Final Report

Annual Report (Year 1): Barry Road Offset Site, Thomastown, Victoria

Prepared for

YourLand Developments

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Ecology and Heritage Partners Pty Ltd

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Ecology and Heritage Partners acknowledge the Traditional Owners of the country we live and work on, and we pay our respect to Elders past, present and emerging.

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1 INTRODUCTION

1.1 Background

Ecology and Heritage Partners Pty Ltd was commissioned by YourLand Developments (herein referred to as 'YourLand') to undertake the Year 1 ecological monitoring and oversee management works for the Barry Road offset site, located at 135-161 Barry Road, Thomastown, Victoria (Figure 1).

The offset site (Conservation Reserve) was established as a part of the approval conditions issued for EPBC 2014/7364 (date of decision 20/06/2018). The project was referred to the Department of the Environment and Energy (DoEE) due to impacts proposed to one nationally significant ecological community, *Natural Temperate Grassland of the Victorian Volcanic Plain* (NTGVVP) and 36 Matted Flax-lily (MFL) *Dianella amoena* plants. The project was deemed a Controlled Action due to the significant impact on 'Listed threatened species and communities (Section 18 & Section 18A). In line with Condition 2 of the EPBC Approval 2014/7364, 5.01 hectares of NTGVVP was offset in accordance with the Melbourne Urban Development (MUD) Policy. The MFL offset obligation is to be achieved via the retention of 74 MFL plants, with 38 retained in-situ and 36 translocated to an area of non-native vegetation within the now established Conservation Reserve. The translocation process was undertaken in accordance with Condition 3 of the EPBC Approval 2014/7364 as per the approved and implemented Matted Flax-lily Translocation Plan (MTP) contained within the Environmental Management Plan (EMP) (EHP 2022).

The established Conservation Reserve, as secured by a Section 173 agreement, also achieves the required state offsets and satisfies the Conditions of the Development Plan Overlay – Schedule 35 of the City of Whittlesea Planning Scheme. An additional third-party offset was established for the remaining State offset requirement.

The management, monitoring and auditing works required to be undertaken within the offset site are detailed in the EMP (Ecology and Heritage Partners (EHP) 2022). Specifically, the works relate to the protection and ecological monitoring of the quality of the native vegetation and significant ecological values present within the offset site, including two matters of National Environmental Significance (NES); NTGVVP and MFL.

Ecology and Heritage Partners subcontracted Aus Eco Solutions Pty Ltd (AES) to implement pest plant and animal control, biomass reduction and revegetation for the ecological management works for the Year 1 works.

This report outlines the results of the Year 1 annual monitoring and addresses all undertaken management actions, in accordance with the EMP and MTP.

1.2 State Offset Strategy

To meet the State offset obligation and Condition 16 of Planning Permit 716769 PLN-38153 issued by the City of Whittlesea for the removal of 5.009 hectares of native Plains Grassland vegetation in support of the residential development, 0.731 General BEU's are required to be secured. 0.248 General BEU's, with an SBS of 0.268, are to be achieved via Security gain, Maintenance gain and Improvement gain as detailed by the EMP. The Security gain (and as per Condition 9 of the City of Whittlesea Planning Permit 716769 PLN-38153,

required by Development Plan Overlay – Schedule 35) has been achieved via the implementation of a Section 173 agreement under the *Planning and Environment Act 1987*. The Maintenance and Improvement gains will be met via the enhanced management of at least 3.062 hectares of Plains Grassland vegetation within the now established 4.151 hectare Conservation Reserve (1.833 hectares within private land and 2.318 hectares within Crown Land). The remaining 0.483 General BEU's required to fulfill the remaining offset obligation were achieved via securing third-party offsets of 0.106 General BEU's (City of Whittlesea) and 0.377 (Port Phillip and Western Port CMA).

1.3 Objectives

The overall objective of the EMP is to protect and improve the quality and extent of native vegetation and significant ecological values present within the on-site offset. This includes the nationally significant species listed under the EPBC Act, Matted Flax-lily (MFL) *Dianella amoena*, as well as the Critically Endangered ecological community, *Natural Temperate Grassland of the Victorian Volcanic Plain*.

1.4 Offset Site Security

Condition 9 of the Planning Permit approval specifies that the land identified as the on-site offset (Conservation Reserve) identified in the Environmental Management Plan (EHP 2022) adjacent to the clearing site must be secured. A Section 173 Agreement was entered into to fulfill the requirement of Section 3.0 of Schedule 35 to the Development Plan Overlay (DPO35) in the Whittlesea Planning Scheme (title secured and registered 27 September 2022).

1.5 Relevant Reports

A summary of past reports prepared for the study area are provided below, and were used to understand the original condition of the offset site and to inform the current Year 1 monitoring report. The reports included:

- Environmental Management Plan (EHP 2022): Barry Road Development, Thomastown, Victoria. The associated EMP outlines the initial survey conditions of the onsite vegetation and details the ongoing management requirements over the 10 Year management period.
- Matted Flax-lily *Dianella amoena* Translocation Plan (EHP 2018a): 135-161 Barry Road, Thomastown. The MTP outlines the MFL population within the conservation area and construction footprint and details the translocation and monitoring procedure over the 5 year monitoring period. It also outlines contingency measures for low survivorship within the transplanted cohort.
- EPBC 2014/7364: Construction Environmental Management Plan (EHP 2018b): Barry Road Development Thomastown, Victoria. The CEMP proscribes mitigation measures throughout the construction phase of the proposed development to ensure that construction activities do not impact on environmental values present within the Conservation Reserve or in surrounding areas, and that appropriate environmental protection measures are implemented during construction works.
- Barry Road Offset Land Management 2022-23 - Annual Report completed by contracted land manager Aus Eco Solutions. The report outlines the actions undertaken during Year 1 of management.

2 MONITORING METHODS

Monitoring of the condition of native vegetation within the offset site, as well as the population status of MFL within the offset site was undertaken on the 14 June 2019 to inform the CEMP (EHP 2019) and EMP (EHP 2022). Subsequent baseline data was undertaken on the 17 January 2023 to determine the extent and quality of Plains Grassland and NTGVVP within the offset site prior to the commencement of Year 1 management in accordance with the EMP. Ecological management and monitoring is actively undertaken annually (and will continue over a period of 10 years) to ensure that the quality conditions outlined within the EMP are met.

Ecological monitoring in Year 1 was undertaken to monitor the quality and extent of PG and NTGVVP, as well monitor the health and progress of the transplanted population of MFL residing within the offset site. The following section outlines the methods used to undertake the monitoring in Year 1, in accordance with the EMP (EHP 2022) and MFL Translocation Plan therein.

2.1 Native Vegetation

The following methods have been undertaken in accordance with the EMP (EHP 2022) and associated federal policy documents, *Nationally Threatened Ecological Communities of the Victorian Volcanic Plain: Natural Temperate Grassland & Grassy Eucalypt Woodland* (Commonwealth of Australia 2011a) and *Commonwealth Listing Advice on Natural Temperate Grassland of the Victorian Volcanic Plain* (Threatened Species Scientific Committee 2008):

- To assess changes in quality and extent of PG and NTGVVP, the following monitoring was undertaken:
    - The extent of PG and NTGVVP was mapped and a Habitat Hectare assessment (as per the *Vegetation Quality Assessment Manual: Guidelines for applying the habitat hectares scoring method* (DSE 2004) was undertaken to determine the overall quality (i.e. condition) on 25th of January, 31st of May, 28th of August 1st and 14th of November 2023; and,
    - Photo point (see Figure 1) monitoring was undertaken at photo points established in Year 1, which were placed in areas of native vegetation and predominantly weeds.
- Weed Monitoring to determine the effectiveness of management:
    - Record of cover, extent and composition (i.e. herbaceous, grassy, woody) of weeds within the offset site; and,
    - The cover and extent of all high threat weeds, as per the EMP, were recorded.

2.2 Matted Flax-lily

During 2016 targeted surveys for creation of the EMP, a population of 74 MFL was recorded within the site. Of these, 36 were within the construction area and 38 within the Barry Road Offset Site. To mitigate the impacts to MFL within the site, the MTP was produced detailing the translocation of the 36 MFL within the construction area to within the conservation area. This translocation took place on the 25 and 26 of October 2022, prior to commencement of construction. During this translocation, 32 of the 36 MFL within the construction area were located and one third of each plant translocated into the recipient site, with the other

two thirds being sent to a nursery to act as a reserve population. Four of the MFL could not be located despite intense search efforts and were presumed no longer present. The translocated MFL were had ongoing monitoring to ensure the best survivorship.

The following methods have been undertaken in accordance with the EMP (EHP 2022):

- Monitoring was completed by suitably qualified botanists (i.e. botanists with prior survey experience);
- Monitoring looked for drought stress, pest plant and animal impacts, biomass and other site disturbances;
- Monitoring was conducted fortnightly for the first two months, monthly for the next four months bi-monthly for the remainder of the first year;
- Water provided when required during monitoring and management visits;
- Survey Monitoring data taken consisted of:
    - Dimensions of the plants;
    - Number of “leaflets” or “tillers” associated with each plant;
    - Average tiller height; and,
    - If any, the number of flowering spikes or culms from that season present.

Monitoring will continue every 3-6 months for the remainder of the five-year monitoring period as per the Translocation Plan (EHP 2018a).

3 MONITORING RESULTS

3.1 Native Vegetation

Baseline data collection to determine the current condition and extent of native vegetation within the offset site was undertaken on 17 January 2023. In the seven years between the EMP generation and baseline data recordings, the offset site had deteriorated in condition. The spread of high threat weed species such as Sweet Briar and Sweet Vernal-grass throughout the site caused a reduction in the cover of native perennial grasses. Due to this, the EMP recorded the entirety of PG1 as NTGVVP, whereas the baseline data recorded 0.236 ha of NTGVVP within the PG1 area.

In Year 1, detailed vegetation monitoring was undertaken on 25th of January, 31st of May, 28th of August 1st and 14th of November 2023, by a suitably qualified Botanist. A habitat hectare assessment was undertaken on the most recent assessment to quantify any changes in the vegetation quality and/or extent from the baseline. Three main habitat zones were identified in the Year 1 vegetation monitoring, Plains Grassland (PG) 1, PG2 and PG3. A description is provided below for each habitat zone and the habitat hectare scores from the most recent site visit (14th November 2023) for each zone are provided in Appendix 1.

Plains Grassland 1 (PG1)

Patch PG1 covers the bulk of the offset site, and the condition of the native vegetation within this patch remained relatively consistent with the baseline. This area remained in moderate condition with high covers of native tussock grasses such as Kangaroo Grass *Themeda triandra*, Wallaby-grasses *Rytidosperma* spp. and Common Tussock-grass *Poa labillardierei*. A high diversity of native herbs and graminoids were present such as Blue Devil *Eryngium ovinum*, Sheeps Burr *Acaena echinata*, Bindweed *Convolvulus* spp., Yellow Sebaea *Sebaea ovata* and Chocolate Lily *Arthropodium strictum* (Plate 1 to Plate 4).

Plate 1. Area dominated by Common Tussock Grass within PG1 (Ecology and Heritage Partners Pty Ltd 14/11/2023).

Plate 2. Blue Devil flowering within PG1 (Ecology and Heritage Partners Pty Ltd 14/11/2023).

Plate 3. Chocolate Lilies flowering within PG1 (Ecology and Heritage Partners Pty Ltd 01/11/2023).

Plate 4. Wiry Dock *Rumex dumosis* within PG1 (Ecology and Heritage Partners Pty Ltd 14/11/2023).

Biomass was generally moderate-high, however varied throughout. Areas dominated by larger tussock grasses such as Common Tuccosk-grass generally had high biomass whereas areas dominated by Kangaroo Grass and Wallaby-grasses had moderate biomass, with greater intertussock space.

Herbs, grasses and woody weeds were all abundant throughout PG1. Grassy weeds were common, with high cover from annuals such as Soft Brome *Bromus hordeaceus*, Wimmera Rye Grass *Lolium rigidum* and Greater Quaking-grass *Briza maxima*. The dominant perennial species included Toowomba Canary-grass *Phalaris aquatica* and Sweet Vernal-grass *Anthoxanthum odoratum.* Woody weeds pose an active threat to native vegetation, with Sweet Briar *Rosa rubiginosa* occurring in many dense thickets (of up to 75% cover within PG1), as well as actively recruiting around existing individuals. A single mature African Boxthorn *Lycium ferocissimum* and single emerging Broom *Broom* sp. was present near the middle of PG1. Several clusters of Fennel *Foeniculum vulgare* are also scattered throughout PG1, with larger clusters occurring in the central, weedier, area. Intensive weed control works to reduce the cover of high threat and woody weeds were undertaken by Aus Eco Solutions throughout Year 1. These control works focused on cut and paint removal of Sweet Briar and Fennel around the boundary of the offset site, aiming to work inwards towards the central areas with the highest cover of Sweet Briar. While no control works were undertaken in the central area, the intensive control works around the edges caused a reduction from approximately 15% cover to 10%, localised within the central untreated areas of PG1 (Figure 1) (Plate 5 to Plate 8).

Due to these control works, an improvement in quality was noted for this area compared to the baseline data, however due to the high cover of other high threat weeds such as Sweet vernal-grass, this reduction in woody weed cover did not result in a change in the Habitat Hectare scores achieved compared to the baseline. Additionally, Sweet Briar and Fennel were noted recruiting and re-sprouting around treated areas. These weeds are still abundant with higher cover in the central areas of PG1, and ongoing removal works will be required in subsequent years to achieve the control targets.

Plate 5. Fennel re-sprouting from treated areas in PG1 (Ecology and Heritage Partners Pty Ltd 14/11/2023).

Plate 6. Emerging Broom sp. within PG1 (Ecology and Heritage Partners Pty Ltd 14/11/2023).

Plate 7. Thickets of Sweet Briar persisting within central areas of PG1 (Ecology and Heritage Partners Pty Ltd 14/11/2023).

Plate 8. Sweet Briar re-emerging from areas of treated thickets (eastern boarder of PG1) (Ecology and Heritage Partners Pty Ltd 14/11/2023).

Plains Grassland 2

PG2 includes two small patches, one on the eastern edge and the north-western corner of the offset site (Figure 1). PG2 areas are primarily dominated by Kangaroo Grass with native herbs such as Variable Willow Herb *Epilobium billiardierianum* and Bluebells *Wahlenbergia* sp., however these patches are less diverse than PG1. These habitat patches are not contiguous with PG1 and are separated by areas of high weed cover, however, future weed control works could see these patches increase in size and become contiguous with PG1. Weed cover was high (60%) in PG2, and the dominant species included Toowoomba Canary-grass, Paspalum *Paspalum dilatatum*, and Sweet Vernal-grass.

Plains Grassland 3

The area along the southern border of the site was not previously been recorded as Plains Grassland during the baseline assessment, having been dominated by exotic grasses such as Toowomba Canary-grass. However, large portions of this area have experienced a high rate of emergence of Spear-grass (*Austrostipa scabra* subsp. *falcata*) and have become dominated by dense swathes (approximately 75% cover within the habitat zone). These patches are generally lower quality than the northern patch (PG1 on Figure 1) given they lack much of the native herb diversity, however the higher cover of Spear-grass within these patches qualifies them as NTGVVP. This represents a total of 0.1707 hectares of re-established Plains Grassland and NTGVVP within the offset (Plate 9; Plate 10). Weed cover is moderate in these patches (<30%), and primarily consists of grassy weeds. High threat grassy weeds are present throughout these patches, and abundant within the surrounding area with this area harbouring the highest cover of Chilean Needle-grass *Nassella neesiana* and other grasses such as Quaking Grasses *Briza* spp. and Sweet Vernal-grass.

Due to ongoing control works by AES, woody weeds are far lower cover within these patches and in the adjacent southern portion of the offset site. Woody weeds are still present with Sweet Briar re-emerging from areas previously treated, however its cover was reduced to <2% within the PG3 patches.

Plate 9. Dense swathe of Spear Grass within PG3a (Ecology and Heritage Partners Pty Ltd 14/11/2023).

Plate 10. Dense swathe of Spear Grass within PG3b (Ecology and Heritage Partners Pty Ltd 14/11/2023).

3.2 Matted Flax Lily

3.2.1 Monitoring Cohort

During the 2018 preliminary surveys and preparation of the Environment Management Plan (EHP 2022), a total of 36 MFL were estimated to be impacted as part of the proposed development, and subsequently proposed to be salvaged. MFL translocation occurred over two days (22 and 25 November 2022) prior to the commencement of construction. During the translocation, 32 plants were located and salvaged. The locations

of the missing four MFL were intensely surveyed to locate them, however they were deemed no longer present. Given MFL are rhizomatous, clump forming plants, individual tufts or ramtes from the plant can be separated and grown to produce two genetic clones of the original plant. Given this, one third of each plant was translocated into the recipient site with the other two thirds being sent to a nursery (Western Plains Flora) to be held for up to five years as contingency. Each plant was successfully split into three clones, two of which remain with the nursery in good condition. These clones will remain with the nursery for a further four years to act as a contingency population.

The 32 MFL were transplanted as per the Matted Flax-lily Translocation Plan (EHP 2018a), into the southern portion of the offset site. They were clearly marked with stakes and metal pegs for ongoing monitoring, and were later individually fenced by Aus Eco Solutions in March 2023 to prevent grazing by kangaroos which move between the offset site and surrounding area (Plate 11).

Seven additional remnant MFL throughout the offset site (predominantly along the eastern edge) were damaged during an off-target damage incident by AES during weed control works (incident detailed in section 3.7). One further remnant MFL was close to control works however was not directly impacted by the off-target damage. These eight plants were included in the monitoring schedule and checked alongside the transplanted MFL.

The top soil of an area of the offset site in the north-western corner was scraped away during construction of the fence, impacting the remnant vegetation (incident detailed in section 3.8.1). This potentially caused a loss of two remnant MFL. Although they were undetected during surveys, the potential remains that they persisted through underground biomass. To compensate for this a further four MFL, taken from the reserve stock held at Western Plains Flora, were translocated into the recipient site by AES on 7th September 2023. These additional MFL were monitored alongside transplanted MFL cohort.

In summary, 32 MFL were salvaged and translocated from the proposed impact area. Each salvaged MFL was divided, with one third being directly planted into the recipient site (i.e. without nursery care), and the remaining 2/3rds of each plant were relocated to a nursery for care. A total of 44 MFL were monitored throughout Year 1, the data from the most recent check (1st November 2023) is provided in appendix 2.

3.2.2 Monitoring Results

Matted Flax-lily monitoring of the 36 translocated MFL was undertaken by a suitably qualified botanist following the schedule outlined in the Translocation Plan. These checks occurred on 27 January, 6 and 20 of February, 6 and 20 of March, 3 of April, 2 and 31 of May, 4 of July, 7 of September and 1 of November 2023.

The translocated MFL performed well in Year 1. Many translocated plants experienced die-off after transplanting, particularly through the hotter months, and presented no above-ground living tissue. Up to 14 plants were recorded as dead throughout the February-May period. However, all translocated plants continued to be watered by AES and EHP as required, and throughout the year most of these 14 plants resprouted.

As of the most recent monitoring event, almost all MFL previously recorded as dead had resprouted with at least one ramet (MFL clone) in good condition (Plate 12). Only one of the 36 plants within the translocated

cohort failed to resprout throughout the year and is assumed dead (Figure 1, plant ID #2). Ten MFL within the translocated cohort were flowering by the final monitoring check on 1 November 2023 (Plate 13; plate 14).

After Year 1, the translocated cohort has a 97% establishment rate and is on track to meet the 70% requirement by the end of Year 5, as specific in the MTP (EHP 2018a).

Of the eight MFL damaged by the weed control works, seven were in good condition, with six flowering by November (Plate 15). One MFL (#39) was recorded as dead during the first monitoring event and did not resprout throughout the year. This plant is assumed to have died due to the damage from off-target weed spraying (plate 16). The 30 remnant MFL within the offset site which were not impacted by off-target damage remained in good health. These 30 remnant MFL and the 42 surviving MFL from the monitoring groups total 72 good condition MFL within the offset site. This is currently not meeting the population target of 74 MFL as detailed in the EMP.

Plate 11. Fenced translocated MFL in the recipient site to prevent grazing by Kangaroos (Ecology and Heritage Partners 01/11/2023).

Plate 12. Resprouting MFL (#17) previously recorded as dead within the translocated cohort (Ecology and Heritage Partners 01/11/2023).

Plate 13. Healthy transplanted MFL (#10) flowering within the recipient site (Ecology and Heritage Partners 01/11/2023).

Plate 14. One of the additional transplanted MFL (#41) flowering within the recipient site (Ecology and Heritage Partners 01/11/2023).

Plate 15. Healthy remnant MFL (#34) flowering after being damaged by off-target herbicide spray (Ecology and Heritage Partners 01/11/2023).

Plate 16. Location of impacted MFL (#39), no longer present (Ecology and Heritage Partners 01/11/2023).

3.2.3 Contingency Measures Triggered

The translocated cohort of MFL have good survivorship after Year 1. However, as per the Translocation Plan, any failed translocations are recommended to be replaced by a genetically identical clone from the reserve plants. Similarly, an additional MFL from reserve stock should be transplanted into the recipient site to account for the one dead MFL from the off-target damage (#39). It is recommended that in Year 2 two MFL (one of which a clone of MFL #2) be transplanted into the recipient site to maintain genetic diversity and compensate for the death of MFL #2 and #39. This transplanting should occur between April and August 2024 to give facilitate establishment during the wetter months. These additional 2 plants will help achieve the target of at least a 74 plant population of MFL within the offset site in Year 2.

3.3 Weeds

Weed cover throughout the offset site was moderate within mapped patches of native vegetation, and high outside. Grassy and woody weeds are abundant throughout most of the site, with the dominant perennial species including Sweet Briar, Chilean Needle-grass, Sweet Vernal-grass, Fennel, Cocksfoot *Dactylis glomerata*, and Toowoomba Canary-grass.

Overall weed cover has decreased throughout Year 1 through intensive control works targeting woody weeds. Species composition remains stable with no new introductions, however, the total extent and cover of weeds has increased. Weed cover remains highest in the central portions of PG1, and in areas outside of mapped native vegetation.

The overall cover (%) of all weeds recorded throughout the offset site is provided below in Table 1.

Table 1. Weed Cover throughout the Barry Road Offset Site (November 2023). Total covers exceed 100% due to layering habit of species.

Scientific Name	Common Name	Existing / Emerging	Current Cover % within the offset site	EMP Target E (<1%) C (<5%)	EMP Target Achieved (Y/N)
WOODY WEEDS					
Lycium ferocissimum	African Box-thorn	Existing	<1%	E	N
Rosa rubigonsa	Sweet Briar	Existing and Emerging	10%	E	
Broom spp.	Brooms	Emerging	<1%	E	
HERBACEOUS WEEDS					
Anagallis arvensis	Pimpernel	Existing	1%	C	Y
Centaurium Spp.	Common Centaury / Slender Centaury	Existing	1%	C	Y
Cirsium vulgare	Spear Thistle	None observed	0%	E	Y
Cynara cardunculus	Artichoke Thistle	None observed	0%	E	Y
Echium plantagineum	Paterson's Curse	None observed	0%	C	Y
Foeniculum vulgare	Fennel	Existing and Emerging	5%	C	N
Helminthotheca echioides	Ox-tongue	Existing	5%	C	N
Hypochaeris spp. and *Brassica* spp. *etc*	Flat Weeds and Mustards	Existing	5%	C	N
Plantago spp.	Ribwort	Existing	15%	C	N
Romulea rosea	Onion Grass	Exisitng	2%	C	Y

Scientific Name	Common Name	Existing / Emerging	Current Cover % within the offset site	EMP Target E (<1%) C (<5%)	EMP Target Achieved (Y/N)
Sonchus spp.	Sow-thistle	Existing	2%	C	N
Trifolium spp.	Clovers	Existing	5%	C	N
Vicia sativa	Common Vetch	Existing	1%	C	Y
Xanthium spinosum	Bathurst Burr	Existing	1%	C	Y
GRASSY WEEDS					
Avena spp.	Oats	Existing	10%	C	N
Anthoxanthum odoratum	Sweet Vernal Grass	Existing	30%	C	N
Briza spp.	Quaking Grass	Existing	5%	C	N
Brome spp.	Brome	Existing	10%	C	N
Dactylis glomerata	Cocksfoot	Existing	5%	C	N
Lolium rigidum / Lolium perenne	Wimmera Rye-grass / Perennial Rye-grass	Existing	5%	C	N
Nassella neesiana	Chilean Needle-grass	Existing	5%	E	N
Nassella trichotoma	Serrated Tussock	Not observed	0%	E	Y
Paspalum dilatatum	Paspalum	Existing/ Emerging	3%	C	Y
Phalaris aquatica	Toowoomba Canary-grass	Existing	10%	C	N

Notes: C = Control (<5% Cover), E = Eliminate (<1% Cover)

3.3.1 Woody Weeds

Overall cover of woody weeds across the offset site is high, with approximately 10% cover of mature and re-sprouting plants. Mature woody weeds are typically restricted to the centre of the offset site, with many dense thickets of Sweet Briar existing within PG1 (Figure 1). AES have undergone intensive woody weed controls throughout the perimeter (approximately the outermost 50%) of the offset site (AES 2023), primarily on the northern, southern, and eastern sides. Large areas of Sweet Briar were treated through cut and paint removal, with dead stems piled for later removal. This removal strategy aims to gradually eliminate woody weeds from the offset site sequentially, moving inwards towards the densest thickets in the centre of the offset site.

Mature woody weeds have mostly been eliminated within treated areas. However, many scattered Sweet Briar were observed emerging within these areas, particularly from around the sites of treated thickets. Almost all woody weeds within the offset are Sweet Briar, however a single mature African Box-thorn and

emerging Broom were observed within the untreated centre of the offset site in patch PG1 (Figure 1) (Plate 17; Plate 18).

Woody weed management targets were not met in Year 1, with high woody weed cover persisting within the offset site, and off-target damage occurring from incorrect control methods (incident detailed in 3.7). Scattered individuals of Sweet Briar that are re-sprouting and/or germinating within controlled areas should be addressed in Year 2, as should the emerging Broom and existing African Boxthorn before they can become established. Additionally, many mature Sweet Briar individuals persist in the inner untreated portion of the offset site and should be addressed in Year 2.

Plate 17. Dense thickets of Sweet Briar in PG1 (Ecology and Heritage Partners Pty Ltd 01/11/2023).

Plate 18. Treated Sweet Briar stems piled for removal (northern portion of PG1) (Ecology and Heritage Partners Pty Ltd 01/11/2023).

Table 2 below provides a summary of the management targets as detailed by the EMP and the recommended management measures to be undertaken in Year 2 to ensure Year 2 targets are met.

Table 2. Year 1 Woody weed targets, as per EMP.

Target to be achieved*	Action Completed	Recommendation
<1% cover of all listed woody weeds, with no mature plants present at the end of Year 1	No	Intensive woody weed control throughout Year 2.
Minimise off-target damage	No	Remediation actions taken (as described in section 3.7) to account for off-target MFL impacts. Direct seeding of impacted areas with native grass seeds to encourage reestablishment in Year 2.

*As per the EMP (EHP 2022)

3.3.2 Grassy Weeds

The cover of grassy weeds (perennial and annual) was high within the offset site in Year 1. The dominant grasses within patches are Toowoomba Canary-grass, Sweet Vernal-grass, and annual grasses such as Soft

Brome and Greater Quaking-grass (approx. 40% combined cover throughout the entire site). Throughout PG1, Sweet Briar harbours grassy weeds, with Toowomba Canary-grass, Cocksfoot, and Wild Oats *Avena fatua* often observed growing up from within thickets (Plate 19 to Plate 20).

Areas outside mapped native vegetation are dominated by exotic grasses. The western and southern borders of the study area have a high cover of grassy weeds, with Chilean Needle-grass, Sweet Vernal-grass, Cocksfoot, and Wild Oats being the dominant species (Plate 21). Other high threat grassy weeds such as Paspalum were observed in low numbers in more disturbed areas of the site such as along the site boundaries and within the scraped soil in the north (incident described in section 3.8.1).

Scattered occurrences of Serrated Tussock *Nassella trichotoma* were also observed throughout Year 1. Individuals were spot sprayed by AES with herbicide to prevent further spread, and no living individuals were observed at the end of Year 1 (Plate 22). Ongoing monitoring will check for reoccurrence throughout future years and treat when required to prevent incursion into the offset site.

Plate 19. Phalaris growing up through Sweet Briar thicket in PG1 (Ecology and Heritage Partners Pty Ltd 01/11/2023).

Plate 20. Exotic grasses including Greater Quaking-grass within the weedy southern section (Ecology and Heritage Partners Pty Ltd 08/11/2022).

Plate 21. South-western edge dominated by Chilean Needle-grass (Ecology and Heritage Partners Pty Ltd 01/11/2023).

Plate 22. Treated Serrated Tussock within PG1 (Ecology and Heritage Partners Pty Ltd 01/11/2023).

Table 3 contains a summary of the management targets as set out by the EMP and the corresponding management recommendations to ensure Year 2 targets are achieved.

Table 3. Year 1 Grassy Weed Targets as per EMP.

Target to be achieved	Action Completed	Recommendation
Eliminate (<1% cover) high threat grassy weeds within vegetation patches;	No	Intensive woody weed control throughout Year 2.
Minimise off-target damage (avoid all native plants);	No	Direct seeding of impacted areas with native grass seeds to encourage reestablishment in Year 2.
Control all other grassy weeds (<5% cover);	No	Grassy weed control throughout Year 2.
Reduce perennial grass cover to <40% by end of Year 1; and	No	Grassy weed control throughout Year 2.
Reduce annual grasses to <5% by the end of Year 1.	No	Grassy weed control throughout Year 2.

3.3.3 Herbaceous Weeds

The overall cover of herbaceous weeds was low-moderate in Year 1. No instances of high threat broadleaves such as Artichoke Thistle *Cynara cardunculus*, Spear Thistle *Cirsium vulgare*, or Patersons Curse *Echium plantagineum* were recorded within the offset site. Overall cover within patches of native vegetation is low-moderate (<30%), with less cover observed in higher quality areas of vegetation (such as mapped NTGVVP). The dominant herbaceous weeds include Ribwort, Ox-tongue *Helminthotheca echioides*, Clovers *Trifolium* spp. Flatweed *Hypochaeris radicata* and Fennel (Plate 23; Plate 24).

Plate 23. Area of high Ribwort cover in PG1 (Ecology and Heritage Partners Pty Ltd 01/11/2023).

Plate 24. Bristly Ox-tongue within PG1 (Ecology and Heritage Partners Pty Ltd 01/11/2023).

Table 4 contains a summary of the management targets as set out by the EMP and the corresponding management recommendations to ensure Year 2 targets are achieved.

Table 4. Year 1 Herbaceous weeds targets, as per EMP.

Target to be achieved	Action Completed	Recommendation
Eliminate (<1% cover) high threat herbaceous weeds;	Yes	Monitor for emerging high threat herbaceous weeds throughout Year 2.
Reduce herbaceous board leaves to <5% by the end of Year 2;	No	Ongoing herbaceous broad leaf weed control throughout Year 2.
Minimise off-target damage (avoid all native plants).	Yes	Maintain small scale spot spray approach to prevent off-target damage.

3.3.4 Biomass Management

An Ecological Burn was undertaken by Aus Eco Solutions in July 2023 (Plate 32 – Plate 35). This burn was delayed due to unfavourable weather conditions. The resultant burn occurred on greener vegetation, hindering the biomass reduction (AES 2023).

The offset site was burnt in a patchy mosaic within the northern edge of the offset site. Areas of grassy and herbaceous weeds had been successfully spot sprayed prior to the burn, and these areas were targeted by the burn to reduce the dead weedy biomass. Additionally, the cut stems from treated woody weeds were piled within burn areas and burnt off to remove from the offset site (AES 2023) (Plate 29: Plate 30).

The bare ground provided by the burn was colonised quickly. Opportunistic herbaceous and annual weeds were recoded emerging in these areas, as well as native grass species such as Kangaroo Grass.

Despite pre-burn weed control works being undertaken, weed germination and establishment post-burn were common and follow-up works are required to control weeds, particularly herbaceous weeds, and promote native species growth and spread. Year 2 weed control works should continue to target high threat grasses and herbaceous species that emerge in the burn areas.

Woody weed control works were undertaken throughout Year 1, and continued post burn. Because of this, cut stems from these works continued to pile up within the offset site. These piles have the potential to harbour exotic animal species and smother out native species underneath. These piles should be addressed in Year 2, and either be hand removed or burnt in subsequent burns to reduce their impact on the offset site (Plate 25; Plate 26).

Plate 25. July burn underway by AES crew members (Aus Eco Solutions 07/2023).

Plate 26. Completed ecological burn (Aus Eco Solutions 07/2023).

Plate 27. Pile of cut stems piled by AES from Sweet Briar control (Ecology and Heritage Partners Pty Ltd 01/11/2023).

Plate 28. Pile of cut stems piled by AES from Sweet Briar control (Ecology and Heritage Partners Pty Ltd 01/11/2023).

Table 5 contains a summary of the management targets as set out by the EMP and the corresponding management recommendations to ensure Year 2 targets are achieved.

Table 5. Year 1 Biomass targets, as per EMP.

Target to be achieved	Action Completed	Recommendation
Burn in early spring to avoid seed set of exotic species;	Yes	Monitor biomass in Year 2 and perform further mosaic ecological burns as required.
Provide bare ground and intertussock spaces for native recruitment;	Yes	Monitor biomass in Year 2 and perform further mosaic ecological burns as required.
No loss of native plant diversity as a result of burning regimes; and	Yes	Monitor biomass in Year 2 and perform further mosaic ecological burns as required.
Low intensity and patchy burns to avoid damage to MFL.	Yes	Monitor biomass in Year 2 and perform further mosaic ecological burns as required.

3.4 Fencing / Stock Exclusion

In Year 1, fencing contractors completed a permanent perimeter fence around the offset site. Throughout Year 1 several disturbances to this fence took place. Civil contractors noted that the fence was not constructed to the correct alignment and encroached on the construction area on the southern side. This

portion of the fence was taken down and was reinstated to the correct alignment within a week, with completion on the 27th of June (Plate 29: Plate 30).

Subsequently, the scraping of the northern boundary (incident described in section 3.8.1) and soil erosion along the eastern boundary (incident described in section 3.8.2) both caused compromises to the rabbit proofing of the fence in these areas. While compromised, access underneath the fencing by pest fauna was possible.

Fencing contractors pinned down the fence along the northern boundary, however the eastern edge could not be rectified until completion of the adjacent kerb within the construction area. This kerb has now been completed and the soil levels equalized to prevent further erosion. The rabbit proof fencing remains lifted in areas and access underneath the fence is still possible in places along the eastern boundary. The rabbit proofing along this edge must be pinned down to prevent any pest animal incursion into the offset area.

Plate 29. South-eastern fence being corrected to intended alignment (Ecology and heritage Partners 31/05/2023).

Plate 30. South-eastern fence being corrected to intended alignment (Ecology and heritage Partners 31/05/2023).

Plate 31. Gap underneath eastern fence rabbit proofing (Ecology and Heritage Partners Pty Ltd 01/11/2023).

Plate 32. Gap underneath eastern fence rabbit proofing (Ecology and Heritage Partners Pty Ltd 01/11/2023).

Table 6 contains a summary of the management targets as set out by the EMP and the corresponding management recommendations to ensure Year 2 targets are achieved.

Table 6. Year 1 Fencing/Stock exclusion targets, as per EMP.

Target to be achieved	Action Completed	Recommendation
Erect permanent rabbit proof fencing surrounding the conservation reserve with at least one access gate;	No	In year 2 Pin down rabbit proof fencing on eastern side, adjoining the construction area where rabbit proofing has lifted.
Append rabbit proofing to existing fencing along the western edge of the offset site;	Yes	Ongoing herbaceous broad leaf weed control throughout Year 2.
Install signs around the reserve to highlight the importance of the vegetation within the offset; and	Yes	Monitor signs and repair or replace as required throughout Year 2.
Ongoing monitoring of fencing for damage.	Yes	Monitor fences and repair or replace as required throughout Year 2.

3.5 Pest Animals

No evidence of pest animals was observed during Year 1. However, at several points throughout the year access under the fencing was possible, and as such rabbit presence within the offset site is possible. Ongoing monitoring for pest animals will continue to ensure that none are present within the offset site.

Table 7 contains a summary of the management targets as set out by the EMP and the corresponding management recommendations to ensure Year 2 targets are achieved.

Table 7. Year 1 Fencing/Stock exclusion targets, as per EMP.

Target to be achieved	Action Completed	Recommendation
No surface disturbance within the offset site.	Yes	Monitor offset site for pest animals and control as required throughout Year 2.
No active rabbit warrens to be present.	Yes	Monitor offset site for pest animals and control as required throughout Year 2.
No active fox dens to be present.	Yes	Monitor offset site for pest animals and control as required throughout Year 2.
Control numbers of rabbits and foxes.	Yes	Monitor offset site for pest animals and control as required throughout Year 2.
Control numbers of any new and emerging pest animals.	Yes	Monitor offset site for pest animals and control as required throughout Year 2.

3.6 Rubbish

Rubbish across the site is low, however throughout Year 1, rubbish dumping has occurred within the surrounding land and within the offset site, particularly along the northern border next to the access track from the adjacent Whittlesea Public Gardens. Rubbish within the offset site is believed to have been dumped by the public, lighter pieces blown in by the wind, and fence construction materials abandoned within the offset site by fencing contractors (Plate 33 – Plate 36). This rubbish is continually removed by Aus Eco Solutions as required. While rubbish within the offset site is low, ongoing monitoring from AES and EHP is required to identify and remove rubbish as soon as it occurs.

Plate 33. Dumped rubbish within the offset site (Ecology and Heritage Partners Pty Ltd 31/05/2023).

Plate 34. Unused fencing material abandoned within offset site (Ecology and Heritage Partners Pty Ltd 31/05/2023).

Plate 35. Rubbish dumped within the offset site (Ecology and Heritage Partners Pty Ltd 01/11/2023).

Plate 36. Blow rubbish within the offset site (Ecology and Heritage Partners Pty Ltd 31/05/2023).

3.7 Off-target Damage to Remnant Matted Flax-lily

In January of Year 1, the City of Whittlesea (CoW) notified YourLand Developments that they had undertaken a site inspection and observed off-target damage to native vegetation from inappropriate weed control

works within the offset site. AES had removed large areas of woody weeds (primarily Sweet Briar) by brush cutting and spraying the stems with a non-selective herbicide. The non-selective herbicide was applied to a large area, damaging the surrounding vegetation within a radius of 1-2 metres from the target plant (Plate 1; Plate 2).

Aus Eco Solutions were notified by YourLand Developments of the damage to the offset site via email on 6 January 2023. A site inspection was undertaken by AES (the project coordinator) on 10 January 2023, and an incident report was provided to Ecology and Heritage Partners on 16 January 2023.

Follow up inspections were undertaken by EHP on the 16 January and the 25 January and identified that most of the impacted area consisted of exotic pasture grasses. Relatively little native vegetation impacted, and it was generally only native grasses around the perimeter of the sprayed exotic grasses. However, it was also identified that seven remnant Matted Flax-lily were impacted as off-target damage from the herbicide. An incident report was prepared by AES, reviewed by EHP, and submitted to the Department of Climate Change, Energy, the Environment, and Water on the 7 February 2023. Corrective actions were prepared in consultation with the CoW, EHP and YourLand Developments.

AES undertook several remediation works to prevent a similar incident occurring again. These included:

- Woody weed control will be completed using the correct techniques and herbicides. If brush cutting is used to remove stumps, they will cut at approximately 50 centimetres above ground level to ensure Matted Flax-lily are not impacted by the brush cutting. Herbicide will be applied using a dabber directly to the freshly cut stem, and not during wet weather events. This ensures that broad scale herbicide application does not occur within the conservation area again;
- Direct seeding with native grasses will be undertaken in areas sprayed with herbicide to re-establish the cover of native vegetation;
- All impacted Matted Flax-lily are receiving ongoing monitoring, watering, and hand weeding for the remainder of the monitoring period for the translocated MFL;
- All Matted Flax-lily that do not recover will be replaced with translocated material from salvaged plants in the development area that are being held in a nursery. To date, one MFL has died and will be replaced in year 2;
- Ongoing monitoring around treatment areas to ensure no future off-target damage;
- AES staff will receive additional in-house training; and,
- AES will ensure that all staff understand their responsibilities when undertaking works within the conservation area. All staff undertaking works within the conservation reserve will have access to the EMP and induction material.

The seven impacted MFL, plus one additional MFL which was unimpacted but near control works, were added to the monitoring schedule and regularly checked. Six of the impacted plants recovered and are now in good health, however, one plant (#39) experiencing rapid die-off and can no longer be located. This location will continue to be monitored until the end of the flowering period (November-January 2023/24) to ensure that #39 does not re-emerge. It will then be assumed dead and a replacement MFL from nursery stock will be translocated into the offset site. These additional MFL will be included in all future monitoring and reporting.

3.8 Damage to Offset Site During Construction Works

3.8.1 Soil Scraping Incident

Throughout construction of the rabbit proof fence surrounding the offset site, the topsoil of a 0.011 hectare area within the north-western corner of the offset site was scraped away by civil contractors in June 2023. This removal was unplanned and carried out by the civil contractor to assist fence construction by removal of large, embedded rocks in the area (Plate 37; Plate 38). This incident occurred with no instruction from any party (i.e. Ecology and heritage Partners or YourLand Pty Ltd) and occurred despite both the fencers and civil contractors being inducted in accordance with the CEMP (EHP2018b).

This area had previously been mapped as Plains Grassland and as having two Matted Flax-lily plants within the impact area during preliminary biodiversity surveys (Brett Lane & Associates, 2010). During the MFL survey and translocation works in late 2022, no MFL were found during this area and the individuals recorded in 2010 were believed to no longer be present. Despite this, rectification works were completed to account for the potential loss of these two MFL individuals.

Aus Eco Solutions transplanted an additional four MFL into the recipient site, adjacent to the existing translocated MFL, on 7 September 2023 (Figure 1). These individuals were genetic clones of previously transplanted MFL (plants 1, 6, 10, and 23) which were taken from reserve stock held at the nursey and were added into the monitoring schedule. After slight yellowing of some tillers during the translocation stress, these MFL have established well. All four plants were recorded in good health and flowering during the most recent MFL monitoring event completed on 1 November 2023. These four plants are continuing to be monitored closely by AES and EHP and are being watered if signs of heat stress are identified.

To remediate the scraped area within the offset site, seed collection and direct seeding of native grasses was carried out by AES. A seed mix of native species was direct seeded into the scraped area on August 2023. This seed mix consisted of Kangaroo Grass, Wallaby-grasses and Spear-grass species present within the offset area. This area was monitored for germination of these seeds and emergence of native grasses. Despite the seeding event, primarily opportunistic exotic annual species were recorded emerging within the scraped area. Emerging species included Greater Quaking-grass, Lesser Quaking-grass *Briza minor,* and Ribwort. Perennial species were also recorded emerging within this area including Sweet Briar and Paspalum (Plate 39; Plate 40).

Ongoing seeding and weed control works are currently underway in consultation with the City of Whittlesea to ensure native vegetation characteristic of the previously present native vegetation is reinstated. More native seed comprising a mixture of species better adapted to wet depressions including Common Spikerush *Eleocharis acuta,* Prickfoot *Eryngium vesiculosum,* Native millet *Panicum decompositum var. decompositum* and Tasmanian Wallaby-grass *Rytidosperma semiannulare* will be broadcast within the low lying wet depressions to better suit the microtopographic changes which have occurred as a result of the scraping. Additional native seed comprising species of local provenance, characteristic of the NTGVVP and Plains Grassland vegetation communities will be broadcast in early summer to promote the colonisation of native species and reinstatement of all native vegetation lost during the scraping event.

Plate 37. Scraped area within offset site (Ecology and Heritage Partners Pty Ltd 31/05/2023).

Plate 38. Scraped area within offset site (Ecology and Heritage Partners Pty Ltd 31/05/2023).

Plate 39. Exotic species emerging in the scraped area (Ecology and Heritage Partners Pty Ltd 01/11/2023).

Plate 40. Sweet Briar emerging in the scraped area (Ecology and Heritage Partners Pty Ltd 01/11/2023).

3.8.2 Erosion Along Eastern Fence Line

Throughout Year 1, groundworks occurred for the residential development outside the south-eastern edge of the offset site. Due to the presence of large rocks along this edge of the fence line, civil contractors were required to excavate deeper than initial design levels. Removal of these large rocks was required to form a stable base for future road construction. However, the removal of these rocks caused large holes within the offset site along this edge, and the subsequent erosion of soil from the offset site into the construction zone. This caused some loss of native species and mapped Plains Grassland from within the offset site (Plate 41).

As a temporary measure, civil contractors implemented soil barriers along this edge to prevent further erosion (Plate 42). Additionally, to ensure all civil contractors were aware of the risk works along this edge posed to the offset site, the importance of caution around this edge was addressed in each subsequent 'toolbox talk' meeting. These measures prevented further erosion and damage to the offset site throughout construction, and soil levels were equalized upon completion of a permanent kerb along this edge (Plate 43).

After levelling the ground with kerb placement, weed free soil was placed within any holes remaining from the erosion to level the soil along this edge within the offset site. Following recommendations from Davide

Coppolino (Biodiversity Strategy and Auditing Officer) from the City of Whittlesea, native species effective in binding soil and preventing further erosion will be direct planted into these areas (e.g. Common Tussock Grass *Poa labillardierei)*. In Year 2, monitoring of these planted/seeded areas, additional weed control, direct planting and broadcast of seed will occur to prevent the incursion of weeds and promote the establishment of native species within these areas.

Additionally, several areas of the rabbit proofing along this edge were lifted away from the soil through erosion and the subsequent remediation works. As such, access underneath the fence by rabbits is possible in several locations along this edge (Plate 44). Follow up works are required in to pin down these areas of fence and rabbit proof the offset site.

Plate 41. Erosion of offset site adjoining construction area (Ecology and Heritage Partners Pty Ltd 31/05/2023).

Plate 42. Interim soil barriers implemented to prevent further erosion (Ecology and Heritage Partners Pty Ltd 24/08/2023).

Plate 43. Implemented kerb leveling out soil within offset site and adjacent construction zone (Ecology and Heritage Partners Pty Ltd 01/11/2023).

Plate 44. Rabbit proofing lifting along eastern fence, adjoining construction works (Ecology and Heritage Partners Pty Ltd 01/11/2023).

3.9 Management Action Plan

An assessment of completed actions to date against the Management Actions for the Conservation Reserve as outlined in table 10 of the EMP. One minor correction to the management actions has been made since the preparation of the EMP and will be included within the updated EMP to be completed in 2024. The Key performance targets for Actions 1.4 and 1.5 read "Reduce cover of woody weeds to <1% by the end of Year 1" and "Reduction in weed cover to <5%" respectively. However, due to the impracticality of achieving these targets by the end of Year 1, and in the context of subsequent management actions, these targets are understood to have been an error. The Action 1.4 Key performance target will be reviewed in an amended EMP to be completed by the end of April 2024. Action 1.5 was adjusted below and will be adjusted in the amended EMP to read ''a reduction of perennial grass cover to <40% and annual grasses/broadleaves to <5%'', in line with the subsequent targets in actions 3.2 – 10.2.

Table 2. Summary of Management Actions and Targets for Year 1 of Monitoring.

Year	Action No.	Land use and management actions to be completed	Resource/ personnel required	Timing of action	Key performance target	Target Achieved (Y/N)	Action Required in Year 2
	Year 1						
0	*0.1*	Approve Environment Management Plan	Liaise between Council, DELWP/ DoE	Pre-commencement of any works associated with the construction of the residential development.	EMP approved by relevant parties. No construction works to occur until Action 0.1 and 0.2 are satisfied.	Y	-
0	*0.2*	Secure Conservation Reserve with Section 173 Agreement	Landowner/Council	Once EMP approved	Conservation Reserve secured with on-title agreement. No construction works to occur until Action 0.1 and 0.2 are satisfied.	Y	-
0	*0.3*	Commence salvage of Matted Flax-lily plants	Landowner/ Bushland Manager/ Qualified Ecologist	Once Conservation Reserve secured with s.173	All impacted Matted Flax-lily salvaged from development footprint.	Y	Ongoing monitoring of transplanted MFL for a further 4 years in accordance with the MTP.
1	*1.1*	Install Perimeter Rabbit Proof Fence around Conservation Reserve	Landowner/Fencing Contractor	Prior to the commencement of all construction works including any approved early works or site clearing.	Permanent fence is installed and signs erected prior to commencement of residential development works	N	Permanent fence installed and in good condition, however sections along eastern side need pinning down to re-establish rabbit proofing. Continue to monitor and undertake repairs, if required.

Year	Action No.	Land use and management actions to be completed	Resource/ personnel required	Timing of action	Key performance target	Target Achieved (Y/N)	Action Required in Year 2
1	*1.2*	Install temporary construction fencing around Public Reserve	Landowner/Fencing or Building Contractor	Prior to the commencement of all construction works including any approved early works or site clearing.	Temporary fence is installed and signs erected prior to commencement of residential development works	Y	Maintain temporary fencing throughout construction.
1	*1.3*	Removal of all existing rubbish from site and rubbish removed immediately if further dumping occurs.	Landowner/Contractor	Prior to commencement of residential development works – Ongoing.	All rubbished removed and removed immediately if dumping occurs	Y	Rubbish is typically windblown and dumped rubbish that enters the offset site from the adjacent public land. AES regularly remove rubbish from the offset site and will continue to remove rubbish in Year 2.
1	*1.4*	Removal of all woody weeds specifically African Boxthorn and Sweet Briar. Remove all woody debris from site.	Bushland Mgt Contractor/Landowner	Before seed heads mature in spring/summer.	Reduce cover of woody weeds to <1% by the end of Year 1	N	Ongoing woody weed control focusing on the dense thickets of Sweet Briar in the centre of PG1. In Year 2, additional resources have been allocated to increase woody weed control.
1	*1.5*	Undertake control of exotic grasses and herbaceous broad leaves. Two visits in spring, one visit in summer, autumn, winter	Bushland Mgt Contractor/ Landowner	Before seed heads mature in spring/summer Five visits per year	Reduce perennial grass cover to <40% and annual grasses/broadleaves to <5%	N	Ongoing grassy weed control.
1	*1.6*	Conduct rabbit control if required. (Warren fumigation and/or thatch removal)	Pest Mgt Contractor/Landowner	After peak breeding season - late summer/early autumn.	Significant reduction in number/signs of rabbits.	Y	Continue to monitor for evidence of pest animals and undertake pest animal control, if required.
1	*1.7*	Undertake biomass reduction either through weeding or small mosaic burns in selected areas.	Bushland Mgt Contractor/ Landowner	Autumn	Areas of intertussock space opened up to allow recruitment	Y	Burn completed in July 2023. Undertake further biomass reduction (weeding/mosaic burns) in targeted areas as required.

Year	Action No.	Land use and management actions to be completed	Resource/ personnel required	Timing of action	Key performance target	Target Achieved (Y/N)	Action Required in Year 2
1	*1.8*	Undertake collection of grass seeds for direct seeding in Year 2	Bushland Mgt Contractor/ Landowner	Summer	Enough seed collected to cover areas to be direct seeded in Year 2	Y	Native grass seed was collected and spread. Undergo further collection as required to direct seed planned areas.
1	*1.9*	Prepare area to be direct seeded in year 2.	Bushland Mgt Contractor/ Landowner	Spring/Summer	Area of low native cover prepared to be directed seeded	Y	Burnt and damaged areas opened for direct seeding. Continue with planned direct seeding of these prepared areas.
1	*1.10*	Install signage detailing significance of area for ecological values	Landowner	Immediately after acceptance of Offset Management Plan	Signage is installed and remains in place for the duration of the offsets	Y	Undertake repairs or replacement of Significant Vegetation signs if required
1	*1.11*	Monitor status of vegetation condition, and the status Matted Flax-lily and the condition of habitat within the reserves and provide annual report to relevant authorities.	Qualified Ecologist/ Landowner	12 months after CMP is implemented	Report provided to relevant authorities detailing monitoring results.	Y	Continue to monitor Plains Grassland and MFL population.

4 CONCLUSION AND RECOMENDATIONS

Year 1 monitoring was undertaken as outlined in the EMP to ensure compliance with the EPBC Act approval conditions. The overall quality of vegetation in the offset site has improved from the baseline conditions observed, however ongoing management and monitoring is required to eliminate existing high threat weeds.

Most of the vegetation patches (extent and quality) remained consistent with the baseline and maintained a high diversity of native herbs and graminoid species. Additionally, a large portion of the weedy southern area (0.1707 hectares) which was not recorded as native vegetation during the baseline assessment was recorded as Plains Grassland during the most recent vegetation assessment completed in November 2023. The total Plains Grassland on site is now 3.16 hectares and of that, 0.343 hectares qualify as NTGVVP.

The cover of herbaceous and grassy weed species did not increase beyond the baseline levels, and the woody weed cover saw substantial decrease due to the intensive control works undertaken by AES. There is still a high cover of Sweet Briar within the offset (approx. 10%) consisting of mature and recruiting individuals within PG1's centre, and re-emerging individuals around the perimeters of PG1 and in the southern portion of the offset site. This does not meet the <1% at the end of Year 1 target, and intensive woody weed control works will have to continue in Year 2 to eliminate woody weeds.

Biomass is generally moderate-high throughout the offset site, with PG1 having many large Sweet Briar thickets with large weedy grasses such as Wild Oat, Toowomba Canary-grass, Cocksfoot, and Chilean Needle-grass. A small patch burn was undertaken in July of Year 1. This was later than desired and resulted in less biomass reduction than anticipated. This burn removed several small drifts of Toowomba Canary-grass and other exotic grasses and cut stems from the woody weed control works. However, many new piles of cut Sweet Briar stems have since been left within the offset area which require removal in Year 2.

Survivorship of the translocated MFL was high and suggests translocation was successful. Of the 44 MFL monitored (from both transplanted cohorts and in-situ MFL), 42 were reported in good-moderate health, 16 of which were flowering during the 1 November 2023 monitoring. Two individuals (one from the initial transplant cohort, and one in-situ MFL from the off-target damage) were recorded as dead. These individuals will continue to be monitored throughout the flowering period to observe any re-emergence, after which time replacement MFL from the reserve stock will be translocated into the offset site to compensate for their loss.

Two incidents occurred within the offset site in Year 1, soil erosion along the eastern boundary and scraping of the ground near the north-western boundary. These two incidents were reported, and remediation works have commenced. An additional four MFL were transplanted into the recipient site to allow for potential loss of two MFL within the scraped area, and the construction of the kerb along the eastern boundary has been completed, with the soil level re-instated to match that of the offset site. All impacted areas within the offset site will continue to be rehabilitated during Year 2. Follow up weed control and subsequent direct seeding of will be undertaken to prevent the dominance of weeds and encourage the re-colonisation of native species within the impacted areas.

To ensure that the native vegetation and habitat for MFL continues to improve, the following works should be incorporated into the Year 2 land management and monitoring in addition to EMP management requirements (EHP 2022: Table 10):

- Pin down rabbit proof fencing where it has lifted along the eastern boundary;
- Follow up weed control and direct seeding of areas impacted by the northern scraping and eastern edge erosion incidents;
- Remove all piles of cut woody weed stems from within the offset site;
- Transplant two (2) new MFL from reserve stock into the recipient location if MFL #2 and #39 do not re-emerge; and,
- Continue intensive woody weed control works to achieve the target of <1% cover.

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Figure 1
Ecological values
135-161 Barry Road, Thomastown

Legend

- Conservation Area
- 135-161 Barry Road
- Construction boundary
- Matted Flax-lily recipient site
- Translocated Matted Flax-lily 2023
- Translocated Matted Flax-lily 2022
- Matted Flax-lily
- Photopoints
- Impacted Matted Flax-lily
- Proposed Natural Temperate Grassland of the Victorian Volcanic Plain offset area

Ecological Vegetation Class

- Plains Grassland (EVC 132)

EPBC Act Listed Community

- Natural Temperate Grassland of the Victorian Volcanic Plain

N

0 15 30
Metres

Map Scale: 1:1,500 @ A4
Coordinate System:
GDA 1994 MGA Zone 55

ecology & heritage partners

15695_Fig01_EcoFeatCA 12/12/2023 melsley

Aerial source: Nearmap 2023

APPENDICES

Appendix 1. Habitat Hectare Assessment

Table A1.1. Habitat hectare assessment for Year 1 (01/11/2023).

Vegetation Zone		PG1	PG2(a-b)	PG3(a-b)
Bioregion		VVP	VVP	VVP
EVC / Tree		PG	PG	PG
EVC Number		132_61	132_61	132_61
EVC Conservation Status		Endangered	Endangered	Endangered
Patch Condition	Large Old Trees /10	NA	NA	NA
	Canopy Cover /5	NA	NA	NA
	Under storey /25	15	5	10
	Lack of Weeds /15	4	4	7
	Recruitment /10	6	3	3
	Organic Matter /5	2	3	3
	Logs /5	NA	NA	NA
	Treeless EVC Multiplier	1.36	1.36	1.36
	Subtotal =	36.72	20.4	31.28
Landscape Value /25		10	5	5
Habitat Points /100		46.72	25.4	36.28
Habitat Score		**0.47**	**0.25**	**0.36**

Notes: PG = Plains Grassland, VVP = Victorian Volcanic Plain.

Appendix 2. *Dianella amoena* (MFL) Monitoring Sheet Data (01/11/2023)

Plant No.	Alive (Y/N)	Length (cm)	Width (cm)	Height (cm)	No. Flower Spikes	No. Leaflets/tillers	No. ramets	Overall Health (G/M/P)	Grazing damage (Y/N)
Initial 32 MFL Translocation Cohort									
1	Y	30	30	25	-	60	20	G	N
2	N	-	-	-	-	-	-	-	-
3	Y	2	2	20	-	4	1	G	N
4	Y	20	30	20	-	30	12	G	N
5	Y	2	2	16	-	4	1	G	N
6	Y	10	25	15	-	23	7	G	N
7	Y	40	35	22	-	45	15	G	N
8	Y	30	20	13	-	17	5	G	N
9	Y	35	40	27	-	75	25	G	N
10	Y	40	40	40	9	75	25	G	N
11	Y	20	30	21	2	15	3	G	N
12	Y	30	10	15	-	8	2	G	N
13	Y	30	15	25	1	22	5	G	N
14	Y	30	40	25	2	70	20	G	N
15	Y	20	30	35	3	50	10	G	N
16	Y	30	30	25	1	40	10	G	N
17	Y	50	40	20	-	25	6	G	N
18	Y	20	35	23	-	24	7	G	N

Plant No.	Alive (Y/N)	Length (cm)	Width (cm)	Height (cm)	No. Flower Spikes	No. Leaflets/tillers	No. ramets	Overall Health (G/M/P)	Grazing damage (Y/N)
19	Y	10	15	18	-	9	2	G	N
20	Y	25	10	19	-	20	5	G	N
21	Y	5	5	20	-	7	2	G	N
22	Y	35	30	22	-	25	8	G	N
23	Y	20	10	14	-	14	4	G	N
24	Y	30	50	25	-	100+	30+	G	N
25	Y	20	30	20	-	50	15	G	N
26	Y	20	25	18	-	20	6	G	N
27	Y	20	15	8	-	16	5	G	N
28	Y	20	20	10	-	22	7	G	N
29	Y	35	10	16	-	29	7	G	N
30	Y	20	10	13	-	18	5	G	N
31	Y	25	30	17	-	35	10	G	N
32	Y	20	15	11	-	25	8	G	N
Off-target Damage affected MFL									
33	Y	30	30	18	2	20	5	G	N
34	Y	30	45	14	1	40	15	G	N
35	Y	150	200	35	-	150+	50+	G	N
36	Y	20	50	15	2	16	3	G	N
37	Y	70	150	25	2	150+	40+	M	N
38	Y	100	60	20	18	150+	30+	G	N
39	**N**	-	-	-	-	-	-	-	-

Plant No.	Alive (Y/N)	Length (cm)	Width (cm)	Height (cm)	No. Flower Spikes	No. Leaflets/tillers	No. ramets	Overall Health (G/M/P)	Grazing damage (Y/N)
40	Y	100+	100+	20	2	many	many	G	N
Remediation MFL for Scraping Incident									
41 (6.1)	Y	30	30	40	3	50	15	G	N
42 (23.1)	Y	25	25	35	4	50	15	G	N
43 (1.1)	Y	30	25	40	5	70+	20+	G	N
44 (10.1)	Y	30	40	35	7	100+	25+	G	N

Notes: MFL#40 intermingled with many chocolate lilies, in good health but unable to accurately determine complete extent.

Appendix 3. Photo Points (November 2023)

A2.1 Year One Photo Points

A 4.1. Photo point 1 (Ecology and Heritage Partners 01/11/2023).

A 4.2 Photo point 2 (Ecology and Heritage Partners 01/11/2023).

A 4.3. Photo point 3 (Ecology and Heritage Partners 01/11/2023).

A 4.4. Photo point 4 (Ecology and Heritage Partners 01/11/2023).

A 4.5. Photo point 5 (Ecology and Heritage Partners 01/11/2023).

A 4.6. Photo point 6 (Ecology and Heritage Partners 01/11/2023).

A 4.7. Photo point 7 (Ecology and Heritage Partners 01/11/2023).

A 4.8. Photo point 8 (Ecology and Heritage Partners 01/11/2023).

A 4.9. Photo point 9 (Ecology and Heritage Partners 01/11/2023).

A.2.2 Photo Point Data

Date	Photo Point ID	Direction
1/11/2023	1	South-west
1/11/2023	2	South
1/11/2023	3	South-east
1/11/2023	4	East
1/11/2023	5	North
1/11/2023	6	North-west
1/11/2023	7	North-west
1/11/2023	8	West
1/11/2023	9	South

Appendix 4. Summary of EHP Year 1 Activities within the Offset

Table A4.1. Summary of EHP activities onsite in year 1.

Date	Activity
17/01/2023	Baseline Data Collection
27/01/2023	Summer Site Assessment MFL Monitoring Check
06/02/2023	MFL Monitoring Check
20/02/2023	MFL Monitoring Check
06/03/2023	MFL Monitoring Check
20/03/2023	MFL Monitoring Check
03/04/2023	MFL Monitoring Check
02/05/2023	MFL Monitoring Check
31/05/2023	Autumn Site Assessment MFL Monitoring Check
04/07/2023	MFL Monitoring Check
24/08/2023	Winter Site Assessment
07/09/2023	MFL Monitoring Check
01/11/2023	Spring Site Assessment MFL Monitoring Check
15/11/2023	PG and NTGVVP Monitoring

A2480 P3778 - Barry Road Offset Land Management 2022-23 - Annual Report

Report for Your Land and EHP

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Contents

1. Introduction:

Aus Eco solutions were engaged by Your Land developments and EHP to undertake the vegetation and land management works of the Barry's road grassland reserve for the 2022-2023 year/ Year 1 of the EMP.

1.2 PROJECT BACKGROUND:

SITE DESCRIPTION:

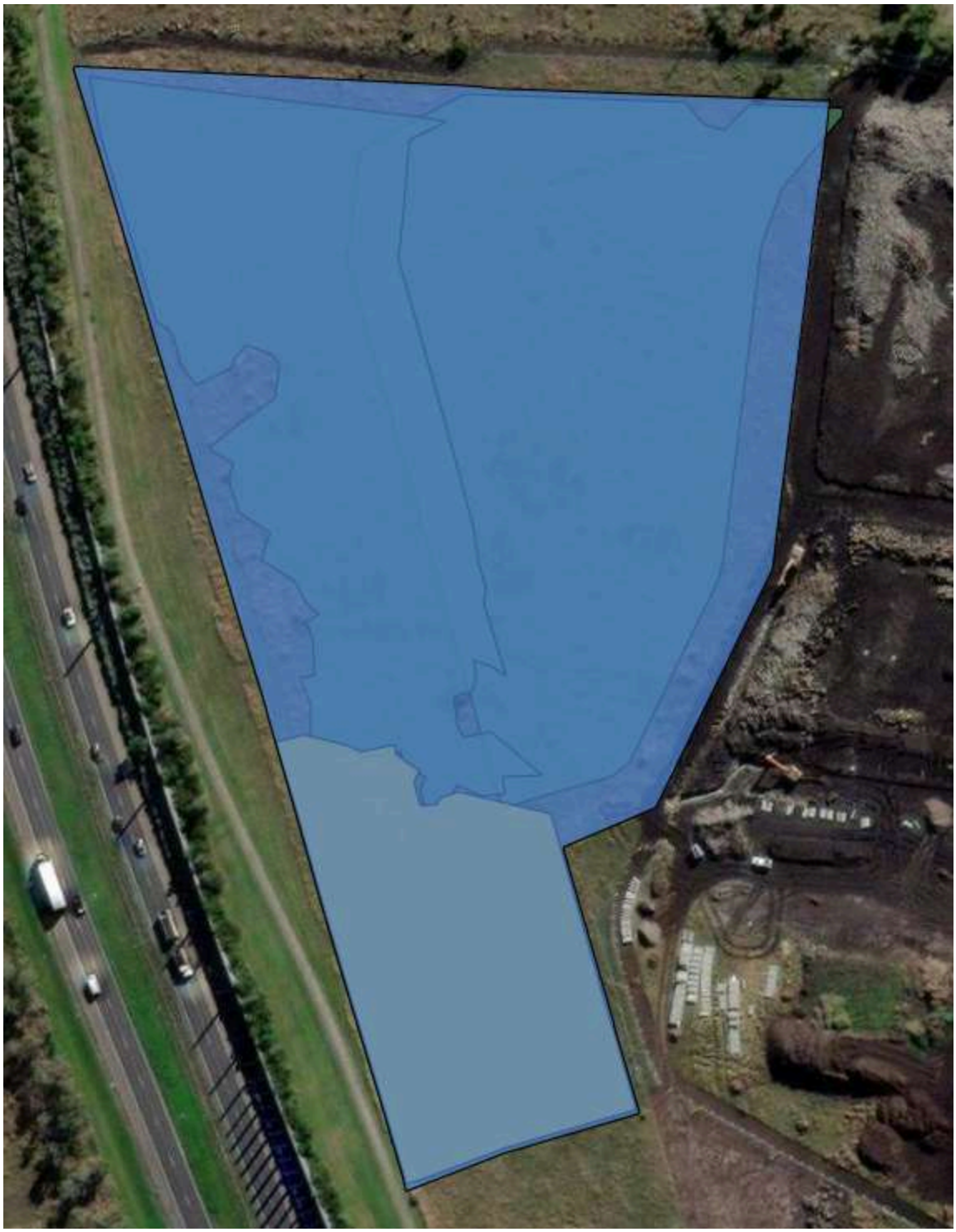
The Barry's road grassland reserve is approximately 4.151 hectares in size and is boarded by the Craigieburn bypass to the North and West and the Your Land development to the East. The Grassland reserve is management for the conservation and enhancement of the grassland reserve including the endangered species Matted Flax-lilly which has been found across the site and has also be translocated from the adjoining Construction site. The site in dominated by exotic invasive weeds including large patches of sweet bria with scattered patches native grassland species.

AUS ECO SOLUTIONS

Aus Eco Solutions has depots in Ballan west of Melbourne in Victoria and Wingham on the mid-north coast of New South Wales. Our family based business combines the technical knowledge of 25+ years of our founder, Kristian Guppy, with the 30+ year's experience in business systems and project management skills of his wife, Kerrie Guppy. Our business attracts a dedicated, qualified and experienced team who work with integrity and take great pride in the legacy of our work to restore native ecosystems.

Kristian holds a DELWP VIC Commercial Operators License. The Aus Eco Solutions team includes a mix of people with financial, managerial, administrative and conservation and land management qualifications and experience. Relevant qualifications include; Bachelors and Masters in Applied Science, Zoology and Environmental Management, Diplomas and Certificates II, III & IV in Conservation and Land Management, DELWP VIC Agricultural Chemical User Permits (ACUP), Chemcert, chainsaw (fallers and crosscut), pest animal management, all-terrain vehicle training, OHS training, vehicle hygiene and first aid (level 2). Our employees also have significant experience in plant identification, particularly weeds and natives to ensure off-target damage is minimised.

Aus Eco Solutions has an integrated management system framework in place that covers quality, environmental and occupational health and safety. This framework is certified to AS/ISO 9001 Quality Management Systems, AS/ISO 14001 Environmental Management Systems, AS/ISO 45000 Occupational Health and Safety Management Systems. Aus Eco Solutions is also a member of VECCI to ensure industrial relations and OHS requirements are met.



2 . Project Objective

The project objectives are as set in the EMP:

Maintain and enhance the identified ecological values present in the form of remnant Natural Temperate Grassland of the Victoria.Volcanic Plain (NTGVVP) community and the Matted Flax-lily population, and provide applicable, transparentgovernance arrangements that allow ongoing management objectives and performance targets to be readilymeasured, monitored, audited and enforced.

3. Management Actions

The following management actions have been undertaken from

October 2022 to October 2023 timeframe to assist in achieving the overall project objectives for this site as started in the EMP.

Note:

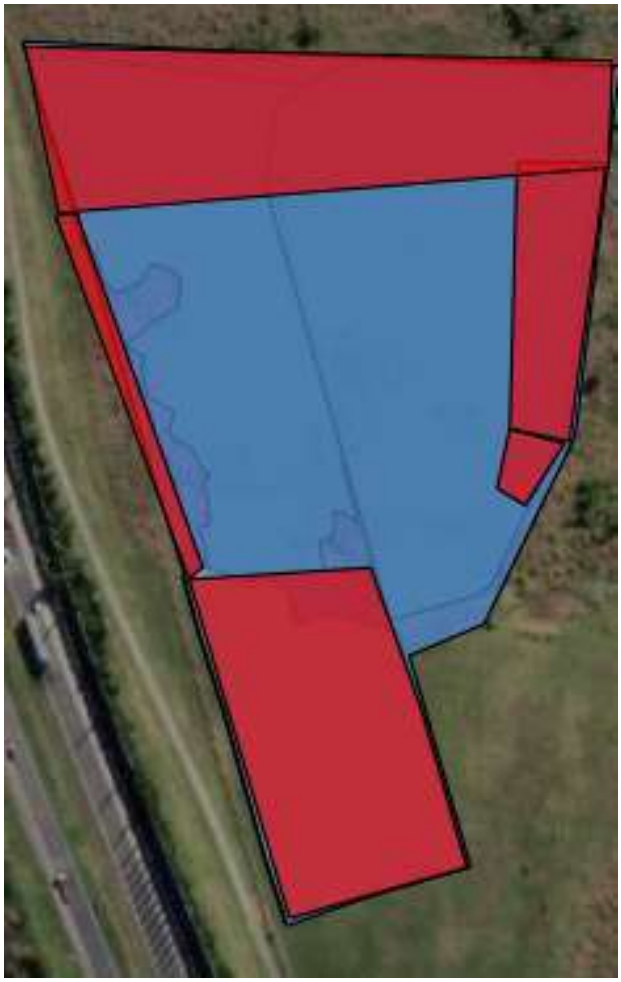
We were unable to reach the original weed control objectives for year 1 of the EMP due to the size of the patches of invasive weeds, mainly the Bria Rose densities. See below maps for further information about the areas we treated during Year 1.

3.1 MFL TRANSLOCATION

The MFL translocation occurred from October through the December, there was 32 plants total with a third of each plant going into the recipient site. With the remaining 2 thirds going to the nursery (1/3rd held as replacements for the recipient site and 1/3 held for up to 5 years and back ups)

3.2 WOODY WEED CONTROL

The year one woody weed control focused on works around the MFL translocation site and the perimeters of the reserve , working from the fence line into the reserve . The middle section of the grassland did not receive any woody weed control during this management period and the works done on the Perimeters and the translocation site will; require follow up for new Bria rose from the current seed bank. See below map for areas treated in Red. The woody weed control works performed have reduce the overall weedy bio mass for the red areas and allowed for native species recruitment throughout the patches.



Pile of cut and painted Bria Rose

3.3 HERBACEOUS/ GRASSY WEED CONTROL

The Herbaceous/ Grassy weed control for year 1 focuses on high threat noxious weeds across the reserve including Artichoke thistle, Pattersons curse, Chilean needle grass.

3.4 TRANSLOCATED MFL MONITORING AND MAINTENANCE

The translocation MFL monitoring and maintenance for year 1 was performed for the all translocated clumps and the 4 additional plants from the nursery. The works included watering as per the watering table, hand weeding and steaking/ guarding the plants to protect them from grazing and provide them time to bounce back from the translocation.

Additional as our crews have been performing the Woody weed control works we have found new MFL plants popping up. these plants have been tagged and will also be monitored/ maintained as needed.

3.5 NATIVE SEED SOURCING AND SPREADING

The native seed that was sourced included Themeda triandra (Kangaroo grass) , Rytidosperma caespitosum (Evans Wallaby grass) and Austrostipa scabra (Rough Spear grass). The native seed was spread along the scalped area near the North Western boundary fence line.

MFL translocated from nursery to site

MFL in translocation site bouncing back from translocation

3.6 PEST ANIMAL CONTROL

Pest animal activity was monitored while crew were conducting the other management activities. The Northern, Western and Southern boundary fence lines were also pinned down to help prevent access for rabbits to the reserve.

3.7 RESERVE FENCE AND SIGNAGE

During year 1 the rabbit proof mesh was further pinned down along the fence boundaries to the North, South and West of the reserve. Ongoing monitoring was performed for the east boundaries for the erosion.

3.8 LITTER AND RUBBISH REMOVAL

A rubbish run across the site was the site in July of 2023, ongoing monitoring of rubbish was performed across the whole year 1.

3.9 RECTIFICATION WORKS

The follow rectification works were performed onsite following the off target damage in January 2023 by Aus Eco Solutions crew (see the incident investigation for further details)

Follow up cutting and painting works to clear up area.

Direct seeding of Themeda triandra (Kangaroo grass) in damaged area

Additional broadleaved weed control and hand weeding of MFL in damaged area.

Area along eastern boundary that will require erosion repairs

3.10 BIOMASS REDUCTION (ECOLOGICAL BURN)

The Ecological burn was conducted in June 2023, the burn occurs later in the season then we had hopped resulting in a greener burn. Because of this we were not able to get as much bio mass burnt as we were hoping for. The burn occurred as per the burn plan along the Northern side of the reserve, The previously cut bria rose pile were placed in the burn area to reduce the woody weed bio mass. The wind for the burn was as required for the burn and ensured there was no smoke going over the adjacent Craigieburn bypass or the construction zone to the east. The areas that did burn well have seen a reduction in weedy bio mass and creation of inter tussock spacing has allowed for new native flora growth.

WEED DENSITIES

Below is a list of weeds that have been identified onsite, Weeds that are listed as 0% may still have a seed bank in the area that will be monitored and controlled as needed. The below percentages also include any new emerging weeds for existing seed bank for example follow up on any cut and painted bria rose needs to be performed to remove emerging seedlings from the existing seed bank.

Weed Species	Weed Cover percentage end of Year 1	Weed Cover percentage end of Year 2	Weed Cover percentage end of Year 3
Sweet Vernal-grass			
Spear Thistle	0%		
Artichoke Thistle	0%		
Paterson's Curse	0%		
Fennel	5%		
Flatweed	15%		
Chilean Needle-grass	5%		
Canary-grass	80%		
Ribwort	25%		
Oxtongue	15%		
Sweet Briar	90%		
Cape Broom	0%		

NATIVE SPECIES RECORDED ONSITE

Native Species name	Date Surveyed
Matted Flax Lilly	04/10/2022
Kangaroo Grass	04/10/2022
Chocolate lilly	28/10/2023
Milk maids	28/10/2023
Blue Devil	28/10/2023
Scented Sun- Orchid	28/10/2023
Cotton fireweed	28/10/2023
Common tussock grass	28/10/2023
Branching Blue bell	28/10/2023
Golden Wattle	04/10/2022

Chocolate lilly found onsite

Milkmaid Found onsite

4 . Year 2 management actions

The year 2 management actions have been developed in accordance with the EMP and recommendation from YourLand, EHP, Whittlesea council and Aus Eco solutions.

TRANSLOCATED MFL MONITORING AND MAINTENANCE

Ongoing work will be performed for the translocated MFL to continue to enhance and protect the species this will include watering as required / as pre the watering table, hand weeding as needed, updating guarding as required.

WOODY WEED CONTROL

The woody weed control targets for year 2 will be reducing the overall woody weed cover for the site to 50%. This work will include follow up woody weed control around the site boundaries to remove new growth from the existing seed bank and Woody weed control in the middle of the reserve will focus on the removal of the current adult bria rose and follow up in 2024 for new growth from seed bank.

HERBACEOUS/ GRASSY WEED CONTROL

The Herbaceous and grassy weed control will focus on any areas of high threat weeds and buffering patches of good vegetation. The Herbaceous and grassy weed control will also focus on the area near the translocation site to prepare this area for direct seeding in year 3. The exact densities of Herbaceous and grassy weeds will alter once the woody weed vegetation has been reduced and there may be a need for additional Herbaceous and grassy weed control, this will be monitored.

PEST ANIMAL CONTROL

Pinning down of the eastern fence will be completed once the backfilling works have been done. Once complete Aus Eco will continue to monitor for signs of pest animals and input control measures as required for pest animals.

RESERVE FENCE AND SIGNAGE MONITORING AND MAINTENANCE

The eastern boundary erosion control backfilling works will be completed as part of the Year management actions and ongoing monitoring will be done for further areas that will require backfilling as well as general fence maintenance if required, Tube stock plantings will also be installed in the back filled areas within the conservation reserve, the tube stock will be of local provence and species typical of the EVC. Ongoing monitoring will be performed for the Northern boundary to monitor the success of the direct seeded area.

LITTER AND RUBBISH REMOVAL

Ongoing monitoring and removal of rubbish will be performed across year 2 . Any occurrences of large amounts of rubbish dumping will be reported to your land and council.

BIOMASS REDUCTION (ECOLOGICAL BURN)

An ecological burn will take place in Autumn of 2024 this will be in accordance with the EMP . The exact area of the burn will be confirmed with Yourland and EHP. Once the area has been identified and burn plan will be created for the burn.

REFERENCES:

- Ecology and Heritage Partners Pty Ltd. (August 2022) . Environmental Management Plan: Barry Road Development