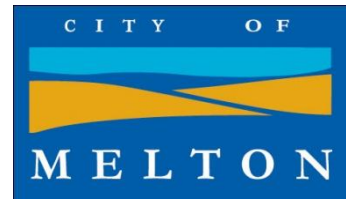


A Proud Community,  
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# COMMONWEALTH SPINY RICE-FLOWER OFFSET AT MOUNT COTTRELL RECREATION RESERVE

## ANNUAL REPORT 2016

### EPBC REFERENCE 2009/5247

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## 1 Introduction

As part of the commonwealth approvals process under the *Environment Protection and Biodiversity Conservation act 1999* (EPBC Act) for the Gourlay Road duplication project within Caroline Springs, Melton City Council was required to establish a Spiny Rice-flower offset area. This offset area was established within Mount Cottrell Recreation Reserve, Mount Cottrell (EPBC reference 2009/5247).

An Offset Management Plan (OMP) for the 3 hectare management area within Mount Cottrell Recreation Reserve was prepared by consultants (Biosis, 2013) and approved by the Commonwealth Environment Minister on December 12, 2013. The requirements for monitoring and reporting on this offset are set out in Section 4 of the approved OMP, Monitoring and Reporting (Biosis 2013). This current report is guided by these requirements.

Environmental management of the site began in 2012 but Melton City Council commenced the ten years of formal management under the OMP from November 2014.<sup>1</sup> The first full Annual Report was submitted in December 2015, reporting on the November 2014 to October 2015 management year.

This current report provides a summary of management actions undertaken between November 2015 and December 2016. It includes an assessment of the success of these actions, management recommendations and monitoring results for the offset area.

The next round of monitoring will be undertaken in June-October 2017. The next report is due to be submitted to Department of Environment and Energy (DoEE) by 31<sup>st</sup> January 2018. The DoEE recently agreed to change the annual reporting date for future years to 31<sup>st</sup> January, so that management actions up to the 31<sup>st</sup> December can be incorporated into future reports (email correspondence 22 December 2016 between Mick Welsh of the EPBC Compliance Monitoring Team Leader, Monitoring and Assurance Section, Compliance and Enforcement Branch and Sjaan Bidwell, Environmental Planner, Melton City Council).

## 2 Methods

### 2.1 SUMMARY OF MANAGEMENT ACTIONS

Ongoing management of the offset site has been carried out by suitably qualified environmental management contractors and overseen by Council's Senior Land Management Officer (Tony Herwerth). Detailed Works Summary Sheets for these management actions, dating back to July 2012, have been kept and are available for inspection upon request. A summary of these management actions has been prepared and is provided in this report.

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<sup>1</sup> The Deed of Covenant applying to the Spiny Rice-flower offset area was executed 24 September 2014 and, following the execution of the covenant, a bond held by Trust for Nature was released in March 2015. This release of the bond allowed access to the funds intended for the implementation of the 10 year OMP.

It should be noted that delays occurred in the approval of the OMP and the implementation of the Deed of Covenant relative to the timelines conditioned in the Commonwealth permit. These delays have been investigated by the Commonwealth Environment Department and Melton City Council was informed that no further action will be taken over these delays; however, these delays have resulted in some of the monitoring and reporting actions for November 2013-October 2014 (note that the annual management cycle is defined in the OMP to run from November to October the following year) not being completed exactly as prescribed in the OMP. Given that the OMP was not approved until December 2013 and funds for management were not released until March 2015, this was unavoidable.

## 2.2 GENERAL VEGETATION CONDITION

### SITE WALKOVERS

The Melton City Council Land Management Officer has regularly inspected the site at intervals of less than 3 months. Inspection has involved walking over the site in a random meander and then inspecting areas/issues that draw attention in more detail. Feedback is then provided to the Land Management Contractor.

An additional inspection of the general vegetation condition is undertaken annually and includes a walk over the Spiny Rice-flower offset area and the larger area of Mount Cottrell Recreation Reserve.

### GENERAL VEGETATION CONDITION MONITORING QUADRATS

To help capture and document changes in vegetation condition, five 10 X 10 m flora quadrats, aligned north-south, were established in representative areas. These comprised 2 quadrats in the inner zone and 3 quadrats in the outer zone. Star pickets were used to mark the quadrats and each quadrat was clearly labeled as described in Section 4.1 of the OMP. The location of these quadrats on the site is shown in Figure 1.

Monitoring dates are provided in Table 1. The next (annual) monitoring of these quadrats will occur in spring (October) 2017.

In each quadrat the following is recorded: percentage cover of each species, total percentage cover of indigenous species, total percentage cover of weeds, percentage cover of native shrubs, grasses and forbs, percentage cover of introduced shrubs, grasses and forbs and percentage cover of bare ground.

**Table 1 Monitoring of vegetation condition and Spiny Rice-flower population**

Date of monitoring	Monitoring completed
<b>May 2014</b>	Establishment of quadrats
<b>12 August 2014</b>	Vegetation condition monitoring of 5 quadrats
<b>August 2014</b>	Spiny Rice-flower monitoring
<b>1 July 2015</b>	Spiny Rice-flower monitoring
<b>20 October 2015</b>	Vegetation condition monitoring of 5 quadrats
<b>20 July 2016</b>	Spiny Rice-flower monitoring
<b>6 October 2016</b>	Vegetation condition monitoring of 5 quadrats

## 2.4 SPINY RICE-FLOWER MONITORING

Dates of monitoring of the health and survivorship of known Spiny Rice-flower individuals within the reserve are provided in Table 1 **Error! Reference source not found..** Data was recorded into the data collection template provided in the OMP. New plants were also tagged with a unique ID number at this time. Remnant Spiny Rice-flower and the Spiny Rice-flower planted in 2012 had been tagged previously.

The monitoring included recording the health of the plant, whether the plant was flowering and sex of any new plants established since the last monitoring round.

## 2.3 PHOTO POINT MONITORING

Photo point monitoring included General Vegetation Condition Quadrats only this year. Within each of the 5, 10 X 10 m quadrats, one photo was taken facing south into each quadrat. Owing to high cover of annual grasses this year, photos of the Spiny Rice-flower plots were not taken because the plants were obscured by the annual grasses in the fore-ground.

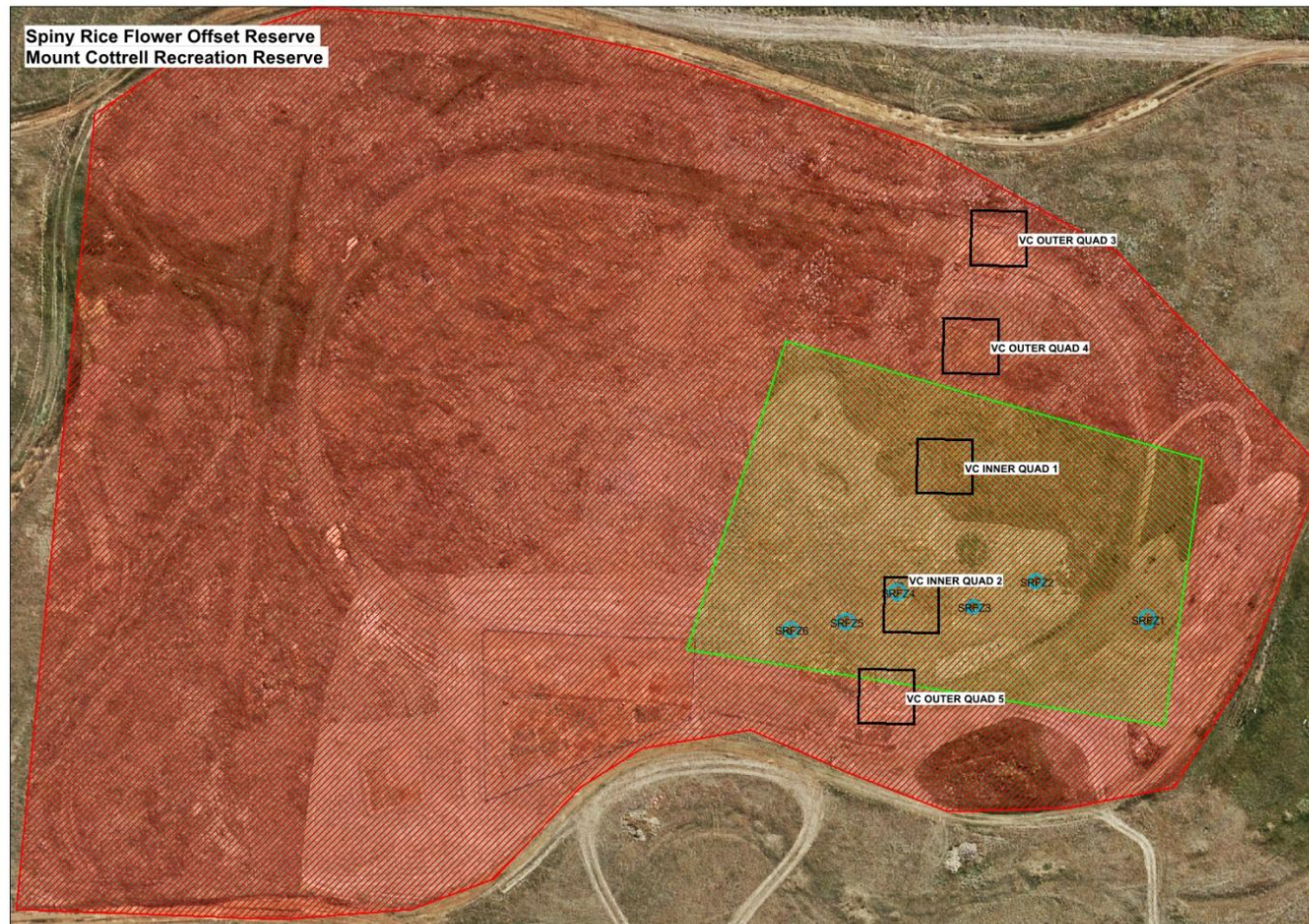
## 2.5 MANAGEMENT RECOMMENDATIONS

### REMEDIAL ACTIONS & RECOMMENDED CHANGES TO WORKS PROGRAM

The OMP (Table 3) details the management actions and timing of management actions for the Spiny Rice-flower offset area. The success with which each of these actions has been implemented is addressed in Section 3.5. Discussion is also provided of any remediation required and recommendations for changes to the works program.



Figure 1 Mount Cottrell Recreation Reserve Spiny Rice-flower Management Zones showing General Vegetation Condition Quadrats (VC INNER/OUTER QUAD #) and Spiny Rice-flower zones (SRPZ#)



## 3.Results

### 3.1 SUMMARY OF MANAGEMENT ACTIONS

A summary of management actions, drawn from works summary sheets, is presented in Appendix A. These management actions date back to 2012 and include hand weeding, burning, targeted spot spraying, direct seeding, watering, planting of Spiny Rice-flower and indigenous herbs and monitoring.

### 3.2 MANAGEMENT RECOMMENDATIONS, REMEDIAL ACTIONS & RECOMMENDED CHANGES TO WORKS PROGRAM

A summary of how each of the management actions outlined in Table 3 of the OMP has been implemented is provided in Table 2. An assessment of the success of each action and notes on any required remediation are also provided.

All of the proposed management actions for year 2 (actions 2.1 to 2.10, outlined in the OMP) were successfully completed in 2016. This included planting of an additional seven Spiny Rice-flowers in the inner zone.

Based on detailed knowledge of the offset site and local area, additional indigenous species were added to the planting schedule provided in the OMP. Table 3 lists the indigenous species planted in the management area in 2015 and 2016. To date, 48 indigenous species have been planted within the offset site and 8528 tubestock have been planted.

Table 4 shows the planting species schedule from the OMP, including which of these species have been planted in the management area to date and how they will be used in subsequent plantings. Essentially, some species were not used because stock could not be sourced, and some indigenous species were added as they have been historically common in the local area but are now threatened with loss due to urban development. Priority was given to locally threatened species where local provenance stock or seed is currently available but where local populations are likely to be removed in the future. Other common species detailed in the OMP planting schedule but not used thus far in plantings will be used in coming years, where possible.

There are no other management recommendations at this time. However, Council will investigate whether an autumn burn is appropriate for 2017 to manage biomass (depending on site conditions and seasonal factors, such as inter tussock space and grass senescence).



**Table 2 Management actions, assessment of success and required remediation**

Year	Action number	Action	Successful	Reason why not	Remediation required
<b>1 (2015)</b>	1.1	Install permanent rabbit proof fencing, with gates and signs around perimeter of Outer Zone	yes		no
	1.2	Establish baseline monitoring and photo monitoring points.	Yes		no
	1.3	Undertake supplementary planting /seeding of plains Rice flowers in inner zone	Yes		no
	1.4	Hand weed all introduced species from within plains rice Flower zones	Yes		no
	1.5	Control pest animals (e.g. rabbits, hares) within offset areas and surrounding areas	Yes		no
	1.6	Water newly planted Spiny Rice-flower individuals every 2 weeks for first summer (Dec-Feb)	Yes		no
	1.7	Control perennial grass weeds species over whole offset area	Yes		no
	1.8	Control broadleaf herbaceous weed species over whole offset area	Yes		no
	1.9	Control annual grasses over whole offset area	Yes		no
	1.10	Annual monitoring of spiny rice flower population (flowering period)	Yes		no
	1.11	Annual monitoring of reserve general condition quadrants and photo points	Yes		no
	1.12	Undertake ecological burn within Outer and inner zones	No	Biomass and vegetation cover has not increased sufficiently to warrant burning since the May 2013 Burn	no
<b>2 (2016)</b>	2.1	Update management actions required for Year 2 based on observations made at the end of Year 1.	Yes		no
	2.2	Spot spray all high-threat grass / herb weeds in Outer and Inner Zone before seed set using appropriate herbicide. Control total cover of weeds.	Yes		no
	2.3	Hand weed all introduced species from within Spiny Rice-flower Zones.	Yes		no

Year	Action number	Action	Successful	Reason why not	Remediation required
	2.4	Control pest animals (e.g. rabbits, hares) within the offset and surrounding area (i.e. MCRR).	Yes		no
	2.5	Water planted Spiny Rice-flower individuals.	Yes		no
	2.6	Undertake ecological burn within Outer and Inner Zones as required.	No, not considered required in 2016.		Investigate if autumn burn in 2017 will be beneficial and achievable.
	2.7	Undertake supplementary planting/seeding in the Outer Zone as required.	Yes		no
	2.8	Undertake annual monitoring of Spiny Rice-flower population during flowering period May	Yes		no
	2.9	Plant additional Spiny Rice-flower seedlings in Spiny Rice-flower Zones.	Yes  7 plants planted in the inner zone (zone 6)		no
	2.10	Undertake annual monitoring of reserve including general condition, quadrats and photo monitoring and prepare report.	Yes		no

**Table 3 Species planted within the Offset Area up to December 2016**

Scientific name	Common name	Number of tubestock planted		
		2015	2016	Grand Total
<i>Arthropodium fimbriatum</i>	Nodding Chocolate-lily		100	100
<i>Arthropodium minus</i>	Small Vanilla-lily		100	100
<i>Arthropodium strictum</i>	Chocolate Lily	200	100	300
<i>Asperula conferta</i>	Common Woodruff		100	100
<i>Brachyscome dentata</i>	Lobe-seed Daisy	200	50	250
<i>Brachyscome paludicola</i> <sup>2</sup>	Daisy	200	100	300
<i>Bulbine bulbosa</i>	Bulbine Lily	200	200	400
<i>Bulbine glauca</i>	Rock Lily	200	100	300
<i>Caesia calliantha</i>	Blue-grass Lily		300	300
<i>Calocephalus citreus</i>	Lemon Beauty-heads	200	50	250
<i>Calocephalus lacteus</i>	Milky Beauty-heads		50	50
<i>Calotis anthemoides</i>	Cut-leaf Burr-daisy		50	50
<i>Calotis scabiosifolia</i>	Rough Burr-daisy		50	50
<i>Calotis scapigera</i>	Tufted Burr-daisy		50	50
<i>Chrysocephalum apiculatum</i>	Common Everlasting	200	300	500
<i>Chrysocephalum semipapposum</i>	Clustered Everlasting	50		50
<i>Chrysocephalum semipapposum</i> green form	Clustered Everlasting		200	200
<i>Chrysocephalum semipapposum</i> grey form	Clustered Everlasting		50	50
<i>Coronidium gunnianum</i> <sup>3</sup>			50	50
<i>Craspedia variabilis</i>			50	50
<i>Cullen parvum</i>	Small Scurf-pea	200	50	250
<i>Cullen tenax</i>	Tough Scurf-pea		50	50
<i>Cynoglossum suaveolens</i>	Sweet Hound's-tongue		25	25
<i>Dianella longifolia</i>	Pale Flax-lily		200	200
<i>Eryngium vesiculosum</i>	Prickfoot		25	25
<i>Goodenia pinnatifida</i>	Cut-leaf Goodenia		100	100
<i>Kennedia prostrata</i>	Running Postman		25	25
<i>Leiocarpa panaetioides</i>	Woolly Buttons	100	100	200
<i>Leptorhynchos squamatus</i>	Scaly Buttons	500	100	600
<i>Linum marginale</i>	Native Flax	100		100
<i>Lobelia pratioides</i>	Poison Lobelia		50	50
<i>Microseris lanceolata</i>		150	100	250
<i>Minuria leptophylla</i>	Minnie Daisy		100	100
<i>Pelargonium rodneyanum</i>	Magenta Stork's-bill	50	100	150
<i>Pimelea curviflora</i>	Rice-flower		25	25
<i>Pimelea glauca</i>	Smooth Rice-flower		25	25
<i>Pimelea spinescens</i> subsp. <i>spinescens</i>	Spiny Rice-flower	103		103
<i>Plantago gaudichaudii</i>	Narrow Plantain		100	100
<i>Plantago varia</i>	Variable Plantain		100	100
<i>Podolepis jaceoides</i>	Showy Podolepis	700	200	900
<i>Ptilotus macrocephalus</i>	Feather-heads		25	25
<i>Ptilotus spathulatus</i>	Ptilotus		100	100

<sup>2</sup> Previously known as *Brachyscome basaltica*

<sup>3</sup> Previously known as *Helichrysum rutidolepis*

Scientific name	Common name	Number of tubestock planted		
		2015	2016	Grand Total
<i>Pycnosorus chrysanthus</i>	Golden Billy-buttons	50	200	250
<i>Pycnosorus globosus</i>	Drumsticks	50	300	350
<i>Ranunculus lappaceus</i>	Australian Buttercup		25	25
<i>Rutidosis leptorhynchoides</i>		200	300	500
<i>Teucrium racemosum</i>	Grey Germander		25	25
<i>Velleia paradoxa</i>	Spur Velleia	200	100	300
<i>Veronica gracilis</i>	Slender Speedwell	50		50
<i>Xerochrysum viscosum</i> <sup>4</sup>	Sticky Everlasting		25	25
<b>Grand Total</b>		<b>3903</b>	<b>4625</b>	<b>8528</b>

**Table 4 Species listed in the Offset Management Plan for planting**

Life-form	Plant species listed in OMP	Planting date or reason for not planting to date
<b>Grasses</b>	<i>Anthosachne scabra</i> Common Wheat-grass	To be direct seeded when seed is obtained
	<i>Austrostipa bigeniculata</i> Knead Spear-grass	To be direct seeded after herb establishment, council has access to extremely large quantities of the seed of this species
	<i>Austrostipa scabra</i> Rough Spear-grass	To be direct seeded after herb establishment, council has access to extremely large quantities of the seed of this species
	<i>Bothriochloa macra</i> Red-leg Grass	To be direct seeded after herb establishment
	<i>Rytidosperma caespitosum</i> Common Wallaby-grass	To be direct seeded after herb establishment
	<i>Rytidosperma duttonianum</i> Brown-back Wallaby-grass	To be direct seeded after herb establishment
	<i>Themeda triandra</i> Kangaroo Grass	To be direct seeded after herb establishment
<b>Forbs</b>	<i>Calocephalus citreus</i> Lemon Beauty-heads	Planted 2015 and 2016
	<i>Haloragis heterophylla</i> Varied Raspwort	To be planted when rainfall increases
	<i>Leptorhynchus squamatus</i> Scaly Buttons	Planted 2015 and 2016
	<i>Plantago gaudichaudii</i> Narrow Plantain	Plant 2016
	<i>Solenogyne dominii</i> Smooth Solenogyne	Plant not available in 2015 or 2016
	<i>Tricoryne elatior</i> Yellow Rush-lily	Plant unavailable, seed defies attempts at germination may be able to source from plants rescued from construction areas
	<i>Velleia paradoxa</i> Spur Velleia	Planted 2015 and 2016
	<i>Wahlenbergia luteola</i> Bronze Bluebell	To be direct seeded

<sup>4</sup> Previously known as *Bracteantha viscosa*

### 3.3 GENERAL VEGETATION CONDITION

#### SITE WALKOVERS

General vegetation condition was judged to be good on the October 2016 walkover, with very little declared noxious weeds (listed under the Victorian *Catchment and Land Protection Act 1994*) or high threat<sup>5</sup> environmental weeds present. It was also noted that there was no sign of rabbit impact, levels of biomass were good, with good inter-tussock space maintained, and there was a variety of indigenous grasses and forbs present. However, across the broader site, the cover of annual introduced grasses was high in spring 2016, most likely owing to recent high rainfall during winter and early spring. Dominant introduced grasses included: *Avena barbata* (Bearded Oat), *Vulpia bromoides* (Squirrel-tail Fescue) and *Lolium rigidum* (Wimmera Rye-grass).

#### GENERAL VEGETATION CONDITION MONITORING QUADRATS

In October 2016, overall weed cover varied between 10% and 20% cover within the monitoring quadrats (Table 5). Weeds comprised a combination of forbs (< 5 % cover) and grasses (10-20% cover) but no woody weeds were present.

Overall indigenous species cover within the quadrats varied from 35% to 65%. The most common native grasses within the quadrats were *Austrostipa* and *Rytidosperma* species but other native grasses, less common at the site, were also recorded including *Themeda triandra*, *Chloris truncata* and *Panicum decompositum*. A variety of native forbs were recorded in low cover (typically < 5 % cover).

Comparing data from 2016 to 2015, the following is noted:

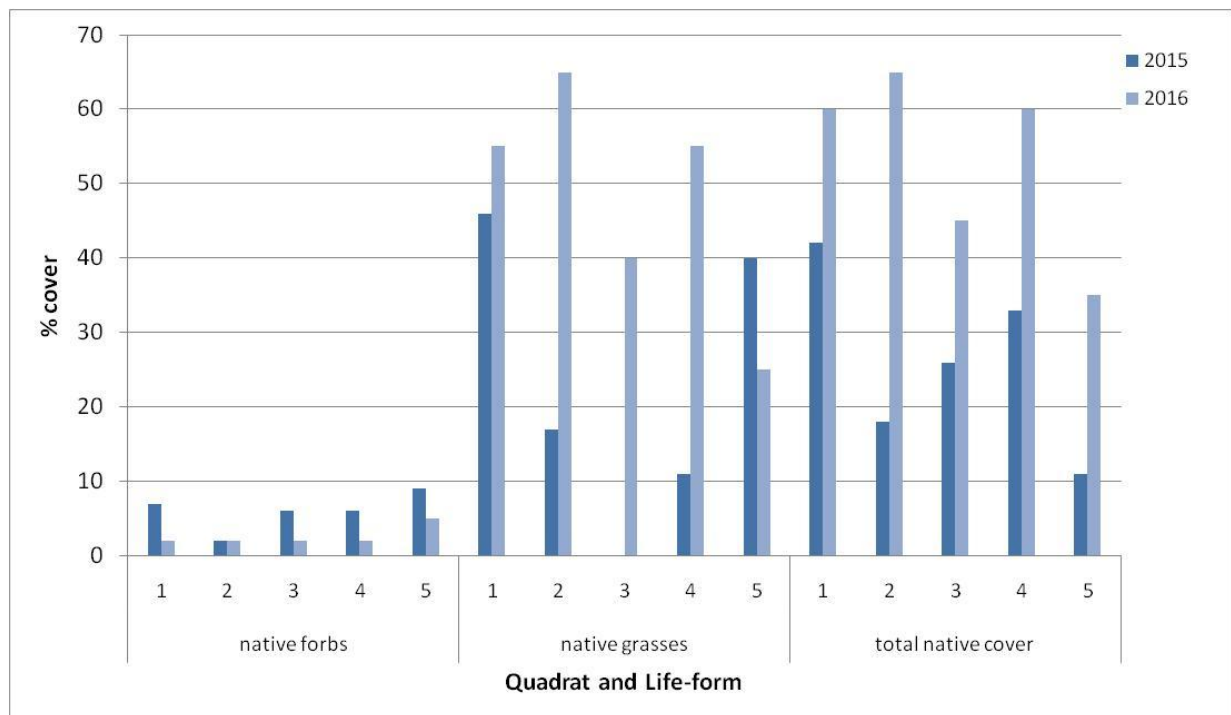
- Cover of native species has increased substantially between 2015 and 2016 in all quadrats, attributed to an increase in cover of native grasses (Figure 2). For example, in 2015 cover of native species ranged from 10 to 35% and in 2016 cover ranged from 35 to 65%;
- Species richness of indigenous flora has almost doubled between 2015 (15 species) and 2016 (29 species), most likely attributed to supplementary planting over the past 2 years. Recent high rainfall in winter and early spring of 2016 could also have contributed to higher species richness recorded in 2016;
- Cover of weed species has decreased substantially between 2015 and 2016 in all quadrats (Figure 3), with current weed cover ≤ 20% cover in all quadrats.

Full results of the flora survey are shown in Table 5 and presented in Figure 2 and Figure 3.

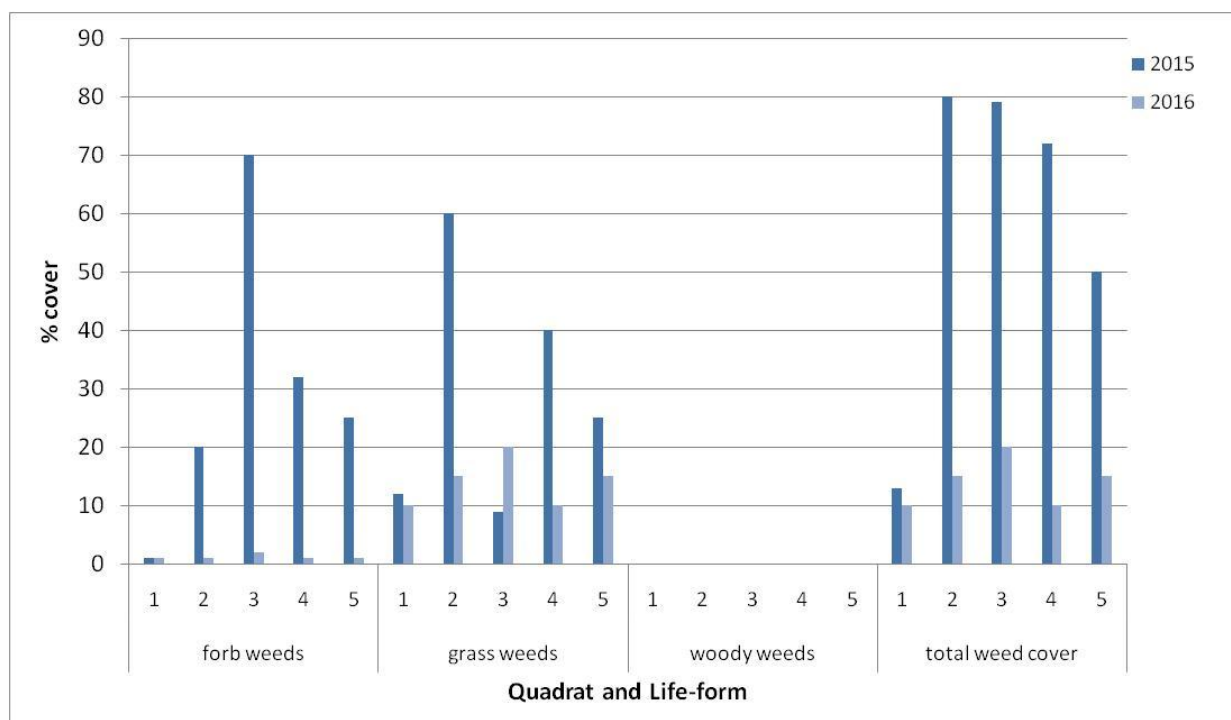
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<sup>5</sup> High threat according to the Plains Grassland Ecological Vegetation Class Benchmark.

**Figure 2 Percentage cover of native flora species in quadrats 1-5 in 2015 and 2016**



**Figure 3 Percentage cover of weeds in quadrats 1-5 in 2015 and 2016**





**Table 5 General vegetation condition survey results for the 10 X 10 m quadrats 2016**

date	6/10/2016	Assessors: Tony Herwerth and Sjaan Bidwell (Melton City Council)				
	understorey vegetation	Quadrats % Cover				
		inner zone		outer zone		
		1	2	3	4	5
weeds	<i>Aira elegantissima</i>	<1			<1	<1
	<i>Arctotheca calendula</i>	<1	<1	<5	<1	<1
	<i>Avena barbata</i>	<1	<5	<5	<1	<1
	<i>Centaureum tenuiflorum</i>	<1				
	<i>Ehrharta longiflora</i>		<1			
	<i>Hypochaeris radicata</i>		<1	<1	<1	<1
	<i>Lolium</i> sp.	<1	<1	<1		<1
	<i>Nassella trichotoma</i>	<1				
	<i>Plantago coronopus</i>	<1		<1	<1	
	<i>Plantago lanceolata</i>	<1	<1	<1	<1	<1
	<i>Poa trivialis</i>	<1	<1		<1	
	<i>Polygonum aviculare</i>					<1
	<i>Romulea rosea</i>	<1	<1	<1	<1	<1
	<i>Setaria</i> sp.		<1			
	<i>Trifolium</i> sp. (not flowering)		<1	<1		
	<i>Vulpia bromoides</i>	<1	<5	10%	<5	10%
	<b>Woody weeds</b>	0%	0%	0%	0%	0%
	<b>Herb weeds (other than grasses)</b>	<1	<1	<5	<1	<1
	<b>Grass weeds</b>	10%	15%	20%	10%	15%
	<b>OVERALL weed cover</b>	10%	15%	20%	10%	15%

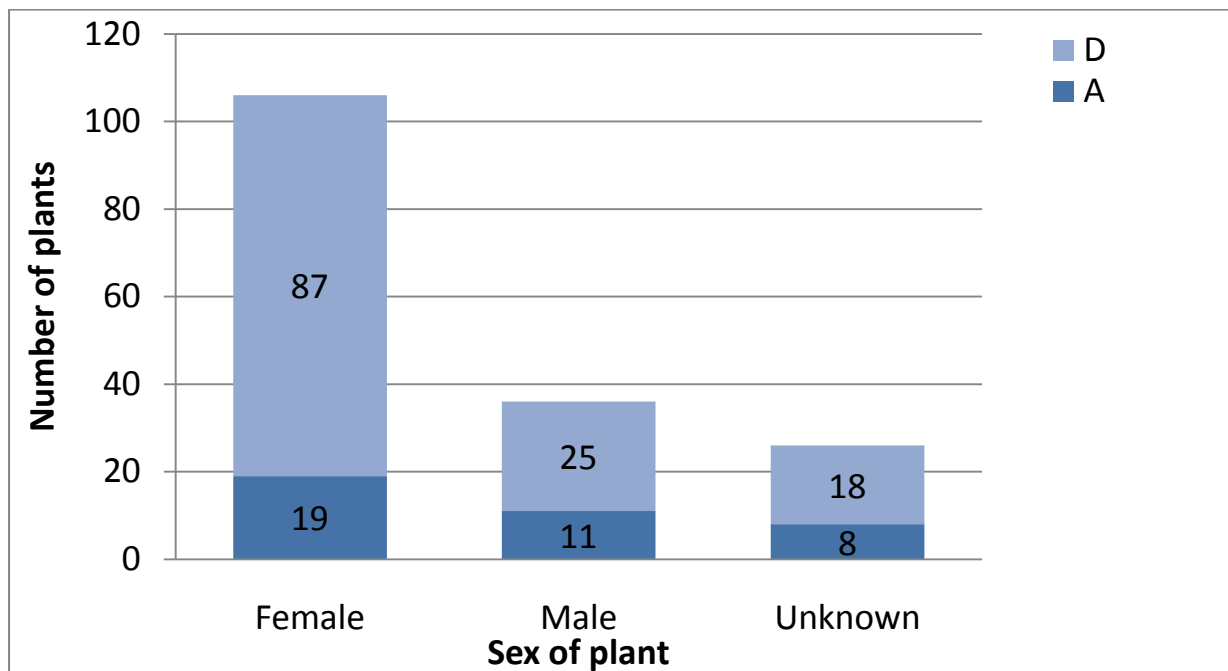
date	6/10/2016	Assessors: Tony Herwerth and Sjaan Bidwell (Melton City Council)				
	understorey vegetation	Quadrats % Cover				
		inner zone		outer zone		
		1	2	3	4	5
natives	<b>Native grasses</b>	<b>55%</b>	<b>65%</b>	<b>40%</b>	<b>55%</b>	<b>25%</b>
	<i>Austrostipa</i> species	50%	60%	15	25%	10%
	<i>Rytidosperma</i> species	<5	<5	10	10%	15%
	<i>Isolepis marginata</i>	<1	<1	<1	<1	<1
	<i>Juncus bufonius</i>					<1
	<i>Themeda triandra</i>	<1	<1	15	20%	<1
	<b>Native forbs</b>	<b>&lt;5</b>	<b>&lt;5</b>	<b>&lt;5</b>	<b>&lt;5</b>	<b>5%</b>
	<i>Arthropodium strictum</i>					<1
	<i>Asperula conferta</i>	<1	<1			
	<i>Brachyscome dentata</i> or <i>B. paludicola</i>			<1		<1
	<i>Bulbine bulbosa</i>					<1
	<i>Convolvulus angustissimus</i>	<1				
	<i>Crassula decumbens</i>	<1	<1	<1	<1	<1
	<i>Eryngium ovium</i>	<5		<1	<5	
	<i>Geranium</i> sp.					<1
	<i>Goodenia pinnatifida</i>	<1				
	<i>Hypericum gramineum</i>					<1
	<i>Kennedia prostrata</i>					<1
	<i>Leptorhynchus squamatus</i>					<1
	<i>Oxalis perennans</i>	<1				<1
	<i>Pelargonium rodyneyanum</i>				<1	<1
	<i>Pimelea spinescens</i> subsp. <i>spinescens</i>		<1			
	<i>Plantago gaudichaudii</i>	<1				
	<i>Plantago varia</i>	<1				
	<i>Podolepis linearifolia</i>			<1		
	<i>Ptilotus spathulata</i>			<1		<1
	<i>Pycnosurus globosus</i>			<1		
	<i>Rutidosus leptorhynchoides</i>					<1
	<i>Senecio quadridentatus</i>				<1	<1
	<i>Velleia paradoxa</i>					<1
	<i>Wahlenbergia</i> species	<1				
	<b>Native shrubs (small &lt; 1 m)</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>
	<b>Native climbers/scramblers</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>
	<b>OVERALL native understorey cover</b>	<b>60%</b>	<b>65%</b>	<b>45%</b>	<b>60%</b>	<b>35%</b>
	Bare ground	20%	10%	30%	35%	25%

### 3.4 SPINY RICE-FLOWER MONITORING

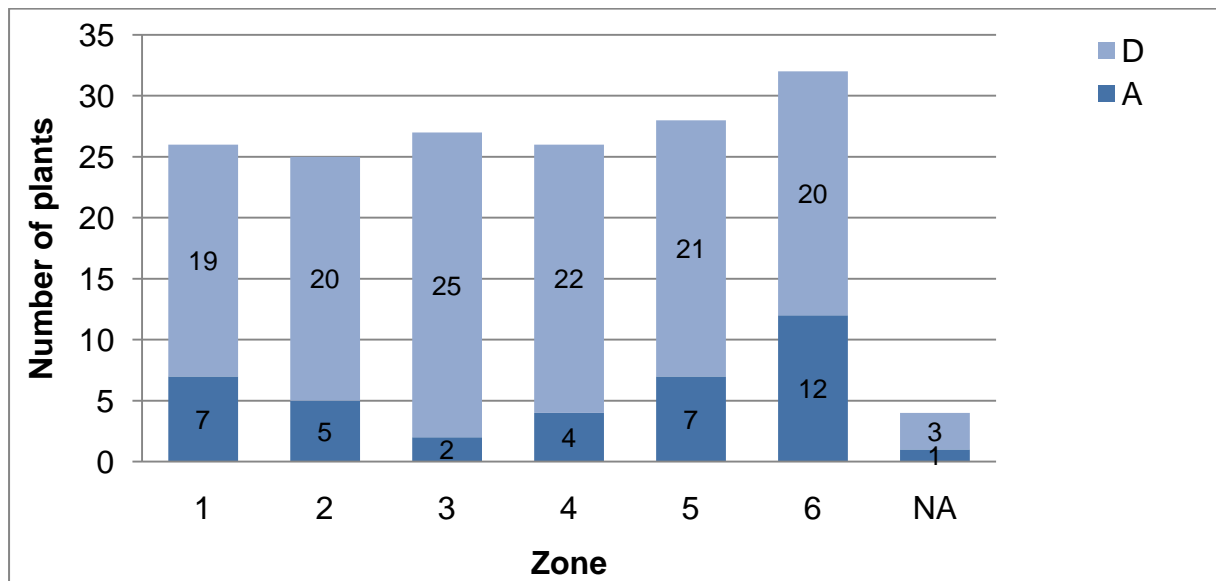
The annual monitoring of Spiny Rice-flower was completed on 20 July 2016 and included monitoring of all known plants (i.e. remnants, those planted in 2012, 2014 and 2016).

Spiny Rice-flower survey results for 2016 are presented in Figure 4 to Figure 7. Full results are presented in Appendix B. The current number of living plants exceeds the long-term target of 30 plants (currently there are 38 living plants; refer to Figure 4). The majority of living plants were in good condition and flowering in July 2016 (refer to Figure 7).

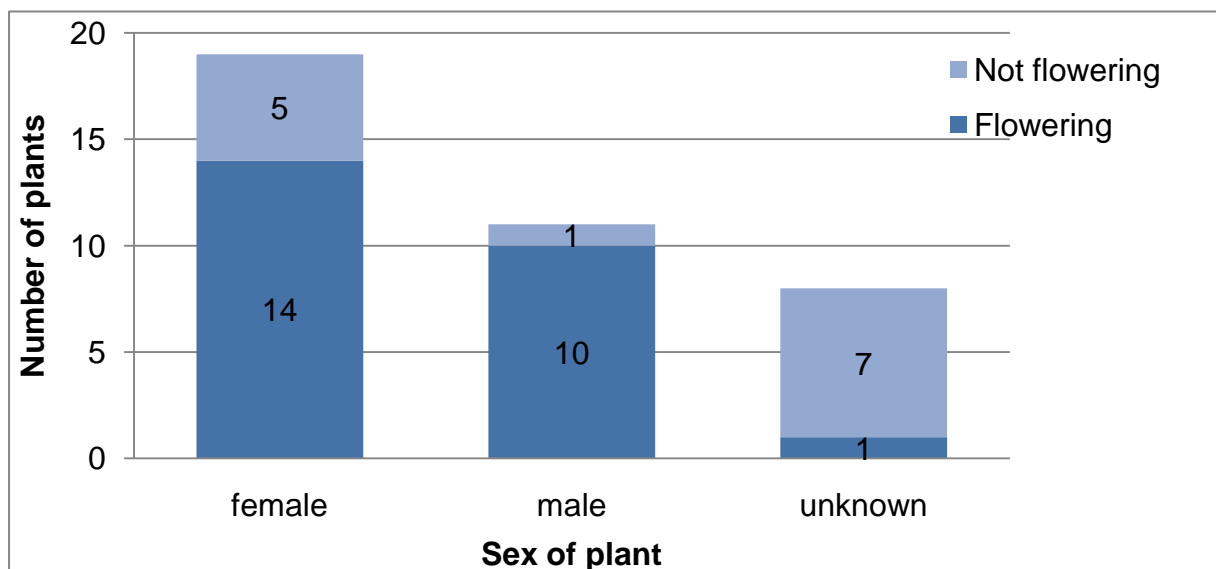
**Figure 4: Number of Spiny Rice Flower plants alive (A) and dead (D) in 2016 by plant sex**



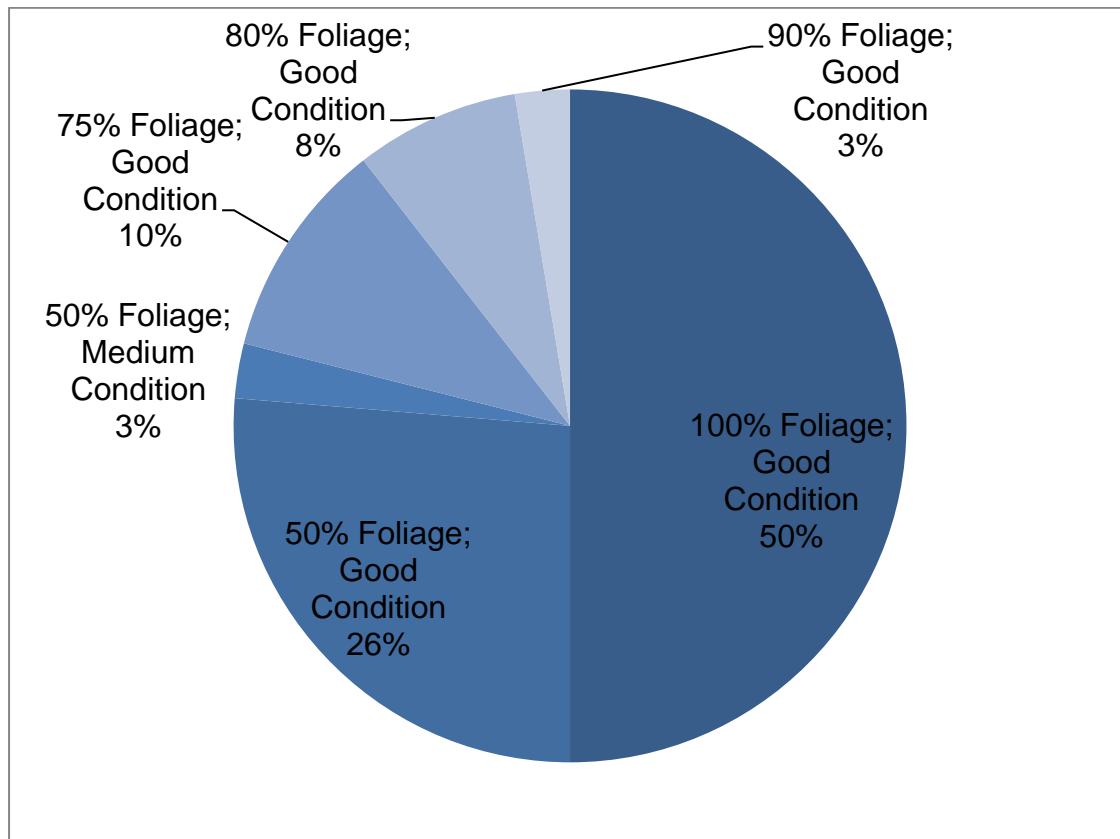
**Figure 5: Number of Spiny Rice Flower plants alive (A) and dead (D) in 2016 in each planting zone**



**Figure 6: Number of living Spiny Rice Flower plants flowering in 2016**



**Figure 7: Percentage of living Spiny Rice Flower plants in each condition category in 2016**



#### 4. CONCLUSION

This report describes the work done to date in protecting and improving the Spiny Rice-flower offset site at Mount Cottrell Recreation Reserve. Skilled environmental management of the grassland community at the site has been occurring since 2012 with substantial planting and direct seeding as well as augmenting of the Spiny Rice-flower population at the site.

This is the second OMP monitoring report to be prepared for the site. The monitoring to date demonstrates an improvement in vegetation condition at the site as shown by an increase in percentage cover of native species, decrease cover of weed species and an increase in species richness of indigenous flora within monitoring quadrats. The current population of Spiny Rice-flower includes 38 living plants, above the target of 30 plants. The majority of living plants were in good condition and flowering in July 2016.

Melton City Council will undertake the next round of monitoring in July 2017 (Spiny Rice-flower) and October 2017 (flora quadrats and photopoint monitoring) and continue to manage the reserve in accordance with the OMP. The next report is scheduled to be submitted to DoEE by 31<sup>st</sup> January 2018.



## PLATES: MONITORING QUADRAT PHOTOS (2015 AND 2016)

VQ1



2015



2016

VQ2



2015



2016



VQ3



2015



2016

VQ4



2015



2016



VQ5



2015



2016

BURNING OF OFFSET AREA MARCH 2013



TRUST FOR NATURE REPRESENTATIVES INSPECTING SPINY RICE-FLOWER PLANTS WITH MELTON'S COORDINATOR OF ENVIRONMENTAL SERVICES, ADRIAN MURPHY, JAN 2013.





**APPENDIX A: SUMMARY OF MANAGEMENT ACTIONS PERFORMED WITHIN OFFSET ZONE TO DATE, INVOICE NUMBER REFERS TO INVOICE RECORDS KEPT BY MELTON CITY COUNCIL.**

Date	Invoice no	Activity performed
Jul 2012	4613	Sensitive brushcut of weeds looking for Spiny Rice-flower
Aug 2012	4646	Guarded remnant Spiny Rice-flower plants; biomass reduction with brush cutters and rakes
Aug 2012	4656	Sorted Spiny Rice-flower for planting into male and female to plants
Aug 2012	4676	Planted Spiny Rice-flower, large stock, local provenance, commercially sourced; erected fencing around planted stock
Aug 2012	4685	Planting Spiny Rice-flower; watering
Sep 2012	4697	Watering Spiny Rice-flower
Sep 2012	4731	Watering Spiny Rice-flower
Sep 2012	4753	Watering Spiny Rice-flower
Sep 2012	4775	Watering Spiny Rice-flower; modified fencing
Nov 2012	4864	Watering Spiny Rice-flower; spot spray Chilean Needle grass and Serrated Tussock
Nov 2012	4912	Watering Spiny Rice-flower
Oct 2012	4949	Watering Spiny Rice-flower
Mar 2013	5223	Watering Spiny Rice-flower
Apr 2013	5275	Watering Spiny Rice-flower
Apr 2013	5326	Hand weeding; temporary rabbit proof fence construction; watering Spiny Rice-flower
Jun 2013	5382	Watering Spiny Rice-flower
Jun 2013	5402	Burning offset area and surrounds
Jul 2014	6447	Direct seeded Spiny Rice-flower into offset area
Aug 12 2014	6426	Hand weed; and set up monitoring quadrats; carried out monitoring
Aug 12 2014	6467	Hand weed Spiny Rice-flower
Aug 12 2014	6547	Planting; brush cutting; hand weed Spiny Rice-flower areas
Aug 12 2014	6569	Planting; hand weeding Spiny Rice-flower areas
Aug 12 2014	6576	Hand weed Spiny Rice-flower area; direct seeded native herbs; watering Spiny Rice-flower
Aug 12 2014	6606	Planting herbs; watering Spiny Rice-flower; planting 50 small Spiny Rice-flower, 34 females 16 Males grown by Melton City Council from bought local provenance seed.
Aug 28 2014	6608	Planting and watering herbs in Spiny Rice-flower area
Sep 15 2014	6611	Fence repairs Mount Cottrell Recreation reserve
Sep 15 2014	6627	Spot spraying Serrated Tussock and Chilean Needle Grass;

Date	Invoice no	Activity performed
		planting herbs; watering Spiny Rice-flower
Oct 10 2014	6667	Herb planting
Oct 13 2014	6620	Planting and watering herbs; watering Spiny Rice-flower
Oct 13 2014	6625	Fencing; planting herbs; spot spray preparation in offset area
Oct 13 2014	6637	Spot spraying; watering Spiny Rice-flower; fencing; watering; spot spray weeds in outer zone
Oct 13 2014	6663	Herb planting
Oct 13 2014	6673	Planting and watering herbs and Spiny Rice-flower
Oct 13 2014	6686	Watering herbs and Spiny Rice-flower
Nov 14 2014	6748	Watering Spiny Rice-flower
Nov 14 2014	6779	Watering
Nov 14 2014	6800	Spot spray Serrated Tussock and Chilean Needle Grass
Nov 26 2014	6734	Hand weed; spot spray; plant herbs
Nov 27 2014	6726	Mow and catch and brush cut non-indigenous annual grasses
Nov 27 2014	6770	Spot Spray Serrated Tussock and Chilean Needle Grass; hand weeding herbs.
Nov 27 2014	6831	Mow and catch weedy areas; watering herb areas and Spiny Rice-flower zones
Jan 5 2015	6953	Hand weed Spiny Rice-flower and herb zones
Feb 24 2015	6905	Spot spray annual grasses and C4 grasses
Feb 24 2015	6953	Hand weed spot spray serrated tussock
Jan 5 2015	6953	Hand weed Spiny Rice-flower and herb zones
Apr 29 2015	7094	Spot spray broad leaf weeds; erect photo points; mow and catch
Apr 29 2015	7093	Hand weed Spiny Rice-flower zones; spot spray Serrated Tussock and broad leaf weeds
Apr 29 2015	7073	Hand weed Spiny Rice-flower; spot spray Serrated Tussock
Jun 11 2015	7175	Hand weed
Jun 12 2015	7193	Spot spray broad leaf weeds; spot burns and planting
Jun 22 2015	7231	Planting herbs; hand weed
Jun 22 2015	7218	Spiny Rice-flower planting and herb planting
Jun 22 2015	7224	Spiny Rice-flower direct seeding; setting up enclosures; spot spray
Jun 24 2015	30445	Plants
Jun 26 2015	7256	Planting herbs
Jun 26 2015	7244	Planting herbs
Jun 29 2015	30266	Plants
Jun 29 2015	30365	Plants
Jun 30 2015	7276	Planting and watering
Jun 30 2015	7273	Planting and watering

Date	Invoice no	Activity performed
Aug 10 2015	615920	Supply of plants
Aug 25 2015	7094	Supply and install rabbit proof fence
Aug 27 2015	616472	Watering
Sep 7 2015	616692	Watering herbs
Sep 7 2015	616684	Plants
Sep 11 2015	616831	Hand weed plantings; watering herbs; spot spray annual grasses
Sep 11 2015	616829	Hand weed plantings of herbs
Sep 11 2015	616830	Spot spray broad leaf weeds
Oct 1 2015	617279	Weed control and fence repairs
Oct 5 2015	617316	Watering herbs
Oct 5 2015	617315	Planting herbs prep spray
Oct 5 2015	617314	Spot spray broad leaf weeds
Oct 5 2015	617313	Planting herbs; spot spray annual grasses
Oct 5 2015	617312	Planting herbs; spot spray and hand weed broad leaf weeds
Oct 29 2015	617884	Watering herb planting; brushcut oats
Nov 13 2015	618201	Brushcut annual grasses; hand weed Spiny Rice-flower plots.
Dec 17 2015	619048	Spot spray Serrated Tussock and Chilean Needle Grass; hand weed; watering Spiny Rice-flower and herbs; setting up monitoring points
Jan 7 2016	7588	Spot spray broad leaf weeds
Apr 1 2016	620964	Brushcut; watering; planting
Apr 27 2016	621440	Direct seed herbs
May 10 2016	621739	Watering herbs and Spiny Rice-flower
May 27 2016	622241	Planting herbs
May 27 2016	622242	Spot spray; planting herbs, spot spray broad leaf weeds
Jun 10 2016	622574	
Jun 10 2016	622563	Spot spray; hand weed plantings
Jun 30 2016	623044	Hand weed broad leaf weeds
Jun 30 2016	7969	Spot spray; hand weed
Jul 1 2016	7969	Spot spray; hand weed
Sep 11 2015	616830	Spot spray broad leaf weeds
Sep 13 2016	8044	Spot spray; hand weed; planting
Sep 26 2016	8062	Planting herbs
Oct 11 2016	8080	Spot spray; hand weed broad leaf weeds; planting herbs; spot spray and brushcut annual grasses
Oct 11 2016	8083	Watering Spiny Rice-flower and herbs; hand weed
Oct 11 2016	8082	Spot spray; hand weed broad leaf weeds; planting herbs; spot spray; brushcut annual grasses
Oct 28 2016	8111	Mow and catch annual grasses

Date	Invoice no	Activity performed
Nov 13 2015	618201	Brushcut annual grasses; hand weed Spiny Rice-flower plots
Nov 14 2016	8156	Hand weed plantings; watering Spiny Rice-flowers; planting and watering Spiny Rice-flowers.
Nov 29 2016	8164	Spot spray Serrated Tussock and Chilean Needle Grass; hand weed herbs; watering
Dec 21 2016	8188	Spot spray broad leaf weeds; Serrated Tussock and Chilean Needle Grass; hand weed in herb areas

## APPENDIX B: SPINY RICE-FLOWER MONITORING DATA, 2016

Zone (inner/ outer )	plant no	Year recruited /planted	Sex	Alive / Dead	Flowering	Condition	Tag no.	Pimelea Zone
inner	1	unknown	F	A	Y	100% Foliage; Good Condition	PS 1 REM	1
inner	51	2014	M	D			PS 51 PLD	1
inner	52	2014	F	A	Y	100% Foliage; Good Condition	PS 52 PLD	1
inner	53	2014	F	A	Y	100% Foliage; Good Condition	PS 53 PLD	1
inner	54	2014	F	A	Y	100% Foliage; Good Condition	PS 54 PLD	1
inner	55	2014	F	D			PS 55 PLD	1
inner	56	2014	M	A	Y	100% Foliage; Good Condition	PS 56 PLD	1
inner	57	2014	F	A	Y	100% Foliage; Good Condition	PS 57 PLD	1
inner	58	2014	M	D			PS 58 PLD	1
inner	145	2015	Unknown	D	N	25% Foliage; Poor	PS 145 PLD	1
inner	146	2015	F	D			PS 146 PLD	1
inner	147	2015	F	D			PS 147 PLD	1
inner	148	2015	M	D			PS 148 PLD	1
inner	149	2015	F	D			PS 149 PLD	1
inner	150	2015	F	D			PS 150 PLD	1
inner	151	2015	Unknown	D			PS 151 PLD	1
inner	152	2015	F	D			PS 152 PLD	1
inner	153	2015	F	D	N		PS 153 PLD	1
inner	154	2015	F	D			PS 154 PLD	1
inner	155	2015	F	D			PS 155 PLD	1
inner	156	2015	F	D			PS 156 PLD	1
inner	157	2015	M	D			PS 157 PLD	1
inner	158	2015	F	D			PS 158 PLD	1
inner	159	2015	F	D			PS 159 PLD	1

Zone (inner/ outer )	plant no	Year recruited /planted	Sex	Alive / Dead	Flowering	Condition	Tag no.	<i>Pimelea</i> Zone
inner	160	2015	M	A	Y	100% Foliage; Good Condition	PS 160 PLD	1
inner	161	2015	F	D			PS 161 PLD	1
inner	2	unknown	M	A	Y	100% Foliage; Good Condition	PS 2 REM	2
inner	44	2014	M	D			PS 44 PLD	2
inner	45	2014	F	A	Y	100% Foliage; Good Condition	PS 45 PLD	2
inner	46	2014	F	A	N	100% Foliage; Good Condition; Just Finished Flowering	PS 46 PLD	2
inner	47	2014	F	D			PS 47 PLD	2
inner	48	2014	F	D			PS 48 PLD	2
inner	49	2014	F	D			PS 49 PLD	2
inner	50	2014	M	D			PS 50 PLD	2
inner	128	2015	M	D			PS 128 PLD	2
inner	129	2015	Unknown	D			PS 129 PLD	2
inner	130	2015	F	D			PS 130 PLD	2
inner	131	2015	F	D			PS 131 PLD	2
inner	132	2015	M	D			PS 132 PLD	2
inner	133	2015	F	D			PS 133 PLD	2
inner	134	2015	Unknown	D			PS 134 PLD	2
inner	135	2015	F	D			PS 135 PLD	2
inner	136	2015	F	D			PS 136 PLD	2
inner	137	2015	F	D			PS 137 PLD	2
inner	138	2015	M	D			PS 138 PLD	2
inner	139	2015	F	D			PS 139 PLD	2
inner	140	2015	F	D			PS 140 PLD	2
inner	141	2015	F	D			PS 141 PLD	2
inner	142	2015	Unknown	D			PS 142 PLD	2



Zone (inner/ outer )	plant no	Year recruited /planted	Sex	Alive / Dead	Flowering	Condition	Tag no.	Pimelea Zone
inner	143	2015	F	A	Y	75% Foliage; Good Condition	PS 143 PLD	2
inner	144	2015	F	A	Y	50% Foliage; Medium Condition	PS 144 PLD	2
inner	7	?		D				
inner	8	2013		A	Y	100% Foliage; Good Condition; (Large Planted)		
inner	3	2013	F	A	N	75% Foliage; Good Condition; Just Finished Flowering	PS 3 PLD	3
inner	35	2014	M	D			PS 35 PLD	3
inner	36	2014	F	D			PS 36 PLD	3
inner	37	2014	M	A	F	100% Foliage; Good Condition; Just Finished Flowering	PS 37 PLD	3
inner	38	2014	F	D			PS 38 PLD	3
inner	39	2014	F	D			PS 39 PLD	3
inner	40	2014	F	D			PS 40 PLD	3
inner	41	2014	F	D			PS 41 PLD	3
inner	42	2014	F	D			PS 42 PLD	3
inner	43	2014	M	D			PS 43 PLD	3
inner	111	2015	Unknown	D			PS 111 PLD	3
inner	112	2015	F	D			PS 112 PLD	3
inner	113	2015	F	D			PS 113 PLD	3
inner	114	2015	Unknown	D			PS 114 PLD	3
inner	115	2015	F	D			PS 115 PLD	3
inner	116	2015	F	D			PS 116 PLD	3
inner	117	2015	M	D			PS 117 PLD	3
inner	118	2015	F	D			PS 118 PLD	3

Zone (inner/ outer )	plant no	Year recruited /planted	Sex	Alive / Dead	Flowering	Condition	Tag no.	Pimelea Zone
inner	119	2015	F	D			PS 119 PLD	3
inner	120	2015	F	D			PS 120 PLD	3
inner	121	2015	M	D			PS 121 PLD	3
inner	122	2015	F	D			PS 122 PLD	3
inner	123	2015	Unknown	D			PS 123 PLD	3
inner	124	2015	F	D			PS 124 PLD	3
inner	125	2015	F	D			PS 125 PLD	3
inner	126	2015	M	D			PS 126 PLD	3
inner	127	2015	F	D			PS 127 PLD	3
inner	26	2014	F	D			PS 26 PLD	4
inner	27	2014	M	D			PS 27 PLD	4
inner	28	2014	F	D			PS 28 PLD	4
inner	29	2014	F	D			PS 29 PLD	4
inner	30	2014	F	D			PS 30 PLD	4
inner	31	2014	F	A	Y	100% Foliage; Good Condition	PS 31 PLD	4
inner	32	2014	M	D			PS 32 PLD	4
inner	33	2014	F	A	N	100% Foliage; Good Condition;	PS 33 PLD	4
inner	34	2014	M	A	Y	50% Foliage; Good Condition	PS 34 PLD	4
inner	94	2015	F	D			PS 94 PLD	4
inner	95	2015	F	D			PS 95 PLD	4
inner	96	2015	F	D			PS 96 PLD	4
inner	97	2015	Unknown	D			PS 97 PLD	4
inner	98	2015	M	D			PS 98 PLD	4
inner	99	2015	F	D			PS 99 PLD	4
inner	100	2015	M	D			PS 100 PLD	4
inner	101	2015	F	D			PS 101 PLD	4

Zone (inner/ outer )	plant no	Year recruited /planted	Sex	Alive / Dead	Flowering	Condition	Tag no.	<i>Pimelea</i> Zone
inner	102	2015	F	D			PS 102 PLD	4
inner	103	2015	Unknown	D			PS 103 PLD	4
inner	104	2015	M	A	N	100% Foliage; Good Condition	PS 104 PLD	4
inner	105	2015	F	D			PS 105 PLD	4
inner	106	2015	F	D			PS 106 PLD	4
inner	107	2015	F	D			PS 107 PLD	4
inner	108	2015	Unknown	D			PS 108 PLD	4
inner	109	2015	F	D			PS 109 PLD	4
inner	110	2015	F	D			PS 110 PLD	4
inner	15	2014	F	A	Y	75% Foliage; Good Condition	PS 15 PLD	5
inner	16	2014	M	A	Y	100% Foliage; Good Condition	PS 16 PLD	5
inner	17	2014	F	D			PS 17 PLD	5
inner	18	2014	F	D			PS 18 PLD	5
inner	19	2014	F	D			PS 19 PLD	5
inner	20	2014	F	D			PS 20 PLD	5
inner	21	2014	F	A	Y	75% Foliage; Good Condition	PS 21 PLD	5
inner	22	2014	M	D			PS 22 PLD	5
inner	23	2014	F	A	N	80% Foliage; Good Condition; Just Finished Flowering	PS 23 PLD	5
inner	24	2014	F	A	Y	100% Foliage; Good Condition	PS 24 PLD	5
inner	25	2014	M	A	Y	100% Foliage; Good Condition	PS 25 PLD	5
inner	77	2015	M	D			PS 77 PLD	5
inner	78	2015	F	D			PS 78 PLD	5
inner	79	2015	Unknown	D			PS 79 PLD	5
inner	80	2015	F	D			PS 80 PLD	5
inner	81	2015	Unknown	D			PS 81 PLD	5

Zone (inner/ outer )	plant no	Year recruited /planted	Sex	Alive / Dead	Flowering	Condition	Tag no.	Pimelea Zone
inner	82	2015	F	A	N	90% Foliage; Good Condition; Just Finished Flowering	PS 82 PLD	5
inner	83	2015	F	D			PS 83 PLD	5
inner	84	2015	F	D			PS 84 PLD	5
inner	85	2015	F	D			PS 85 PLD	5
inner	86	2015	F	D			PS 86 PLD	5
inner	87	2015	M	D			PS 87 PLD	5
inner	88	2015	F	D			PS 88 PLD	5
inner	89	2015	Unknown	D			PS 89 PLD	5
inner	90	2015	F	D			PS 90 PLD	5
inner	91	2015	M	D			PS 91 PLD	5
inner	92	2015	F	D			PS 92 PLD	5
inner	93	2015	F	D			PS 93 PLD	5
inner	6	unknown	F	A	Y	100% Foliage; Good Condition	PS 6 REM	6
inner	9	2014	F	D			PS 9 PLD	6
inner	10	2014	M	A	Y	80% Foliage; Good Condition	PS 10 PLD	6
inner	11	2014	F	D			PS 11 PLD	6
inner	12	2014	F	D			PS 12 PLD	6
inner	13	2014	M	A	Y	50% Foliage; Good Condition	PS 13 PLD	6
inner	14	2014	F	A	F	80% Foliage; Good Condition	PS 14 PLD	6
inner	59	2015	Unknown	D			PS 59 PLD	6
inner	60	2015	F	D			PS 60 PLD	6
inner	61	2015	F	D			PS 61 PLD	6
inner	62	2015	Unknown	D			PS 62 PLD	6
inner	63	2015	F	D			PS 63 PLD	6
inner	64	2015	M	D			PS 64 PLD	6
inner	65	2015	F	D			PS 65 PLD	6

Zone (inner/ outer )	plant no	Year recruited /planted	Sex	Alive / Dead	Flowering	Condition	Tag no.	Pimelea Zone
inner	66	2015	F	D			PS 66 PLD	6
inner	67	2015	Unknown	D			PS 67 PLD	6
inner	68	2015	F	D			PS 68 PLD	6
inner	69	2015	F	D			PS 69 PLD	6
inner	70	2015	M	D			PS 70 PLD	6
inner	71	2015	F	D			PS 71 PLD	6
inner	72	2015	M	D			PS 72 PLD	6
inner	73	2015	F	D			PS 73 PLD	6
inner	74	2015	F	D			PS 74 PLD	6
inner	75	2015	F	D			PS 75 PLD	6
inner	76	2015	M	A	F	50% Foliage; Good Condition	PS 76 PLD	6
inner	162	2016		A		50% Foliage; Good Condition	PS162 PLD	6
inner	163	2016		A		50% Foliage; Good Condition	PS163 PLD	6
inner	164	2016		A		50% Foliage; Good Condition	PS164 PLD	6
inner	165	2016		A		50% Foliage; Good Condition	PS165 PLD	6
inner	166	2016		A		50% Foliage; Good Condition	PS166 PLD	6
inner	167	2016		A		50% Foliage; Good Condition	PS167 PLD	6
inner	168	2016		A		50% Foliage; Good Condition	PS168 PLD	6
inner	4	2013	F	D	no	Dead (2013)	NA	
inner	5	2013	F	D	no	Dead (2013)	NA	

KEY
REM = Remnant
REL = Relocated
REC = Recruited
PLD = Planted