

City of Albany
Management plan

ENVIRONMENTAL WEED MANAGEMENT PLAN

Document Approval			
Document Development Officer:		Document Owner(s):	
Reserves Officer		Executive Director Infrastructure & Environment Manager Reserves	
Document Control			
File Number - Document Type:	EM.PLA.1 - Management Plan		
Document Reference Number:	NMP1999130		
Status of Document:	Council decision: Adopted 26/03/2019		
Quality Assurance:	Executive Director Infrastructure and Environment		
Distribution:	Public Document		
Document Revision History			
Version	Author	Version Description	Date Completed
0.1	Reserves Officer	Author: Sandra Maciejewski - Draft v1, prepared for stakeholder consultation and review by Council.	22/02/2019
1.0	Reserves Officer	Adopted by Council on 26/03/2019 Report Item DIS151.	26/03/2019

CONTENTS

Vision	4
Objective	4
Scope	4
Stakeholders	4
Strategic Context	5
Strategic Guiding Principles	6
Objectives and Strategies	7
Priority Reserves	9
Priority Weeds	10
Weed Management Plans	14
Weed Mapping	14
Implementation	14
Review Position and Date	15
Associated Documents	15
APPENDIX 1: Annual Action Plan for the City of Albany Environmental Weed Management Plan (October 2018 - September 2019)	16
APPENDIX 2: Weed Control Methods Used by the City of Albany	20
APPENDIX 3: Weed Control Methods Not Used by the City of Albany. Modified from the City of Joondalup (2016)	23
APPENDIX 4: Herbicides used by the City of Albany	25

Vision

To control environmental weeds in high conservation and community valued City of Albany reserves, while supporting community groups actively involved in caring for the City's reserves.

Objective

The objective of this strategy is to provide a targeted approach to controlling environmental weeds on land managed by the City of Albany.

Given the scale of the weed problem, and the amount of land for which the City is responsible, it is essential that areas of high conservation value and community interest, and priority weeds be targeted, as resource levels do not permit for all weeds in all areas to be controlled. By focussing the resources that are available on priority tasks, better on-ground outcomes will be achieved.

Scope

This strategy applies to all land managed by the City of Albany. This includes Crown land reserves, road reserves and any freehold land under the care and control of the City.

There are more than 438 City of Albany reserves comprising 12,227 ha of land. These reserves range in use from Public Open Space, active sporting grounds to passive natural bushland recreation space. Some of these reserves are isolated, whilst others are grouped together. The largest grouping of City of Albany reserves is 3,060 ha in size and is located between Sandpatch and Cosy Corner, and comprises primarily of natural vegetation. The smaller reserves can be less than 1 ha in size, with some simply being drainage easements.

The City also manages 1,132 ha of freehold land, and 1,629 km of roads and associated verges.

Stakeholders

Implementation of this plan is primary the responsibility of the Reserves Team, under the City's Infrastructure and Environment Directorate.

Stakeholders of this Strategy include everyone who lives and/or works within and adjacent to the City of Albany, as everyone has the potential to impact on weeds, whether it be in a negative or positive manner.

Although this Strategy is written primarily for City land, if weed control techniques were applied to only these areas, then recontamination from adjacent land would continuously undo any work undertaken. Therefore, an important component of this Strategy is to educate the general public on environmental weed management, and to encourage them to undertake weed control works on lands for which they are responsible and to reduce the risk of spreading weeds.

Strategic Context

Australian Weeds Strategy 2017 to 2027 – This document provides national guidance on best practice weed management. It aims to guide coordination of effort across all jurisdictions and affected stakeholders and to inform plans and actions by state and territory governments, local governments, regional natural resource management agencies, as well as by industry, landowners and the wider community. It provides a national framework for addressing weed issues whilst maintaining the profitability and sustainability of Australia’s primary industries and reducing the impact of weeds on the environment.

Environmental Weed Strategy for Western Australia (CALM 1999) - This Strategy lists 1,350 environmental weeds of actual and potential significance in Western Australia, including terrestrial, aquatic and marine. These species have been rated based on their impacts on biodiversity according to predetermined criteria.

Community Strategic Plan – Albany 2023 - The Albany community and Council have identified that it is important to them to protect and enhance our natural environment.

Key Focus Area

2. Clean, Green and Sustainable

Community Priority

2.1 To protect and enhance our natural environment.

Natural Reserves Strategy and Action Plan 2017 – 2021 - This document recognises the importance of managing environmental weeds by the City of Albany.

Strategic Goal

1.3. To reduce the impact of invasive species on the natural environment.

Strategic Guiding Principles

The guiding principles which form the basis for actions in this Strategy are in Table 1.

TABLE 1 Strategic Guiding Principles for Environmental Weed Management

<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 and Strategies

The objectives and strategies for this Strategy are listed below in Table 2. They are not listed in order of priority.

TABLE 2 Objectives and Strategies of the Environmental Weed Strategy

Objective 1:

To improve the condition of bushland in Priority City of Albany Reserves (as identified in this Plan) and in close proximity to conservation listed flora and ecological communities, through the control of environmental weeds and other related activities.

Strategies

- 1.1. Prepare and implement weed management plans for Priority City of Albany reserves as identified in this Plan.
- 1.2. Control weeds that threaten conservation listed flora or ecological communities on land vested with the City of Albany.
- 1.3. Undertake weed mapping where it assists with implementing strategies within this document. Utilise modern technology to make mapping on-the-job friendly for staff.
- 1.4. Assess effectiveness of weed control techniques to deliver more effective and targeted control of environmental weeds.

Objective 2:

To control Weeds of National Significance (WONS), Declared Species, Alert Weeds and Pest Plants on land managed by the City of Albany.

Strategies

- 2.1 Plan and implement an annual program to control Declared Species, Alert Weeds, and Pest Plants on land managed with the City of Albany.
- 2.2 Consider developing a Pest Plant Local Law for the City of Albany.

Objective 3:

To encourage and acknowledge other organisations, groups and individuals actively involved in the management of bushland on land vested with the City of Albany to continue to undertake works that are conducive to implementing this Plan.

Strategies

- 3.1 Attend meetings of the Bushcarers and other community groups to provide information on City of Albany weed control programs.
- 3.2 Assist community groups, individuals and other organisations to undertake weed control works on land vested with the City of Albany.

Objective 3: (Continued)

- 3.3 Assist community groups with preparing grant applications for funding to undertake environmental weed control works within the City of Albany.
- 3.4 Promote the achievements of the City of Albany, Bushcarers Group, Progress Associations and other groups and individuals involved in the management of weeds.
- 3.5 Encourage and educate private landholders and businesses, to undertake weed control works on their land, such as plantation companies and lease holders.
- 3.6 Place conditions on new developments to adequately address weed infestations on land to be developed, as well as on Public Open Spaces.
- 3.7 To a limited extent, target weed “black spots” that are prominent and of high importance to the general community, with adequate consideration of native fauna that may inhabit these areas.
- 3.8 Encourage the Albany community to stop dumping green waste in bushland by implementing the “Bush Watch Program”.

Objective 4:

To minimise the impact of capital works and maintenance works on the spread of weeds, and utilise these activities, where possible, to include weed control.

Strategies

- 4.1 Implement the Environmental Code of Conduct for Works on City of Albany Controlled land.
- 4.2 Implement the Environmental Impact Assessment Procedure, where all City capital works are assessed and mitigation procedures are applied.
- 4.3 Undertake pre-fire assessments, monitor and implement post-fire weed control works.
- 4.4 Control woody weeds in the vicinity of Rural Road Maintenance and Fire Access Track Maintenance Programs, to reduce the ongoing maintenance requirements.
- 4.5 Develop a program to control weeds and rehabilitate old resource pits and disposal sites on City land.

Objective 5:

To ensure that the City of Albany does not work in isolation, but is aware of, or actively involved with National, State and Regional initiatives addressing environmental weed management.

Strategies

- 5.1 To participate in the development and implementation of National, State and Regional initiatives addressing environmental weed management.

Priority Reserves

Priority reserves within this Strategy have been identified for their high conservation value, proximity to conservation reserves and for the level of community interest in actively managing these areas. These criteria are further discussed in Table 3.

TABLE 3 Justification for Priority Reserves for Environmental Weed Control

Size & Shape
The bigger the patch of bush, the better, and the more compact the patch of bush the better. This is due to the perimeter to area ratio being lower, and as a result the proportion of the area influenced by “edge effect” is reduced. Edge effect comprises of those factors that affect the edges of bush, such as wind speed, temperature, humidity, solar radiation, chemical drift off farmland, invasion and competition from organisms on surrounding lands, human incursion and disturbance.
Condition
Bushland in good condition is of greater conservation value than areas that are degraded and have been altered significantly from their original form. Areas in good condition require much less effort and resources to keep them in good condition than areas that are already degraded. Good condition bushland is also more resilient to change compared to degraded areas. See Table 3 for condition classification used by the City.
Proximity to Conservation Reserves
Reserves adjacent to conservation reserves have a higher conservation value than isolated ones. This is especially so where the adjacent bushland is protected for conservation purposes such as National Parks and Nature Reserves. Continuous vegetation can form important corridors that allow for the movement of native animals and plant genes. It also makes the total area of vegetation in that area bigger (see “size” above) and usually in better condition (see “condition” above). Within the City of Albany, there is a near continuous corridor of vegetation along the entire coastline. This corridor was recognised and named the “Coastal Macrocorridor” through a project undertaken by CALM, called the “South Coast Macro Corridor Project”.
Community Interest and Use
Reserves where active community groups exist or have the potential to be developed are regarded to be of higher priority than those reserves that community interest is unknown. The reason for this is that community groups are regarded as a valuable resource to the City, as it is impossible for the City to manage and maintain all of the land under its management on its own. Community groups can (and already do in some cases) play an extremely important role in assisting the City to maintain reserves.

TABLE 3 (Continued)

Time already invested by the City of Albany

Reserves where the City of Albany and the other groups and individuals have already invested time and effort are a priority over reserves where no environmental weed control works have been undertaken to date. If these previous works are not followed up (control of any reoccurring weeds on an ongoing basis), then those initial works could potentially have been a waste of time, as the weeds could regain hold. Maintenance of reserves from environmental weeds can take many years, until the weed seed source is deleted. However, if recontamination occurs, then maintenance will be ongoing indefinitely.

Reserves identified as a priority in this Strategy, and justification for their selection, are listed in Table 4. These reserves are in order of priority. This list is similar to the priority list in the previous version of this Plan, with Mount Martin removed as it now managed by the Department of Biodiversity, Conservation and Attractions, and Mount Melville has been promoted to being Priority 2, as community interest in this reserve has increased in recent years. The aim is to work towards getting Priority 1 to “maintenance level”, before moving to Priority 2 and so on.

“Maintenance level” means that there are no mature woody weeds present, and a program suitable for the site and weeds being controlled is developed to maintain the reserve into the future.

Vegetation condition by the City is determined using the categories in Table 5, as described by Kaesehagen (1995).

Priority Weeds

Some species will be targeted throughout the City of Albany, as they are Weeds of National Significance (WONS), Declared Plants, Alert Weeds or Pest Plants. The species that fall into these categories are seen as our priority species and annual programs will be developed and implemented to address these species.

Weeds of National Significance (WONS) – Thirty-two species have been agreed to be WONS by Australian governments, based on an assessment process that prioritised these weeds based on their invasiveness, potential for spreading and environmental, social and economic impacts.

Eight WONS are recognised as occurring within the City of Albany:

- Arrowhead *Sagittaria platyphylla*
- Asparagus Fern *Asparagus scandens*
- Asparagus Fern *Asparagus aethiopicus*
- Blackberry *Rubus* spp.
- Bridal Creeper *Asparagus asparagoides*
- Bridal Veil *Asparagus declinatus*
- Gorse *Ulex europaeus*
- Lantana *Lantana camara*.

National Environmental Alert Weeds – The purpose of the National Environmental Alert List is to identify those species that are in the early stages of establishment and have the potential to become a significant threat to biodiversity if they are not managed. There are currently 28 species on this list with only six of these known to occur in Western Australia and only two species are known from the City of Albany:

- False Yellowhead *Dittrichia viscosa*
- Holly-leaved Senecio *Senecio glastifolius*

Declared Plants – To protect Western Australian agriculture, the Department of Primary Industries and Regional Development regulates harmful plants under the Biosecurity and Agriculture Management Act 2007 (BOM Act). Plants that are prevented entry into the State or have control or keeping requirements within the State are known as declared pests.

If a declared pest is found in the area, land owners/occupiers and other persons must adhere to requirements under the BOM Act 2007 and its subsidiary legislation. Eight Declared Plants that are known to occur on land vested with the City of Albany.

- Apple of Sodom *Solanum linnaeanum*
- Arum Lily *Zantedeschia aethiopica*
- Blackberry *Rubus fruticosus*
- Cape Tulip *Moraea flaccida* & *M miniata*
- Golden Dodder *Cuscuta campestris*
- Gorse *Ulex europaeus*
- Paterson's Curse *Echium plantagineum*
- Sagittaria *Sagittaria platyphylla*

TABLE 4 Priority Reserves for Environmental Weed Management

RESERVE NAME	JUSTIFICATION
1. Mount Clarence & Mount Adelaide (incl Bluff and Wagon Rocks)	<ul style="list-style-type: none"> Majority of bushland in very good to excellent condition. Large area of reserve is at maintenance level. High community interest and use. Aesthetic values from CBD. Active community group exists. Already invested time into controlling environmental weeds in this area.
2. Mount Melville	<ul style="list-style-type: none"> Bushland in good condition, but weeds are a major threat. High community interest and use. Aesthetic values from CBD. Potential of active community group. Already invested time into controlling environmental weeds in this area.
3. Lake Seppings to Emu Point (incl Middleton Beach)	<ul style="list-style-type: none"> Bushland condition varies, with some areas in good condition. Some areas at maintenance level. High community interest and use. Active community group exists at Lake Seppings and Emu Point. Already invested time into controlling environmental weeds in this area.
4. Little Grove to Frenchman Bay (incl Vancouver Peninsula)	<ul style="list-style-type: none"> Bushland condition varies, with some areas in excellent condition. Active community groups in Little Grove and Goode Beach. Adjacent to conservation estate. Major tourist route. Already invested a lot of time into controlling weeds in this area.
5. Sandpatch to Cosy Corner	<ul style="list-style-type: none"> Largest continuous area of bushland vested with the City. Bushland in excellent condition. Active community groups at Cosy Corner and Torbay. Adjacent to conservation estate, part of Coastal Macro Corridor.
6. Bon Accord Reserves	<ul style="list-style-type: none"> Vegetation in excellent condition. Supports a Priority Ecological Community and Threatened Flora. Already invested a lot of time into controlling weeds in this area.
7. Marbellup Reserves	<ul style="list-style-type: none"> One of the largest City of Albany bushland reserves. Bushland in excellent condition, with weeds a threat at some locations. Includes old gravel extraction site and old tip sites. High potential to rehabilitate reserve.
8. Kalgan River	<ul style="list-style-type: none"> Riparian area of major waterway. Already invested time in controlling environmental weeds in this area. Existing active community group.
9. King River	<ul style="list-style-type: none"> Riparian area of major waterway. Already invested time in controlling environmental weeds in this area. Existing active community group.
10. Bettys Beach	<ul style="list-style-type: none"> One of the largest City of Albany reserves. Bushland in excellent condition, with minimal weeds. Supports Threatened Ecological Community and Threatened Flora. Adjacent to large areas of bush managed by Water Corp and CALM.
11. Lowlands Beach	<ul style="list-style-type: none"> One of the largest City of Albany bushland reserves. Part of Coastal Macro Corridor. Bushland in excellent condition, with minimal weeds. Active community group working in reserve.
12. Cheynes Beach	<ul style="list-style-type: none"> Vegetation is good condition. Surrounded by conservation reserves.

TABLE 5 Vegetation condition categories to be used when assessing the condition of the vegetation in City of Albany reserves (Kaesehagen 1995).

CATEGORY	DESCRIPTION OF EACH CATEGORY
Very Good – Excellent	80-100 % native flora composition. Vegetation structure intact or nearly so. Cover / abundance of weeds less than 5 %. No or minimal signs of disturbance.
Fair to Good	50-80 % native flora composition. Vegetation structure modified or nearly so. Cover / abundance of weeds 5–20 %, any number of individuals. Minor signs of disturbance.
Poor	20-50 % native flora composition. Vegetation structure completely modified. Cover / abundance of weeds 20-60 %, any number of individuals. Disturbance incidence high.
Very Poor	0-20 % native flora composition. Vegetation structure disappeared. Cover / abundance of weeds 60–100 % cover, any number of individuals. Disturbance incidence very high.

Pest Plants - Under the *BOM Act*, local government authorities can prescribe any plant, other than a Declared Plant, to be a pest plant. It is each local government authority’s responsibility to schedule a plant for pest plant status and administer the pest plant sections of the *BOM Act* in respect of that plant. At present there is no Pest Plant Local Law for the City of Albany. It is essential when considering the development of a Pest Local Law, how it will be administered. Staff resources would need to be made available to inspect properties, notify landowners of the presence of a pest plant on their property, potentially arrange for works to be undertaken on private property if not undertaken by owner and the administration involved in seeking payment for such works.

Environmental Weeds - The Environmental Weed Strategy for Western Australia defines environmental weeds as “plants that establish themselves in natural ecosystems (marine, aquatic and terrestrial) and proceed to modify natural processes, usually adversely, resulting in the decline of the communities they invade” (CALM 1999). The most common environmental weeds that occur within the City of Albany are listed in Table 6. These species have not been prioritised.

Weed Management Plans

Weed management planning will be undertaken in priority reserves. Reserves will be divided up into management cells (likely to mirror fire management cells), and the appropriate weed control will be applied. The aim is to get each cell down to maintenance level which only requires a maintenance run on an annual or biennial basis. Areas still requiring intensive weed control are to be identified and specific projects developed to manage the area.

TABLE 6: A list of most common environmental weeds within the City of Albany

Common Scientific name	Common Scientific name
African Cornflag <i>Chasmanthe floribunda</i>	Pampas Grass <i>Cortaderis selloana</i>
African Lovegrass <i>Eragrotus curvula</i>	Pinaster Pine <i>Pinus pinaster</i>
Agapanthus <i>Agapanthus praecox</i>	Purple African Daisy <i>Senecio glastifolius</i>
Arum Lily <i>Zantedeschia aethiopica</i>	Purple Groundsel <i>Senecio elegans*</i>
Blackberry <i>Rubus spp.</i>	Radiata Pine <i>Pinus radiata</i>
Blackwood <i>Acacia melanoxylon</i>	Rose Pelargonium <i>Pelargonium capitatum*</i>
Bridal Creeper <i>Asparagus asparagoides</i>	Silver Wattle <i>Acacia dealbata</i>
Bull Rush <i>Typha orientalis</i>	Sweet Pittosporum <i>Pittosporum undulatum</i>
Canary Creeper <i>Senecio tamoides</i>	Sydney Golden Wattle <i>Acacia longifolia</i>
Cootamundra Wattle <i>Acacia baileyana</i>	Tagasaste <i>Chamaecytisus palmensis</i>
Dolichos Pea <i>Dipogon lignosis</i>	Tangier Pea <i>Lathyrus tingitanus</i>
Flinders Range wattle <i>Acacia iteaphylla</i>	Taylorina <i>Psoralea pinnata</i>
Gorse <i>Ulex europaeus</i>	Victorian Tea Tree <i>Leptospermum laevigatum</i>
Inkweed <i>Phytolacca octandra</i>	Watsonia <i>Watsonia spp</i>
Kangaroo Apple <i>Solanum aviculare</i>	Wavy Gladiolus <i>Gladiolus undulates</i>
Lantana <i>Lantana camara</i>	Yellow-flowered Stinkwort <i>Dittrichea viscosa</i>
Myrtle-leaved Milkwort <i>Polygala myrtifolia</i>	
Introduced eucalyptus species in bushland areas e.g. Tasmanian Bluegum	
Introduced grasses in good bushland e.g. Kikuyu	

*These species are considered by some to be “naturalised”. This is due to them being very widespread, and that they serve a purpose in stabilising soil, in particular on sand dunes. These species will be controlled only in areas where they are not widespread, and are isolated from other areas i.e. in the middle of an area of bushland in excellent condition.

Weed Mapping

Weed mapping will be undertaken where it is determined to be useful to future on-ground works. For example, locations of priority weed control sites will be mapped to assist with the planning of follow-up works.

Mapping will also be used to define weed control cells within Priority Reserves. Once at reserves are at maintenance level, areas of continued active weed control will also be mapped and works scheduled in.

Implementation

Implementation of this plan is primarily reliant on an annual operational budget provided through City of Albany Council and funding opportunities.

Table 7 indicates what was spent on environmental weed control (including staff, contractors and materials) over the past six financial years. The true figure would actually be higher than indicated here, as it does not include coordination costs. These funds are often used to leverage grant funding being sought by community groups and not-for-profit organisations to undertake additional weed control works on Council and other land within the City of Albany. With the 2004/2005 budget for controlling environmental weeds at \$148,038, these figures show that the City has been gradually spending more on this task which is likely due to more staff resources being allocated and grant funding.

TABLE 7 Council dollars spent on Environmental Weed Control

FINANCIAL YEAR	AMOUNT
2012-13	\$137,645
2013-14	\$130,941
2014-15	\$174,914
2015-16	\$274,366
2016-17	\$206,747
2017-18	\$184,594

To assist with the implementation of this Plan, an Annual Action Plan will be developed based on the objectives and strategies in this Strategy. The first year's Action Plan can be viewed in Appendix 1.

The weed control techniques that the city employs are outlined in Appendix 2.

Appendix 3 outline those techniques that the City doesn't not currently employ.

The herbicides that the City uses to control weeds is listed in Appendix 4, with information on when each is used and on what species.

Review Position and Date

This document is to be reviewed in five years.

Associated Documents

- Bradley J. 1997. *Bringing Back the Bush – The Bradley Method of Bush Regeneration*. Lansdowne Publishing Pty Ltd, The Rocks, NSW, Australia.
- CALM. 1999. *Environmental Weed Strategy for Western Australia*. Department of Conservation & Land Management, Como, WA, Australia.
- City of Albany. 2013. *Community Strategic Plan. Albany 2023*. City of Albany, Albany.
- City of Albany. 2017. *Natural Reserves Strategy & Action Plan. 2017-2021*. City of Albany, Albany.
- City of Joondalup. 2016. *Weed Management Plan*. Joondalup WA.
- Commonwealth of Australia. 2017. *Australian Weeds Strategy 2017 to 2027*.
- Kaesehagen D. 1995. *Bushland Condition Mapping*. Pp 33-39 In Burke G (Ed) *Invasive Weeds & Regenerating Ecosystems in Western Australia*, Murdoch University.

APPENDIX 1: Annual Action Plan for the City of Albany Environmental Weed Management Plan (October 2018 - September 2019)

#	ACTION	RESPONSIBILITY	MONTH
Strategy 1.1 Prepare and implement weed management plans for Priority City of Albany reserves as identified in this Plan.			
1	Prepare and implement a weed management plan for Mount Clarence/Adelaide, where whole reserve is covered/searched for weeds and future weed control requirements are identified and planned.	Reserves Coordinator	Oct
2	Prepare a weed management plan for Bluff Rock and implement, where whole reserve is combed for weeds and future weed control requirements are identified and planned.	Reserves Coordinator	Oct
3	Prepare a management plan for Wagon Rock and implement, where whole reserve is combed for weeds and future weed control requirements are identified and planned.	Reserves Coordinator	Mar
Strategy 1.2 Control weeds that threaten conservation listed flora or ecological communities on land vested with the City of Albany.			
4	Liaise with DBCA to identify any conservation listed plants or communities that require weed management, and undertake works if feasible.	Reserves Officer	July
Strategy 1.3 Undertake weed mapping where it assists with implementing strategies within this document. Utilise modern technology to make mapping on-the-job friendly for staff.			
5	Develop a Blackberry spray program and implement.	Reserves Coordinator	Dec-Jan
6	Liaise with SCNRM on locations of Gorse for spraying through their program.	Reserves Coordinator	Dec-Jan

#	ACTION	RESPONSIBILITY	MONTH
Strategy 1.4 Assess effectiveness of weed control techniques to deliver more effective and targeted control of environmental weeds.			
7	Hold a team discussion on effectiveness of weed control techniques being used and explore if there are any techniques that should be trialled. Trial new techniques and communicate results with team and others involved in weed control.	Reserves Leading Hand	Oct
Strategy 2.1 Plan and implement an annual program to control Declared Species, Alert Weeds, and Pest Plants on land managed with the City of Albany.			
8	Implement <i>Senecio</i> control in known control areas, and remove from any new populations. Liaise with other agencies who have secured funding for <i>Senecio</i> control within the City of Albany to improve coordination of control programs.	Reserves Coordinator	Oct-Dec
9	Control other priority weeds within priority reserves, and as reported by public where feasible.	Reserves Coordinator	All year
Strategy 2.2 Consider developing a Pest Plant Local Law for the City of Albany.			
10	Hold a meeting to discuss the development of a Pest Plant Local Law.	Reserves Officer	July
Strategy 3.1 Attend meetings of the Bushcarers and other community groups to provide information on City of Albany weed control programs.			
11	Attend Bushcarers Group, Progress Association and other community group meetings.	Reserves Coordinator NR Leading Hand	Monthly
Strategy 3.2 Assist community groups, individuals and other organisations to undertake weed control works on land vested with the City of Albany.			
12	Help community groups plan and run busy bees on City land.	NR Leading Hand	All year
Strategy 3.3 Assist community groups with preparing grant applications for funding to undertake environmental weed control works within the City of Albany.			
13	Determine how the City can help match grant funding, and prepare support letters.	NR Team	All year

#	ACTION	RESPONSIBILITY	MONTH
Strategy 3.4 Promote the achievements of the City of Albany, Bushcarers Group, Progress Associations and other groups and individuals involved in the management of weeds.			
14	Attend the Albany Agricultural Show to promote the Bushcarers Group.	Reserves Coordinator NR Leading Hand	Nov
Strategy 3.4 Encourage and educate private landholders and businesses to undertake weed control works on their land, such as plantation companies and lease holders.			
15	Write a monthly article for the newspaper.	NR Team	All year
Strategy 3.5 Place conditions on new developments to adequately address weed infestations on land to be developed, as well as on Public Open Spaces.			
16	Maintain previous “black spot” weed control sites and select a new one for this year if feasible.	Reserves Coordinator NR Leading Hand	July
Strategy 3.6 To a limited extent, target weed “black spots” that are prominent and of high importance to the general community, with adequate consideration of native fauna that may inhabit these areas.			
17	Attend Planning TAG meetings and apply weed control conditions to new development.	Reserves Officer	All year
Strategy 3.7 Encourage the Albany community to stop dumping green waste in bushland by implementing the “Bush Watch Program”.			
18	Promote the Bush Watch Program at the Albany Show and other opportunities e.g. Green Fair.	NR Team	All year
Strategy 4.1 Implement the Environmental Code of Conduct for Works on City of Albany Controlled land.			
19	Implement ECOC by applying to proposed works and inspecting works and ensure all Works, Construction and Reserves teams have a yearly information/review session.	All	All year

#	ACTION	RESPONSIBILITY	MONTH
Strategy 4.2 Implement the Environmental Impact Assessment Procedure, where all City capital works are assessed and mitigation procedures are applied.			
20	Undertake EIAs for all proposed works on City land.	Reserves Officers	All year
Strategy 4.3 Undertake pre-fire assessments, monitor and implement post-fire weed control works.			
21	Weed management considered in the planning of fuel reduction activities. Ensure Fire Control Officer forwards planned prescribed burning program to the NR Leading Hand to assist with reserve work schedules.	Reserves Fire Officer	All year
22	Program weed control on burnt sites.	Reserves Coordinator Reserves Fire Officer	All year
Strategy 4.4 Control woody weeds in the vicinity of Rural Road Maintenance and Fire Access Track Maintenance Programs, to reduce the ongoing maintenance requirements.			
23	Undertake woody weed control along rural roads as per schedule.	Reserves Coordinator NR Leading Hand	All year
Strategy 4.5 Develop a program to control weeds and rehabilitate old resource pits and disposal sites on City land.			
24	Identify which resource pit/s will be worked on and implement works.	Reserves Coordinator	July
Strategy 5.1 To participate in the development and implementation of National, State and Regional initiatives addressing environmental weed management.			
25	Attend meetings and review proposals regarding the control of environmental weeds and biodiversity conservation organisations by any National, State or Regional organisations.	Reserves Officer NR Leading Hand NR Team Leader	When opportunities arise

APPENDIX 2: Weed Control Methods Used by the City of Albany

Weed Control Method	Suitable for Species such as	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.

Weed Control Method	Suitable for Species such as	Notes	Advantages	Disadvantages
Mowing	Annual grasses.	Previously cleared areas.	Covers large area with minimal labour time.	Needs maintenance unless used with other techniques. Can spread weeds too.
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 aboveground biomass. To be done before seed set.	Delays production of seed. Will eventually deplete the soil seed store.	

Weed Control Method	Suitable for Species such as	Notes	Advantages	Disadvantages
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 scarp 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.

APPENDIX 3: Weed Control Methods Not Used by the City of Albany. Modified from the City of Joondalup (2016)

Weed Control Method	Suitable for Species	Notes	Advantages	Disadvantages
Smothering	All	Most effective of weeds are cleared before applying. Suppresses or kills weeds by blocking sunlight. Use materials such as black plastic and	<ul style="list-style-type: none"> • Prevents germination of weed seeds. • No chemicals. 	<ul style="list-style-type: none"> • Expensive. • Materials can be difficult to apply around established plants. • Possible issues with water penetration. • Time spent removing plastic and possible waste generation.
Stem injection	Woody weed (low numbers)	City uses basal spraying instead of this technique.	<ul style="list-style-type: none"> • Target weed application. 	<ul style="list-style-type: none"> • Time consuming for large populations.
Herbicide granules	Various	Granules are applied to the surface of moist soil.	<ul style="list-style-type: none"> • No spray drift. • Can reduce the need for repeat applications. 	<ul style="list-style-type: none"> • Rain of moisture required • Limited choice of herbicides • Potential for herbicide to be washed off site • May effect non-target species
Drowning	Emergent species e.g. Bulrush and Kikuyu	Suited to wetland. Need to cut plants below the water levels.	<ul style="list-style-type: none"> • Effective method for emergent species. 	<ul style="list-style-type: none"> • Time consuming.
Solarisation	Low-growing and semi-aquatic weeds	Weeds are smothered with plastic sheeting until seeds or plants have been cooked.	<ul style="list-style-type: none"> • Best used on small infestations. • No chemicals 	<ul style="list-style-type: none"> • May not kill seed stored in the soil. • Plastic may need to be left in place for months. • Time consuming.
Flame weeding	Young weeds and grasses, some annual and perennial weeds	Direct propane flame at weeds. A thin blast of heat causes water to boil within plant. Developed Reserves Team are considering using this technique.	<ul style="list-style-type: none"> • No chemicals • No soil disturbance 	<ul style="list-style-type: none"> • Safety and fire hazards • May affect non-target species • Time consuming • Water usage • May need to be repeated

Weed Control Method	Suitable for Species	Notes	Advantages	Disadvantages
Infrared radiation	Shallow rooted weeds	Uses gas burners and has not visible flame on the combustion surface.	<ul style="list-style-type: none"> • Cover a more closely defined area than flame weeders. 	<ul style="list-style-type: none"> • Unsure about effectiveness against deep rooted weeds.
Steam	Young weeds	<p>Jets of steam are applied to weeds through standard spray nozzle enclosed under a steel housing.</p> <p>Developed Reserves Team are considering using this technique in some public areas.</p>	<ul style="list-style-type: none"> • More effective than flame weeders. 	<ul style="list-style-type: none"> • May not reduce subsequent weed seedling emergence. Very labour intensive and not cost effective compared to chemical control.
Boiling water	Annuals and perennials	Boil water and pour on to the crown of the plant.	<ul style="list-style-type: none"> • Works well in concrete, paved and rock areas. 	<ul style="list-style-type: none"> • Safety hazards • Time consuming • May need to be repeated
Acidic	Annuals, biennials and perennials	Contains approx. 15-20% acidic ingredients such as lemon, lime or vinegar, sprayed directly on the leaves.	<ul style="list-style-type: none"> • No chemicals 	<ul style="list-style-type: none"> • May effect non-target species
Fatty acids	Annual weeds, grasses and broadleaf weeds	Coconut fatty acid is often an ingredient. Dissolves membranes of plant leaves.	<ul style="list-style-type: none"> • Fast acting • Leaves no residue in soil. 	<ul style="list-style-type: none"> • Repeat application may be required on larger weeds
Schedule S7 and above herbicides	Hard to kill weeds	Chemical application as per label.	<ul style="list-style-type: none"> • Used for specific species. 	<ul style="list-style-type: none"> • Higher levels of PPE and management.

APPENDIX 4: Herbicides used by the City of Albany

Herbicide*	Application	Where	Species controlled	Notes
Glyphosate 450	Hand gun, knapsack, boom spray	Bushland, road reserves, parklands, trails, firebreaks	Broad range of species controlled	Broad spectrum, systemic, general knockdown
Glyphosate Aquatic 360	Hand gun, knapsack, boom spray	Waterways and drains	Broad range of species controlled	Broad spectrum, systemic, general knockdown. Does not contain surfactants so is suitable for use in sensitive areas such as waterways and wetlands
Access (Triclopyr, Picloram)	Knapsack	Bushland, road reserves, parklands, trails, firebreaks	Sydney golden wattle (SGW), pittosporum, taylorina, and various wattle species.	Basal bark application for woody weeds
Dalapon/Allapon/Propon/2,2 DPA	Hand gun, knapsack	Watsonia	Watsonia	Selective herbicide for watsonia
Brush off (Metsulfuron methyl)	Hand gun, knapsack, boom spray	Bushland, road reserves, parklands, trails, firebreaks	Woody weeds such as: SGW, pittosporum, taylorina, European gorse, blackberry, Victorian tea tree	Broadleaf selective with some residual capacity
Grazon (Triclopyr, Picloram)	Hand gun, knapsack, boom spray	Bushland, road reserves, parklands, trails, firebreaks	Blackberry and gorse	Broadleaf selective suitable for use in areas that may be used by stock
Lontrel	Hand gun, knapsack, boom spray	Bushland, road reserves, parklands, trails, firebreaks	Broadleaf selective	Broadleaf selective chemical

Herbicide*	Application	Where	Species controlled	Notes
Pulse (Adjuvant)	Hand gun, knapsack, boom spray	Bushland, road reserves, parklands, trails, firebreaks	Used for hard to kill species such as blackberry and gorse	Pulse is a penetrant that is used in conjunction with herbicides to increase efficacy of the chemicals in use
Simazine 900 WG	Hand gun, knapsack, boom spray	Road reserves and verges, trails and firebreaks	Pre and post emergent for considered use	Careful consideration of the area to be treated is needed as this chemical is not for general use
Taskforce (Fluprofonate)	Hand gun, knapsack, boom spray	Road reserves and verges, trails and firebreaks	African lovegrass	Clumping grass selective. Provides excellent residual control of lovegrass for 1 – 2 years
Fusilade	Hand gun, knapsack, boom spray	Grass selective areas	Grass species	Grass selective herbicide. Excellent for use

**All herbicides used as per label and MSDS.*

***Residents can request to be put register if they have a medical reason or are undertaking verge maintenance themselves to avoid chemicals.*