

**ROSENTHAL ESTATE, SUNBURY**  
**CONSERVATION MANAGEMENT PLAN**  
**YEAR 2 MONITORING**

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## 1. INTRODUCTION AND METHODS

T.F. & A. Millett, C/- Urban Design and Management Pty. Ltd. engaged Brett Lane and Associates Pty. Ltd. (BL&A) to monitor the results of the implementation of a Conservation Management Plan (CMP) for the Rosenthal Estate residential development located at 100 Vineyard Road, Sunbury (EHP 2015a).

The Conservation Management Plan relates to two conservation reserves (Eastern Reserve and Western Reserve), totalling 12.64 hectares.

A site assessment of both reserves was undertaken on 12<sup>th</sup> December 2017 to:

- Assess the extent to which the year two management actions from the CMP had been implemented; and
- Implement monitoring requirements set out in the CMP.

Species records and all cover estimates were recorded for each management zone within each reserve. Cover estimates were then extrapolated for each reserve (as a whole) by weighing data by the relative areas of the management zones.

Note that very high grassy biomass reduced the ability to observe low-lying flora during the current site monitoring. This was considered to limit the ability to accurately determine indigenous and introduced species diversity and cover.

Progress against management actions listed in Table 13 of the Offset Management Plan (EHP 2015b) – as requested by Hume City Council – are set out in Appendix 2.

This investigation was undertaken by a team from BL&A comprising Verity Fyfe (Botanist) and Alan Brennan (Senior Ecologist & Project Manager).

## 2. EASTERN RESERVE

### 2.1. Monitoring results

Table 1 provides an assessment of the extent to which year two management actions set out in the CMP for the Eastern Reserve have been implemented. This table also references sections of this report which provide adaptive management recommendations. Table 2 details the photo-point locations, Table 3 the biomass cover, Table 4 the weed cover and Table 5 the indigenous species cover.

Key findings are listed below.

- Vegetation biomass remains high (same as December 2016).
- Indigenous vegetation cover was the same as December 2016 (32%) while weed cover had significantly decreased (down from 74% to 60%).
- Woody weed control had been undertaken – mostly successfully. Some smaller plants had been left untreated. In some areas treated woody weeds require follow up control.
- Control of perennial grasses such as Serrated Tussock, Perennial Rye-grass, Cocksfoot, Chilean Needle-grass and Paspalum was evident. Serrated Tussock cover was reduced by 75% over the year. However, in a few areas many sprayed Serrated Tussock plants had survived and follow up control was required. Spraying should occur when plants are actively growing and are not stressed. Mature plants with a lot of dead tissue may require larger volumes of herbicide to be applied.
- No key weed species had increased in cover since December 2016.
- A total of 35 weed species were recorded (two more than at December 2016).
- A total of 18 indigenous flora species were recorded (the same as December 2016).

Table 1: Eastern reserve year 2 management actions

Action	Management action	Responsible entity	Timing of action	Implementation notes and recommendations
1.2	Conduct weed control and implement revegetation plan	Landowner / Bushland Management Contractor	As per Table 2 of CMP	Overall, woody weed control has been undertaken successfully, though some smaller plants missed and some areas require follow up control. Control of high-threat perennial grasses evident.  Weed management approach recommended (see Section 2.2.2).
1.3	Monitor populations of pest animals and conduct control works if required	Landowner / Pest Animal Contractor	Late summer / early autumn	Existing warrens under Boxthorn and Blackberry fumigated and closed. Follow up with baiting, if required.
1.4	Conduct monitoring of all vegetation and Golden Sun Moth habitat	Suitably qualified ecological specialist	One year after commencement of works	Undertaken in December 2017. No Golden Sun Moth recorded.
1.5	Monitor organic litter and biomass density and develop ecological burn or fuel reduction plan if appropriate	Landowner / Bushland Management Contractor	Outside of the GSM active season (October – January)	Monitoring undertaken in December 2017. Biomass levels very high. Biomass management recommended (see Section 2.2.2).
1.6	Contact nursery for seed collection and propagation of native species suitable for supplementary planting into Management Zone B	Landowner / Bushland Management Contractor / Local nursery	Order in Year 3 for potential supplementary planting in Year 3 and progressively on an annual or biennial basis.	Seed to be collected.  It is recommended that the area to be revegetated be expanded (see Section 2.2.3).

Table 2: Eastern Reserve photo-points

Photo-point #	December 2016	December 2017
1		
2		


Photo-point #	December 2016	December 2017
3		
4		


Photo-point #	December 2016	December 2017
5	 A photograph showing a hillside covered in tall, green grass under a blue sky with scattered white clouds. The grass appears to be blowing in the wind.	 A photograph showing a hillside covered in tall, dry, yellowish-brown grass. The sky is not clearly visible, appearing overcast.
6	 A photograph showing a grassy field with a small stream or ditch in the middle ground. The grass is green, and the sky is overcast.	 A photograph showing a field of tall, dry, yellowish-brown grass. The sky is blue with some white clouds.



Photo-point #	December 2016	December 2017
7	 A photograph showing a grassy field with green and brown grasses under a cloudy sky. The field appears to be a mix of different grass species, with some taller, more upright grasses and some shorter, more clumped ones.	 A photograph showing a grassy field with mostly brown and tan grasses, indicating a drier or later season. The grasses are taller and more uniform in color compared to the 2016 photo.
8	 A photograph showing a grassy field with green and brown grasses under a cloudy sky. The field appears to be a mix of different grass species, with some taller, more upright grasses and some shorter, more clumped ones.	 A photograph showing a grassy field with mostly brown and tan grasses, indicating a drier or later season. The grasses are taller and more uniform in color compared to the 2016 photo.

Photo-point #	December 2016	December 2017
9		

Table 3: Eastern Reserve biomass observations

Estimate	December 2015	December 2016	December 2017
Total native vegetation cover (%)	40	32	32
Total weed cover (%)	45	74	60
Litter cover (%)	-	27	40
Biomass cover (%)	-	99	95
Biomass - main height range (m) (min)	-	0.3	0.3
Biomass - main height range (m) (max)	-	1.2	1.2

Table 4: Eastern Reserve weed cover observations

Common name	Scientific name	High-threat	Projective foliage cover (%)		
			December 2015	December 2016	December 2017
<b>Key weed species</b>					
African Box-thorn	<i>Lycium ferocissimum</i>	X	<1		
Artichoke Thistle	<i>Cynara cardunculus</i>	X	<1		
Bearded Oat	<i>Avena barbata</i>		1	6	2
Blackberry	<i>Rubus fruticosus</i> spp. agg.	X	2	<1	<1
Brown-top Bent	<i>Agrostis capillaris</i>		1		1
Chilean Needle-grass	<i>Nassella neesiana</i>	X	1	1	4
Flatweed	<i>Hypochaeris radicata</i>		1	1	1
Perennial Rye-grass	<i>Lolium perenne</i>		10	22	15
Prairie Grass	<i>Bromus catharticus</i>		<1*	1	3
Ribwort	<i>Plantago lanceolata</i>		2	<1	3
Serrated Tussock	<i>Nassella trichotoma</i>	X	10	13	3
Sheep Sorrel	<i>Acetocella vulgaris</i>		2		2
Soft Brome	<i>Bromus hordeaceus</i> subsp. <i>hordeaceus</i>		<1*	2	1
Spear Thistle	<i>Cirsium vulgare</i>	X	1	<1	
Sweet Briar	<i>Rosa rubiginosa</i>	X	1		1
Sweet Vernal-grass	<i>Anthoxanthum odoratum</i>		1		
Tall Mallow	<i>Malva sylvestris</i>		<1	<1	<1
Toowoomba Canary-grass	<i>Phalaris aquatica</i>	X	10	1	1
<b>Other weed species</b>					
Barley Grass	<i>Hordeum</i> sp.		NA	<1	<1
Cape Weed	<i>Arctotheca calendula</i>		NA	<1	
Clustered Dock	<i>Rumex conglomeratus</i>		NA	<1	<1
Cocksfoot	<i>Dactylis glomerata</i>	X	NA	16	20

Common name	Scientific name	High-threat	Projective foliage cover (%)		
			December 2015	December 2016	December 2017
Common Peppercross	<i>Lepidium africanum</i>		NA	<1	<1
Common Sow-thistle	<i>Sonchus oleraceus</i>		NA	<1	3
Curled Dock	<i>Rumex crispus</i>		NA	<1	<1
Hogweed	<i>Polygonum aviculare</i>		NA	<1	<1
Hop Clover	<i>Trifolium campestre</i> var. <i>campestre</i>		NA	<1	<1
Indian Mustard	<i>Brassica X juncea</i>		NA	<1	<1
Medic	<i>Medicago</i> sp.		NA	<1	<1
Narrow-leaf Clover	<i>Trifolium angustifolium</i> var. <i>angustifolium</i>		NA	<1	<1
Onion Grass	<i>Romulea rosea</i>		NA	<1	<1
Ox-tongue	<i>Helminthotheca echioides</i>		NA	<1	<1
Panic Veldt-grass	<i>Ehrharta erecta</i> var. <i>erecta</i>	X	NA	<1	<1
Paspalum	<i>Paspalum dilatatum</i>	X	NA		1
Paterson's Curse	<i>Echium plantagineum</i>	X	NA		
Prickly lettuce	<i>Lactuca serriola</i>		NA	<1	1
Red-flower Mallow	<i>Modiola caroliniana</i>		NA	<1	2
Rough Dog's-tail	<i>Cynosurus echinatus</i>		NA	2	2
Squirrel-tail Fescue	<i>Vulpia bromoides</i>		NA	2	2
Tall Fescue	<i>Festuca arundinacea</i>	X	NA	<1	<1
Texas Needle-grass	<i>Nassella leucotricha</i>	X	NA	<1	<1
<b>Total number of species</b>				<b>33</b>	<b>35</b>

\* = assumed to be less than one given combined cover was recorded as one under *Bromus* spp.

Table 5: Indigenous flora species recorded in the Eastern Reserve

Common name	Scientific name	Management Zone		Total
		A	B	
Blue Devil	<i>Eryngium ovinum</i>	X		X
Bristly Wallaby-grass	<i>Rytidosperma setaceum</i>	X		X
Brown-back Wallaby-grass	<i>Rytidosperma duttonianum</i>	X	X	X
Club Sedge	<i>Isolepis</i> sp.		X	X
Common Wheat-grass	<i>Anthosachne scaber</i>	X	X	X
Fibrous Spear-grass	<i>Austrostipa semibarbata</i>	X	X	X
Finger Rush	<i>Juncus subsecundus</i>	X	X	X
Grey Tussock-grass	<i>Poa sieberiana</i>	X		X
Kangaroo Grass	<i>Themeda triandra</i>	X	X	X
Knead Spear-grass	<i>Austrostipa bigeniculata</i>	X	X	X
Lemon Beauty-heads	<i>Calocephalus citreus</i>	X		X
Quizzical Spear-grass	<i>Austrostipa stuposa</i>	X		X
Rough Spear-grass	<i>Austrostipa scabra</i>	X	X	X
Sheep's Burr	<i>Acaena echinata</i>	X	X	X
Short Wallaby-grass	<i>Rytidosperma carphoides</i>	X		X
Slender Bindweed	<i>Convolvulus angustissimus</i> subsp. <i>omnigracilis</i>	X		X
Slender Dock	<i>Rumex brownii</i>	X	X	X
Variable Willow-herb	<i>Epilobium billardierianum</i>	X	X	X
<b>Total Number of species</b>		<b>17</b>	<b>11</b>	<b>18</b>

## 2.2. Adaptive management recommendations

### 2.2.1. Weed control

Continued intensive weed control is required for the following *Nassella* species in the Eastern Reserve:

- Serrated Tussock;
- Chilean Needle-grass; and
- Texas Needle-grass.

While Serrated Tussock cover was reduced significantly during 2017, Chilean Needle-grass cover rose significantly (off a low base level).

This effort should commence early in 2018, after the Golden Sun Moth flight season ends and the peak seeding period for the above listed weeds commences.

Weed control should first concentrate on the least-weedy portion of the reserve then progress through to the most-weedy portion.

Weed control should be intensified following a biomass-reduction burn planned for autumn 2018 that aims to facilitate the recruitment of indigenous species.

The additional species listed below should be closely monitored and controlled immediately following any works that exposes significant areas or bare earth as well as following any future ecological or biomass-reduction burning:

- Cocksfoot
- Perennial Rye-grass
- Toowoomba Canary-grass
- Paspalum
- Spear Thistle
- Paterson's Curse

The above species have the ability to spread rapidly.

### 2.2.2. Biomass management

No biomass management was originally recommended for 2017 due to the high abundance of *Nassella* weeds across the Eastern Reserve. The rationale behind this was that burning is likely to open up recruitment space for *Nassella* species and slashing would likely further spread these species across the reserve, countering weed control efforts. In addition, delaying biomass removal would allow for seed set of indigenous species (particularly grasses), thereby creating competition for weeds and slowing their reinvasion.

However, a burn was sought for late 2017 but it was not supported by Council's Municipal Fire Prevention Officer and so CFA could not support it. Contractors were unable to be engaged in a timely manner.

Options for biomass management have been revisited following the current assessment. Given that the overall cover of *Nassella* species has been significantly reduced and that biomass (including dead plant material) cover remains very high, biomass management is now considered a viable management option. A hot (high intensity) burn is recommended to be undertaken in Autumn 2018. This would reduce biomass, most importantly the cover

of weeds (including dead/sprayed weeds), as well as facilitate the recruitment of indigenous species. In addition, the availability of bare ground would provide more suitable habitat for Golden Sun Moth.

Given the availability of bare ground following a burn weed control should be conducted soon after fire in order to reduce competition from weeds and to facilitate the recruitment of indigenous species. Following initial treatment, weed control should be conducted frequently (at least every two months) following the burn. Weed control should be prioritised in areas supporting the highest cover of indigenous species.

### **2.2.3. Revegetation**

Much of the low-lying ephemeral drainage line which divides the south-eastern higher ground from the remainder of the higher ground, known as Management Zone B, almost exclusively supported weeds. The existing management plan prescribes revegetation for Management Zone B. Revegetation may be achieved through planting and/or direct seeding and should predominantly consist of indigenous grass species which are known to occur on the site. The optimum time for revegetation is likely to be following the Autumn burn in early-mid Winter when weed cover and competition from weeds is minimal. This change in approach is consistent with the adaptive management approach required by the CMP (EHP 2015a).



### 3. WESTERN RESERVE

#### 3.1. Monitoring results

Table 6 provides an assessment of the extent to which year two management actions set out in the Conservation Management Plan for the Western Reserve have been implemented. This table also references sections of this report which provide adaptive management recommendations. Table 7 details the photo-point locations, Table 8 the biomass cover, Table 9 the weed cover and Table 10 the indigenous species cover.

Key findings are listed below.

- Vegetation biomass remains very high.
- Indigenous vegetation cover had decreased since December 2016 but remains higher than at December 2015
- Weed cover had decreased by approximately 15% since December 2016.
- Woody weed control had been undertaken, however some small plants had been left untreated.
- Of the key weed species, only Chilean Needle Grass had increased in cover (slightly) since December 2016. Serrated Tussock cover and Perennial Rye-grass cover have decreased substantially.
- A total of 39 weed species were recorded.
- A total of 26 indigenous flora species were recorded.

Table 6: Western Reserve year 2 management actions

Action	Management action	Responsible entity	Timing of action	Implementation notes and recommendations
1.2	Conduct weed control and implement revegetation plan	Landowner / Bushland Management Contractor	As per Table 2 of CMP	Woody weed control undertaken. Further woody weed control is required to treat mature and recruiting plants. Control of high-threat perennial grasses evident. Weed management approach recommended (see Section 3.2.1).
1.3	Monitor populations of pest animals and conduct control works if required	Landowner / Pest Animal Contractor	Late summer / early autumn	Existing warrens under Boxthorn and Blackberry fumigated and closed. Follow up with baiting, if required.
1.4	Conduct monitoring of all vegetation and Golden Sun Moth habitat	Suitably qualified ecological specialist	One year after commencement of works	Undertaken in December 2017, avoiding southern section co-dominated by <i>Nassella</i> species and Cocksfoot. No Golden Sun Moth recorded.
1.5	Monitor organic litter and biomass density and develop ecological burn or fuel reduction plan if appropriate	Landowner / Bushland Management Contractor	Outside of the GSM active season	Monitoring undertaken in December 2017. Biomass management recommended (see Section 3.2.2).
1.6	Contact nursery for seed collection and propagation of native species suitable for supplementary planting into Management Zone B	Landowner / Bushland Management Contractor / Local nursery	Order in Year 3 for potential supplementary planting in Year 3 and progressively on an annual or biennial basis.	Seed to be collected. Revegetation expansion and delay recommended (see Section 3.2.3).





Table 7: Western Reserve photopoints

Photopoint #	December 2016	December 2017
17		
18		

Photopoint #	December 2016	December 2017
19		
20		

Photopoint #	December 2016	December 2017
21		
23		

Photopoint #	December 2016	December 2017
24		
25		

Photopoint #	December 2016	December 2017
26		
29		

Photopoint #	December 2016	December 2017
32		
33		



Photopoint #	December 2016	December 2017
34		
35		

Photopoint #	December 2016	December 2017
36		
37		

Photopoint #	December 2016	December 2017
38		
39		

**Table 8: Western Reserve biomass observations**

Observation	Dec 2015	Dec 2016	Dec 2017
Total native vegetation cover (%)	35	50	40
Total weed cover (%)	50	59	50
Litter cover (%)	-	12	20
Biomass cover (%)	-	96	94
Biomass – main height range (m) (min)	-	0.4	0.4
Biomass – main height range (m) (max)	-	1.1	1.1

Table 9: Western Reserve weed cover observations

Common name	Scientific name	High-threat	Projective foliage cover		
			December 2015	December 2016	December 2017
<b>Key weed species</b>					
African Box-thorn	<i>Lycium ferocissimum</i>	X	<1	<1	<1
Artichoke Thistle	<i>Cynara cardunculus subsp. flavescens</i>	X	<1	<1	<1
Bearded Oat	<i>Avena barbata</i>		1	4	3
Brown-top Bent	<i>Agrostis capillaris</i>		<1		1
Chilean Needle-grass	<i>Nassella neesiana</i>	X	5	1	3
Drain Flat-sedge	<i>Cyperus eragrostis</i>		1	<1	<1
Flatweed	<i>Hypochaeris radicata</i>		<1	2	1
Galenia	<i>Galenia pubescens var. pubescens</i>		2	<1	1
Narrow-leaf Clover	<i>Trifolium angustifolium var. angustifolium</i>		1	<1	1
Perennial Rye-grass	<i>Lolium perenne</i>		5	21	10
Prairie Grass	<i>Bromus catharticus</i>		<1	2	2
Prunus	<i>Prunus sp.</i>		<1	<1	<1
Red-flower Mallow	<i>Modiola caroliniana</i>			<1	<1
Ribwort	<i>Plantago lanceolata</i>		<1	1	1
Serrated Tussock	<i>Nassella trichotoma</i>	X	10	8	5
Sheep Sorrel	<i>Acetosella vulgaris</i>		2	<1	1
Soft Brome	<i>Bromus hordeaceus subsp. hordeaceus</i>		<1	4	3
Spear Thistle	<i>Cirsium vulgare</i>	X	3	<1	1
Sweet Briar	<i>Rosa rubiginosa</i>	X	5	<1	1
Sweet Vernal-grass	<i>Anthoxanthum odoratum</i>		1		<1
Toowoomba Canary-grass	<i>Phalaris aquatica</i>	X	10		6
Yorkshire Fog	<i>Holcus lanatus</i>	X	4	3	4

Common name	Scientific name	High-threat	Projective foliage cover		
			December 2015	December 2016	December 2017
<b>Other weed species</b>					
Big Heron's-bill	<i>Erodium botrys</i>		NA	<1	<1
Cocksfoot	<i>Dactylis glomerata</i>	X	NA	10	10
Common Peppergrass	<i>Lepidium africanum</i>		NA	<1	<1
Curled Dock	<i>Rumex crispus</i>		NA	<1	<1
Fiddle Dock	<i>Rumex pulcher subsp. pulcher</i>		NA		<1
Garden Dandelion	<i>Taraxacum officinale spp. agg.</i>		NA	<1	<1
Indian Mustard	<i>Brassica X juncea</i>		NA	<1	<1
Onion Grass	<i>Romulea rosea</i>		NA	1	<1
Ox-tongue	<i>Helminthotheca echioides</i>		NA	<1	<1
Paterson's Curse	<i>Echium plantagineum</i>	X	NA	<1	<1
Rough Dog's-tail	<i>Cynosurus echinatus</i>		NA	<1	<1
Rough Sow-thistle	<i>Sonchus asper</i>		NA	<1	1
Squirrel-tail Fescue	<i>Vulpia bromoides</i>		NA	9	4
Tall Fescue	<i>Festuca arundinacea</i>	X	NA	1	1
Texas Needle-grass	<i>Nassella leucotricha</i>	X	NA	1	1
Trefoil	<i>Lotus sp.</i>		NA	1	1
Variegated Thistle	<i>Silybum marianum</i>	X	NA	<1	<1
<b>Total number of species</b>				<b>35</b>	<b>39</b>

Table 10: Indigenous flora species recorded in the Western Reserve

Common name	Scientific name	Management Zone		Total
		A	B	
Blue Devil	<i>Eryngium ovinum</i>	X	X	X
Bristly Wallaby-grass	<i>Rytidosperma setaceum</i>	X		X
Brown-back Wallaby-grass	<i>Rytidosperma duttonianum</i>	X		X
Common Tussock-grass	<i>Poa labillardierei</i>		X	X
Common Wallaby-grass	<i>Rytidosperma caespitosum</i>	X		X
Common Wheat-grass	<i>Anthosachne scabra</i> s.l.	X	X	X
Fibrous Spear-grass	<i>Austrostipa semibarbata</i>	X	X	X
Fine-head Spear-grass	<i>Austrostipa oligostachya</i>	X		X
Grassland Wood-sorrel	<i>Oxalis perennans</i>	X		X
Grey Tussock-grass	<i>Poa sieberiana</i>	X		X
Kangaroo Grass	<i>Themeda triandra</i>	X	X	X
Kneed Spear-grass	<i>Austrostipa bigeniculata</i>	X	X	X
Pale Rush	<i>Juncus pallidus</i>	X	X	X
River Red-gum	<i>Eucalyptus camaldulensis</i>	X	X	X
Rough Spear-grass	<i>Austrostipa scabra</i>	X	X	X
Rush	<i>Juncus</i> sp.	X		X
Sheep's Burr	<i>Acaena echinata</i>	X		X
Short Wallaby-grass	<i>Rytidosperma carphoides</i>	X		X
Slender Bindweed	<i>Convolvulus angustissimus</i> subsp. <i>omnigracilis</i>	X		X
Slender Dock	<i>Rumex brownii</i>	X	X	X
Small St John's Wort	<i>Hypericum gramineum</i>	X		X
Spear Grass	<i>Austrostipa</i> sp.		X	X

Common name	Scientific name	Management Zone		Total
		A	B	
Supple Spear-grass	<i>Austrostipa mollis</i>	X		X
Variable Willow-herb	<i>Epilobium billardierianum</i>	X	X	X
Weeping Grass	<i>Microlaena stipoides</i> var. <i>stipoides</i>	X		X
Wiry Dock	<i>Rumex dumosus</i>	X		X
<b>Total number of species</b>		<b>24</b>	<b>12</b>	<b>26</b>



## 3.2. Adaptive management recommendations

### 3.2.1. Weed control

An intensive weed control effort is still required for the following *Nassella* species in the Western Reserve:

- Serrated Tussock;
- Chilean Needle-grass; and
- Texas Needle-grass.

Serrated Tussock cover was reduced substantially during 2017 while Chilean Needle-grass cover increased slightly. Perennial Rye-grass cover have decreased substantially.

This control effort should commence early in 2018, after the Golden Sun Moth flight season ends and before the peak seeding period for the above listed weeds.

Given the abundance and extent of *Nassella* weed species, access into the Western Reserve during summer (i.e. peak seeding period) is likely to significantly exacerbate the weed problem and counter the weed control effort. Fixed internal access routes should be considered to limit personnel movement to set parts of the reserve. These routes and associated directions of travel should, as much as is practicable, reduce the movement of personnel from denser *Nassella* infestations into areas of lighter infestations or areas where these species do not yet occur.

Until *Nassella* species have been sufficiently controlled, consideration should be given to limiting Golden Sun Moth surveys transects to areas where weeds have been controlled and reserve boundaries. This is an acceptable change, demonstrating an adaptive management approach, that will enable annual monitoring to continue as required under the CMP (EHP 2015a).

*Nassella* control in this low lying weedy area is likely to require long acting systemic herbicides. This is an acceptable change to the management prescribed by the CMP (EHP 2015a) given the adaptive management approach being taken. Systemic herbicides will more effectively control weeds as required under the CMP (EHP 2015a).

The spread of Serrated Tussock seed by wind is also considered likely to significantly hamper weed control success if not controlled. This species seeds poorly the year or two following fire. Frequent burns (e.g. yearly and preferably hot but not coinciding with Golden Sun Moth activity) should therefore be aimed for in areas supporting heavy infestations of Serrated Tussock. A burn is planned for autumn 2018.

The additional species listed below should be closely monitored and controlled immediately following weed control which exposes significant areas or bare earth as well as following any ecological or biomass-reduction burning:

- Artichoke Thistle
- Variegated Thistle
- Sweet Briar
- Spear Thistle
- African Box-thorn
- Paterson's Curse

Although the above species are currently in relatively low abundance, they have the ability to spread rapidly.

### **3.2.2. Biomass management**

The biomass management proposed for the Western Reserve in 2018 is provided in graphic form at Appendix 1.

The northern portion of the Western Reserve should be burnt in Autumn 2018. This should be a hot (high intensity) burn.

The low-lying wetter ground in the southern part of the reserve currently supports extremely high weed cover. This area is co-dominated by Cocksfoot and Chilean and Texas Needle-grasses. Only a very small amount of indigenous flora has been observed in these areas (e.g. Weeping Grass).

Once *Nassella* species have been controlled to negligible levels, burning should be reconsidered as a biomass management option for this area.

### **3.2.3. Revegetation**

Much of the, known as Management Zone B, low-lying wetter ground in the southern part of the Western Reserve, almost exclusively supported weeds. The existing management plan prescribes revegetation for Management Zone B.

Revegetation may be achieved through planting and/or direct seeding and should predominantly consist of indigenous grass species which are known to occur on the site.

Much of the immediate management effort should be focusing upon controlling the spread of weeds into sections of the study area which still support a significant indigenous element. It is therefore recommended that revegetation be delayed until key weeds are controlled to more appropriate levels across the reserve. This will also ensure minimal revegetation failure due to weed invasion from surrounding infestations. This change in approach is consistent with the adaptive management approach required by the CMP (EHP 2015a).

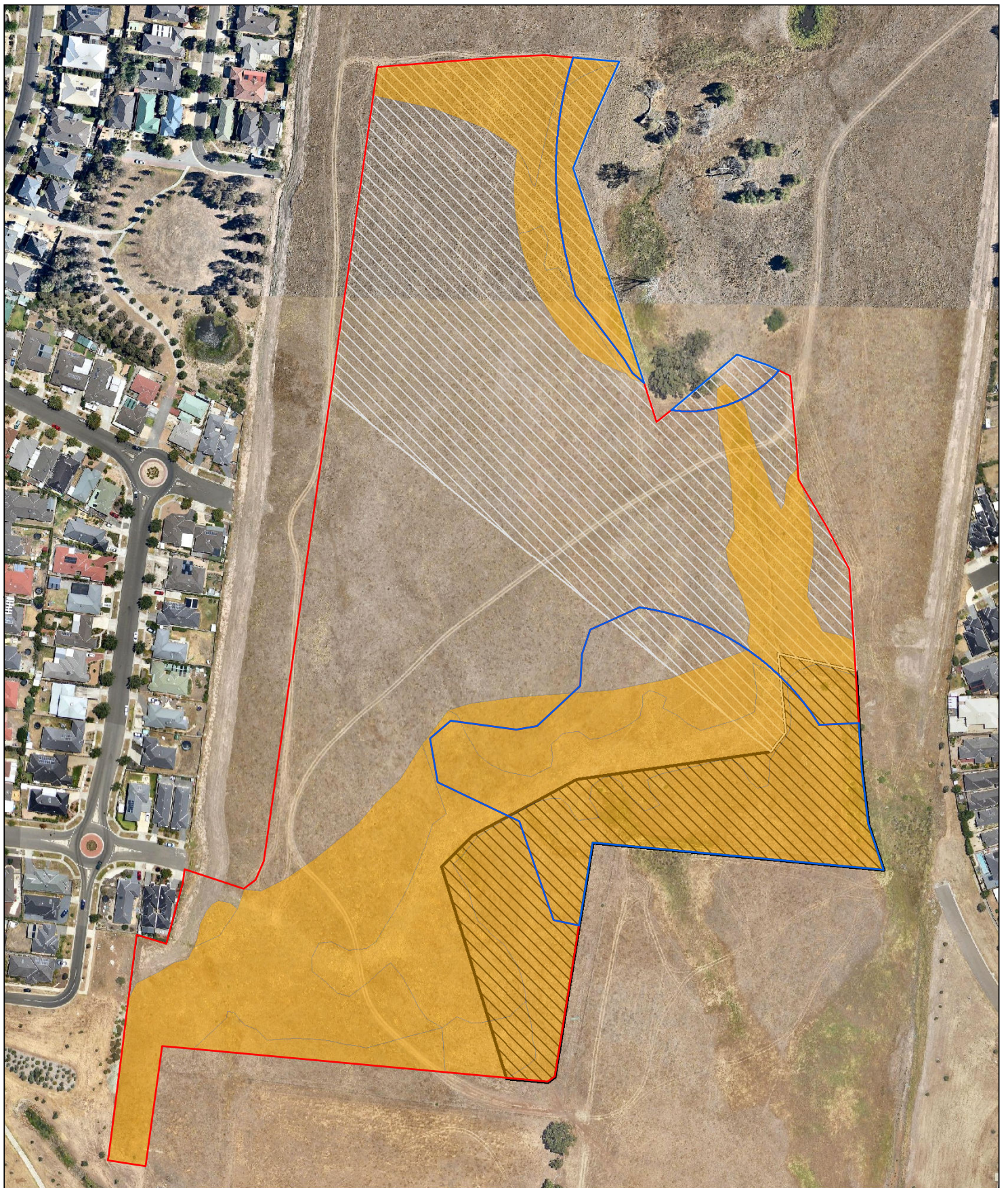
#### **4. REFERENCES**

Brett Lane & Associates (BL&A) 2017, Rosenthal Estate Conservation Management Plan Year 1 Monitoring - Report No. 15148 (2.0), Brett Lane & Associates Pty Ltd, Hawthorn East, consultant report prepared for Urban Design & Management Pty Ltd.

Ecology and Heritage Partners (EHP) 2015a, Conservation Management Plan: Rosenthal Estate, 100 Vineyard Road, Sunbury, Victoria, Consultant report for Urban Design and Management Pty. Ltd.


Ecology and Heritage Partners (EHP) 2015b, Offset Management Plan: Rosenthal Estate, 100 Vineyard Road, Sunbury, Victoria, Consultant report for Urban Design and Management Pty. Ltd.

## Appendix 1: Proposed 2018 weed and biomass management for Western Reserve



**Appendix 1: Proposed 2018 weed and biomass management for Western Reserve**

**Project:** 100 Vineyard Road, Sunbury **Client:** TF and A Millett **Date:** 10/01/2018


 Weedy areas


**Management zones**

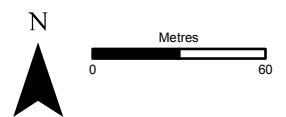
 A

 B

**Management actions**

 Autumn (preferably hot) burn

 Eliminate Nassella weeds then slash when soils are dry and keep cut material in place



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**Appendix 2: Progress against management actions listed in Table 13 of the Offset Management Plan (EHP 2015b)**

Table 13: Management Actions Table

Year	Action	Management action	Responsible authority / personnel	Timing of action	Date completed
0	0.1	Implement on-title legal agreements for offset site	Liaise between the landowner, DELWP and Council.	Within three months of this plan being approved by DELWP and DoE	2016
0	0.2	Acquire baseline monitoring data	Suitably qualified ecological specialist	Within three months of this plan being approved by DELWP and DoE	8/12/15
0	0.3	Prepare tenders for relevant management contractors where required	Landowners / engaged consultants	Prior to commencement of development	27/5/16
1	1.1	Install permanent fences and access gates surrounding the offset sites	Landowner	Within three months of this plan being approved by DELWP and DoE	2016
1	1.2	Conduct weed control	Landowner/Bushland Management Contractor	Species dependent	8/12/16
1	1.3	Monitor populations of pest animals and conduct control works if required	Landowner/Pest Animal Contractor	After peak breeding season - late summer/early autumn	8/12/16
1	1.4	Conduct monitoring for Golden Sun Moth	Suitably qualified ecological specialist	One year after commencement of OMP	16/2/17
1	1.5	Monitor biomass density and implement stock grazing regime or develop ecological burn/ fuel reduction plan if appropriate	Landowner/Bushland Management Contractor/CFA	Summer/Autumn	8/12/16
1	1.6	Contract nursery for seed collection and propagation of native species suitable for supplementary planting into <b>Management Zone B of each in-situ reserve.</b>	Landowner/Bushland Management Contractor/Local Nursery	Year 1 for potential supplementary planting in Year 2 or Year 3 and progressively on an annual or biennial basis. <b>Management Zone B – in-situ reserves only.</b>	—
2	2.1	Conduct weed control	Landowner/Bushland Management Contractor	Species dependent	19/12/17
2	2.2	Monitor populations of pest animals and conduct control works if required	Landowner/Pest Animal Contractor	After peak breeding season - late summer/early autumn	19/12/17
2	2.3	Conduct monitoring for vegetation and Golden Sun Moth	Suitably qualified ecological specialist	Two years after commencement of OMP	19/12/17
2	2.4	Maintain fences	Landowner/Fencing Contractor	As required	19/12/17

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Year	Action	Management action	Responsible authority / personnel	Timing of action	Date completed
2	2.5	Monitor biomass density and implement stock grazing regime or develop ecological burn/ fuel reduction plan if appropriate	Landowner/Bushland Management Contractor/CFA	Summer/Autumn	19/12/17
2	2.6	Commence supplementary planting within <b>Management Zone B of in-situ reserves</b>	Landowner/Bushland Management Contractor	Early Spring Year 2 – subject to availability of plants and environmental conditions	CONDITIONS NOT SUITABLE
2	2.7	Monitor and assess works, and prepare progress report for <b>both in-situ and ex-situ offsets</b>	Suitably qualified ecological specialist	Two years after commencement of OMP for <b>both in-situ and ex-situ offsets</b>	INSITU 23/1/18
3	3.1	Conduct weed control	Landowner/Bushland Management Contractor	Species dependent	
3	3.2	Monitor populations of pest animals and conduct control works if required	Landowner/Pest Animal Contractor	After peak breeding season - late summer/early autumn	
3	3.3	Conduct monitoring for Golden Sun Moth	Suitably qualified ecological specialist	Three years after commencement of OMP	
3	3.4	Maintain fences	Landowner/Fencing Contractor	As required	
3	3.5	Monitor biomass density and implement stock grazing regime or develop ecological burn/ fuel reduction plan if appropriate	Landowner/Bushland Management Contractor/CFA	Summer/Autumn	
3	3.6	Continue supplementary planting within <b>Management Zone B of in-situ reserves</b>	Landowner/Bushland Management Contractor	Early Spring Year 3 – subject to availability of plants and environmental conditions	
4	4.1	Conduct weed control	Landowner/Bushland Management Contractor	Species dependent	
4	4.2	Monitor populations of pest animals and conduct control works if required	Landowner/Pest Animal Contractor	After peak breeding season - late summer/early autumn	
4	4.3	Conduct monitoring for vegetation and Golden Sun Moth	Suitably qualified ecological specialist	Four years after commencement of OMP	
4	4.4	Maintain fences	Landowner/Fencing Contractor	As required	

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