocated MFL identified a survival rate of 98.8% (494 of 500) across both sites indicating that the plants are healthy and well managed. No replacement planting is required.

This section summarises the results of the monitoring during the reporting period. Raw field data sheets are provided in Appendix B.

### 2.2 Nursery conditions

During the reporting period one nursery audit was undertaken by qualified AECOM botanists at the ABZECO nursery in Research, Victoria.

The audit, undertaken on the 3 June 2021, found that all criteria within the translocation plan were being met and that the MFL were observed to be in a healthy condition and well managed. Specifically, the audit identified that:

- 250 pots of live, healthy MFL representing the required number of clones were observed.
- Individuals were clearly labelled and potted in appropriate pots and potting medium, and
- No diseased individuals were observed.

The full audit report for 2021 is provided in Appendix C.

### 2.3 Site conditions potential threats and management issues

#### 2.3.1 Quarry Hills Park

The translocation area totals 0.42 ha and is fenced by a chain wire mesh exclusion fence with horizontal skirt at base to exclude kangaroos, hares, and rabbits. Monitoring has re-located 245 individuals planted in a rough, unevenly spaced, grid-like pattern; however, it is assumed 250 individuals in total were planted (Section 1.2). During the January 2021 monitoring event, one MFL was not able to be located and was assumed to be dead. Locations of monitoring quadrats and photo monitoring points are provided in Figure 1 Appendix A.

The site is in good condition and is well managed, with relatively minor management issues identified during the course of the monitoring including:

- Discrete instances where Sweet Vernal-grass *Anthoxanthum odoratum* was noted to be smothering some MFL, but this has subsequently been well managed.
- As the MFL grow and spread, some ID tags have been hard to find but the use of maps and previously recorded spatial location data has ensured all MFL can still be located.

A summary of management actions required by the Translocation Plan (Rev 9), excluding watering, have been included in Table 1. Management actions, such as weed control is undertaken by a contractor engaged by City of Whittlesea.

**Table 1 Management actions undertaken at Quarry Hills Park**

Date	Management action	Notes
April 2021	Weed control – Brush cutting, Knapsack spraying, hand weeding	Weed control undertaken at Quarry Hills Park

Date	Management action	Notes
May – June 2021	Weed control – Brush cutting, spot-spraying, hand weeding.  Biomass control	Targeted weed control of perennial grasses, herbaceous weeds and woody weeds. Biomass control through hand weeding to minimise competition around each MFL and selective spot-spraying (not within 30 cm of each MFL plant).
July – December 2021	Weed control – Brush cutting, hand weeding, Knapsack spraying.  Additional native species planting.  Biomass control	Targeted weed control of perennial grasses such as Sweet Vernal-grass, Bentgrass <i>Agrostis</i> sp. and Yorkshire fog <i>Holcus lanatus</i> .  Brush cutting River Red-gum sapling regeneration  Ongoing maintenance of the locally indigenous ground cover plants which have been planted at the site to help revegetate and assist in weed suppression, in accordance with the translocation plan.  Biomass control via brush cutting  Fence repair as required  Purchase of Kangaroo Grass <i>Themeda triandra</i> tubestock. Planted in areas to complement existing Kangaroo Grass and to out compete exotic perennial grasses.
January 2022	Weed control – Brush cutting, Knapsack spraying.	Weed control undertaken at Quarry Hills Park
March 2022	Weed control – Knapsack spraying.	Weed control undertaken at Quarry Hills Park

In previous years the key issues impacting the Quarry Hills Park recipient site, was dryness impacting a small number of plants in the eastern portion of the site, and grassy and shrubby weeds smothering MFL. Dryness continues to be noted within the eastern portion of the site, but this is considered to be a natural response to changes in the seasons. Weeds have been well managed in the last year and smothering of planted by exotic weeds was no longer identified to be an issue, resulting in a high survivorship at the site (Section 0).

### 2.3.2 Plenty Gorge Parklands

The translocation area totals 0.42 ha and is fenced by a chain wire mesh exclusion fence with horizontal skirt at base to exclude kangaroos, hares and rabbits. Monitoring has re-located 249 individuals planted in 43 clusters consisting of between four and seven plants; however, it is assumed 250 individuals in total were planted (Section 1.2).

The site is in good condition and is well managed with relatively minor management issues. The main change to the site is the removal of the green shade cloth as it continues to rip and was deemed not effective in excluding weeds seeds.

A summary of management actions (excluding watering) undertaken during the monitoring period have been included in Table 2.

Table 2 Management actions undertaken at Plenty Gorge Parklands

Date	Management action	Note
April 2021	Weed control – Brush cutting, knapsack spraying, hand weeding	Fortnightly maintenance undertaken including hand weeding around MFL, brush cutting River Red-gum sapling regeneration and other exotic growth, knapsack spot-spraying of broadleaf weeds and exotic grasses with selective herbicides.
May – June 2021	Weed control – Hand weeding, knapsack spraying, brush cutting	Weed control including hand weeding, brush cutting and selective spot-spraying (not within 30cm of each MFL plant).  General weed control across the entire site for direct seeding  Intensive weed control around fence perimeter to provide a weed free buffer
July – December 2021	Weed control – Hand weeding, knapsack spraying, brush cutting	Weed control including hand weeding, brush cutting and selective spot-spraying (not within 30cm of each MFL plant). Weeding had a focus on controlling Chilean Needle Grass <i>Nassella neesiana</i> and preventing seed drop.  Ongoing maintenance of the locally indigenous ground cover plants which have been planted at the site to help revegetate and assist in weed suppression, in accordance with the translocation plan.  Biomass control via brush cutting  Fence repair as required  Intensive weed control around fence perimeter to provide a weed free buffer  Planting using hand tools.  Direct seeding (using hand casting) of areas where appropriate (in between Matted Flex-lily and embellishment plantings), lightly cultivating soil whilst following Parks Victoria Cultural heritage contingency plan.
January – April 2022	Weed control – Hand weeding, knapsack spraying, brush cutting  Fencing works  Pest animal management	Rabbit monitoring and baiting due to evidence of rabbit activity Weed control including hand weeding, brush cutting and selective spot-spraying (not within 30cm of each MFL plant). Weeding had a focus on controlling Chilean Needle Grass <i>Nassella neesiana</i> and high threat broadleaf weeds.  Brush cutting River Red-gum sapling regeneration

Date	Management action	Note
		<p>Supply and install of local provenance species seed for direct seeded areas already prepared</p> <p>Supply and install of 500 local provenance tubestock, as per species list in Translocation Plan Rev. 9</p> <p>Weed control around fence perimeter to maintain a weed buffer</p> <p>Track maintained to provide safe access, and to reduce the spread of weeds and the risk of wildfire</p>

The key issue impacting the Plenty Gorge Parklands recipient site, identified above, are grassy and broadleaf weeds. Management has generally been well targeted to address these issues and has resulted in a high survivorship at the site (Section 0).

## 2.4 Survivorship and growth of plants

### 2.4.1 Total population count

Total population counts were undertaken three times during the reporting period in April 2021, July 2021 and January 2022. Individual plants were recorded as either 'Alive', 'Stressed' or 'Dead'. In each monitoring event:

- At Quarry Hills Park, 245 plants were re-located and alive, 5 plants were not re-located and considered dead, and approximately 4 to 5 plants were stressed during each monitoring event.
- At Plenty Gorge Parklands, 249 plants were re-located and alive, 1 plant was not re-located and considered dead, and between 0 and 25 plants were stressed during each monitoring event. The higher number of plants considered stressed during the January 2022 monitoring event is not unusual given the hot and dry conditions over the summer period. Subsequent visits to Plenty Gorge Parklands have noted the plants are in good condition following milder conditions.

Table 3 Summary of total population count data at both sites.

Population health (%)	Monitoring Event								
	April 2020	May 2020	June 2020	July 2020	November 2020	January 2021	April 2021	July 2021	January 2022
<b>Quarry Hills Park</b>									
<b>Alive</b>	98.4% ( <i>n</i> = 246)	98.4% ( <i>n</i> = 246)	98.4% ( <i>n</i> = 246)	98.4% ( <i>n</i> = 246)	98.4% ( <i>n</i> = 246)	98.4% ( <i>n</i> = 246)	98.4% ( <i>n</i> = 246)	98.4% ( <i>n</i> = 246)	98.0% ( <i>n</i> = 245)
<b>Alive, but stressed</b>	0.81% ( <i>n</i> = 2)	1.63% ( <i>n</i> = 4)	0.41% ( <i>n</i> = 1)	0.0% ( <i>n</i> = 0)	1.63% ( <i>n</i> = 4)	2.03% ( <i>n</i> = 5)	2.03% ( <i>n</i> = 5)	1.63% ( <i>n</i> = 4)	2.03% ( <i>n</i> = 5)
<b>Dead</b>	1.6% ( <i>n</i> = 4)	1.6% ( <i>n</i> = 4)	1.6% ( <i>n</i> = 4)	1.6% ( <i>n</i> = 4)	1.6% ( <i>n</i> = 4)	1.6% ( <i>n</i> = 4)	1.6% ( <i>n</i> = 4)	1.6% ( <i>n</i> = 4)	2.0% ( <i>n</i> = 5)
<b>Plenty Gorge Parklands</b>									
<b>Alive</b>	99.6% ( <i>n</i> = 249)	99.6% ( <i>n</i> = 249)	99.6% ( <i>n</i> = 249)	99.6% ( <i>n</i> = 249)	99.6% ( <i>n</i> = 249)	99.6% ( <i>n</i> = 249)	99.6% ( <i>n</i> = 249)	99.6% ( <i>n</i> = 249)	99.6% ( <i>n</i> = 249)
<b>Alive, but stressed</b>	0.00% ( <i>n</i> = 0)	0.00% ( <i>n</i> = 0)	0.40% ( <i>n</i> = 1)	0.0% ( <i>n</i> = 0)	0.00% ( <i>n</i> = 0)	0.40% ( <i>n</i> = 1)	0.40% ( <i>n</i> = 1)	0.80% ( <i>n</i> = 2)	10.04% ( <i>n</i> = 25)
<b>Dead</b>	0.4% ( <i>n</i> = 1)	0.4% ( <i>n</i> = 1)	0.4% ( <i>n</i> = 1)	0.4% ( <i>n</i> = 1)	0.4% ( <i>n</i> = 1)	0.4% ( <i>n</i> = 1)	0.4% ( <i>n</i> = 1)	0.4% ( <i>n</i> = 1)	0.4% ( <i>n</i> = 1)



## 2.4.2 Annual growth and condition monitoring

Annual quadrat monitoring for growth and condition was undertaken once during the reporting period in January 2022, as per the requirements of Section 7.4 of the Translocation Plan (AECOM-GHD JV 2020a – Revision 9).

A summary of average annual growth and condition data for the quadrats at each site is provided in Table 4 and raw data is provided in Appendix B.

The next annual quadrat monitoring event is due to occur in January 2023.

**Table 4 Summary of average annual growth and condition monitoring at both sites.**

Quadrat no.	Cover abundance (%)	Plant basal diameter (mm)	Max Leaf Length (mm) - height	No. leaves/shoots	Flowering?	Height (mm)	Number of flowers per plant	Number of fruits per plant	Herbivory	Water Stress	Weed encroachment / competition
<b>Quarry Hills Park</b>											
<b>Year 1 (2019-2020)</b>											
Quadrat 1	20	810	392	10+	Yes	650	5-10	5-10	No	Yes	No
Quadrat 2	14	670	393	10+	Yes	607	10+	10+	No	Yes	No
Quadrat 3	15	700	383	10+	Yes	708	10+	5-10	No	No	No
Quadrat 4	2	410	290	0 - <5	Yes	583	0 - <5	0 - <5	No	Yes	No
<b>Year 2 (2020-2021)</b>											
Quadrat 1	23	973	507	10+	No	1013	5-10	5-10	No	No	No
Quadrat 2	17	797	353	10+	No	690	10+	10+	No	No	No
Quadrat 3	20	1085	498	10+	No	693	5-10	10+	No	No	Yes
Quadrat 4	2	585	240	5-10	No	690	5-10	0 - <5	No	Yes	No
<b>Year 3 (2021-2022)</b>											
Quadrat 1	22	1113	346	10+	No	810	10+	10+	No	No	No
Quadrat 2	10	799	296	10+	No	531	5-10	5-10	No	No	No
Quadrat 3	19	875	324	10+	No	535	5-10	5-10	No	No	No
Quadrat 4	2	485	235	10+	No	675	0 - <5	0 - <5	No	Yes	No
<b>Plenty Gorge Parkland</b>											

Quadrat no.	Cover abundance (%)	Plant basal diameter (mm)	Max Leaf Length (mm) - height	No. leaves/shoots	Flowering?	Height (mm)	Number of flowers per plant	Number of fruits per plant	Herbivory	Water Stress	Weed encroachment / competition
<b>Quarry Hills Park</b>											
<b>Year 1 (2019-2020)</b>											
Quadrat 1	19	739	370	10+	Yes	476	10+	10+	No	No	No
Quadrat 2	17	803	358.4	10+	Yes	627	10+	5-10	No	Yes	No
Quadrat 3	12	484	331	10+	Yes	606	5-10	5-10	No	Yes	No
Quadrat 4	12	510	321	5-10	Yes	586	5-10	0 - <5	No	Yes	No
<b>Year 2 (2020-2021)</b>											
Quadrat 1	28	958	512	10+	No	873	10+	5-10	No	No	No
Quadrat 2	29	1206	590	10+	No	922	10+	5-10	No	No	No
Quadrat 3	18	1073	468	10+	No	867	10+	5-10	No	No	No
Quadrat 4	18	933	468	10+	No	942	0 - <5	0 - <5	No	No	No
<b>Year 2 (2021-2022)</b>											
Quadrat 1	25	863	388	10+	No	837	5-10	0 - <5	No	No	No
Quadrat 2*	100	2205	551	10+	No	1115	10+	10+	No	No	No
Quadrat 3	23	1023	416	10+	No	787	0 - <5	5-10	No	No	No
Quadrat 4	13	715	352	10+	No	815	5-10	0 - <5	No	No	No

\*During the January 2022 quadrat monitoring, it was noted that due to the MFL at Plenty Gorge Parklands being planted in close clusters of approximately six plants, the plants over time had begun to spread and mat together, particularly Quadrat 2 (Cluster 9). Matted Flax-lily typically forms loose clumps up to 5 m wide which was observed at Plenty Gorge Parklands and reflects the natural growth habitat of the species. This made it difficult and sometimes impossible to differentiate individual plants, as per the assessment method. Due to this, the assessment method had to be adjusted and the extent of the mat within the quadrat has been considered rather than individual plants. This method is currently applied at Quadrat 2 (Cluster 9) and will be applied to other quadrats in the future where necessary.

## 2.5 Assessment against performance benchmarks

Across both sites, 98.8% (or 494 of 500) of translocated MFLs are surviving, with:

- 245 at Quarry Hills Park; and
- 249 at Plenty Gorge Parklands.

These survival rates meet a performance standard of 85% (or 412 of 500), as defined in Section 7.2 of the Translocation Plan (AECOM-GHD JV 2020a – Revision 9).

Therefore, no replanting is required, and the project will continue to monitor the survivorship of MFL at both sites against the benchmark criteria.

## 2.6 Rainfall and watering data

Suggested watering frequency from the Translocation Plan (AECOM-GHD JV 2020a – Revision 9) was based around the time between 'significant rainfall events', i.e. where  $\geq 20$  mm of rainfall was received within a 24-hour period. Rainfall data was collected from Yan Yean weather station, located approximately 4.5km from the recipient sites. Dates where rainfall was  $\geq 20$  mm include:

- 10<sup>th</sup> June 2021
- 4<sup>th</sup> September 2021
- 5<sup>th</sup> September 2021
- 16<sup>th</sup> October 2021
- 4<sup>th</sup> November 2021
- 13<sup>th</sup> November 2021
- 27<sup>th</sup> January 2022
- 28<sup>th</sup> January 2022
- 5<sup>th</sup> March 2022

Table 5 summarises the watering requirements for the translocated MFL outlined in Section 5.1 of the Translocation Plan (AECOM-GHD JV 2020a – Revision 9), dates of watering events carried out for each site, and any additional notes.

**Table 5 Watering log for Quarry Hills Park and Plenty Gorge Parklands**

Watering Date	Months after translocation / period between significant rainfall events that will trigger watering	Actual watering frequency
April – June 2021	1-2 months	Supplementary watering was not required during these months.
8 September 2021	1-2 months	3 months
13 December 2021	1-2 months	3 months
10/11 January 2022	1-2 months	1 month
19 January 2022	1-2 months	1 week
7 February 2022	1-2 months	3 weeks
16 February 2022	1-2 months	1 week
21/22 February 2022	1-2 months	1 week
4 March 2022	1-2 months	2 weeks

Watering Date	Months after translocation / period between significant rainfall events that will trigger watering	Actual watering frequency
30 March 2022	1-2 months	1 month

## 2.7 Quarterly photo monitoring

During the reporting period, monitoring photos at both sites were taken in April 2021, July 2021 and January 2022. These photos are provided in Plates 1 to 27, and locations of the photo monitoring points are provided in Appendix A.





**Plate 1 Quarry Hills Park Photo Monitoring Point 1 – April 2021**



**Plate 2 Quarry Hills Park Photo Monitoring Point 1 - July 2021**



**Plate 3 Quarry Hills Park Photo Monitoring Point 1 – January 2022**



**Plate 4 Quarry Hills Park Photo Monitoring Point 2 – April 2021**





**Plate 5 Quarry Hills Park Photo Monitoring Point 2 – July 2021**



**Plate 6 Quarry Hills Park Photo Monitoring Point 2 – January 2022**



**Plate 7 Quarry Hills Park Photo Monitoring Point 3 – April 2021**



**Plate 8 Quarry Hills Park Photo Monitoring Point 3 – July 2021**





**Plate 9 Quarry Hills Park Photo Monitoring Point 3 – January 2022**



**Plate 10 Quarry Hills Park Photo Monitoring Point 4 – April 2021**



**Plate 11 Quarry Hills Park Photo Monitoring Point 4 – July 2021**



**Plate 12 Quarry Hills Park Photo Monitoring Point 4 – January 2022**





Plate 13 Plenty Gorge Parklands Photo Monitoring Point 1 – April 2021



Plate 14 Plenty Gorge Parklands Photo Monitoring Point 1 – July 2021



Plate 15 Plenty Gorge Parklands Photo Monitoring Point 1 – January 2022



Plate 16 Plenty Gorge Parklands Photo Monitoring Point 2 – April 2021





Plate 17 Plenty Gorge Parklands Photo Monitoring Point 2 – July 2021



Plate 18 Plenty Gorge Parklands Photo Monitoring Point 2 – January 2022



Plate 19 Plenty Gorge Parklands Photo Monitoring Point 3 – April 2021



Plate 20 Plenty Gorge Parklands Photo Monitoring Point 3 – July 2021





Plate 21 Plenty Gorge Parklands Photo Monitoring Point 3 – January 2022



Plate 22 Plenty Gorge Parklands Photo Monitoring Point 4 – April 2021



Plate 23 Plenty Gorge Parklands Photo Monitoring Point 4 – July 2021



Plate 24 Plenty Gorge Parklands Photo Monitoring Point 4 – January 2022





**Plate 25 Plenty Gorge Parklands Photo Monitoring Point 5 – April 2022**



**Plate 26 Plenty Gorge Parklands Photo Monitoring Point 5 – July 2021**



**Plate 27 Plenty Gorge Parklands Photo Monitoring Point 5 – January 2022**

### 3.0 Conclusion

The survival rates of translocated MFLs at 98.8% (or 494 of 500) meet the performance standard of 85% (or 412 of 500), as defined in Section 7.2 of the Translocation Plan (AECOM-GHD JV 2020a – Revision 9). Therefore, no additional replanting is required.

### 4.0 Next steps

Monitoring continues as per the schedule in Sections 6.1.3 and 6.2.3 of the Translocation Plan (AECOM-GHD JV 2020a – Revision 9).

The next Annual Monitoring Report will document results for monitoring events undertaken between 4 April 2022 and 3 April 2023.

### 5.0 References

AECOM-GHD JV. 2019. Matted Flax Lily Nursery Audit. Memo prepared for the Level Crossing Removal Project, April 2020.

AECOM-GHD JV. 2020a. Mernda Rail Extension Project: EPBC 2016/7674 Matted Flax-lily Translocation Plan Rev 9. Report prepared for the Level Crossing Removal Project, May 2020.

AECOM-GHD JV. 2020b. Salvage, Propagation and Translocation Summary Report - Matted Flax-lily. Report prepared for the Level Crossing Removal Project, March 2020.

Bureau of Meteorology 2022. Yan Yean Weather Station – Daily Rainfall. Australian Government Bureau of Meteorology. Accessed 20/07/2022. <http://www.bom.gov.au/climate/data/stations/>.

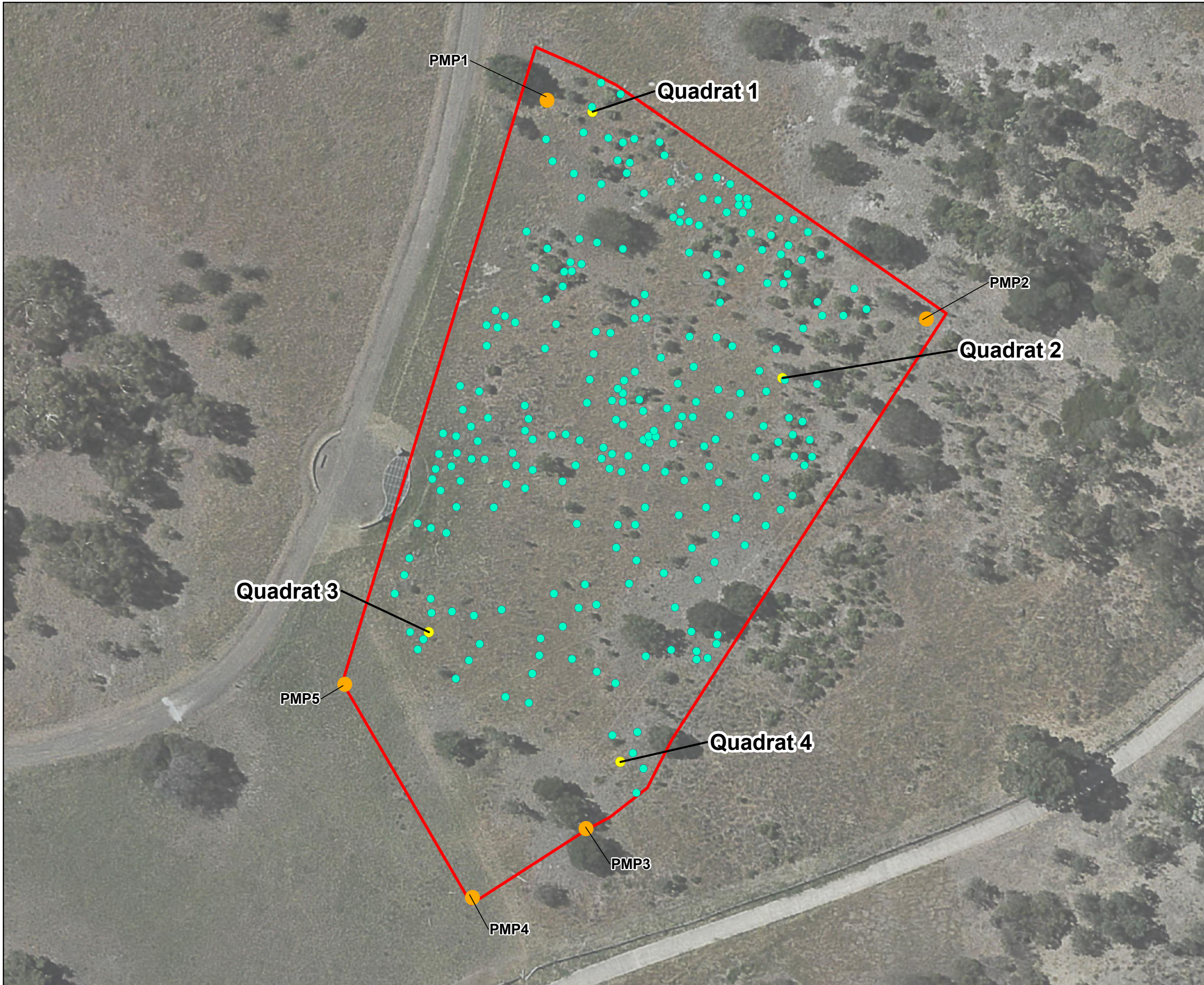
Carter. 2010. National Recovery Plan for Matted Flax-lily *Dianella amoena*. Department of Sustainability and Environment, Melbourne

EP. 2010. Translocation and Management Plan for Matted Flax-lily *Dianella amoena*, South Morang Rail Extension, South Morang, Victoria. Prepared for Department of Transportation, February 2010.

# Appendix A

Figures



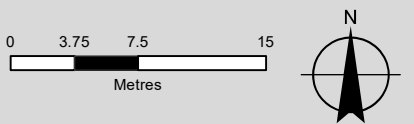


**Legend**

- MFL
- Monitoring Quadrat
- Photo Monitoring Points
- Recipient Site

**Quarry Hills Park  
Recipient Site**

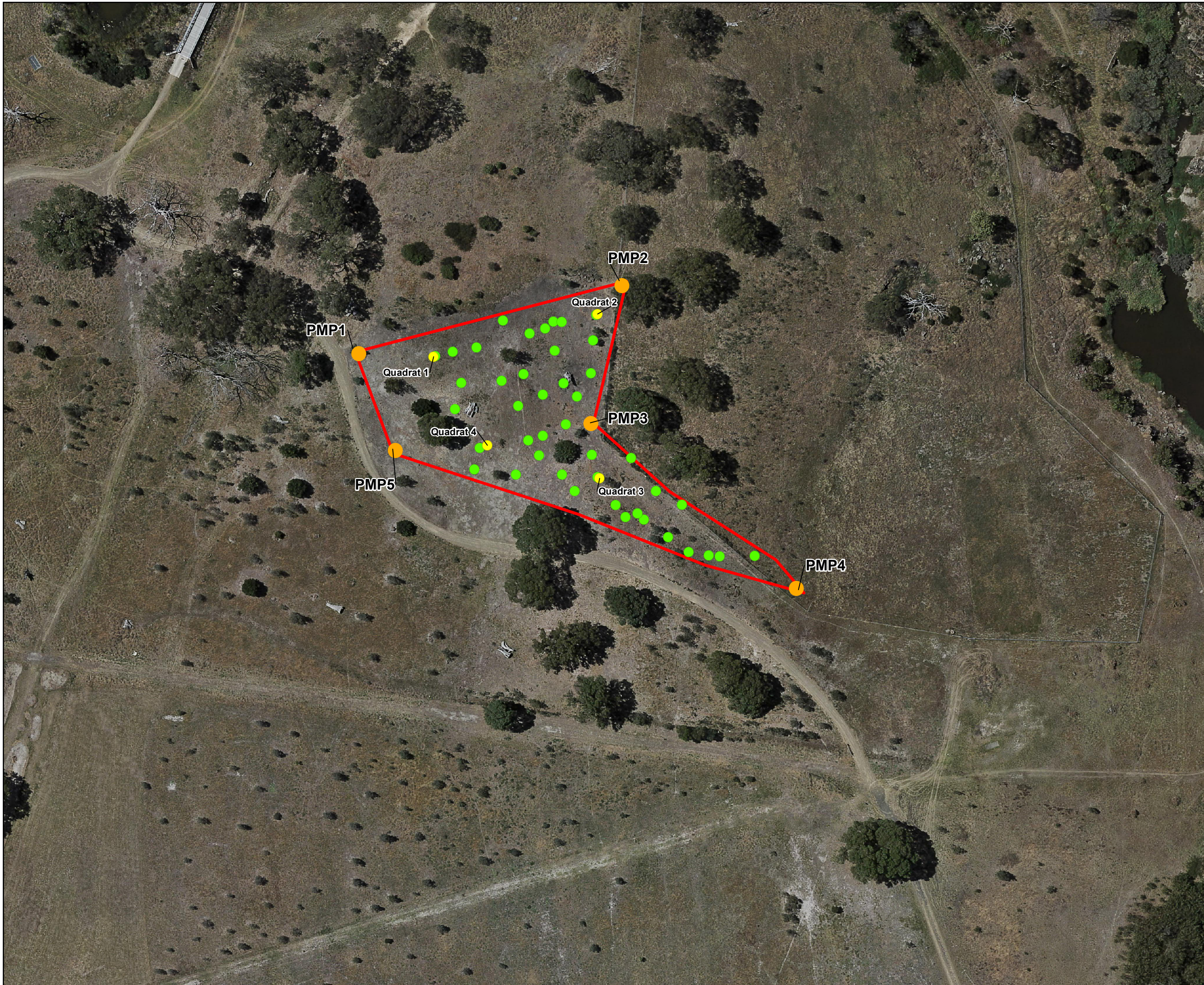
Figure 1



Paper Size A3  
 Map Projection: Transverse Mercator  
 Horizontal Datum: GDA 1994  
 Grid: GDA 1994 MGA Zone 55

Conditions of Use. This document may only be used by the client of the AECOM and GHD Joint Venture (JV) (and any other person who the JV has agreed can use this document) for the purpose for which it was prepared and must not be used by any other person or for any other purpose.

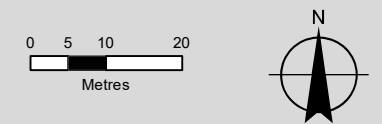




- Legend**
- Monitoring Quadrat
  - Matted Flax-lily Cluster
  - Photo Monitoring Points
  - Recipient Site

Plenty Gorge Parklands  
Recipient Site

Figure 2



Paper Size A3  
Map Projection: Transverse Mercator  
Horizontal Datum: GDA 1994  
Grid: GDA 1994 MGA Zone 55

Conditions of Use. This document may only be used by the client of the AECOM and GHD Joint Venture (JV) (and any other person who the JV has agreed can use this document) for the purpose for which it was prepared and must not be used by any other person or for any other purpose.



# Appendix B

Raw field data sheets



Quarry Hills Park: Population Total Count

Date: 9/4/21

Plant ID	Live/Dead	Notes	Plant ID	Live/Dead	Notes
001-001	L	very small	029-002	L	
001-002	L		030-001	L	
002-001	L	small	030-002	L	
002-002	L		031-001	L	
003-001	L		031-002	L	
003-002	L		032-001	L	
004-001	L		032-002	L	
004-002	L		033-001	L	
005-001	L		033-002	L	
005-002	L		034-001	L	
006-001	L		034-002	L	
006-002	L		035-001	L	
007-001	L	very small	035-002	L	
007-002	L		036-001	L	
008-001	L		036-002	L	
008-002	L		037-001	L	
009-001	L		037-002	L	
009-002	L		038-001	L	
010-002	L		038-002	L	
010-003	L		039-001	L	Very small, water stressed
011-001	L		039-002	L	Very small, water stressed
011-002	L		040-001	L	
012-001	L		040-002	L	
012-002	L		041-001	L	
013-001	L		041-002	L	
013-002	L		042-001	L	
014-001	L		042-002	L	
014-002	L		043-001	L	
015-001	L		043-002	L	
015-002	L		044-001	L	
016-001	L		044-002	L	
016-002	L		045-001	L	
017-001	L		045-002	L	
017-002	L		046-001	L	
018-001	L		046-002	L	
018-002	L		047-001	L	
019-001	L		047-002	L	
019-002	L		048-001	L	
020-001	L		048-002	L	
020-002	L		049-001	L	
021-001	L		049-002	L	
021-002	L	Very water stressed.	050-001	L	
022-001	L		050-002	L	
022-002	L		051-001	L	
023-001	L		051-002	L	
023-002	L	Very water stressed	052-001	L	
024-001	L		052-002	L	
024-002	L		053-001	L	
025-001	L		053-002	L	
025-002	L		054-001	L	
026-001	L		054-002	L	
026-002	L		055-001	L	
027-001	L		055-002	L	
027-002	L		056-001	L	
028-001	L		056-002	L	small
028-002	L		057-001	L	

\*  
4

4

46

Plant ID	Live/Dead	Notes	Plant ID	Live/Dead	Notes
057-002	L		087-002	L	small
058-001	L		088-001	L	
058-002	L		088-002	L	
059-001	L		089-001	L	
059-002	L	Small	089-002	L	
060-001	L		090-001*	L	
060-002	L		090-002	L	
061-001	L		091-001	L	
061-002	L		091-002	L	
062-001	L		092-001	L	
062-002	L		092-002	L	
063-001	L		093-001	L	
063-002	L		093-002	L	
064-001	L		094-001	L	
064-002	L		094-002	L	
065-001	L		095-001	L	
065-002	L		095-002	L	
066-001	L		096-001	L	
066-002	L		096-002	L	
067-001	L		097-001	L	
067-002	L		097-002	L	
068-001	L		098-001	L	
068-002	L		098-002	L	
069-001	L		099-001	L	
069-002	L		099-002	L	small
070-001	L		100-001	L	
070-002	L		100-002	L	
071-001	L		101-001	L	Check for burrowing
071-002	L		101-002	L	Small Very wet Stressed
072-002	L		102-001	L	
073-001	L		102-002	L	
073-003	L		103-001	L	
074-001	L		103-002	L	
074-002	L		104-001	L	
075-001	L		104-002	L	
075-002	L		105-001	L	
076-002	L		105-002	L	
076-003	L		106-001	L	
077-001	L		106-002	L	
077-002	L		107-001	L	
078-001	L		107-002	L	
078-002	L		108-001	L	
079-001	L		108-002	L	
079-002	L		109-001	L	
080-001	L		109-002	L	
080-002	L		110-001	L	
081-001	L		110-002	L	
081-002	L		111-001	L	
082-001	L		111-002	L	
082-002	L		112-001	L	
083-001	L		112-003	L	
083-002	L		113-001	L	
084-001	L		113-002	L	
084-002	L		114-001	L	
085-001	L		114-002	L	
085-002	L		115-001	L	
086-001	L		115-002	L	

086-002	L		116-001	L	
087-001	L		116-002	L	
<b>Quarry Hills Park: Population Total Count</b>					
<b>Date:</b>	9/4/22				
<b>Plant ID</b>	<b>Live/Dead</b>	<b>Notes</b>	<b>Plant ID</b>	<b>Live/Dead</b>	<b>Notes</b>
117-001	L	Small			
117-002	L				
118-001	L				
119-001	L				
119-002	L				
120-001	L				
120-002	L				
121-001	L				
122-001	L				
122-002	L				
123-001	L				
123-002	L				
124-001	L				
124-002	L				
125-001	L				
125-002	L				

Plenty Gorge Parklands: Population Total Count

Date: 9/4/21

Cluster ID	Plant ID	Live/Dead	Notes	Cluster ID	Plant ID	Live/Dead	Notes
1	001-003	L		12	040-004	L	
1	001-004	L		12	042-004	L	
1	002-003	L		12	045-003	L	
1	002-004	L		12	045-004	L	
1	003-004	L		12	048-004	L	
1	033-004	L		13	025-003	L	
2	004-003	L		13	026-004	L	
2	004-004	L		13	033-003	L	
2	005-004	L		13	037-003	L	
2	006-003	L		13	042-003	L	
2	006-004	L		13	071-003	L	
2	026-003	L		14	003-003	L	
3	007-003	L		14	040-003	L	
3	007-004	L		14	041-003	L	
3	008-003	L		14	044-003	L	Very small
3	008-004	L		14	055-003	L	
3	009-003	L		14	055-004	L	
3	009-004	L		15	005-003	L	
4	010-001	L		15	024-003	L	
4	010-004	L		15	028-004	L	
4	011-003	L		15	029-003	L	
4	011-004	L		15	029-004	L	
4	012-004	L		16	025-004	L	
4	043-004	L		16	031-004	L	
5	012-003	L		16	049-003	L	
5	013-004	L		16	051-004	L	
5	014-003	L		16	050-003	L	
5	063-003	L		17	070-004	L	
5	073-004	L		17	060-003	L	
5	080-003	L		17	064-003	L	
6	016-004	L		17	046-003	L	
6	017-003	L		17	050-004	L	
6	017-004	L		17	101-003	L	
6	018-003	L		18	046-004	L	
6	018-004	L		18	051-003	L	
6	048-003	L		18	052-004	L	
7	019-003	L		18	054-003	L	
7	020-003	L		18	058-003	L	
7	020-004	L		18	058-004	L	
7	021-003	L		19	081-003	L	
7	021-004	L		19	081-004	L	
7	041-004	L		19	083-004	L	
8	013-003	L		19	087-004	L	
8	015-004	L		19	093-003	L	
8	022-003	L	could not find.	19	102-003	L	
8	022-004	L	May be buried with	20	057-003	L	
8	023-003	L	another plant	20	057-004	L	
8	023-004	L		20	065-003	L	
9	015-003	L		20	065-004	L	
9	024-004	L		20	066-003	L	
9	027-003	L		20	066-004	L	
9	027-004	L		21	028-003	L	
9	044-004	L	small due to being in	21	031-003	L	
-10	059-004	L	Cockatoos the middle of the	21	032-003	L	
10	112-004	L	cluster	21	035-004	L	
-10	061-003	L		21	037-004	L	
-10	096-004	L		21	038-003	L	
-10	043-003	L		22	053-003	L	
-10	014-004	L		22	056-003	L	
11	047-003	L		22	062-003	L	
11	049-004	L		22	062-004	L	
11	052-003	L		22	104-004	L	
11	053-004	L		23	059-003	L	
11	103-003	L		23	060-004	L	
11	114-004	L		23	061-004	L	
12	016-003	L		23	063-004	L	
12	019-004	L		23	064-004	L	



Cluster ID	Plant ID	Live/Dead	Notes	Cluster ID	Plant ID	Live/Dead	Notes
	23 073-002	✓			35 097-003	✓	
	24 084-003	✓			36 082-003	✓	
	24 084-004	✓			36 082-004	✓	
	24 086-004	✓			36 083-003	✓	Small, white streak
	24 101-004	✓			36 085-003	✓	
	24 102-004	✓			36 115-003	✓	
	24 104-003	✓			36 115-004	✓	
	25 076-001	✓			37 108-003	✓	
	25 079-004	✓			37 109-003	✓	
	25 085-004	✓			37 109-004	✓	
	25 089-004	✓			37 110-004	✓	
	26 088-003	✓			37 113-004	✓	
	26 088-004	✓			37 114-003	✓	
	26 099-004	✓			38 067-003	✓	
	26 100-003	✓			38 069-003	✓	
	26 110-003	✓			38 072-003	✓	
	26 111-003	✓			38 077-004	✓	
-	27 093-004	✓			38 080-004	✓	
	27 094-004	✓	Could not find tag		38 103-004	✓	
-	27 095-003	✓	but assigned to her		39 067-004	✓	
-	27 095-004	✓			39 068-003	✓	
-	27 106-003	✓			39 068-004	✓	
-	27 106-004	✓			39 074-003	✓	
	28 016-004	✓			39 078-003	✓	
	28 117-003	✓			40 034-003	✓	
	28 117-004	✓			40 034-004	✓	
	28 118-003	✓			40 035-003	✓	
	28 122-004	✓			40 036-004	✓	
	28 123-004	✓			40 038-004	✓	
	29 121-004	✓			- 41 030-003	✓	
	29 123-003	✓			41 030-004	✓	
	29 124-003	✓			41 036-003	✓	
	29 124-004	✓			41 039-003	✓	Very small
	29 125-003	✓			41 054-004	✓	
	29 125-004	✓			- 41 056-004	✓	
	30 108-004	✓			42 069-004	✓	
	30 119-004	✓			42 070-003	✓	
	30 120-003	✓			42 074-004	✓	
	30 120-004	✓			42 075-003	✓	
	30 121-003	✓			42 075-004	✓	
	30 122-003	✓			42 078-004	✓	
	31 107-003	✓			43 032-004	✓	
	31 107-004	✓			43 039-004	✓	
	31 111-004	✓			43 047-004	✓	
	31 112-002	✓			43 071-004	✓	
	31 113-003	✓			43 076-004	✓	
	31 119-003	✓			43 079-003	✓	
	32 072-004	✓					
	32 097-004	✓					
	32 105-003	✓					
	32 105-004	✓					
	33 098-003	✓					
	33 098-004	✓					
	33 099-003	✓					
	33 100-004	✓					
	33 116-003	✓					
	33 118-004	✓					
	34 089-003	✓					
	34 091-004	✓					
	34 092-003	✓					
	34 092-004	✓					
	34 094-003	✓					
	34 096-003	✓					
	35 086-003	✓					
	35 087-003	✓	Small				
	35 090-003	✓					
	35 090-004	✓					
	35 091-003	✓					

Quarry Hills Park: Population Total Count

Date: 9/7/21

Plant ID	Live/Dead	Notes	Plant ID	Live/Dead	Notes
001-001	L		029-002	L	
001-002	L		030-001	L	
002-001	L		030-002	L	
002-002	L		031-001	L	
003-001	L		031-002	L	
003-002	L		032-001	L	
004-001	L		032-002	L	
004-002	L		033-001	L	
005-001	L		033-002	L	
005-002	L		034-001	L	
006-001	L		034-002	L	
006-002	L		035-001	L	
007-001	L		035-002	L	
007-002	L		036-001	L	
008-001	L		036-002	L	
008-002	L		037-001	L	
009-001	L		037-002	L	
009-002	L		038-001	L	
010-002	L		038-002	L	
010-003	L		039-001	L	
011-001	L		039-002	L	
011-002	L		040-001	L	
012-001	L		040-002	L	
012-002	L		041-001	L	
013-001	L		041-002	L	
013-002	L		042-001	L	
014-001	L		042-002	L	
014-002	L		043-001	L	
015-001	L		043-002	L	
015-002	L		044-001	L	
016-001	L		044-002	L	
016-002	L		045-001	L	
017-001	L		045-002	L	
017-002	L		046-001	L	stressed
018-001	L		046-002	L	
018-002	L		047-001	L	
019-001	L		047-002	L	
019-002	L		048-001	L	
020-001	L		048-002	L	
020-002	L		049-001	L	
021-001	L		049-002	L	Smoothed
021-002	L		050-001	L	
022-001	L		050-002	L	
022-002	L		051-001	L	
023-001	L		051-002	L	
023-002	L	stressed	052-001	L	
024-001	L		052-002	L	
024-002	L		053-001	L	
025-001	L		053-002	L	
025-002	L		054-001	L	
026-001	L		054-002	L	
026-002	L		055-001	L	
027-001	L	No tag	055-002	L	
027-002	L		056-001	L	
028-001	L		056-002	L	
028-002	L		057-001	L	

Plant ID	Live/Dead	Notes	Plant ID	Live/Dead	Notes
057-002	L		087-002	L	
058-001	L		088-001	L	
058-002	L		088-002	L	
059-001	L		089-001	L	
059-002	L		089-002	L	
060-001	L		090-001	L	
060-002	L		090-002	L	stressed
061-001	L		091-001	L	
061-002	L		091-002	L	
062-001	L		092-001	L	
062-002	L		092-002	L	
063-001	L		093-001	L	
063-002	L		093-002	L	
064-001	L		094-001	L	
064-002	L		094-002	L	
065-001	L		095-001	L	
065-002	L		095-002	L	
066-001	L		096-001	L	
066-002	L		096-002	L	
067-001	L		097-001	L	
067-002	L		097-002	L	
068-001	L		098-001	L	
068-002	L		098-002	L	
069-001	L		099-001	L	
069-002	L		099-002	L	
070-001	L		100-001	L	
070-002	L		100-002	L	
071-001	L		101-001	L	Check for burrowing
071-002	L		101-002	L	
072-002	L		102-001	L	
073-001	L		102-002	L	
073-003	L	stressed	103-001	L	
074-001	L		103-002	L	
074-002	L		104-001	L	
075-001	L		104-002	L	
075-002	L		105-001	L	
076-002	L		105-002	L	
076-003	L		106-001	L	
077-001	L		106-002	L	
077-002	L		107-001	L	
078-001	L		107-002	L	
078-002	L		108-001	L	
079-001	L		108-002	L	
079-002	L		109-001	L	
080-001	L		109-002	L	
080-002	L		110-001	L	
081-001	L		110-002	L	
081-002	L		111-001	L	
082-001	L		111-002	L	
082-002	L		112-001	L	
083-001	L		112-003	L	
083-002	L		113-001	L	
084-001	L		113-002	L	
084-002	L		114-001	L	
085-001	L		114-002	L	
085-002	L		115-001	L	
086-001	L		115-002	L	

086-002	L		116-001	L	
087-001	L		116-002	L	
<b>Quarry Hills Park: Population Total Count</b>					
Date:	9/7/24				
Plant ID	Live/Dead	Notes	Plant ID	Live/Dead	Notes
117-001	L				
117-002	L				
118-001	L				
119-001	L				
119-002	L				
120-001	L				
120-002	L				
121-001	L				
122-001	L				
122-002	L				
123-001	L				
123-002	L				
124-001	L				
124-002	L				
125-001	L				
125-002	L				



Plenty Gorge Parklands: Population Total Count

Date: 9/9/2

Cluster ID	Plant ID	Live/Dead	Notes	Cluster ID	Plant ID	Live/Dead	Notes
1	001-003	L		12	040-004	L	
1	001-004	L		12	042-004	L	
1	002-003	L		12	045-003	L	
1	002-004	L		12	045-004	L	
1	003-004	L		12	048-004	L	Blackberry present
1	033-004	L		13	025-003	L	
2	004-003	L		13	026-004	L	
2	004-004	L		13	033-003	L	
2	005-004	L		13	037-003	L	
2	006-003	L		13	042-003	L	
2	006-004	L		13	071-003	L	
2	026-003	L		14	003-003	L	
3	007-003	L		14	040-003	L	
3	007-004	L		14	041-003	L	
3	008-003	L		14	044-003	L	Stressed
3	008-004	L		14	055-003	L	
3	009-003	L		14	055-004	L	
3	009-004	L		15	005-003	L	
4	010-001	L		15	024-003	L	
4	010-004	L		15	028-004	L	
4	011-003	L		15	029-003	L	
4	011-004	L		15	029-004	L	
4	012-004	L		16	025-004	L	
4	043-004	L		16	031-004	L	
5	012-003	L		16	049-003	L	
5	013-004	L		16	051-004	L	
5	014-003	L		16	050-003	L	
5	063-003	L		17	070-004	L	
5	073-004	L		17	060-003	L	
5	080-003	L		17	064-003	L	
6	016-004	L		17	046-003	L	
6	017-003	L		17	050-004	L	
6	017-004	L		17	101-003	L	
6	018-003	L		18	046-004	L	
6	018-004	L		18	051-003	L	
6	048-003	L		18	052-004	L	
7	019-003	L		18	054-003	L	
7	020-003	L		18	058-003	L	
7	020-004	L		18	058-004	L	
7	021-003	L		19	081-003	L	
7	021-004	L		19	081-004	L	
7	041-004	L		19	083-004	L	
8	013-003	L		19	087-004	L	
8	015-004	L		19	093-003	L	
8	022-003	L		19	102-003	L	
8	022-004	L		20	057-003	L	
8	023-003	L		20	057-004	L	
8	023-004	L		20	065-003	L	
9	015-003	L		20	065-004	L	
9	024-004	L		20	066-003	L	
9	027-003	L		20	066-004	L	
9	027-004	L		21	028-003	L	
9	044-004	L		21	031-003	L	
10	059-004	L	Geckatoos	21	032-003	L	
10	112-004	L		21	035-004	L	
10	061-003	L		21	037-004	L	
10	096-004	L		21	038-003	L	
10	043-003	L		22	053-003	L	
10	014-004	L		22	056-003	L	
11	047-003	L		22	062-003	L	
11	049-004	L		22	062-004	L	
11	052-003	L		22	104-004	L	
11	053-004	L		23	059-003	L	
11	103-003	L		23	060-004	L	
11	114-004	L		23	061-004	L	
12	016-003	L		23	063-004	L	
12	019-004	L		23	064-004	L	

\* Blackberry - cluster 048004

Cluster ID	Plant ID	Live/Dead	Notes	Cluster ID	Plant ID	Live/Dead	Notes
23	073-002	L		35	097-003	L	
24	084-003	L		36	082-003	L	
24	084-004	L		36	082-004	L	
24	086-004	L		36	083-003	L	
24	101-004	L		36	085-003	L	
24	102-004	L		36	115-003	L	
24	104-003	L		36	115-004	L	
25	076-001	L		37	108-003	L	
25	079-004	L		37	109-003	L	
25	085-004	L		37	109-004	L	
25	089-004	L		37	110-004	L	
26	088-003	L		37	113-004	L	
26	088-004	L		37	114-003	L	
26	099-004	L		38	067-003	L	
26	100-003	L		38	069-003	L	
26	110-003	L		38	072-003	L	
26	111-003	L		38	077-004	L	
27	093-004	L		38	080-004	L	
27	094-004	L	} Pile of dead # recently losing foliage adj to cluster birds or management?	38	103-004	L	
27	095-003	L		39	067-004	L	
27	095-004	L		39	068-003	L	
27	106-003	L		39	068-004	L	
27	106-004	L		39	074-003	L	
28	016-004	L		39	078-003	L	
28	117-003	L		40	034-003	L	
28	117-004	L		40	034-004	L	
28	118-003	L		40	035-003	L	
28	122-004	L		40	036-004	L	
28	123-004	L		40	038-004	L	
29	121-004	L		41	030-003	L	
29	123-003	L		41	030-004	L	
29	124-003	L		41	036-003	L	
29	124-004	L		41	039-003	L	Stressed.
29	125-003	L		41	054-004	L	
29	125-004	L		41	056-004	L	
30	108-004	L		42	069-004	L	
30	119-004	L		42	070-003	L	
30	120-003	L		42	074-004	L	
30	120-004	L		42	075-003	L	
30	121-003	L		42	075-004	L	
30	122-003	L		42	078-004	L	
31	107-003	L		43	032-004	L	
31	107-004	L		43	039-004	L	
31	111-004	L		43	047-004	L	
31	112-002	L		43	071-004	L	
31	113-003	L		43	076-004	L	
31	119-003	L		43	079-003	L	
32	072-004	L					
32	097-004	L					
32	105-003	L					
32	105-004	L					
33	098-003	L					
33	098-004	L					
33	099-003	L					
33	100-004	L					
33	116-003	L					
33	118-004	L					
34	089-003	L					
34	091-004	L					
34	092-003	L					
34	092-004	L					
34	094-003	L					
34	096-003	L					
35	086-003	L					
35	087-003	L					
35	090-003	L					
35	090-004	L					
35	091-003	L					



Plenty Gorge Parklands: Population Total Count

Date: 11/1/22

Cluster ID	Plant ID	Live/Dead	Notes	Cluster ID	Plant ID	Live/Dead	Notes
1	001-003	✓		12	040-004	✓	
1	001-004	✓		12	042-004	✓	
1	002-003	✓		12	045-003	✓	
1	002-004	✓		12	045-004	✓	
1	003-004	✓		12	048-004	✓	
1	033-004	✓		13	025-003	✓	
2	004-003	✓		13	026-004	✓	
2	004-004	✓		13	033-003	✓	
2	005-004	✓		13	037-003	✓	can't find tag but probably in cluster
2	006-003	✓		13	042-003	✓	
2	006-004	✓		13	071-003	✓	
2	026-003	✓		14	003-003	✓	
3	007-003	✓		14	040-003	✓	
3	007-004	✓		14	041-003	✓	
3	008-003	✓		14	044-003	✓	
3	008-004	✓		14	055-003	✓	
3	009-003	✓		14	055-004	✓	
3	009-004	✓		15	005-003	✓	
4	010-001	✓	Can't find tag	15	024-003	✓	
4	010-004	✓		15	028-004	✓	
4	011-003	✓		15	029-003	✓	
4	011-004	✓		15	029-004	✓	
4	012-004	✓		16	025-004	✓	
4	043-004	✓		16	031-004	✓	
5	012-003	✓		16	049-003	✓	
5	013-004	✓		16	051-004	✓	
5	014-003	✓		16	050-003	✓	
5	063-003	✓		17	070-004	✓	
5	073-004	✓		17	060-003	✓	
5	080-003	✓		17	064-003	✓	
6	016-004	✓		17	046-003	✓	
6	017-003	✓		17	050-004	✓	
6	017-004	✓		-17	101-003	✓	
6	018-003	✓		18	046-004	✓	
6	018-004	✓		18	051-003	✓	
6	048-003	✓		18	052-004	✓	
7	019-003	✓		18	054-003	✓	
7	020-003	✓	Looking dry	18	058-003	✓	
7	020-004	✓		18	058-004	✓	
7	021-003	✓		19	081-003	✓	
7	021-004	✓		19	081-004	✓	
7	041-004	✓		19	083-004	✓	
8	013-003	✓		19	087-004	✓	
8	015-004	✓		19	093-003	✓	
8	022-003	✓		19	102-003	✓	
8	022-004	✓		20	057-003	✓	
8	023-003	✓		20	057-004	✓	
8	023-004	✓		20	065-003	✓	
9	015-003	✓		20	065-004	✓	
9	024-004	✓		20	066-003	✓	
9	027-003	✓		20	066-004	✓	
9	027-004	✓		21	028-003	✓	
9	044-004	✓		21	031-003	✓	
10	059-004	✓		21	032-003	✓	
10	112-004	✓		21	035-004	✓	
10	061-003	✓		21	037-004	✓	
10	096-004	✓		21	038-003	✓	
10	043-003	✓		22	053-003	✓	
10	014-004	✓		22	056-003	✓	
11	047-003	✓		22	062-003	✓	
11	049-004	✓		22	062-004	✓	
11	052-003	✓		22	104-004	✓	
11	053-004	✓		23	059-003	✓	
11	103-003	✓		23	060-004	✓	
11	114-004	✓		23	061-004	✓	small struggle
12	016-003	✓		23	063-004	✓	
12	019-004	✓		23	064-004	✓	



Cluster ID	Plant ID	Live/Dead	Notes	Cluster ID	Plant ID	Live/Dead	Notes
23	073-002	L		35	097-003	L	
24	084-003	L		36	082-003	L	
24	084-004	L	} Stressed	36	082-004	L	
24	086-004	L		36	083-003	L	
24	101-004	L		36	085-003	L	
24	102-004	L		36	115-003	L	
24	104-003	L		36	115-004	L	
25	076-001	L		37	108-003	L	
25	079-004	L		37	109-003	L	
25	085-004	L		37	109-004	L	
25	089-004	L		37	110-004	L	
26	088-003	L		37	113-004	L	
26	088-004	L	} Stressed very small plant	37	114-003	L	
26	099-004	L		38	067-003	L	
26	100-003	L		38	069-003	L	
26	110-003	L		38	072-003	L	
26	111-003	L		38	077-004	L	
27	093-004	L		38	080-004	L	
27	094-004	L		38	103-004	L	
27	095-003	L	} flowering	39	067-004	L	
27	095-004	L		39	068-003	L	
27	106-003	L		39	068-004	L	
27	106-004	L		39	074-003	L	
28	016-004	L		39	078-003	L	
28	117-003	L	} winter stress	40	034-003	L	
28	117-004	L		40	034-004	L	
28	118-003	L		40	035-003	L	
28	122-004	L		40	036-004	L	
28	123-004	L		40	038-004	L	
29	121-004	L		41	030-003	L	
29	123-003	L		41	030-004	L	
29	124-003	L		41	036-003	L	
29	124-004	L		41	039-003	L	very small
29	125-003	L		41	054-004	L	
29	125-004	L		41	056-004	L	
30	108-004	L		42	069-004	L	
30	119-004	L		42	070-003	L	
30	120-003	L		42	074-004	L	
30	120-004	L		42	075-003	L	
30	121-003	L		42	075-004	L	
30	122-003	L		42	078-004	L	
31	107-003	L		43	032-004	L	
31	107-004	L		43	039-004	L	
31	111-004	L		43	047-004	L	
31	112-002	L		43	071-004	L	
31	113-003	L		43	076-004	L	
31	119-003	L		43	079-003	L	
32	072-004	L					
32	097-004	L					
32	105-003	L					
32	105-004	L					
33	098-003	L					
33	098-004	L					
33	099-003	L					
33	100-004	L					
33	116-003	L					
33	118-004	L					
34	089-003	L					
34	091-004	L					
34	092-003	L					
34	092-004	L					
34	094-003	L					
34	096-003	L					
35	086-003	L					
35	087-003	L					
35	090-003	L					
35	090-004	L					
35	091-003	L					



Quarry Hills Park: Population Total Count

Date: 11/01/2022

Plant ID	Live/Dead	Notes	Plant ID	Live/Dead	Notes
001-001	L		029-002	L	
001-002	L	No tag	030-001	L	
002-001	L		030-002	L	
002-002	L		031-001	L	
003-001	L		031-002	L	
003-002	L		032-001	L	
004-001	L	No tag	032-002	L	
004-002	L		033-001	L	
005-001	L		033-002	L	
005-002	L		034-001	L	
006-001	L		034-002	L	
006-002	L		035-001	L	
007-001	L		035-002	L	
007-002	L		036-001	L	
008-001	L		036-002	L	
008-002	L		037-001	L	
009-001	L		037-002	L	
009-002	L		038-001	L	st
010-002	L		038-002	L	
010-003	L		039-001	L	Stressed
011-001	L		039-002	L	<del>stressed</del> Stressed
011-002	L		040-001	L	
012-001	L		040-002	L	
012-002	L		041-001	L	
013-001	L	No tag	041-002	L	
013-002	L		042-001	L	
014-001	L		042-002	L	
014-002	L		043-001	L	
015-001	L		043-002	L	
015-002	L		044-001	L	
016-001	L		044-002	L	
016-002	L		045-001	L	
017-001	L		045-002	L	
017-002	L		046-001	L	
018-001	L		046-002	L	
018-002	L		047-001	L	
019-001	L		047-002	L	
019-002	L		048-001	L	
020-001	L		048-002	L	
020-002	L		049-001	L	
021-001	L		049-002	L	No tag?
021-002	L		050-001	L	
022-001	L		050-002	L	
022-002	L		051-001	L	
023-001	L		051-002	L	
023-002	L		052-001	L	
024-001	L		052-002	L	
024-002	L		053-001	L	
025-001	L		053-002	L	
025-002	L		054-001	L	
026-001	L		054-002	L	
026-002	L		055-001	L	
027-001	L		055-002	L	
027-002	L		056-001	L	
028-001	L		056-002	L	
028-002	L		057-001	L	



Plant ID	Live/Dead	Notes	Plant ID	Live/Dead	Notes
057-002	L		087-002	L	
058-001	L		088-001	L	
058-002	L		088-002	L	
059-001	L		089-001	L	
059-002	L		089-002	L	
060-001	L		090-001	L	
060-002	L		090-002	L	
061-001	L		091-001	L	
061-002	L		091-002	L	
062-001	L		092-001	L	
062-002	L		092-002	L	
063-001	L		093-001	L	
063-002	L		093-002	L	
064-001	L		094-001	L	
064-002	L		094-002	L	
065-001	L		095-001	L	
065-002	L		095-002	L	
066-001	L		096-001	L	
066-002	L		096-002	L	
067-001	L		097-001	L	
067-002	L		097-002	L	
068-001	L		098-001	L	
068-002	L		098-002	L	
069-001	L		099-001	L	
069-002	L		099-002	L	Water stressed
070-001	L	no tag	100-001	L	
070-002	L		100-002	L	
071-001	L		101-001	L	
071-002	L		101-002	L	
072-002	L	No <del>plant</del> or tag	102-001	L	
073-001	L		102-002	L	
073-003	L		103-001	L	
074-001	L		103-002	L	
074-002	L		104-001	L	
075-001	L		104-002	L	
075-002	L		105-001	L	
076-002	L		105-002	L	
076-003	L		106-001	L	
077-001	L		106-002	L	
077-002	L		107-001	L	
078-001	L		107-002	L	
078-002	L		108-001	L	
079-001	L	Water stressed	108-002	L	
079-002	L		109-001	L	
080-001	L		109-002	L	
080-002	L		110-001	L	
081-001	L		110-002	L	
081-002	L	No tag	111-001	L	
082-001	L		111-002	L	Water stressed
082-002	L		112-001	L	
083-001	L		112-003	L	
083-002	L	Plant not present	113-001	L	
084-001	L		113-002	L	
084-002	L		114-001	L	
085-001	L		114-002	L	
085-002	L		115-001	L	
086-001	L		115-002	L	

46-002



086-002	L		116-001	L	
087-001	L		116-002	L	

**Quarry Hills Park: Population Total Count**

Date: 11/1/2022

Plant ID	Live/Dead	Notes	Plant ID	Live/Dead	Notes
117-001	L				
117-002	L				
118-001	L				
119-001	L				
119-002	L				
120-001	L				
120-002	L				
121-001	L				
122-001	L				
122-002	L				
123-001	L				
123-002	L				
124-001	L				
124-002	L				
125-001	L				
125-002	L				

12/8/22



Quarry Hills Park: Quadrat Monitoring

Date: 11/1/2022 Surveyors: JB + CS

1 = 0 - 5    2 = >5 - 10    3 = 10+

Quadrat 1

Plant ID	Cover-abundance	Plant basal diameter (mm)	Max Leaf Length (mm) - height	No. leaves/shoot (1 - 3)	Inflorescence/infructescence				Evidence of...			Other Comments
					Flowering? (Y/N)	Height (mm)	Flowering (1 - 3)	Fruiting (1-3)	Herbivory (Y/N)	Water Stress (Y/N)	Weed encroachment/competition (Y/N)	
012-001	20	1500	319	3	Z	254	3	1	Z	Z	Z	
018-002	30	978	435	3	Z	42	3	1	Z	Z	Z	
022-002	15	1000	285	3	Z	34	3	1	Z	Z	Z	



Quadrat 2

Plant ID	Cover-abundance	Plant basal diameter (mm)	Max Leaf Length (mm) - height	No. leaves/shoot (1 - 3)	Inflorescence/infructescence				Evidence of...			Other Comments
					Flowering? (Y/N)	Height (mm)	Flowering (1 - 3)	Fruiting (1-3)	Herbivory (Y/N)	Water Stress (Y/N)	Weed encroachment/competition (Y/N)	
028-002	5	737	330	3	Y	471	1	1	2	2	2	
096-0032	10	885	283	3	Y	598	2	2	2	2	2	
105-001	15	775	276	3	Y	525	2	2	2	2	2	



QHP 11/1/22

Quadrat 3

Plant ID	Cover-abundance	Plant basal diameter (mm)	Max Leaf Length (mm) - height	No. leaves/shoot (1 - 3)	Inflorescence/inflorescence				Evidence of...			Other Comments
					Flowering? (Y/N)	Height (mm)	Flowering (1 - 3)	Fruiting (1-3)	Herbivory (Y/N)	Water Stress (Y/N)	Weed encroachment/competition (Y/N)	
029-002	10	810	275	3	Y	434	2	2	Y	Y	Y	
033-002	5	392	225	3	Y	474	1	2	Y	Y	Y	
106-001	45	1204	491	3	Y	755	3	2	Y	Y	Y	
095-002	15	1095	303	3	Y	475	3	1	Y	Y	Y	



QHP 11/1/22

Quadrat 4

Plant ID	Cover-abundance	Plant basal diameter (mm)	Max Leaf Length (mm) - height	No. leaves/shoot (1 - 3)	Inflorescence/infructescence				Evidence of...			Other Comments
					Flowering? (Y/N)	Height (mm)	Flowering (1 - 3)	Fruiting (1-3)	Herbivory (Y/N)	Water Stress (Y/N)	Weed encroachment/competition (Y/N)	
039-001	1	535	276	3	Y	758	1	1	Y	Y	Y	
039-002	1	240	193	2	Y	678	1	1	Y	Y	Y	
057-001	2	689	237	3	Y	598	1	2	Y	Y	Y	



Plenty Gorge Parklands: Quadrat Monitoring

Date: 11/1/22 Surveyors: JB + CS

1 = 0 - 5    2 = >5 - 10    3 = 10+

Quadrat 1 (Cluster 1)

Plant ID	Cover-abundance	Plant basal diameter (mm)	Max Leaf Length (mm) - height	No. leaves/shoot (1 - 3)	Inflorescence/infructescence				Evidence of...			Other Comments
					Flowering? (Y/N)	Height (mm)	Flowering (1 - 3)	Fruiting (1-3)	Herbivory (Y/N)	Water Stress (Y/N)	Weed encroachment/competition (Y/N)	
002-003	5	700	330	2	2	940	2	1	2	2	2	
001-004	30	1096	345	3	2	730	3	1	2	2	2	
002-004	10	647	417	3	2	1025	1	1	2	2	2	
001-003	15	814	356	3	2	804	2	1	2	2	2	
003-004	45	960	482	3	2	895	2	1	2	2	2	
033-004	45	960	400	3	2	626	1	2	2	2	2	



PGP 11/11/22

Quadrat 2 (Cluster 9)

Plant ID	Cover-abundance	Plant basal diameter (mm)	Max Leaf Length (mm) - height	No. leaves/shoot (1 - 3)	Inflorescence/infructescence				Evidence of...			Other Comments	
					Flowering? (Y/N)	Height (mm)	Flowering (1 - 3)	Fruiting (1-3)	Herbivory (Y/N)	Water Stress (Y/N)	Weed encroachment/competition (Y/N)		
027-004													
024-004													
044-004													
015-003													
027-003													

~~2205~~ 2205 551 3 2 1115 3 3 2 2 2  
100

has formed one clump/plant and as such is counted as 1 plant.



PGP 11/1/22

Quadrat 3 (Cluster 37)

Plant ID	Cover-abundance	Plant basal diameter (mm)	Max Leaf Length (mm) - height	No. leaves/shoot (1 - 3)	Inflorescence/infructescence				Evidence of...			Other Comments
					Flowering? (Y/N)	Height (mm)	Flowering (1 - 3)	Fruiting (1-3)	Herbivory (Y/N)	Water Stress (Y/N)	Weed encroachment/competition (Y/N)	
109-004	45	1142	395	3	2	330	1	3	2	2	2	
113-004	10	738	365	3	2	774	1	1	2	2	2	
109-003	35	1025	<del>423</del> 395	3	2	<del>730</del>	1	2	2	2	2	
110-004	20	1230 <sup>956</sup>	362	3	2	730	1	1	2	2	2	
108-003	35	<del>1142</del>	455	3	2	975	1	3	2	2	2	
114-003	2	600	495	3	2	975	1	1	2	2	2	



PEP 11/1/22

Quadrat 4 (Cluster 21)

Plant ID	Cover-abundance	Plant basal diameter (mm)	Max Leaf Length (mm) - height	No. leaves/shoot (1 - 3)	Inflorescence/infructescence				Evidence of...			Other Comments
					Flowering? (Y/N)	Height (mm)	Flowering (1 - 3)	Fruiting (1-3)	Herbivory (Y/N)	Water Stress (Y/N)	Weed encroachment/competition (Y/N)	
038-003	5	495	298	2	2	795	1	1	2	2	2	Very small, only a few shoots
031-003	30	885	465	2	2	882	3	1	2	2	2	
035-004	5	595	230	2	2	675	1	1	2	2	2	
032-003	10	670	348	3	2	885	2	1	2	2	2	
037-004	2	770	350	3	2	942	1	1	2	2	2	
028-003	30	875	322	3	2	730	3	1	2	2	2	

# Appendix C

## Nursery Audit



# Matted Flax-lily Nursery Audit - 2021

26-Jun-2021

# Matted Flax-lily Nursery Audit - 2021

Client: Department of Transport

ABN: 69981208782

Prepared by

**AECOM Australia Pty Ltd**

Level 10, Tower Two, 727 Collins Street, Melbourne VIC 3008, Australia

T +61 3 9653 1234 F +61 3 9654 7117 www.aecom.com

ABN 20 093 846 925

26-Jun-2021

Job No.: 60637387

AECOM in Australia and New Zealand is certified to ISO9001, ISO14001 and ISO45001.

© AECOM Australia Pty Ltd (AECOM). All rights reserved.

AECOM has prepared this document for the sole use of the Client and for a specific purpose, each as expressly stated in the document. No other party should rely on this document without the prior written consent of AECOM. AECOM undertakes no duty, nor accepts any responsibility, to any third party who may rely upon or use this document. This document has been prepared based on the Client's description of its requirements and AECOM's experience, having regard to assumptions that AECOM can reasonably be expected to make in accordance with sound professional principles. AECOM may also have relied upon information provided by the Client and other third parties to prepare this document, some of which may not have been verified. Subject to the above conditions, this document may be transmitted, reproduced or disseminated only in its entirety.



## Quality Information

Document Matted Flax-lily Nursery Audit - 2021

Ref 60637387

Date 26-Jun-2021

Prepared by Helen Vickers

Reviewed by Dan Haysom

### Revision History

Rev	Revision Date	Details	Authorised	
			Name/Position	Signature
0	21-Jun-2021	Draft	Dan Haysom Principal Environmental Planner	
1	26-Jun-2021	Final	Dan Haysom Principal Environmental Planner	

## Table of Contents

1.0	Introduction	1
	1.1 Purpose	1
2.0	Results of June 2021 audit	1
3.0	Next Steps	4
4.0	References	5



## 1.0 Introduction

AECOM was initially engaged by the Level Crossing Removal Project (LXRP) to undertake regular audits of a population of Matted Flax-lily *Dianella amoena* salvaged from the construction footprint of the Mernda Rail Extension Project (the Project) in April 2017. Since October 2020 the Project has formally transferred from LXRP to the Department of Transport (DoT). DoT are now the agency responsible for undertaking reporting and monitoring events as required by the EPBC 2016/27674 Matted Flax-lily Translocation Plan.

The plants subject to this audit are managed at ABZECO nursery as 'insurance stock' to ensure that plants translocated in July/August 2019 can be supplemented if necessary to achieve an overall survival rate of at least 85%. This 'insurance stock' is in the care of ABZECO consultants, who will manage and maintain the plants until the maintenance period is over (between two and 10 years) at which time any remaining plants will be provided to Parks Victoria and/or other local agencies for revegetation projects within the region. It should be noted that plants already translocated are subject to a separate audit and are not within the scope of this memo. The salvage, maintenance and final translocation of the Matted Flax-lily to their recipient sites are guided by the EPBC 2016/27674 Matted Flax-lily Translocation Plan (LXRA-MNDA-00-PA-RPT-004 Revision: 9) released on 9 March 2020.

This nursery audit forms part of the Year 3 2021-2022 Matted Flax-lily Annual Summary Report.

### 1.1 Purpose

This memorandum provides a summary of the current status of the Matted Flax-lily 'insurance stock' as a result of the most recent audit. Specifically, the memorandum will detail:

- The current management and number of transplants available as 'insurance stock'
- Evidence of correct labelling and documentation maintained throughout the propagation and management period
- Evidence of the appropriate sized pot usage
- Evidence of the health, growth and survivorship of clones created from parent plants
- Evidence of weed and pest control
- Evidence of 'hardening' off if required for future translocations.

## 2.0 Results of June 2021 audit

On the 3 June 2021, a senior botanist and professional ecologist met with Jack Latti, the nursery manager and Richard Francis Director of ABZECO consulting. The nursery is located at 105 Gumtree Road, Research.

The audit found that all criteria documented within the translocation plan were being met and the 'insurance stock' Matted Flax-lilies were observed to be in a healthy condition and well managed. Specifically;

- 250 pots of live, healthy Matted Flax-lily representing the required number of clones were observed,
- individuals were clearly labelled and potted in appropriate pots and potting medium, and
- no diseased individuals were observed.

Results are described in greater detail in Table 1 and supported by Plate 1 to Plate 4

**Table 1 Results of 2021 audit**

Item	Details
<p>The required number of clones are available for translocation</p> <p>6 clones to be created per salvaged plant where possible</p> <p>4 clones per salvaged plant available for translocation</p> <p>2 clones per salvaged plant maintained in nursery conditions</p>	<p>250 pots containing clones of the original salvaged plants were observed at the nursery. These represented a minimum of 2 (more in some instances) clones per salvaged plant which are maintained at the nursery as 'insurance stock'. This observation was further supported by the spreadsheet detailed in ABZECO (2021) which tracked the translocation of plants to the recipient sites and the plants remaining at the nursery.</p>
<p>Labelling of clones with staked metal nursery tags in addition to labelling of pot with permanent marker in the format of 001 (patch number) – 001 (clone number)</p>	<p>The 'insurance stock' clones were clearly labelled with a metal tag and permanent marker on the outside of the pot. Labels represented the patch and clone number as required.</p>
<p>Clones to be in good health with minimal individuals showing signs of stress or having senesced, evidence of growth</p>	<p>Clones were observed to be in good health, having recently been cleared of thatch (last year's growth which had dried off and been left in place during summer as a form of mulch and to assist with water retention). Some individuals, as anticipated were larger in form than others which is attributed to genetic variation.</p>
<p>Evidence of disease</p>	<p>No evidence of disease was observed.</p>
<p>Pest control actively managed (e.g. thrips, rabbits, deer)</p>	<p>Rabbit proof fencing had been removed at the time of the audit. The nursery manager reported that they had not seen a rabbit within the vicinity of the nursery and that the boundary fence of the property was sufficient to keep out deer and rabbits. The presence of a dog which patrolled the nursery and surrounds is also likely to keep animal pests at bay.</p> <p>The nursery manager indicated there had been historic thrip attack on some plants (which was in keeping with the 2020 audit). The nursery manager used white oil to treat the infestation. No evidence of thrip infestation or damage was observed at the time of the audit.</p>
<p>Weed control actively managed (e.g. hand weeded during winter months or as needed)</p>	<p>No weeds were observed within the pots. The nursery manager confirmed that hand weeding occurred on a regular basis, especially during winter months.</p>
<p>Propagation material appropriate (e.g. sandy loam etc.)</p>	<p>The nursery manager identified that the potting material originally used for the clones had been changed from typical potting mix used for native vegetation to a sandy-loam mix which had resulted in less drying out of pots and better water retention.</p>
<p>Pot size appropriate (e.g. minimum of 14 cm diameter pot)</p>	<p>Pot sizes were observed to be within the recommended range.</p>
<p>Watering and fertilizer regime appropriate (e.g. reflective of climatic conditions where appropriate, fertilisation in advance of translocation)</p>	<p>The nursery manager confirmed that no additional fertilizer had been added to the pots as they were aiming to maintain, not stimulate growth. At the time of the audit, plants had not been actively watered or fertilised in keeping with hardening-off of plants.</p>



Item	Details
	Watering will continue to occur on an irregular basis, with the exception of hot dry spells that occur during summer where water is applied as necessary. As the nursery is located outdoors, watering by hand is considered supplementary to rainfall.
Evidence of 'hardening off' of plants prior to translocation	Plants occur outdoors and are exposed to climatic conditions.
Additional observations (e.g. thatch kept/removed to assist with water retention etc.)	Thatch had been removed.



Plate 1 Insurance stock



Plate 2 Healthy plants with thatch removed

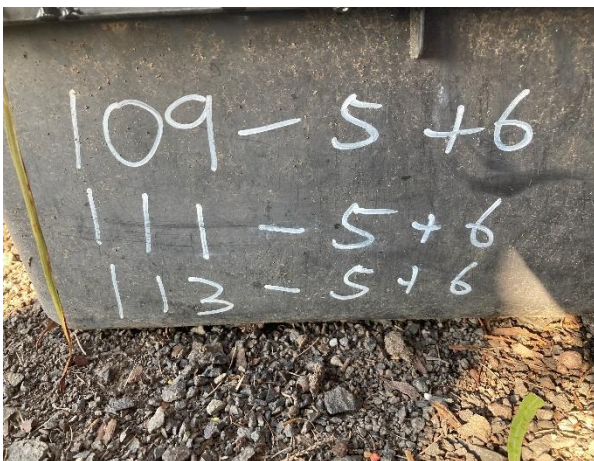


Plate 3 Labelling of clones in community tubs



Plate 4 Labelling of clones

### 3.0 Next Steps

The ‘insurance stock’ Matted Flax-lilies should continue to be monitored on an annual basis as per the schedule in Table 2. An auditor’s checklist is provided below in Table 3 to provide consistency and assist with future audits. Results of the nursery audits should be included in the translocation program’s annual report.

Table 2 Audit schedule

Year	Audit 1	Audit 2
Salvage	April 2017	



Year	Audit 1	Audit 2
Year 1		
6 monthly audit	September 2017	April 2018
Year 2		
6 monthly audit	September 2018	April 2019
Year 3	April 2020	
Year 4	April 2021	
Year 5	April 2022	
Year 6	April 2023	
Year 7	April 2024	
Year 8	April 2025	
Year 9	April 2026	
Year 10	April 2027	

Table 3 Auditor's checklist

Item	Details
The required number of clones are available for translocation 6 clones to be created per salvaged plant where possible 4 clones per salvaged plant available for translocation 2 clones per salvaged plant maintained in nursery conditions	
Labelling of clones with staked metal nursery tags in addition to labelling of pot with permanent marker in the format of 0001 (patch number) – 001 (clone number)	
Clones to be in good health with minimal individuals showing signs of stress or having senesced, evidence of growth	
Evidence of disease	
Pest control actively managed (e.g. thrips, rabbits, deer)	
Weed control actively managed (e.g. hand weeded during winter months or as needed)	
Propagation material appropriate (e.g. sandy loam etc.)	
Pot size appropriate (e.g. minimum of 14 cm diameter pot)	
Watering and fertilizer regime appropriate (e.g. reflective of climatic conditions where appropriate, fertilisation in advance of translocation)	
Evidence of 'hardening off' of plants prior to translocation	
Additional observations (e.g. thatch kept/removed to assist with water retention etc.)	

## 4.0 References

AECOM-GHD Joint Venture. 2018. Mernda Rail Extension Project – EPBC 2016/7674 Matted Flax-lily Translocation Plan (LXRA-MNDA-00-PA-RPT-0004) Revision 8.

AECOM-GHD Joint Venture. 2020b. Mernda Rail Extension Project: EPBC 2016/7674 Matted Flax-lily Translocation Plan. Report prepared for the Level Crossing Removal Authority, Revision 9, March 2020.

Kind regards



Dr Helen Vickers

Senior Ecologist

AECOM