



City of Albany
Weed Management Plan

WEED MANAGEMENT PLAN

**Reserve 2682, Albany Heritage Park
Lot 172 on Deposited Plan 222002**

Background

Albany Heritage Park ('The Mounts' comprises Mt Adelaide / Irrerup and Mt Clarence / Corndarup and surrounding environs. The Park is a place of unique social, cultural and natural value, with abundant native vegetation rich in wildlife.

The Albany Heritage Link Trails (V2) project is a planned development that will consolidate existing walking, cycling and dual-use trails in the Heritage Park. This will be through the construction of purpose-built trails to the most sustainable best-practice standard, combined with the closure and rehabilitation of existing illegally-built trails throughout the park.

As part of the process of achieving the clearing permit for the Link Trails, the City of Albany is offering various conservation and rehabilitation commitments to offset the residual impact to vegetation and habitats in the park. This Weed Management Plan commits to weed management actions to be carried out in relation to three areas of land which provide habitat for Western Ringtail Possums:

- 8.09 hectares of freehold native vegetation within Lot 172 on Deposited Plan 222002, which will be incorporated into the AHP Crown Reserve.
- Two areas of marri/jarrah forest/peppermint woodland within Reserve 2682 measuring 14ha together.



Map 1: Site context within Albany Heritage Park. Lot 172 is shown in cross-hatching

Site Assessment

A weed assessment of the three land parcels was undertaken for the City of Albany by Southern Ecology in October 2023 to inform the type and extent of weeds present.

The weed assessment was conducted by foot traverse and a hand-held GPS unit. Only weeds considered significant by Federal, State or LGA authorities were recorded. Hence, agricultural grasses and herbs may be present, but are not reported or mapped here. The survey effort was focused on tracks, firebreaks and the boundaries where weeds and vectors are generally most prevalent. Some weeds and conservation significant flora within close vicinity to the assessment boundary were also included in the mapping. Associated spatial data and maps in PDF format are appended to this report.

Fourteen weed species were recorded:

- *Acacia longifolia* – Sydney Golden Wattle
- *Asparagus asparagoides* – Bridal Creeper
- *Asparagus declinatus* – Bridal Veil
- *Cortaderia selloana* – Pampas Grass
- *Dipogon lignosus* - Dolichos Pea
- *Freesia alba x leichtlinii* – Freesia
- *Hedera helix* – Common Ivy
- *Pinus radiata* - Pine Tree
- *Pittosporum undulatum* - Victorian Box
- *Polygala myrtifolia* - Myrtle-leaved Milkwort
- *Psoralea pinnata* - African Scurf-Pea
- *Vinca major* – Periwinkle
- *Watsonia meriana var. bulbifera* – Watsonia / Bugle-Lily
- *Zantedeschia aethiopica* – Arum Lily

Three Priority-listed flora by DBCA were recorded within or close to the assessment area (or were previously known):

- *Spyridium spadiceum* (P4)
- *Stylidium falcatum* (P2)
- *Thysanotus isantherus* (P4)

The ground cover of these weeds was estimated to be between 5 – 10% within the context of the entire conservation area, with dense clusters in localised areas. Certain woody weeds and creepers are encroaching on undisturbed areas, and this threat is a key issue to address.

See *Appendix B: Weed Assessment Albany Heritage Park* for the illustrative map.

Strategic Guiding Principles

The target outcomes have been developed with consideration to the strategic framework within the City of Albany's Environmental Weed Management Planning Strategy and the following principles:

<p>Principle One</p>	<p>The Bradley Method of Bush Regeneration:</p> <p>The Bradley Method of bush regeneration as described in Bradley (Bradley 1997) works on three general principles, which are:</p> <ol style="list-style-type: none"> 1. work outwards from good bush areas towards areas of weed; 2. make minimal disturbance to the environment; and 3. let native plant regeneration dictate rate of weed removal. <p>Other important points highlighted in Bradley (1997) include:</p> <ol style="list-style-type: none"> 1. don't start on large weed infestations unless you are sure you will get back to do the follow-up work (removing parent plants may create light and space for hundreds of new weeds); 2. many plants require 3 years or more of control; and 3. aim for control, not eradication, and tipping the balance in favour of the local native plants.
<p>Principle Two</p>	<p>Prevention:</p> <p>Early detection and early intervention are the most cost-effective means of weed management.</p>
<p>Principle Three</p>	<p>Long-term Commitment:</p> <p>Effective weed management requires a long-term commitment from managers of private and public lands.</p>
<p>Principle Four</p>	<p>Coordinated Approach:</p> <p>Effective weed management requires a coordinated approach involving all relevant stakeholders.</p>
<p>Principle Five</p>	<p>Priority Setting and Planning:</p> <p>A simple and effective priority setting and planning process is required to best utilise available weed management resources.</p>
<p>Principle Six</p>	<p>Education:</p> <p>Educate others on environmental weed management, and how to reduce the risk of spreading weeds.</p>
<p>Principle Seven</p>	<p>Local Provenance:</p> <p>Local provenance plant material only (sourced from within local area of each site) will be used in revegetation projects.</p>
<p>Principle Eight</p>	<p>Minimise transportation of weed material/sustainable weed disposal:</p> <p>Weeds that have been cut or pulled will be left in the bush if possible, as it will result in minimising disturbance to native vegetation, reducing the risk of spread, using less energy to remove material from the site and incurring less cost in disposing of material. Where necessary, seed carrying material will be removed from the site to be disposed of appropriately to minimise further spread.</p>

Objectives

- Establishment of resilient and self-sustaining vegetation achieved through weed control measures, revegetation, and by providing protection from disturbance through closure of unauthorised pathways and access roads.
 - A key disturbance issue has been identified regarding the future conservation reserve at Lot 172 on Deposited Plan 222002, with unauthorised driveways having been constructed through the bushland. The City commits to enforcing closure of these driveways and constructing an alternate access, with weed eradication works and rehabilitation carried out on the former driveways and surrounds.
- Recording and monitoring of locally significant weeds or those listed by State or Commonwealth agencies.
- Implementation of the management practices contained in the Albany Heritage Park Link Trails Operational Hygiene Management Plan (Appendix D).
- The completion criteria were developed to address the SMART principles:
 - Specific: reference vegetation units that were surveyed prior to disturbance and or construction.
 - Measurable: permanent monitoring quadrats to be established in weed management areas and adjacent undisturbed vegetation.
 - Achievable: criteria developed with the understanding of the constraints of the site and the resources available to the City of Albany Reserves team.
 - Relevant: reference sites will be chosen to target primary concerns.
 - Time-bound: a program of monitoring, contingencies, and measuring success.

Target outcome	Indicators	Data source/methodology
Active management of high priority weeds and/or weeds that threaten priority flora	Reduction in extent / density of weeds to 2-5%	Follow-up site assessment in Spring City of Albany Reserves records Permanent monitoring quadrats to be established in weed management areas and adjacent undisturbed vegetation Monitoring sites to be established in target areas for photo monitoring
Closure of unauthorised driveways traversing Lot 172 (see Appendix C) to restrict access to conservation area	Closure of driveways and construction of crossover in neighbouring road reserve	Issuing of compliance requirements for landowners Construction of alternate crossover and physical closure of driveways
Introduction of new weeds prevented	No new weeds introduced and no increase in weed cover	Follow-up site assessment in Spring City of Albany Reserves records Monitoring sites to be established in target areas for photo monitoring

Target outcome	Indicators	Data source/methodology
Improved protection for possum habitat bushland against weed incursion	Complete eradication of weed species encroaching on undisturbed bushland	Follow-up site assessment in Spring Monitoring sites to be established in target areas for photo monitoring
Continue to collaborate with partner agencies, community groups and landholders, to plan and implement weed programs	Arrangements with Friends Of groups and NRMs	City of Albany Reserves records

Methodology

City of Albany weed control methods at Albany Heritage Park and environs

Method	Species suitable for	Notes	Advantages	Disadvantages
Hand removal or digging	Young plants Small plants	Good for community busy bees. Need to remove whole plant.	No chemicals. Allows selective removal of weeds.	Not suitable for some species, such as watsonia and gladiolus where it is difficult to remove all reproductive material or when infestations are large.
Spot spray	Grasses and annuals Woody weed seedlings	Application of diluted herbicide with hand-held spray gun. Foot paths, turf, medium strips, urban gutters	Effective. Selective. Can be done by knapsack or with vehicle mounted spray unit. Can cover a lot of ground. Minimises herbicide wastage.	Weather dependent.
Cut	Taylorina	Some species will coppice if herbicide not also applied.	If material is removed from site it can be visually pleasing and reduce fuel loads.	Labour intensive. Need to find bare area to lay cut material on; or dispose of material off site.
Cut and paint	Sydney Golden Wattle Victorian Teatree	Good for small infestations	If material is removed from site it can be visually pleasing and reduce fuel loads.	Labour intensive. Need to find bare area to lay cut material on; or dispose of material off site.
Basal bark treatment	Sydney Golden Wattle Taylorina Eastern states Eucalyptus sp	Diluted herbicide is painted or sprayed on the bark at the base of tree, from ground level to 50 cm. Road verges or within natural reserves.	Allow plant to die in-situ. Less labour involved. Minimal site disturbance. No risk of regrowth. Target weed only affected.	Can be unsightly if in public place. Must be applied around entire trunk when trunk surface is dry.
Mowing	Annual grasses	Previously cleared areas.	Covers large area with minimal labour time.	Needs maintenance unless used with other techniques. Can spread weeds too.

Method	Species suitable for	Notes	Advantages	Disadvantages
Mulching using loose particles of organic matter e.g. woodchips	All	Suppresses weeds after other techniques used.	Medium-term results; gives natives chance to establish and shade out weed species. Best to use mulched material from same site, or mulch that contains no weed seed.	Can be labour intensive, but if planned ahead, can reuse material produced from another site.
Biological control	Bridal Creeper Rust	Already established in Albany; spread by wind; can move around by taking infected leaves to new site.	No works required.	Won't eradicate it, but just prevents it from increasing too quickly.
Broadscale spraying	Watsonia Other weeds	Roadsides	Cost and time efficient; allows City to keep to schedule for maintaining roadsides. Selective chemicals can be used.	All vegetation on road side is killed if non-selective chemical used. Weather dependent.
Mechanical mulching	All, but woody weeds in particular	Large infestations such as at old resource pits or other highly disturbed sites.	Covers large area with minimal labour time.	Removes most habitat in one hit. Need to be mindful of fauna using the site.
Brushcutting	Annual species Trail edges Small disturbance sites	Controls and reduces above ground biomass. To be done before seed set.	Delays production of seed. Will eventually deplete the soil seed store.	
Scrape and paint	Large vines and scrambling plants with woody stem	Scrape 20cm to 100cm of the stem with a knife, for a third of the stem to expose the sapwood just below the bark. Apply herbicide immediately to the scaped section.	Effective method of control.	Time consuming for large populations.
Drowning	Emergent species e.g. Bulrush and Kikuyu	Used sometimes in conjunction with herbicide treatments. Suited to wetland areas. Need to cut plants below the water levels.	Effective method for emergent species.	Time consuming.

Monitoring and Contingency Measures

Monitoring is the quantitative method of assessment of compliance to completion criteria targets and the achievement of weed eradication. Monitoring triggers when contingency measures are to be implemented.

Additionally, the City will undertake weed control monitoring alongside rehabilitation monitoring in the Heritage Park, which is likely to include:

- Evidence of weed control events undertaken (photos and receipts/invoices);
- Weed species observed during weed control events;
- Evidence of vehicle inspections (inspection records);
- Photos of public access prevention;
- Photos of weed prevention;
- Results of vegetation condition mapping including:
 - Percentage of each condition type across rehabilitation areas;
- Results of revegetation monitoring including:
 - Percentage survival / mortality of planted seedlings within revegetation areas; and
 - Any evidence of water stress / potential factors contributing to mortality.

Contingency measures

Trigger	Action
Increase in distribution, abundance or density/cover of a specific weed species or persistence (within quadrats) of weed infestation subsequent to treatment (with a threshold of over 5% coverage)	<p>Map the revised extent of the specific weed species within the site.</p> <p>Identify activities that may have potentially increased the abundance, distribution, or density/cover of weed species.</p> <p>Review and revise (if required) weed control program (may involve seeking advice from relevant authorities) according to findings.</p> <p>Implement revised hygiene control and education measures.</p>
New weed species observed within monitoring sites or opportunistically within rehabilitation areas	<p>Map the distribution of the newly introduced weed species.</p> <p>Identify activities that may have potentially introduced the weed species.</p> <p>Review and revise (if required) weed control program (may involve seeking advice from relevant authorities) to include relevant controls for new species.</p> <p>Implement revised hygiene control and education measures.</p>
Unrestricted or unauthorised access	<p>Determine how access was gained and, if possible, the likely time of access.</p> <p>Implement remedy, which could include:</p> <ul style="list-style-type: none"> • Erecting signs to highlight private property.

	<ul style="list-style-type: none"> • Installing barriers around pedestrian paths. • Monitoring success of control.
Fire incident	<p>Respond to fire in accordance with relevant Department of Fire and Emergency Services (DFES) and/or the City's fire response procedures.</p> <p>Investigate cause of fire.</p> <p>Implement any remedial actions, if practicable, to prevent future fire incidents, seeking advice of DFES if necessary.</p> <p>Monitor success of remedy.</p>
Inadequate native flora species richness and/or cover	<p>Identify cause.</p> <p>Implement approach to remedy cause, which could include:</p> <ul style="list-style-type: none"> • Collecting additional provenance seed for direct seeding or plant propagation to compensate for the insufficient native plant species richness and/or cover. • Undertake infill seedling planting and direct seeding. • Application of fertilisers or wetting agents etc, as approved by DBCA. • Monitor success of remedy.

Schedule and timescales

Action	Timing
Active management of high priority weeds and/or weeds that threaten priority flora	Weed control will occur up to four times in 12 months, depending on weeds present and severity of infestation (most likely timing: late autumn, midwinter, mid-spring, early summer). Up to 12 months of weed control will be undertaken prior to any revegetation works occurring. This will continue on a rolling program in coordination with the works detailed in the Albany Heritage Park Trails Link Project Rehabilitation Management Plan (Appendix E).
Closure of unauthorised driveways traversing Lot 172 (see Appendix C) to restrict access to conservation area	Compliance measures issued by the City of Albany to commence in the immediate future. Works to construct an alternate crossover and physically close the unauthorised driveways to be undertaken within two years of the compliance measures.
Introduction of new weeds prevented	Operational Hygiene Management Plan (Appendix D) measures to be adopted by all City staff and contractors during the trails construction program and closure of unauthorised trails and access tracks.
Eradication of weed species encroaching on undisturbed bushland	A rolling program of weed management over the five year rehabilitation program, with continuing monitoring and contingency measures applying beyond.
Collaboration with partner agencies and community groups to plan and implement weed programs	Ongoing and in accordance with issues identified during monitoring activities.
Monitoring activities	Establish permanent monitoring quadrats. Follow-up site assessments to monitor weeds to take place in Spring. Photo monitoring of reference sites to take place up to four times in 12 months, with likely timing to coincide with weed control programs.

Appendices

Appendix A: Map of weed management areas within the Albany Heritage Park with conservation areas shown

Appendix B: Weed assessment of conservation areas in Albany Heritage Park

Appendix C: Map showing planned closures of unauthorised driveways constructed in Lot 172 on Deposited Plan 222002

Appendix D: Operational Hygiene Management Plan (Weeds and Dieback) for Albany Heritage Park, Great Southern Biologic, August 2022

Appendix E: Albany Heritage Park Trails Link Project Rehabilitation Management Plan, JBS&G Australia, January 2023

Appendix F: Shapefiles of conservation and weed management areas

Appendix G: Shapefiles of weed management areas and significant weed colonies within