La Trobe University Offset Site Year 2 ecological monitoring

FINAL REPORT

Prepared for La Trobe University

17 July 2023

Biosis offices

NEW SOUTH WALES

Albury
Phone: (02) 6069 9200
Email: albury@biosis.com.au

Newcastle
Phone: (02) 4911 4040
Email: newcastle@biosis.com.au

Sydney
Phone: (02) 9101 8700
Email: sydney@biosis.com.au

Western Sydney
Phone: (02) 9101 8700
Email: sydneyoffice@biosis.com.au

Wollongong
Phone: (02) 4201 1090
Email: wollongong@biosis.com.au

VICTORIA

Ballarat
Phone: (03) 5304 4250
Email: ballarat@biosis.com.au

Melbourne (Head Office)
Phone: (03) 8686 4800
Email: melbourne@biosis.com.au

Wangaratta
Phone: (03) 5718 6900
Email: wangaratta@biosis.com.au

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- Sammy Bodycomb (assistance in the field)
- Lucy Wilson and Sally Mitchell (mapping)
- Jane Kenny (quality assurance)

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1. Introduction

1.1 Background

Biosis is engaged by La Trobe University (La Trobe) to undertake annual ecological monitoring at the La Trobe University offset site in accordance with the approved Offset Management Plan (OMP) (Biosis 2020). The offset site (offset site) is located in the south-western corner of the campus, just west of the western end of Sports Field Lake (Figure 1).

The development of the La Trobe University Sports Precinct Stage 3 resulted in the clearing of 3.203 hectares of native vegetation. The development also resulted in the loss of 23 Matted Flax-lily *Dianella amoena* within 1.26 hectares of suitable habitat.

The offset site is known to provide habitat for Matted Flax-lily, a flora species listed as endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and critically endangered under the Victorian *Flora and Fauna Guarantee Act 1988* (FFG Act). One Matted Flax-lily was recorded within the offset site in 2019 (Biosis 2019) and two additional Matted Flax-lily were recorded during the 2022 survey (Figure 4). The 2.81 hectare offset site meets the quantity and quality requirements for an offset of Matted Flax-lily habitat as determined by the Australian Government Department of Climate Change, Energy, the Environment and Water (DCCEEW) under the EPBC Act in association with the approval conditions for EPBC 2018/8343 for the La Trobe University Sports Precinct Stage 3.

The Offset Management Plan (Biosis 2020) specifies a range of management actions for the offset site, including weed management, revegetation works, ecological burning and protection of the habitat values from degradation by development and unauthorised access. Management of the offset site will involve protection and active ecological management of 2.81 hectares of vegetation, which is potential Matted Flax-lily habitat and supports remnant Matted Flax-lily individuals and patches of Plains Grassy Woodland Ecological Vegetation Class (EVC) 55.

The ecological monitoring and reporting for Year 1 of the OMP was undertaken by Biosis in 2021 (Biosis 2022). The current report presents the results of the second year of OMP implementation in 2022 (Year 2, calendar year 2022), at the La Trobe University offset site, including the findings of the ecological monitoring activities and a summary of compliance against management actions. At the time of the report submission (July 2023) many of the outstanding actions have been addressed. This will be detailed in the Year 3 (2023) monitoring report.

1.2 Purpose

This report details the findings of the Year 2 ecological monitoring undertaken in December 2022 in accordance with the OMP (Biosis 2020), with a focus on vegetation management. Where action is required to meet management targets, recommendations are provided. This report documents:

- Management measures commenced and completed during the reporting period.
- Changes in management measures and rationale for changes.
- Detailed description of the baseline monitoring program.
- Results and analysis of baseline monitoring data.
- Discussion of baseline ecological monitoring results.

- Recommendations for management and/or additional monitoring.

1.3 Relationship to other documents

This monitoring report is to be read in conjunction with the following documents:

- The endorsed OMP (Biosis 2020), which identifies the targets to manage the offset site.
- Vegetation condition assessment and offset suitability for Matted Flax-lily report (Biosis 2019) that details the biodiversity values of the offset site .

1.4 The offset site

The offset site (approximately 2.81 hectares) is located in the south-western corner of the campus, just west of the western end of Sports Field Lake on a portion of land otherwise known as 906 Plenty Road, Bundoora (Figure 1). The property is currently zoned as Public Use Zone 2 (PUZ2) and is covered by Environmental Significance Overlay – Schedule 2 (ESO2).

This land parcel includes broader areas dominated by degraded Plains Grassy Woodland EVC 55 in relatively uniform, poor condition. Other parts of this parcel of land (outside of the offset site) have been cleared for the development of a variety of sporting fields and other infrastructure. The entire offset site has been designated as suitable Matted Flax-lily habit based on presence of the original topsoil and some native vegetation in the ground layer, even in areas dominated by weeds, where Matted Flax-lily have been shown to persist. The offset site includes four habitat zones and other areas dominated by introduced species, all of which will be managed to provide the Matted Flax-lily offsets for development of the Stage 3 Sporting Precinct (EPBC Referral 2018/8343).

The study area is within the:

- Victorian Volcanic Plain Bioregion
- Yarra River Basin
- Management area of Melbourne Water
- Darebin Shire
- Traditional lands of the Wurundjeri.

1.4.1 Landscape context

The offset site is within the La Trobe University Bundoora campus and is in close proximity to residential housing, university buildings and other facilities. More broadly, the campus has important wildlife values based on the Nangak Tamboree Wildlife Sanctuary. The surrounding area (including the offset site) is known habitat for Matted Flax-lily with an area immediately south of the proposed offset area managed by the City of Banyule and a natural remnant supporting Matted Flax-lily.

Additionally, Darebin Creek is approximately 30 metres from the western boundary of the offset, flowing south. The creek is an important habitat feature in north-east Melbourne forming a wildlife corridor within the suburbs, connecting with the larger Yarra River corridor. Native vegetation throughout the campus provides connectivity to the Darebin Creek corridor

1.4.2 Ecological values

Flora and fauna species recorded from the offset site are detailed in Appendix 1 of the OMP and Appendix 1 of this monitoring report.

Significant ecological values (Biosis 2019) include:

- 1.28 ha of native vegetation classified as Plains Grassy Woodland EVC 55 which has a bioregional conservation status of Endangered.
- Known habitat for Matted Flax-lily, listed as threatened under the EPBC Act and FFG Act. Three individuals are known to occur within the offset area (Figure 4).

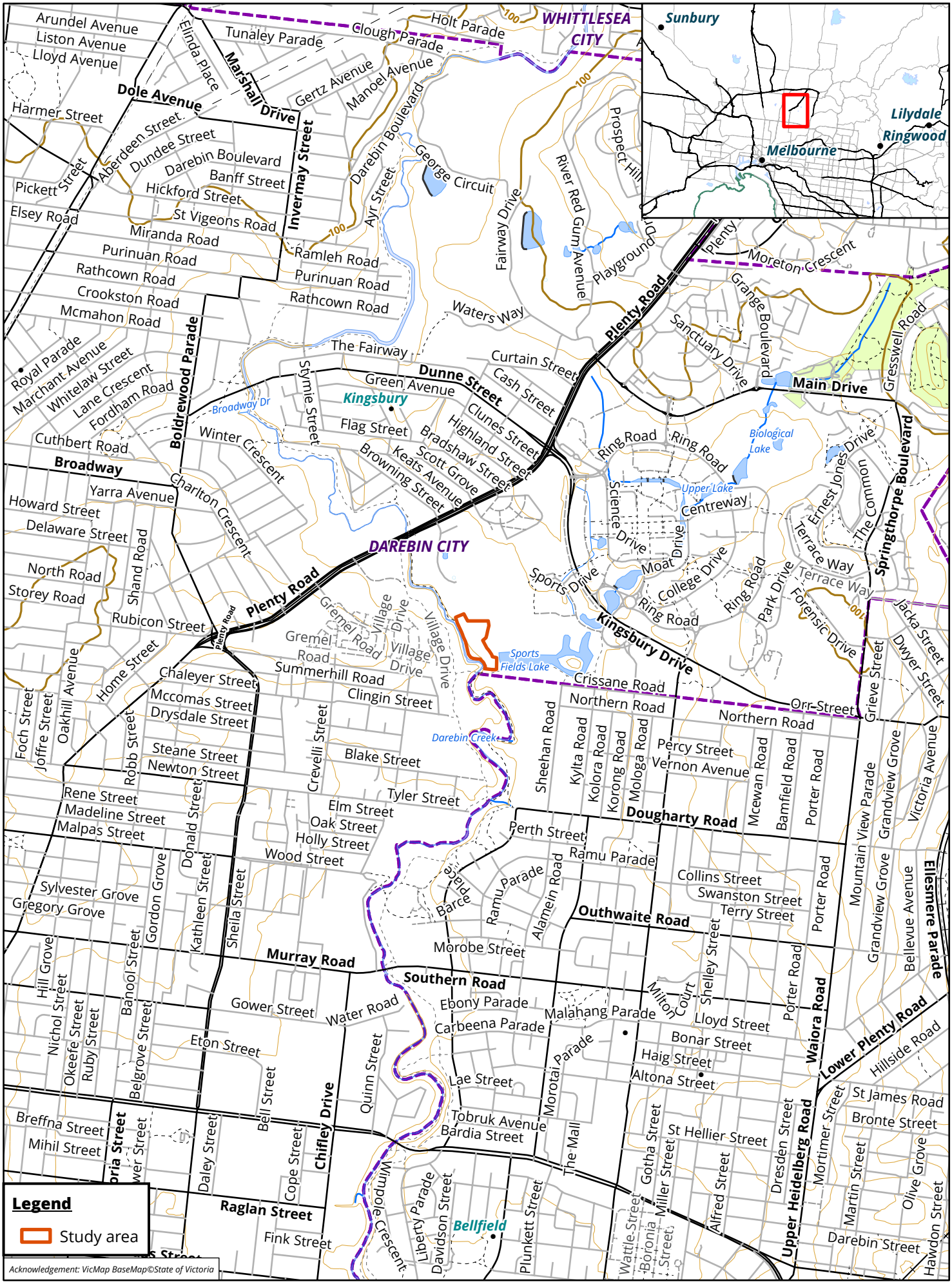

Figure 1 Location of the study area

biosis

Matter: 34751,
Date: 11 July 2023 ,
Prepared for: SH, Prepared by: SKM, Last edited by: smitchell
Layout: 34751_F1_Location
Project: P:\34700s\34751\Mapping\34751_LaTrobe_Stage3_OffsetMFLmonitoring.aprx

0 250 500 750 1,000
Metres
Scale: 1:25,000 @ A4
Coordinate System GDA 1994 MGA Zone 55

N

00

2. Compliance and reporting requirements

2.1 Responsibilities of La Trobe University

La Trobe University is responsible for the implementation of the OMP and the management of the offset site in perpetuity via a covenant. Management responsibilities are detailed in the OMP and include:

1. Implementing the OMP.
2. Ensuring all staff and contractors comply with all OMP requirements.
3. Ensuring preparation of ongoing management audit/review.
4. Ensuring preparation of annual management objectives for the next year including targets and standards.
5. Appointing of consultant ecologist and specialist bushland management contractor to implement management of the site.
6. Reporting to Trust for Nature (TfN) and DCCEEW as required.

These tasks will be undertaken by dates specified in the OMP. La Trobe's compliance with their responsibilities under the OMP are addressed in Section 3.2 of this report.

The works program will be audited at the end of Year 1, Year 4, Year 8, Year 10 and Year 18. An annual report will be prepared that documents the works completed and an assessment against targets that have been established.

2.2 Responsibilities of all staff or contractors on site

All staff or contractors must:

- Undertake all works in accordance with the OMP.
- Report any issues or incidents to the Project Manager.

For the current reporting year (Year 2; 2022), all staff and contractors worked in accordance with the OMP and reported any issues or incidents to the Project Manager.

2.3 Environmental approvals

Vegetation removal associated with the construction of the La Trobe University Sports Precinct Stage 3 has been authorised under the EPBC Act approval (EPBC 2018/8343). Vegetation proposed for removal is described in the biodiversity assessment prepared by Biosis (2019).

2.4 Enforcement

Compliance with the approved OMP is mandatory under the EPBC act approval and will be subject to enforcement by DCCEEW.

2.5 Reporting

Unless otherwise advised by the Minister, the landowner, via the approval holder (La Trobe), must submit a report annually to TfN and DCCEEW for the period of the approval (i.e. until 2040). Reports are to be submitted at least two months prior to the anniversary date of the execution of the OMP to allow time for compliance to be assessed before the anniversary date. Reports will also be published on the La Trobe website within three months of every twelve month anniversary.

The annual report will address progress against the commitments set out in the OMP. Annual reports will provide enough detail in the form of written comments and supporting evidence that an assessor can easily determine the completion of/progress against the management commitments and completion criteria for the offset site.

The annual report will include:

- Details of management actions, including on ground works, undertaken within the reporting period.
- Results of monitoring activities, including fence condition, weeds, pest animals, habitat quality, vegetation quality and ground cover biomass accumulation / the cover of open ground.
- Tracking of results in comparison to management performance targets and completion criteria.
- Site photographs including from five defined photo points.
- Details of compliance or non-compliance with the schedule of management actions (Table 1).
- Details of compliance or non-compliance with performance targets (Section 3.2).
- Details of any incidents or new and emerging management issues, with recommendations for corrective action and plan review in order to obtain the offset completion criteria.
- Any triggers exceeded and which corrective actions were implemented.
- Results of Matted Flax-lily monitoring events.

2.6 Data management

The qualified ecologist undertaking ecological components of the monitoring program will retain all monitoring data in an appropriate database format. Spatial data will be maintained within an appropriate GIS file format (e.g. ESRI shape file). All flora and fauna records will be submitted to DEECA for incorporation into the Victorian Biodiversity Atlas (VBA) as per the requirements of relevant licences.

La Trobe will ensure all records of inductions, inspections and monitoring are stored safely and are readily accessible for auditing. Types of records relevant to this plan include:

- All monitoring, inspection and compliance reports
- Induction and training records
- Correspondence with public authorities
- Reports on incidents impacting on biodiversity values and follow-up actions
- Spatial data.

3. Monitoring compliance with management actions

3.1 Approach to monitoring

Biosis monitored completion of management during Year 2 (2022). The annual compliance monitoring included:

- Undertaking a site inspection at the end of Year 2 to record whether actions had been completed satisfactorily e.g. erection of fencing and signage.
- Checking other evidence of completion of management actions.

3.2 Management actions completed at Year 2 (2022)

The management actions specified in the approved OMP for the current reporting period (calendar year 2022) are listed in Table 1. The table indicates whether the action is completed, currently in progress or not yet commenced. Some actions are considered ongoing, in which case compliance for 2022 was reported. Table 1 also indicates whether the management is considered compliant (shaded green), partially compliant (shaded orange) or non-compliant (shaded red). Where non-compliance was reported, recommendations are provided to ensure compliance going forward.

Notably, all of the relevant actions specified for this period have been completed or are ongoing in accordance with the OMP in 2022. In summary, La Trobe University has satisfactorily complied with the OMP during the 2022 reporting year.

* At the time of the report submission (July 2023) many of the outstanding actions have been addressed. This will be detailed in the Year 3 (2023) monitoring report.

Table 1 Year 2 progress against management actions for the offset site as outlined in the OMP

Management item	Year 2 action (Biosis 2020)	Progress at end of Year 2
Long-term protection	The offset area will be secured in-perpetuity via a covenant as to part Section 3A Victorian Conservation Trust Act 1972, to be registered on the title prior to the commencement of development associated with the Stage 3 Sporting Precinct.	Partially compliant - covenant with TfN is in the process of being finalised.
Annual works program	Prior to any works being undertaken each year an annual works program will be developed by an experienced bushland regenerator.	Compliant; Annual works program prepared by Darebin Creek Management Committee.

Management item	Year 2 action (Biosis 2020)	Progress at end of Year 2
Fencing, information and access control	Establish fencing and or other access control devices (i.e. gates) to control access to the offset site and repair promptly if damage occurs.	Compliant; Fencing and access control has been established and maintained.
	Establish posts to mark the boundary of the offset site for management and monitoring purposes under supervision from a qualified ecologist.	Compliant; Posts to mark the boundary of the offset site have been established.
	Control access and any passive use to minimise impacts on native vegetation.	Compliant; Offset site is fenced, and gates are locked.
	Provide access for management vehicles into the offset site, using the existing track network. No additional vehicle access is to be established.	Compliant; No new tracks have been established within the offset site. The existing track network is used for vehicle access.
	Surveys of the offset boundary and any associated access control infrastructure will be conducted quarterly, and when visiting the site to conduct other monitoring or management actions.	Compliant; Fencing was in good condition during the Year 2 compliance monitoring.
Weed control	Treat all existing infestations of woody weeds within 12 months, and eradicate within three years. Continuous follow-up control to eradicate woody weed seedlings and other regeneration.	Compliant (ongoing); The land management team attended the site on a number of occasions through 2022. Evidence of weed removal and spraying was recorded during site visits for compliance monitoring and provided to Biosis.

Management item	Year 2 action (Biosis 2020)	Progress at end of Year 2
	Spot spraying of weeds with appropriate herbicide will be undertaken, particularly through spring and early summer.	Compliant; As above.
	Target weeds will be treated before seed set; this requires repeated monitoring and treatment during the growing season.	Ongoing; weeds are still present, however, management is underway.
	Ensure the absence of high threat woody weeds within the offset area through monitoring and where found to occur, control and eliminate promptly. Preferably control nearby infestations to prevent the spread of these species.	Ongoing; weeds are still present, however, management is underway.
	Control works will ensure that the total cover of perennial weeds will be reduced to no more than 2% and preferably eliminated. Specific targets include: a reduction of high threat weeds in accordance with Table 4; perennial grassy weeds will be reduced to less than 1% total cover; and broadleaf weeds reduced to no more than 2% cover.	Ongoing; weeds are still present, however, management is underway.
	Monitoring will be undertaken to demonstrate the effectiveness of weed control works and the results are to be used to adapt future control works and targets.	Ongoing; Year 2 monitoring complete.
	Any populations of new and emerging high threat weeds will be treated promptly and eliminated. This will be done in consultation with TfN.	Ongoing; Land management have undertaken weed removal on a number of occasions during the second year of management.

Management item	Year 2 action (Biosis 2020)	Progress at end of Year 2
	Any other significant environmental weeds identified during the ongoing site monitoring will also be controlled in consultation with TfN.	Ongoing; As above.
	During weed control, natural regeneration of indigenous flora will be protected from off-target damage.	Ongoing; No evidence of damage to indigenous flora was observed during the monitoring events.
Weed monitoring	Weed monitoring conducted annually in spring as part of the annual monitoring event.	Compliant; results of weed monitoring included in this report.
Pest animals	Control and seek to locally eliminate European Hares, European Rabbits, cats and foxes and using appropriate control techniques including poison baits or similar methods, without significant soil disturbance (i.e. ripping of warrens is not acceptable).	No evidence of rabbit, hares, cats or fox populations were noted during monitoring events. Baiting has accordingly not yet commenced.
	Fumigate rabbit warrens within three weeks of detection. Fumigation works will be conducted by a suitably qualified operator.	No active rabbit warrens have been noted within the offset site.
Pest animal monitoring	Pest animal monitoring will occur annually in November. This will include a systematic survey of the offset site lasting no longer than thirty minutes.	A night survey was undertaken, and a subsequent shooting program occurred on 5 July 2022. Several hares that were identified survey the survey were eradicated from the offset site.

Management item	Year 2 action (Biosis 2020)	Progress at end of Year 2
Biomass/ organic litter	Engage a qualified contractor to produce a fire management plan which allows for an ecological burning regime described in the following dot points:	Non-compliant: Planned burns for the offset site could not go ahead due to weather conditions and impacts of covid on staff. Burns are planned during 2023. This target has been kept orange as the lack of burn was primarily due to unavoidable environmental issues.
	Undertake ecological burning over the offset area (or parts there-of) so that no area is burnt more frequently than every two years;	
	When planning burns, liaise with any relevant regulator regarding appropriate planning and permits in a timely manner;	
	Plan and conduct ecological burning within different seasons to promote regeneration of a variety of species and remove debris created by the control of woody weeds.	
Understorey diversity and recruitment	Active weed management to be undertaken as outlined in Section 3.8.2 of the OMP.	The land management team have visited site on a several occasions and undertaken weed management, i.e. spraying and woody weed removal. Refer to weed control items above for compliance.
	Biomass will be managed to enhance recruitment – see Sections 3.8.4 above.	Partially compliant (ongoing); Biomass control is underway. A burn is planned for 2023.
Revegetation	Once weed and biomass control activities have established areas with a low cover of weeds, these areas will be sown with a variety of suitable native graminoids (Appendix 1). This direct seeding will target a minimum establishment density of five grasses per square metre.	Not applicable - This action cannot occur until several years of weed and biomass control has occurred.

Management item	Year 2 action (Biosis 2020)	Progress at end of Year 2
Baseline site condition monitoring	Within three months approval of the OMP and prior to the commencement of any management activities a suitably experienced botanist will systematically survey the site and collect information on flora species by the establishment of five permanent five by five metre monitoring quadrats.	Compliant; Baseline monitoring of the offset site was undertaken on 21 October 2021.
Continuous monitoring	Regular site inspections (of about two hours at least every two months) will be undertaken to provide general condition observations. The Landowner must keep a diary of any works conducted within the offset site and record any observations which could influence or initiate a management response.	Compliant; land management group keeps records of daily works and general condition observations. Daily works records are available for review.
Woodland monitoring	The condition of the Plains Grassy Woodland will be assessed annually during spring. This will be done using the offset site as a single unit and using the habitat hectare method.	Compliant - habitat hectare assessment undertaken during Year 2 of monitoring.
Matted Flax-lily monitoring	Surveys of translocated Matted Flax-lily individuals to occur annually during late spring to early summer.	Not applicable - Translocation of Matted Flax-lily individuals has not yet occurred. Due to occur in 2024.
Revegetation monitoring	Monitoring of the revegetation works will commence in the spring of Year 3.	Not applicable - monitoring to begin in Year 3.
Reporting	La Trobe must submit a report annually to TfN and DCCEEW for the period of the approval (i.e. until 2040). Reports are to be submitted at least two months prior to the anniversary date of the execution of the OMP. The annual report will address progress against commitments set out in the OMP.	Compliant once this report is submitted to TfN and DCCEEW.

4. Key offset outcomes and monitoring of vegetation

4.1 Key offset outcomes

The key environmental outcomes / criteria to be achieved through protection and management of the offset site are:

- Permanent legal protection of 2.81 hectares of Matted Flax-lily habitat.
- Physical protection of the habitat area from manageable threats including grazing by domestic stock, weed infestations and degradation by pest animals.
- Attainment of Matted Flax-lily habitat condition completion criteria (below), as measured by habitat monitoring.

4.1.1 Future site condition – completion criteria

The 2.81 hectare offset site must achieve the following:

- Be dominated by good quality native vegetation (target Vegetation Quality Assessment [VQA] site condition score of 30 - 45/75).
- Support a population of Matted Flax-lily with a density of at least 2 to 5 plants per hectare.

4.2 Methods

The Year 2 flora assessment was undertaken on 21 and 22 December 2022. Five permanent 5 x 5 metre monitoring quadrats were established within the offset site. Plots were selected based on topographic variation present (floodplain, rocky slope and elevated plain) and the variation in site conditions (across a spectrum of weed dominated to patch vegetation). The location of quadrats is shown in Figure 3. A star picket was placed in the north-west corner of each quadrat so the quadrats could be easily located in future monitoring years.

4.2.1 Photo point monitoring

Photo points were established at each quadrat and photos are to be taken annually. Four photos were taken facing into the quadrat from each corner and photos were digitally labelled with the quadrat number and orientation (e.g. Q1 NW to denote the north-west corner of quadrat 1). Each photo was taken standing approximately 1.5 metres back from each corner of the quadrat. See Appendix 2 for photos.

During the 2022 monitoring it was noted that not all pickets have been placed in the correct corner of the quadrat. This in turn has caused some issues with the accuracy of the photo point monitoring. To avoid confusion in future monitoring years, permanent pickets will be installed at all corners of the quadrats during Year 3 monitoring (2023).

4.2.2 Vegetation monitoring

A 5 x 5 metre monitoring quadrat was used to define the area of assessment with a single peg placed in the north-west corner. At each quadrat the following attributes were recorded:

- Flora species, noting whether the species is native or introduced and/or a high threat weed.
- Total percent cover of each species using a modified Braun-Blanquet cover abundance scale (Table 2).

- Total native vegetation cover (%).
- Total weed cover (%).
- Cover of bare ground, leaf litter, soil crust, bryophytes and inter-tussock space (%).

Table 2 Modified braun blanquet cover abundance categories

Value	Cover and abundance	Low %	Mid %	High %
+	Cover <5%, less than 3 individuals	0.1	0.5	0.9
1	Cover <5%, more than 3 individuals	1	3	4.9
2	Cover 5-25%, any number of individuals	5	12.5	19.9
3	Cover 25-50%, any number of individuals	20	35	49.9
4	Cover 50-75%, any number of individuals	50	62.5	74.9
5	Cover 75-100%, any number of individuals	75	87.5	100

4.2.3 Vegetation height

A measuring stick was placed vertically at 1 metre intervals inside each quadrat 16 times (Figure 2).

At each interval the height of the tallest vegetation touching the stick was recorded.

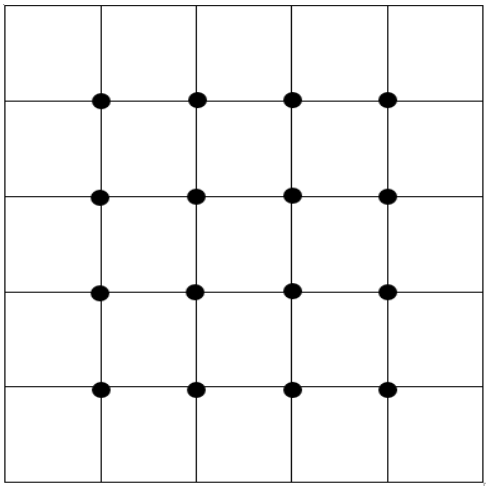

Figure 2 Locations of vegetation height measurements taken at 1 metre intervals

4.2.4 Biomass assessment

Four sub-samples were recorded to determine biomass accumulation at each of the five quadrats. Using the golf ball method (Morgan 2015) to measure how open or dense vegetation is, a 1 x 1 metre quadrat was placed at each corner of the 5 x 5 metre quadrat. Eighteen golf balls were randomly dropped into the 1 x 1 metre quadrat from a height of 1.3 metres. The visibility of the golf balls from a standing position above the quadrat was scored as follows:

- Any golf ball that was more than 90% visible was given a score of 1.
- Any golf ball that was 33% to 90% visible was given a score of 0.5.
- Any golf ball that was less than 33% visible was given a score of 0 (zero).

Each 1 x 1 metre quadrat was given a total score out of 18. Average golf ball scores for a given 5 x 5 metre quadrat can be categorised as follows (Morgan 2015):

- High biomass (0-5): low golf ball visibility, which suggests that biomass reduction (e.g. through fire and/or grazing) is required.
- Moderate biomass (6-14): moderate golf ball visibility, which suggests that the need for biomass reduction should continue to be closely monitored.
- Low biomass (15-18): high golf ball visibility, which suggests that biomass reduction is not required.

4.3 General site inspection and walkover

During the offset suitability assessment in September 2019, a preliminary flora species list was collected for the offset site. The flora species list is updated annually during monitoring with new species observations.

While the current species list is relatively comprehensive, it is not exhaustive. Some species may not have been observed due to their very low abundance, dormancy or seasonal conditions. Though the timing of the December 2022 monitoring captured the peak flowering period for many species, some species had recently finished flowering or were not yet flowering, making it difficult to identify some specimens to species level. It is expected that more species will be added to the list in the coming years.

During the site visit, relevant management issues were noted and, where appropriate, their locations were mapped using a GPS-enabled tablet, typically to an accuracy of 3 metres. Where relevant, the location of woody weeds, new and emerging weeds and evidence of pest animals was mapped.

4.4 Data management

A project database has been established and will be maintained allowing for data storage and protection, data extraction, quality control, analysis, interpretation, reporting and presentation.

4.5 Future monitoring

Future annual ecological monitoring must follow the methods outlined in the OMP, whilst incorporating the specific methods outlined above.

Legend

- Offset area
- Quadrat

Figure 3 Location of quadrats

0 10 20 30 40 50

Metres

Scale: 1:1,200 @ A3

Coordinate System: GDA 1994 MGA Zone 55

N

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Matter: 34751,
Date: 11 July 2023 ,
Prepared for: SH, Prepared by: SKM, Last edited by: smitchell
Layout: 34751_F3_Quadrats
Project: P:\34700s\34751\Mapping\
34751_LaTrobe_Stage3_OffsetMFLmonitoring.aprx

5. Results of vegetation monitoring

A summary of targets as outlined in the OMP and the status of these targets during the Year 2 (2022) monitoring event of the offset site is provided in Table 3.

Table 3 Summary of progress against targets at end of Year 2

Item	Year 10 target	Outcome at end of Year 2
Weeds	Eliminate woody weeds	Woody woods recorded within offset area, however evidence of woody weed removal was noted.
	Cover of perennial grassy weeds to no more than 2% cover across the site	Cover of perennial grassy weeds >2% across the site
	Cover of broad leaf weeds to no more than 2% cover across the site	Cover of broad leaf weeds >2% across the site
	No mature woody weeds present within the offset area at the completion of Year 2.	Mature woody weeds present within offset area, however evidence woody weed removal was observed.
Revegetation	Areas not identified as having 25% cover of native vegetation will need extenisve revegetation works to meet this target	Large areas still remain <25% of native vegetation
Vegetation quality	Offset site to be dominated by good quality native vegetation (VQA site condition score of 30 - 45/75)	VQA score of the offset site as a single habitat zone is 21/75.
MFLs	Support a population of MFL with a density of at least 2 to 5 plants per hectare.	NA - translocation of MFLs not yet occurred. Due to occur in 2024.

5.1 General Vegetation quality

The offset site must be dominated by high quality native vegetation (VQA site condition score of 30-45/75) by the end of Year 10 as stated in Section 3.4.1 of the OMP.

The initial site condition report (Biosis 2019) identified four habitat zones within the offset area. These zones are mapped in

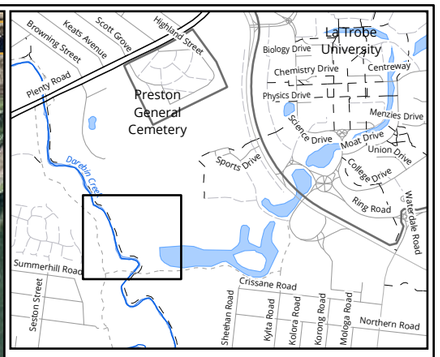
Figure 4 4 and the 2019 VQA scores are presented in Table 4.
The OMP states that a VQA is to be undertaken on an annual basis using the offset site as a single habitat zone. The results of the Year 2 (2022) VQA are presented in Table 5.

Table 4 VQA results of native vegetation within the offset site (Biosis 2019)

Habitat Zone ID			4.2	7	8	A
EVC #: Name			Plains Grassy Woodland EVC 55			
		Max Score	Score	Score	Score	Score
Site Condition	Large Old Trees	10	0	0	0	0
	Canopy Cover	5	0	5	5	0
	Lack of Weeds	15	4	4	4	4
	Understorey	25	5	5	5	5
	Recruitment	10	5	5	0	5
	Organic Matter	5	3	3	3	3
	Logs	5	0	0	0	0
	Total Site Score		**17**	**22**	**17**	**17**
Landscape Value	Patch Size	10	1	1	1	1
	Neighbourhood	10	0	0	0	0
	Distance to Core	5	0	0	0	0
	Total Landscape Score		1	1	1	1
HABITAT SCORE		100	**18**	**23**	**18**	**18**
Habitat points = #/100		1	0.18	0.23	0.18	0.18

Table 5 VQA results of the offset site as a single habitat zone

Habitat Zone ID			1
EVC #: Name			Plains Grassy Woodland EVC 55
		Max Score	Score
Site Condition	Large Trees	10	3
	Tree Canopy Cover	5	3
	Lack of Weeds	15	0
	Understorey	25	5
	Recruitment	10	6
	Organic Matter	5	3
	Logs	5	0
	Total Site Score		20
Landscape Value	Patch Size	10	1
	Neighbourhood	10	0
	Distance to Core Area	5	0
	Total Landscape Score		1
Habitat points = #/100		100	21
CONDITION SCORE		1	0.21



Legend

- Offset area
- Matted Flax-lily within survey area (Biosis 2018)
- Matted Flax-lily within survey area (Biosis 2023)

Habitat Zones

- (VVP_0055_61) Plains Grassy Woodland

Figure 4 The distribution of MFL and its habitat at the La Trobe University offset site

0 10 20 30 40 50

Metres

Scale: 1:1,200 @ A3

Coordinate System: GDA 1994 MGA Zone 55

N

Matter: 34751,
Date: 12 July 2023 ,
Prepared for: SH, Prepared by: SKM, Last edited by: smitchell
Layout: 34751_F4_HZs_MFLs
Project: P:\34700s\34751\Mapping\
34751_LaTrobe_Stage3_OffsetMFLmonitoring.aprx

5.2 Quadrat monitoring

Quadrat monitoring was undertaken on 21 and 22 December 2022, which was an appropriate time to survey, as many of the species at La Trobe were in flower or fruit and were readily identifiable. The results of the quadrat monitoring are discussed here and displayed in Appendix 2. Native vegetation features and locations of quadrats within the La Trobe University offset site are displayed in Figure 3.

5.2.1 Flora species

A total of 73 flora species were recorded during the Year 2 monitoring (a combination of quadrat data and incidental species) (Appendix 1). This list includes 29 native species and 44 introduced species. Forty-two species were recorded within quadrats. The quadrat list includes 14 native species and 28 introduced species.

One threatened flora species was recorded during the Year 2 monitoring; Matted Flax-lily *Dianella amoena* (listed as endangered under the EPBC Act and critically endangered under the FFG Act). This species was recorded in quadrat two for the first time and is also known from two other locations within the offset site (Figure 4).

5.2.2 Life forms

Thirty eight percent of lifeforms were recorded during the VQA assessment across the offset site in Year 2. To achieve higher site condition scores, greater richness of species and cover will be required for most of the benchmark lifeforms, such as medium and small shrubs, large, medium and small herbs and large and medium tufted graminoids.

5.2.3 Vegetation diversity and cover

Figure 5 and Figure 6 present the number and cover of indigenous and introduced flora recorded within each quadrat, respectively. Similarly to 2021, in 2022 the number of introduced flora exceeded the number of indigenous flora in all quadrats. Overall, species richness of indigenous flora was considered low, ranging from three to seven species within the five 5 by 5 metre quadrats in 2022.

Cover of indigenous flora was highly variable across quadrats in 2022, ranging from 3% to 60% cover. The cover of introduced flora exceeded the cover of indigenous flora. In 2021, Quadrat 2 had a higher cover of native species than introduced species which was entirely attributed to the presence of Kangaroo Grass *Themeda triandra*. This was the only indigenous species recorded within this quadrat. In 2022, Kangaroo Grass was still recorded within the quadrat, however, the introduced species Chilean Needle Grass *Nassella neesiana* is now the dominant species.

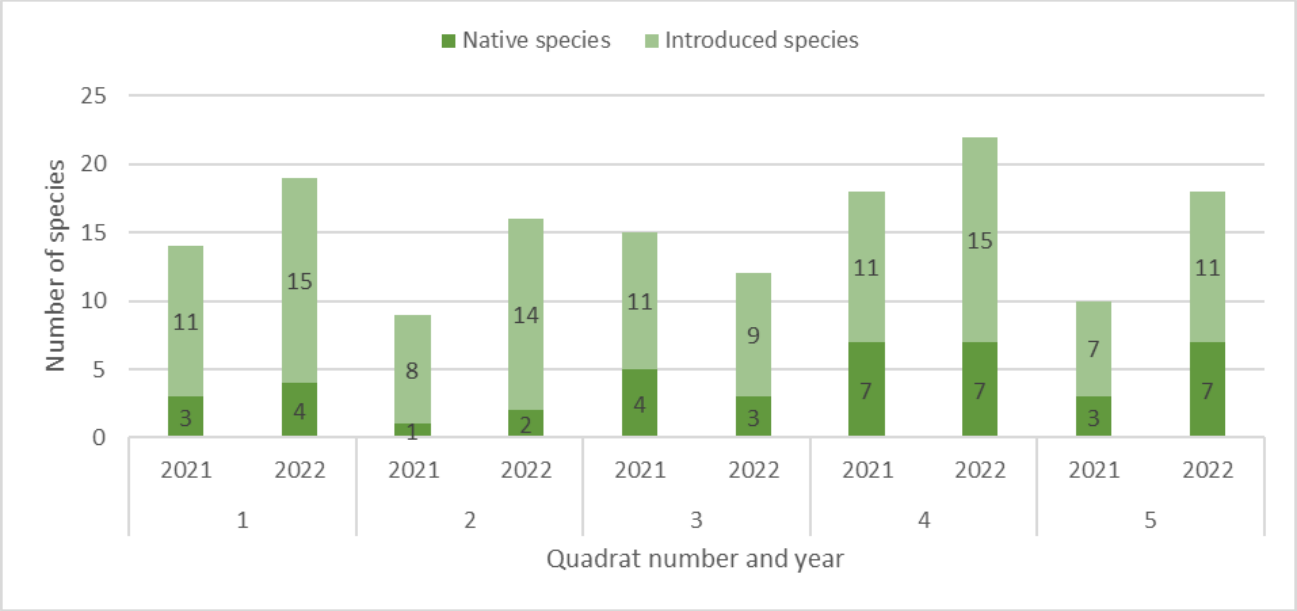


Figure 5 Number of indigenous and introduced flora species in each quadrat in 2021 and 2022

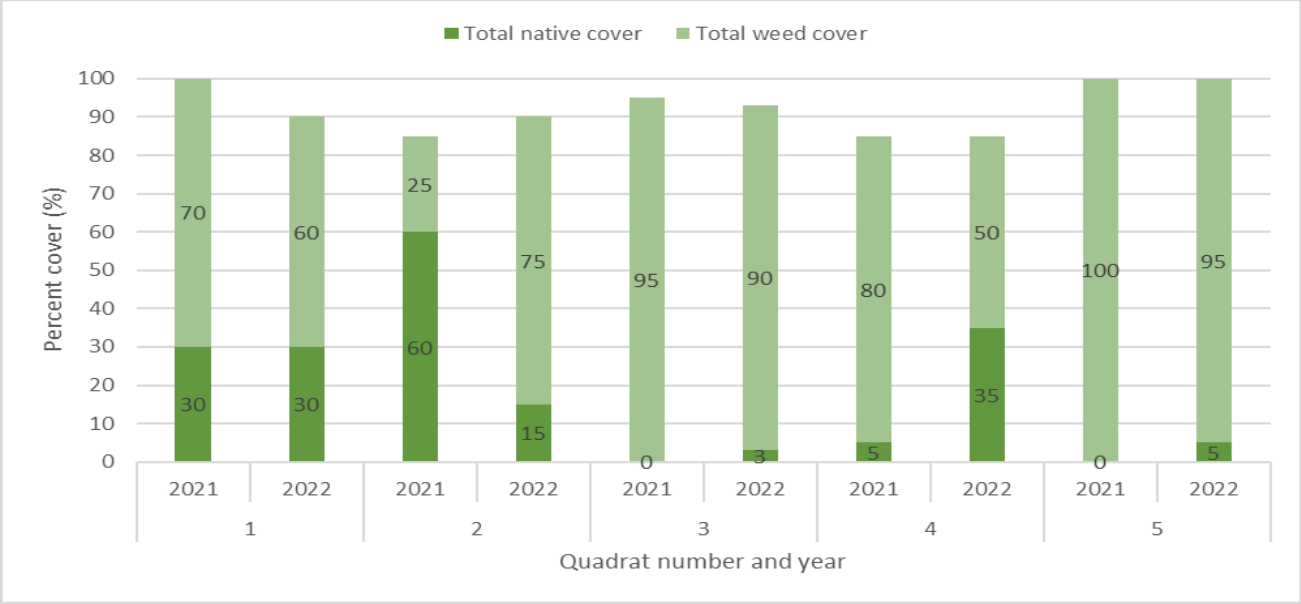


Figure 6 Cover of indigenous and introduced flora species in each quadrat in 2021 and 2022

5.2.4 Weed management

At the completion of Year 10 the offset site must support a population of Matted Flax-lily with a density of 2 to 5 plants per hectare. A key performance target, to assist in attainment of a habitat score of at least 30-45/70, is to eliminate woody weeds and reduce the abundance of perennial, introduced pasture grasses such as Chilean Needle-grass *Nassella neesiana*, Toowoomba Canary-grass *Phalaris aquatica* and Cocksfoot *Dactylis glomerata.*

The weed reduction target for introduced perennial grasses is set at <2% total cover. In Year 2, perennial grass cover ranged from 42% to 92% cover across quadrats, with an average cover of 68%. This average is a 6% increase on the Year 1 results.

Mean total weed cover within the five monitoring quadrats during Year 2 monitoring in December 2022 was 74%. This is a 2% increase on mean weed cover across quadrats compared to 2021.

Toowoomba Canary Grass was a dominant perennial weed species across the study area and was recorded for the first time in quadrats three to five. Chilean Needle Grass also saw an increase in cover across quadrats and the offset area in general. Other notable weed infestations include Serrated Tussock *Nassella neesiana* and Cocksfoot, which were both recorded across most of the offset area and presented in quadrats with a higher cover then 2021.

Achieving the nominated targets will increase the Lack of Weeds score and provide opportunities for additional understorey lifeforms to establish. These outcomes will elevate the offset site condition score to the required level to achieve the defined completion criteria.

The declared noxious weeds and high threat weeds recorded during the Year 1 and Year 2 monitoring are listed in Table 6. These weed species should be the focus of future weed management programs at La Trobe University.

Table 6 List of declared noxious weeds and high threat weeds recorded during Year 1 and Year 2 monitoring at La Trobe Univeristy offset site

CaLP Act status	Scientific name	Common name
R	*Asparagus asparagoides*	Bridal Creeper
R	*Allium triquetrum*	Angled Onion
RC	*Cirsium vulgare*	Spear Thistle
RC	*Crataegus monogyna*	Hawthorn
RC	*Echium plantagineum*	Paterson's Curse
RC	*Genista monspessulana*	Montpellier Broom
RC	*Lycium ferocissimum*	African Box-thorn
R	*Nassella neesiana*	Chilean Needle-grass
RC	*Nassella trichotoma*	Serrated Tussock
R	*Oxalis pes-caprae*	Soursob
RC	*Rosa rubiginosa*	Sweet Briar
RC	*Rubus anglocandicans*	Common Blackberry
RC	*Ulex europaeus*	Gorse

5.2.5 Biomass accumulation

Where there is a sustained build up in ground cover biomass over any one year, resulting in a reduction of inter grass tussock space to an average of less than 30%, biomass will need to be actively reduced. Inter-tussock space is important for plant recruitment and is used as a collective term for bare ground, bryophytes, lichens and soil crust, all of which provide a medium upon which plant recruitment can occur (DSE 2004). Across all quadrats there was an average of 4% cover of inter tussock space, a 2% reduction compared to 2021 and significantly lower than the target of 30%.

This result corresponded with a mean golf ball score of 7 which indicates there is a moderate cover of biomass within the offset site.

A low golf ball score is indicative of high biomass across the offset site. This is evident in Quadrat 5, which is dominated by introduced species such as Toowoomba Canary Grass and Cocksfoot, which can both grow to 1 metre in height. Table 7 summarises the biomass accumulation results for each of the five quadrats.

Table 7 Mean inter-tussock space, golf ball score and maximum vegetation height for the five permanent monitoring quadrats

Quadrat	Cover of inter tussock space (%)	Mean golf ball score	Mean maximum vegetation height (cm)
1	6	10 - moderate biomass	33
2	2	7 - moderate biomass	44
3	3	6 - moderate biomass	36
4	7	8 - moderate biomass	36
5	0	5 - high biomass	51
MEAN	**4**	**7 – moderate biomass**	**40**
TARGET	**30 (+/- 10)**	**≥15 – low biomass**	**≤25**

5.3 Pest animal control

There must be no active rabbit warrens or fox dens within the offset site (Objective 9 of the OMP) and new and emerging pest animals must be controlled (Objective 10 of the OMP). No active rabbit warrens or fox dens and no signs of new and emerging pest animals were recorded during monitoring in December 2022.

5.4 General site condition

Weed cover remains high within the offset site, however, there is evidence of weed management being undertaken (spraying and removal of high threat woody weeds). Remnant trees remain in good condition and works have been carried out around the trunks of many of the young trees to remove biomass in preparation for a burn. Biomass is high, which is likely a result of the failure to undertake a burn within the offset area. Fencing and gates are in good condition and rubbish is absent from the offset area.

6. Discussion and recommendations

6.1 Conclusions

La Trobe University satisfactorily complied with the OMP during the 2022 reporting year. All specified management actions for the year were completed in accordance with the OMP, except where they were considered not relevant at that point in time or where environmental conditions prevented them from occurring (i.e. planned burn).

Some progress is needed towards meeting certain management objectives and targets over the coming years. Particular attention will need to be given to ensuring that vegetation quality and weed control targets are met. This will require diligent implementation of the OMP (e.g. weed control actions), regular monitoring of progress and adapting of management actions accordingly, where relevant. Management of declared noxious weeds should be a high priority in the next two to three years and biomass control through the use of planned burns should be utilised.

6.2 Recommendations

6.2.1 Management recommendations

Based on results of the Year 2 monitoring, the following management actions in accordance with the OMP will assist in ensuring the 10 year targets for vegetation quality and Matted Flax-lily are met:

- Continue the comprehensive weed management program, including ecological burns under appropriate seasonal conditions.
- Monitor for any new and emerging weeds and continuously treat those weeds to avoid further seed set, dispersal and infestation.
- Revegetate areas not identified as patches with locally indigenous species.
- Continue to undertake biomass reduction to assist with weed control and recruitment of native species.
- Maintain a progressive annual works plan which caters to current conditions and prescribes ongoing management with the promotion of perennial grasses.
- The OMP outlines several specific weed targets for the offset area. For this report, we have used the target of <2% cover of perennial introduced grasses and broad leaf weeds. This target is repeated throughout the OMP and thus used in this monitoring report. There are other targets that are discussed within the OMP which may prove to be more achievable i.e. an overall reduction from approximately 50% perennial weed cover to 20% perennial weed cover or a 50% reduction of the baseline monitoring cover of perennial weeds. La Trobe University could consider undertaking a review of the OMP to clarify these targets.

6.3 Management actions for Year 3 (2023)

Refer to Table 5 of the OMP for management actions specified for Year 3 and beyond.

References

Biosis 2019. La Trobe University Sports Precinct Stage 3: - Vegetation condition assessment and offset suitability for Matted Flax-lily. Report for La Trobe University. Author: Mueck, S. Biosis Pty Ltd, Melbourne, Vic. Project no. 30808

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Biosis 2022. La Trobe University Offset Site Ecological Monitoring Report for 2021. Report for La Trobe University. Author: Hilliar, S. Biosis Pty Ltd, Melbourne, Vic. Project no. 34751

DSE 2004. *Native Vegetation: Sustaining a Living Landscape. Vegetation Quality Assessment Manual – Guidelines for Applying the Habitat Hectares Scoring Method. Version 1.3.* Victorian Government Department of Sustainability and Environment, Melbourne.

Morgan 2015. Biomass management in native grasslands. In: *Land of Sweeping Plains: Managing and Restoring the Native Grasslands of South-Eastern Australia* (eds A. Marshall, N. Williams and J. W. Morgan). Pp. 201-222. CSIRO Publishing, Melbourne.

Appendices

Appendix 1 Flora recorded

The following abbreviations and symbols are relevant to this Appendix:

Code	Meaning	Reference
National listings (EPBC Act)		
EX	Extinct	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
CR	Critically endangered	
EN	Endangered	
VU	Vulnerable	
PMST	Protected Matters Search Tool	
State listings (FFG Act)		
x	Extinct	Victorian *Flora and Fauna Guarantee Act 1988* (FFG Act)
cr	Critically endangered	
e	Endangered	
v	Vulnerable	
P	Protected (public land only)	
Weed status (CaLP Act,)		
SP	State prohibited species	Victorian *Catchment and Land Protection Act 1994* (CaLP Act)
RP	Regionally prohibited species	
RC	Regionally controlled species	
R	Restricted species	

A1.1 Flora species recorded from the offset site

Table A1.1 Flora species recorded from the offset site

Status	Scientific Name	Common Name
Indigenous species		
	Acacia implexa	Lightwood
P	*Acacia mearnsii*	Black Wattle
	Acacia melanoxylon	Blackwood
	Acaena spp.	Sheep's Burr
	Allocasuarina spp.	Sheoak
	Amyema quandang var. *quandang*	Grey Mistletoe
	Anthosachne scabra s.l.	Common Wheat-grass
	Asperula conferta	Common Woodruff
	Atriplex semibaccata	Berry Saltbush
	Carex tereticaulis	Poong'ort
	Cassinia sifton	Drooping Cassinia
	Cynodon dactylon	Couch
EN, cr, P	*Dianella amoena*	Matted Flax-lily
	Eleocharis spp.	Spike Sedge
	Erodium spp.	Heron's Bill
	Eucalyptus camaldulensis	River Red-gum
	Eucalyptus ovata	Swamp Gum
P	*Euchiton japonicus s.s.*	Creeping Cudweed
	Exocarpos spp.	Ballart
	Juncus spp.	Rush
	Lepidosperma laterale	Variable Sword-sedge
	Melaleuca ericifolia	Swamp Paperbark
	Oxalis perennans	Grassland Wood-sorrel
	Poa labillardierei	Common Tussock-grass
	Rumex spp.	Dock
	Rytidosperma pilosum	Velvet Wallaby-grass
	Rytidosperma setaceum	Bristly Wallaby-grass
P	*Senecio quadridentatus*	Cotton Fireweed
	Themeda triandra	Kangaroo Grass
Introduced species		
	Aira elegantissima	Delicate Hair-grass
	Allium neapolitanum	Naples Onion
R	*Allium triquetrum*	Angled Onion
	Arctotheca calendula	Cape Weed
R	*Asparagus asparagoides*	Bridal Creeper
	Avena barbata	Bearded Oat

Status	Scientific Name	Common Name
	Briza maxima	Large Quaking-grass
	Briza minor	Lesser Quaking-grass
	Bromus hordeaceus	Soft Brome
	Cenchrus clandestinus	Kikuyu
	Centaurium erythraea	Common Centuary
	Cerastium spp.	Mouse-ear Chickweed
RC	*Cirsium vulgare*	Spear Thistle
RC	*Crataegus monogyna*	Hawthorn
	Dactylis glomerata	Cocksfoot
RC	*Echium plantagineum*	Paterson's Curse
	Ehrharta erecta	Panic Veldt-grass
	Ehrharta longiflora	Annual Veldt-grass
	Erigeron spp.	Fleabane
	Fraxinus angustifolia	Desert Ash
	Galium aparine	Cleavers
RC	*Genista monspessulana*	Montpellier Broom
	Geranium dissectum	Cut-leaf Crane's-bill
	Helminthotheca echioides	Ox-tongue
	Holcus lanatus	Yorkshire Fog
	Hypochaeris radicata	Flatweed
	Lysimachia arvensis	Pimpernel
RC	*Lycium ferocissimum*	African Box-thorn
R	*Nassella neesiana*	Chilean Needle-grass
RC	*Nassella trichotoma*	Serrated Tussock
R	*Oxalis pes-caprae*	Soursob
	Paspalum dilatatum	Paspalum
	Phalaris aquatica	Toowoomba Canary-grass
	Plantago lanceolata	Ribwort
	Romulea rosea	Onion Grass
RC	*Rosa rubiginosa*	Sweet Briar
RC	*Rubus anglocandicans*	Common Blackberry
	Sonchus asper s.s.	Rough Sow-thistle
	Sonchus oleraceus	Common Sow-thistle
	Trifolium spp.	Clover
RC	*Ulex europaeus*	Gorse
	Verbascum spp.	Mullein
	Vicia sativa	Common Vetch
	Vulpia bromoides	Squirrel-tail Fescue

Appendix 2 Vegetation diversity and cover results

Table 8 Quadrat 1 - Vegetation cover and diversity using percent cover and modifed Braun Blanquet cover

Quadrat 1		2021		2022	
Scientific name	**Common name**	**% cover**	**BB cover**	**% cover**	**BB cover**
Native species					
Euchiton japonicus	Creeping Cudweed			1	1
Poa labillardierei var. labillardierei	Common Tussock-grass	10	2	15	2
Rytidosperma spp.	Wallaby Grass	2	1	1	1
Themeda triandra	Kangaroo Grass	10	2	10	2
Introduced species					
Acetosella vulgaris	Sheep Sorrell			1	+
Aira elegantissima	Delicate Hair-grass	1	1	1	1
Avena barbata	Bearded Oat	10	2	2	1
Briza maxima	Large Quaking-grass	1	1	1	+
Centaurium erythraea	Common Centaury			1	1
Cerastium spp.	Mouse-ear Chickweed	1	1		
Dactylis glomerata	Cocksfoot			1	1
Echium plantagineum	Patersons Curse			1	1
Ehrharta longiflora	Annual Veldt-grass	1	1	1	1
Erigeron sp.	Fleabane			1	+
Nassella neesiana	Chilean Needle-grass	20	2	45	3
Nassella trichotoma	Serrated Tussock	10	2	10	2
Sonchus asper	Rough Sow-thistle	1	+		

Quadrat 1		2021		2022	
Scientific name	**Common name**	**% cover**	**BB cover**	**% cover**	**BB cover**
Sonchus oleraceus	Common Sow-thistle			1	1
Trifolium spp.	Clover			1	1
Vicia spp.	Vetch	1	1	1	1
Vulpia myuros	Rat's-tail Fescue			1	1

Table 9 Quadrat 2 - Vegetation cover and diversity using percent cover and modified Braun Blanquet cover

Quadrat 2		2021		2022	
Scientific name	**Common name**	**% cover**	**BB cover**	**% cover**	**BB cover**
Native species					
Dianella amoena	Matted Flax-lily			1	+
Themeda triandra	Kangaroo Grass	60	4	15	2
Introduced species					
Aira elegantissima	Delicate Hair-grass	1	1	1	1
Briza maxima	Large Quaking-grass			2	1
Bromus hordeaceus	Soft Brome	1	1		
Centaurium erythraea	Common Centaury			1	1
Dactylis glomerata	Cocksfoot	10	2	1	1
Hypochaeris radicata	Flatweed			1	1
Nassella neesiana	Chilean Needle-grass	5	2	40	3
Nassella trichotoma	Serrated Tussock	2	1	10	2
Paspalum dilatatum	Paspalum			1	1
Phalaris aquatica	Toowoomba Canary-grass	5	2	15	2
Plantago lanceolata	Ribwort	1	1	1	1
Sonchus asper s.s.	Rough Sow-thistle			1	+
Trifolium spp.	Clover			1	1
Vicia spp.	Vetch	1	1	2	1
Vulpia myuros	Rat's-tail Fescue			1	1

Table 10 Quadrat 3 - Vegetation cover and diversity using percent cover and modified Braun Blanquet cover

Quadrat 3		2021		2022	
Scientific name	**Common name**	**% cover**	**BB cover**	**% cover**	**BB cover**
Native species					
Carex tereticaulis	Poong'ort			1	+
Eragrostis spp.	Love Grass	1	+		
Eucalyptus ovata	Swamp Gum			1	+
Galium spp.	Bedstraw	1	+		
Oxalis perennans	Grassland Wood-sorrel	1	+		
Poa labillardierei var. labillardierei	Common Tussock-grass			1	1
Rytidosperma setaceum	Bristly Wallaby-grass	1	+		
Introduced species					
Allium triquetrum	Angled Onion	3	1		
Briza minor	Lesser Quaking-grass	1	+		
Cenchrus clandestinus	Kikuyu			20	2
Centaurium erythraea	Common Centaury			1	
Cerastium spp.	Mouse-ear Chickweed	2	1		
Cynodon dactylon	Couch	1	1		
Dactylis glomerata	Cocksfoot	80	5		
Helminthotheca echioides	Ox-tongue			1	+
Hypochaeris radicata	Flatweed	1	+		
Paspalum dilatatum	Paspalum			2	1
Phalaris aquatica	Toowoomba Canary-grass			70	4
Plantago lanceolata	Ribwort	1	+	1	1
Rumex spp.	Dock			1	1
Sonchus asper s.s.	Rough Sow-thistle	1	+	1	1

Quadrat 3		2021		2022	
Scientific name	**Common name**	**% cover**	**BB cover**	**% cover**	**BB cover**
Sonchus oleraceus	Common Sow-thistle	1	+	1	1
Trifolium spp.	Clover	2	1		
Vicia spp.	Vetch	3	1		

Table 11 Quadrat 4 - Vegetation cover and diversity using percent cover and modified Braun Blanquet cover

Quadrat 4		2021		2022	
Scientific name	**Common name**	**% cover**	**BB cover**	**% cover**	**BB cover**
Native species					
Anthosachne scabra s.l.	Common Wheat-grass	1	1		
Asperula spp.	Woodruff	1	1	15	2
Eucalyptus camaldulensis	River Red-gum	1	+	1	+
Juncus spp.	Rush	1	+		
Oxalis perennans	Grassland Wood-sorrel	1	1		
Poa labillardierei var. labillardierei	Common Tussock-grass	20	2	25	2
Rytidosperma spp.	Wallaby Grass			1	1
Senecio quadridentatus	Cottony Fireweed			1	1
Themeda triandra	Kangaroo Grass	1	1	5	1
Introduced species					
Asparagus asparagoides	Bridal Creeper	3	1		
Avena barbata	Bearded Oat	2	1		
Briza minor	Lesser Quaking-grass			1	1
Centaurium erythraea	Common Centaury			1	1
Cirsium vulgare	Spear Thistle	1	+		
Dactylis glomerata	Cocksfoot	20	2	30	3
Erigeron sp.	Fleabane			1	1
Ehrharta erecta	Panic Veldt-grass	1	1	1	1
Hypochaeris radicata	Flatweed	1	+	1	1
Lycium ferocissimum	African Box-thorn			1	1
Lysimachia arvensis	Scarlet Pipernel			1	1
Nassella leucotricha	Texas Needle-grass	1	1		

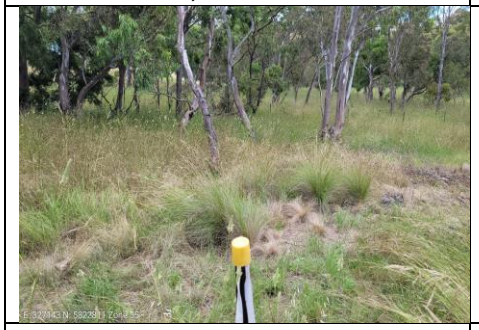
Quadrat 4		2021		2022	
Scientific name	**Common name**	**% cover**	**BB cover**	**% cover**	**BB cover**
Nassella neesiana	Chilean Needle-grass	5	2		
Nassella trichotoma	Serrated Tussock	25	2		
Paspalum dilatatum	Paspalum			1	1
Phalaris aquatica	Toowoomba Canary-grass			2	1
Sonchus asper s.s.	Rough Sow-thistle	1	+	1	1
Sonchus oleraceus	Common Sow-thistle	1	+	1	1
Trifolium spp.	clover			1	1
Ulex europaeus	Gorse			1	1
Vicia spp.	Vetch			1	1

Table 12 Quadrat 5 - Vegetation cover and diversity using percent cover and modified Braun Blanquet cover

Quadrat 5		2021		2022	
Scientific name	**Common name**	**% cover**	**BB cover**	**% cover**	**BB cover**
Native species					
Asperula conferta	Common Woodruff	1	1	1	1
Carex tereticaulis	Poong'ort			1	1
Eucalyptus camaldulensis	River Red-gum			2	1
Juncus spp.	Rush			1	1
Geranium spp.	Crane's Bill	1	+		
Rumex spp.	Dock	1	+		
Introduced species					
Briza minor	Lesser Quaking-grass			1	+
Centaurium erythraea	Common Centaury			1	1
Cirsium vulgare	Spear Thistle	1	1		
Dactylis glomerata	Cocksfoot	95	5	5	2
Hypochaeris radicata	Flatweed	1	1	1	1
Paspalum dilatatum	Paspalum			1	1
Phalaris aquatica	Toowoomba Canary-grass			80	5
Plantago lanceolata	Ribwort	1	1	1	1
Rosa rubiginosa	Sweet Briar			1	+
Rumex spp.	dock			1	1
Sonchus oleraceus	Common Sow-thistle	1	1	1	1
Trifolium spp.	Clover			1	1
Ulex europaeus	Gorse	1	1		
Vicia spp.	Vetch	2	1		

Appendix 2 Photo points

1. Photo points – Quadrat 1 - 2021 and 2022

			
Quadrat 1 NW, 2021	Quadrat 1 NE, 2021	Quadrat 1 SE, 2021	Quadrat 1 SW, 2021
			
Quadrat 1 NW, 2022	Quadrat 1 NE, 2022	Quadrat 1 SE, 2022	Quadrat 1 SW 2022

2. Photo points – Quadrat 2 - 2021 and 2022			
			
Quadrat 2 NW, 2021	Quadrat 2 NE, 2021	Quadrat 2 SE, 2021	Quadrat 2 SW, 2021
			
Quadrat 2 NW, 2022 – no photo	Quadrat 2 NE, 2022	Quadrat 2 SE, 2022	Quadrat 2 SW, 2022

3. Photo points – Quadrat 3 - 2021 and 2022			
			
Quadrat 3 NW, 2021	Quadrat 3 NE, 2021	Quadrat 3 SE, 2021	Quadrat 3 SW, 2021
			
Quadrat 3 NW, 2022	Quadrat 3 NE, 2022	Quadrat 3 SE, 2022	Quadrat 3 SW, 2022

4. Photo points – Quadrat 4 - 2021 and 2022

			
Quadrat 4 NW, 2021	Quadrat 4 NE, 2021	Quadrat 4 SE, 2021	Quadrat 4 SW, 2021
			
Quadrat 4 NW, 2022	Quadrat 4 NE, 2022	Quadrat 4 SE, 2022	Quadrat 4 SW, 2022

5. Photo points – Quadrat 5 - 2021 and 2022

			
Quadrat 5 NW, 2021	Quadrat 5 NE, 2021	Quadrat 5 SE, 2021	Quadrat 5 SW, 2021
			
Quadrat 5 NW, 2022	Quadrat 5 NE, 2022	Quadrat 5 SE, 2022	Quadrat 5 SW, 2022