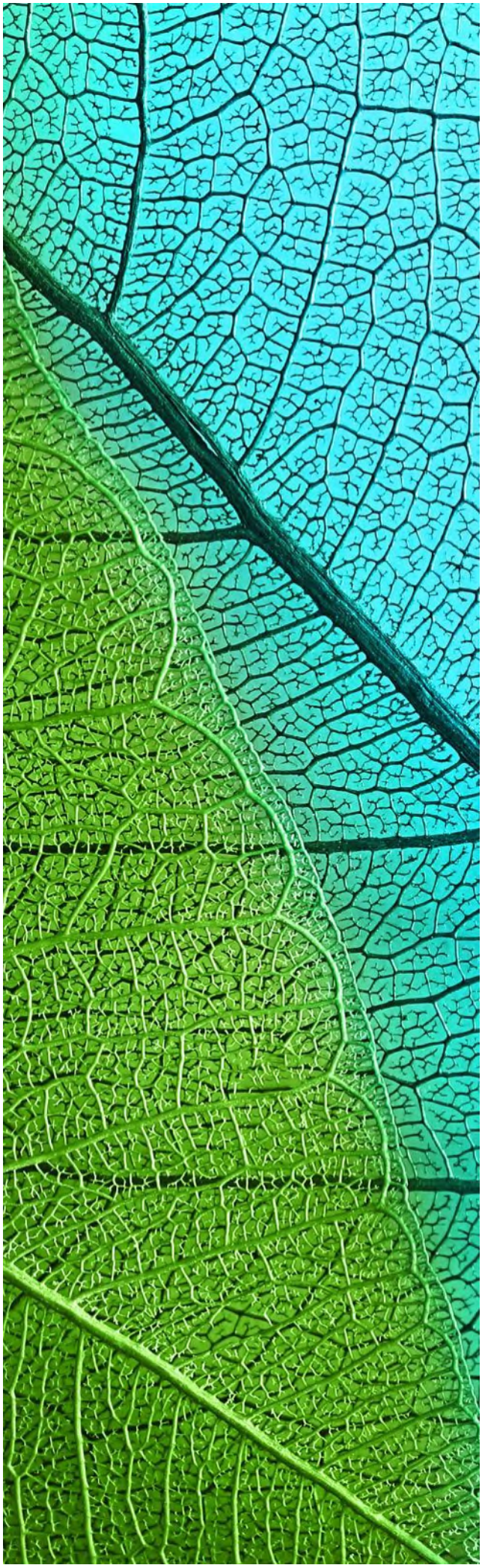

DELWP BIOSITE 3546, ST ALBANS

CONSERVATION MANAGEMENT AND BUTTON WRINKLEWORT RECOVERY PLAN

ANNUAL MONITORING REPORT, JANUARY 2023

Prepared for

VICTORIA State Government | Department of Transport

April 2024
Report No. 18208 (6.0)

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Contents

Tables

Appendices

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 fifth round of annual monitoring, undertaken by Nature Advisory in January 2023. 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 (6.0)
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 Arend Kwak, a Botanist from Nature Advisory (formerly Brett Lane & Associates), from the 11th to 13th January 2023 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 zones D and E of the Biosite was found to be in a satisfactory condition. However, a small opening in the fencing was noted in Zone F, adjacent to management zone F4c.

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

Repair damaged fencing in Zone F and continue to regularly inspect the condition of the fencing and ‘No-go Zone’ signage.

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 January 2023, in order to map the extent of any ecological burns, if undertaken.

A substantial increase in biomass was noted throughout all zones, and this consequently impacted the assessment of ecological burns and their extent.

3.2.2. Results

Ecological mosaic burning was undertaken by Merri Creek Management Committee (MCMC) in May 2022 in Zone D, which removed approximately 60% of the biomass in that zone.

The extent of ecological burning undertaken in Zone D is provided in Figure 1 of MCMC's works summary, attached as Appendix 6 to this report.

3.2.3. Recommendations

If weather conditions are favourable, commence annual ecological burning in autumn 2023 in accordance with the CMP.

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

Areas of dense Kangaroo Grass and introduced vegetation should be prioritised for ecological burning, to promote inter-tussock spaces and subsequent recruitment of native forbs.

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 January 2023 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.

It should be noted that due to the site's high biomass at the time of assessment, detection of Button Wrinklewort and Spiny Rice-flower was significantly impacted. Many tags were also found to be buried or entirely absent, which greatly limited the identification of specific individuals. Furthermore, senescence was noted in many Button Wrinklewort and it is therefore likely that this species was entering a state of dormancy at the time of assessment. Large-headed Fireweed was also found to be completely dormant.

On the basis of the aforementioned limitations, a tally system was employed to monitor threatened species. This involved recording the number of individuals in each zone and taking note of any signs of stress and mortality. The threatened species census table used in previous reports could not be populated, due to very limited detection of individual plants and their associated identification tags.

3.3.2. Results

The following numbers of Spiny Rice-flower and Button Wrinklewort were recorded across the biosite zones:

- Zone F
  - Spiny Rice-flower: 62 plants
  - Button Wrinklewort: 6 plants
- Zone E

    - Spiny Rice-flower: 25 plants
    - Button Wrinklewort: 9 plants
- Zone D
    - Spiny Rice-flower: 41 plants
    - Button Wrinklewort: 7 plants

Please note that the above numbers, particularly that of Spiny Rice-flower, are substantially lower than previously reported. As no signs of mortality in Spiny Rice-flower plants have been observed to date, it is assumed that total numbers of these plants are still consistent to that reported in an appended table in previous reports.

Spiny Rice-flower and Button Wrinklewort plants were inspected and no signs of mortality or stress were observed in any individuals. However, many tagged individuals were obscured by the dense growth of Kangaroo Grass and are at risk of being smothered. This is particularly relevant to those individuals present in zones D3, E2 and F4B.

The NTGVVP community also showed no signs of mortality or stress.

As part of the 2019-2022 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 the good condition of those individuals identified.

See photo point photos in Section 3.7 below for examples of plant and community health between spring 2018 and January 2023.

It should be noted that threatened species points from the 2021 assessment have been retained in the relevant figures and should be treated as indicative of the distribution of these species across the management zones.

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.

Consider thinning Kangaroo Grass around these species, to avoid smothering and to allow for additional recruitment.

Conduct targeted surveys at seasonally-appropriate times and re-tag threatened species. This should occur from April-August for Spiny Rice-flower, November-December for Button Wrinklewort and August-October for Large-headed Fireweed. The use of a differential GPS for providing precise locations and additional numbered tags on wire supports is advised for ease of surveying.

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 January 2023 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

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).

January 2023 data demonstrated a slight increase in the cover of high-threat weeds across the majority of management zones, when compared to the December 2021 assessment. Nonetheless, covers were significantly less than the 2018 baseline data. The data also shows an increase in the diversity of weed species in the vast majority of management zones. This increase in diversity, as well as the aforementioned covers, is likely attributable to the high rainfall experienced in 2022, which has been conducive to the establishment of weeds.

Of the recommendations provided in the December 2021 annual report, the following has been achieved:

- 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.
- 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.

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 high-threat grass species as a matter of priority across the Biosite.

Prioritise weed control along reserve boundaries, where introduced vegetation cover is greatest.

Table 1: Summary of monitoring results – Habitat Zone F

Measure	Management Zone																												
	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023
	1	1	1	1	1	2a	2a	2a	2a	2a	2b	2b	2b	2b	2b	3	3	3	3	3	4a	4a	4a	4a	4a	4b	4b	4b	4b	4b
No. indigenous species	4	6	6	6	9	6	9	9	9	13	6	8	8	8	10	22	22	22	22	20	20	20	20	20	17	21	23	23	23	18
No. weed species	20	14	9	8	12	5	8	6	3	7	9	11	9	7	9	17	10	8	6	11	15	3	6	3	7	17	4	5	4	8
No. high threat weed species	16	13	6	4	8	4	6	3	3	4	5	6	3	2	5	13	6	3	2	5	11	2	2	1	5	11	4	3	1	5
% cover high threat weeds	45	53	39	21	18	15	10	3	2	3	10	8	4	2	5	7	5	3	2	6	5	3	3	1	2	5	5	2	2	2

Measure	Management Zone																												
	Mar 2020	Spring 2020	Dec 2021	Jan 2023	Mar 2020	Spring 2020	Dec 2021	Jan 2023	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023
	4c	4c	4c	4c	5a	5a	5a	5a	5b	5b	5b	5b	6	6	6	6	6	7	7	7	7	7	8	8	8	8	8
No. indigenous species	18	18	18	17	10	10	11	12	10	10	12	13	5	9	9	9	18	12	13	13	13	21	4	5	5	5	6
No. weed species	5	4	4	4	3	4	4	6	3	4	5	4	11	6	8	7	10	26	10	11	15	15	7	5	4	4	5
No. high threat weed species	5	2	2	3	2	3	1	4	2	3	3	3	9	6	4	3	6	20	7	7	9	8	5	4	3	2	4
% cover high threat weeds	8	2	1	1	6	3	+	2	6	3	1	1	20	23	13	9	12	45	61	38	39	21	15	14	4	1	8

Measure	Management Zone				
	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023
	9	9	9	9	9
No. indigenous species	4	5	5	17	15
No. weed species	7	5	4	5	8
No. high threat weed species	5	4	3	3	4
% cover high threat weeds	15	14	4	4	6

Table 2: Summary of monitoring results – Habitat Zone E

Measure	Management Zone																													
	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023
	1	1	1	1	1	2	2	2	2	2	3	3	3	3	3	4	4	4	4	4	5	5	5	5	5	6	6	6	6	6
No. indigenous species	24	26	26	26	16	19	21	21	21	21	14	16	16	16	10	16	18	18	18	21	10	18	18	18	18	7	10	10	10	12
No. weed species	11	4	6	7	3	14	8	9	11	8	16	6	10	7	8	9	9	11	8	9	8	14	12	20	18	12	8	12	9	6
No. high threat weed species	6	3	2	3	1	9	5	3	4	4	14	4	5	3	5	8	5	6	3	5	7	9	9	8	10	9	6	5	4	3
% cover high threat weeds	2	3	+	2	1	7	10	2	4	6	20	15	7	4	6	5	5	2	3	4	50	72	22	18	20	25	20	5	4	9

Table 3: Summary of monitoring results – Habitat Zone D

Measure	Management Zone																												
	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023
	1	1	1	1	1	2	2	2	2	2	3	3	3	3	3	4	4	4	4	4	6	6	6	6	6	7	7	7	7	7
No. indigenous species	7	9	9	9	19	6	7	7	7	11	19	19	19	19	15	21	25	25	25	26	3	3	3	3	7	5	5	5	5	9
No. weed species	27	17	10	15	15	8	9	11	7	7	4	6	4	5	6	13	10	6	6	10	5	4	3	5	6	6	9	5	3	5
No. high threat weed species	18	10	6	8	8	5	7	6	4	4	2	4	1	2	3	10	7	2	2	5	4	2	1	3	3	5	5	3	1	2
% cover high threat weeds	45	75	30	14	9	30	30	19	10	10	5	5	1	1	2	7	12	5	3	11	20	45	8	8	10	30	33	9	2	3

Measure	Management Zone																			
	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	Mar 2020	Spring 2020	Dec 2021	Jan 2023	
	8	8	8	8	8	9	9	9	9	9	10	10	10	10	10	11	11	11	11	
No. indigenous species	7	7	7	7	4	5	5	5	5	10	8	8	8	8	8	3	3	3	9	
No. weed species	6	5	5	8	7	3	8	5	4	6	7	4	6	8	7	9	6	7	4	
No. high threat weed species	3	3	2	3	3	1	4	3	1	2	6	3	2	3	3	6	3	4	3	
% cover high threat weeds	25	13	7	3	7	45	40	13	2	2	7	21	15	4	2	72	42	19	20	

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 January 2023 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.

Further ecological mosaic burning was undertaken by MCMC in May 2022 in Zone D, which removed approximately 60% of the biomass in that zone. Further brush-cutting (including thatch removal and hand removal) was also undertaken in sensitive areas throughout 2022. 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 – 1 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.

These results demonstrate a notable decrease in the available bare ground across all zones. This is likely due to the high rainfall experienced in 2022, which has resulted in a dramatic increase in biomass. Kangaroo Grass remains the most prevalent species within

all zones and was found to form large swathes with minimal inter-tussock space. This is likely to have an impact upon the health and diversity of native forbs, as well as their ability to successfully recruit.

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	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020
	1	1	1	1	1	2a	2a	2a	2a	2a	2b	2b	2b	2b	2b	3	3	3	3	3	4a	4a	4a	4a	4a	4b	4b	4b
Bare ground cover (%)	40	25	25	55	50	30	35	35	40	40	5	3	20	40	12	18	15	15	25	2	45	55	50	40	45	20	25	15

Measure	Management Zone																											
	Dec 2021	Jan 2023	Mar 2020	Spring 2020	Dec 2021	Jan 2023	Mar 2020	Spring 2020	Dec 2021	Jan 2023	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018
	4b	4b	4c	4c	4c	4c	5a	5a	5a	5a	5b	5b	5b	5b	6	6	6	6	6	7	7	7	7	7	8	8	8	8	8	9
Bare ground cover (%)	25	5	22	20	50	40	25	25	30	25	50	45	45	40	10	7	15	12	5	40	17	35	30	10	10	11	15	5	+	10

Measure	Management Zone			
	Mar 2020	Spring 2020	Dec 2021	Jan 2023
	9	9	9	9
Bare ground cover (%)	13	15	30	10

Management Zone E

Measure	Management Zone																												
	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023
	1	1	1	1	1	2	2	2	2	2	3	3	3	3	3	4	4	4	4	4	5	5	5	5	5	6	6	6	6	6
Bare ground cover (%)	5	5	16	40	10	8	3	10	15	2	7	7	5	10	2	5	5	10	30	20	40	16	30	40	40	10	5	7	8	3

Management Zone D

Measure	Management Zone																												
	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023
	1	1	1	1	1	2	2	2	2	2	3	3	3	3	3	4	4	4	4	4	6	6	6	6	6	7	7	7	7	7
Bare ground cover (%)	35	10	40	40	15	15	11	15	10	10	10	10	10	4	5	7	8	5	1	10	15	15	30	15	15	15	15	30	2	1

Measure	Management Zone																	
	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	Mar 2020	Spring 2020	Dec 2021	Jan 2023
	8	8	8	8	8	9	9	9	9	9	10	10	10	10	10	11	11	11	11
Bare ground cover (%)	5	5	3	+	+	25	22	50	1	5	3	4	30	10	10	5	30	15	15

3.5.3. Recommendations

Undertake annual ecological burning in March 2023 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 January 2023 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 January 2023 to update the photo points documented in the baseline 2018 and January 2022 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

There is 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.

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 2023, 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 management zones of the Biosite, raising the total number of plants in the Biosite from 12 in 2015 to an estimated 25 at present, which is likely an underestimate. Most of these plants are planted seedlings, while others are remnant plants and a few are recruits from remnant 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.

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.

A further 160 Button Wrinklewort seedlings were planted on 04/07/2022 and 08/09/2022. 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. The seedlings were planted throughout all three zones and, with some planted to compliment existing clusters of Button Wrinklewort and others planted to create new clusters.

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.

In addition, in May 2021, 30 grams of Large-headed Fireweed seed was 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 2021 and 2022 plantings 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.

Undertake an annual September to October targeted survey 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 grams 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.

2022

As discussed above, 160 Button Wrinklewort seedlings were planted in July and September 2022 by MCMC throughout all three zones.

Assorted native grass seed was sown in April and June 2022 into bare ground along the perimeters of all three zones and in areas from which woody weeds were removed in previous years. This comprised:

- 30 grams of spear grass (*Austrostipa* spp) seed;
- 70 grams of wallaby grass (*Rytidosperma* spp) seed; and
- 50 grams of Kangaroo Grass (*Themeda triandra*) seed.

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 brief 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 were 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

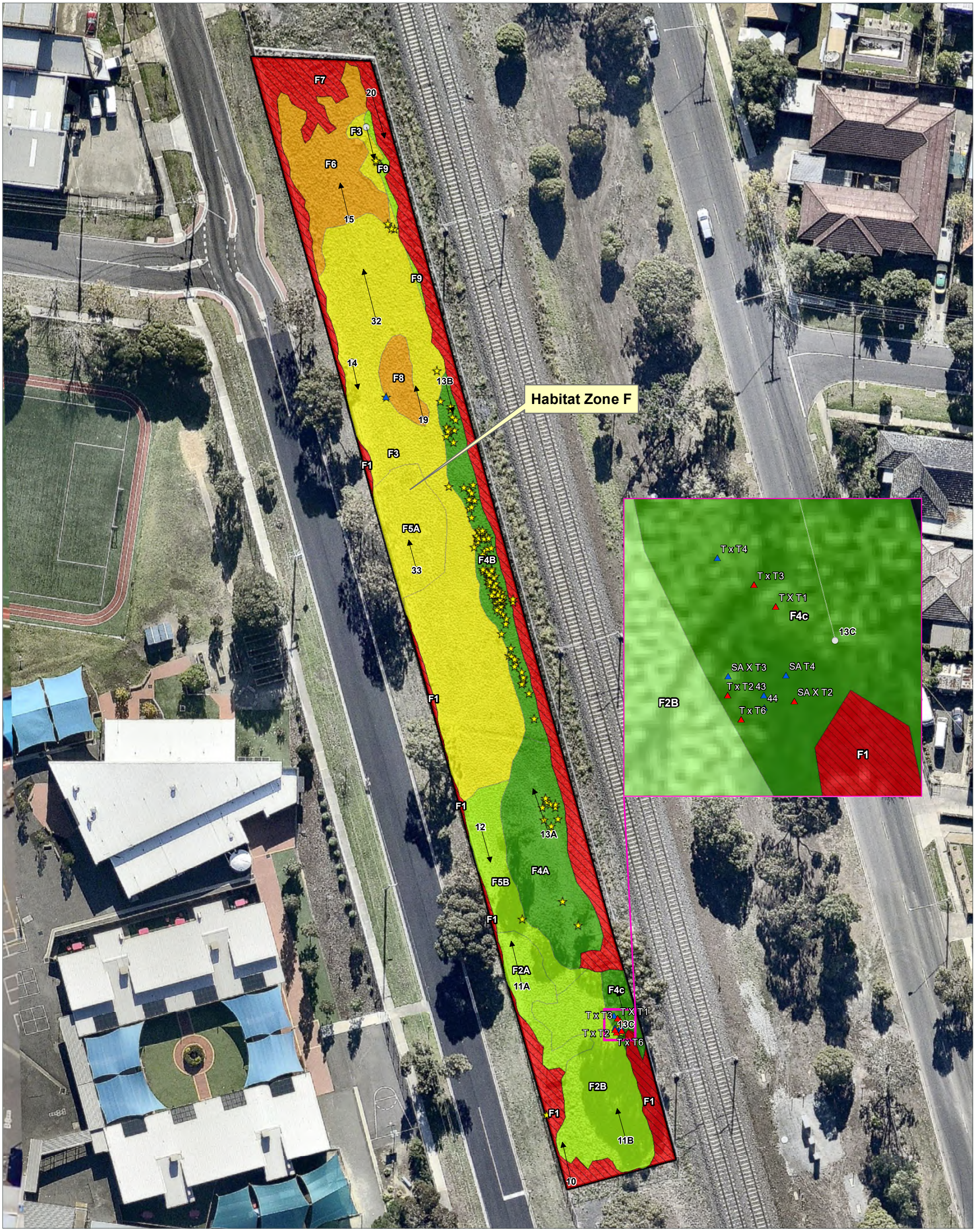

Figure 2: Conservation reserve mapping

Project: St Albans Biosite Monitoring **Client**: Main Road St. Albans Level Crossing Removal **Date**: 24/01/2023

- Existing fencing
- Button Wrinklewort
- Button Wrinklewort no longer present
- Spiny Rice-flower
- Photo point direction
- 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: - E:\GIS\2018 Jobs\18208\18208 Conservation Reserve rework FIG2 220111_2.mxd

Figure 3: Conservation reserve mapping

Project: St Albans Biosite Monitoring **Client**: Main Road St. Albans Level Crossing Removal **Date**: 24/01/2023

- Existing fencing
- Button Wrinklewort
- Button Wrinklewort no longer present
- Spiny Rice-flower
- Spiny Rice-flowe no longer present
- Photo point direction
- 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: - E:\GIS\2018 Jobs\18208\18208 Conservation Reserve rework FIG2 220111_2.mxd

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	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023
	1	1	1	1	1	2a	2a	2a	2a	2a	2b	2b	2b	2b	2b	3	3	3	3	3	4a	4a	4a	4a	4a
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**	**100**
Overall species cover (%)	50	60	65	37	47	60	55	55	47	46	85	83	70	45	87	67	70	70	60	98	40	38	40	46	46
Indigenous species cover (%)	5	7	10	7	20	45	45	52	45	45	75	75	62	45	80	60	65	62	55	85	35	35	37	45	45
Introduced species cover (%)	45	53	55	30	27	15	10	3	2	1	10	8	8	5	7	7	5	8	5	13	5	3	3	1	1
Bare ground cover (%)	40	25	25	53	50	30	35	35	40	40	5	3	20	40	12	18	15	15	25	2	45	55	50	40	45
Organic litter cover (%)	10	15	10	10	10	10	10	10	10	10	10	14	10	10	5	15	15	15	15	5	15	7	10	5	10

Cover Estimate Measures	Hz F Management Zones																								
	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	Mar 2020	Spring 2020	Dec 2021	Jan 2023	Mar 2020	Spring 2020	Dec 2021	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023
	4b	4b	4b	4b	4b	4c	4c	4c	4c	5a	5a	5a	5b	5b	5b	6	6	6	6	6	7	7	7	7	7
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**	**100**
Overall species cover (%)	70	70	75	60	90	53	55	42	51	41	40	51	40	37	39	75	78	70	75	95	50	66	55	65	61
Indigenous species cover (%)	65	65	72	56	85	45	52	40	50	35	37	49	38	35	38	55	55	55	65	75	5	5	5	10	35
Introduced species cover (%)	5	5	3	4	5	8	3	2	1	6	3	1	2	2	1	20	23	15	10	20	45	61	50	55	26
Bare ground cover (%)	20	25	15	25	5	22	20	50	40	25	25	30	45	45	40	10	7	15	14	5	40	17	35	30	10
Organic litter cover (%)	10	5	10	15	5	25	25	8	25	34	35	20	15	18	10	15	15	15	11	5	10	17	10	5	5

Cover Estimate Measures	Hz F Management Zones									
	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023
	8	8	8	8	8	9	9	9	9	9
Total cover (%)	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**97**	**100**	**100**
Overall species cover (%)	75	74	73	75	96	80	77	75	65	90
Indigenous species cover (%)	60	60	68	70	85	70	70	60	55	76
Introduced species cover (%)	15	14	5	5	11	10	7	15	10	14
Bare ground cover (%)	10	11	15	5	+	10	13	15	25	10
Organic litter cover (%)	15	15	12	20	5	10	10	7	10	2

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		X	X		X
Asperula conferta	Common Woodruff		X				X				X	X		X
Atriplex semibaccata	Berry Saltbush								X					
Austrostipa scabra subsp. falcata	Slender Spear-grass											X		
Austrostipa sp.	Spear Grass	X	X	X	X	X	X	X	X	X	X	X		
Calocephalus citreus	Lemon Beauty-heads		X	X	X	X	X	X	X	X	X	X		X
Chloris truncata	Windmill Grass	X										X		
Chrysocephalum sp. 1	Plains Everlasting		X		X	X	X							
Convolvulus angustissimus subsp, omnigracilis	Slender Bindweed	X	X	X	X	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	X			X			X
Geranium retrorsum s.l.	Grassland Crane's-bill				X		X				X	X	X	X
Goodenia pinnatifida	Cut-leaf Goodenia													
Juncus pallidus	Pale Rush											X		
Juncus spp.	Rush										X	X		X
Juncus subsecundus	Finger Rush													
Lomandra micrantha subsp. micrantha	Small-flower Mat-rush				X		X				X			
Minuria leptophylla	Minnie Daisy													
Oxalis perennans	Grassland Wood-sorrel		X		X	X		X			X	X	X	X
Pimelea curviflora var. 1	Curved Rice-flower													
Pimelea glauca	Smooth Rice-flower							X			X			X
Pimelea spinescens subsp. spinescens	Spiny Rice-flower				X	X	X			X		X		X
Plantago gaudichaudii	Narrow Plantain					X			X					
Poa labillardierei var. labillardierei	Common Tussock-grass													
Poa sieberiana	Grey Tussock-grass		X		X		X						X	
Pycnosorus chrysanthes	Golden Billy-buttons						X			X		X		
Rutidosis leptorhynchoides	Button Wrinklewort				X	X		X	X	X				
Rytidosperma caespitosum	Common Wallaby-grass	X	X	X	X	X		X		X	X	X		X
Rytidosperma racemosum var. racemosum	Slender Wallaby-grass		X	X		X		X			X			X
Rytidosperma setaceum	Bristly Wallaby-grass			X		X			X	X		X		
Solenogyne dominii	Smooth Solenogyne						X	X						
Rytidosperma sp.	Wallaby Grass			X	X	X	X	X	X	X	X		X	
Senecio quadridentatus	Cotton Fireweed				X	X	X					X		
Themeda triandra	Kangaroo Grass	X	X	X	X	X	X	X	X		X	X	X	X
Tricoryne elatior	Yellow Rush-lily			X				X						
Velleia paradoxa	Spur Velleia													

Scientific Name	Common Name	Hz F Management Zones - Presence (X)											
		1	2a	2b	3	4a	4b	4c	5a	5b	6	7	8	9
Vittadinia cuneata	Fuzzy New Holland Daisy		X		X	X		X		X		X		
Wahlenbergia communis s.s.	Tufted Bluebell		X		X	X	X			X		X		
Walwhalleya proluta	Rigid Panic	X			X			X		X	X	X	X	X
No. indigenous species		**9**	**13**	**10**	**20**	**17**	**18**	**17**	**12**	**13**	**18**	**21**	**6**	**15**

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	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023
				1	1	1	1	1	2a	2a	2a	2a	2a	2b	2b	2b	2b	2b	3	3	3	3	3
#Pl	*Acacia pycnantha*	Golden Wattle	Yes										+										
*	*Aira spp.*	Hair Grass	No												X	X	1	+		X	X	1	5
*	*Aster subulatus*	Aster-weed	No																				
*	*Avena sp.*	Oat	No	X	X	2	5	3		X	X			X	X	X		+	X	X	X	+	1
*	*Brassica fruticulosa*	Twiggy Turnip	Yes	15	30	2	+	3	5	5			+	1	+	+	+		+	2	+		+
*	*Briza spp.*	Quaking-grass	No	X			3	+	X					X	X	X	+	1	X		X		1
*	*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					+					+				+	+				+	1
*	*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	+	+																		
*	*Cyperus eragrostis*	Drain Flat-sedge						+															
*	*Dactylis glomerata*	Cocksfoot	Yes	+	2			+	+	2	+			5	1			3	+	+			+
*	*Ehrharta erecta var. erecta*	Panic Veldt-grass	Yes		+																		
*	*Ehrharta longiflora*	Annual Veldt-grass	No	X		X	+				X					X							
*	*Erigeron sp.*	Fleabane	Yes					+				+			+								
*Pl	*Eucalyptus cladocalyx*	Sugar Gum	Yes	7																			
*Pl	*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										+		+			+

Origin	Scientific Name	Common Name	High Threat	Hz F Management Zones - Presence (x) / Projected Foliage Cover (%)																		
				2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023
				1	1	1	1	1	2a	2a	2a	2a	2a	2b	2b	2b	2b	2b	3	3	3	3	3
*	*Hypochaeris radicata*	Cat's Ear	Yes																				
*	*Lactuca serriola*	Prickly Lettuce	No										+							X			+
*	*Lepidium africanum*	Common Peppercress	No																				
*	*Lolium spp.*	Rye grass	Yes			35	5				1												
*	*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	+		+													+		1		
*	*Paspalum dilatatum*	Paspalum	Yes	+	+			2											+				
*	*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	10	3	2	1	1	5	4	3	2	1	5	3	2		5
*	*Rapistrum rugosum*	Giant mustard	Yes																	+			
*	*Romulea rosea*	Onion Grass	Yes	+	+		+	1	+	+		1	+	+	+		+	+	+			+	+
*	*Rumex crispus*	Curled Dock	No																				
*	*Sonchus oleraceus*	Common Sow-thistle	No				+	5		X			+		X	X	+		X	X	X		+
*	*Tragopogon porrifolius subsp. porrifolius*	Salsify	No																				
*	*Trifolium angustifolium var. angustifolium*	Narrow-leaf Clover	No											X								+	
*	*Vicia sativa*	Common Vetch	No											X									
No. weed species				20	14	9	8	12	5	8	6	3	7	9	11	9	7	9	17	10	8	6	11
No. high threat weed species				16	13	6	4	8	4	6	3	3	4	5	6	3	2	5	13	6	3	2	5
% cover high threat weed species				45	53	39	21	18	15	10	3	3	3	10	8	4	2	5	7	5	3	2	6

Origin	Scientific Name	Common Name	High Threat	Hz F Management Zones - Presence (x) / Projected Foliage Cover (%)																			
				2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	Mar 2020	Spring 2020	Dec 2021	Jan 2023	Mar 2020	Spring 2020	Dec 2021	Jan 2023	Mar 2020	Spring 2020	Dec 2021	Jan 2023
				4a	4a	4a	4a	4a	4b	4b	4b	4b	4b	4c	4c	4c	4c	5a	5a	5a	5a	5b	5b	5b	5b
#PI	*Acacia pycnantha*	Golden Wattle	Yes	+					+																
*	*Aira spp.*	Hair Grass	No								X	1	2												
*	*Aster subulatus*	Aster-weed	No																						
*	*Avena sp.*	Oat	No	X		X			X		X	+	+		X	+	+					X			
*	*Brassica fruticulosa*	Twiggy Turnip	Yes	+				+	+	1				2				3	+	+	+	3	+	+	
*	*Briza spp.*	Quaking-grass	No			X	+		X						X	+									
*	*Bromus catharticus var. catharticus*	Prairie Grass	Yes																						

Origin	Scientific Name	Common Name	High Threat	Hz F Management Zones - Presence (x) / Projected Foliage Cover (%)																				
				2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	Mar 2020	Spring 2020	Dec 2021	Jan 2023	Mar 2020	Spring 2020	Dec 2021	Jan 2023	Mar 2020	Spring 2020	Dec 2021	Jan 2023
				4a	4a	4a	4a	4a	4b	4b	4b	4b	4b	4c	4c	4c	4c	5a	5a	5a	5a	5b	5b	5b	5b
*	*Bromus hordeaceus subsp. hordeaceus*	Soft Brome	No																						
*	*Cenchrus clandestinus*	Kikuyu	Yes											1								1			
*	*Centaurium erythraea*	Commom Century	No					+				+	1							+					+
*	*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								+		+	+								+		+	
*	*Ehrharta erecta var. erecta*	Panic Veldt-grass	Yes					+																	
*	*Ehrharta longiflora*	Annual Veldt-grass	No																						
*	*Erigeron sp.*	Fleabane	Yes														+								
*Pl	*Eucalyptus cladocalyx*	Sugar Gum	Yes																			x			
*Pl	*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					+													+				
*	*Lepidium africanum*	Common Peppercress	No	X					X																
*	*Lolium spp.*	Rye grass	Yes																				+		
*	*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				+		
*	*Paspalum dilatatum*	Paspalum	Yes																						
*	*Phalaris aquatica*	Toowoomba Canary-grass	Yes	+					+				+												
*	*Plantago coronopus subsp. coronopus*	Buck's-horn Plantain	Yes	+		+															+				
*	*Plantago lanceolata*	Ribwort	Yes	5	3	3	1	1	3	4	1	2	1	5	2	+	+	3	2	+	1	1	2	+	1
*	*Rapistrum rugosum*	Giant mustard	Yes																						
*	*Romulea rosea*	Onion Grass	Yes	+	+			+	+	+			+			+	+				+	+		+	+
*	*Rumex crispus*	Curled Dock	No																						
*	*Sonchus oleraceus*	Common Sow-thistle	No		X	X	+		X												+				
*	*Tragopogon porrifolius subsp. porrifolius*	Salsify	No			X												X	X	+				+	

Origin	Scientific Name	Common Name	High Threat	Hz F Management Zones - Presence (x) / Projected Foliage Cover (%)																				
				2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	Mar 2020	Spring 2020	Dec 2021	Jan 2023	Mar 2020	Spring 2020	Dec 2021	Jan 2023	Mar 2020	Spring 2020	Dec 2021	Jan 2023
				4a	4a	4a	4a	4a	4b	4b	4b	4b	4b	4c	4c	4c	4c	5a	5a	5a	5a	5b	5b	5b	5b
*	*Trifolium angustifolium var. angustifolium*	Narrow-leaf Clover	No																					
*	*Vicia sativa*	Common Vetch	No	X					X															
No. weed species				15	3	6	3	7	17	4	5	4	8	5	4	4	4	3	4	4	6	7	4	5	4
No. high threat weed species				11	2	2	1	5	11	4	3	1	5	5	2	2	3	2	3	2	4	6	4	4	3
% cover high threat weed species				5	3	3	1	2	5	5	2	2	2	8	2	1	1	6	3	1	2	5	2	2	1

Origin	Scientific Name	Common Name	High Threat	Hz F Management Zones - Presence (x) / Projected Foliage Cover (%)																				
				2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	
				6	6	6	6	6	7	7	7	7	7	8	8	8	8	8	9	9	9	9	9	
#PI	*Acacia pycnantha*	Golden Wattle	Yes						1															
*	*Aira spp.*	Hair Grass	No	X		X	1	3				+	+								X	1	5	
*	*Aster subulatus*	Aster-weed	No	X					X			+												
*	*Avena sp.*	Oat	No	X		X		1	X		X	5	5		X	X	+	3			X		+	
*	*Brassica fruticulosa*	Twiggy Turnip	Yes	5	5	+		+	15	35	+	1	+	3	7	+	+		+	3				
*	*Briza spp.*	Quaking-grass	No			X		1			X		+								X		1	
*	*Bromus catharticus var. catharticus*	Prairie Grass	Yes									5												
*	*Bromus hordeaceus subsp. hordeaceus*	Soft Brome	No								X	5		X										
*	*Cenchrus clandestinus*	Kikuyu	Yes						+								+					+		
*	*Centaurium erythraea*	Common Century	No				+	2				2	1										1	
*	*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								+	+				
*	*Cyperus eragrostis*	Drain Flat-sedge											+											
*	*Dactylis glomerata*	Cocksfoot	Yes	2	3	3			+					+				+	2	+			+	
*	*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						4															
*PI	*Fraxinus angustifolia*	Desert Ash	Yes						+															
*	*Galenia pubescens var. pubescens*	Galenia	Yes																					
*	*Gazania linearis*	Gazania	Yes																					

Origin	Scientific Name	Common Name	High Threat	Hz F Management Zones - Presence (x) / Projected Foliage Cover (%)																	
				2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023
				6	6	6	6	6	7	7	7	7	7	8	8	8	8	8	9	9	9	9	9
*	*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			+							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	+		+			+					+		2			+		3		
*	*Paspalum dilatatum*	Paspalum	Yes					+	+	3	1	+	+					1		+			
*	*Phalaris aquatica*	Toowoomba Canary-grass	Yes	+			+	1	5		+	5	10					2					1
*	*Plantago coronopus subsp. coronopus*	Buck's-horn Plantain	Yes						+										+				
*	*Plantago lanceolata*	Ribwort	Yes	12	15	10	8	10	10	15	5	20	10	12	7	2	4	5	8	4	2	3	5
*	*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	1	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				11	6	8	7	10	26	10	11	15	15	7	5	4	4	5	8	7	5	5	8
No. high threat weed species				9	6	4	3	6	20	7	7	9	8	5	4	3	1	4	8	6	2	3	4
% cover high threat weed species				20	23	13	9	12	45	61	38	34	21	15	14	4	4	8	10	7	5	4	6

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	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023
	1	1	1	1	1	2	2	2	2	2	3	3	3	3	3	4	4	4	4	4	5	5	5	5	5
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**	**100**
Overall species cover (%)	87	83	77	50	80	82	82	80	75	95	80	80	70	67	75	65	65	65	55	65	55	77	30	40	53
Indigenous species cover (%)	85	80	75	45	78	75	72	70	65	80	60	65	60	60	60	60	60	60	50	60	5	5	5	10	5
Introduced species cover (%)	2	3	2	5	2	7	10	10	10	11	20	15	10	7	13	5	5	5	5	5	50	72	25	30	48
Bare ground cover (%)	5	5	16	33	10	8	3	10	15	2	7	7	5	13	2	5	5	10	30	20	40	16	30	40	40
Organic litter cover (%)	8	12	7	17	15	10	15	10	10	15	13	13	25	20	20	30	30	25	15	30	5	7	40	20	10

Cover Estimate Measures	Hz E Management Zones				
	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023
	6	6	6	6	6
Total cover (%)	**100**	**100**	**100**	**100**	**100**
Overall species cover (%)	70	80	80	77	82
Indigenous species cover (%)	45	60	67	65	70
Introduced species cover (%)	25	20	13	12	12
Bare ground cover (%)	10	5	7	10	3
Organic litter cover (%)	20	15	13	13	10

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	X	X	X	X
Anthosachne scabra s.l.	Common Wheat-grass	X			X	X	X
Asperula conferta	Common Woodruff	X	X	X	X	X	X
Austrostipa bigeniculata	Kneed Spear-grass		X	X	X	X	X
Austrostipa scabra subsp. falcata	Slender Spear-grass						
Austrostipa sp.	Spear Grass					X	
Calocephalus citreus	Lemon Beauty-heads	X	X		X		
Cassinia sifton	Drooping Cassinia					X	
Chloris truncata	Windmill Grass					X	
Comesperma polygaloides	Small Milkwort						
Convolvulus angustissimus subsp, omnigracilis	Slender Bindweed	X	X		X	X	X

Scientific Name	Common Name	Hz E Management Zones - Presence (X)					
		1	2	3	4	5	6
Dianella admixta	Black-anther Flax-lily	X	X	X	X	X	X
Einadia nutans	Nodding Saltbush	X	X		X		
Enchylaena tomentosa var. tomentosa	Ruby Saltbush						
Eryngium ovinum	Blue Devil		X		X		
Geranium retrorsum s.l.	Grassland Crane's-bill						
Goodenia pinnatifida	Cut-leaf Goodenia				X		
Juncus sp.	Rush					X	X
Lachnagrostis filiformis s.l.	Common Blown-grass						
Lomandra micrantha subsp. micrantha	Small-flower Mat-rush	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				
Pimelea glauca	Smooth Rice-flower	X	X		X	X	
Pimelea spinescens subsp. spinescens	Spiny Rice-flower	X	X				
Plantago gaudichaudii	Narrow Plantain		X		X		
Poa labillardierei var. labillardierei	Common Tussock-grass						
Poa sieberiana	Grey Tussock-grass		X				
Rutidosis leptorhynchoides	Button Wrinklewort		X		X		
Rytidosperma caespitosum	Common Wallaby-grass	X	X		X		
Rytidosperma duttonianum	Brown-back Wallaby-grass		X	X	X	X	X
Rytidosperma sp.	Wallaby Grass	X		X	X	X	
Senecio macrocarpus	Large-headed Fireweed						
Senecio quadridentatus	Cotton Fireweed	X	X	X	X	X	X
Themeda triandra	Kangaroo Grass	X	X	X	X	X	X
Tricoryne elatior	Yellow Rush-lily						
Velleia paradoxa	Spur Velleia						
Veronica gracilis	Slender Speedwell						
Vittadinia cuneata	Fuzzy New Holland Daisy				X		
Wahlenbergia communis s.s.	Tufted Bluebell	X	X	X	X	X	
Walwhalleya proluta	Rigid Panic					X	X
	No. indigenous species	**16**	**21**	**10**	**21**	**18**	**12**

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	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023
				1	1	1	1	1	2	2	2	2	2	3	3	3	3	3	4	4	4	4	4
#PI	*Acacia pycnantha*	Golden Wattle	Yes																+				
*	*Aira spp.*	Aira	No	X		X	+		X	X	X	2					+						
*	*Alium triquetrum*	Angled Onion	Yes						+		+			+									
*	*Avena sp.*	Oat	No	X		X	1	+	X	X	X	3	5	X	X	X	2	5	X	X	X	+	+
*	*Brassica fruticulosa*	Twiggy Turnip	Yes	+		+	+		2	2	+		+	2	5	1			2	2	+	1	1
*	*Briza spp.*	Quaking-grass	No	X	X	X	2		X	X	X	2	+			X	+	1		X	X	+	+
*	*Bromus catharticus var. catharticus*	Prairie Grass	Yes													+							
*	*Bromus hordeaceus subsp. hordeaceus*	Soft Brome	No	X					X		X	1					2			X			
*	*Centaurium spp.*	Centaury	No				+	+				+	+					+				+	+
*	*Cenchrus clandestinus*	Kikuyu	Yes									+		3	5	1			+				
*	*Cynara cardunculus subsp. flavescens*	Artichoke Thistle	Yes																				
*	*Cynodon dactylon var. dactylon*	Couch	Yes											+				1					
*	*Cyperus eragrostis*	Drain Flat-sedge	Yes																				
*	*Dactylis glomerata*	Cocksfoot	Yes						+											+			
*	*Ehrharta erecta var. erecta*	Panic Veldt-grass	Yes						+				+	+		3		+					+
*	*Ehrharta longiflora*	Annual Veldt-grass	No													X					X		
*	*Erigeron sp.*	Fleabane	Yes							+													+
*PI	*Eucalyptus cladocalyx*	Sugar Gum	Yes	+															+	+			
*PI	*Fraxinus angustifolia*	Desert Ash	Yes	+					+														
*	*Galenia pubescens var. pubescens*	Galenia	Yes											+									
*	*Geranium molle*	Dove's Foot	Yes											+									
*	*Helminthotheca echioides*	Ox-tongue	Yes						+	+									+		+		+
*	*Holcus lanatus*	Yorkshire Fog	No	X																			
*	*Hordeum vulgare*	Barley	No																				
*	*Hypochaeris radicata*	Flatweed	Yes									+					+						
*	*Iridaceae*	Iris	Yes						+														
*	*Lactuca serriola*	Prickly Lettuce	No																	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											+					+		+		

Origin	Scientific Name	Common Name	High Threat	Hz E Management Zones - Presence (x) / Projected Foliage Cover (%)																	
				2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023
				1	1	1	1	1	2	2	2	2	2	3	3	3	3	3	4	4	4	4	4
*	*Oxalis purpurea*	Large-flower Wood-sorrel	Yes											+					+		+		
*	*Paspalum dilatatum*	Paspalum	Yes																				
*	*Phalaris aquatica*	Toowoomba Canary-grass	Yes	+	+													+					
*	*Plantago coronopus subsp. coronopus*	Buck's-horn Plantain	Yes											+									
*	*Plantago lanceolata*	Ribwort	Yes	2	3	+	1	1	5	5	2	3	5	15	5	2	2	5	3	3	2	2	2
*	*Romulea rosea*	Onion Grass	Yes	+	+				+			+		+	+		1	+		+		+	
*	*Sonchus oleraceus*	Common Sow-thistle	No			X					X					X					X	+	
*	*Tragopogon porrifolius subsp. porrifolius*	Salsify	No						X		X	+			X	X					X		
*	*Trifolium arvense*	Hare's Foot Clover	No									+	+									+	
*	*Vicia sativa*	Common Vetch	No											X									
*	*Vinca major*	Blue Periwinkle	Yes											+									
No. weed species				11	4	6	7	3	14	8	9	11	8	16	6	10	7	8	9	9	11	8	9
No. high threat weed species				6	3	2	3	1	9	5	3	4	4	14	4	5	3	5	8	5	6	3	5
% cover high threat weed species				2	3	+	2	1	7	10	2	4	6	20	15	7	3	6	5	5	2	3	4

Origin	Scientific Name	Common Name	High Threat	Hz E Management Zones - Presence (x) / Projected Foliage Cover (%)									
				2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023
				5	5	5	5	5	6	6	6	6	6
#PI	*Acacia pycnantha*	Golden Wattle	Yes										
*	*Aira spp.*	Aira	No				+			X	X	1	
*	*Alium triquetrum*	Angled Onion	Yes	+									
*	*Avena sp.*	Oat	No				5	20	X	X	X	4	2
*	*Brassica fruticulosa*	Twiggy Turnip	Yes	25	45	+	5	5	5	10			
*	*Briza spp.*	Quaking-grass	No	X			2	+			X	1	+
*	*Bromus catharticus var. catharticus*	Prairie Grass	Yes		+	+	+						
*	*Bromus hordeaceus subsp. hordeaceus*	Soft Brome	No				3				X	1	
*	*Centaurium spp.*	Centaury	No			X	+	+					+

Origin	Scientific Name	Common Name	High Threat	Hz E Management Zones - Presence (x) / Projected Foliage Cover (%)									
				2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023
				5	5	5	5	5	6	6	6	6	6
*	*Cenchrus clandestinus*	Kikuyu	Yes		7	10	+	+	+	2			
*	*Cynara cardunculus subsp. flavescens*	Artichoke Thistle	Yes		+								
*	*Cynodon dactylon var. dactylon*	Couch	Yes		+	2	+	+	+				
*	*Cyperus eragrostis*	Drain Flat-sedge	Yes			+		+					
*	*Dactylis glomerata*	Cocksfoot	Yes						+	+	1		
*	*Ehrharta erecta var. erecta*	Panic Veldt-grass	Yes			+	+		+	+	+	1	1
*	*Ehrharta longiflora*	Annual Veldt-grass	No		X	X	1				X		
*	*Erigeron sp.*	Fleabane	Yes					2					
*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		+	2					
*	*Holcus lanatus*	Yorkshire Fog	No										
*	*Hordeum vulgare*	Barley	No				+						
*	*Hypochaeris radicata*	Flatweed	Yes										
*	*Iridaceae*	Iris	Yes										
*	*Lactuca serriola*	Prickly Lettuce	No		X		+	3				+	
*	*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		+			2					

Origin	Scientific Name	Common Name	High Threat	Hz E Management Zones - Presence (x) / Projected Foliage Cover (%)									
				2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023
				5	5	5	5	5	6	6	6	6	6
*	*Phalaris aquatica*	Toowoomba Canary-grass	Yes									1	3
*	*Plantago coronopus subsp. coronopus*	Buck's-horn Plantain	Yes										
*	*Plantago lanceolata*	Ribwort	Yes	17	15	10	10	10	20	5	3	2	5
*	*Romulea rosea*	Onion Grass	Yes	+		+	1	+				+	
*	*Sonchus oleraceus*	Common Sow-thistle	No		X	X	1	2	X		X		
*	*Tragopogon porrifolius subsp. porrifolius*	Salsify	No		X		+	+					
*	*Trifolium arvense*	Hare's Foot Clover	No										
*	*Vicia sativa*	Common Vetch	No		X		+		X		X		
*	*Vinca major*	Blue Periwinkle	Yes										
No. weed species				**8**	**14**	**12**	**20**	**18**	**12**	**8**	**12**	**9**	**6**
No. high threat weed species				**7**	**9**	**9**	**8**	**10**	**9**	**6**	**5**	**4**	**3**
% cover high threat weed species				**50**	**72**	**22**	**18**	**20**	**25**	**20**	**5**	**4**	**9**

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	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023
	1	1	1	1	1	2	2	2	2	2	3	3	3	3	3	4	4	4	4	4	6	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**	**100**
Overall species cover (%)	50	80	45	40	65	70	72	65	75	82	80	75	75	75	87	77	77	80	79	96	35	65	50	58	81
Indigenous species cover (%)	5	5	15	40	40	40	42	40	65	70	75	70	73	70	80	70	65	73	73	75	15	20	40	50	65
Introduced species cover (%)	45	75	30	15	25	30	30	25	10	12	5	5	2	5	7	7	12	7	6	21	20	45	10	8	16
Bare ground cover (%)	35	10	40	15	15	15	11	15	10	10	10	10	10	5	5	7	8	5	1	10	15	15	30	20	15
Organic litter cover (%)	15	10	15	15	10	15	17	20	25	1	10	15	15	20	5	16	15	15	20	10	50	20	20	22	15

Cover Estimate Measures	Hz D Management Zones																							
	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	Mar 2020	Spring 2020	Dec 2021	Jan 2023
	7	7	7	7	7	8	8	8	8	8	9	9	9	9	9	10	10	10	10	10	11	11	11	11
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 (%)	70	73	50	71	88	80	78	77	73	93	60	62	30	75	90	22	26	50	70	83	87	50	60	55
Indigenous species cover (%)	40	40	40	65	80	55	65	70	65	75	15	22	15	65	80	15	5	30	60	70	15	7	45	30
Introduced species cover (%)	30	33	10	6	8	25	13	7	8	18	45	40	15	10	10	7	21	20	10	13	72	43	15	25
Bare ground cover (%)	15	12	30	4	1	5	5	3	+	+	25	22	50	5	5	3	4	30	10	10	5	30	20	15
Organic litter cover (%)	15	15	20	25	5	15	17	20	25	10	15	16	20	20	15	75	70	20	20	20	8	20	20	1

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	X						
Asperula conferta	Common Woodruff	X	X	X	X			X			
Austrostipa bigeniculata	Kneed Spear-grass	X			X	X	X				
Austrostipa sp.	Spear Grass		X		X				X	X	
Calocephalus citreus	Lemon Beauty-heads			X	X						X
Chloris truncata	Windmill Grass										
Chrysocephalum sp. 1	Plains Everlasting										
Convolvulus angustissimus subsp, omnigracilis	Slender Bindweed	X	X	X	X				X		X
Dianella admixta	Black-anther Flax-lily	X	X	X	X	X	X	X		X	X
Dianella sp. aff. longifolia (Benambra)	Arching Flax-lily				X						
Enchylaena tomentosa var. tomentosa	Ruby Saltbush										

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	X	X			X			
Geranium retrorsum s.l.	Grassland Crane's-bill	X	X	X	X						X
Goodenia pinnatifida	Cut-leaf Goodenia										
Juncus sp.	Rush				X				X		
Minuria leptophylla	Minnie Daisy										
Oxalis perennans	Grassland Wood-sorrel	X	X	X	X	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						
Plantago gaudichaudii	Narrow Plantain										
Poa labillardierei var. labillardierei	Common Tussock-grass	X			X					X	
Poa sieberiana	Grey Tussock-grass	X			X		X				
Pycnosorus chrysanthes	Golden Billy-buttons			X	X						
Rutidosis leptorhynchoides	Button Wrinklewort			X	X						
Rytidosperma caespitosum	Common Wallaby-grass	X	X		X	X	X		X	X	
Rytidosperma duttonianum	Brown-back Wallaby-grass	X			X	X	X		X	X	
Rytidosperma sp.	Wallaby Grass	X			X						X
Senecio quadridentatus	Cotton Fireweed	X			X						X
Senecio squarrosus s.l.	Leafy Fireweed										
Solenogyne dominii	Smooth Solenogyne										
Themeda triandra	Kangaroo Grass	X	X	X	X	X	X	X	X	X	X
Velleia paradoxa	Spur Velleia										
Veronica gracilis	Slender Speedwell										
Vittadinia cuneata	Fuzzy New Holland Daisy				X	X			X		
Wahlenbergia communis s.s.	Tufted Bluebell	X									
Walwhalleya proluta	Rigid Panic	X		X	X		X		X		X
No. indigenous species		**19**	**11**	**15**	**26**	**7**	**9**	**4**	**10**	**8**	**9**

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	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023
				1	1	1	1	1	2	2	2	2	2	3	3	3	3	3	4	4	4	4	4	6	6	6	6	6
#PI	*Acacia pycnantha*	Golden Wattle						+																				
*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	10	X	X	X	+	+	X		X	+	+	X	X	X		3		X	X	4	5

Origin	Scientific Name	Common Name	High Threat	Hz D Management Zones - Presence (x) / Projected Foliage Cover (%)																							
				2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023
				1	1	1	1	1	2	2	2	2	2	3	3	3	3	3	4	4	4	4	4	6	6	6	6	6
*	*Brassica fruticulosa*	Twiggy Turnip	Yes	10	20	2	2	1		+	+				+				+	2				+	30		+	+
*	*Briza spp.*	Quaking-grass	No	X		X	2	5			X	+	1	X	X	X	3	5	X	X	X	4	7					
*	*Bromus catharticus var. catharticus*	Prairie Grass	Yes	+			+																					
*	*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	1				+	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						+																			
*	*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	2	10	7	2	3	5		1			1	+	+		+	+					
*	*Plantago lanceolata*	Ribwort	Yes	25	45	12	5	5	15	15	10	6	5	5	4	1	1	1	6	8	5	2	10	5	15	8	4	10
*	*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			+

Origin	Scientific Name	Common Name	High Threat	Hz D Management Zones - Presence (x) / Projected Foliage Cover (%)																						
				2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023
				1	1	1	1	1	2	2	2	2	2	3	3	3	3	3	4	4	4	4	4	6	6	6	6	6
*	*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	15	8	9	11	7	7	4	6	4	5	6	13	10	6	6	10	5	4	3	5	6
No. high threat weed species				18	10	6	8	8	5	7	6	4	4	2	4	1	2	3	10	7	2	2	5	4	2	1	3	3
% cover high threat weed species				45	75	30	14	9	30	30	19	10	10	5	5	1	1	2	7	12	5	2	11	20	45	8	5	10

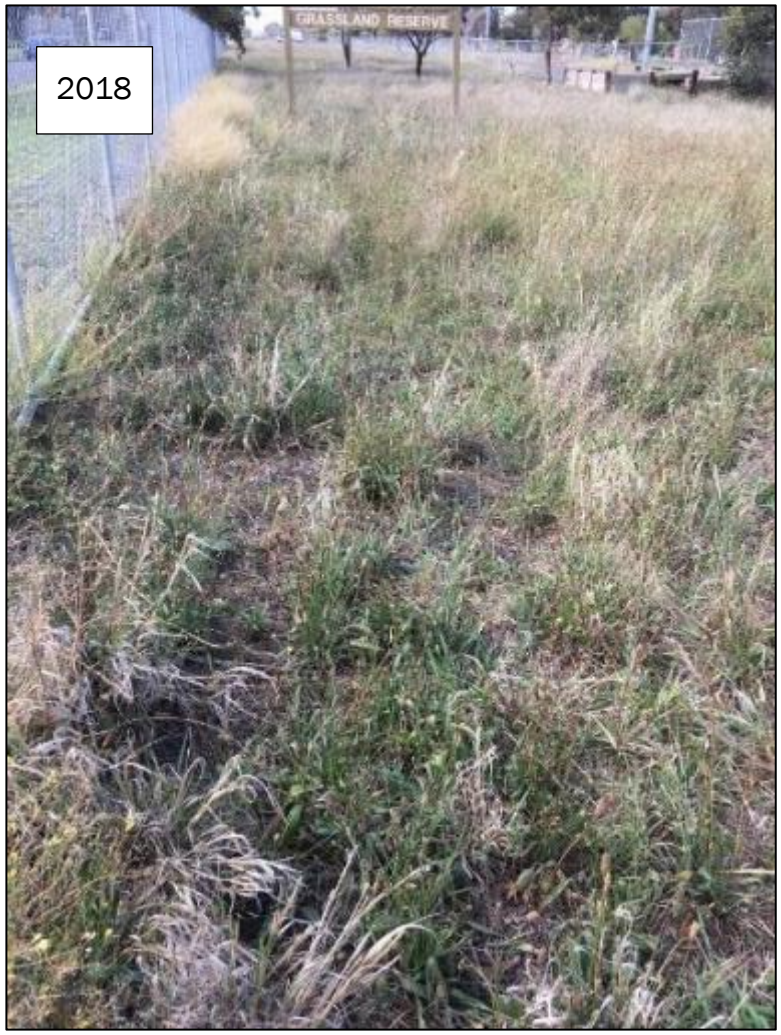
Origin	Scientific Name	Common Name	High Threat	Hz D Management Zones - Presence (x) / Projected Foliage Cover (%)																						
				2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023
				7	7	7	7	7	8	8	8	8	8	9	9	9	9	9	10	10	10	10	10	11	11	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	5	X	X		+	1	10	X	X	3	5	2		X	2	5		X	+		
*	*Brassica fruticulosa*	Twiggy Turnip	Yes	+	3	1			+	3	2				+				2	1		+	+					
*	*Briza spp.*	Quaking-grass	No	X		X	3	+	X		X	4	10	X	X	X	5	3	X		X	4	5	X		1	5		
*	*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																									
*	*Helminthotheca echioides*	Ox-tongue	Yes		+			+					+		+						+			10				
*	*Hypochaeris radicata*	Cat's Ear	Yes																									
*	*Iridaceae*	Iris	Yes																									
*	*Lactuca serriola*	Prickly Lettuce	No										+							X								

Origin	Scientific Name	Common Name	High Threat	Hz D Management Zones - Presence (x) / Projected Foliage Cover (%)																							
				2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	2018	Mar 2020	Spring 2020	Dec 2021	Jan 2023	Mar 2020	Spring 2020	Dec 2021	Jan 2023
				7	7	7	7	7	8	8	8	8	8	9	9	9	9	9	10	10	10	10	10	11	11	11	11
*	*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	+		+	2											30		2	15
*	*Plantago lanceolata*	Ribwort	Yes	30	30	8	2	3	20	10	5	2	5	35	40	4	2	2	2	15	15	3	2	30	40	10	5
*	*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		
*	*Tragopogon porrifolius subsp. porrifolius*	Salsify	No		X																						
*	*Vicia sativa*	Common Vetch	No																					X			
		No. weed species		6	9	5	3	5	6	5	5	8	7	3	8	5	4	6	7	4	6	8	7	9	6	7	4
		No. high threat weed species		5	5	3	1	2	3	3	2	3	3	1	4	3	1	2	6	3	2	3	3	6	3	5	3
		% cover high threat weed species		30	33	9	2	3	25	13	7	3	7	45	40	13	2	2	7	21	15	4	2	72	42	19	20

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 January 2023

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



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

2018

Jan 2023

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

2018

Jan 2023

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

2018

Jan 2023

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

Mar 2020

Jan 2023

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

2018

Jan 2023

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

2018

Jan 2023

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

March 2020

Jan 2023

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

March 2020

Jan 2023

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

March 2020

Jan 2023

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

2018

Jan 2023

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

2018

Jan 2023

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

2018

Jan 2023

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

2018

Jan 2023

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

2018

Jan 2023

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

2018

Jan 2023

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

2018

Jan 2023

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

2018

Jan 2023

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

2018

Jan 2023

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

2018

Jan 2023

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

2018

Jan 2023

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

2018

Jan 2023

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

2018

Jan 2023

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

2018

Jan 2023

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

2018

Jan 2023

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

2018

Jan 2023

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

2018

Jan 2023

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

2018

Jan 2023

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

2018

Jan 2023

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

2018

Jan 2023

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

2018

Jan 2023

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

2018

Jan 2023

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

March 2020

Dec 2021 (Note: representative of 2023 results)

Appendix 6: MCMC Biosite works summary (December 2021 – November 2022)

Summary of works by Merri Creek Management Committee at Biosite 3546, Main St, St Albans, under the 2021-22 Environmental Management Works Program

Environmental Management Works

Approximately 994 hours of environmental management works were performed at Biosite 3546 between 13/12/2021 and 31/10/2022. 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
Dec 2021	Hand weed, brushcut,	13	Annual grasses, Chilean Needle Grass
	Spot spray	26	Couch, Kikuyu, Toowoomba Canary Grass
	Watering	8	Button Wrinklewort
Jan 2022	Hand weed, brushcut	10	Bristly Ox-tongue
	Watering	5	Button Wrinklewort
	Herbicide dabber	40	Couch, Kikuyu
	Spot spray	15	Couch, Kikuyu, Convolvulus
Feb 2022	Hand weed, brushcut	44	Annual grasses, Barnyard Grass
	Watering	5	Button Wrinklewort
	Biomass removal	10	Biomass around threatened species
	Herbicide dabber	20	Couch, Kikuyu
	Spot spray	8	Couch, Kikuyu
March 2022	Hand weed, brushcut	7	Annual grasses, Paspalum, Plantain, Brassica
	Biomass removal	10	Biomass around threatened species
	Herbicide dabber	25	Couch, Kikuyu
	Spot spray	38	Couch, Kikuyu, Plantain, Brassica
April 2022	Hand weed, brushcut	48	Plantain, Brassica
	Rubbish removal	8	
	Spot spray	8	Brassica
	Burn preparation	16	Firebreaks
May 2022	Hand weed, brushcut	55	Annual grasses, Plantain
	Biomass removal	16	Biomass around threatened species
	Spot spray	23	Plantain, Panic Veldt Grass, Wild Oats
	Ecological burn	39	
July 2022	Hand weed, brush cut	131	Annual grasses, Plantain, Brassica
	Planting	23	Button Winklewort
	Flame weed	22	Annual grasses, Purple Woodsorrel
	Spot spray	8	Wild Oats, Rye Grass
August 2022	Hand weed, brushcut	147	Annual grasses, Plantain, Brassica
	Flame weed	4	Purple Woodsorrel

	Spot spray	24	Annual grasses, broadleaf germinants
Sep 2022	Hand weed, brushcut	16	Annual grasses
	Planting	23	Button wrinklewort
	Direct seeding	16	Austrostipa sp., Rytidosperma sp.
Oct 2022	Hand weed	8	Annual grasses
	Spot spray	16	Annual grasses

Ecological burns

Ecological burns were undertaken on 20/05/2022 in Zone D. Approximately 60% (0.20ha) of Zone D was burnt. Conditions were dry, resulting in close to 100% of vegetation being burnt in the areas to which fire was applied (see Figure 1).

Figure 1. Ecological burn in Zone D, May 2022.

Revegetation

Direct seeding

Assorted native grass seed was sown in April and June 2022 into bare ground along the perimeters of all three zones and in areas from which woody weeds were removed in previous years. 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 2022

Botanical name	Volume of seed (g)
Austrostipa sp.	30
Rytidosperma spp.	70
Themeda triandra	50

Button Wrinklewort recovery

160 seedlings of Button Wrinklewort (*Rutidosis leptorhyncoides*) were planted on 04/07/2022 and 08/09/2022. 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. The seedlings were planted throughout all three zones and, with some planted to compliment existing clusters of Button Wrinklewort and others planted to create new clusters.