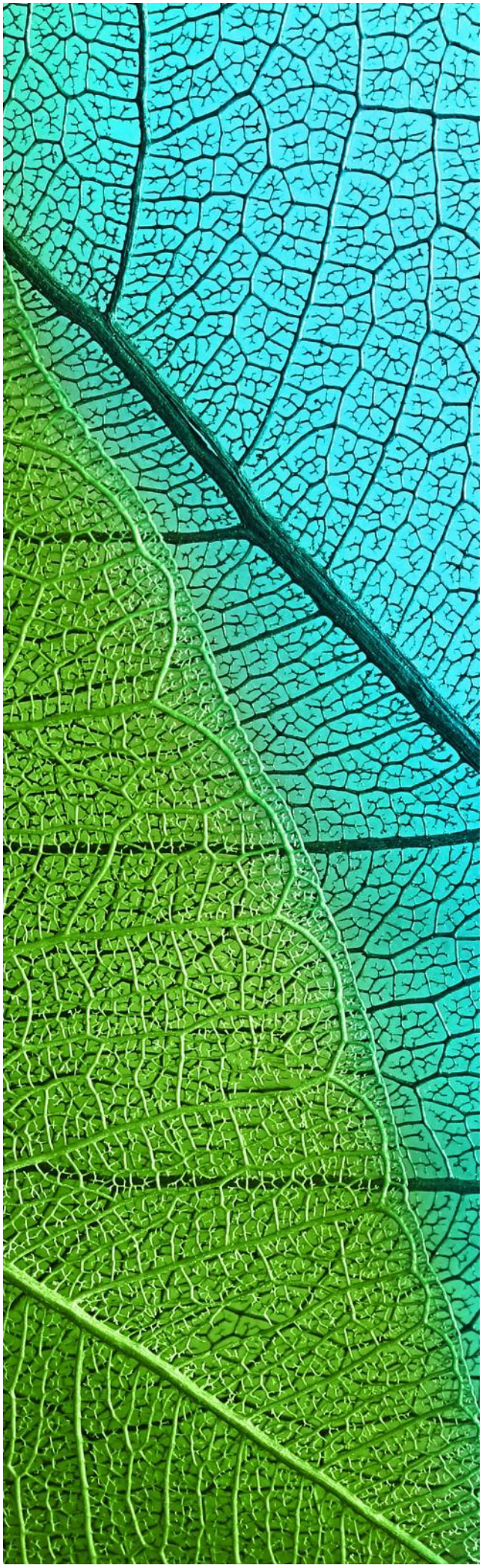

DELWP BIOSITE 3546, ST ALBANS

CONSERVATION MANAGEMENT AND BUTTON WRINKLEWORT RECOVERY PLAN

ANNUAL MONITORING REPORT, DECEMBER 2021

Prepared for

VICTORIA State Government | Department of Transport

February 2022
Report No. 18208 (5.0)

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1. INTRODUCTION

The approved *Conservation Management and Button Wrinklewort Recovery Plan* (the 'CMP', Brett Lane and Associates (BL&A) Report 12152 (10.5), dated April 2016) for the Main Road, St Albans Level Crossing Removal Project was prepared to manage Biosite 3546, referred to herein as the 'Biosite'.

The CMP requires that for every year for five years after the commencement of construction activities, surveys for listed threatened species and ecological communities are to be undertaken by a suitably qualified expert in accordance with the most recent version of the Department of the Environment's guidelines. The person undertaking the action shall provide a report of these monitoring surveys to the Minister within 10 days of completion of the monitoring surveys.

The following are to be monitored and detailed within monitoring reports:

- Fencing and signage integrity;
- Dates and mapped extent of ecological burns;
- Mortality or observed stress in Spiny Rice-flower (*Pimelea spinecens* subsp. *spinescens*) and Button Wrinklewort (*Rutidosis leptorhynchoides*) plants and assessment of causes;
- Undertake vegetation quality mapping as per the method adopted for the CMP;
- Biomass levels;
- Documentation of any areas of off-target kills (from weed control) exceeding 1% projective foliage cover over at least 1m^2; and
- Photo points will also be taken annually at each photo point location within each management zone.

Prior to August 2018, the St Albans Biosite was managed by LXRA/VicRoads Major Projects team with the VicRoads MNW Environmental and Roadside Management Team providing advice/assistance on environmental management for the site. In September 2018, VicRoads Metro Assets Environmental and Roadside Management Team (previously MNW) was formally awarded the management of the site from LXRA for the duration of the CMP. Since taking over the management of the site in September 2018, the following items have occurred as per the CMP requirements:

- BL&A were awarded and have undertaken the Annual Monitoring reporting in November 2018, February/March 2020, spring 2020 and December 2021; and
- Environmental Works Program including the Ecological Burn contract awarded with works to commence in early January 2019.

The first round of annual monitoring of the Biosite was undertaken by Nature Advisory (then BL&A) in late spring 2018, the results of which represent the baseline condition of the vegetation community and threatened species status, against which the success of future management can be compared (in subsequent annual monitoring reports).

This current annual report presents the findings of the fourth round of annual monitoring, undertaken by Nature Advisory in December 2021. The report also compares the current findings with the 2018 baseline findings.

As per the requirements of the CMP, a completed monitoring and reporting form has been provided on the next page.

Monitoring and reporting form – January 2022

Person Undertaking Action	Department of Transport (formerly VicRoads)
Location and address of Conservation Reserve	DELWP Biosite 3546 (Located in St Albans (3021) along West Esplanade/Bendigo Rail Line, between Adelaide Street and Constance Street and along East Esplanade/Bendigo Rail Line, between Arthur Street and Alexina Street)
Approval reference	EPBC 2014/7203
Administering Authority	Commonwealth Department of the Environment
Report No.	18208 (3.0)
Name	
Signature	
Date	

2. OBJECTIVES OF THE CMP

As stated in the CMP, the objectives of the plan are to:

- Satisfy Conditions 2, 4 and 5 of the Commonwealth approval for the Project (reference EPBC 2014/7203);
- Protect and enhance the listed threatened species and communities present at Biosite 3546, including but not limited to the Spiny Rice-flower and the Button Wrinklewort;
- Identify threats to the listed threatened species and communities present at Biosite 3546;
- Provide methods to manage threats to the listed threatened species and communities present at Biosite 3546; and
- Identify environmental rehabilitation measures that are appropriately designed and implemented where required.
- Satisfy Condition 5.3 of the Main Road, St Albans Level Crossing Removal Project Incorporated Document.

3. MONITORING METHODS, RESULTS AND RECOMMENDATIONS

Monitoring of the Biosite was undertaken by Verity Fyfe, Senior Ecologist from Nature Advisory (formerly Brett Lane & Associates), from the 21st to 23rd December 2021 in accordance with the requirements of the CMP.

The methods employed, monitoring results and recommendations for future management are provided in the following sub-sections. For context, a summary of the CMP objectives and requirements is provided as an introduction to each sub-chapter.

3.1. Fencing and signage integrity

New 1.8m high cyclone fencing was erected around the perimeters of the three individual components of the Biosite c. 2016, as part of the pre-construction phase of the Project. This fencing is considered to be sufficient to physically prevent undesirable access into, and activity within the Biosite.

Existing fencing will be supported by deterrent signage with the aim of discouraging pedestrian, rail personnel and project personnel, equipment, machinery and vehicle movement into and/or through the Biosite.

Fencing and signage integrity will be maintained for the duration of this Plan.

All signage shall be simple, clear and consistent in design. NO GO ZONE signage with contact details for access will be erected around the perimeters of the Biosite.

3.1.1. Methods

A site inspection was undertaken on foot to assess the integrity of the fencing and signage enclosing the three components of the Biosite.

3.1.2. Results

Fencing around all three components of the Biosite was found to be in a satisfactory condition. The fencing gates at each of the Biosite components are adequately locked and a finer mesh skirt has been installed at the base of all fencing to reduce debris and weed seed blowing into the Biosite.

Adequate 'No-go Zone' signage is in place around the three components of the Biosite.

3.1.3. Recommendations

Continue to regularly inspect the condition of the fencing and 'No-go Zone' signage and repair if necessary.

3.2. Ecological burns

Biomass control measures are to be undertaken in the Biosite. This will comprise ecological burning during March each year, which is the period when EPBC-listed species in the Biosite are likely to be least impacted upon by fire.

Only part of the Biosite will be burnt in any given year. Ecological burning must retain at least 25% of the Conservation Reserve as unburnt after each individual burn (i.e. be a mosaic burn). At least one of the three sections of the Biosite shall be left unburned in any given year to provide refuge for the Striped Legless Lizard. The area left unburned shall be different each burn year.

The frequency of burns will depend upon the level of biomass build-up. Burns in a given area shall be undertaken at a frequency of one to three years during wetter periods when biomass growth will be greater and three to five years during dryer periods when biomass growth will be less.

3.2.1. Methods

A site inspection within all three components of the Biosite was undertaken during the current assessment, in December 2021, in order to map the extent of any ecological burns, if undertaken.

While it was clear that large portions of Zone E and Zone F had been burned, it proved difficult to determine and map the burn area boundaries due to the substantial growth which had occurred during the time following the burns.

3.2.2. Results

Ecological burns were undertaken by Merri Creek Management Committee (MCMC) in April 2021, which resulted in effective 'mosaic' burning of approximately 60% of Zone E (0.17 ha) and 62% of Zone F (0.21 ha).

The extent of ecological burning undertaken in zones E and F is provided in Figure 1 of MCMC's works summary, attached as Appendix 7 to this report.

3.2.3. Recommendations

If weather conditions are favourable, commence annual ecological burning in autumn 2022 in accordance with the CMP.

If weather conditions are not favourable for ecological burning, repeat the spot burning method.

3.3. Mortality and stress in Spiny Rice-flower and Button Wrinklewort plants and NTGVVP community

Plant health monitoring will be undertaken by a suitably-qualified botanist or ecologist, annually between September and November during construction and then annually post-construction. Plant health monitoring will involve visually inspecting Spiny Rice-flower and Button Wrinklewort plants for mortality and signs of stress.

Stress in Spiny Rice-flower plants is observed as yellowing and/or shedding of leaves while stress in Button Wrinklewort is observed as leaf or stem die-back during periods of active growth (i.e. between September and November).

As per Condition 6 of the EPBC Act approval, if the monitoring surveys identify that construction activities result in a loss of greater than five (5) Spiny Rice-flower plants, any Button Wrinklewort plants or of greater than 1.5 hectares of Natural Temperate Grassland of the Victorian Volcanic Plain (NTGVVP), such as through changes in hydrology, the person taking the action must notify the Minister, prepare an updated CMP, identify and secure appropriate offsets and prepare an Offset Management Plan.

3.3.1. Methods

A site inspection within all three components of the Biosite was undertaken in December 2021 to assess the health, mortality or observed stress in all Spiny Rice-flower and Button Wrinklewort plants previously recorded and tagged in the Biosite, as well as the NTGVVP community.

Assessment of plant health, or stress, primarily involved inspection of foliage for condition, as described in the CMP. Plant mortality was determined through observed absence of plants at tagged locations or presence of dead plant material.

Reasons for any plant mortality or stress observed were also explored in an attempt to determine whether or not this was attributable to construction activities.

3.3.2. Results

All previously tagged, and newly discovered, Spiny Rice-flower and Button Wrinklewort plants were inspected and no signs of mortality or stress were observed in any individuals. All previously tagged plants were found to be in situ and in a healthy state. The NTGVVP community also showed no signs of mortality or stress.

As part of the 2019, 2020 and 2021 management activities, brush-cutting and hand weeding was undertaken around Button Wrinklewort and Spiny Rice-flower plants to reduce competition and promote recruitment of these species, which would have contributed some degree to their excellent condition.

See photo point photos in Section 3.7 below for examples of plant and community health between spring 2018 and December 2021.

New Button Wrinklewort plants and other threatened flora species recorded during this current survey are discussed in Section 3.8.3.

3.3.3. Recommendations

Remove dumped rubbish from within the Biosite on a regular basis to reduce the likelihood of Spiny Rice-flower and Button Wrinklewort plants and the NTGVVP community being smothered and potentially causing areas of dieback.

Continue hand weeding around Button Wrinklewort, Spiny Rice-flower and Large-headed Fireweed (*Senecio marcrocarpus*) to reduce competition and promote recruitment of these species.

3.4. Vegetation quality mapping and flora composition

As discussed in the 2018 annual report, baseline vegetation quality mapping and flora composition estimates were established that year, as minimal management had been undertaken between 2018 and the original 2015 baseline mapping and data.

Hence, the results of this current monitoring exercise, and future monitoring results, will be compared to the 2018 baseline mapping and data to track the effectiveness of management interventions at the Biosite.

3.4.1. Methods

A site inspection within all three components of the Biosite was undertaken in December 2021 to update vegetation quality mapping, where required, as per Figures 2 and 3 in the CMP, as well as document the plant composition in management zones in accordance with the method employed in the CMP.

3.4.2. Results

Several adjustments were made to the 2018 vegetation quality mapping to better reflect actual on-ground conditions observed during the spring 2020 survey. Some zones were amalgamated, as they didn't display any discernible defences; several new zones were created, as they did display discernible differences with the zones they were split from; and the quality rating of some of the zones were amended to reflect changes in vegetation quality, all of which were increases in quality on this occasion.

During the current assessment (conducted in December 2021), it was decided that the number and extent of management zones should remain as previous, for ease of comparison to data from previous years. Vegetation quality ratings however were subject to change. Current vegetation quality mapping is provided as Appendix 1.

Mapping of the extent of the NTGVVP community within the Biosite was also revised, as it was assessed at a finer management zone scale. This is depicted in the vegetation quality mapping as Appendix 1.

Baseline plant composition monitoring data differed to that collected in 2018, primarily because several introduced weed species were raised to high threat status, particularly the perennial broad-leaf weed Ribwort (*Plantago lanceolata*), which is one of the most entrenched weeds within the Biosite.

A summary of plant composition monitoring data for each management zone is provided in Table 1 (Zone F), Table 2 (Zone E) and Table 3 (Zone D). Detailed raw data is provided in Appendix 2 (Zone F), Appendix 3 (Zone E) and Appendix 4 (Zone D).

Spring 2020 data demonstrated a considerable reduction in the cover high-threat weeds in almost all management zones. Similarly, current data from December 2021 demonstrates a further reduction in the cover of high-threat weeds in all but three of the management zones, including a reduction of ≥50% cover in 13 of the 28 zones.

The data also shows some wide fluctuations in the number of introduced species recorded across the Biosite against the 2018 baseline data. This is largely attributable to the highly dynamic nature of the lower quality management zones.

Of the recommendations provided in the spring 2020 annual report, the following has been achieved:

- Continue to place emphasis on rehabilitation of the areas where Golden-wreath Wattle and Golden Wattle were removed from management zones D10, D6 and D1 until native species out-compete introduced species.
- Continue to monitor for and eradicate any tree and shrub seedlings in all management zones in the Biosite.
- Continue to monitor for and eradicate outbreaks of Chilean Needle-grass (*Nassella neesiana*) across the Biosite, as a matter of priority.

3.4.3. Recommendations

Continue to monitor for and eradicate any tree and shrub seedlings in all management zones in the Biosite.

Continue to monitor for and eradicate outbreaks of Chilean Needle-grass across the Biosite, as a matter of priority.

A new high-threat grass weed, Slender Pigeon Grass (*Setaria parviflora*), was recorded within Management Zone F7. Eradicate Slender Pigeon Grass as soon as practical and continue to monitor and eradicate outbreaks of this species, and any other high-threat grass species, as a matter of priority.

Table 1: Summary of monitoring results – Habitat Zone F

Measure	Management Zone																							
	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021
	1	1	1	1	2a	2a	2a	2a	2b	2b	2b	2b	3	3	3	3	4a	4a	4a	4a	4b	4b	4b	4b
No. indigenous species	4	6	6	6	6	9	9	9	6	8	8	8	22	22	22	22	20	20	20	20	21	23	23	23
No. weed species	20	14	9	8	5	8	6	3	9	11	9	7	17	10	8	6	15	3	6	3	17	4	5	4
No. high threat weed species	16	13	6	4	4	6	3	3	5	6	3	2	13	6	3	2	11	2	2	1	11	4	3	1
% cover high threat weeds	45	53	39	21	15	10	3	2	10	8	4	2	7	5	3	2	5	3	3	1	5	5	2	2

Measure	Management Zone																							
	Mar 2020	Spring 2020	Dec 2021	Mar 2020	Spring 2020	Dec 2021	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021
	4c	4c	4c	5a	5a	5a	5b	5b	5b	6	6	6	6	7	7	7	7	8	8	8	8	9	9	9	9
No. indigenous species	18	18	18	10	10	11	10	10	12	5	9	9	9	12	13	13	13	4	5	5	5	4	5	5	17
No. weed species	5	4	4	3	4	4	3	4	5	11	6	8	7	26	10	11	15	7	5	4	4	7	5	4	5
No. high threat weed species	5	2	2	2	3	1	2	3	3	9	6	4	3	20	7	7	9	5	4	3	2	5	4	3	3
% cover high threat weeds	8	2	1	6	3	+	6	3	1	20	23	13	9	45	61	38	39	15	14	4	1	15	14	4	4

Table 2: Summary of monitoring results – Habitat Zone E

Measure	Management Zone																							
	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021
	1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	6
No. indigenous species	24	26	26	26	19	21	21	21	14	16	16	16	16	18	18	18	10	18	18	18	7	10	10	10
No. weed species	11	4	6	7	14	8	9	11	16	6	10	7	9	9	11	8	8	14	12	20	12	8	12	9
No. high threat weed species	6	3	2	3	9	5	3	4	14	4	5	3	8	5	6	3	7	9	9	8	9	6	5	4
% cover high threat weeds	2	3	+	2	7	10	2	4	20	15	7	4	5	5	2	3	50	72	22	18	25	20	5	4

Table 3: Summary of monitoring results – Habitat Zone D

Measure	Management Zone																							
	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021
	1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	6	6	6	6	7	7	7	7
No. indigenous species	7	9	9	9	6	7	7	7	19	19	19	19	21	25	25	25	3	3	3	3	5	5	5	5
No. weed species	27	17	10	15	8	9	11	7	4	6	4	5	13	10	6	6	5	4	3	5	6	9	5	3
No. high threat weed species	18	10	6	8	5	7	6	4	2	4	1	2	10	7	2	2	4	2	1	3	5	5	3	1
% cover high threat weeds	45	75	30	14	30	30	19	10	5	5	1	1	7	12	5	3	20	45	8	8	30	33	9	2

Measure	Management Zone														
	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	Mar 2020	Spring 2020	Dec 2021
	8	8	8	8	9	9	9	9	10	10	10	10	11	11	11
No. indigenous species	7	7	7	7	5	5	5	5	8	8	8	8	3	3	3
No. weed species	6	5	5	8	3	8	5	4	7	4	6	8	9	6	7
No. high threat weed species	3	3	2	3	1	4	3	1	6	3	2	3	6	3	4
% cover high threat weeds	25	13	7	3	45	40	13	2	7	21	15	4	72	42	19

3.5. Biomass levels

Native grasslands dominated by Kangaroo Grass (*Themeda triandra*) require frequent biomass removal to prevent senescence of Kangaroo Grass and the build-up of detritus. Senescence and senescence die-back of Kangaroo Grass and resulting detritus build-up can smother out inter-tussock forbs, reduce species diversity and leave gaps which can be more swiftly invaded by high threat weeds, such as Chilean Needle-grass.

Biomass control measures will comprise ecological burning during March as set out in the CMP. If conditions are not favourable for autumn burning, other methods of achieving biomass reduction will be undertaken.

Any burning must occur prior to planting any Button Wrinklewort seedlings in the Biosite to avoid impacts to newly established plants.

3.5.1. Methods

A site inspection within all three components of the Biosite was undertaken in December 2021 to assess vegetation biomass levels. As biomass levels are correlated with graminoid and forb health and recruitment potential, biomass levels were measured as the percentage cover of bare ground (including bryophytes and soil crust, but not organic litter).

3.5.2. Results

Ecological 'mosaic' burning was undertaken by Merri Creek Management Committee (MCMC) in April 2021, which removed a significant amount of biomass from approximately 60% of Zone E and 62% of Zone F. Biomass control (brush-cutting - including thatch removal and hand removal) was also undertaken in sensitive areas. This included the opening of spaces around the Button Wrinklewort plants to help promote germination of seedlings.

Percentage cover of bare ground (including bryophytes and soil crust, but not organic litter) within all management zones of the Biosite is provided below in Table 4.

Ideally, percentage cover of bare ground should be maintained at between 20% and 30%. Percentage cover of bare ground was within this range in the three biosite blocks as follows:

- Z F management zones – 5 out of 13 zones in optimal range;
- Z E management zones – 1 out of 6 zones in optimal range; and
- Z D management zones – 0 out of 10 zones in optimal range.

Table 4: Percentage cover of bare ground in management zones throughout the Biosite

Management Zone F

Measure	Management Zone																					
	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020
	1	1	1	1	2a	2a	2a	2a	2b	2b	2b	2b	3	3	3	3	4a	4a	4a	4a	4b	4b	4b
Bare ground cover (%)	40	25	25	55	30	35	35	40	5	3	20	40	18	15	15	25	45	55	50	40	20	25	15

Measure	Management Zone																					
	Dec 2021	Mar 2020	Spring 2020	Dec 2021	Mar 2020	Spring 2020	Dec 2021	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018
	4b	4c	4c	4c	5a	5a	5a	5b	5b	5b	6	6	6	6	7	7	7	7	8	8	8	8	9
Bare ground cover (%)	25	22	20	50	25	25	30	50	45	45	10	7	15	12	40	17	35	30	10	11	15	5	10

Measure	Management Zone		
	Mar 2020	Spring 2020	Dec 2021
	9	9	9
Bare ground cover (%)	13	15	30

Management Zone E

Measure	Management Zone																					
	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021
	1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	6
Bare ground cover (%)	5	5	16	40	8	3	10	15	7	7	5	10	5	5	10	30	40	16	30	40	10	5	7	8

Management Zone D

Measure	Management Zone																							
	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021
	1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	6	6	6	6	7	7	7	7
Bare ground cover (%)	35	10	40	40	15	11	15	10	10	10	10	4	7	8	5	1	15	15	30	15	15	15	30	2

Measure	Management Zone														
	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	Mar 2020	Spring 2020	Dec 2021
	8	8	8	8	9	9	9	9	10	10	10	10	11	11	11
Bare ground cover (%)	5	5	3	+	25	22	50	1	3	4	30	10	5	30	15

3.5.3. Recommendations

Undertake annual ecological burning in March 2022 in accordance with the CMP, with particular emphasis on Zone D.

3.6. Off-target plant mortality

Weed control is one of the two most intrusive management actions within the Biosite (the other being ecological burning) and has the potential to cause considerable damage to the native vegetation therein if not undertaken appropriately. As such, the CMP requires that a high degree of care be taken to ensure that no Spiny Rice-flower or Button Wrinklewort plants, or any other indigenous species, are damaged as a result of weed control activities.

All non-target mortality (i.e. cover of indigenous flora species killed as a result of weed control works) will be documented and provided in an annual report. Non-target mortality is not to exceed 1% projective foliage cover over at least 1m^2 in any given area.

3.6.1. Methods

A site inspection within all three components of the Biosite was undertaken in early December 2021 to determine the extent, if any, of off-target plant mortality as a result of weed control works. The threshold for this assessment was mortality of off-target indigenous species exceeding 1% projective foliage cover over at least 1m^2 in any given area.

3.6.2. Results

No instances of non-target mortality at or above the above threshold were detected across the Biosite during the current assessment.

3.6.3. Recommendations

Continue to undertake weed control in a sensitive manner to minimise off-target plant mortality.

3.7. Photo points

Photo points will be taken annually at each photo point location within each management zone of the three components of the Biosite.

3.7.1. Methods

A site inspection within all three components of the Biosite was undertaken in December 2021 to update the photo points documented in the baseline 2018 and spring 2020 annual reports.

3.7.2. Results

Current photo points photos are provided as Appendix 5.

3.8. Incidental observations

3.8.1. New species observed

Tussock Skink (*Pseudemoia pagenstecheri*) was observed basking in considerable numbers in all habitat zones during the spring 2020 survey. This suggests that there may be a healthy and stable population of this species of conservation concern at the Biosite.

There is also the possibility that a population of the EPBC Act-listed Striped Legless Lizard (*Delma impar*) is resident in the Biosite, as the habitat is excellent and the St Albans locality is a known 'hotspot' for the species.

3.8.2. Establishment of Striped Legless Lizard detection points

As a means of detecting the presence or otherwise of the EPBC Act-listed Striped Legless Lizard, MCMC placed roof tiles in select low-impact areas throughout the Biosite in June 2020 (6 in each of the three blocks of the Biosite). Spring tile checks were undertaken ad-hoc and infrequently during the peak activity period for the species (late September to early December) and none have been detected as yet.

The locations of the tiles are provided in Figure 3 of MCMC's works summary, attached as Appendix 7 to this report.

Recommendations

To maximise the chances of detecting Striped Legless Lizard within the Biosite, a more concerted and systematic tile check program should be undertaken between late September and early December 2022, involving fortnightly morning checks of all tiles in the Biosite, when the measured temperature beneath the tiles is between 15 and 25 degrees Celsius.

3.8.3. Adjustments to threatened flora species census and mapping

Since 2015, additional Button Wrinklewort plants have been recorded in all three habitat zones of the Biosite, raising the total number of plants in the Biosite from 12 in 2015 to an estimated 97 at present. Most of these plants are planted seedlings, while a few are recruits from existing adult plants.

Twenty-four seedlings were planted in August 2020 by MCMC and of these, 4 were dead by the time of the spring 2020 survey.

A further 100 Button Wrinklewort seedlings (very tiny) were planted in November 2021 by MCMC, 70 within Zone F and 30 within Zone E. The majority of these plants were not marked with flags and were very tiny, so counting them proved difficult. Nevertheless, it was estimated that some 60% of the seedlings had survived.

Given the minute size of the Button Wrinklewort seedlings and the short time between when they were planted and the current survey, it is likely that more plants will die.

All seedlings to date have been supplied by DELWP's Arthur Rylah Institute, the seed of which was sourced from remnant individuals at the Biosite and from the large population at Truganina Cemetery.

Further details of the 2021 plantings are provided in MCMC's works summary, attached as Appendix 7 to this report.

To reflect this change in Button Wrinklewort numbers at the Biosite, **excluding the seedlings planted in November 2021**, an amended threatened species census list has been provided as Appendix 6.

In addition, in May 2021, 30 kilograms of Large-headed Fireweed were sown into 1m^2 plots within 20 metres of remnant plants within Zone E. No further Large-headed Fireweed plants were detected during the December 2021 survey and MCMC have not reported detecting any new plants either.

As Large-headed Fireweed is a species of concern (EPBC Act-listed) in the Biosite, ongoing September to October targeted surveying would facilitate an accurate census of the species in the Biosite.

Recommendations

All surviving Button Wrinklewort seedlings from the November 2021 planting must be marked or flagged by someone who knows the precise locations of these plants so that they can be distinguished from other Button Wrinklewort plants on the site. Only then can an accurate census of these plants be conducted.

Annual September to October targeted surveying for Large-headed Fireweed.

3.9. Other management activities

3.9.1. Infill forb plantings

2019

A revegetation program was commenced in September 2019, involving infill plantings of approximately 700 nursery-raised native forb species in cells. The intention of this program was to increase the species diversity and native forb abundance across the Biosite.

Species planted were:

- Button Wrinklewort (10 plants only in Habitat Zone F);
- Fuzzy New Holland Daisy (*Vittadinia cuneata*);
- Lemon Beauty-heads (*Calocephalus citreus*);
- Spur Velleia (*Velleia paradoxa*); and
- Blue Devil (*Eryngium ovinum*).

The seedlings were watered for a 2-month period following planting, as it was un-usually dry over the spring of 2019. Even so, the survival rate was low. For example, of the 10 Button Wrinklewort plantings, only one has survived to present.

Native grass seed was also collected on site and then scattered in bare areas across the site.

2020

As discussed above, a further 24 Button Wrinklewort seedlings were planted across the Biosite in August 2020 by MCMC. Four of these have since died and the survivors are in various states of health and growth, most looking to have a reasonable prospect of establishment.

MCMC also undertook a direct seeding program in May 2020, where seed collected from a mixture of native grasses and daisies across the Biosite was sown into bare earth in zones D and E.

2021

As discussed above, 100 Button Wrinklewort seedlings (very tiny) were planted in November 2021 by MCMC (70 within Zone F and 30 within Zone E), and 30 kilograms of Large-headed Fireweed seed was sown into Zone E.

Further revegetation of 2,800 grasses was conducted in June 2021, during which an even number of grasses were planted in each zone, concentrating on areas of bare ground (namely around the edges of the reserve and areas that previously hosted woody weeds).

MCMC also undertook a direct seeding program in April and June 2021, where seed collected from a mixture of native grasses and daisies across the Biosite was sown into bare earth in zones D and E.

Further details of these revegetation works are provided in MCMC's works summary, attached as Appendix 7 to this report.

Recommendations

Continuation of the program should focus on first increasing the abundance (percentage cover) of forb species which already occur at the Biosite, preferably using seed collected from these plants. In addition to raising seedlings from these extant plants in a nursery, seed should also be hand-spread in newly created bare areas within the Biosite, where weed infestations have been physically removed.

Priority should be given to augmenting the populations of the most endangered species occurring in the Biosite, such as Button Wrinklewort, Large-headed Fireweed, Spiny Rice-flower and Small Milkwort (*Comesperma polygaloides*). Only one plant of the latter has been recorded to date.

Consideration should also be given to introducing local species which don't currently occur in the Biosite, but would likely have in the past. There are a multitude of forb species available for this, which survive in other native grassland reserves in the locality, which would benefit from being dispersed. Brimbank City Council have a thorough inventory of species occurring in conservation reserves on public land in the municipality, including rail and road reserves.

For example, ephemeral wetlands were once common in the locality and supported unique floral communities of 'bog plants', specifically adapted to seasonal inundation. Some of these wetlands have survived in conservation reserves in the locality and still support these now locally rare bog plants, the more iconic of which are Plains Yam-daisy (*Microseris*

scapigera)—also known as Murnong—Woodland Swamp-daisy (*Brachyscome paludicola*)—previously known as Basalt Daisy (*Brachyscome basaltica*)—Golden Billy-buttons (*Pycnosorus chrysanthes*) and Swamp Billy-buttons (*Craspedia paludicola*).

A small population of Golden Billy-buttons is still resident in the Biosite, where it prefers the edges of the drainage swales on the rail line side of the three Biosite components. The wetter parts of these drainage swales are ideal for the re-establishment of a bog plant community.

The iconic local orchid Sunshine Diuris (*Diuris fragrantissima*) would likely benefit as a species from introduction (or re-introduction) to the Biosite.

3.9.2. Button Wrinklewort study

In 2019, Steve Sinclair of the Arthur Rylah Institute (ARI), the environmental research arm of the State Department of the Environment, Land, Water and Planning (DELWP), undertook a study of Button Wrinklewort at the Biosite which included mapping the distribution of the species, genetic sampling and collection of seed.

As discussed above, ARI produced the 24 Button Wrinklewort seedlings which planted at the Biosite in August 2020, including crosses with plants from the Truganina population to enhance the genetic fitness of the population at the Biosite.

Further details on the progress of this study will be provided once they come to hand.

Appendix 1: Vegetation quality mapping, photo points and threatened species locations

Figure 2: Conservation reserve mapping

Project: St Albans Biosite Monitoring **Client**: Main Road St. Albans Level Crossing Removal **Date**: 13/01/2022

- Existing fencing
- Button Wrinklewort
- Button Wrinklewort no longer present
- Spiny Rice-flower
- Photo point directions
- Photo points

Vegetation quality

- Introduced vegetation
- Native vegetation - Moderate quality with high-threat weeds
- Native vegetation - Moderate quality with negligible threat weeds
- Native vegetation - High quality with high-threat weeds
- Native vegetation - High quality with negligible threat weeds
- Not NTGVVP

N

Metres 0 10

Nature Advisory
PO Box 337, Camberwell, VIC 3124, Australia
www.natureadvisory.com.au
03 9815 2111 - info@natureadvisory.com.au

Layers - Created by: - \\Nat-haw-dt04\e\GIS\2018 Jobs\18208\Biosite\Biosite_220112.aprx

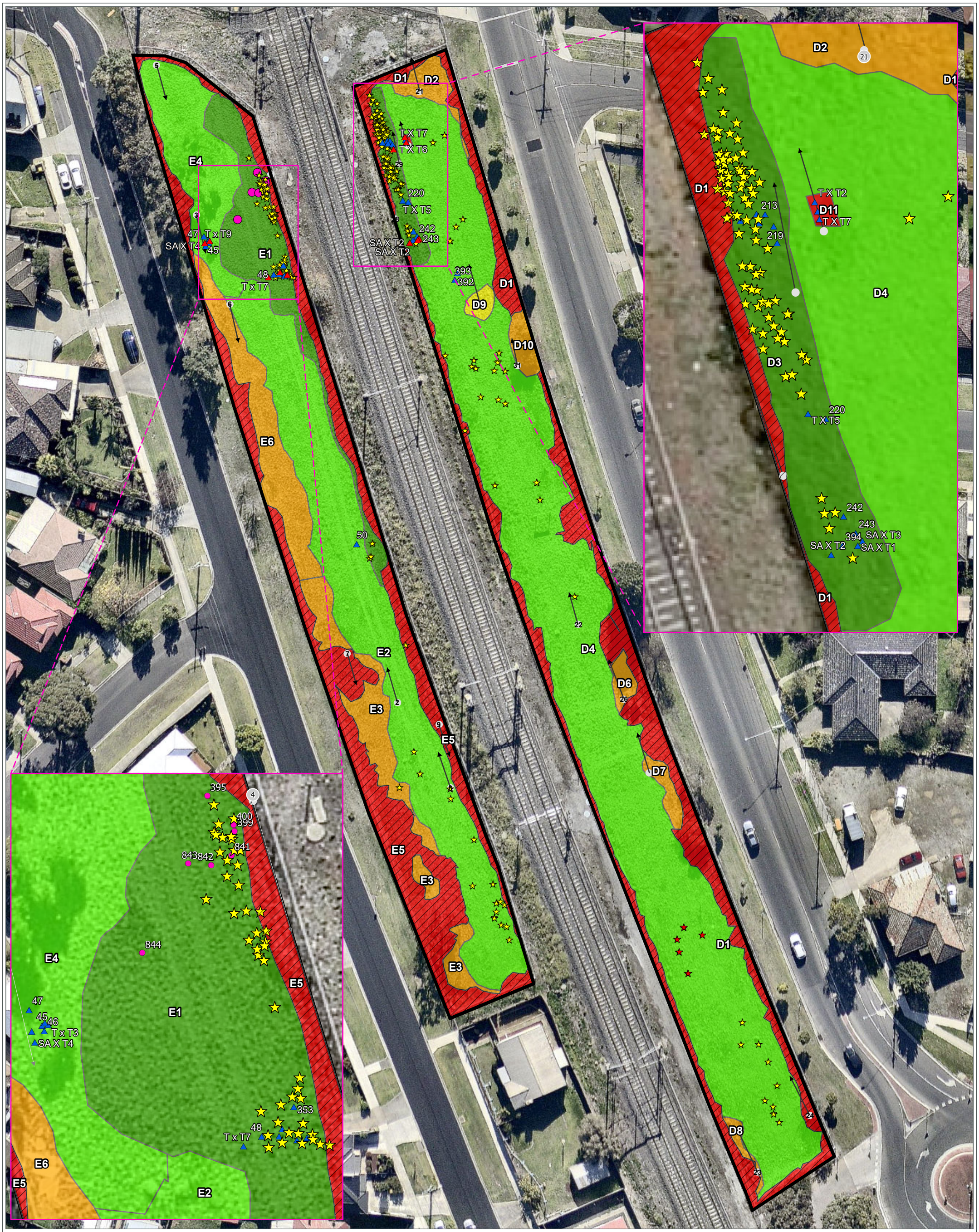

Figure 3: Conservation reserve mapping

Project: St Albans Biosite Monitoring **Client**: Main Road St. Albans Level Crossing Removal **Date**: 13/01/2022

- Existing fencing
- Button Wrinklewort
- Button Wrinklewort no longer present
- Spiny Rice-flower
- Spiny Rice-flower no longer present
- Large-headed Fireweed
- Photo point directions
- Photo points

Vegetation quality

- Introduced vegetation
- Native vegetation - Moderate quality with high-threat weeds
- Native vegetation - Moderate quality with negligible threat weeds
- Native vegetation - High quality with high-threat weeds
- Native vegetation - High quality with negligible threat weeds
- Not NTGVVP

N

Metres 0 10

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Layers - Created by: - \\Nat-haw-dt04\e\GIS\2018 Jobs\18208\Biosite\Biosite_220112.aprx

Appendix 2: Raw baseline data for species composition and high-threat weed cover – Habitat Zone F

Cover estimates

Cover Estimate Measures	Hz F Management Zones																							
	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021
	1	1	1	1	2a	2a	2a	2a	2b	2b	2b	2b	3	3	3	3	4a	4a	4a	4a	4b	4b	4b	4b
Total cover (%)	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Overall species cover (%)	50	60	65	37	60	55	55	47	85	83	70	45	67	70	70	60	40	38	40	46	70	70	75	60
Indigenous species cover (%)	5	7	10	7	45	45	52	45	75	75	62	45	60	65	62	55	35	35	37	45	65	65	72	56
Introduced species cover (%)	45	53	55	30	15	10	3	2	10	8	8	5	7	5	8	5	5	3	3	1	5	5	3	4
Bare ground cover (%)	40	25	25	53	30	35	35	40	5	3	20	40	18	15	15	25	45	55	50	40	20	25	15	25
Organic litter cover (%)	10	15	10	10	10	10	10	10	10	14	10	10	15	15	15	15	15	7	10	5	10	5	10	15

Cover Estimate Measures	Hz F Management Zones																							
	Mar 2020	Spring 2020	Dec 2021	Mar 2020	Spring 2020	Dec 2021	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021
	4c	4c	4c	5a	5a	5a	5b	5b	5b	6	6	6	6	7	7	7	7	8	8	8	8	9	9	9	9
Total cover (%)	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**97**	**100**
Overall species cover (%)	53	55	42	41	40	51	30	40	37	75	78	70	75	50	66	55	65	75	74	73	75	80	77	75	65
Indigenous species cover (%)	45	52	40	35	37	49	25	38	35	55	55	55	65	5	5	5	10	60	60	68	70	70	70	60	55
Introduced species cover (%)	8	3	2	6	3	1	5	2	2	20	23	15	10	45	61	50	55	15	14	5	5	10	7	15	10
Bare ground cover (%)	22	20	50	25	25	30	50	45	45	10	7	15	14	40	17	35	30	10	11	15	5	10	13	15	25
Organic litter cover (%)	25	25	8	34	35	20	20	15	18	15	15	15	11	10	17	10	5	15	15	12	20	10	10	7	10

Indigenous species

Scientific Name	Common Name	Hz F Management Zones - Presence (X)											
		1	2a	2b	3	4a	4b	4c	5a	5b	6	7	8	9
Acaena echinata	Sheep's Burr				X	X	X	X						X
Asperula conferta	Common Woodruff		X	X	X	X	X				X	X		X
Atriplex semibaccata	Berry Saltbush													
Austrostipa scabra subsp. falcata	Slender Spear-grass				X	X	X							
Austrostipa sp.	Spear Grass				X			X	X	X				
Calocephalus citreus	Lemon Beauty-heads		X		X			X	X	X				X
Chloris truncata	Windmill Grass	X		X	X		X		X	X	X	X	X	
Chrysocephalum sp. 1	Plains Everlasting					X	X							X
Convolvulus angustissimus subsp, omnigracilis	Slender Bindweed		X	X	X	X	X	X	X		X			
Dianella admixta	Black-anther Flax-lily	X	X	X	X	X	X	X	X	X	X	X		X
Einadia nutans	Nodding Saltbush								X					
Epilobium hirtigerum	Hairy Willow-herb											X		
Eryngium ovinum	Blue Devil					X	X	X						

Scientific Name	Common Name	Hz F Management Zones - Presence (X)												
		1	2a	2b	3	4a	4b	4c	5a	5b	6	7	8	9
Geranium retrorsum s.l.	Grassland Crane's-bill	X	X	X	X	X	X				X	X	X	X
Goodenia pinnatifida	Cut-leaf Goodenia					X	X							X
Juncus pallidus	Pale Rush											X		
Juncus spp.	Rush				X							X		
Juncus subsecundus	Finger Rush											X		
Lomandra micrantha subsp. micrantha	Small-flower Mat-rush				X	X	X			X				
Minuria leptophylla	Minnie Daisy							X						
Oxalis perennans	Grassland Wood-sorrel	X	X			X	X			X	X		X	X
Pimelea curviflora var. 1	Curved Rice-flower				X	X	X	X						X
Pimelea glauca	Smooth Rice-flower													X
Pimelea spinescens subsp. spinescens	Spiny Rice-flower		X		X	X	X	X		X		X		X
Plantago gaudichaudii	Narrow Plantain				X	X	X							X
Poa labillardierei var. labillardierei	Common Tussock-grass				X						X			
Poa sieberiana	Grey Tussock-grass			X	X									
Pycnosorus chrysanthes	Golden Billy-buttons					X	X					X		X
Rutidosis leptorhynchoides	Button Wrinklewort				X			X						
Rytidosperma caespitosum	Common Wallaby-grass							X	X					
Rytidosperma racemosum var. racemosum	Slender Wallaby-grass					X	X							
Rytidosperma setaceum	Bristly Wallaby-grass				X									
Solenogyne dominii	Smooth Solenogyne							X						
Rytidosperma sp.	Wallaby Grass								X	X				
Senecio quadridentatus	Cotton Fireweed				X	X	X	X		X		X		X
Themeda triandra	Kangaroo Grass	X	X	X	X	X	X	X	X	X	X	X	X	X
Tricoryne elatior	Yellow Rush-lily			X				X						
Velleia paradoxa	Spur Velleia				X	X	X	X						X
Vittadinia cuneata	Fuzzy New Holland Daisy						X	X	X	X				
Wahlenbergia communis s.s.	Tufted Bluebell		X		X	X	X	X		X				X
Walwhalleya proluta	Rigid Panic	X					X		X		X	X	X	
	No. indigenous species	**6**	**9**	**8**	**22**	**20**	**23**	**18**	**11**	**12**	**9**	**13**	**5**	**17**

Introduced species

Origin	Scientific Name	Common Name	High Threat	Hz F Management Zones - Presence (x) / Projected Foliage Cover (%)																					
				2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021
				1	1	1	1	2a	2a	2a	2a	2b	2b	2b	2b	3	3	3	3	4a	4a	4a	4a	4b	4b	4b	4b
#PI	*Acacia pycnantha*	Golden Wattle	Yes																	+				+			
*	*Aira spp.*	Hair Grass	No										X	X	1		X	X	1							X	1
*	*Aster subulatus*	Aster-weed	No																								
*	*Avena sp.*	Oat	No	X	X	2	5		X	X		X	X	X		X	X	X	+	X		X		X		X	+
*	*Brassica fruticulosa*	Twiggy Turnip	Yes	15	30	2	+	5	5			1	+	+	+	+	2	+		+				+	1		
*	*Briza spp.*	Quaking-grass	No	X			3	X				X	X	X	+	X		X				X	+	X			
*	*Bromus catharticus var. catharticus*	Prairie Grass	Yes	+											+												
*	*Bromus hordeaceus subsp. hordeaceus*	Soft Brome	No	X		15				X		X	X	X		X		X									
*	*Cenchrus clandestinus*	Kikuyu	Yes			+			+																		
*	*Centaurium erythraea*	Commom Century	No												+				+								+
*	*Cirsium vulgare*	Spear Thistle	Yes	+	+				+																		
*	*Corymbia citriodora subsp. citriodora*	Lemon-scented Gum	Yes													+											
*	*Cynara cardunculus subsp. flavescens*	Artichoke Thistle	Yes	+	+											+											
*	*Cynodon dactylon var. dactylon*	Couch	Yes	+	+															+				+	+		
*	*Dactylis glomerata*	Cocksfoot	Yes	+	2			+	2	+		5	1			+	+									+	
*	*Ehrharta erecta var. erecta*	Panic Veldt-grass	Yes		+																						
*	*Ehrharta longiflora*	Annual Veldt-grass	No	X		X	+			X				X													
*	*Erigeron sp.*	Fleabane	Yes								+		+														
*PI	*Eucalyptus cladocalyx*	Sugar Gum	Yes	7																							
*PI	*Fraxinus angustifolia*	Desert Ash	Yes	+																							
*	*Galenia pubescens var. pubescens*	Galenia	Yes													+											
*	*Gazania linearis*	Gazania	Yes													+											
*	*Geranium molle*	Dove's Foot	Yes																								
*	*Helminthotheca echioides*	Ox-tongue	Yes	+	+												+			+				+			
*	*Hypochaeris radicata*	Cat's Ear	Yes																					+			
*	*Lactuca serriola*	Prickly Lettuce	No														X										
*	*Lepidium africanum*	Common Peppercress	No																	X				X			
*	*Lolium spp.*	Rye grass	Yes			35	5			1																	
*	*Lysimachia arvensis (Blue-flowered variant)*	Blue Pimpernel	No																	X				X			
*	*Nassella neesiana*	Chilean Needle-grass	Yes		+																						
*	*Nassella trichotoma*	Serrated Tussock	Yes									+				+				+				+			
*	*Oxalis pes-caprae*	Soursob	Yes	+		+								+		+				+				+			
*	*Oxalis purpurea*	Large-flower Wood-sorrel	Yes	+		+										+		1		+				+		1	

Origin	Scientific Name	Common Name	High Threat	Hz F Management Zones - Presence (x) / Projected Foliage Cover (%)																							
				2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021
				1	1	1	1	2a	2a	2a	2a	2b	2b	2b	2b	3	3	3	3	4a	4a	4a	4a	4b	4b	4b	4b
*	*Paspalum dilatatum*	Paspalum	Yes	+	+											+											
*	*Phalaris aquatica*	Toowoomba Canary-grass	Yes	2	+								2			+	+			+				+			
*	*Plantago coronopus subsp. coronopus*	Buck's-horn Plantain	Yes																	+		+					
*	*Plantago lanceolata*	Ribwort	Yes	20	20	2	15	10	3	2	1	5	4	3	2	5	3	2		5	3	3	1	3	4	1	2
*	*Rapistrum rugosum*	Giant mustard	Yes														+										
*	*Romulea rosea*	Onion Grass	Yes	+	+		+	+	+		1	+	+		+	+			+	+	+			+	+		
*	*Rumex crispus*	Curled Dock	No																								
*	*Sonchus oleraceus*	Common Sow-thistle	No				+		X				X	X	+	X	X	X			X	X	+	X			
*	*Tragopogon porrifolius subsp. porrifolius*	Salsify	No																			X					
*	*Trifolium angustifolium var. angustifolium*	Narrow-leaf Clover	No									X							+								
*	*Vicia sativa*	Common Vetch	No									X								X				X			
No. weed species				20	14	9	8	5	8	6	3	9	11	9	7	17	10	8	6	15	3	6	3	17	4	5	4
No. high threat weed species				16	13	6	4	4	6	3	3	5	6	3	2	13	6	3	2	11	2	2	1	11	4	3	1
% cover high threat weed species				45	53	39	21	15	10	3	3	10	8	4	2	7	5	3	2	5	3	3	1	5	5	2	2

Origin	Scientific Name	Common Name	High Threat	Hz F Management Zones - Presence (x) / Projected Foliage Cover (%)															
				Mar 2020	Spring 2020	Dec 2021	Mar 2020	Spring 2020	Dec 2021	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021
				4c	4c	4c	5a	5a	5a	5b	5b	5b	6	6	6	6	7	7	7	7
#PI	*Acacia pycnantha*	Golden Wattle	Yes														1			
*	*Aira spp.*	Hair Grass	No										X		X	1				+
*	*Aster subulatus*	Aster-weed	No										X				X			+
*	*Avena sp.*	Oat	No		X	+				X			X		X		X		X	5
*	*Brassica fruticulosa*	Twiggy Turnip	Yes	2			3	+	+	3	+	+	5	5	+		15	35	+	1
*	*Briza spp.*	Quaking-grass	No		X	+									X				X	
*	*Bromus catharticus var. catharticus*	Prairie Grass	Yes																	5
*	*Bromus hordeaceus subsp. hordeaceus*	Soft Brome	No																X	5
*	*Cenchrus clandestinus*	Kikuyu	Yes	1						1							+			
*	*Centaurium erythraea*	Common Century	No						+							+				2
*	*Cirsium vulgare*	Spear Thistle	Yes														+			
*	*Corymbia citriodora subsp. citriodora*	Lemon-scented Gum	Yes																	
*	*Cynara cardunculus subsp. flavescens*	Artichoke Thistle	Yes																	
*	*Cynodon dactylon var. dactylon*	Couch	Yes	+	+								+				+	3	1	
*	*Dactylis glomerata*	Cocksfoot	Yes	+						+		+	2	3	3		+			
*	*Ehrharta erecta var. erecta*	Panic Veldt-grass	Yes														+			
*	*Ehrharta longiflora*	Annual Veldt-grass	No														X			
*	*Erigeron sp.*	Fleabane	Yes										+				+	+		+
*PI	*Eucalyptus cladocalyx*	Sugar Gum	Yes							x							4			
*PI	*Fraxinus angustifolia*	Desert Ash	Yes														+			
*	*Galenia pubescens var. pubescens*	Galenia	Yes																	
*	*Gazania linearis*	Gazania	Yes																	
*	*Geranium molle*	Dove's Foot	Yes																	
*	*Helminthotheca echioides*	Ox-tongue	Yes										1	+			5	5	1	2
*	*Hypochaeris radicata*	Cat's Ear	Yes																	
*	*Lactuca serriola*	Prickly Lettuce	No														X	X		
*	*Lepidium africanum*	Common Peppercress	No																	
*	*Lolium spp.*	Rye grass	Yes								+								30	5
*	*Lysimachia arvensis (Blue-flowered variant)*	Blue Pimpernel	No																	
*	*Nassella neesiana*	Chilean Needle-grass	Yes																	
*	*Nassella trichotoma*	Serrated Tussock	Yes														+			
*	*Oxalis pes-caprae*	Soursob	Yes														5			
*	*Oxalis purpurea*	Large-flower Wood-sorrel	Yes					1			+		+		+		+			
*	*Paspalum dilatatum*	Paspalum	Yes														+	3	1	+

Origin	Scientific Name	Common Name	High Threat	Hz F Management Zones - Presence (x) / Projected Foliage Cover (%)															
				Mar 2020	Spring 2020	Dec 2021	Mar 2020	Spring 2020	Dec 2021	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021
				4c	4c	4c	5a	5a	5a	5b	5b	5b	6	6	6	6	7	7	7	7
*	*Phalaris aquatica*	Toowoomba Canary-grass	Yes										+			+	5		+	5
*	*Plantago coronopus subsp. coronopus*	Buck's-horn Plantain	Yes														+			
*	*Plantago lanceolata*	Ribwort	Yes	5	2	+	3	2	+	1	2	+	12	15	10	8	10	15	5	20
*	*Rapistrum rugosum*	Giant mustard	Yes											+						
*	*Romulea rosea*	Onion Grass	Yes			+				+		+	+	+		+	+	+		
*	*Rumex crispus*	Curled Dock	No														X	X		
*	*Setaria parviflora*	Slender Pigeon Grass	Yes																	+
*	*Sonchus oleraceus*	Common Sow-thistle	No				X	X	+			+			X	+			X	1
*	*Tragopogon porrifolius subsp. porrifolius*	Salsify	No														X			
*	*Trifolium angustifolium var. angustifolium*	Narrow-leaf Clover	No													+		X		
*	*Vicia sativa*	Common Vetch	No														X			
No. weed species				**5**	**4**	**4**	**3**	**4**	**4**	**7**	**4**	**5**	**11**	**6**	**8**	**7**	**26**	**10**	**11**	**15**
No. high threat weed species				**5**	**2**	**2**	**2**	**3**	**2**	**6**	**4**	**4**	**9**	**6**	**4**	**3**	**20**	**7**	**7**	**9**
% cover high threat weed species				**8**	**2**	**1**	**6**	**3**	**1**	**5**	**2**	**2**	**20**	**23**	**13**	**9**	**45**	**61**	**38**	**34**

Origin	Scientific Name	Common Name	High Threat	Hz F Management Zones - Presence (x) / Projected Foliage Cover (%)							
				2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021
				8	8	8	8	9	9	9	9
#PI	*Acacia pycnantha*	Golden Wattle	Yes								
*	*Aira spp.*	Hair Grass	No							X	1
*	*Aster subulatus*	Aster-weed	No								
*	*Avena sp.*	Oat	No		X	X	+			X	
*	*Brassica fruticulosa*	Twiggy Turnip	Yes	3	7	+	+	+	3		
*	*Briza spp.*	Quaking-grass	No							X	
*	*Bromus catharticus var. catharticus*	Prairie Grass	Yes								
*	*Bromus hordeaceus subsp. hordeaceus*	Soft Brome	No	X							
*	*Centaurium eurythaea*	Common Century	No				+				+
*	*Cenchrus clandestinus*	Kikuyu	Yes								
*	*Cirsium vulgare*	Spear Thistle	Yes								
*	*Corymbia citriodora subsp. citriodora*	Lemon-scented Gum	Yes								
*	*Cynara cardunculus subsp. flavescens*	Artichoke Thistle	Yes								
*	*Cynodon dactylon var. dactylon*	Couch	Yes					+	+		

Origin	Scientific Name	Common Name	High Threat	Hz F Management Zones - Presence (x) / Projected Foliage Cover (%)							
				2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021
				8	8	8	8	9	9	9	9
*	*Dactylis glomerata*	Cocksfoot	Yes	+				2	+		
*	*Ehrharta erecta var. erecta*	Panic Veldt-grass	Yes								
*	*Ehrharta longiflora*	Annual Veldt-grass	No								
*	*Erigeron sp.*	Fleabane	Yes								
*PI	*Eucalyptus cladocalyx*	Sugar Gum	Yes								
*PI	*Fraxinus angustifolia*	Desert Ash	Yes								
*	*Galenia pubescens var. pubescens*	Galenia	Yes								
*	*Gazania linearis*	Gazania	Yes								
*	*Geranium molle*	Dove's Foot	Yes								
*	*Helminthotheca echioides*	Ox-tongue	Yes								+
*	*Hypochaeris radicata*	Cat's Ear	Yes								
*	*Lactuca serriola*	Prickly Lettuce	No						X		
*	*Lepidium africanum*	Common Peppercress	No								
*	*Lolium spp.*	Rye grass	Yes								
*	*Lysimachia arvensis (Blue-flowered variant)*	Blue Pimpernel	No								
*	*Nassella neesiana*	Chilean Needle-grass	Yes								
*	*Nassella trichotoma*	Serrated Tussock	Yes								
*	*Oxalis pes-caprae*	Soursob	Yes					+			
*	*Oxalis purpurea*	Large-flower Wood-sorrel	Yes	+		2		+		3	
*	*Paspalum dilatatum*	Paspalum	Yes						+		
*	*Phalaris aquatica*	Toowoomba Canary-grass	Yes								
*	*Plantago coronopus subsp. coronopus*	Buck's-horn Plantain	Yes					+			
*	*Plantago lanceolata*	Ribwort	Yes	12	7	2	4	8	4	2	3
*	*Rapistrum rugosum*	Giant mustard	Yes		+						
*	*Romulea rosea*	Onion Grass	Yes	+	+			+	+		+
*	*Rumex crispus*	Curled Dock	No								
*	*Sonchus oleraceus*	Common Sow-thistle	No								
*	*Tragopogon porrifolius subsp. porrifolius*	Salsify	No								
*	*Trifolium angustifolium var. angustifolium*	Narrow-leaf Clover	No								
*	*Vicia sativa*	Common Vetch	No								
			No. weed species	7	5	4	4	8	7	5	5
			No. high threat weed species	5	4	3	1	8	6	2	3
			% cover high threat weed species	15	14	4	4	10	7	5	4

Legend for all tables: ***** = introduced species; **#** = native species occurring outside of natural range; **PI** = planted, **X** = species recorded but cover not assessed (i.e. not high-threat weed species); **+** = negligible cover

Appendix 3: Raw baseline data for species composition and high-threat weed cover – Habitat Zone E

Cover estimates

Cover Estimate Measures	Hz E Management Zones																							
	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021
	1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	6
Total cover (%)	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Overall species cover (%)	87	83	77	50	82	82	80	75	80	80	70	67	65	65	65	55	55	77	30	40	70	80	80	77
Indigenous species cover (%)	85	80	75	45	75	72	70	65	60	65	60	60	60	60	60	50	5	5	5	10	45	60	67	65
Introduced species cover (%)	2	3	2	5	7	10	10	10	20	15	10	7	5	5	5	5	50	72	25	30	25	20	13	12
Bare ground cover (%)	5	5	16	33	8	3	10	15	7	7	5	13	5	5	10	30	40	16	30	40	10	5	7	10
Organic litter cover (%)	8	12	7	17	10	15	10	10	13	13	25	20	30	30	25	15	5	7	40	20	20	15	13	13

Indigenous species

Scientific Name	Common Name	Hz E Management Zones - Presence (X)					
		1	2	3	4	5	6
Acaena echinata	Sheep's Burr	X	X				
Anthosachne scabra s.l.	Common Wheat-grass			X	X		
Asperula conferta	Common Woodruff	X	X	X	X	X	X
Austrostipa bigeniculata	Kneed Spear-grass			X		X	
Austrostipa scabra subsp. falcata	Slender Spear-grass		X		X		
Austrostipa sp.	Spear Grass	X	X		X		
Calocephalus citreus	Lemon Beauty-heads	X					
Cassinia sifton	Drooping Cassinia					X	
Chloris truncata	Windmill Grass					X	
Comesperma polygaloides	Small Milkwort	X					
Convolvulus angustissimus subsp, omnigracilis	Slender Bindweed	X	X		X		
Dianella admixta	Black-anther Flax-lily	X	X	X	X	X	X
Einadia nutans	Nodding Saltbush		X	X	X		
Enchylaena tomentosa var. tomentosa	Ruby Saltbus					X	
Eryngium ovinum	Blue Devil			X			
Geranium retrorsum s.l.	Grassland Crane's-bill	X	X	X	X	X	X
Goodenia pinnatifida	Cut-leaf Goodenia	X					
Lachnagrostis filiformis s.l.	Common Blown-grass						
Lomandra micrantha subsp. micrantha	Small-flower Mat-rush	X			X		X
Minuria leptophylla	Minnie Daisy	X					
Oxalis perennans	Grassland Wood-sorrel	X	X		X	X	X
Pimelea curviflora var. 1	Curved Rice-flower	X	X		X		
Pimelea glauca	Smooth Rice-flower	X	X	X	X	X	X
Pimelea spinescens subsp. spinescens	Spiny Rice-flower	X	X	X		X	
Plantago gaudichaudii	Narrow Plantain	X	X			X	

Scientific Name	Common Name	Hz E Management Zones - Presence (X)					
		1	2	3	4	5	6
Poa labillardierei var. labillardierei	Common Tussock-grass	X	X	X			
Poa sieberiana	Grey Tussock-grass	X	X	X	X	X	
Rutidosis leptorhynchoides	Button Wrinklewort	X	X		X		
Rytidosperma caespitosum	Common Wallaby-grass			X	X	X	X
Rytidosperma duttonianum	Brown-back Wallaby-grass					X	
Rytidosperma sp.	Wallaby Grass						
Senecio macrocarpus	Large-headed Fireweed	X	X				
Senecio quadridentatus	Cotton Fireweed	X	X	X		X	X
Themeda triandra	Kangaroo Grass	X	X	X	X	X	X
Tricoryne elatior	Yellow Rush-lily	X					
Velleia paradoxa	Spur Velleia	X					
Veronica gracilis	Slender Speedwell		X	X		X	
Vittadinia cuneata	Fuzzy New Holland Daisy				X		X
Wahlenbergia communis s.s.	Tufted Bluebell	X	X	X	X	X	
Walwhalleya proluta	Rigid Panic	X					
	No. indigenous species	**26**	**21**	**16**	**18**	**18**	**10**

Introduced species

Origin	Scientific Name	Common Name	High Threat	Hz E Management Zones - Presence (x) / Projected Foliage Cover (%)																							
				2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021
				1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	6
#PI	*Acacia pycnantha*	Golden Wattle	Yes													+											
*	*Aira spp.*	Aira	No	X		X	+	X	X	X	2				+								+		X	X	1
*	*Alium triquetrum*	Angled Onion	Yes					+		+		+								+							
*	*Avena sp.*	Oat	No	X		X	1	X	X	X	3	X	X	X	2	X	X	X	+				5	X	X	X	4
*	*Brassica fruticulosa*	Twiggy Turnip	Yes	+		+	+	2	2	+		2	5	1		2	2	+	1	25	45	+	5	5	10		
*	*Briza spp.*	Quaking-grass	No	X	X	X	2	X	X	X	2			X	+		X	X	+	X			2			X	1
*	*Bromus catharticus var. catharticus*	Prairie Grass	Yes											+							+	+	+				
*	*Bromus hordeaceus subsp. hordeaceus*	Soft Brome	No	X				X		X	1				2		X						3			X	1
*	*Centaurium spp.*	Centaury	No				+				+								+			X	+				
*	*Cenchrus clandestinus*	Kikuyu	Yes								+	3	5	1		+					7	10	+	+	2		
*	*Cynara cardunculus subsp. flavescens*	Artichoke Thistle	Yes																		+						
*	*Cynodon dactylon var. dactylon*	Couch	Yes									+									+	2	+	+			
*	*Cyperus eragrostis*	Drain Flat-sedge	Yes																			+					

Origin	Scientific Name	Common Name	High Threat	Hz E Management Zones - Presence (x) / Projected Foliage Cover (%)																					
				2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021
				1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	6
*	*Dactylis glomerata*	Cocksfoot	Yes					+								+								+	+	1	
*	*Ehrharta erecta var. erecta*	Panic Veldt-grass	Yes					+				+		3								+	+	+	+	+	1
*	*Ehrharta longiflora*	Annual Veldt-grass	No											X			X				X	X	1			X	
*	*Erigeron sp.*	Fleabane	Yes						+																		
*Pl	*Eucalyptus cladocalyx*	Sugar Gum	Yes	+												+	+										
*Pl	*Fraxinus angustifolia*	Desert Ash	Yes	+				+																+	+		
*	*Galenia pubescens var. pubescens*	Galenia	Yes									+									+	+					
*	*Geranium molle*	Dove's Foot	Yes									+								+							
*	*Helminthotheca echioides*	Ox-tongue	Yes					+	+							+		+		7	5		+				
*	*Holcus lanatus*	Yorkshire Fog	No	X																							
*	*Hordeum vulgare*	Barley	No																				+				
*	*Hypochaeris radicata*	Flatweed	Yes								+				+												
*	*Iridaceae*	Iris	Yes					+																			
*	*Lactuca serriola*	Prickly Lettuce	No														X				X		+				+
*	*Lolium spp.*	Rye grass	Yes																							+	
*	*Malva sp*	Mallow	No																				+				
*	*Nassella neesiana*	Chilean Needle-grass	Yes															+									
*	*Nassella trichotoma*	Serrated Tussock	Yes						+			+								+				+			
*	*Oxalis pes-caprae*	Soursob	Yes									+				+		+						+		1	
*	*Oxalis purpurea*	Large-flower Wood-sorrel	Yes									+				+		+									
*	*Paspalum dilatatum*	Paspalum	Yes																		+						
*	*Phalaris aquatica*	Toowoomba Canary-grass	Yes	+	+																						1
*	*Plantago coronopus subsp. coronopus*	Buck's-horn Plantain	Yes									+															
*	*Plantago lanceolata*	Ribwort	Yes	2	3	+	1	5	5	2	3	15	5	2	2	3	3	2	2	17	15	10	10	20	5	3	2
*	*Romulea rosea*	Onion Grass	Yes	+	+			+			+	+	+		1		+		+	+		+	1				+
*	*Sonchus oleraceus*	Common Sow-thistle	No			X				X				X				X	+		X	X	1	X		X	
*	*Tragopogon porrifolius subsp. porrifolius*	Salsify	No					X		X	+		X	X				X			X		+				
*	*Trifolium arvense*	Hare's Foot Clover	No								+								+								
*	*Vicia sativa*	Common Vetch	No									X									X		+	X		X	

Origin	Scientific Name	Common Name	High Threat	Hz E Management Zones - Presence (x) / Projected Foliage Cover (%)																							
				2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021
				1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	6
*	*Vinca major*	Blue Periwinkle	Yes									+															
No. weed species				11	4	6	7	14	8	9	11	16	6	10	7	9	9	11	8	8	14	12	20	12	8	12	9
No. high threat weed species				6	3	2	3	9	5	3	4	14	4	5	3	8	5	6	3	7	9	9	8	9	6	5	4
% cover high threat weed species				2	3	+	2	7	10	2	4	20	15	7	3	5	5	2	3	50	72	22	18	25	20	5	4

Legend for all tables: ***** = introduced species; **#** = native species occurring outside of natural range; **PI** = planted, **X** = species recorded but cover not assessed (i.e. not high-threat weed species); **+** = negligible cover

Appendix 4: Raw baseline data for species composition and high-threat weed cover – Habit Zone D

Cover estimates

Cover Estimate Measures	Hz D Management Zones																			
	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021
	1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	6	6	6	6
Total cover (%)	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
Overall species cover (%)	50	80	45	40	70	72	65	75	80	75	75	75	77	77	80	79	35	65	50	58
Indigenous species cover (%)	5	5	15	40	40	42	40	65	75	70	73	70	70	65	73	73	15	20	40	50
Introduced species cover (%)	45	75	30	15	30	30	25	10	5	5	2	5	7	12	7	6	20	45	10	8
Bare ground cover (%)	35	10	40	15	15	11	15	10	10	10	10	5	7	8	5	1	15	15	30	20
Organic litter cover (%)	15	10	15	15	15	17	20	25	10	15	15	20	16	15	15	20	50	20	20	22

Cover Estimate Measures	Hz D Management Zones																			
	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	Mar 2020	Spring 2020	Dec 2021	
	7	7	7	7	8	8	8	8	9	9	9	9	10	10	10	10	11	11	11	
Total cover (%)	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	
Overall species cover (%)	70	73	50	71	80	78	77	73	60	62	30	75	22	26	50	70	87	50	60	
Indigenous species cover (%)	40	40	40	65	55	65	70	65	15	22	15	65	15	5	30	60	15	7	45	
Introduced species cover (%)	30	33	10	6	25	13	7	8	45	40	15	10	7	21	20	10	72	43	15	
Bare ground cover (%)	15	12	30	4	5	5	3	+	25	22	50	5	3	4	30	10	5	30	20	
Organic litter cover (%)	15	15	20	25	15	17	20	25	15	16	20	20	75	70	20	20	8	20	20	

Indigenous species

Scientific Name	Common Name	Hz D Management Zones - Presence (X)									
		1	2	3	4	6	7	8	9	10	11
Acaena echinata	Sheep's Burr	X		X	X						
Asperula conferta	Common Woodruff		X					X			
Austrostipa bigeniculata	Kneed Spear-grass		X								
Austrostipa sp.	Spear Grass	X			X	X	X		X	X	
Calocephalus citreus	Lemon Beauty-heads			X	X						X
Chloris truncata	Windmill Grass	X									
Chrysocephalum sp. 1	Plains Everlasting			X							
Convolvulus angustissimus subsp, omnigracilis	Slender Bindweed			X						X	
Dianella admixta	Black-anther Flax-lily	X	X	X	X	X	X	X		X	
Dianella sp. aff. longifolia (Benambra)	Arching Flax-lily				X						
Enchylaena tomentosa var. tomentosa	Ruby Saltbush				X						

Scientific Name	Common Name	Hz D Management Zones - Presence (X)									
		1	2	3	4	6	7	8	9	10	11
Eryngium ovinum	Blue Devil				X					X	
Geranium retrorsum s.l.	Grassland Crane's-bill	X	X	X	X			X			
Goodenia pinnatifida	Cut-leaf Goodenia			X	X						
Minuria leptophylla	Minnie Daisy			X	X						
Oxalis perennans	Grassland Wood-sorrel			X				X	X		
Pimelea curviflora var. 1	Curved Rice-flower			X	X						
Pimelea glauca	Smooth Rice-flower	X		X	X		X			X	
Pimelea spinescens subsp. spinescens	Spiny Rice-flower		X	X	X						
Plantago gaudichaudii	Narrow Plantain			X	X						
Poa labillardierei var. labillardierei	Common Tussock-grass				X						
Poa sieberiana	Grey Tussock-grass			X	X			X		X	
Pycnosorus chrysanthes	Golden Billy-buttons			X							
Rutidosis leptorhynchoides	Button Wrinklewort			X	X						
Rytidosperma caespitosum	Common Wallaby-grass	X	X				X				X
Rytidosperma duttonianum	Brown-back Wallaby-grass				X						
Rytidosperma sp.	Wallaby Grass				X				X	X	
Senecio quadridentatus	Cotton Fireweed				X			X			
Senecio squarrosus s.l.	Leafy Fireweed				X						
Solenogyne dominii	Smooth Solenogyne			X							
Themeda triandra	Kangaroo Grass	X	X	X	X	X	X	X	X	X	X
Velleia paradoxa	Spur Velleia			X	X						
Veronica gracilis	Slender Speedwell				X						
Vittadinia cuneata	Fuzzy New Holland Daisy				X						
Walwhalleya proluta	Rigid Panic	X							X		
No. indigenous species		**9**	**7**	**19**	**25**	**3**	**5**	**7**	**5**	**8**	**3**

Introduced species

Origin	Scientific Name	Common Name	High Threat	Hz D Management Zones - Presence (x) / Projected Foliage Cover (%)																			
				2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021
				1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	6	6	6	6
*PI	*Acacia saligna*	Golden-wreath Wattle	Yes	+												+							
*	*Aira spp.*	Aira	No		X		+						X	X					+				+
*	*Asparagus asparagoides*	Bridal Creeper	Yes		+														1				
*	*Avena sp.*	Oat	No	X	X	X	5	X	X	X	+	X		X	+	X	X	X			X	X	4
*	*Brassica fruticulosa*	Twiggy Turnip	Yes	10	20	2	2		+	+			+			+	2			+	30		+
*	*Briza spp.*	Quaking-grass	No	X		X	2			X	+	X	X	X	3	X	X	X	4				
*	*Bromus catharticus var. catharticus*	Prairie Grass	Yes	+			+																

Origin	Scientific Name	Common Name	High Threat	Hz D Management Zones - Presence (x) / Projected Foliage Cover (%)																			
				2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021
				1	1	1	1	2	2	2	2	3	3	3	3	4	4	4	4	6	6	6	6
*	*Bromus hordeaceus subsp. hordeaceus*	Soft Brome	No	X						X						X	X	X	+	X			
*	*Cenchrus clandestinus*	Kikuyu	Yes	3	7	10		5	7														
*	*Centaurium spp.*	Centaury	No			+	1				+				+			X					
*	*Cirsium vulgare*	Spear Thistle	Yes	+																			
*	*Cynara cardunculus subsp. flavescens*	Artichoke Thistle	Yes					+															
*	*Cynodon dactylon var. dactylon*	Couch	Yes	+	2	6	+									+	+						
*	*Ehrharta erecta var. erecta*	Panic Veldt-grass	Yes	+	+																		
*	*Erigeron sp.*	Fleabane	Yes		+				+								+						
*PI	*Fraxinus angustifolia*	Desert Ash	Yes	+					+														
*	*Galenia pubescens var. pubescens*	Galenia	Yes		+																		
*	*Geranium molle*	Dove's Foot	Yes																				
*	*Geranium molle*	Dove's Foot	Yes					+															
*	*Helminthotheca echioides*	Ox-tongue	Yes	5	1	+	+		+	2	+					+	+	+					
*	*Hypochaeris radicata*	Cat's Ear	Yes	+																			
*	*Iridaceae*	Iris	Yes													+							
*	*Lactuca serriola*	Prickly Lettuce	No	X	X		+																
*	*Lolium spp.*	Rye grass	Yes	X			+			5													
*	*Lysimachia arvense*	Scarlet Pimpernel	No				+																
*	*Nassella neesiana*	Chilean Needle-grass	Yes	+																15			
*	*Nassella trichotoma*	Serrated Tussock	Yes													+							
*	*Oxalis pes-caprae*	Soursob	Yes	+				+												+			
*	*Paspalum dilatatum*	Paspalum	Yes	+												+							
*	*Phalaris aquatica*	Toowoomba Canary-grass	Yes	2	+	+	5	10	7	2	3		1			+	+		+				
*	*Plantago lanceolata*	Ribwort	Yes	25	45	12	5	15	15	10	6	5	4	1	1	6	8	5	2	5	15	8	4
*	*Rapistrum rugosum*	Giant mustard	Yes	+																			
*	*Romulea rosea*	Onion Grass	Yes	+			+	+		+	+	+	+		+	+	+						+
*	*Rumex crispus*	Curled Dock	No	X																			
*	*Solanum nigrin*	Black Nightshade	No		X																		
*	*Sonchus oleraceus*	Common Sow-thistle	No	X	X	X	+		X	X											X		
*	*Tragopogon porrifolius subsp. porrifolius*	Salsify	No	X	X			X		X												X	
*	*Vicia sativa*	Common Vetch	No	X	X			X															
No. weed species				**27**	**17**	**10**	**15**	**8**	**9**	**11**	**7**	**4**	**6**	**4**	**5**	**13**	**10**	**6**	**6**	**5**	**4**	**3**	**5**
No. high threat weed species				**18**	**10**	**6**	**8**	**5**	**7**	**6**	**4**	**2**	**4**	**1**	**2**	**10**	**7**	**2**	**2**	**4**	**2**	**1**	**3**
% cover high threat weed species				**45**	**75**	**30**	**14**	**30**	**30**	**19**	**10**	**5**	**5**	**1**	**1**	**7**	**12**	**5**	**2**	**20**	**45**	**8**	**5**

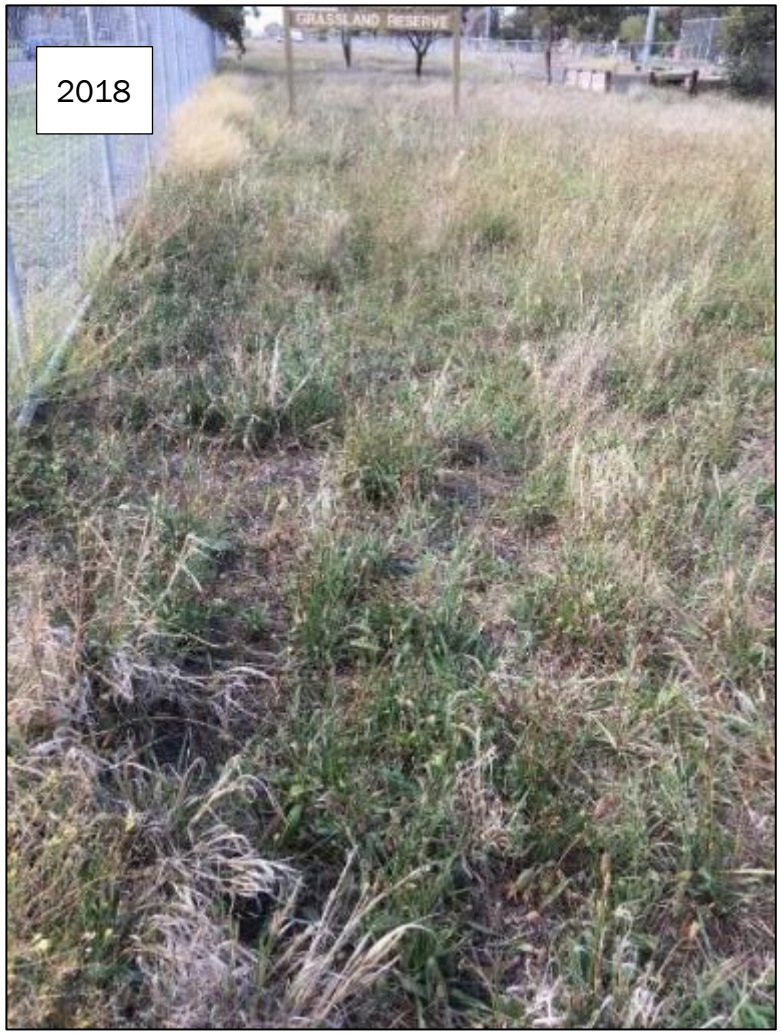
Origin	Scientific Name	Common Name	High Threat	Hz D Management Zones - Presence (x) / Projected Foliage Cover (%)																	
				2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	Mar 2020	Spring 2020	Dec 2021
				7	7	7	7	8	8	8	8	9	9	9	9	10	10	10	10	11	11	11
*PI	*Acacia saligna*	Golden-wreath Wattle	Yes													+	3					
*	*Aira spp.*	Aira	No		X					X	1		X		+				+	X		
*	*Asparagus asparagoides*	Bridal Creeper	Yes																			
*	*Avena sp.*	Oat	No		X	X	1	X	X		+	10	X	X	3	2		X	2		X	+
*	*Brassica fruticulosa*	Twiggy Turnip	Yes	+	3	1		+	3	2			+			2	1		+			
*	*Briza spp.*	Quaking-grass	No	X		X	3	X		X	4	X	X	X	5	X		X	4	X		1
*	*Bromus catharticus var. catharticus*	Prairie Grass	Yes																	+	1	
*	*Bromus hordeaceus subsp. hordeaceus*	Soft Brome	No					X	X		1								+			
*	*Cenchrus clandestinus*	Kikuyu	Yes													1						
*	*Centaurium spp.*	Centaury	No								+							X	1		X	
*	*Cirsium vulgare*	Spear Thistle	Yes																			
*	*Cynara cardunculus subsp. flavescens*	Artichoke Thistle	Yes																			
*	*Cynodon dactylon var. dactylon*	Couch	Yes																	2		+
*	*Ehrharta erecta var. erecta*	Panic Veldt-grass	Yes	+																		
*	*Erigeron sp.*	Fleabane	Yes		+								+									
*PI	*Fraxinus angustifolia*	Desert Ash	Yes													+						
*	*Galenia pubescens var. pubescens*	Galenia	Yes																			
*	*Geranium molle*	Dove's Foot	Yes																			
*	*Geranium molle*	Dove's Foot	Yes																			
*	*Helminthotheca echioides*	Ox-tongue	Yes		+								+					+		10		
*	*Hypochaeris radicata*	Cat's Ear	Yes																			
*	*Iridaceae*	Iris	Yes																			
*	*Lactuca serriola*	Prickly Lettuce	No														X					
*	*Lolium spp.*	Rye grass	Yes											7								
*	*Nassella neesiana*	Chilean Needle-grass	Yes																			
*	*Nassella trichotoma*	Serrated Tussock	Yes		+																	
*	*Oxalis pes-caprae*	Soursob	Yes	+																		
*	*Paspalum dilatatum*	Paspalum	Yes																			
*	*Phalaris aquatica*	Toowoomba Canary-grass	Yes					1	+		+									30		2
*	*Plantago lanceolata*	Ribwort	Yes	30	30	8	2	20	10	5	2	35	40	4	2	2	15	15	3	30	40	10
*	*Rapistrum rugosum*	Giant mustard	Yes																			
*	*Romulea rosea*	Onion Grass	Yes	+		+					+			2					+		1	1
*	*Rumex crispus*	Curled Dock	No																	X		
*	*Solanum nigrin*	Black Nightshade	No																			
*	*Sonchus oleraceus*	Common Sow-thistle	No		X					X			X					X			X	

Origin	Scientific Name	Common Name	High Threat	Hz D Management Zones - Presence (x) / Projected Foliage Cover (%)																	
				2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	2018	Mar 2020	Spring 2020	Dec 2021	Mar 2020	Spring 2020	Dec 2021
				7	7	7	7	8	8	8	8	9	9	9	9	10	10	10	10	11	11	11
*	*Tragopogon porrifolius subsp. porrifolius*	Salsify	No		X																	
*	*Vicia sativa*	Common Vetch	No																	X		
No. weed species				6	9	5	3	6	5	5	8	3	8	5	4	7	4	6	8	9	6	7
No. high threat weed species				5	5	3	1	3	3	2	3	1	4	3	1	6	3	2	3	6	3	5
% cover high threat weed species				30	33	9	2	25	13	7	3	45	40	13	2	7	21	15	4	72	42	19

Legend for all tables: ***** = introduced species; **#** = native species occurring outside of natural range; **Pl** = planted, **X** = species recorded but cover not assessed (i.e. not high-threat weed species); **+** = negligible cover

Appendix 5: Photo points: Comparison between November 2018 and Dec 2021

Habitat Zone F - Management Zone 1 (Photo point 10)



Habitat Zone F - Management Zone 2a (Photo point 11a)

2018

Dec 2021

Habitat Zone F - Management Zone 2b (Photo point 11b)

2018

Dec 2021

Habitat Zone F - Management Zone 3 (Photo point 14) – was formerly in Zone F5

2018

Dec 2021

Habitat Zone F - Management Zone 3 (Photo point 32) – new photo point created in Mar 2020

Mar 2020

Dec 2021

Habitat Zone F - Management Zone 4a (Photo point 13a)

2018

Dec 2021

Habitat Zone F - Management Zone 4b (Photo point 13b)

2018

Dec 2021

Habitat Zone F - Management Zone 4c (Photo point 13c) - new photo point created in Mar 2020

March 2020

Dec 2021

Habitat Zone F - Management Zone 5a (Photo point 33) - new photo point created in Mar 2020

March 2020

Dec 2021

Habitat Zone F - Management Zone 5b (Photo point 12) - new photo point created in Mar 2020

March 2020

Dec 2021

Habitat Zone F - Management Zone 6 (Photo point 15)

2018

Dec 2021

Habitat Zone F - Management Zone 7 (Photo point 20)

2018

Dec 2021

Habitat Zone F - Management Zone 8 (Photo point 19)

2018

Dec 2021

Habitat Zone F - Management Zone 9 (Photo point 16)

2018

Dec 2021

Habitat Zone E - Management Zone 1 (Photo point 4)

2018

Dec 2021

Habitat Zone E - Management Zone 2 (Photo point 2)

2018

Dec 2021

Habitat Zone E - Management Zone 2 (Photo point 8) - was formerly in Zone E7

2018

Dec 2021

Habitat Zone E - Management Zone 3 (Photo point 7)

2018

Dec 2021

Habitat Zone E - Management Zone 4 (Photo point 3)

2018

Dec 2021

Habitat Zone E - Management Zone 4 (Photo point 5)

2018

Dec 2021

Habitat Zone E - Management Zone 5 (Photo point 9)

2018

Dec 2021

Habitat Zone E - Management Zone 6 (Photo point 6)

2018

Dec 2021

Habitat Zone D - Management Zone 1 (Photo point 24)

2018

Dec 2021

Habitat Zone D - Management Zone 1 (Photo point 28)

2018

Dec 2021

Habitat Zone D - Management Zone 2 (Photo point 21)

2018

Dec 2021

Habitat Zone D - Management Zone 3 (Photo point 29)

2018

Dec 2021

Habitat Zone D - Management Zone 4 (Photo point 22)

2018

Dec 2021

Habitat Zone D - Management Zone 6 (Photo point 26)

2018

Dec 2021

Habitat Zone D - Management Zone 7 (Photo point 25)

2018

Dec 2021

Habitat Zone D - Management Zone 8 (Photo point 23)

2018

Dec 2021

Habitat Zone D - Management Zone 9 (Photo point 30)

2018

Dec 2021

Habitat Zone D - Management Zone 10 (Photo point 31)

2018

Dec 2021

Habitat Zone D - Management Zone 11 (Photo point 34) – new zone added in March 2020

March 2020

Dec 2021

Appendix 6: Threatened species census list – December 2021

Species	Tag number (BL&A)	Tag number (MCMC)	Distance from fence (m)	Number of plants	Notes
Species counts					
Button Wrinklewort				37	Excluding seedlings planted in Nov 2021
Large-headed Fireweed				7	
Small Milkwort				1	
Spiny Rice-flower				536	
Species list					
Button Wrinklewort	398	34	-	1	
Button Wrinklewort	396	35	-	1	
Button Wrinklewort	219	36		1	
Button Wrinklewort	213	37	3.7	1	
Button Wrinklewort	220	38	3	1	
Button Wrinklewort	242	39	2.45	1	
Button Wrinklewort	394	40	-	1	
Button Wrinklewort	243	41	2.8	1	
Button Wrinklewort	393	42	-	1	Tag 42 missing
Button Wrinklewort	-	43	-	1	
Button Wrinklewort	-	44	-	1	
Button Wrinklewort	-	45	-	1	
Button Wrinklewort	-	46	-	1	
Button Wrinklewort	-	47	-	1	
Button Wrinklewort	-	48	-	1	
Button Wrinklewort	-	49		1	
Button Wrinklewort	-	50	-	1	
Button Wrinklewort	218	51	3.25	1	
Button Wrinklewort	353	-	-	1	New recruit (2019)
Button Wrinklewort	391	-	-	1	Planted spring 2019
Button Wrinklewort	392	-	-	1	New recruit (2019)
Button Wrinklewort	-	SA X T4	-	1	Planted spring 2020
Button Wrinklewort	-	T X T9	-	1	Planted spring 2020
Button Wrinklewort	-	T X T3	-	1	Planted spring 2020
Button Wrinklewort	-	SA X T3	-	1	Planted spring 2020
Button Wrinklewort	-	T X T5	-	1	Planted spring 2020
Button Wrinklewort	-	SA X T2	-	1	Planted spring 2020
Button Wrinklewort	-	T X T1	-	1	Planted spring 2020
Button Wrinklewort	-	T X T7	-	1	Planted spring 2020
Button Wrinklewort	-	SA x T4	-	1	Planted spring 2020
Button Wrinklewort	-	T X T1	-	1	Planted spring 2020
Button Wrinklewort	-	T X T3	-	1	Planted spring 2020 – now gone

Species	Tag number (BL&A)	Tag number (MCMC)	Distance from fence (m)	Number of plants	Notes
Button Wrinklewort	-	T X T6	-	1	Planted spring 2020 – now gone
Button Wrinklewort	-	T X T2	-	1	Planted spring 2020 – now dead
Button Wrinklewort	-	SA X T3	-	1	Planted spring 2020 – now gone
Button Wrinklewort	-	T X T4	-	1	Planted spring 2020
Button Wrinklewort	-	SA X T2	-	1	Planted spring 2020 – now gone
Button Wrinklewort		T X T7		1	Planted spring 2020 – now dead
Button Wrinklewort		T X T2		1	Planted spring 2020
Button Wrinklewort		SA X T4		1	Planted spring 2020
Button Wrinklewort		T X T6		1	Planted spring 2020
Button Wrinklewort		SA X T1		1	Planted spring 2020 – now gone
Button Wrinklewort		SA X t3		1	Planted spring 2020
Button Wrinklewort		SA x t2		1	Planted spring 2020
Large-headed Fireweed	395	-	-	1	New record
Large-headed Fireweed	399	-	-	1	New record
Large-headed Fireweed	400	-	-	1	New record
Large-headed Fireweed	841	-	-	1	New record
Large-headed Fireweed	842	-	-	1	New record
Large-headed Fireweed	843	-	-	1	New record
Large-headed Fireweed	844	-	-	1	New record
Small Milkwort	124		2.9	1	
Spiny Rice-flower	101		3	1	
Spiny Rice-flower	102		2.5	3	
Spiny Rice-flower	103		2.1	1	
Spiny Rice-flower	104		2.5	1	
Spiny Rice-flower	105		2.15	1	
Spiny Rice-flower	106		1.7	1	
Spiny Rice-flower	107		1.3	1	
Spiny Rice-flower	108		2.15	2	
Spiny Rice-flower	109		2.45	2	
Spiny Rice-flower	110		2.25	1	
Spiny Rice-flower	111		1.45	1	
Spiny Rice-flower	112		1.75	1	
Spiny Rice-flower	113		1.8	3	
Spiny Rice-flower	114		2.05	2	

Species	Tag number (BL&A)	Tag number (MCMC)	Distance from fence (m)	Number of plants	Notes
Spiny Rice-flower	114		2.35	3	
Spiny Rice-flower	115		1.35	1	
Spiny Rice-flower	115		1.9	1	
Spiny Rice-flower	116		2.5	1	
Spiny Rice-flower	117		3.9	1	
Spiny Rice-flower	118		2.7	1	
Spiny Rice-flower	118		2.15	6	
Spiny Rice-flower	119		2.05	1	
Spiny Rice-flower	120		1.35	2	
Spiny Rice-flower	121		1.9	3	
Spiny Rice-flower	122		2.1	2	
Spiny Rice-flower	123		2.35	4	
Spiny Rice-flower	125		1.55	3	
Spiny Rice-flower	126		3.85	2	
Spiny Rice-flower	127		2.2	1	
Spiny Rice-flower	128		3.5	1	
Spiny Rice-flower	129		2.75	1	
Spiny Rice-flower	130		2.4	1	
Spiny Rice-flower	131		1.9	2	
Spiny Rice-flower	132		2.5	1	
Spiny Rice-flower	132		3.1	2	
Spiny Rice-flower	133		2.6	3	
Spiny Rice-flower	134		2.95	3	
Spiny Rice-flower	134		2.15	4	
Spiny Rice-flower	135		3.1	1	
Spiny Rice-flower	136		3	1	
Spiny Rice-flower	137		3	1	
Spiny Rice-flower	138		2.8	1	
Spiny Rice-flower	138		3.6	1	
Spiny Rice-flower	139		2.45	2	
Spiny Rice-flower	140		1.5	1	
Spiny Rice-flower	140		1.7	2	
Spiny Rice-flower	141		1.9	1	
Spiny Rice-flower	142		2.35	1	
Spiny Rice-flower	143		1.9	1	
Spiny Rice-flower	144		3	1	
Spiny Rice-flower	145		3.05	1	
Spiny Rice-flower	146		2.55	1	
Spiny Rice-flower	147		1.3	2	

Species	Tag number (BL&A)	Tag number (MCMC)	Distance from fence (m)	Number of plants	Notes
Spiny Rice-flower	148		1.55	2	
Spiny Rice-flower	149		2	2	
Spiny Rice-flower	150		1.25	1	
Spiny Rice-flower	151		2.2	1	
Spiny Rice-flower	152		2.15	1	
Spiny Rice-flower	153		1.8	2	
Spiny Rice-flower	154		2.6	1	
Spiny Rice-flower	155		2.9	1	
Spiny Rice-flower	156		5.2	1	
Spiny Rice-flower	156		3.3	4	
Spiny Rice-flower	157		2	1	
Spiny Rice-flower	158		1.4	1	
Spiny Rice-flower	158		1.15	1	
Spiny Rice-flower	159		2.6	1	
Spiny Rice-flower	160		3	2	
Spiny Rice-flower	160		2.2	2	
Spiny Rice-flower	161		1.9	2	
Spiny Rice-flower	161		3.1	1	
Spiny Rice-flower	162		2.6	1	
Spiny Rice-flower	162		2.35	3	
Spiny Rice-flower	163		2.85	1	
Spiny Rice-flower	163		1.95	4	
Spiny Rice-flower	164		3.5	1	
Spiny Rice-flower	165		3	1	
Spiny Rice-flower	165		3.4	1	
Spiny Rice-flower	166		1.7	1	
Spiny Rice-flower	166		1.4	1	
Spiny Rice-flower	167		2.8	1	
Spiny Rice-flower	168		3	2	
Spiny Rice-flower	168		2.05	2	
Spiny Rice-flower	169		1.35	2	
Spiny Rice-flower	169		2.8	4	
Spiny Rice-flower	170		1.65	1	
Spiny Rice-flower	170		2.4	1	
Spiny Rice-flower	171		1.5	1	
Spiny Rice-flower	172		2.9	2	
Spiny Rice-flower	173		2.15	2	
Spiny Rice-flower	174		2.7	2	
Spiny Rice-flower	174		2.35	2	

Species	Tag number (BL&A)	Tag number (MCMC)	Distance from fence (m)	Number of plants	Notes
Spiny Rice-flower	175		3.2	1	
Spiny Rice-flower	175		2.3	3	
Spiny Rice-flower	176		3.55	1	
Spiny Rice-flower	176		2.6	1	
Spiny Rice-flower	177		2.15	2	
Spiny Rice-flower	177		2.9	1	
Spiny Rice-flower	178		2.05	1	
Spiny Rice-flower	178		1.8	4	
Spiny Rice-flower	179		2.6	1	
Spiny Rice-flower	179		2.05	2	
Spiny Rice-flower	180		2.7	1	
Spiny Rice-flower	180		2.55	3	
Spiny Rice-flower	181		5.2	1	
Spiny Rice-flower	182		3.8	1	
Spiny Rice-flower	182		3.1	3	
Spiny Rice-flower	183		3.4	1	
Spiny Rice-flower	184		2.4	1	
Spiny Rice-flower	185		2.7	4	
Spiny Rice-flower	185		2.6	1	
Spiny Rice-flower	186		3.15	1	
Spiny Rice-flower	187		3.6	1	
Spiny Rice-flower	188		2.75	2	
Spiny Rice-flower	189		3.3	4	
Spiny Rice-flower	189		2.1	2	
Spiny Rice-flower	190		2.9	3	
Spiny Rice-flower	190		3.45	1	
Spiny Rice-flower	191		2.65	1	
Spiny Rice-flower	192		2.35	2	
Spiny Rice-flower	193		2.05	2	
Spiny Rice-flower	194		1.6	4	
Spiny Rice-flower	195		3	1	
Spiny Rice-flower	196		2.35	3	
Spiny Rice-flower	197		3	6	
Spiny Rice-flower	197		3	2	
Spiny Rice-flower	198		2.55	4	
Spiny Rice-flower	199		2.2	2	
Spiny Rice-flower	200		2.35	3	
Spiny Rice-flower	201		1.95	1	
Spiny Rice-flower	202		3.8	1	

Species	Tag number (BL&A)	Tag number (MCMC)	Distance from fence (m)	Number of plants	Notes
Spiny Rice-flower	203		3.15	4	
Spiny Rice-flower	204		2.9	6	
Spiny Rice-flower	205		1.9	1	
Spiny Rice-flower	206		2.15	6	
Spiny Rice-flower	207		1.95	4	
Spiny Rice-flower	208		1.6	3	
Spiny Rice-flower	209		3.15	4	
Spiny Rice-flower	210		2.85	3	
Spiny Rice-flower	211		3.15	3	
Spiny Rice-flower	212		3.15	3	
Spiny Rice-flower	214		2.7	4	
Spiny Rice-flower	215		2.4	3	
Spiny Rice-flower	216		2	2	
Spiny Rice-flower	217		2.2	4	
Spiny Rice-flower	219		2.05	3	
Spiny Rice-flower	222		2.5	1	
Spiny Rice-flower	223		1.3	1	
Spiny Rice-flower	224		1.1	1	
Spiny Rice-flower	225		1.55	2	
Spiny Rice-flower	226		2.95	2	
Spiny Rice-flower	226		1.75	2	
Spiny Rice-flower	227		3.15	1	
Spiny Rice-flower	227		1.95	3	
Spiny Rice-flower	228		2.2	1	
Spiny Rice-flower	228		2.5	4	
Spiny Rice-flower	229		3.1	1	
Spiny Rice-flower	229		2.5	6	
Spiny Rice-flower	230		2.5	1	
Spiny Rice-flower	230		2.2	2	
Spiny Rice-flower	231		3	1	
Spiny Rice-flower	231		2.1	4	
Spiny Rice-flower	232		3.3	1	
Spiny Rice-flower	232		3.1	2	
Spiny Rice-flower	233		3.5	1	
Spiny Rice-flower	233		3.3	2	
Spiny Rice-flower	234		2.7	1	
Spiny Rice-flower	234		1.6	2	
Spiny Rice-flower	234		3.15	4	
Spiny Rice-flower	235		3	1	

Species	Tag number (BL&A)	Tag number (MCMC)	Distance from fence (m)	Number of plants	Notes
Spiny Rice-flower	235		2	4	
Spiny Rice-flower	236		3.35	1	
Spiny Rice-flower	236		2.35	5	
Spiny Rice-flower	237		2.6	1	
Spiny Rice-flower	237		2.45	3	
Spiny Rice-flower	238		3.3	1	
Spiny Rice-flower	238		1.85	1	
Spiny Rice-flower	239		2.8	2	
Spiny Rice-flower	239		1.75	1	
Spiny Rice-flower	240		1.9	1	
Spiny Rice-flower	240		2.3	1	
Spiny Rice-flower	241		3	1	
Spiny Rice-flower	241		1.75	1	
Spiny Rice-flower	242		2.3	1	
Spiny Rice-flower	243		2.8	1	
Spiny Rice-flower	244		2.7	1	
Spiny Rice-flower	244		0.65	2	
Spiny Rice-flower	245		2.1	2	
Spiny Rice-flower	245		2.7	2	
Spiny Rice-flower	246		2.2	1	
Spiny Rice-flower	246		4.5	1	
Spiny Rice-flower	247		2.3	1	
Spiny Rice-flower	247		9.3	1	
Spiny Rice-flower	248		2.1	1	
Spiny Rice-flower	248		9.25	1	
Spiny Rice-flower	249		2.4	2	
Spiny Rice-flower	249		8.9	1	
Spiny Rice-flower	250		1.8	1	
Spiny Rice-flower	250		11.4	1	
Spiny Rice-flower	251		2.6	1	
Spiny Rice-flower	251		8.4	3	
Spiny Rice-flower	252		3.1	1	
Spiny Rice-flower	252		8.25	1	
Spiny Rice-flower	253		3.4	1	
Spiny Rice-flower	253		4.5	2	
Spiny Rice-flower	254		2.5	1	
Spiny Rice-flower	254		5	2	
Spiny Rice-flower	255		2.3	1	
Spiny Rice-flower	255		9.35	2	

Species	Tag number (BL&A)	Tag number (MCMC)	Distance from fence (m)	Number of plants	Notes
Spiny Rice-flower	256		2.8	1	
Spiny Rice-flower	256		6.9	1	
Spiny Rice-flower	257		2.3	1	
Spiny Rice-flower	257		9.4	1	
Spiny Rice-flower	258		2	1	
Spiny Rice-flower	258		5.8	1	
Spiny Rice-flower	259		0.15	1	
Spiny Rice-flower	259		5.15	1	
Spiny Rice-flower	260		0.3	1	
Spiny Rice-flower	260		5.85	1	
Spiny Rice-flower	261		2.3	1	
Spiny Rice-flower	261		10.5	1	
Spiny Rice-flower	262		2.4	1	
Spiny Rice-flower	262		10.5	2	
Spiny Rice-flower	263		2.3	1	
Spiny Rice-flower	263		9.8	1	
Spiny Rice-flower	264		2.1	1	
Spiny Rice-flower	264		1.3	1	
Spiny Rice-flower	265		8.3	1	
Spiny Rice-flower	266		1.85	2	
Spiny Rice-flower	266		10.7	1	
Spiny Rice-flower	267		1.65	1	
Spiny Rice-flower	267		13	1	
Spiny Rice-flower	268		1.5	1	
Spiny Rice-flower	268		10	2	
Spiny Rice-flower	269		2.2	3	
Spiny Rice-flower	269		11.5	1	
Spiny Rice-flower	270		2.55	1	
Spiny Rice-flower	270		8.7	2	
Spiny Rice-flower	271		2.6	1	
Spiny Rice-flower	271		8.8	2	
Spiny Rice-flower	272		2.95	1	
Spiny Rice-flower	272		7.9	1	
Spiny Rice-flower	273		2.75	1	
Spiny Rice-flower	273		5	2	
Spiny Rice-flower	274		2.85	3	
Spiny Rice-flower	274		9.7	3	
Spiny Rice-flower	275		3	1	
Spiny Rice-flower	275		9.25	1	

Species	Tag number (BL&A)	Tag number (MCMC)	Distance from fence (m)	Number of plants	Notes
Spiny Rice-flower	276		2.25	1	
Spiny Rice-flower	276		11.15	1	
Spiny Rice-flower	277		2.55	2	
Spiny Rice-flower	277		10	1	
Spiny Rice-flower	278		2.45	1	
Spiny Rice-flower	278		11.5	1	
Spiny Rice-flower	280		1.9	1	
Spiny Rice-flower	281		1.75	1	
Spiny Rice-flower	282		2.45	1	
Spiny Rice-flower	283		2.1	1	
Spiny Rice-flower	284		2.35	1	
Spiny Rice-flower	285		2.6	2	
Spiny Rice-flower	286		2.55	1	
Spiny Rice-flower	287		2.85	1	
Spiny Rice-flower	288		2.45	1	
Spiny Rice-flower	289		3.2	1	
Spiny Rice-flower	290		2.85	1	
Spiny Rice-flower	291		2.4	1	
Spiny Rice-flower	292		1.95	1	
Spiny Rice-flower	293		1.95	2	
Spiny Rice-flower	294		2	1	
Spiny Rice-flower	295		2.5	2	
Spiny Rice-flower	296		2.15	1	
Spiny Rice-flower	297		1.8	2	
Spiny Rice-flower	298		2.1	2	
Spiny Rice-flower	299		3.6	1	
Spiny Rice-flower	300		3.5	1	
Spiny Rice-flower	301		3.7	1	
Spiny Rice-flower	302		3.1	1	
Spiny Rice-flower	303		3.8	1	
Spiny Rice-flower	304		4	1	
Spiny Rice-flower	305		4.4	1	
Spiny Rice-flower	306		4.7	1	
Spiny Rice-flower	307		2.3	1	
Spiny Rice-flower	308		2.4	1	
Spiny Rice-flower	309		2.5	1	
Spiny Rice-flower	310		12.2	1	
Spiny Rice-flower	311		2	1	
Spiny Rice-flower	312		2.35	1	

Species	Tag number (BL&A)	Tag number (MCMC)	Distance from fence (m)	Number of plants	Notes
Spiny Rice-flower	313		1.1	1	
Spiny Rice-flower	314		1.6	1	
Spiny Rice-flower	315		2.25	1	
Spiny Rice-flower	316		3.5	1	
Spiny Rice-flower	317		2.8	1	
Spiny Rice-flower	318		2.8	1	
Spiny Rice-flower	319		2.3	1	
Spiny Rice-flower	320		3.8	1	
Spiny Rice-flower	321		3.25	1	
Spiny Rice-flower	322		7.4	1	
Spiny Rice-flower	323		2.25	2	
Spiny Rice-flower	324		1.75	1	
Spiny Rice-flower	325		2.8	1	
Spiny Rice-flower	326		3.1	1	
Spiny Rice-flower	327		2.75	1	
Spiny Rice-flower	328		4.45	1	
Spiny Rice-flower	330		4.3	1	
Spiny Rice-flower	331		2.1	1	
Spiny Rice-flower	332		3.2	1	
Spiny Rice-flower	333		3.2	3	
Spiny Rice-flower	334		3.6	1	
Spiny Rice-flower	335		3.7	3	
Spiny Rice-flower	337		2.5	1	
Spiny Rice-flower	338		1.8	2	
Spiny Rice-flower	339		2.1	1	
Spiny Rice-flower	340		1.35	3	
Spiny Rice-flower	341		2.35	1	
Spiny Rice-flower	342		2.05	1	
Spiny Rice-flower	343		1.7	2	
Spiny Rice-flower	343		4.3	1	
Spiny Rice-flower	344		2.7	1	
Spiny Rice-flower	345		1.85	1	
Spiny Rice-flower	346		2.05	1	
Spiny Rice-flower	347		2.1	1	
Spiny Rice-flower	348		2	5	
Spiny Rice-flower	349		1.65	1	
Spiny Rice-flower	350		1.85	2	

Appendix 7: MCMC Biosite works summary (2020 - 2021)

Summary of works by Merri Creek Management Committee at Biosite 3546, Main St, St Albans, under the 2020-2021 Environmental Management Works Program

Environmental Management Works

Approximately 1300 hours of environmental management works were performed at Biosite 3546 between 23/09/2020 and 1/09/2021. Table 1 contains a monthly breakdown of activities performed, total hours, and main targets.

Table 1. Monthly summary of environmental management works

Month	Activity	Hours	Target
Sept 2020	Handweed, brushcut	92	Plantago, Brassica, Angled Onion, annual grasses
	Spot spray	8	Brassica, annual grasses
Oct 2020	Rubbish removal	8	
	Handweed, brushcut	40	Annual grasses, Cocksfoot, Chilean Needle Grass
	Spot spray	24	Annual grasses, Kikuyu, Chilean Needle Grass
Nov 2020	Handweed, brushcut	80	Annual grasses, plantago
	Spot spray	32	Annual grasses, Chilean Needle Grass, Plantago, Kikuyu, Couch
	Biomass removal	8	Biomass around threatened species
	Cut and paint	8	Resprouting Desert Ash
Dec 2020	Handweed, brushcut	92	Annual grasses, Kikuyu, Plantago
	Rubbish removal	4	
	Watering	4	Planted Rutidosis
	Spot spray	48	Annuals, Plantago, Kikuyu, Couch
	Seed collection	8	Austrostipa sp., Rytidosperma sp.
Jan 2021	Spot spray	40	Couch, Kikuyu, Bristly Ox-tongue
	Handweed	24	Salsify, Paspalum
Feb 2021	Spot spray	48	Brassica, C4 annuals, Kikuyu, Couch, Paspalum
	Handweed	72	Nassella germinants, C4 annuals, Phalaris, Couch
March 2021	Spot spray	32	Annual grasses
	Handweed	80	Annual grasses, Couch, Plantago
April 2021	Ecological burn	48	
	Spot spray	24	Annual grasses, broadleaf germinants
	Handweed	32	Annual grasses, Plantago
	Direct seeding	32	Assorted grasses
May 2021	Direct seeding	16	Large-fruited Fireweed
	Spot spray	64	Annual grasses, Brassica, Oxalis purpurea, Plantago, Cocksfoot
June 2021	Planting	48	Grasses
	Handweed	28	Cocksfoot, Phalaris

	Direct seeding	10	Assorted grasses
	Rubbish removal	6	
July 2021	Spot spray	72	Plantago, Cocksfoot, Phalaris, Oxalis, annual grasses
	Handweed	16	Plantago
Aug 2021	Spot spray	56	Oxalis, Plantago, Cocksfoot
	Handweed	108	Plantago, annuals
Sept 2021	Spot spray	16	

Ecological burns

Ecological burns were undertaken on 8/04/2021 in Zones E and F. Approximately 60% (0.17ha) of Zone E was burnt, along with 62% (0.21 ha) of Zone F. Conditions were drier than in autumn 2020, allowing close to 100% of vegetation being burnt in the areas to which fire was applied (see Figure 1).

Figure 1. Ecological burns in Zones E and F, April 2021.

Revegetation

Direct seeding

Assorted native grass seed was sown in April and June 2021 into bare ground along the perimeters of all three zones. Table 2 lists the grass species and volumes sown. Seed was either sourced from within the site, or harvested from other rail corridor biosites in Calder Park and Sunbury.

Table 2. Quantities of grass seed sown in 2021

Botanical name	Volume of seed (g)
Austrostipa sp.	51
Rytidosperma setaceum	2
Rytidosperma fulvum	12
Rytidosperma spp.	320
Themeda triandra	300

Additionally, 30g of Large-fruited Fireweed (*Senecio macrocarpus*) seed was sown in May 2021 into several 1m^2 plots, within 20m of remnant plants in Zone E. This seed was sourced from a seed production area containing stock descended from larger populations of Large-fruit Fireweed in the rail reserve at Calder Park and Sunbury.

General revegetation

Assorted grassy species were planted on 17/06/2021 and 24/06/2021, 2800 plants in total. The plants were divided approximately evenly between the 3 zones. In each zone, planting was concentrated in bare ground around the edges of the reserve, and in bare areas previously hosting woody weed species. *Rytidosperma duttonianum* was planted in wetter portions of the site, *Austrostipa bigeniculata* was planted in drier areas, while other species were planted across all moisture gradients. The full revegetation list is provided in the table below.

Botanical name	Number
Rytidosperma caespitosum	200
Rytidosperma duttonianum	200
Rytidosperma setaceum	400
Austrostipa bigeniculata	400
Themeda triandra	1600
Total	2800

Button Wrinklewort recovery

100 seedlings of Button Wrinklewort (*Rutidosis leptorhyncoides*) were planted on 8/11/2021. 70 seedlings were planted into Zone F, and 30 into Zone E. Seedlings were supplied by DELWP's Arthur Rylah Institute, and grown from crosses of remnant diploid plants from St Albans, and from the larger diploid population at Truganina Cemetery.