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Bushland Weed Management Plan

For Town of Bassendean

Document Status

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Acknowledgments

Bushland Weed Management Plan

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Steve McCabe, Environmental Officer/ Planning, Town of Bassendean

Peter Randolf, Senior Heritage Officer, Department of Indigenous Affairs

Summary

Bushland Weed Management Plan

Ecoscape conducted a weed assessment of five reserves vested in the town of Bassendean. Items examined included:

- bushland condition
- weed species inventories
- distribution of weed species
- priority of weed species
- weed types
- control options
- constraints that may affect weed control activities.

Broadway and Success Hill were all assessed as in Degraded bushland condition while the remnant vegetation in Jubilee Reserve and Pickering Park were assessed as Good or better bushland condition. A total of 80 weed species were recorded across the five reserves. Of these, 24 species were considered to be of high priority for control. A total of 25 weed maps were produced to indicate the distribution of the majority of these weed species.

Aboriginal heritage sites were recorded within or in the near vicinity of each reserve. The importance of preserving and enhancing these heritage sites meant obtaining consent from the Minister for Indigenous Affairs before any weed control activities may take place. Such consent would require strict procedures and controls to be in place.

Dieback was identified as another constraint for weed control activities in Success Hill. Any work would require stringent hygiene procedures to prevent further spread of this disease.

Recommendations for the town of Bassendean to undertake weed control activities in their reserves are summarised in **Table 1** on the following page.

Table 1: Summary of weed control recommendations for Bassendean reserves

No.	RECOMMENDATIONS
1	Target weed species in each reserve: • in order of priority • during optimal times of the year • using recommended methods: o according to their morphology and nature of infestation o in a manner that will not have an impact on the environment or heritage values of the reserve.
2	Monitor changes to weed populations.
3	Continue to map populations of high priority weed species.
4	Appropriate herbicides are to be selected for use near wetlands, waterways or springs in Bindaring Park, Broadway, Pickering Park and Success Hill. The Town is to refer to MSDS and the DOW (2000) *Statewide Policy 2: Pesticides in Public Drinking Water Sources Areas* when choosing appropriate herbicide treatments.
5	Follow the conditions and requests made by the Minister for Indigenous Affairs.
6	Ensure hygiene practices are in place for any weed control activities in Success Hill to prevent further spread of dieback infection.
7	Restrict access to and revegetate informal paths in Broadway, Jubilee B and Success Hill.
8	Develop formal paths using appropriate materials in Bindaring North and Success Hill to prevent further bushland degradation.

1.0 Introduction

Bushland Weed Management Plan

There has been an increasing awareness of the need to conserve and manage the town of Bassendean's bushland area. Such management should aim to enhance the visual, functional, landscape, heritage and environmental qualities of each natural area. A critical component of this work is to develop a bushland weed management plan to remove or reduce the presence of weed species that are degrading these qualities.

The following Bushland Weed Management Plan was prepared by Ecoscape for five reserves vested in the Town of Bassendean:

- Bindaring Park (10.3 ha)
- Broadway Arboretum in Nyibra Swamp (2.97 ha)
- Jubilee Reserve (13.8 ha)
- Pickering Park (3.32 ha)
- Success Hill (3.51 ha).

The locations of these reserves within the Town are presented in **Figure 1**.

The objectives of the Bushland Weed Management Plan are to:

1. map bushland condition and the location of weed species within each reserve
2. identify weed species that are of high priority to control
3. provide strategies for controlling all identified weed species
4. enhance the cultural heritage within each reserve
5. identify constraints to weed control activities
6. identify management priorities
7. provide an opinion of probable cost for controlling weed species in each reserve
8. identify possible funding sources to finance the recommended works.

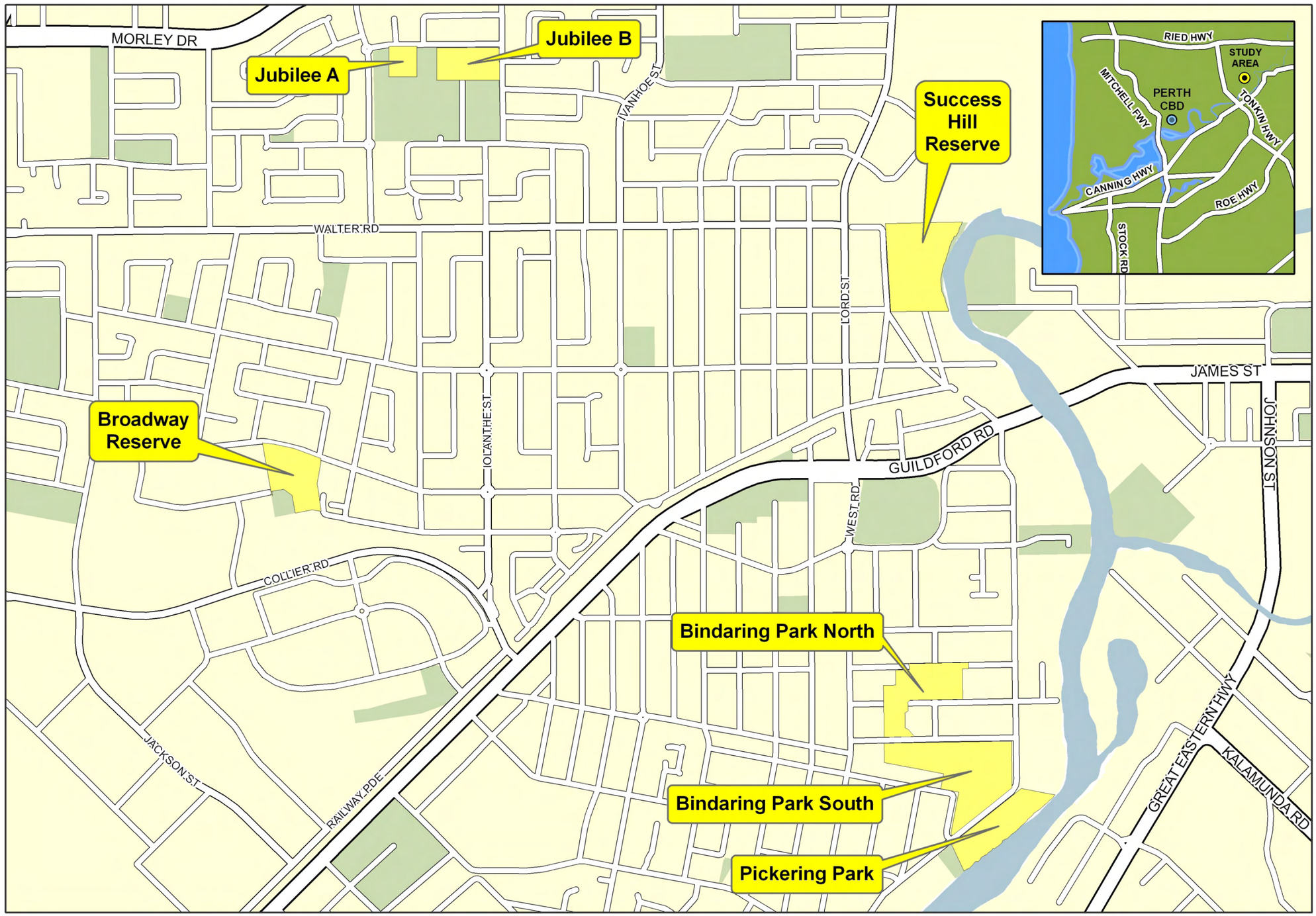

Figure 1: Selected reserves in Town of Bassendean

2.0 Methodology

Fieldwork for all five reserves occurred between the 20th and 27th October 2009.

2.1 Bushland Condition and Land Function

Bushland condition and distribution were determined using the Keighery (1994) condition scale. Areas within the sites that were not bushland were also assessed and mapped according to their current land function using categories adopted from the City of Cockburn (2008) *Biodiversity Assessment templates*. The condition and land function categories are described in **Table 2** below.

Table 2: Bushland Condition and Land Function categories

CATEGORY	DESCRIPTION
Bushland Condition (Keighery 1994)	
Pristine	No obvious signs of disturbance.
Excellent	Vegetation structure intact, disturbance only affecting individual species and weeds are non-aggressive species.
Very Good	Vegetation structure altered, obvious signs of disturbance (eg repeated fires, aggressive weeds, dieback, logging and grazing).
Good	Vegetation structure altered, obvious signs of disturbance. Retains basic vegetation structure or ability to regenerate it. The presence of very aggressive weeds at high density, partial clearing, dieback, logging and grazing.
Degraded	Basic vegetation structure severely impacted by disturbance. Requires intensive management. The presence of very aggressive weeds at high density, partial clearing, dieback, logging and grazing.
Completely Degraded	Vegetation structure is no longer intact and the area is completely or almost completely without native flora.
Land Function (City of Cockburn 2008)	
Revegetation	Clear signs of planting works in progress (eg tubestock) using local native species to restore area.
Parkland	Clear signs of planting works in progress (eg tubestock) using non-local native species for soft landscapes.
Open Water	Permanent water body.
Other	Other land use to those described above.

2.2 Weeds

2.2.1 Weed Inventory

Weed inventories were collated and distributions of all observed weed species were mapped for each site. A total of 80 weed species were observed across all sites (**Appendix One**). However, it must be noted that this list is not exhaustive and additional weed species may be present at different times of the year.

2.2.2 Weed Mapping

The distribution of the majority of the weed species in each reserve were mapped where practical.

Jubilee Reserve consists of predominantly parkland, the two small areas of remnant vegetation were mapped separately and renamed:

- Jubilee Reserve (A) – remnant bushland at central northern edge of the reserve
- Jubilee Reserve (B) – fenced bushland in the north-east corner of reserve.

The size of Bindaring Park (10 ha) made it impractical to effectively illustrate weed populations on a single A3 page. The reserve was therefore separated into two sections, using Hyland Street as the dividing border. The two sections were named according to whether they were north or south of Hyland Street:

- Bindaring Park (North)
- Bindaring Park (South).

Weed species were subdivided into four broad groups based upon their morphology and similar control methods. Maps were then prepared for each reserve or section, indicating locations of weed species according to the group type. This approach allowed for the locations and distributions of 65 weed species across seven reserves/sections to be illustrated across 25 maps.

Locations of individual plants were recorded using a GPS hand held unit. Distributions of populations were recorded by either using a GPS handheld unit to trace the perimeter of each population or by marking boundaries on printed aerial photographs of the reserve.

Densities of each weed population were classed by the following percentage weed covers:

- *Trace* - <1% cover
- *Low* - 1-10% cover
- *Moderate* - 11-50% cover
- *High* - >50% cover.

2.2.3 Priority Weed Species

Each weed species was assigned a priority rating according to their deemed threat level to each particular reserve:

- *High Priority* - need to have immediate targeted strategies developed and implemented
- *Moderate Priority* - should be targeted to enhance the site condition if there are any resources available after controlling the high priority weed species
- *Low Priority* - should be controlled as part of non-target or site-focused maintenance weed strategies if there are any resources available after controlling the high and moderate priority weed species.

The priority ratings of each weed species were determined after examining:

- the ratings under the *Environmental Weed Strategy of Western Australia* (EWSWA) by the Department of Conservation and Land Management (CALM 1999)
- the ratings under the *Environmental Weed Census and Prioritisation* (EWCP) by the Swan Natural Resource Management (Swan NRM 2008)
- the ratings under Dixon and Keighery (1995) *Recommended methods to control specific weed species*
- whether it was listed under the DAFWA (1976) *Agricultural and Related Resources Protection Act* (ARRPA)
- whether it was listed as a *Weed of National Significance* (WONS) (Weed Australia 2008)
- its local significance to the natural areas.

It should be noted that a weed species may differ in its priority status between reserves as a result of its local significance. For example, a weed species may be more invasive and dominant in a wetland community than in a sandy upland community. Therefore this species should be regarded as a higher priority to control in reserves containing wetlands than in reserves containing only upland vegetation.

The full methodology for determining the priority of each weed species, and associated calculations for each reserve, is presented in **Appendix Two.**

2.2.4 Weed Types

Weed species were separated into four groups:

- grass, sedge and rush weeds
- geophyte weeds (ie those that propagate from bulbs, corms and tubers)
- broad leaf herb weeds
- tree, shrub and climber weeds.

Separation was chiefly based according to their biology and similarities in methods of control. The grouping was to aid in understanding what types of weeds were dominating each reserve and what main control actions would be needed to reduce their diversity and presence.

2.3 Constraints

2.3.1 Aboriginal Heritage

The presence of aboriginal heritage sites and dieback in the reserves was identified to determine whether they could be potentially impacted by weed control methodologies. Weed control activities will need to be permitted by the Minister for Indigenous Affairs for any identified sites before any works may commence. Activities must be designed towards enhancing the cultural significance of the sites, not purely for ecological purposes. The nature of the heritage sites may also impose additional constraints on weed control activities. Permission may be granted through either Section 18 or Regulation 10 of the Government of Western Australia (1972) *Aboriginal Heritage Act*.

Ecoscape consulted the Department of Indigenous Affairs (DIA 2009) *Aboriginal Heritage Enquiry System - Sites and Surveys* dataset to determine if any registered indigenous heritage sites occur within any of the five reserves and whether any additional constraints were present. All identified heritage sites are tabulated in **Appendix Three**.

2.3.2 Dieback

The dieback status of each reserve was determined by consulting relevant Town of Bassendean documents. The constraints of this disease in conducting weed control were then discussed.

2.4 Access

The location and distribution of current footpaths and “goat tracks” in each reserve were mapped. The access tracks were then assessed to determine whether any of them should be closed or formalised in order to improve bushland condition and to prevent further spread of weeds.

3.0 Status of Reserves

Bushland condition and weed maps for all five reserves are presented in **Appendix Four**.

3.1 Bindaring Park

3.1.1 Bushland Condition and Land Function

Half of Bindaring Park is made up remnant vegetation, with the remaining half being parkland or open water. All of the vegetation in Bindaring was assessed as either *Degraded* or *Completely Degraded* condition. The northern section was in poorer condition than the southern section. The degraded condition was attributed to clearing and weed dominance. Weeds were predominantly located in or near the waterways of the southern section, while they were scattered throughout the northern section. Little to no native understorey remained. No restoration work was observed in this reserve (**Maps 1a and 1b**).

3.1.2 Weed Species

A total of 57 weed species were recorded in Bindaring Park. Of these:

- 16 species were High Priority
- 21 species were Moderate Priority
- 20 species were Low Priority.

The southern section had a greater diversity of weed species (51) than the northern section (37).

The High Priority weed species in this reserve were:

- Arum Lily (*Zantedeschia aethiopica*)
- Barley Grass (*Hordeum leporinum*)
- Bridal Creeper (*Asparagus asparagoides*)
- Brome grass (*Bromus diandrus*)
- Buffalo Grass (*Stenotaphrum secundatum*)
- Couch (*Cynodon dactylon*)
- Edible Fig (*Ficus carica*)
- Hares Tail Grass (*Lagurus ovatus*)
- Japanese Pepper (*Schinus terebinthifolia*)
- Kikuyu (*Pennisetum clandestinum*)
- Mile-a-Minute (*Ipomoea cairica*)
- Paspalum (*Paspalum dilatatum*)
- Perennial Veldt Grass (*Ehrharta calycina*)

- Soursob (*Oxalis pes-caprae*)
- Watsonia (*Watsonia meriana*)
- Wild Oat (*Avena barbata*)
- Watsonia (*Watsonia meriana*).

Most of the high priority weed species in Bindaring Park were grasses and geophytes that dominated the understorey adjacent to the waterway. Overall, there was a large diversity of all four weed types present in this reserve (**Maps 1c to 1j**).

3.1.3 Constraints

Heritage

The DIA database search indicated that there were two Aboriginal Heritage sites recorded in or in the immediate vicinity of Bindaring Park:

- Swan River (Site number S02548)
- Helena River (Site number S02148).

Swan River is recognised has mythological significance. This site has open access and a known location. No additional constraints were identified.

Helena River also has mythological significance. It is a ceremonial site with a repository. Additional constraints that must be completed before any weed control activities may commence include obtaining:

- the exact location of the site
- consent from the Minister for Indigenous Affairs to access the closed site.

Dieback

No dieback infestations are currently known in this reserve.

3.1.4 Access

Bindaring North has three formal access paths. One is a footpath which provides a link between Lovelock Place and Anstey Road. Another footpath starts in the north east corner, extending westwards from Paul Place. Near the eastern perimeter, a vehicle access track provides a link between Anstey Road and the northern footpath. An informal track was observed linking Harcourt Street in the north-west corner to Anstey Road (**Map 1k**).

Bindaring South has only one formal access – a pathway aligned immediately to the east of the waterway. At the northern end, a new formal path section has been created to shorten the pathway. No informal paths or goat tracks were observed (**Map 1l**).

3.2 Broadway Arboretum in Nyibra Swamp

3.2.1 Bushland Condition and Land Function

The vegetation in Broadway reserve was assessed in *Degraded* or *Completely Degraded* condition. Weeds dominated the understorey. Very few native understorey plants were observed (**Map 2a**).

Only a small section of the reserve was assessed as *Parkland*. Formal paths existed throughout the reserve, however several informal tracks were also observed. Some minor revegetation work has been carried out in the eastern section where tree seedlings have been planted.

3.2.2 Weed Species

A total of 37 weed species were recorded in Broadway Reserve. Of these:

- 9 species were High Priority
- 18 species were Moderate Priority
- 10 species were Low Priority.

The High Priority weed species identified in this reserve were:

- Brome Grass (*Bromus diandrus*)
- Couch (*Cynodon dactylon*)
- Geraldton Carnation Weed (*Euphorbia terracina*)
- Japanese Pepper (*Schinus terebinthifolia*)
- Summer Scented Wattle (*Acacia rostellifera*)
- Tamarisk (*Tamarix aphylla*)
- Tobacco Tree (*Nicotiana glauca*)
- Wild Oat (*Avena barbata*)
- Wild Radish (*Raphanus raphanistrum*).

Most of the high priority weed species were grasses and trees. Over half of the identified weed species were broad leaf herbs. No geophyte weed species were recorded. The locations and distributions of weed species in this reserve are presented in **Maps 2b to 2d**.

3.2.3 Constraints

Heritage

The DIA database search revealed three aboriginal heritage sites within or immediately adjacent to the Broadway reserve:

- Snake Swamp (Site number S00712)
- Bennet Brook (Site number S01997)
- Nyimbra Swamp (Site number S02198).

Snake Swamp is recorded as being an artefacts/scatter site, with open access and identified locations. Bennet Brook is registered as a ceremonial, mythological and historical site that is recorded as containing skeletal material/ burials sites, man-made structures, fish traps and scattered artefacts. The locations of both sites are known to be outside the reserve. As weed activities will not impact on the adjacent areas, no additional constraints were identified to protect these sites.

Nyibra Swamp was recently determined by the Aboriginal Cultural Material Committee as not being a site that was defined under section 5 of the *Aboriginal Heritage Act 1972* (Randolph pers comm.). As such this site is not protected under this Act.

Dieback

No dieback infestations are currently known in this reserve.

3.2.4 Access

The site is divided by a series of formal paths. One path has a bridge which crosses the far eastern end of the swamp, however it is currently in need of repair and has been fenced off. This restriction has resulted in pedestrians using an access track around the eastern side of the swamp. There are also vehicle access tracks along the eastern boundary of the study area. An informal track was observed traversing from the playground, along the northern side of the swamp to a path along the western boundary (**Map 2e**).

3.3 Jubilee Reserve

3.3.1 Bushland Condition and Land Function

The majority of Jubilee reserve was assessed as *Parkland*, with just over 10% being remnant vegetation. Jubilee (A) was assessed as *Very Good* bushland condition, with only some signs of disturbance and reduced understory species. (**Map 3a**). Most of the vegetation in Jubilee (B) was *Good* to *Excellent*, however areas adjacent to the pathways and along most of the fencing were *Degraded* from site disturbance and weed invasion (**Map 3b**).

3.3.2 Weed Species

A total of 20 weed species were recorded in Jubilee Reserve. Of these:

- 5 species were High Priority
- 13 species were Moderate Priority
- 2 species were Low Priority.

The High Priority weed species identified in this reserve were:

- Couch (*Cynodon dactylon*)
- Guildford Grass (*Romulea rosea*)
- Perennial Veldt Grass (*Ehrharta calycina*)
- Soursob (*Oxalis pes-caprae*)
- Wild Gladiolus (*Gladiolus caryophyllaceus*).

Half of the High Priority weed species were grasses while the other half were geophytes. Overall, most of the weed species in Jubilee were broad leaf herbs.

The locations and distributions of weed species in this reserve are presented in **Map 3c to 3i**.

3.3.3 Constraints

Heritage

A total of five Aboriginal Heritage sites were recorded in the immediate vicinity of Jubilee Reserve:

- Bennet Brook: Rosher Park (Site number S0662)
- Bennet Brook: Lord Street 1 (Site number S02663)
- Bennet Brook: Lord Street 2(Site number S02664)
- Bennet Brook: Camp Area (Site number S01997)
- Walkington Way (Site number S00717).

All five sites are closed to public access. All of the Bennet Brook sites do not have their exact locations given while Walkington Way's location is noted to be unreliable. The Bennet Brook Lord Street and Camp Area sites are also identified as having skeletal remains or burial sites. As such, additional constraints for this reserve are listed below:

- Obtain consent from the Minister for Indigenous Affairs to:
    - access all of the closed sites.
    - to conduct weed control, including possible digging.
- Ensure procedures are in place if skeletal material is revealed from any digging activities.

Dieback

No dieback infestations are currently known in this reserve.

3.3.4 Access

Jubilee (A) had a single formal path along its eastern boundary. No informal tracks were observed (**Map 3j**).

Jubilee (B) has a pathway connecting May Road to the western boundary. This path divides in the centre which connects to the car park located to the south of the bushland area. Two informal tracks were observed in this area, both starting from the entrance at the western end. One track traverses north-east into the bushland. The other acts as a shortcut to the southern car park (**Map 3k**).

3.4 Pickering Park

3.4.1 Bushland Condition and Land Function

Most of Pickering Park is designated as *Parkland*. Some revegetation work was observed adjacent to the entrance road to the parking area and within the bushland area along the waterway. Most of the vegetation was assessed as *Very Good* bushland condition, except where there was disturbance or weed invasion (**Map 4**).

3.4.2 Weed Species

A total of 18 weed species were recorded in Pickering Park. Of these:

- 2 species were High Priority
- 11 species were Moderate Priority
- 5 species were Low Priority.

The High Priority weed species identified in this reserve were:

- Couch (*Cynodon dactylon*)
- Kikuyu (*Pennisetum clandestinum*).

All three high weed species are lawn grasses. Almost all of the weed species in Pickering Park were broad leaf herbs and grasses, barring one shrub species – Black Nightshade (*Solanum nigrum*). No geophyte weed species were recorded.

The locations and distributions of weed species in this reserve are presented in **Map 4b**.

3.4.3 Constraints

Heritage

As Pickering Park is adjacent to Bindaring Park, the same heritage sites were identified within or in vicinity of this reserve. The Minister for Indigenous Affairs (Roberts 2007) has already given consent for improvement activities to occur in Pickering Park, on subject on set conditions. The only condition relevant to weed control activities is:

> "If any skeletal remains are found, they are to be reported to the Western Australian Police and the Registrar of Aboriginal Sites ("the Registrar"). Where it is determined that the remains are Aboriginal in original and not a police matter, they must remain in situ and undisturbed until the Registrar makes a decision about how to proceed in respect of the Remains. The Landowner must at its expense manage the Remains in accordance with the Registrar's decision and report the whereabouts of the remains to the DIA and Anthropology Department of the Western Australian Museum."

In addition, Roberts (2007) referred to the Aboriginal Cultural Management Committee having two requests relevant to weed control activities:

> "The Landowner give due consideration to requests made by the Aboriginal people consulted about the Purpose [including weed control activities], regarding the protection of Aboriginal heritage and the recognition of Aboriginal culture and history."

> "The Landowner ensure that all persons employed or engaged in respect of the Purpose [including weed control activities] be made aware of their obligations under the AHA"

Dieback

No dieback infestations are currently known in this reserve.

3.4.4 Access

A single formal access path occurs along the northern side of the bushland at Pickering Park. The path begins from the car park in the south-west corner and extends to the length of the open parkland area. No informal tracks were observed (**Map 4c**).

3.5 Success Hill

3.5.1 Bushland Condition and Land Function

Vegetation covered just over half of the reserve. Bushland condition varied from *Degraded* to *Completely Degraded* as a result of severe site disturbance and weed invasion. The remaining area consisted of *Parkland* and a car park (**Map 5a**).

The site experienced a fire on December 31st 2009, after the site assessment. As a result, there was extensive damage to the northern half of the bushland vegetation along the foreshore (Town of Bassendean 2010). This damage is likely to have lowered some of the site's bushland condition from Degraded to Completely Degraded.

3.5.2 Weed Species

A total of 30 weed species were recorded in Success Hill. Of these:

- 8 species were High Priority
- 19 species were Moderate Priority
- 53 species were Low Priority.

The High Priority weed species identified in this reserve were:

- Arum Lily (*Zantedeschia aethiopica*)
- Bridal Creeper (*Asparagus asparagoides*)
- Kikuyu (*Pennisetum clandestinum*)
- Lantana (*Lantana camara*)
- Perennial Veldt Grass (*Ehrharta calycina*)
- Wild Gladiolus (*Gladiolus caryophyllaceus*)
- Wild Oat (*Avena barbata*)
- Watsonia (*Watsonia meriana*).

Kikuyu (*Pennisetum clandestinum*), Perennial Veldt Grass (*Ehrharta calycina*) and Watsonia (*Watsonia meriana*) are of particularly high importance to control as they are all known to rapidly invade and dominate sites after a bushfire.

The high priority weed species were a composition of all four weed types. This was also reflected in the total species inventory for this reserve.

The locations and distributions of weed species in this reserve are presented in **Maps 5a to 5e.**

3.5.3 Constraints

Heritage

The DIA database indicated nine recorded heritage site within or in the immediate vicinity of Success Hill:

- Bennet Brook: Eden Hill R. (S02661)
- Bennet Brook: Lord St. 1 (S02663)
- Bennet Brook: Lord St. 2 (S02664)
- Swan River (S02548)
- Bennet Brook: In Toto (S02254)
- Success Hill (S02147)
- Helena River (S02148)
- Bennet Brook: Camp Area (S01997)
- Pyrton A5 (no site number given).

Helena River, Success Hill and all of the Bennet Brook sites are closed sites and do not have their exact locations provided in the database search. Bennet Brooks: Lord 1 and 2 and Camp Area, Success Hill are identified as containing skeletal remains or burials sites.

The Minister for Indigenous Affairs (Roberts 2008) has already given consent for improvement activities to occur in Success Hill, subject to set conditions. The two conditions relevant to weed control activities are:

> "If any skeletal remains are found, they are to be reported to the Western Australian Police and the Registrar of Aboriginal Sites ("the Registrar"). Where it is determined that the remains are Aboriginal in original and not a police matter, they must remain in situ and undisturbed until the Registrar makes a decision about how to proceed in respect of the Remains. The Landowner must at its expense manage the Remains in accordance with the Registrar's decision and report the whereabouts of the remains to the DIA and Anthropology Department of the Western Australian Museum."

> "Provide to the Registrar annual, or at the completion of the Purpose…. a written report advising the Registrar whether and what extent the Purpose has impacted on all or any Sites or objects within the meaning of section 6 of the AHA ("Objects") that may be located on the Land and to assist the AMC to reassess the status of the Sites"

In addition, Roberts (2008) referred to the Aboriginal Cultural Management Committee having two requests relevant to weed control activities:

"The Landowner give due consideration to requests made by the Aboriginal people consulted about the Purpose [including weed control activities], regarding the protection of Aboriginal heritage and the recognition of Aboriginal culture and history."

"The Landowner ensure that all persons employed or engaged in respect of the Purpose [including weed control activities] be made aware of their obligations under the AHA"

Dieback

The entire reserve is reported to be infected with dieback (Dieback Treatment Services 2008). Weed control activities will be constrained to limit any further spread of the disease in of out of the reserve.

3.5.4 Access

Success Hill only has one formal path. This path extends eastwards from the car park to the foreshore vegetation and then southwards to River Street. A vehicle access track starts from the parkland and extends in a north-east direction, adjacent to the foreshore vegetation. (**Map 5f**).

The reserve has experienced a high level of foot traffic. The grassland in the northern portion is criss-crossed with intersecting tracks. Another track extends from the formal footpath to the foreshore edge.

3.6 Status of Reserves Summary

The bushland condition status of each reserve is summarised in **Table 3** below:

Table 3: Areas of Bushland Condition and land function of Bassendean reserves

CATEGORY	RESERVE					TOTAL AREA	
	Bindaring	Broadway	Jubilee	Pickering	Success Hill	ha	%
Condition							
Pristine	0	0	0	0	0	0	0
Excellent	0	0	0.60	0	0	0.60	4.5
Very Good	0	0	0.46	0.56	0	1.02	7.7
Good	0	0.15	0.20	0.07	0	0.42	3.2
Degraded	3.94	1.38	0.34	0.04	3.12	8.82	66.5
Completely Degraded	0.88	1.13	0	0	0.39	2.40	18.1
Total Vegetation	**4.82**	**2.66**	**1.60**	**0.67**	**3.51**	**13.26**	**100**
Land Function							
Revegetation	0	0	0	0.01	0	0.01	0.04
Parkland	3.42	0.12	11.26	2.24	2.02	19.06	83.2
Open water	1.17	0	0	0	0	1.17	5.1
Other	0.92	0.19	0.94	0.40	0.22	2.67	11.6
Total Land Function	**5.51**	**0.31**	**12.20**	**2.65**	**2.24**	**22.91**	**100**
TOTAL	**10.33**	**2.97**	**13.80**	**3.32**	**5.75**	**36.17**	

The numbers of different priority weed species and groups for each reserve is summarised in **Table 4** below:

Table 4: Priority ratings and weed groups of weeds identified in Bassendean reserves

CATEGORY	RESERVE				
	Bindaring	Broadway	Jubilee	Pickering	Success Hill
Priority Rating					
High	11	9	4	2	8
Moderate	21	15	11	10	19
Low	25	13	5	6	3
Weed Type					
Grass, Sedge and Rush	20	7	3	7	11
Geophyte	4	0	3	0	6
Broad Leaf Herb	21	21	12	11	10
Tree, Shrub and Climber	12	9	2	0	3
TOTAL	**57**	**36**	**20**	**19**	**30**

The determined high priority weeds species for each reserve is listed in **Table 5** below:

Table 5: High Priority Weed Species identified in Bassendean Reserves

WEED SPECIES		RESERVE					
Scientific Name	**Common Name**	**Bindaring Park**	**Broadway**	**Jubilee**	**Pickering Park**	**Hill Success**	**TOTAL**
Grass, Sedge and Rush							
Avena barbata	Wild Oat	*	*			*	**3**
Bromus diandrus	Brome Grass	*	*				**2**
Cynodon dactylon	Couch	*	*	*	*		**4**
Ehrharta calycina	Perennial Veldt Grass	*		*		*	**3**
Hordeum leporinum	Barley Grass	*					**1**
Lagurus ovatus	Hares Tail Grass	*					**1**
Paspalum dilatatum	Paspalum	*					**1**
Pennisetum clandestinum	Kikuyu	*			*	*	**3**
Stenotaphrum secundatum	Buffalo Grass	*					**1**
Geophyte							
Asparagus asparagoides	Bridal Creeper	*				*	**2**
Gladiolus caryophyllaceus	Wild Gladiolus			*			**1**
Oxalis pes-caprae	Soursob	*		*			**2**
Romulea rosea	Guildford Grass			*			**1**
Watsonia meriana	Watsonia	*				*	**2**
Zantedeschia aethiopica	Arum Lily	*				*	**2**
Broad Leaf Herb							
Euphorbia terracina	Geraldton Carnation Weed		*				**1**
Raphanus raphanistrum	Wild Radish		*				**1**
Tree, Shrub and Climber							
*Acacia rostellifera**	Summer Scented Wattle*		*				**1**
Ficus carica	Edible Fig	*					**1**
Lantana camara	Lantana					*	**1**
Ipomoea cairica	Mile-a-Minute	*					**1**
Nicotiana glauca	Tobacco Tree		*				**1**
Schinus terebinthifolia	Japanese Pepper	*	*				**1**
Tamarix aphylla	Tamarisk		*				**1**
TOTAL		**16**	**9**	**5**	**2**	**7**	**24**

A summary of identified constraints for weed control activities is presented in **Table 6:**

Table 6: Identified constraints on weed control activities for Bassendean reserves

CONSTRAINT	RESERVE
Permission required from Minister of Indigenous Affairs before any weed control activities may commence in recorded Aboriginal heritage sites	Bindaring Jubilee
Permission from Minister of Indigenous Affairs required to access closed Aboriginal heritage sites	Jubilee
Locations of certain aboriginal heritage need to be established before weed control activities may commence.	All reserves
Procedures must be in place for managing exposure of any skeletal remains	Broadway Jubilee Pickering Park Success Hill
Weed control activities must be carried out in manner that does not spread dieback within or out of reserve.	Success Hill

4.0 Weed Control Strategy

Bushland Weed Management Plan

4.1 Objectives

The objectives of the Weed Control Strategy are to:

- identify the weed species with the highest priority for control
- prevent introduction of additional weed species
- prevent further encroachment of weeds into bushland areas
- integrate the weed control programme with heritage enhancement programs
- set performance targets aimed at demonstrating the effectiveness of control strategies, reductions in weed populations and improvement in bush condition.

4.2 Background

Weeds are plants that establish themselves in native plant communities. Impacts caused by weeds include:

- resource competition, as weeds often out-compete native species
- prevention of seedling recruitment of native species
- alteration to geomorphological processes, such as increased erosion
- changes to soil nutrient status
- alteration of fire regime, usually through increased fire frequency
- reduction in the abundance of indigenous fauna due to less diverse habitat
- loss of native species diversity
- changes to the structure of vegetation communities, often by the removal of the shrub layer or native ground covers.

The following Weed Control Strategy is aimed at prioritising and controlling weed species within five reserves by the Town of Bassendean. It is important that the weed control measures aimed at reducing the extent of weeds are coupled with improving the condition of the bushland condition and overall amenity of the area. This can be achieved through the preparation of specific weed control programmes.

4.3 Weed Strategy

4.3.1 Priority

The priority status of individual weed species should be used as a basis for their control. In general:

- High Priority weed species should be targeted first
- Moderate Priority weed species should be controlled opportunistically, if resources allow after targeted control of High Priority Weeds
- Low Priority weed species should be controlled opportunistically, if resources allow after control of Moderate and High Priority Weeds.

4.3.2 Control Timing

Control timing is crucial in effectively managing weeds. Generally, weed populations should be targeted when actively growing (ie usually in winter or spring) to allow maximum uptake of herbicides, but before flowering to prevent seed spread. In certain cases, this time window can sometimes be reduced to target weed species without harming native species (eg many annual grass weed species flower before native grasses) (Hussey & Wallace 2003).

The optimal times of the year to control all the observed weed species in each reserve are presented in **Table 7** below. The methodology for selecting the best optimal times are illustrated in **Tables A2.2** to **A2.6** in **Appendix Two**.

Table 7: Optimal control times for targeting priority weed species in Bassendean reserves

RESERVE	OPTIMAL CONTROL TIME											
	J	F	M	A	M	J	J	A	S	O	N	D
Bindaring Park												
Broadway												
Jubilee												
Pickering Park												
Success Hill												

Optimal times to target High Priority Weed species

Additional times to target additional Moderate and Low Priority Weed species

For all reserves except Pickering Park will require a minimum of having three rounds of weed control activities a year to target all High Priority weed species: May, August and October/ November. Pickering Park will require a minimum of two rounds of weed control activities to target all of its High Priority weed species: May and November.

These months are also ideal in targeting all of the Moderate and Low Priority weed species for all of the reserves except for Pickering Park. If resources allow, opportunistic control of the non-high priority weeds should also occur while personnel are on site.

If the Town chooses to target non-high priority weed species in Pickering Park, an additional site visit in August will be required to effectively target several non-priority species that are most vulnerable in this month.

The optimal control times for several Moderate and Low Priority weed species lie just outside the indicated months (eg Curled Dock's optimal control time is June to July). However, given their close proximity to the proposed control times, these species should still be reasonably controlled in the recommended control times.

It should be noted that the timing for the targeting of specific weeds presented in this report is an estimate only, and can vary depending on local weather conditions (eg a hot dry spring may cause weeds to seed earlier). Reserves should be monitored before these target months each year to detect the most effective time to conduct weed control.

It should also be noted that as weed control of priority species progresses, other weed species which previously may not have been rated as high, may spread and become greater threats. It is important to keep weed control programmes flexible and updated according to monitoring data to ensure that as soft landscape condition changes and weed species dominance changes, the control activities are adjusted accordingly.

4.4 Control Methods for Weeds

4.4.1 Approach

When controlling weeds, the process should follow the Bradley (1971) *Bush Regeneration* method. The aim of the Bradley Method is the systematic removal of weeds to allow native plants to re-establish themselves when and where they choose. This method does not involve replanting – simply the gradual removal of weeds so that no large openings are made. This makes the Bradley method ideal for many situations, such as where native plants are able to colonise the site by seeds or vegetative means, areas sensitive to erosion and areas likely to be over-used. The process of the Bradley method is detailed in **Appendix Five.**

A variety of control methods for each weed species has been provided in **Appendix Six**. Details of the different options which are suitable are described on the following pages. Weed management recommendations are based on information from:

- Brown and Brooks (2002) *Bushland Weeds*
- Dixon and Keighery (1995) *Recommended methods to control specific weed species*
- Moore and Wheeler (2008) *Southern Weeds and their control.*

4.4.2 Manual Removal

Methods

Removing weeds by hand is the most common method recommended for dealing with individual plants or small populations. Care must be taken to extract the main roots; as if left in the soil they may resprout. Any weed material should be disposed of appropriately away from the site. It should be noted that this method is difficult for weed species that produce tubers or corms underground. In such cases, the soil surrounding each individual plant will need to also be removed and disposed.

4.4.3 Herbicides

Methods

Five methods of applying herbicides are recommended:

- wicker wiping
- cut stump
- stem injection
- spot spraying
- basal bark spraying.

Herbaceous weed species may be treated with herbicide by wicker wiping. This involves sponge or rope soaked in a concentrated herbicide solution which is wiped against the leaves of the plant (Dixon & Keighery 1995). Wiping is often more effective in targeting weed plants and not harming adjacent native plants, however this process may be more labour intensive. Weeds most ideal for this treatment are small populations of small shrubs and broadleaf herbs.

Some species may be controlled by cutting down to ground level and treating the stump with straight herbicide. Typical species suitable for cut stump treatment are trees, shrubs and vines (Dixon & Keighery 1995).

An easy method to kill large trees and shrubs is with stem injection. To do this, a hole into the trunk at a 45 degree angle and to immediately fill the hole with herbicide. The hole must be deep enough to penetrate the sapwood to ensure the herbicide is absorbed and circulated within the plant. If the plant has multiple stems, then all stems will need to be treated (Dixon & Keighery 1995).

Spot spraying involves fine spraying a weak solution of herbicide over the foliage of the weeds. Surfactants and wetting agents are often included to increase the amount of herbicide absorbed by the plants. Care must be taken to avoid accidental spraying of adjacent native plants.

Basal bark spraying is an alternative method for controlling trees. Similar to spot spraying, the base of the trunks with particular herbicides diluted in diesel.

Chemicals

Where possible, a variety of herbicides were recommended for controlling each weed species. Selective herbicides that target the weed species yet have minimal harm to adjacent native plants are preferred over broad spectrum herbicides (Dixon & Keighery 1995). It is up to the Town to decide which herbicide is the most appropriate to use, depending on costs and availability of the herbicides.

As Bindaring Park, Broadway, Pickering Park and Success Hill are near wetlands and waterways, particular care should be exercised when selecting herbicide treatments in these areas. Many common herbicides such as Roundup® contain NPE surfactants which are known to affect the development of amphibian species such as frogs, which can lead to a decline or even loss of such fauna species (Mann 2000). Alternative formulations of herbicides not containing NPE surfactants, such as Roundup Biactive®, are strongly recommended. Other herbicides that are known to have low toxicities to aquatic animals are Ally®, Brushoff® and Fusilade® (Water and Rivers Commission 2001). Information relating to the mobility of herbicides in soil, average half life in soil and water, and bioaccumulation can be found within the herbicide's Materials Safety Data Sheet (MSDS). The herbicide's label should also contain a section outlining appropriate measures for the "Protection of Wildlife, Fish, Crustaceans and Environment".

The application of herbicides must also be in accordance with water catchment restrictions. Chemical based weed control strategies in particular must recognise potential adverse impacts on water resources such as lakes, wetlands, streams, rivers and dams. Clearly, significant control measures must be implemented in Public Drinking Water Sources Areas for the water we consume. The Department of Water's (DOW 2000) *Statewide Policy No.2 Pesticides in Public Drinking Water Sources Areas* will provide further advice on this matter.

It should also be noted that the strength of herbicide treatments are a suggestion only and many were adapted from large scale agriculture rates. The types and rates of herbicides should be verified by a qualified weed scientist before any such methods are used near any water source.

It is necessary that the application of herbicides be in accordance to labelling requirements or the manufacturers MSDS and must be undertaken by personnel trained in the use of herbicide chemicals. The application of any herbicide for purposes not specified on the labelling requires an Off-Label Permit from the National Registration Authority in Canberra.

Details of the herbicides recommended for controlling weeds in the Bassendean reserves are provided in **Appendix Six.**

4.5 Weed Types

It is important to understand the biology of each identified weed species in order to determine the best way to control them. Knowledge should focus on how the plant grows and propagates in order to both remove the existing plants and to prevent future generations. As such, the identified weed species were separated into four types, according to their biology and the type of control methods.

The following section describes the biology of each of the four weed types and notes which of the above control method are the most effective to control that type. It also lists which High Priority weed species belonged to that weed type and in which reserves such species occur. It should be reminded that the high priority weed species listed here may not be high priority for all of the reserve they were recorded in.

4.5.1 Grasses, Sedges and Rushes

Grass, sedge and rush species are all monocots. As such, they have similar physiology which makes them susceptible to certain herbicides that may not be as harmful to broad leaf plants. Using grass selective herbicides such as Fusilade® may assist in controlling monocot weeds while having minimal impact to adjacent broad leaf native plants. Herbicides may be applied through wicker wiping or spot spraying.

Many of these species are highly competitive with native plants and can dominate the understorey. Most monocot weeds, particularly annuals, produce high numbers of seeds to ensure seedling recruitment in the following year. It is therefore vital to control infestations before they set seed to prevent further spread of these populations.

Some of these species, in particular lawn grasses, can also spread by rhizomes and stolons. If the grasses cover the ground, effectively forming a lawn, they may in some circumstances be controlled by either smothering them in black plastic in summer. If the grasses are invading into bushland areas, they may be controlled by manually gathering the spreading rhizomes/ stolons and removing them off the site.

All five reserves contained High Priority grass species. Three species are escaped lawn grasses:

- Buffalo Grass (*Stenotaphrum secundatum*)
- Couch (*Cynodon dactylon*)
- Kikuyu (*Pennisetum clandestinum*)

The remaining grass species are common weeds in the Perth region:

- Barley Grass (*Hordeum leporinum*)
- Brome Grass (*Bromus diandrus*)

- Hares Tail Grass (*Lagurus ovatus*)
- Paspalum (*Paspalum dilatatum*)
- Perennial Veldt Grass (*Ehrharta calycina*)
- Wild Oat (*Avena barbata*).

4.5.2 Geophytes

Many geophyte weeds are 'garden escapes'; originally planted in people's gardens for aesthetics where seeds have entered adjacent bushland. Most of these species are Irises (family Iridaceae) from the cape region of South Africa. The similar climate and soil types made the Perth metropolitan region and south west highly suitable for these species to proliferate and become major environmental weeds.

Geophyte weeds are plants capable or reproducing though underground propagules such as bulbs, corms and tubers. Normal weed control practices are inefficient, as the parent plant may be killed, but the plants may return from sprouting underground propagules. Weed control therefore requires targeting the propagules as well as the parent plant.

If the populations are small, it may be practical to manually remove the plants. Care must be taken to dig around each plant and ensure that all of the underground propagules are also removed, otherwise new plants will appear in the following year. Caution must also be taken if digging in aboriginal heritage sites, as this method risks exposing burial remains.

Certain herbicides such as chlorsulfuron, metsulfuron and 2, 2 DPA are often used to control geophytes, as they can poison both the parent plant and the underground propagules. Such herbicides are best applied when the plants are flowering to maximise the absorption into the propagules. Application can be carried out by either wicker wiping or spot spraying, depending on the species (eg wicker wiping is ineffective on Guildford Grass but is highly effective on Watsonia). Special care must be taken to ensure that adjacent native plants are not exposed to these harmful chemicals.

High Priority geophyte weed species were identified in Bindaring Park, Jubilee and Success Hill. Such weed species to be targeted in these reserves are:

- Arum Lily (*Zantedeschia aethiopica*)
- Bridal Creeper (*Asparagus asparagoides*)
- Guildford Grass (*Romulea rosea*)
- Soursob (*Oxalis pes-caprae*)
- Watsonia (*Watsonia meriana*)
- Wild Gladiolus (*Gladiolus caryophyllaceus*).

4.5.3 Broad Leaf Herbs

Along with grasses, broad leaf herbs are usually the most common type of weed species in a bushland. Most species do not invade good condition bushland, rather they are opportunists that enter when a site is disturbed. Broad leaf herbs are generally easier to control than geophytes, as they only spread by seed and do not have underground propagules. Such weeds should therefore be controlled before they can set seed, as this is their only method of reproduction.

Broad leaf herbs are can be controlled though most general methods. Small populations should be manually removed before they set seed. Care must be taken to remove the crown and taproot, otherwise plants may resprout.

Most species are susceptible to glyphosate when activity growing, although other herbicides may be required on some glyphosate tolerant species. Herbicide application may be though either wicker wiping or spot spraying, depending on the size and nature of the infestation in each reserve.

High Priority broad leaf weed species require to be targeted in Bindaring Park. Two High Priority broad leaf herb species identified in this reserve were:

- Geraldton Carnation Weed (*Euphorbia terracina*)
- Wild Radish (*Raphanus raphanistrum*).

4.5.4 Trees, Shrubs and Climbers

Many tree, shrub and climber weeds are 'garden escapes' which have invaded adjacent bushlands. Other species, such as the Summer Scented Wattle, are local native species which can be aggressive and dominate in disturbed environments. Most species of this type are generally easy to control. Timing should focus on when they are actively growing and before they set seed.

Mature plants of trees, shrubs and perennial climbers may be cut to ground level and the stump treated with straight glyphosate to prevent the roots from resprouting. Trees and shrubs with prominent stumps may be treated with stem injection or basal bark spraying.

Seedlings and annual climbers should be eliminated before they can mature. If numbers are small, it is best to manually remove them. If numbers are high, spot spraying would be more practical.

Reserves identified as having High Priority tree, shrub and climber species were:

- Bindaring Park
- Broadway Reserve
- Success Hill.

High Priority tree, shrub and climber species identified were:

- Edible Fig (*Ficus carica*)
- Japanese Pepper (*Schinus terebinthifolia*)
- Lantana (*Lantana camara*)
- Mile-a-Minute (*Ipomoea cairica*)
- Summer Scented Wattle (*Acacia rostellifera*)
- Tamarisk (*Tamarix aphylla*)
- Tobacco tree (*Nicotiana glauca*).

No climber species were rated as a high priority to control.

4.6 Managing Constraints

4.6.1 Aboriginal Heritage

Recorded aboriginal heritage sites were identified within or in the vicinity of all five reserves. Any proposed works in these sites must first be approved by the Minister for Indigenous Affairs, either under Section 18 or Regulation 10 of the Government of Western Australia's *Aboriginal Heritage Act 1972*. Works must also have the approval of the local aboriginal people.

Many of the sites are closed sites and their exact location not given. The Town will need to contact the Department of Indigenous Affairs (DIA) to request the locations of these sites before any works can commence. It is also possible that the exact location is not known. In this case, the Town will need to commission a study of the area to identify heritage values and location of the site.

Any proposed restoration works within heritage sites cannot be for ecological reasons alone. Instead, works must aspire towards enhancing the heritage value of the sites. It is under this objective that suitable weed management works may be developed.

Several of the sites are registered as containing skeletal remains or being burial sites. Procedures must be developed and enforced for handling any situations when remains are exposed. Works must immediately cease and the exposure reported to DIA. Only when the DIA is satisfied that the remains have been correctly deal with, can weed management works resume.

4.6.2 Dieback

Description

Dieback infestation was identified throughout Success Hill.

There are 15 *Phytophthora* species known to exist in Western Australia. These are soil-borne water moulds that kill a wide selection of plant species within the south west of Western Australia. As *Phytophthora* is a parasite, it requires a living host on which to feed and extracts nutrients and water through a mass of thread-like mycelium, which forms the body of the organism. *Phytophthora* kills its host by girdling the base of the stem, destroying the roots and depriving the plant access to nutrients and water. *Phytophthora cinnamomi* is the most significant species and its life cycle requires moist, non-alkaline conditions that favour survival, sporulation and dispersal (Murray 1997).

Many native plant species are known to be vulnerable to dieback, particularly those of the family Proteaceae (eg Banksias, Grevilleas, Hakeas, Isopogons, Petrophiles, Woolybushes), and also in several other families: Dilleniaceae (eg Hibbertias), Papilionaceae (eg Daviesias, Jacksonias), Epacridaceae (eg Leucopogons) and Xanthorrhoeaceae (Grasstrees) (Groves, Hardy & McComb 2007). It is thought that up to 41% of the 6000 species in South West Botanical province are susceptible to this disease (Dunstan et al. 2008).

Control

Human activity is the biggest factor contributing to the spread of this disease. Infected soil can be moved around the reserve by vehicles, footwear, animal movements, road construction and earth moving equipment.

As dieback cannot be cured, the best control is to prevent further spread of infection. Hygiene measures should be practiced in any weed control activity to prevent the transfer of any infected soil or water into dieback free sites. Such activities include:

- only working in dry conditions
- ensuring all machinery, vehicles, equipment and footwear entering or leaving Success Hill is free of soil and mud
- minimising movement of vehicles, machinery, equipment and footwear between disease free and disease infected sites
- not removing any road making materials (eg gravel) from infected sites
- working in mini catchments and not moving material from one catchment to another (Hussey & Wallace 2003).

4.7 Access

Several of the reserves were observed to have informal tracks. Such tracks need to be either formalised or blocked to prevent further degradation of bushland condition and invasion of weeds. Access to the other informal tracks should be restricted with temporary fencing and planted with appropriate local plants to restore the bushland condition. Educational signs could inform the public of the importance of them to remain on the formal paths, thus reducing further trampling of the vegetation.

Several formal paths have been recommended for Bindaring (North) and Success Hill (**Maps 1k and 5F**). These paths should act to direct pedestrians to their destination without needing to trample more vegetation.

Pathways should not be left as bare sand as this may encourage weeds to establish. Instead they should be covered with path materials to prevent weed seed germinating on the paths. Several path materials are presented below, which should be considered for each site:

- bitumen
- concrete
- crushed limestone stabilised with concrete
- gravel stabilised with concrete
- shredded mulch.

The Town should decide which path material is most appropriate to be used in both sites according to the reserve's social and environmental values.

Weeds may still appear along the sides of the path. As such the paths will need to be routinely inspected as part of monitoring efforts and any weeds observed to be removed.

Path width should be ideally wide enough to act as a vehicle access track. This will allow maintenance and emergency vehicle (eg fire fighting trucks) to effectively traverse the reserves without needing to damage vegetation. It may also serve as a form of fire break, and reduce the spread of any fire outbreak. It is recommended that the paths be at least 3 m in width.

4.8 Monitoring

4.8.1 Monitoring Criteria

When monitoring the site, the following strategies should be adopted:

- Establish monitoring quadrats in the area subject to weed control programs to record the effectiveness of control methods.
- Monitor any change in distribution of the species identified in **Table 4.**
- Monitor for establishment of new weed species.

4.8.2 Performance Criteria

In order to determine the effectiveness of any weed control programme, there needs to be a method of determining success and ongoing progress. The following performance criteria could be used for each reserve, based on the monitoring data collected:

- Control/ eradicate at least three priority weed species over the next five years.
- Reduction in the area of priority weed infestations by 20% over 5 years.
- Reduction in the total number of weed species by 20% over 5 years.

Although not appropriate as performance criteria, other information can be recorded to assist in an overall view of the effectiveness of weed control activities within the site:

- The number of new weed species recorded – it is expected that, initially, new weed species may be recorded as they may not have been identifiable at the time of the field survey. Over time, it is anticipated that the total number of weed species recorded should plateau, and then decrease.
- Any new infestations of High Priority species – this information can be used to determine areas of new infestations, and allow an analysis for the control of these new infestations.

4.8.3 Frequency of Monitoring

Monitoring of bushland condition is recommended to be undertaken every 1-2 years. This is based on the time it takes to undertake initial weed control and then follow-up weed control to remove plants missed. Monitoring bushland condition within the site over a shorter time frame is unlikely to show dramatic changes and could be a waste of resources.

Monitoring of weed quadrats should occur annually, and updating of records should occur as often is as practicable. The bushland condition could be remapped after the performance targets have been met (ie after five years).

Weeds to be mapped annually

Highly invasive weeds with the potential to expand rapidly are high priorities for control and should be mapped each year. These include:

- Bridal Creeper (*Asparagus asparagoides*)
- Geraldton Carnation Weed (*Euphorbia terracina*)
- Kikuyu (*Pennisetum clandestinum*)
- Perennial Veldt Grass (*Ehrharta calycina*)
- Watsonia (*Watsonia meriana*).

Weeds to be mapped every 2 years

High Priority weeds that are not rapid invaders should be mapped every two years. These include:

- Arum Lily (*Zantedeschia aethiopica*)
- Barely Grass (*Hordeum leporinum*)
- Brome Grass (*Bromus diandrus*)
- Buffalo Grass (*Stenotaphrum secundatum*)
- Couch (*Cynodon dactylon*)
- Edible Fig (*Ficus carica*)
- Guildford Grass (*Romulea rosea*)
- Hares Tail Grass (*Lagurus ovatus*)
- Japanese Pepper (*Schinus terebinthifolia*)
- Lantana (*Lantana camara*)
- Mile-a-Minute (*Ipomoea cairica*)
- Paspalum (*Paspalum dilatatum*)
- Soursob (*Oxalis pes-caprae*)
- Summer Scented Wattle (*Acacia rostellifera*)
- Tamarisk (*Tamarix aphylla*)
- Tobacco Tree (*Nicotiana glauca*)
- Wild Oat (*Avena barbata*)
- Wild Radish (*Raphanus raphanistrum*)
- Wild Gladiolus (*Gladiolus caryophyllaceus*).

5.0 Costs and Funding

Bushland Weed Management Plan

5.1 Indicative Costs

Significant funding is required for reducing and eliminating weed species in the Bassendean reserves. An Opinion of Probable Cost (OPC) for improving weed control for each reserve is provided in **Tables 8 to 12** and a summary of all reserve costs are presented in **Table 13**. The OPC calculations were derived using a variety of assumptions. The indicative costs are projected over a 5 year period to improve the overall bushland condition of the reserves. This OPC is intended as a guide only as costs can vary considerably depending on various factors such as whether work is undertaken by staff or volunteers rather than weed contractors.

It should be noted that figures for Success Hill may be underestimated, as the site was subject to a fire after it had been assessed. It is likely that the weeds may invade and dominate the burnt areas, leading to an increase of cost and resources.

5.1.1 Calculated Cost

Calculations were based on bushland condition area figures:

- *Degraded* and *Completely Degraded* areas contained more weed cover, therefore would be more expensive to control than *Good* areas in terms of man hours and resources.
- *Very Good* and *Excellent* areas contained less weeds, however would require more highly skilled workers to locate and remove them without disturbing the site, and therefore would be more expensive to control than *Good* areas.

The unit costs of various weed control and monitoring methods were estimated from examining previous works provided by several weed control contractors and followed the below listed assumptions:

- Weed control is always conducted at optimal times using recommended methods.
- A decline of 20% weed cover subsequently occurs each year as a result of the previous weed control activities.
- Unit area weed costs increase if site characteristics make weed control more difficult (eg dieback hygiene practices, care in not disturbing heritage sites).

5.1.2 Floor Cost

It was realised that as weed presence declined over the years, the costs of actual weed control work may be lower than the estimated costs for conducting monitoring, maintenance and mapping each reserve each year (eg mobilisation, staff hours involved). As such, a "floor cost" was estimated for conducting the minimal required work for each reserve. If the calculated cost was lower than the floor cost, the floor cost figure was used instead. The final chosen figure per year (either calculated or floor cost) for each reserve are in bold font in **Tables 8 to 12**.

5.1.3 Extra Costs

Additional funding was allowed for each reserve for each year to account for the following factors:

- A contingency of 5% was included each year to fund any additional work required to control any new threats or site disturbances (eg introduction of new weed species, fire).
- It is anticipated that the costs of labour and herbicides will increase by 3% per year over the five year period.

5.1.4 Days Labour

The rate to conduct weed control at a site (hours/hectare) corresponded to:

- the difficulty in traversing that site (eg Bindaring Park would take longer to traverse per hectare than Pickering Park)
- the difficulty in conducting weed control (eg controlling some species require more time and effort than other species)

The number of days of weed control labour in each reserve was estimated by:

- summing the total areas for each weed treatment (ha)
- dividing by the rate to conduct weed control (hours)
- dividing by the number of hours in a working day.

Table 8: OPC for weed control in Bindaring Park over five years

Task	Figure	Unit	Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
Weed Control								
Degraded	39,400	sq m	$23,640	$18,912	$15,130	$12,104	$9,683	$79,468
Completely Degraded	8,800	sq m	$6,600	$5,280	$4,224	$3,379	$2,703	$22,187
Calculated Cost			**$30,240**	**$24,192**	**$19,354**	**$15,483**	**$12,386**	$101,655
Floor Cost	$2,000	$/ha	$9,640	$9,640	$9,640	$9,640	$9,640	$48,200
Contingency	5	%	$1,512	$1,210	$968	$774	$619	$5,083
Inflation	3	%	$0	$726	$1,179	$1,435	$1,554	$4,894
Total	**4.82**	**ha**	**$31,752**	**$26,127**	**$21,500**	**$17,692**	**$14,560**	**$111,632**
No. days labour		days	20.2	16.1	12.9	10.3	8.3	**67.8**

Table 9: OPC for weed control in Broadway over five years

Task	Figure	Unit	Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
Weed Control								
Good	1,500	sq m	$450	$360	$288	$230	$184	$1,513
Degraded	13,800	sq m	$6,624	$5,299	$4,239	$3,391	$2,713	$22,267
Completely Degraded	11,300	sq m	$6,780	$5,424	$4,339	$3,471	$2,777	$22,792
Calculated Cost			**$13,854**	**$11,083**	**$8,867**	**$7,093**	**$5,675**	$46,572
Floor Cost	$2,000	$/ha	$5,320	$5,320	$5,320	$5,320	$5,320	$26,600
Contingency	5	%	$693	$554	$443	$355	$284	$2,329
Inflation	3	%	$0	$332	$540	$658	$712	$2,242
Total	**2.66**	**ha**	**$14,547**	**$11,970**	**$9,850**	**$8,105**	**$6,670**	**$51,142**
No. days labour		days	11.5	9.2	7.4	5.9	4.7	**38.8**

Table 10: OPC for weed control in Jubilee Reserve over five years

Task	Figure	Unit	Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
Weed Control								
Excellent	6,000	sq m	$2,940	$2,352	$1,882	$1,505	$1,204	$9,883
Very Good	4,600	sq m	$1,932	$1,546	$1,236	$989	$791	$6,495
Good	2,000	sq m	$700	$560	$448	$358	$287	$2,353
Degraded	3,400	sq m	$1,904	$1,523	$1,219	$975	$780	$6,400
Calculated Cost			**$7,476**	**$5,981**	**$4,785**	**$3,828**	$3,062	$25,131
Floor Cost	$2,000	$/ha	$3,200	$3,200	$3,200	$3,200	**$3,200**	$16,000
Contingency	5	%	$374	$299	$239	$191	$160	$1,263
Inflation	3	%	$0	$464	$792	$1,024	$1,190	$3,470
Total	**1.6**	**ha**	**$7,850**	**$6,744**	**$5,816**	**$5,043**	**$4,550**	**$30,003**
No. days labour		days	5.3	4.3	3.4	2.7	2.2	**18.0**

Table 11: OPC for weed control in Pickering Park over five years

Task	Figure	Unit	Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
Weed Control								
Very Good	5,600	sq m	$2,016	$1,613	$1,290	$1,032	$826	$6,777
Good	700	sq m	$210	$168	$134	$108	$86	$706
Degraded	400	sq m	$192	$154	$123	$98	$79	$645
Calculated Cost			**$2,418**	**$1,934**	**$1,548**	$1,238	$990	$8,128
Floor Cost	2,000	ha	$1,340	$1,340	$1,340	**$1,340**	**$1,340**	$6,700
Contingency	5	%	$121	$97	$77	$67	$67	$429
Inflation	3	%	$0	$58	$94	$124	$168	$445
Total	**0.67**	**ha**	**$2,539**	**$2,089**	**$1,719**	**$1,531**	**$1,575**	**$9,454**
No. days labour		days	1.3	1.1	0.9	0.7	0.6	**4.5**

Table 12: OPC for weed control in Success Hill over five years

Task	Figure	Unit	Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
Weed Control								
Degraded	31,200	sq m	$44,928	$35,942	$28,754	$23,003	$18,403	$151,030
Completely Degraded	3,900	sq m	$7,020	$5,616	$4,493	$3,594	$2,875	$23,598
Calculated Cost			**$51,948**	**$41,558**	**$33,247**	**$26,597**	**$21,278**	$174,628
Floor Cost	$2,000	ha	$7,020	$7,020	$7,020	$7,020	$7,020	$35,100
Contingency	5	%	$2,597	$2,078	$1,662	$1,330	$1,064	$8,731
Inflation	3	%	$0	$1,247	$997	$798	$638	$3,680
Total	**3.51**	**ha**	**$54,545**	**$44,883**	**$35,906**	**$28,725**	**$22,980**	**$187,040**
No. days labour		days	14.4	11.5	9.2	7.4	5.9	**48.5**

Table 13: OPC for total costs for weed control in Bassendean reserves over five years

Reserve	Area	Unit	Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
Bindaring Park	4.82	ha	$31,752	$26,127	$21,500	$17,692	$14,560	$111,632
Broadway	2.66	ha	$14,547	$11,970	$9,850	$8,105	$6,670	$51,142
Jubilee	1.6	ha	$7,850	$6,744	$5,816	$5,043	$4,550	$30,003
Pickering Park	0.67	ha	$2,539	$2,089	$1,719	$1,531	$1,575	$9,454
Success Hill	3.51	ha	$54,545	$44,883	$35,906	$28,725	$22,980	$187,040
Total	**13.26**	**ha**	**$111.233**	**$91,813**	**$71,791**	**$61,096**	**$50,335**	**$389,271**

5.2 Funding Opportunities

A variety of other funding sources are available which may be approached to further finance the work scheme. Many of these sources cannot be directly approached by local governments, however local community groups may apply for and manage the funds for a particular project. Also, some of these sources may require the Town to contribute part of the funds.

National funding bodies include:

- Australia Post Landcare Community Development
- Australian Bird Environment Foundation (ABEF)
- Australian Tourism Development Program
- Caring for our Country (DEWHA)
- Envirofund
- Mazda Foundation
- Myer Foundation
- National Landcare Program
- Norman Wettenhall Foundation
- Threatened Species network Community Grant (WWF)
- Westpac: Operation Backyard.

Possible state sources include:

- Alcoa Foundation
- Bushland Benefits (DEC)
- Community Conservation Grants (DEC)
- Conservation Volunteers Australia
- Environmental Eduction Grants Program (Environment Australia)
- Gordon Reid Conservation of Natural Heritage Grants
- Grants to Voluntary Environment and Heritage Organisitons (DEH)
- Ian Potter Foundation
- Lotterywest grants
- Regional NRM catchment councils
- SGIO Community Help Grant Program
- Swan Alcoa Landcare grants
- Western Australian Regional Initiatives Scheme (WARIS).

Funding may also be possibly obtained from state and Commonwealth heritage programs to enhance the heritage values of the aboriginal sites in the reserves. Suitable sources include:

- Heritage Grants Program
- Indigenous Heritage Program
- Indigenous Protected Areas Program
- Indigenous Start Up and Incentive Land Care Grants.

Volunteer groups may also be approached for on ground works and training opportunities, which may reduce the costs of works. Possible groups include:

- Green Corps
- Green Skills
- local Friends groups.

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Bushland Weed Management Plan

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Appendix One: Weed Inventory

Bushland Weed Management Plan

Table A1.1: Weed inventory of Bassendean reserves

WEED SPECIES		RESERVES							
Scientific Name	Common Name	Bindaring Park (North)	Bindaring Park (South)	Broadway	Jubilee (A)	Jubilee (B)	Pickering Park	Success Hill	TOTAL
Grass, Sedge and Rush Weeds									
Arundo donax	Giant Reed	*	*					*	**3**
Avena barbata	Wild Oat	*	*	*				*	**4**
*Bolboschoenus caldwellii**	Marsh Club-rush*		*						**1**
Briza maxima	Blowfly Grass	*	*		*	*	*	*	**6**
Briza minor	Shiver Grass	*	*					*	**3**
Bromus diandrus	Brome Grass		*	*				*	**3**
Cynodon dactylon	Couch		*	*	*		*		**4**
Cyperus involucratus	Cyperus	*							**1**
Digitaria sanguinalis	Crab Grass	*	*	*			*		**4**
Ehrharta calycina	Perennial Veldt Grass		*		*	*		*	**4**
Ehrharta longifolia	Annual Veldt Grass			*			*		**2**
Hordeum leporinum	Barley Grass	*	*				*		**3**
Lagurus ovatus	Hares Tail Grass		*					*	**2**
Lolium rigidum	Ryegrass	*	*	*				*	**4**
Paspalum dilatatum	Paspalum	*	*						**2**
Pennisetum clandestinum	Kikuyu	*	*				*	*	**4**
Phyllostachys sp.	Bamboo	*	*						**2**
Polypogon monspeliensis	Annual Barbgrass	*	*				*	*	**4**
Setaria palmifolia	Pigeon Grass	*							**1**
Stenotaphrum secundatum	Buffalo Grass		*						**1**
*Typha domingensis**	Bullrush*	*	*	*				*	**4**
Geophyte Weeds									
Asparagus asparagoides	Bridal Creeper	*	*					*	**3**
Freesia sp.	Freesia							*	**1**
Gladiolus caryophyllaceus	Wild Gladiolus					*		*	**2**
Oxalis pes-caprae	Soursob	*	*		*			*	**4**
Romulea rosea	Guildford Grass				*	*			**2**
Watsonia meriana	Watsonia	*	*					*	**3**
Zantedeschia aethiopica	Arum Lily	*	*					*	**3**
Broad Leaf Herb Weeds									
Anagallis arvensis	Pimpernel	*	*	*					**3**
Arctotheca calendula	Capeweed		*			*	*		**3**
Citrullus lanatus	Wild Melon			*					**1**
Conyza bonariensis	Fleabane	*	*	*	*		*	*	**6**
Euphorbia terracina	Geraldton Carnation Weed			*					**1**
Fumaria capreolata	Whiteflower Fumitory	*	*	*				*	**4**
Galium sp.	Bedstraw		*	*					**2**
Geranium molle	Dove-foot Cranebill			*					**1**
Hypochaeris sp.	Flatweed	*	*	*	*	*	*	*	**7**

WEED SPECIES		RESERVES							
Scientific Name	**Common Name**	**Bindaring Park (North)**	**Bindaring Park (South)**	**Broadway**	**Jubilee (A)**	**Jubilee (B)**	**Pickering Park**	**Success Hill**	**TOTAL**
Lactuca serriola	Prickly Lettuce	*	*	*	*	*	*	*	**7**
Lotus angustissimus	Birdsfoot	*	*	*		*			**4**
Lupinus angustifolius	Narrow leaf Lupin			*		*		*	**3**
Lupinus cosentinii	Western Blue Lupin							*	**1**
Malva parviflora	Small Flowered Mallow		*	*					**2**
Medicago polymorpha	Burr Medic		*	*			*		**3**
Melilotus indicus	Common Meliot			*		*	*	*	**4**
Oenothera drummondii	Beach Evening Primrose			*					**1**
Ornithopus compressus	Yellow Seradella				*	*	*		**3**
Plantago lanceolata	Ribwort Plantain	*	*				*		**3**
Raphanus raphanistrum	Wild Radish	*	*	*					**3**
Rorippa nasturtium-aquaticum	Watercress	*							**1**
Rumex crispus	Curled Dock	*	*						**2**
Solidago canadensis	Goldenrod	*							**1**
Solanum nigrum	Black Nightshade	*	*	*			*		**4**
Sonchus asper	Prickly Sowthistle	*	*	*	*	*	*	*	**7**
Sonchus oleraceus	Sowthistle		*	*	*	*		*	**5**
Stachys arvensis	Stagger Weed						*		**1**
Tribulus terrestris	Caltrop			*					**1**
Trifolium angustifolium	Narrowleaf Clover	*	*		*	*			**4**
Trifolium arvense	Hares Tail Clover					*		*	**2**
Tropaeolum majus	Nasturtium	*							**1**
Unknown sp.			*						**1**
Wahlenbergia capensis	Cape Bluebell			*					**1**
Trees, Shrubs and Climber Weeds									
*Acacia rostellifera**	Summer Scented Wattle*			*					**1**
Campsis radicans	Trumpet Vine	*							**1**
Chamaecytisus palmensis	Tagasaste			*					**1**
Chamelaucium uncinatum	Geraldton Wax			*					**1**
Ficus carica	Edible Fig		*						**1**
Hibiscus sp.	Hibiscus		*						**1**
Ipomoea cairica	Mile-a-Minute		*						**1**
Ipomoea indica	Morning Glory	*	*					*	**3**
*Kennedia nigricans**	Black Kennedia		*						**1**
Lantana camara	Lantana							*	**1**
Lathyrus tingitanus	Tangier Pea							*	**1**
Melia azedarach	Cape Lilac Tree		*	*					**2**
Nicotiana glauca	Tobacco Tree			*					**1**
Ricinus communis	Castor Oil		*	*				*	**3**
Schinus terebinthifolia	Japanese Pepper	*	*	*		*			**4**
Tamarix aphylla	Tamarix			*					**1**
Vicia sativa	Vetch	*	*	*		*			**4**
Vitis vinifera	Grapevine		*						**1**
Washingtonia filifera	Cotton Palm		*						**1**
TOTAL		37	51	36	12	17	19	32	**80**

* native species

Methodology of Prioritising Weeds

Rating Systems

The priority ratings of each weed species were determined after examining:

- the ratings under the *Environmental Weed Strategy of Western Australia* (EWSWA) by the Department of Conservation and Land Management (CALM 1999)
- the ratings under the *Environmental Weed Census and Prioritisation* (EWCP) by the Swan Natural Resource Management (Swan NRM 2008)
- the ratings under Dixon and Keighery (1995) *Recommended methods to control specific weed species*
- whether it was listed under the DAFWA (1976) *Agricultural and Related Resources Protection Act* (ARRPA)
- whether it was listed as a *Weed of National Significance* (WONS) (Weed Australia 2008)
- its local significance to the natural areas.

The role of EWSWA is to highlight which weed species pose significant environmental risk in Western Australia. The EWSWA rating provides a basis for determining which weeds are most critical to control. The three characteristics used for determining the EWSWA rating are:

- *invasiveness* – ability to invade bushland in good to excellent condition
- *distribution* – wide current or potential distribution including consideration of known history of wide distribution elsewhere in the world
- *environment impacts* – ability to change the structure, composition and function of ecosystems, in particular to form a monoculture in a vegetation community.

EWSWA weed species were rated accordingly:

- *High* – have all three of the characteristics
- *Moderate* – have two of the characteristics
- *Mild* – have one of the characteristics
- *Low* – not deemed to have any of the characteristics.

However, EWSWA is a general guide for prioritising weeds across the State. The Swan Natural Resource Management (2008) *Environmental Weed Census and Prioritisation* (EWCP) rates weeds species as a threat in Perth bushland conditions. A total of eight ratings are used, according to the risk each species poses to environmental assets in the region, based on invasiveness, ecological impact, current and potential distribution, and thus priority for management. In order of descending, priority, they are:

- Very High
- High
- Further Assessment Required (FAR)/ High
- Moderate/ High
- Moderate
- Low/ Moderate
- Low
- Further Assessment required (FAR)

Dixon and Keighery (1995) developed a rating system for 145 weed species. The rating system classified each species according to the threat they pose to bushland in the Perth Metropolitan region. The three classifications used were:

- *Priority 1* – major weeds, which are the most serious weeds within their ecosystem, often affecting many reserves or habitats in ways likely to permanently degrade them -
- *Priority 2* – nuisance weeds, which are generally found only in a few locations or ecosystems, usually in disturbed areas
- *Priority 3* – minor weeds, which have little known effect and occur in smaller numbers or are less competitive than *Priority 2* weeds.

The type of control for ARRPA declared weed species are listed below:

- *P1* – Prohibits movement of plants or their seeds within the State. This prohibits the movement of contaminated machinery and produce including livestock and feed.
- *P2* – Eradicate infestation to destroy and prevent propagation each year until no plants remain. The infested area must be managed in such a way that prevents the spread of seed or plant parts on or in livestock, fodder, grain, vehicles and/or machinery.
- *P3* – Control infestation in such a way that prevents the spread of seed or plant parts within and form the property on or in livestock, fodder, grain, vehicles and/or machinery. Treat to destroy and prevent seed set all plants.
- *P4* – Prevent the spread of infestation from the property on or in livestock, fodder, grain, vehicles and/or machinery. Treat to destroy and prevent seed set on all plants.

WONS was jointly declared by the Minister for Forestry and Conservation, the Minister for Agriculture, Fisheries and Forestry and the Minister for The Environment in 1999 as part of the *National Weeds Strategy*. The four characteristics used for determining where the species was of national significance were:

- invasiveness
- impacts
- potential for spread
- socioeconomic and environmental values.

Ranking Priority Weeds

The above sources were used to rank the recorded weed species in order of priority for control. Both the EWCP (Swan Natural Resource Management 2008) and EWSWA (CALM 1999) ratings were used because it allowed most weeds identified in the study area to be assigned a rating and thereby ranked. If only one source had been used, some of the weed species would have not been assigned a rating score.

The use of two rating systems does result in some conflict when assigning a ranking for a weed species. To overcome this issue, a matrix scoring system was developed to enable the ranking of the weed species. The matrix scoring system is summarised in **Table A2.1.** For the purposes of this study, the system gave a slight bias to the EWCP system, as this system was more relevant for the study area.

In addition, as weed species listed under either ARRPA or WONS are required by legislation to be controlled, any of these listed weed species recorded were automatically given a rating of 6.

Table A2.1: Matrix scoring system for rating weed priority

RATING SYSTEM		EWSWA				
		Unrated	Low	Mild	Moderate	High
Perth NRM	Unrated	1	1	3	4	5
	FAR	1	1	3	4	5
	Low	2	2	3	4	5
	L/M	2	3	4	4	5
	M	3	4	4	4	5
	M/H	4	4	4	5	6
	FAR/H	5	5	5	5	6
	H	5	5	5	6	6
	VH	6	6	6	6	6

If any weed species not assigned a rating by these any of the previous sources, the Dixon and Keighery (1995) rating system would then be used:

- Priority 1 = Rating 6
- Priority 2 = Rating 4
- Priority 3 = Rating 2

If any weed species were not given a rating be any of the previous systems, they would receive a default rating of 1.

The calculated ratings were then adjusted according to whether the species were more or less of a threat or dominant in the local native areas. Species with low ratings that were posing a greater threat or were already highly dominant had the rating raised. In contrast, species with high ratings but were not considered to be a local threat had their rating lowered accordingly.

The priority of each weed species was then classified by the final rating:

- Species given a rating of 5 or 6 were *High Priority Weeds*.
- Species with a final rating of 3 or 4 were *Moderate Priority Weeds*.
- Species with a rating of 1 or 2 were *Low Priority Weeds.*

Results

State and National Significance

The following weed species were given priority scores of 6 (High Priority) as they were listed by WONS and/or ARRPA:

- Arum Lily (*Zantedeschia aethiopica*) ARRPA
- Bridal Creeper (*Asparagus asparagoides*) - WONS and ARRPA
- Lantana (*Lantana camara*) WONS and ARRPA
- Tamarix (*Tamarix aphylla*) – ARRPA.

Local Significance

Several mature trees of Japanese Pepper (*Schinus terebinthifolia*) were observed throughout Bindaring Park. Another specimen was recorded resprouting form a root in Jubilee Reserve (B). A sapling was also observed in Broadway. Mature Japanese Peppers are known to dominate and outcompete overstorey species in wetlands and waterways of the Perth metropolitan region. Physical removal of mature trees is also a costly and laborious exercise. As such the species score was upgraded from 1 (Low Priority) to 4, as it is considered to be a Moderate Priority to control in both reserves.

The native species Summer Scented Wattle (*Acacia rostellifera*) was originally planted in Broadway reserve as part of the Arboretum. This species is not local to the Bassendean area. Instead, it naturally occurs in coastal areas, where is an aggressive coloniser of beach sand dunes. This aggressive character has resulted in the many seedlings sprouting across the reserve. The priority score for Summer Scented Wattle was therefore increased from 1 (Low Priority) to 5 (High Priority) for Broadway, as immediate action is required to control the seedlings before the reserve is further degraded.

Large infestations of Brome Grass (*Bromus diandrus*) and Wild Radish (*Raphanus raphanistrum*) were observed dominating much the understorey of Broadway. The species initially scored 4 (Moderate priority) and 2 (Low Priority), respectively. However, the urgency to reduce the cover of these species to restore the native understorey warrants their priority scores to be raised to 5 (High Priority) for this reserve.

Similarly, a large population of Tobacco Tree (*Nicotiana glauca*) was observed in the southwest section of Broadway. The priority score was accordingly raised from 2 (Low Priority) to 5 (High Priority), as this species needs to be immediately controlled before it spreads further.

Numerous populations of Birdsfoot (*Lotus angustissimus*) were recorded bordering the Nyibra Swamp in Broadway. The priority score of this species was raised from 2 (Low Priority) to 4 (Moderate Priority) to reflect the need to reduce the cover of this weed species.

A single plant of Geraldton Wax (*Chamelaucium uncinatum*) was recorded on the southern edge of Nyibra Swamp in the Broadway reserve. This species not known to be an invader of bushland. As this species is not considered to be a threat to the site, its priority score was reduced from 4 (Moderate Priority) to 2 (Low Priority).

The lawn grass Kikuyu (*Pennisetum clandestinum*) was observed along the shoreline in Success Hill. Several parts of the shoreline were covered in Kikuyu, resembling a lawn. The weed species was also observed spreading into the understorey near the shoreline. Similarly, large populations of Watsonia (*Watsonia meriana*) were recorded on and near the slope area of Success Hill. Both species are well known to dominate and smother the understorey of wetlands and waterways in the Perth metropolitan area. They are especially invasive and dominant after a fire, which this site experienced on December 31st 2009. The extreme threats of these species to this reserve resulted in their priority scores to be raised from 5 to 6 (High Priority) to stress their importance to be controlled.

Small infestations of Couch (*Cynodon dactylon*), Freesia (*Freesia* sp.), Hares Tail Grass (*Lagurus ovatus*) and Western Blue Lupin (*Lupinus cosentinii*) were recorded in Success Hill.

The calculated scores for this species are 5, 6, 5 and 6 respectively, indicating that they are all High Priorities. However, as this reserve already has many high priority weed species that needs extensive resources to control (ie Perennial Veldt Grass, Lantana, Arum Lily and Watsonia), the threat of these species to the bushland was relevantly less important. Their scores in Success Hill were therefore reduced to 4 (Moderate Priority).

Table A2.2: Prioritisation and optimal control times of weeds observed at Bindaring Park

WEED SPECIES		SECTION		PRIORITISATION									OPTIMAL CONTROL TIME										
Scientific Name	**Common Name**	**Bindaring North**	**Bindaring South**	**EWSWA**	**Swan NRM**	**WONS**	**ARRPA**	**Dixon & Keighery**	**Calculated Rating**	**Locally significant**	**Final Rating**	**PRIORITY**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Asparagus asparagoides	Bridal Creeper	*	*	High	Very High	*	P1	1	6		**6**	**High**												
Avena barbata	Wild Oat	*	*	Moderate	Very High			1	6		**6**													
Bromus diandrus	Brome Grass		*	High	Very High			3	6		**6**													
Cynodon dactylon	Couch		*	Moderate	Very High			1	6		**6**													
Ehrharta calycina	Perennial Veldt Grass		*	High	Very High			1	6		**6**													
Ficus carica	Edible Fig		*	Moderate	High			1	6		**6**													
Hordeum leporinum	Barley Grass	*	*	Moderate	High			3	6		**6**													
Lagurus ovatus	Hares Tail Grass		*	High	High			2	6		**6**													
Paspalum dilatatum	Paspalum	*	*	Moderate	High			2	6		**6**													
Pennisetum clandestinum	Kikuyu	*	*	Moderate	High			1	6		**6**													
Schinus terebinthifolia	Japanese Pepper	*	*	Unrated	Very High				6		**6**													
Stenotaphrum secundatum	Buffalo Grass		*	Moderate	High			1	6		**6**													
Watsonia meriana	Watsonia	*	*	High	Very High			1	6		**6**													
Zantedeschia aethiopica	Arum Lily	*	*	High	Very High		P1, P4	1	6		**6**													
Ipomoea cairica	Mile-a-Minute		*	Mild	High			3	5		**5**													
Oxalis pes-caprae	Soursob	*	*	Mild	High			2	5		**5**													
Arctotheca calendula	Capeweed		*	Moderate	High			3	6	No	**4**	**Moderate**												
Briza maxima	Blowfly Grass	*	*	Moderate	FAR			2	4		**4**													
Briza minor	Shiver Grass	*	*	Moderate	FAR			2	4		**4**													
Cyperus involucratus	Cyperus	*		Low	Moderate				4		**4**													
Fumaria capreolata	Whiteflower Fumitory	*		Mild	Moderate/ High			2	4		**4**													
Galium sp.	Bedstraw		*	Moderate	Unrated			3	4		**4**													
Hypochaeris sp.	Flatweed	*	*	Moderate	High			3	6	No	**4**													
Ipomoea indica	Morning Glory	*	*	Mild	Moderate/ High			3	4		**4**													
Lactuca serriola	Prickly Lettuce	*	*	Moderate	High			3	6	No	**4**													
Lolium rigidum	Ryegrass	*	*	Moderate	Unrated			3	4		**4**													
Lotus angustissimus	Birdsfoot	*	*	Low	High			3	5	No	**4**													
Polypogon monspeliensis	Annual Barbgrass	*	*	Moderate	Unrated			3	4		**4**													
Rorippa nasturtium-aquaticum	Watercress	*		Moderate	Unrated				4		**4**													
Solanum nigrum	Black Nightshade	*	*	Moderate	Moderate			2	4		**4**													
Sonchus asper	Prickly Sowthistle	*	*	Moderate	FAR				4		**4**													
Sonchus oleraceus	Sowthistle	*	*	Moderate	FAR			3	4		**4**													
Vicia sativa	Vetch	*	*	Moderate	FAR			3	4		**4**													
Arundo donax	Giant Reed	*	*	Unrated	Unrated			2	3		**3**													
Medicago polymorpha	Burr Medic		*	Mild	FAR			3	3		**3**													
Raphanus raphanistrum	Wild Radish	*	*	Mild	FAR			3	3		**3**													
Rumex crispus	Curled Dock	*	*	Mild	FAR			3	3		**3**													

WEED SPECIES		SECTION		PRIORITISATION									OPTIMAL CONTROL TIME										
Scientific Name	**Common Name**	**Bindaring North**	**Bindaring South**	**EWSWA**	**Swan NRM**	**WONS**	**ARRPA**	**Dixon & Keighery**	**Calculated Rating**	**Locally significant**	**Final Rating**	**PRIORITY**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Anagallis arvensis	Pimpernel	*	*	Moderate	FAR			3	4	No	**2**	**Low**												
Conyza bonariensis	Fleabane	*	*	Low	Low			3	2		**2**													
Digitaria sanguinalis	Crab Grass	*	*	Low	Low				2		**2**													
Malva parviflora	Small Flowered Mallow		*	Low	Low			3	2		**2**													
Melia azedarach	Cape Lilac		*	Low	Low				2		**2**													
Plantago lanceolata	Ribwort Plantain	*	*	Low	FAR			3	2		**2**													
Setaria palmifolia	Pigeon Grass	*		Low	Low				2		**2**													
Solidago canadensis	Goldenrod	*		Low	Low				2		**2**													
Trifolium angustifolium	Narrowleaf Clover	*	*	Unrated	FAR			3	2		**2**													
Tropaeolum majus	Nasturtium	*		Low	Low			3	2		**2**													
Washingtonia filifera	Cotton Palm		*	Mild	FAR			3	3	No	**2**													
*Bolboschoenus caldwellii**	Marsh Club-rush*		*						1		**1**													
Campsis radicans	Trumpet Vine	*							1		**1**													
Hibiscus sp.			*	Low					1		**1**													
Kennedia nigricans			*	Unrated	FAR				1		**1**													
Phyllostachys sp.	Bamboo	*	*						1		**1**													
Ricinus communis	Castor Oil		*	Low	Unrated			3	1		**1**													
*Typha domingensis**	Bullrush*	*	*	Low	Unrated				1		**1**													
Unknown Sp. 2			*						1		**1**													
Vitis vinifera	Grapevine		*	Unrated	Unrated				1		**1**													

Optimal control times for targeting weed species

Table A2.3: Prioritisation and optimal control times of weeds observed at Broadway

WEED SPECIES		PRIORITISATION									OPTIMAL CONTROL TIME											
Scientific Name	**Common Name**	**EWSWA**	**Swan NRM**	**WONS**	**ARRPA**	**Dixon & Keighery**	**Calculated Rating**	**Locally significant**	**Final Rating**	**PRIORITY**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Avena barbata	Wild Oat	Moderate	Very High			1	6		**6**	**High**												
Bromus diandrus	Brome Grass	High	Very High			3	6		**6**													
Cynodon dactylon	Couch	Moderate	Very High			1	6		**6**													
Euphorbia terracina	Geraldton Carnation Weed	High	Very High			1	6		**6**													
Schinus terebinthifolia	Japanese Pepper	Unrated	Very High				6		**6**													
Tamarix aphylla	Tamarisk	Moderate	High		P1		6		**6**													
*Acacia rostellifera**	Summer Scented Wattle*						1	Yes	**5**													
Nicotiana glauca	Tobacco Tree	Mild	Moderate			3	4	yes	**5**													
Raphanus raphanistrum	Wild Radish	Mild	FAR			3	3	Yes	**5**													
Chamelaucium uncinatum	Geraldton Wax	Moderate	Moderate			2	4		**4**	**Moderate**												
Ehrharta longifolia	Annual Veldt Grass	Moderate	FAR			3	4		**4**													
Fumaria capreolata	Whiteflower Fumitory	Mild	Moderate/ High			2	4		**4**													
Galium sp.	Bedstraw	Moderate	Unrated			3	4		**4**													
Hypochaeris sp.	Flatweed	Moderate	High			3	6	No	**4**													
Lactuca serriola	Prickly Lettuce	Moderate	High			3	6	No	**4**													
Lolium rigidum	Ryegrass	Moderate	Unrated			3	4		**4**													
Lotus angustissimus	Birdsfoot	Low	High			3	5	No	**4**													
Melilotus indicus	Common Meliot	Moderate	Unrated			3	4		**4**													
Oenothera drummondii	Beach Evening Primrose	Moderate	Unrated			3	4		**4**													
Solanum nigrum	Black Nightshade	Moderate	Moderate			2	4		**4**													
Sonchus asper	Prickly Sowthistle	Moderate	FAR				4		**4**													
Sonchus oleraceus	Sowthistle	Moderate	FAR			3	4		**4**													
Tribulus terrestris	Caltrop	Low	Moderate/ High				4		**4**													
Vicia sativa	Vetch	Moderate	FAR			3	4		**4**													
Chamaecytisus palmensis	Tagasaste	Mild	FAR			2	3		**3**													
Lupinus angustifolius	Narrow leaf Lupin	Mild	Unrated			3	3		**3**													
Medicago polymorpha	Burr Medic	Mild	FAR			3	3		**3**													
Anagallis arvensis	Pimpernel	Moderate	FAR			3	4	No	**2**	**Low**												
Conyza bonariensis	Fleabane	Low	Low			3	2		**2**													
Digitaria sanguinalis	Crab Grass	Low	Low				2		**2**													
Geranium molle	Dove-foot Cranebill	Low	Moderate			3	4	No	**2**													
Malva parviflora	Small Flowered Mallow	Low	Low			3	2		**2**													
Melia azedarach	Cape Lilac Tree	Low	Low				2		**2**													
Wahlenbergia capensis	Cape Bluebell	Moderate	FAR			3	4	No	**2**													
Citrullus lanatus	Wild Melon	Low	Unrated			3	1		**1**													
Ricinus communis	Castor Oil	Low	Unrated			3	1		**1**													
*Typha domingensis**	Bullrush*	Low	Unrated				1		**1**													

Optimal control times for targeting weed species

Table A2.4: Prioritisation and optimal control times of weeds of weeds observed at Jubilee

WEED SPECIES		SECTION		PRIORITISATION									OPTIMAL CONTROL TIME										
Scientific Name	**Common Name**	**Jubilee A**	**Jubilee B**	**EWSWA**	**Swan NRM**	**WONS**	**ARRPA**	**Dixon & Keighery**	**Calculated Rating**	**Locally significant**	**Final Rating**	**PRIORITY**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Cynodon dactylon	Couch	*		Moderate	Very High			1	6		**6**	**High**												
Ehrharta calycina	Perennial Veldt Grass	*	*	High	Very High			1	6		**6**													
Gladiolus caryophyllaceus	Wild Gladiolus		*	Moderate	FAR/ High			1	5		**5**													
Oxalis pes-caprae	Soursob	*		Mild	High			2	5		**5**													
Romulea rosea	Guildford Grass	*	*	High	FAR			1	5		**5**													
Arctotheca calendula	Capeweed		*	Moderate	High			3	6	No	**4**	**Moderate**												
Briza maxima	Blowfly Grass	*	*	Moderate	FAR			2	4		**4**													
Hypochaeris sp.	Flatweed	*	*	Moderate	High			3	6	No	**4**													
Lactuca serriola	Prickly Lettuce	*	*	Moderate	High			3	6	No	**4**													
Lotus angustissimus	Birdsfoot		*	Low	High			3	5	No	**4**													
Melilotus indicus	Common Meliot		*	Moderate	Unrated			3	4		**4**													
Schinus terebinthifolia	Japanese Pepper		*	Unrated	Very High				6	No	**4**													
Sonchus asper	Prickly Sowthistle	*	*	Moderate	FAR				4		**4**													
Sonchus oleraceus	Sowthistle	*	*	Moderate	FAR			3	4		**4**													
Trifolium angustifolium	Narrowleaf Clover	*	*	Unrated	FAR			3	2	yes	**4**													
Trifolium arvense	Hares Tail Clover		*	Moderate	FAR			3	4		**4**													
Vicia sativa	Vetch		*	Moderate	FAR			3	4		**4**													
Lupinus angustifolius	Narrow leaf Lupin		*	Mild	Unrated			3	3		**3**													
Conyza bonariensis	Fleabane	*		Low	Low			3	2		**2**	**Low**												
Ornithopus compressus	Yellow Seradella	*	*	Mild	Moderate			3	4	No	**2**													

Optimal control times for targeting weed species

Table A2.5: Prioritisation and optimal control times of weeds observed at Pickering Park

WEED SPECIES		PRIORITISATION									OPTIMAL CONTROL TIME											
Scientific Name	**Common Name**	**EWSWA**	**Swan NRM**	**WONS**	**ARRPA**	**Dixon & Keighery**	**Calculated Rating**	**Locally significant**	**Final Rating**	**PRIORITY**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Cynodon dactylon	Couch	Moderate	Very High			1	6		**6**	**High**												
Pennisetum clandestinum	Kikuyu	Moderate	High			1	6		**6**													
Arctotheca calendula	Capeweed	Moderate	High			3	6	No	**4**	**Moderate**												
Briza maxima	Blowfly Grass	Moderate	FAR			2	4		**4**													
Ehrharta longifolia	Annual Veldt Grass	Moderate	FAR			3	4		**4**													
Hordeum leporinum	Barley Grass	Moderate	High			3	6	No	**4**													
Hypochaeris sp.	Flatweed	Moderate	High			3	6	No	**4**													
Lactuca serriola	Prickly Lettuce	Moderate	High			3	6	No	**4**													
Melilotus indicus	Common Meliot	Moderate	Unrated			3	4		**4**													
Polypogon monspeliensis	Annual Barbgrass	Moderate	Unrated			3	4		**4**													
Solanum nigrum	Black Nightshade	Moderate	Moderate			2	4		**4**													
Sonchus asper	Prickly Sowthistle	Moderate	FAR				4		**4**													
Medicago polymorpha	Burr Medic	Mild	FAR			3	3		**3**													
Conyza bonariensis	Fleabane	Low	Low			3	2		**2**	**Low**												
Digitaria sanguinalis	Crab Grass	Low	Low				2		**2**													
Ornithopus compressus	Yellow Seradella	Mild	Moderate			3	4	No	**2**													
Plantago lanceolata	Ribwort Plantain	Low	FAR			3	2		**2**													
Stachys arvensis	Stagger Weed	Low	Unrated			3	1		**1**													

Optimal control times for targeting high priority weed species

Additional time for targeting Mod and low priority weed species

Table A2.6: Prioritisation and optimal control times of weeds observed at Success Hill

WEED SPECIES		PRIORITISATION									OPTIMAL CONTROL TIME											
Scientific Name	**Common Name**	**EWSWA**	**Swan NRM**	**WONS**	**ARRPA**	**Dixon & Keighery**	**Calculated Rating**	**Locally significant**	**Final Rating**	**PRIORITY**	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Asparagus asparagoides	Bridal Creeper	High	Very High	*	P1	1	6		**6**	**High**												
Avena barbata	Wild Oat	Moderate	Very High			1	6		**6**													
Ehrharta calycina	Perennial Veldt Grass	High	Very High			1	6		**6**													
Lantana camara	Lantana	Moderate	Moderate	*	P1	3	6		**6**													
Pennisetum clandestinum	Kikuyu	Moderate	High			1	6		**6**													
Watsonia meriana	Watsonia	High	Very High			1	6		**6**													
Zantedeschia aethiopica	Arum Lily	High	Very High		P1, P4	1	6		**6**													
Gladiolus caryophyllaceus	Wild Gladiolus	Moderate	FAR/ High			1	5		**5**													
Briza maxima	Blowfly Grass	Moderate	FAR			2	4		**4**	**Moderate**												
Briza minor	Shiver Grass	Moderate	FAR			2	4		**4**													
Bromus diandrus	Brome Grass	High	Very High			3	6	No	**4**													
Cynodon dactylon	Couch	Moderate	Very High			1	6	No	**4**													
Freesia sp.	Freesia	Unrated	High			1	5	No	**4**													
Fumaria capreolata	Whiteflower Fumitory	Mild	Moderate/ High			2	4		**4**													
Hypochaeris sp.	Flatweed	Moderate	High			3	6	No	**4**													
Ipomoea indica	Morning Glory	Mild	Moderate/ High			3	4		**4**													
Lactuca serriola	Prickly Lettuce	Moderate	High			3	6	No	**4**													
Lagurus ovatus	Hares Tail Grass	High	High			2	6	No	**4**													
Lolium rigidum	Ryegrass	Moderate	Unrated			3	4		**4**													
Lupinus cosentinii	Western Blue Lupin	High	Unrated			1	5	No	**4**													
Melilotus indicus	Common Meliot	Moderate	Unrated			3	4		**4**													
Oxalis pes-caprae	Soursob	Mild	High			2	5	No	**4**													
Polypogon monspeliensis	Annual Barbgrass	Moderate	Unrated			3	4		**4**													
Sonchus asper	Prickly Sowthistle	Moderate	FAR				4		**4**													
Sonchus oleraceus	Sowthistle	Moderate	FAR			3	4		**4**													
Trifolium arvense	Hares Tail Clover	Moderate	FAR			3	4		**4**													
Arundo donax	Giant Reed	Unrated	Unrated			2	3		**3**													
Lupinus angustifolius	Narrow leaf Lupin	Mild	Unrated			3	3		**3**													
Conyza bonariensis	Fleabane	Low	Low			3	2		**2**	**Low**												
Lathyrus tingitanus	Tangier Pea	Low	Low			3	2		**2**													
*Typha domingensis**	Bullrush*	Low					1		**1**													

Optimal control times for targeting high priority weed species

Appendix Three: Heritage Sites

Bushland Weed Management Plan

Table A3.1: Registered Aboriginal sites listed in or adjacent to Bassendean reserves

Site id	Status	Access	Restriction	Site Name	Site type	Grid Ref. (MGA94 Zone 50)	Site No.
Bindaring Park and Pickering Park							
3536	Permanent	Open	None	Swan River	Mythological	443400mE 6461957mN	S02548
3758	Permanent	Closed	None	Helena River	Ceremonial, Mythological, Repository/ cache	Not available	S02148
Broadway							
3134	Insufficient information	0pen	None	Snake Swamp	Artefacts/ Scatter	399378mE 6469734mN	S00712
3748	Stored data	Open	None	Nyibra Swamp	Hunting Place	399013mE 6469737mN	S02198
3840	Permanent	Closed	None	Bennet Brook	Ceremonial, Mythological, Skeletal material/ Burial, Man-made structures, Fish Trap, Artefacts/ Scatter, Historical	Not available	S01997
Jubilee Reserve							
3488	Permanent	Closed	None	Bennet Brook: Rosher Park	Meeting Place/ Camp	Not available	S02662
3489	Permanent	Closed	None	Bennet Brook: Lord Street 1	Ceremonial, Skeletal material/ Burial	Not available	S02663
3490	Insufficient information	Closed	None	Bennet Brook: Lord Street 2	Ceremonial, Skeletal material/ Burial	Not available	S02664
3840	Permanent	Closed	None	Bennet Brook: Camp Area	Ceremonial, Mythological, Skeletal material/ Burial, Man-made structure, First Trap, Artefacts/ Scatter, Historical	Not available	S01997
4369	Stored data	Closed	None	Walkington Way	Artefacts/ Scatter	400014mE 64713914mN (unreliable)	S00717
Success Hill							
3487	Permanent	Closed	None	Bennet Brook: Eden Hill	Meeting Place, Camp, Water Source	Not available	S02661
3489	Permanent	Closed	None	Bennet Brook: Lord Street 1	Ceremonial, Skeletal material/ Burial	Not available	S02663
3490	Insufficient information	Closed	None	Bennet Brook: Lord Street 2	Ceremonial, Skeletal material/ Burial	Not available	S02664
3536	Permanent	Open	None	Swan River	Mythological	443400mE 6461957mN	S02548
3692	Permanent	Closed	None	Bennet Brook: In Toto	Mythological	Not available	S02254
3757	Permanent	Closed	None	Success Hill	Ceremonial, Mythological, Repository/ cache, Man-Made Structure, Fish Trap, Quarry, Artefacts/ Scatter	Not available	S02147
3758	Permanent	Closed	None	Helena River	Ceremonial, Mythological, Repository/ cache	Not available	S02148
3840	Permanent	Closed	None	Bennet Brook	Ceremonial, Mythological, Skeletal material/ Burial, Man-made structures, Fish Trap, Artefacts/ Scatter, Historical	Not available	S01997
17041	Stored data	Open	None	Pyrton A5	Artefacts/ Scatter	401268mE 6470775mN	

Appendix Four: Maps

Bushland Weed Management Plan

The section contains bush condition, weed and walk trail maps in the following order:

1. **Bindaring Park (North and South)**
    a. Bindaring Park (North) Bush Condition
    b. Bindaring Park (South) Bush Condition
    c. Bindaring Park (North) Monocot Weeds
    d. Bindaring Park (South) Monocot Weeds
    e. Bindaring Park (North) Geophyte Weeds
    f. Bindaring Park (South) Geophyte Weeds
    g. Bindaring Park (North) Broad Leaf Herb Weeds
    h. Bindaring Park (South) Broad Leaf Herb Weeds
    i. Bindaring Park (North) Tree, Shrub and Climber Weeds
    j. Bindaring Park (South) Tree, Shrub and Climber Weeds
    k. Bindaring Park (North) Walk Trails
    l. Bindaring Park (South) Walk Trails

2. **Broadway**
    a. Broadway Bush Condition
    b. Broadway Monocot Weeds
    c. Broadway Broad Leaf Herb Weeds
    d. Broadway Tree, Shrub and Climber Weeds
    e. Broadway Walk Trails

3. **Jubilee Reserve (A and B)**
    a. Jubilee Reserve (A) Bush Condition
    b. Jubilee Reserve (A) Monocot Weeds
    c. Jubilee Reserve (A) Geophyte Weeds
    d. Jubilee Reserve (A) Broad Leaf Herb Weeds
    e. Jubilee Reserve (B) Bush Condition
    f. Jubilee Reserve (B) Monocot Weeds
    g. Jubilee Reserve (B) Geophyte Weeds
    h. Jubilee Reserve (B) Broad Leaf Herb Weeds
    i. Jubilee Reserve (B) Tree, Shrub and Climber Weeds
    j. Jubilee Reserve (A) Walk Trails
    k. Jubilee Reserve (B) Walk Trails

4. **Pickering Park**
    a. Pickering Park Bush Condition
    b. Pickering Park Monocot Weeds
    c. Pickering Park Walk Trails

5. **Success Hill**
    a. Success Hill Bush Condition
    b. Success Hill Monocot Weeds
    c. Success Hill Geophyte Weeds
    d. Success Hill Broad Leaf Herb Weeds
    e. Success Hill Tree, Shrub and Climber Weeds
    f. Success Hill Walk Trails

Legend

- Study Boundary
- Firebreak/Track
- Parkland (n/a)
- Open Water (n/a)
- Other Uses (n/a)
- Revegetated (n/a)

Vegetation Condition (Keighery 1994)

- Pristine (n/a)
- Excellent (n/a)
- Very Good (n/a)
- Good (n/a)
- Degraded
- Completely Degraded

Map 1a

Feb 2010

Bushland Weed Management Plan

Bindaring Park (North) Bush Condition

prepared for CITY OF BASSENDEAN

0 10 20 30 40 50 Metres

1:1,000 @ A3

Project No. 2366-09

ecoscape

Legend

- Study Boundary
- Firebreak/Track
- Parkland
- Open Water
- Other Uses
- Revegetated (n/a)

Vegetation Condition (Keighery 1994)

- Pristine (n/a)
- Excellent (n/a)
- Very Good (n/a)
- Good (n/a)
- Degraded
- Completely Degraded (n/a)

Map 1b

Bushland Weed Management Plan

Bindaring Park (South) Bush Condition

Feb 2010

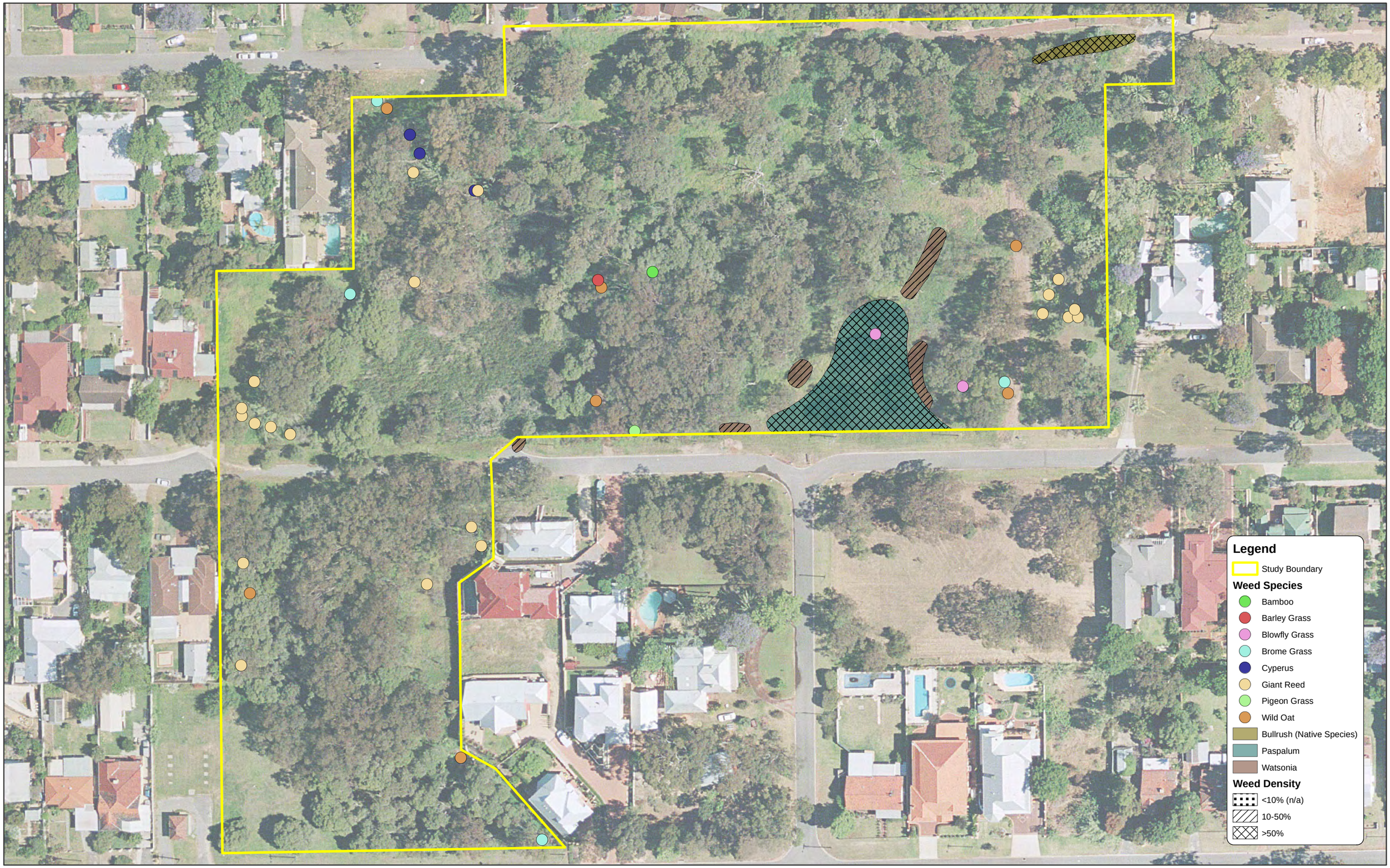
prepared for CITY OF BASSENDEAN

0 10 20 30 40 50 Metres

1:1,300 @ A3

Project No. 2366-09

ecoscape



Map 1c

Feb 2010

Bushland Weed Management Plan

Bindaring Park (North) Grass, Sedge and Rush Weeds

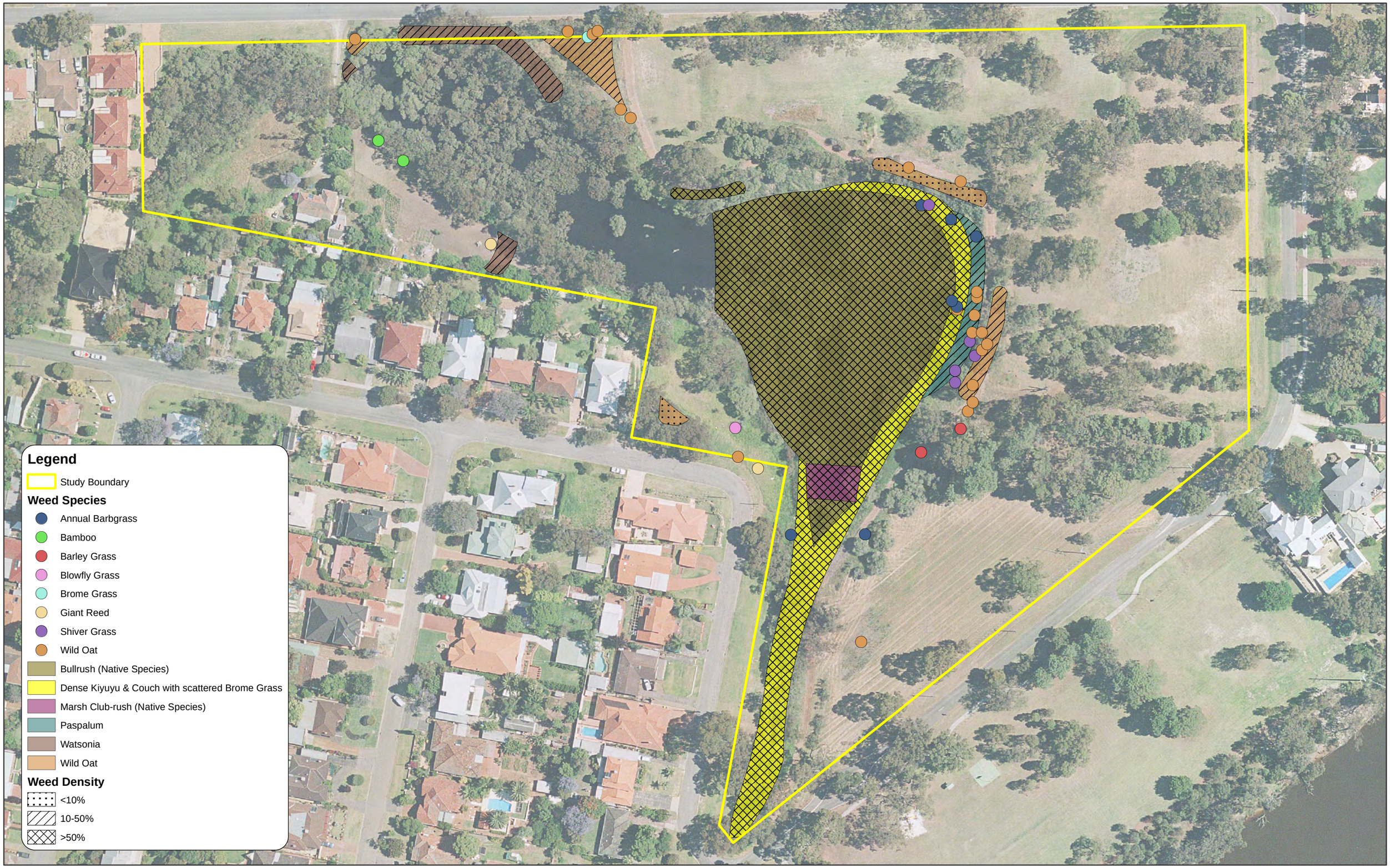
prepared for CITY OF BASSENDEAN

0 10 20 30 40 50 Metres

1:1,000 @ A3

Project No. 2366-09

ecoscape



Map 1d

Feb 2010

Bushland Weed Management Plan

Bindaring Park (South) Grass, Sedge & Rush Weeds

prepared for CITY OF BASSENDEAN

0 10 20 30 40 50 Metres

1:1,300 @ A3

Project No. 2366-09

ecoscape

Legend

Study Boundary

Weed Species

Arum Lily

Bridal Creeper

Map 1e

Feb 2010

Bushland Weed Management Plan

Bindaring Park (North) Geophyte Weeds

prepared for CITY OF BASSENDEAN

0 10 20 30 40 50 Metres

1:1,000 @ A3

Project No. 2366-09

ecoscape

Map 1f

Feb 2010

Bushland Weed Management Plan

Bindaring Park (South) Geophyte Weeds

prepared for CITY OF BASSENDEAN

0 10 20 30 40 50 Metres

1:1,300 @ A3

Project No. 2366-09

ecoscape

Legend

Study Boundary

Weed Species

- Black Nightshade
- Prickly Lettuce
- Prickly Sowthistle
- Whiteflower Fumitory
- Curled Dock
- Unknown Sp 1

Weed Density

- <10%
- 10-50%
- >50%

Map 1g

Bushland Weed Management Plan

Bindaring Park (North) Broad Leaf Herb Weeds

Feb 2010

prepared for CITY OF BASSENDEAN

0 10 20 30 40 50 Metres

1:1,000 @ A3

Project No. 2366-09

ecoscape

Legend

Study Boundary

Weed Species

Black Nightshade

Burr Medic

Fleabane

Narrowleaf Clover

Prickly Lettuce

Prickly Sowthistle

Sowthistle

Whiteflower Fumitory

Bedstraw

Curled Dock

Wild Radish

Weed Density

<10%

10-50%

>50%

Bushland Weed Management Plan

Map 1h

Bindaring Park (South) Broad Leaf Herb Weeds

Feb 2010

prepared for CITY OF BASSENDEAN

0 10 20 30 40 50 Metres

1:1,300 @ A3

Project No. 2366-09

ecoscape

Legend

Study Boundary

Weed Species

- Castor Oil
- Edible Fig
- Grapevine
- Japanese Pepper
- Morning Glory
- Ribwort Plantain
- Tagasaste
- Trumpet Vine
- Vetch

Map 1i

Bushland Weed Management Plan

Bindaring Park (North) Tree, Shrub and Climber Weeds

Feb 2010

prepared for CITY OF BASSENDEAN

0 10 20 30 40 50 Metres

1:1,000 @ A3

Project No. 2366-09

ecoscape

Legend

Study Boundary

Weed Species

- Black Kennedia (Native Species)
- Cape Lilac
- Edible Fig
- Grapevine
- Hibiscus
- Japanese Pepper
- Mile-a-Minute
- Morning Glory
- Ribwort Plantain
- Vetch

Map 1j

Bushland Weed Management Plan

Bindaring Park (South) Tree, Shrub and Climber Weeds

Feb 2010

prepared for CITY OF BASSENDEAN

0 10 20 30 40 50 Metres

1:1,300 @ A3

Project No. 2366-09

ecoscape

Harcourt St

Paul Pl

Lovelock Pl

Anstey Rd

Carnegie Rd

Hyland St

Legend

- Study Boundary
- Access Track
- Existing Path
- Informal Track
- Recommended Path

Map 1k

May 2010

Bushland Weed Management Plan

Bindaring Park (North) Access

prepared for CITY OF BASSENDEAN

0 10 20 30 40 50 Metres

1:1,000 @ A3

Project No. 2366-09

ecoscape

Map 1l

May 2010

Bushland Weed Management Plan

Bindaring Park (South) Access

prepared for CITY OF BASSENDEAN

0 10 20 30 40 50 Metres

1:1,300 @ A3

Project No. 2366-09

ecoscape

Legend

- Study Boundary
- Firebreak/Track
- Parkland
- Open Water (n/a)
- Other Uses
- Revegetated (n/a)

Vegetation Condition (Keighery 1994)

- Pristine (n/a)
- Excellent (n/a)
- Very Good (n/a)
- Good
- Degraded
- Completely Degraded

Map 2a

Feb 2010

Bushland Weed Management Plan

Broadway Reserve Bush Condition

prepared for CITY OF BASSENDEAN

0 5 10 15 20 25 Meters

1:750 @ A3

Project No. 2366-09

ecoscape

Legend

Study Boundary

Weed Species

Giant Reed

Brome Grass

Bullrush (Native Species)

Couch

Weed Density

<10%

10-50%

>50%

Map 2b(i)

Bushland Weed Management Plan

Broadway Reserve Grass, Sedge and Rush Weeds

Feb 2010

prepared for CITY OF BASSENDEAN

0 5 10 15 20 25 Meters

1:750 @ A3

Project No. 2366-09

ecoscape

Bushland Weed Management Plan

Map 2b(ii)

Broadway Reserve Grass, Sedge and Rush Weeds

Feb 2010

prepared for CITY OF BASSENDEAN

0 5 10 15 20 25 Meters

1:750 @ A3

Project No. 2366-09

ecoscape

Legend

Study Boundary

Weed Species

- Beach Evening Primrose
- Black Nightshade
- Flatweed
- Prickly Lettuce
- Whiteflower Fumitory
- Bedstraw
- Birdsfoot
- Narrow Leaf Clover
- Wild Melon
- Wild Radish

Weed Density

- <10%
- 10-50%
- >50%

Bushland Weed Management Plan

Broadway Reserve Broad Leaf Herb Weeds

Map 2c

Feb 2010

prepared for CITY OF BASSENDEAN

0 5 10 15 20 25 Meters

1:750 @ A3

Project No. 2366-09

ecoscape

Legend

Study Boundary

Weed Species

- Cape Lilac
- Castor Oil
- Geraldton Wax
- Japanese Pepper
- Tagasaste
- Tobacco Tree
- Summer Scented Wattle (Native Species)

Weed Density

- <10%
- 10-50% (n/a)
- >50%

Map 2d

Feb 2010

Bushland Weed Management Plan

Broadway Reserve Trees, Shrub and Climber Weeds

prepared for CITY OF BASSENDEAN

0 5 10 15 20 25 Meters

1:750 @ A3

Project No. 2366-09

ecoscape

Broadway

Chesterton Rd

Hanwell Wy

Legend

- Study Boundary
- Access Track
- Existing Path
- Informal Track
- Recommended Path (N/A)
- Bridge Ruins

Map 2e

May 2010

Bushland Weed Management Plan

Broadway Reserve Access

prepared for CITY OF BASSENDEAN

0 5 10 15 20 25 Meters

1:750 @ A3

Project No. 2366-09

ecoscape

Legend

- Study Boundary
- Firebreak/Track
- Parkland
- Open Water (n/a)
- Other Uses
- Revegetated (n/a)

Vegetation Condition (Keighery 1994)

- Pristine (n/a)
- Excellent (n/a)
- Very Good
- Good
- Degraded
- Completely Degraded (n/a)

Map 3a

Feb 2010

Bushland Weed Management Plan

Jubilee Reserve (A) Bush Condition

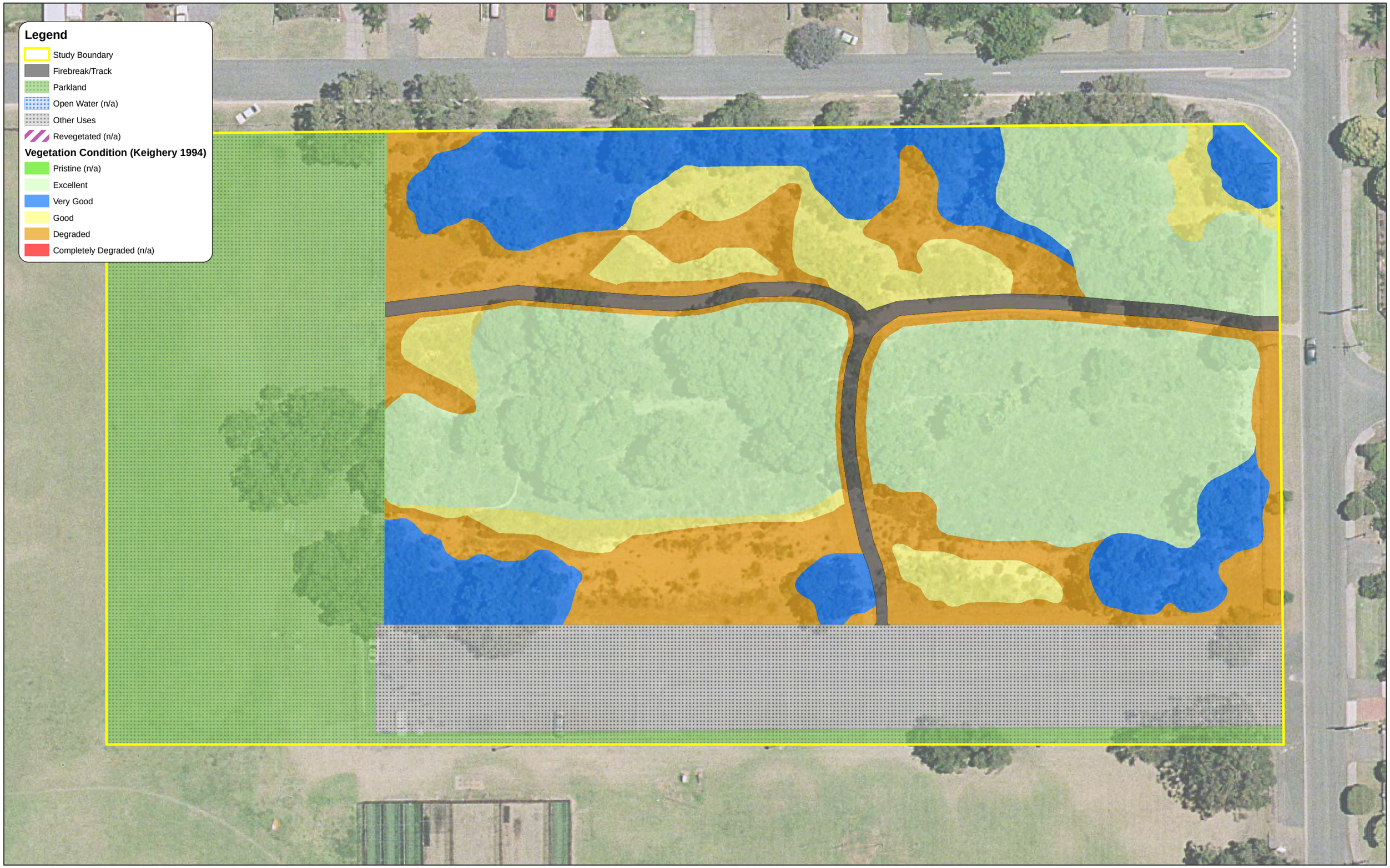
prepared for CITY OF BASSENDEAN

0 5 10 15 Metres

1:350 @ A3

Project No. 2366-09

ecoscape



3b

Bushland Weed Management Plan

Jubilee Reserve (B) Bush Condition

Feb 2010

prepared for CITY OF BASSENDEAN

0 5 10 15 20 25 Metres

1:600 @ A3

Project No. 2366-09

ecoscape

Map 3c

Feb 2010

Bushland Weed Management Plan

Jubilee Reserve (A) Grass, Sedge & Rush Weeds

prepared for CITY OF BASSENDEAN

0 5 10 15 Metres

1:350 @ A3

Project No. 2366-09

ecoscape

3d

Feb 2010

Bushland Weed Management Plan

Jubilee Reserve (B) Grass, Sedge and Rush Weeds

prepared for CITY OF BASSENDEAN

0 5 10 15 20 25 Metres

1:600 @ A3

Project No. 2366-09

ecoscape

Map 3e

Feb 2010

Bushland Weed Management Plan

Jubilee Reserve (A) Geophyte Weeds

prepared for CITY OF BASSENDEAN

0 5 10 15 Metres

1:350 @ A3

Project No. 2366-09

ecoscape

3f

Feb 2010

Bushland Weed Management Plan

Jubilee Reserve (B) Geophyte Weeds

prepared for CITY OF BASSENDEAN

0 5 10 15 20 25 Metres

1:600 @ A3

Project No. 2366-09

ecoscape

Legend

Study Boundary

Weed Species

Prickly Sowthistle

Flatweed

Fleabane

Prickly Lettuce

Sowthistle

Weed Density

<10%

10-50%

>50%

Map 3g

Feb 2010

Bushland Weed Management Plan

Jubilee Reserve (A) Broad Leaf Herb Weeds

prepared for CITY OF BASSENDEAN

0 5 10 15 Metres

1:350 @ A3

Project No. 2366-09

ecoscape

3h(i)

Feb 2010

Bushland Weed Management Plan

Jubilee Reserve (B) Broad Leaf Herb Weeds

prepared for CITY OF BASSENDEAN

0 5 10 15 20 25 Metres

1:600 @ A3

Project No. 2366-09

ecoscape

3h(ii)

Bushland Weed Management Plan

Jubilee Reserve (B) Broad Leaf Herb Weeds

Feb 2010

prepared for CITY OF BASSENDEAN

0 5 10 15 20 25 Metres

1:600 @ A3

Project No. 2366-09

ecoscape

3i

Bushland Weed Management Plan

Jubilee Reserve (B) Tree, Shrub & Climber Weeds

Feb 2010

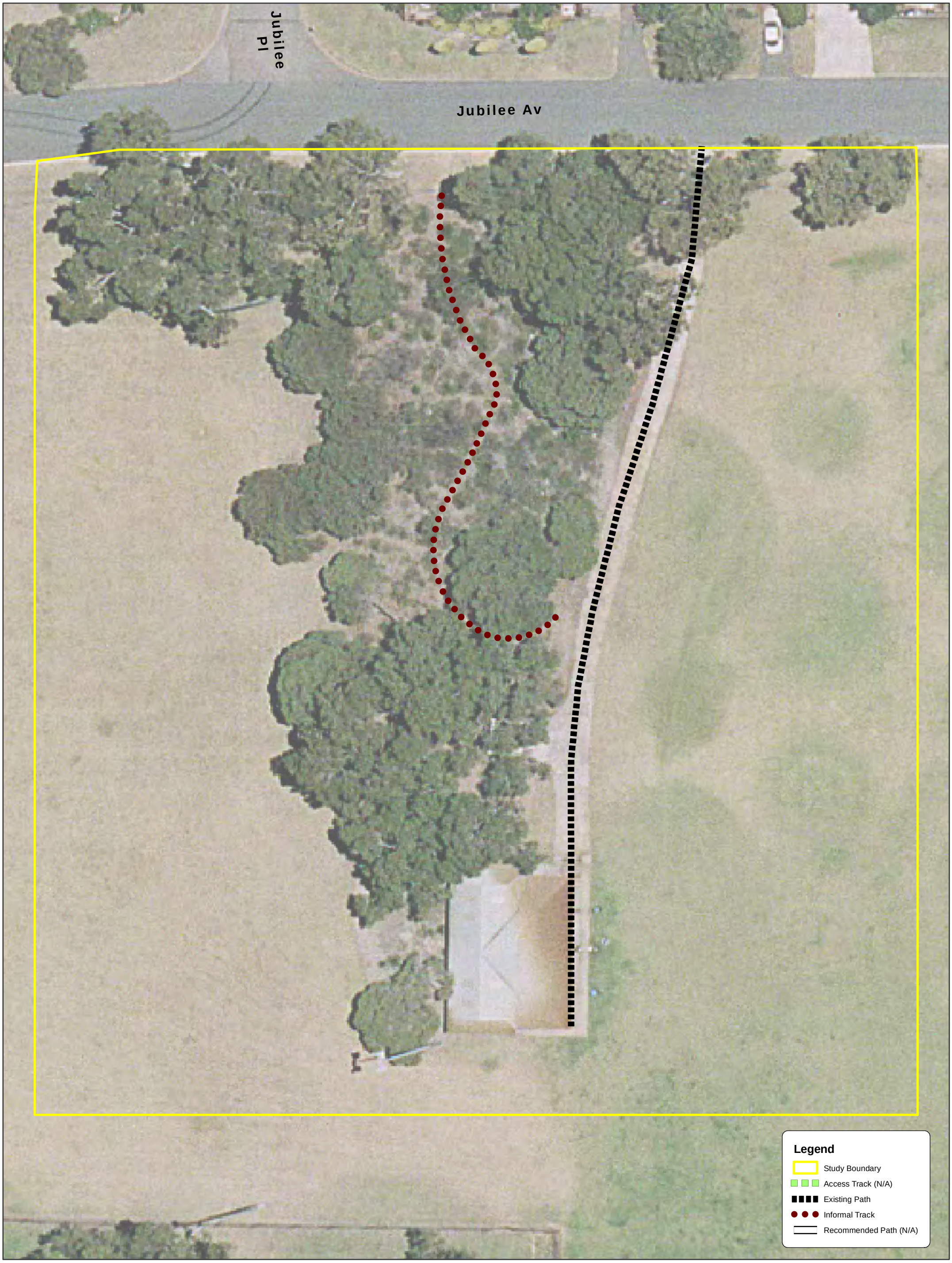
prepared for CITY OF BASSENDEAN

0 5 10 15 20 25 Metres

1:600 @ A3

Project No. 2366-09

ecoscape



Map 3j

May 2010

Bushland Weed Management Plan

Jubilee Reserve (A) Access

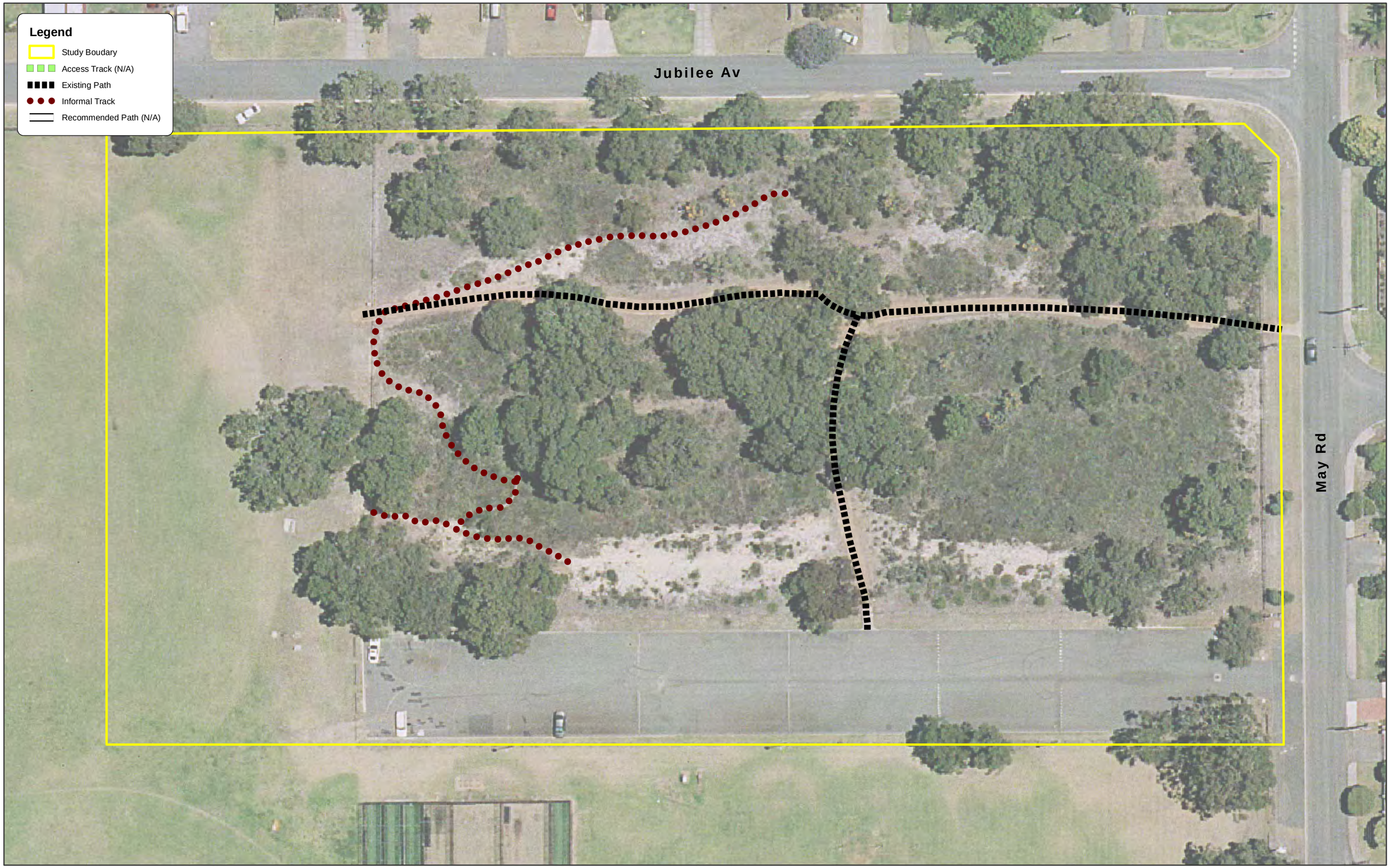
prepared for CITY OF BASSENDEAN

0 5 10 15 Metres

1:350 @ A3

Project No. 2366-09

ecoscape



3k

May 2010

Bushland Weed Management Plan

Jubilee Reserve (B) Access

prepared for CITY OF BASSENDEAN

0 5 10 15 20 25 Metres

1:600 @ A3

Project No. 2366-09

ecoscape

4a

Feb 2010

Bushland Weed Management Plan

Pickering Park Bush Condition

prepared for CITY OF BASSENDEAN

0 10 20 30 40 50 Metres

1:1,250 @ A3

Project No. 2366-09

ecoscape

4b

Bushland Weed Management Plan

Pickering Park Grass, Sedge and Rush Weeds

Feb 2010

prepared for CITY OF BASSENDEAN

0 10 20 30 40 50 Metres

1:1,250 @ A3

Project No. 2366-09

ecoscape

4c

May 2010

Bushland Weed Management Plan

Pickering Park Access

prepared for CITY OF BASSENDEAN

0 10 20 30 40 50 Metres

1:1,250 @ A3

Project No. 2366-09

ecoscape

Legend

- Study Boundary
- Firebreak/Track
- Parkland
- Open Water (n/a)
- Other Uses
- Revegetated (n/a)

Vegetation Condition (Keighery 1994)

- Pristine (n/a)
- Excellent (n/a)
- Very Good (n/a)
- Good (n/a)
- Degraded
- Completely Degraded

Map 5a

Feb 2010

Bushland Weed Management Plan

Success Hill Bush Condition

prepared for CITY OF BASSENDEAN

0 10 20 30 40 50 Metres

1:1,000 @ A3

Project No. 2366-09

ecoscape

Legend

- Study Boundary
- Giant Reed
- Couch
- Kikuyu
- Perennial Veldt Grass
- Watsonia

Weed Density

- <10%
- 10-50%
- >50%

Map 5b

Feb 2010

Bushland Weed Management Plan

Success Hill Grass, Sedge & Rush Weeds

prepared for CITY OF BASSENDEAN

0 10 20 30 40 50 Metres

1:1,000 @ A3

Project No. 2366-09

ecoscape

Legend

Study Boundary

Weed Species

Arum Lily

Bridal Creeper

Map 5c

Feb 2010

Bushland Weed Management Plan

Success Hill Geophyte Weeds

prepared for CITY OF BASSENDEAN

0 10 20 30 40 50 Metres

1:1,000 @ A3

Project No. 2366-09

ecoscape

Map 5d

Feb 2010

Bushland Weed Management Plan

Success Hill Broad Leaf Herb Weeds

prepared for CITY OF BASSENDEAN

0 10 20 30 40 50 Metres

1:1,000 @ A3

Project No. 2366-09

ecoscape

Map 5e

Feb 2010

Bushland Weed Management Plan

Success Hill Trees, Shrub and Climber Weeds

prepared for CITY OF BASSENDEAN

0 10 20 30 40 50 Metres

1:1,000@ A3

Project No. 2366-09

ecoscape

Seventh Av

Eighth Av

River St

Legend

- Study Boundary
- Access Track
- Existing Path
- Informal Track
- Recommended Path

Map 5f

May 2010

Bushland Weed Management Plan

Success Hill Access

prepared for CITY OF BASSENDEAN

0 10 20 30 40 50 Metres

1:1,000 @ A3

Project No. 2366-09

ecoscape

Bradley Method

(Developed from Bradley 1971, Bradley 1988 and Buchanan 1989)

Underlying Principles

1. Always work from areas with native plants towards weed-infested areas.

This makes good ecological sense. If you are relying on natural regeneration then choose areas that will contain the maximum number of existing native plants and native plant seeds, and minimal weed seeds and vegetative reproductive organs of weeds.

2. Make minimal disturbance.

Application of this principal depends on the native species to regenerate. Many plant communities (both weeds and native) need disturbed and sunlit soil for successful regeneration. However, by following the 1st principle above, any weed regeneration should be minimised. Any soil that is disturbed should be returned in its original layers, thus ensuring that any native seed stored in the soil will still be on top. This principle also applies to the application of natural plant mulch in the work area – where a gap is left as a result of weeding, it is recommended that mulch from surrounding areas be added to the gap. This helps to minimise weed regeneration.

3. Let native plant regeneration dictate the rate of weed removal.

The ability to follow this principle may depend on the amount of time and money committed to a particular project. If few weeds and many native plants regenerate, or if the ground remains weed free, little time will need to be spent re-weeding a site, allowing time to be spent on other sites. If masses of weeds regenerate then a lot of time will be required re-weeding so that regenerating native plants can flourish.

DEVELOPING WORK PLANS

1. Prevent deterioration of good areas.

Start by removing weeds scattered through otherwise clean bush. Practically no follow up work will be needed, but it should be checked once or twice a year.

2. Improve the next best area.

Once you are confident you have prevented deterioration of better condition bush, you can start work on thicker patches of weed. Choose a place you can visit easily and often, where thick native growth is pushing up against weeds, preferably no worse than one weed species to every two native plant species. Start with a strip approximately 12 feet wide and no longer than can be managed with monthly weeding days. If the area to be cleared of weeds runs up a slope which may erode, clear a number of smaller patches instead.

3. Hold the advantage gained.

Resist the temptation to push deeper into the weeds before regenerating natives have stabilised each cleared area. The natives do not need to be very tall, but they usually need to form an almost complete ground cover. Weeds will always nearly keep germinating until this is achieved. These newly regenerated areas are most vulnerable to weed reinvasion and so must be re-weeded as required. If weeding occurs adjacent to the regenerating area prior to sufficient new cover light from adjacent cleared patches can affect the regeneration of natives.

4. Cautiously move into the really bad areas.

When new growth coming up consists almost entirely of native plants with only a few weeds among them, it is safe to move deeper into the weeds. Keep working along the regeneration boundary, making new clearings smaller as the weeds get more dense.

WEEDING TECHNIQUES

1. Disturb the soil as little as possible.

All tools used for weeding programmes should be small, such as a broad boning knife, trowels, secateurs, pliers (for pulling roots), loppers, hatchet and small saws. This recommendation is based on the belief that using small tools will cause minimum soil disturbance and minimal damage to the roots and shoots of nearby native plants.

2. Sweep back the mulch surface.

Any weeding will disturb the ground litter and soil will be exposed. Repair the damage as you go, by pushing back as much mulch as possible. It is often helpful to sweep aside mulch prior to removing large plants, so that it can easily be redistributed when you have finished removing the plant.

3. Mulch with the weeds themselves.

Weeds removed can be used to add to existing mulch. In dry areas leaving the weed with its roots exposed will be sufficient to kill it. In moist areas, hanging the weeds on nearby native vegetation will allow them to dry out and die. Some items are unsuitable for mulch, and these are removed from the site. Such items include bulbs and tubers, plants that root at every node and free-seeders with ripe seed.

4. Watch where you put your feet.

Be careful how you move through the bush. A small weeding party moving through thick bush single file can open up a track. Efforts should be made to not walk on the same paths all the time, and to watch where you walk to ensure you are not trampling native vegetation.

Appendix Six: Weed Management Guide

Bushland Weed Management Plan

The following pages provide descriptions and a variety of control methods the weed and aggressive native species recorded in the town of Bassendean.

Weed management recommendations are based on information from:

1. Brown and Brooks (2002) *Bushland Weeds*
2. Dixon and Keighery (1995) *Recommended methods to control specific weed species*
3. Moore and Moore (2008) *Herbiguide.*

Herbicide recommendations have superscripted numbers assigned to them to indicate which of these sources above provided the information on herbicide type and dosage.

The quantities of herbicides suggested for spot spraying rate have been calculated for a 10L backpack with 25mL of wetting agent. It should be noted that surfactants should not be used near and wetlands or waterways. It is recommended that selective herbicides be implemented where practical to limit their impact on adjacent native plants.

Information on each of the recommended herbicide brands are summarised on **Table A6.1** on the following page.

It should be noted that manual control should always be considered first before using herbicides.

Table A6.1: Summary of Herbicide information

Product	H. Group	Active ingredient/s	Concentration	Other ingredients	Poison Schedule	Supplier/Manufacturer	Specific targeted weeds
Access ®	I	2,4-D amine	500g/L	10-20% Diethylene glycol monoethyl ether w/w, 30 - 50%, Aromatic hydrocarbon solvent w/w	S5	Dow AgroSciences	woody and noxious weeds
Achieve ®	A	tralkoxydim	400g/kg	10-30% Talc w/w	S5	Cropcare	Annual grasses (predominantly annual ryegrass and wild oats)
Brodal®	F	diflufenican	500g/L	5% propane-1,2-diol w/w	unscheduled	Bayer	weeds in clover-based pasture, field peas, lentils, lupins and oilseed poppy
Eclipse®	B	metosulam	714g/kg		S6	Bayer	Cereals and Lupins
Fusilade®	A	fluazifop	212g/L		S6	Syngenta	grasses
Garlon 600	I	triclopyr	600g/L			Dow AgroSciences	woody weeds and melons
Logran®	B	triasulfuron	750g/kg		exempt	Syngenta	annual ryegrass, Paradoxa grass and certain broadleaf weeds in wheat; and for post-emergent control of Wild Radish in wheat, oats and barley
Lontrel®	I	clopyralid	300g/L		S5	Dow AgroSciences	broadleaf
Propon®	A	2,2,-D	850g/kg		S2, S13	Agricrop	Couch, kikuyu, annual and perennial grasses, cumbungi and phragmites
Roundup Bioactive®	M	glyphosate	360g/L		S5	Nufarm	annual weeds, perennial weeds ,woody weeds and problem trees
Starane®		Fluroxypyr methylheptyl etster	303g/L			Dow AgroSciences	White clover, docks, large flowered mallow and creeping mallow
Sertin®	A	sethoxydim	186g/L		S5	Bayer	grasses
Starane 200®	I	fluroxypyr	200g/L	59% Aromatic hydrocarbon solvent w/w	S5	Dow AgroSciences	wide range of broadleaf Weeds
Targa®	A	quizalofop	99.5g/L		S6	Sipcam	annual and perennial grasses in alfalfa, onion, carrot, garlic, Swiss chard, spinach, radishh, Chinese cabbage and red beets
Tordon® 75D	I	2,4-D / picloram	300g/L , 75g/L		S5	Dow AgroSciences	broadleaf
Verdict® 520	A	haloxyfop	520g/L		S6	Dow AgroSciences	annual and perennial grass weeds in grain, legume and oilseed crops, lucerne, medic, clover pasture and seed crops, forestry, bananas, citrus, grapes, pineapples, pome fruit, stone fruit, pyrethrum, tropical fruit

Appendix Six: Weed Management Guide

Bushland Weed Management Plan

The following pages provide descriptions and a variety of control methods the weed and aggressive native species recorded in the town of Bassendean.

Weed management recommendations are based on information from:

1. Brown and Brooks (2002) *Bushland Weeds*
2. Dixon and Keighery (1995) *Recommended methods to control specific weed species*
3. Moore and Moore (2008) *Herbiguide.*

Herbicide recommendations have superscripted numbers assigned to them to indicate which of these sources above provided the information on herbicide type and dosage.

The quantities of herbicides suggested for spot spraying rate have been calculated for a 10L backpack with 25mL of wetting agent. It should be noted that surfactants should not be used near and wetlands or waterways. It is recommended that selective herbicides be implemented where practical to limit their impact on adjacent native plants.

Information on each of the recommended herbicide brands are summarised on **Table A6.1** on the following page.

It should be noted that manual control should always be considered first before using herbicides.

Table A6.1: Summary of Herbicide information

Product	H. Group	Active ingredient/s	Concentration	Other ingredients	Poison Schedule	Supplier/Manufacturer	Specific targeted weeds
Access ®	I	2,4-D amine	500g/L	10-20% Diethylene glycol monoethyl ether w/w, 30 - 50%, Aromatic hydrocarbon solvent w/w	S5	Dow AgroSciences	woody and noxious weeds
Achieve ®	A	tralkoxydim	400g/kg	10-30% Talc w/w	S5	Cropcare	Annual grasses (predominantly annual ryegrass and wild oats)
Brodal®	F	diflufenican	500g/L	5% propane-1,2-diol w/w	unscheduled	Bayer	weeds in clover-based pasture, field peas, lentils, lupins and oilseed poppy
Eclipse®	B	metosulam	714g/kg		S6	Bayer	Cereals and Lupins
Fusilade®	A	fluazifop	212g/L		S6	Syngenta	grasses
Garlon 600	I	triclopyr	600g/L			Dow AgroSciences	woody weeds and melons
Logran®	B	triasulfuron	750g/kg		exempt	Syngenta	annual ryegrass, Paradoxa grass and certain broadleaf weeds in wheat; and for post-emergent control of Wild Radish in wheat, oats and barley
Lontrel®	I	clopyralid	300g/L		S5	Dow AgroSciences	broadleaf
Propon®	A	2,2,-D	850g/kg		S2, S13	Agricrop	Couch, kikuyu, annual and perennial grasses, cumbungi and phragmites
Roundup Bioactive®	M	glyphosate	360g/L		S5	Nufarm	annual weeds, perennial weeds ,woody weeds and problem trees
Starane®		Fluroxypyr methylheptyl etster	303g/L			Dow AgroSciences	White clover, docks, large flowered mallow and creeping mallow
Sertin®	A	sethoxydim	186g/L		S5	Bayer	grasses
Starane 200®	I	fluroxypyr	200g/L	59% Aromatic hydrocarbon solvent w/w	S5	Dow AgroSciences	wide range of broadleaf Weeds
Targa®	A	quizalofop	99.5g/L		S6	Sipcam	annual and perennial grasses in alfalfa, onion, carrot, garlic, Swiss chard, spinach, radishh, Chinese cabbage and red beets
Tordon® 75D	I	2,4-D / picloram	300g/L , 75g/L		S5	Dow AgroSciences	broadleaf
Verdict® 520	A	haloxyfop	520g/L		S6	Dow AgroSciences	annual and perennial grass weeds in grain, legume and oilseed crops, lucerne, medic, clover pasture and seed crops, forestry, bananas, citrus, grapes, pineapples, pome fruit, stone fruit, pyrethrum, tropical fruit

Annual Barbgrass (*Polypogon monspeliensis*)

DESCRIPTION	
Locations	• Bindaring Park North and South • Pickering Park • Success Hill
Appearance	Tufted annual to 40cm tall. The flower is dense, narrowly-ovate to oblong and up to 15cm long. The awns give it a soft, feathery appearance.
Habitat	Common weed of disturbed wetlands, both fresh and brackish.
Comments	Flowers in spring and summer. Can sometimes be confused with the native species, *P. tenellus*. Native to Europe, North Africa and Asia.
CONTROL	
Priority	**Moderate**
Timing	Jun - Sep
Manual Control	Manually remove small plants before seeding.
Wipe/ Cut Stump	Wicker wipe with 1: 2 glyphosate to water.
Spot Spray	• 100 mL glyphosate [(1)]

Annual Veldt Grass (*Ehrharta longiflora*)

DESCRIPTION	
Location	• Broadway • Pickering Park
Appearance	Tufted annual to 30cm tall. The greenish-purple inflorescence is a narrow panicle, to 15cm long, flowering in spring.
Habitat	It is a widespread weed of offshore islands, coastal dunes and sandy soils, from Shark Bay to Eucla and inland along disturbed creeklines and grazed woodlands in the western Wheatbelt.
Comments	Smothers small plants and competes with natives. A serious fire hazard.
CONTROL	
Priority	**Moderate**
Timing	Jun - Oct
Manual Control	Remove small populations by hand.
Wipe/ Cut Stump	No specific information.
Spot Spray	• 20 mL Fusilade® + wetting agent before flowering stem emerges provides good control with little damage to broad-leaf species (1 & 2) • 10 mL Fusilade® at 3 – 5 leaf stage (2) • In non-selective situations 40 mL glyphosate applied up to flowering provides good control (2)

Arum Lily (*Zantedeschia aethiopica*)

DESCRIPTION	
Locations	• Bindaring Park North and South • Success Hill
Appearance	Arum Lily has a tuft of dark green, shiny, somewhat succulent leaves arising from tuberous roots. The leaf blades are heart-shaped to arrow-shaped and usually about 25 cm long on a stalk almost as long. Easily recognised by its conspicuous large white funnel-like "flower" about 10 cm across, which has a central pencil-like column of minute male and female flowers. In fruit the tiny female flowers at the base of this column are replaced by orange-yellow berries. Perennial.
Habitat	Arum Lily is a common and widespread serious weed of pasture and bushland, particularly of damp areas but also invading drier sites.
Comments	Replaces native species mainly in highly disturbed sites. Now being found in much drier areas. The berries are spread by birds. Arum Lily may be toxic to stock. Flowers mostly late winter and spring. Native to South Africa.
CONTROL	
Priority	**High**
Timing	June - Nov
Manual Control	Mechanical removal is only effective if all the root fragments are removed.
Wipe/ Cut Stump	Not recommended.
Spot Spray	• Spot spray metsulfuron or chlorsulfuron 0.4 g/15 L of water plus Pulse®, higher concentrations in a one litre hand held sprayer applying a single squirt to leaves avoids off target damage [(1)] • 1 g chlorsulfuron plus 10 mL 2,4-D amine (500g/L) plus 25 mL Pulse® [(2)] • 1g metsulfuron + 25 mL Pulse ® [(2)] • glyphosate is relatively ineffective [(2)].

Bamboo (*Phyllostachys sp.*)

DESCRIPTION	
Locations	• Bindaring Park North and South
Appearance	Tall, woody, grass-like, perennial that sends out tough horizontal runners that rapidly send out vertical shoots and begin to clump. Once established the stems and runners occupy the total surface area of the ground. Produces thick leaf mulch that allows nothing else to grow and often hides the runners spreading out just under the surface of the ground.
Habitat	An Asian ornamental species which has escaped from gardens. Typically colonises along the edges of lakes.
Comments	Suspect specimens in Bindaring South were planted by neighbouring resident.
CONTROL	
Priority	**Low**
Timing	All year round
Manual Control	Cut shoots down low and then use a crowbar or mattock to dig out or lever up roots and rhizomes.
Wipe/ Cut Stump	Cut shoots down low and paint new shoots when they are about 1 m high with neat glyphosate.
Spot Spray	No specific information.

Barley Grass (*Hordeum leporinum*)

DESCRIPTION	
Locations	• Bindaring Park North and South • Pickering Park
Appearance	Annual grass up 60 - 100 cm tall. Flowers in spring with an unbranched bristly head of prominently long-awned spikelets 3-10 cm long.
Habitat	Mainly disturbed areas. It also occurs as a weed anywhere seed is spilt on road and rail verges, but does not persist.
Comments	Escaped agricultural species. Native to Europe
CONTROL	
Priority	**Moderate**
Timing	July-Sep
Manual Control	Manually remove individuals before seeding.
Wipe/ Cut Stump	Not recommended.
Spot Spray	• 5 mL Fusilade®212 + 100 mL spray oil in winter when the grass has 2 – 8 leaves. This treatment is very selective and does not damage broad-leaved native plants [2] • Alternatively, spot spray with 10 mL glyphosate in spring when the seed heads are just emerging. Most natives will tolerate this treatment but higher rates will cause damage [2] • In sensitive areas, 10 – 20 mL Fusilade®212 + 100 mL spray oil applied any time before flowering will provide reasonable control of seed set [1 & 2]

Beach Evening Primrose (*Oenothera drummondii*)

DESCRIPTION	
Location	• Broadway Arboretum in Nyibra Swamp
Appearance	Erect herbs with a basal rosette of large leaves and a tall leafy spike of flowers. The flowers are yellow, opening in the evening, becoming tinged with red and withering the following day. The flowers are up to 10 cm across with a slender tube, 4 large spreading petals and 8 stamens. The fruit is long and slender. Perennial
Habitat	Occurs mainly in highly disturbed areas, especially in coastal dune sands.
Comments	Large populations may only be able to controlled in sheltered areas where erosion from wind is unlikely. Native to North America.
CONTROL	
Priority	**Moderate**
Timing	Aug-Dec
Manual Control	It is difficult to remove by hand because it tends to break off and regrow from the rootstock. If removing manually, use a weed fork and ensure that all the fleshy rootstock is collected and burnt or buried more than 1 m deep.
Wipe/ Cut Stump	Wicker wipe with 1: 2 glyphosate to water.
Spot Spray	• Control in seedling stage, older plants relatively tolerant of herbicide [1 & 2] • 0.4g chlorsulfuron plus 100 mL spray oil [1] • 1 g Logran® plus 100 mL spray oil [2]

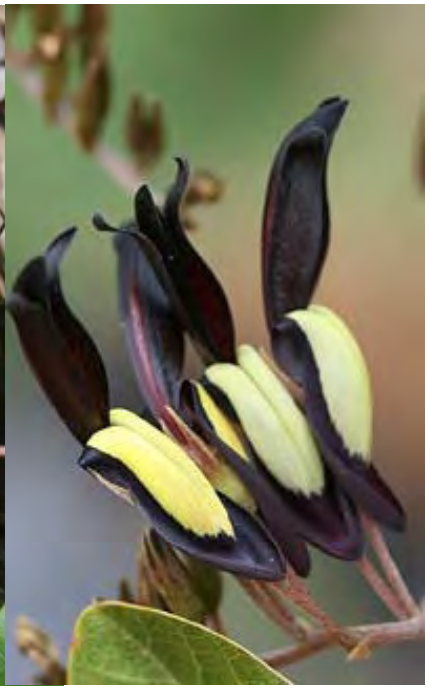
Bedstraw (*Galium* sp.)

DESCRIPTION	
Locations	• Bindaring Park South • Broadway Arboretum in Nyibra Swamp
Appearance	Galium are spring flowering herbs, with slender branches, leaves in ring-like arrangements, and terminal branched greenish-white flowers.
Habitat	Widespread on wasteland, swamps, granite rocks and woodlands.
Comments	
CONTROL	
Priority	**Moderate**
Timing	Jun - Sep
Manual Control	Hand pull small infestations.
Wipe/ Cut Stump	Wicker wipe with 1: 2 glyphosate to water.
Spot Spray	No specific information on herbicide control. Suggest 100mL glyphosate when actively growing before seed set [3].

Birdsfoot (*Lotus angustissimus*)

DESCRIPTION	
Locations	• Bindaring Park North and South • Broadway Arboretum in Nyibra Swamp • Jubilee Reserve B
Appearance	Sprawling herbs with their leaves divided into 5, often hairy, leaflets. Three of the leaflets are towards the tip of the leaf and the remaining two at the base and often somewhat clasping the stem. There are small stalked clusters of flowers produced in spring and summer. The flowers are yellow to orange and 4-7 mm long. The seed pods are narrow and cylindric 2-3 cm long.
Habitat	Birdsfoot has become a weed along roadsides, in winter-wet areas, and particularly along creek lines.
Comments	Native to Europe
CONTROL	
Priority	**Low**
Timing	Jul-Dec
Manual Control	Mowing to 5 cm every 3 weeks provides reasonable control. Do not burn infested areas. Improve drainage to reduce water logging during winter.
Wipe/ Cut Stump	Wicker wipe with 1: 2 glyphosate to water
Spot Spray	• Use 100 mL Tordon® 75-D plus 25 mL wetting agent in grass dominant situations or on small infestations [(2)] • 10 mL Lontrel + 25 mL wetting agent provides reasonable selective control in native vegetation [(2)] • 1 g Logran + 25 mL wetting agent [(2)] • 0.1 g metsulfuron + wetting agent also provides good control but may damage young native species at these rates [(1 & 2)] • Glyphosate generally provides little control [(2)]

Black Kennedia (*Kennedia nigricans*)*

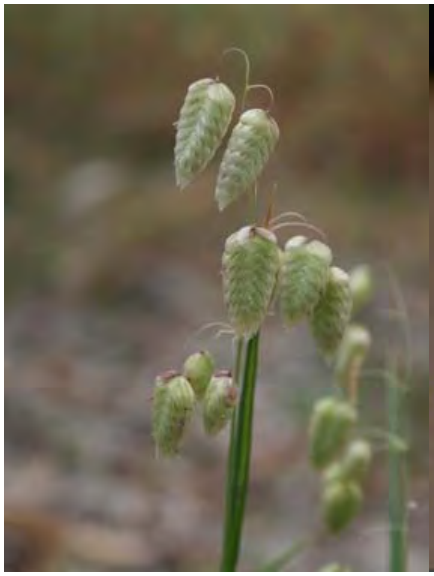



DESCRIPTION	
Location	• Bindaring Park South
Appearance	Robust trailing or twining shrub or climber to 4 m high, with leaves divided in three large leaflets and clusters of black and yellow flowers, produced between July and November.
Habitat	Native to the south-coast between Albany and Esperance, widely cultivated and now naturalised within coastal and swampy sites around Perth.
Comments	
CONTROL	
Priority	**Low**
Timing	Jul - Oct
Manual Control	Hand pull isolated individuals.
Wipe/ Cut Stump	No specific information. Suggest wiping with 1:2 glyphosate to water.
Spot Spray	No specific information on herbicide control.

Black Nightshade (*Solanum nigrum*)


DESCRIPTION	
Locations	• Bindaring Park North and South • Broadway Arboretum in Nyibra Swamp • Pickering Park
Appearance	Herb or small short-lived shrub to 1 m high. The leaves are 2-7.5 cm long, entire or very shallowly lobed. Flowers for much of the year, flowers are white, in short-stalked clusters, each flower about 1 cm across with 5 spreading petals. The succulent, globular berries are at first green but becoming black at maturity.
Habitat	Common weed of horticulture, gardens, pasture and waste land it is readily spread by birds into bushland.
Comments	Probably native to Europe.
CONTROL	
Priority	**Moderate**
Timing	Sep-Dec
Manual Control	Hand-weed small infestations. Shade reduces seed production.
Wipe/ Cut Stump	No specific information. Suggest wiping with 1:2 glyphosate to water.
Spot Spray	• On large infestations, 20 mL Starane®, applied when the weed is actively growing in summer will provide reasonable selective control [(2)] • 20 mL 2,4-D amine (500g/L) can also be used for the control of young plants in early summer and at these rates cause little damage to most established native species [(2)]

Blowfly Grass (*Briza maxima*) and Shiver Grass (*Briza minor*)




DESCRIPTION		
Locations	Blowfly Grass • Bindaring Park North and South • Jubilee Reserve A and B • Pickering Park • Success Hill	Shiver Grass • Bindaring Park North and South • Success Hill
Appearance	Slender tufted annual grasses to 60cm tall. Flowering spikes, produced in spring, consist of a loose compound arrangement of nodding green spikelets. Spikelets of *Briza minor* are much smaller and more numerous the *B. maxima*.	
Habitat	Widespread and common weeds of wasteland, granite rocks, wetlands and woodlands throughout South-western Australia.	
Comments	Easy to control.	
CONTROL		
Priority	**Moderate**	
Timing	Jun-Sep	
Manual Control	Manually remove individuals before seeding.	
Wipe/ Cut Stump	Wicker wipe with 1:2 glyphosate to water.	
Spot Spray	• 10 mL Fusilade®212 + wetting agent at 3 – 5 leaf stage [(1)] • 10 mL glyphosate in late winter to early spring before flowering [(2)] • 200 g Propon® + 25 mL wetting agent applied as above will provide some residual action [(2)] • 4 g Achieve® plus 10 mL Supercharge® oil will provide highly selective control and is applied between the 2 leaf and tillering stage of the grass in winter [(2)]	

Bridal Creeper (*Asparagus asparagoides*)

DESCRIPTION	
Locations	• Bindaring Park North and South • Success Hill
Appearance	Perennial herb and climber, growing to between 1 to 5m high. Flowers in spring, produces red fleshy berries to about 1 cm in diameter before dying back in summer. Re-shoots rapidly to climb and sprawl over other vegetation, eventually smothering it.
Habitat	Extremely invasive, spreading rapidly down roadsides, creeklines and even into undisturbed bushland.
Comments	One of the State's most urgent environmental weed problems, especially in coastal dune ecosystems. It is extremely invasive, spreading rapidly over other vegetation, eventually smothering it. Flowers in spring, dies back over summer and then shoots away in autumn. Native to southern Africa.
CONTROL	
Priority	**High**
Timing	Jul-Sep
Manual Control	As plants are usually under trees and shrubs they are difficult to dig out. However, young plants are easily removed by hand. Mats of bridal creeper can be rolled up and destroyed.
Wipe/ Cut Stump	Apply 1:2 glyphosate to water to leaves and stems with a sponge glove or brush taking care to avoid other species.
Spot Spray	• 0.04g metsulfuron + 25 mL Pulse® (1 & 2) provides good suppression and may be applied with a mister or hand spray in winter with little damage to the bush (1&2) • 100 mL glyphosate + 25 mL Pulse® (1)

Brome Grass (*Bromus diandrus*)



DESCRIPTION	
Locations	• Bindaring Park South • Broadway Arboretum in Nyibra Swamp • Success Hill
Appearance	Tufted annual grass to 90cm with softly hairy, flat or loosely folded leaves. Flowering spikes are either erect or drooping, to 15 – 25 cm long, and consist of a compound arrangement of oblong spikelets with very prominent, rough awns to 60 mm long.
Habitat	Widespread and serious weed of offshore islands, wetlands, road verges, granite rocks, pastures and crops throughout the south-west of WA.
Comments	Competes with natives. Fire hazard.
CONTROL	
Priority	Bindaring and Success Hill – **Moderate** Broadway – **High**
Timing	Sep-Nov
Manual Control	Manually remove individuals.
Wipe/ Cut Stump	Wicker wipe with 1:2 glyphosate to water.
Spot Spray	• 10 mL Fusilade®212 plus 100 mL spray oil [1,2 & 3] • 2 mL Verdict®520 plus 100 mL spray oil [2] • 5 mL glyphosate [2]

Buffalo Grass (*Stenotaphrum secundatum*)

DESCRIPTION	
Locations	• Bindaring Park South • Pickering Park
Appearance	Prostrate perennial grass forming dense colonies. Green - purple flowering heads are produced in summer and consist of a flat central stem with imbedded spikelets.
Habitat	Planted as a lawn grass, it is a weed of riverine edges, swamps and road verges.
Comments	Because of its dense growth habit, it can smother herbaceous species. Native to North and South America and Africa.
CONTROL	
Priority	**High**
Timing	Nov - Feb
Manual Control	Rake the grass out of the rushes and roll back out of the rushes with a small amount of digging. Remove as much of the buffalo grass thatch as possible. Cover the remaining buffalo grass in June/July with black plastic held down with rocks.
Wipe/ Cut Stump	Wicker wipe with 1: 2 glyphosate to water
Spot Spray	• 100 mL glyphosate + 25 mL Pulse applied when the grass is actively growing is the most effective control [1 & 2] • 8 mL Fusilade®212 + wetting agent [1] • 10 mL Verdict®520 + 100 mL of spray oil [2]

Bullrush (*Typha* sp.)*

DESCRIPTION	
Locations	• Bindaring Park North and South • Broadway Arboretum in Nyibra Swamp • Success Hill
Appearance	Tall rigid reed to 4.5 m high with flat strap-like leaves to 2 m long and a thick cylindrical stem. The flowering stem is tipped by a cylindrical, brown, velvety brush of densely packed tiny flowers. Flowers in spring and summer. Perennial.
Habitat	Wetlands and waterways.
Comments	*Typha orientalis* is native to eastern Australia while native Typha (*T. domingensis*) is native to Western Australia. Both species are aggressive colonisers of disturbed wetlands and compete with other native plants. The species can be difficult to correctly identify, especially as it is known to hybridise. Fire hazard.
CONTROL	
Priority	**Low**
Timing	Oct - Dec
Manual Control	Difficult to dig out even small populations and reinfestation can be rapid. Ensure all the rhizomatous root is removed. Remove flowers, seed source. Cut stems below water level in summer or just prior to recharge of wetland, plants then rot. Repeated cuttings in growing season (summer) will kill plants. Remove cut material.
Wipe/ Cut Stump	Hard to get at to wipe, but try wiping with a high rate of Roundup Biactive® (eg 1 to 10 water). Slash plants first and wipe new growth when leaves approximately 1m high[(3)].
Spot Spray	100mL Roundup Biactive® after the male flowers have opened and before the female flowers have expanded. Better results when not stood in water, wait if possible for water level to recede.

Burr Medic (*Medicago polymorpha*)

DESCRIPTION	
Locations	• Bindaring Park South • Broadway Arboretum in Nyibra Swamp • Pickering Park
Appearance	Low-growing sprawling herb with stems up to 60 cm long and leaves divided into 3 heart-shaped leaflets each 4-25 mm long. Flowers in winter and spring producing small clusters of yellow pea flowers. The fruit is a small, tightly coiled burr, often spiny.
Habitat	Burr Medic is a common weed of gardens, pastures and roadsides.
Comments	So common it may not be practical to control it.
CONTROL	
Priority	**Low**
Timing	Aug - Dec
Manual Control	Manually remove individuals from site and destroy.
Wipe/ Cut Stump	Wicker wipe with 1: 2 glyphosate to water.
Spot Spray	• For small infestations and grass dominant areas an annual application of 10 mL Tordon®75-D in early winter gives excellent control of existing plants and has residual activity to control later seedlings [(2)] • In bushland, 10 mL Lontrel® + 25 mL wetting agent **or** 1 g Logran® + 25 mL wetting agent applied in early winter provides reasonably selective control [(2)] • 0.1 g metsulfuron + wetting agent [(1&2)]

Caltrop (*Tribulus terrestris*)

DESCRIPTION	
Locations	• Broadway Arboretum in Nyibra Swamp
Appearance	Caltrop, also known as puncture vine or cats head, is a low spreading annual with pinnate leaves, yellow flowers less than 1cm across and very spiny fruits. The upper surface of leaves is dark green, while the lower surface is covered in hairs, giving it a silvery appearance.
Habitat	It is widespread in the Kimberley and arid zone, and is spreading along roadsides in the south-west.
Comments	This herb plant is a cosmopolitan weed, and forms of it may be native to Western Australia or introduced prior to European settlement. There are several rather similar native caltrops which generally have larger flowers and less spiny fruits.
CONTROL	
Priority	**Low**
Timing	Dec - Jan
Manual Control	Handpulling is effective if the infested area is no too large. Make sure to remove the tap root by pulling from the root crown (where the weed spreads from).
Wipe/ Cut Stump	No specific information. Suggest wiping with 1:2 glyphosate to water.
Spot Spray	• 100 mL glyphosate effective on seedlings [(1)]

Cape Bluebell (*Wahlenbergia capensis*)

DESCRIPTION	
Location	• Broadway Arboretum in Nyibra Swamp
Appearance	Slender, erect annual up to 50cm tall. The stems and leaves are shortly-hairy and the leaves have wavy, toothed edges. Each flowering stem is terminated by a single cup-shaped flower up to 2cm across, bluish-green with a dark blue centre, appearing in spring.
Habitat	Widespread on roadsides, in woodlands and heaths on sandy soils and occasionally in gardens, from Geraldton to Ravensthorpe.
Comments	Native to the Cape Province, South Africa.
CONTROL	
Priority	**Moderate**
Timing	Aug - Dec
Manual Control	Manually remove small populations before seeding.
Wipe/ Cut Stump	No specific information. Suggest wiping with 1:2 glyphosate to water.
Spot Spray	• No specific information for herbicide control. Suggest 75-100 mL glyphosate, when actively growing [3]

Cape Lilac (*Melia azedarach*)

DESCRIPTION	
Locations	• Bindaring Park South • Broadway Arboretum in Nyibra Swamp
Appearance	Deciduous tree to 15m tall, with leaves up to 75 cm long, composed of many leaflets each 2-5cm long. It produces loose sprays of fragrant lilac flowers in spring, then many hard yellow berries, 1-2cm long.
Habitat	Native to the Kimberley, but in the south of the State it is naturalised and is spreading in wasteland around Perth and other settlements.
Comments	Widely grown as an ornamental tree. Native from Iran to northern Australia.
CONTROL	
Priority	**Low**
Timing	All year round
Manual Control	Hand pull seedlings.
Wipe/ Cut Stump	• Inject 100% glyphosate • Basal bark – 10 % triclopyr (summer)
Spot Spray	No specific information, suggest spraying regrowth with 100 mL glyphosate.

Capeweed (*Arctotheca calendula*)


DESCRIPTION	
Locations	• Bindaring Park South • Jubilee Reserve B • Pickering Park
Appearance	An annual daisy with a flat basal rosette of deeply lobed leaves. The leaves are 3 to 25 cm long, green on the upper surface but the lower surface white-hairy. Flowers in late winter and spring producing daisy flower heads, up to 6 cm in diameter held on individual stalks, with the radiating yellow petals and tiny central black florets.
Habitat	A common weed of pastures, crops and roadsides, but also quite common in disturbed bushland.
Comments	Native of South Africa.
CONTROL	
Priority	**Moderate**
Timing	Jun - Sep
Manual Control	Manually remove small populations before flowering.
Wipe/ Cut Stump	Wicker wipe with 1: 2 glyphosate to water.
Spot Spray	• 5 mL Lontrel® + 25 mL wetting agent applied in early growth stages will provide good control and is safe on many native species [1 & 2] • 10 mL glyphosate is also fairly selective in bushland and roadside situations if applied when young or at the budding stage [2]

Castor Oil (*Ricinus communis*)

DESCRIPTION	
Locations	• Bindaring Park South • Broadway Arboretum in Nyibra Swamp • Success Hill
Appearance	Soft-wooded spreading shrub to 4m tall. The leaves are held on stalks 20-60cm long, are palm-like with seven to nine lobes each 10-40cm long. The flowers are large, the male flowers yellow, the female flowers red. The seeds are very poisonous.
Habitat	Common in disturbed sites, it is scattered on road and rail verges, wasteland, rubbish tips, rivers, creeks and wetlands from Port Hedland to the Fraser Range.
Comments	Native to tropical Africa and Asia, it has been successfully controlled in Walunga National Park by slashing before flowering.
CONTROL	
Priority	**Low**
Timing	Dec - May
Manual Control	Manually remove seedlings.
Wipe/ Cut Stump	• Cut plant to ground and treat stump with straight glyphosate • Basal bark – triclopyr or Garlon® (spring-summer)
Spot Spray	• 125 mL glyphosate for large populations of seedlings [3]

Common Meliot (*Melilotus indica*)

DESCRIPTION	
Locations	• Broadway Arboretum in Nyibra Swamp • Jubilee Reserve B • Pickering Park • Success Hill
Appearance	Erect annual or short-lived perennial to 50cm with leaves divided into three toothed leaflets. It has small (2-3mm) yellow flowers produced in spring and summer, held on stalks between 2-10cm long originating from at the base of the leaflets.
Habitat	Occasional weed of pasture paddocks and a widespread weed of islands, coastal dunes, wasteland, creeks, granite rocks and coastal woodlands from Shark Bay to Esperance.
Comments	Native to the Mediterranean, it is an aromatic contaminant in hay and meat products.
CONTROL	
Priority	**Moderate**
Timing	Aug - Dec
Manual Control	Manually remove small plants. If slashing cut below lowest branch axil to prevent re-sprouting.
Wipe/ Cut Stump	Wicker wipe with 1: 2 glyphosate to water.
Spot Spray	• No specific information for herbicide control, suggest 50-75 mL glyphosate when actively growing [3]

Cotton Palm (*Washingtonia filifera*)

DESCRIPTION	
Location	• Bindaring Park South
Appearance	Palm growing to 12–25 m high with a dense crown of fan-shaped, palmate leaves.
Habitat	Garden escape spreading at Kununurra, Millstream, and in the Perth area.
Comments	Native to south-western USA and Mexico.
CONTROL	
Priority	**Low**
Timing	Aug - Dec
Manual Control	Hand pull seedlings, crop off at base when not in fruit.
Wipe/ Cut Stump	Cut stump and paint with neat glyphosate.
Spot Spray	No specific information on herbicide control.

Couch (*Cynodon dactylon*)

DESCRIPTION	
Locations	• Bindaring Park South • Broadway Arboretum in Nyibra Swamp • Jubilee Reserve A • Pickering Park • Success Hill
Appearance	Prostrate perennial grass, spreading both above and below ground to several metres across, rooting at the nodes, and bluish-green leaves. Flowers in late spring and summer, producing windmill-like (digitate) inflorescences comprising two to seven purplish spikes.
Habitat	Mainly in highly disturbed areas. It is widely planted as a lawn grass and it invades wetlands and river edges in southern Western Australia.
Comments	Competes with native species. It is native to the Kimberley and the tropics worldwide.
CONTROL	
Priority	**High**
Timing	Oct – Nov, Apr - May
Manual Control	Shade out with black plastic during spring and autumn.
Wipe/ Cut Stump	No specific information.
Spot Spray	• 50 mL Fusilade®212 + wetting agent in late spring/summer and then in autumn [(1)] • 100 mL glyphosate [(1)]

Crab Grass (*Digitaria sanguinalis*)


DESCRIPTION	
Locations	• Bindaring Park North and South • Broadway Arboretum in Nyibra Swamp • Pickering Park
Appearance	Annual grass with creeping stems, 2-15cm tall. Flowers in summer, producing erect inflorescences comprised of 3 to 10 purple racemes arranged in a windmill (digitate) arrangement.
Habitat	A very common garden weed in southern Western Australia.
Comments	Native to the Mediterranean.
CONTROL	
Priority	**Low**
Timing	Sep - Jan
Manual Control	Manually remove individuals.
Wipe/ Cut Stump	No specific information.
Spot Spray	• 100 mL glyphosate in spring [(1)]

Curled Dock (*Rumex crispus*)

DESCRIPTION	
Locations	• Bindaring Park North and South
Appearance	Erect herbs up to 1.5 m with pointed oval leaves 4-24 cm long. The leafless flower spike has densely clustered flowers in ring-like arrangements, greenish in colour but turning reddish, and swollen in the centre when in fruit. Flowers in winter, spring and early summer.
Habitat	A weed of creeklines, pasture and disturbed woodland.
Comments	Native to Europe and south-west Asia.
CONTROL	
Priority	**Low**
Timing	May - Jul
Manual Control	Remove individual plants by cutting their roots at least 20 cm below ground level.
Wipe/ Cut Stump	Can be wiped with a mixture of 1 L glyphosate in 2 L of water.
Spot Spray	• On small infestations 0.5 g chlorsulfuron plus 100 mL Tordon®75-D in winter will control existing plants and seedlings for about a year [(2)] • 100 mL glyphosate in early bud stage [(1)]

Cyperus (*Cyperus involucratus*)

DESCRIPTION	
Location	• Bindaring Park North
Appearance	Robust, tufted perennial, to 1.2–1.8 m high, producing brown - green flowers from December through to February. Similar growth habit to the other *Cyperus* species, except that it is tall, leafier, and the stems are cylindrical.
Habitat	Garden ornamental found in some wetlands around Perth.
Comments	
CONTROL	
Priority	**Low**
Timing	Aug - Dec
Manual Control	Manually remove isolated individuals, ensuring all tubers and rhizomes are removed.
Wipe/ Cut Stump	No specific information, suggest to wipe leaves with 1: 2 glyphosate to water.
Spot Spray	No specific information, though other *Cyperus* species are known to be controlled by 100 mL glyphosate + Pulse® (1 & 3)

Dove-foot Cranebill (*Geranium molle*)

DESCRIPTION	
Location	• Broadway Arboretum in Nyibra Swamp
Appearance	Spreading or ascending, softly-hairy, short-lived annual or perennial herb. Leaves are palm-like, with pink flowers and a hairless fruit.
Habitat	Found on wasteland, roadsides and occasionally on pastures between Perth and Albany.
Comments	
CONTROL	
Priority	**Low**
Timing	Aug - Dec
Manual Control	Manually remove individuals before seeding.
Wipe/ Cut Stump	Wicker wipe with 1: 2 glyphosate to water.
Spot Spray	No specific information, suggest glyphosate when actively growing. Metsulfuron at 5g/ha will control some plants from the Geraniaceae family [(3)].

Edible Fig (*Ficus carica*)

DESCRIPTION	
Location	• Bindaring Park South
Appearance	Small tree, 1–10 m high. Easily recognised by its large, lobed, hand-shaped leaves and fleshy green or purple pear-shaped fruits that appear in early summer.
Habitat	Usually in disturbed areas, has spread to river banks and creek lines around Perth and also persists at old settlement sites throughout the south-west. Replaces native Melaleuca species.
Comments	Believed to be native to the Mediterranean and the Middle East. Familiar as a cultivated fruit tree. Suspect specimen was planted by neighbouring resident.
CONTROL	
Priority	**High**
Timing	Aug – Dec
Manual Control	Remove seedlings and small populations.
Wipe/ Cut Stump	• Wicker wipe seedlings with 1: 2 glyphosate to water. • Cut trees to ground level and treat stumps with straight glyphosate • Inject with 50 to 100% glyphosate (summer)
Spot Spray	• Spray regrowth with 100 mL glyphosate [(1)]

Flatweeds (*Hypochaeris glabra* and *H. radicata*)

DESCRIPTION	
Locations	• Bindaring Park North and South • Broadway Arboretum in Nyibra Swamp • Jubilee Reserve A and B • Pickering Park • Success Hill
Appearance	*Hypochaeris* has two species in WA, *H. glabra* (smooth catsear) and *H. radicata* (flatweed). They are difficult to tell apart but it is probably not necessary to distinguish them for most practical purposes. They are annuals or short-lived perennials, with a basal rosette of leaves and yellow, dandelion-like flower heads at the top of slender, leafless stalks. *H. glabra* is usually annual, with smooth leaves and heads up to 1.5cm across, *H. radicata* is usually perennial, with rough, bristly leaves and heads up to 3cm across; however, intergrades of all features exist.
Habitat	Common weeds of lawns, horticultural areas, roadsides and bushland throughout the south-west.
Comments	Native to Europe, competes with native herbs especially in richer soils and disturbed areas.
CONTROL	
Priority	**Moderate**
Timing	Aug - Nov
Manual Control	Use a weed fork to extract the taproot if hand pulling before seeding.
Wipe/ Cut Stump	Wipe rosettes with 1: 2 glyphosate to water.
Spot Spray	• 10 mL Lontrel® + 25 mL wetting agent [(1)] • For small infestations 50 mL Tordon®75-D will control growing plants and leave a soil residual to control seedlings for 12 months [(2)] • 100 mL glyphosate [(3)]

Flax Fleabane (*Conyza bonariensis*)


DESCRIPTION	
Locations	• Bindaring Park North and South • Broadway Arboretum in Nyibra Swamp • Jubilee Reserve A • Pickering Park • Success Hill
Appearance	Annual herbs usually to 1 m high, with a basal rosette of entire or toothed leaves and an erect, often greyish, leafy flowering stem. The small flower heads are cream to white and do not have the radiating petal-like florets seen in many daisies. Flowers in summer and autumn.
Habitat	Common weed of roadsides and disturbed bushland in Perth.
Comments	Produces large numbers of seed therefore difficult to control. In poor seasons can flower when only a few cm high. Native to South America.
CONTROL	
Priority	**Low**
Timing	Oct - Dec
Manual Control	Hand pulling after stem elongation is effective on loose soils, but on heavier soils a weed fork is required to prevent the plant breaking and regrowing from the base. Manually remove small populations before they spread.
Wipe/ Cut Stump	Wicker wipe with 1: 2 glyphosate to water.
Spot Spray	• 5 mL Lontrel® plus 25 mL wetting agent can be used for fairly selective control in bushland [(2)] • Isolated patches can be sprayed with 50 mL Tordon®75-D for control of plants and residual control of seedlings [(2)]

Freesia (*Freesia* sp.)

DESCRIPTION	
Locations	• Success Hill
Appearance	Tufted plant with soft light green basal leaves arising from a corm. The erect flowering stem is bent to one side just below the lowest flower. Flowers are cream to yellow, or white which often have yellow to orange markings with an attractive scent. Flowers in spring.
Habitat	This popular garden flower has become a serious weed of urban bushland, coastal heath, woodland, and granite rocks from Gingin to Israelite Bay.
Comments	A hybrid of two South African species.
CONTROL	
Priority	**Moderate**
Timing	Aug – Sep
Manual Control	Very difficult to control by hand weeding because they produce seed, corms and cormels. Loosen the soil before removal to prevent the corm breaking off.
Wipe/ Cut Stump	Painting leaves or wiping with a sponge glove dipped in a mixture of 1 part glyphosate in 2 parts water can be used in selective areas.
Spot Spray	• 0.1 g metsulfuron + 25 mL Pulse® (1 & 2) provides reasonable control with much less damage to native species • 50 mL glyphosate plus 25 mL Pulse applied in winter or spring before the end of flowering provides good control of ewxristing plants but there is often a subsequent germination.

Geraldton Carnation Weed (*Euphorbia terracina*)


DESCRIPTION	
Location	• Broadway Arboretum in Nyibra Swamp
Appearance	Erect perennial to 80cm tall, much branched from the base. The leaves are 1-4cm long, linear to lanceolata, minutely toothed and without stalks. Highly modified yellow-green flowers are located at the end of branches.
Habitat	Common and serious weed of grazing land, road verges, coastal heath and Tuart woodlands from Geraldton to Esperance. Common in Tuart woodland and coastal limestone.
Comments	Produces a very toxic and irritating milky sap when cut. Native to the Mediterranean.
CONTROL	
Priority	**High**
Timing	May - Jun
Manual Control	Manually remove individuals and small populations before seeding.
Wipe/ Cut Stump	Wicker wipe with 1:2 glyphosate to water.
Spot Spray	Large infestations spray with: • 0.1 g metsulfuron in 15 L of water • 0.1 g metsulfuron + 150 mL glyphosate in 15 L of water before flowering [(1)]

Geraldton Wax (*Chamelaucium uncinatum*)

DESCRIPTION	
Location	• Broadway Arboretum in Nyibra Swamp
Appearance	Erect sparse shrub, 0.5–4 m high with white to pink flowers. Perennial.
Habitat	White, grey or yellow sand, over limestone, laterite. Coastal areas, edges of swamps, hillsides, plains.
Comments	Very popular garden species. Should not be confused with the local Wembley Wax that occurs around Bold Park, which is the same species but of different provenance.
CONTROL	
Priority	**Low**
Timing	Sep - Nov
Manual Control	Manually remove seedlings.
Wipe/ Cut Stump	Cut trees to ground level and treat stumps with straight glyphosate.
Spot Spray	Not recommended

Giant Reed (*Arundo donax*)


DESCRIPTION	
Locations	• Bindaring Park North and South • Adjacent to Broadway Arboretum in Nyibra Swamp • Success Hill
Appearance	Similar appearance to Bamboo, only branches are much thicker. Both sub-species (variegated and non-variegated) occur in the study areas. Perennial.
Habitat	Mainly disturbed areas.
Comments	Difficult to control. Serious weed.
CONTROL	
Priority	**Moderate**
Timing	Aug - Dec
Manual Control	Manually remove juvenile individuals.
Wipe/ Cut Stump	Cut down close to ground and paint with neat glyphosate.
Spot Spray	Carefully spot spray regrowth with • 100 mL glyphosate before 60 cm high • 10 mL Verdict®120 + wetting agent • 10mL Fusilade®212 + wetting agent [(1)]

Grapevine (*Vitis vinifera*)


DESCRIPTION	
Location	• Bindaring Park South
Appearance	Woody climber
Habitat	Creek and river banks, lake margins
Comments	Suspect the specimens were planted by a neighbouring resident.
CONTROL	
Priority	**Low**
Timing	Oct - Jan
Manual Control	Remove small seedlings.
Wipe/ Cut Stump	Cut to ground level and paint stump with 50 – 100% glyphosate.
Spot Spray	No specific information available relating to herbicide control, suggest spot spraying regrowth with 100 mL glyphosate.

Guildford Grass (*Romulea rosea*)

DESCRIPTION	
Locations	• Jubilee Reserve A and B
Appearance	Small herb with long and slender, but very tough, cylindrical basal leaves which are produced annually from a small corm: The flowers are formed at the base of the plant on stalks which gradually elongate upwards during flowering and then recurve in fruit. The star-like flowers have a short broad yellowish tube and 6 pink to purple pointed petal lobes 8-15 mm long.
Habitat	A weed of roadsides, garden and pasture, also commonly occurring in bushland.
Comments	Native to South Africa.
CONTROL	
Priority	**High**
Timing	Aug - Oct
Manual Control	Manual control is often difficult because corms tend to break off unless soil is very loose. Very regular and close mowing with a rotary mower and cultivation in summer or early autumn to expose corms so they dry out and die provides some control but also may spread the infestation.
Wipe/ Cut Stump	Blanket wiper treatments using 1-2 L/ha of glyphosate in combination with 10-20 g/ha of chlorsulfuron or metsulfuron have worked well.
Spot Spray	• 0.5 g chlorsulfuron + 25 mL Pulse in winter before flowering [2] • 0.2 g metsulfuron + 37.5 mL Pulse in 15 L of water [1]

Hares Tail Clover (*Trifolium arvense*)


DESCRIPTION	
Locations	• Jubilee Reserve B • Success Hill
Appearance	Erect or sprawling herb with leaves divided into 3 narrow leaflets approx. 5-20 mm long and ovoid to shortly cylindrical heads of white or pink flowers. Flowers late winter, spring and summer.
Habitat	Common weed of roadsides, gardens and waste places, sometimes invading bushland.
Comments	Native to Europe, Asia and northern Africa.
CONTROL	
Priority	**Moderate**
Timing	Jun-Jul
Manual Control	Hand pull scattered individuals, pulling from the root crown, before flowering.
Wipe/ Cut Stump	Wipe with 1:2 glyphosate to water.
Spot Spray	• 10 mL Lontrel® + 25 mL wetting agent in early winter before flowering (1 & 2) • 1g Logran (2) + 25 mL wetting agent • 0.1 g metsulfuron (2) + 25 mL wetting agent • 0.1 g chlorsulfuron (2) + 25 mL wetting agent • In grass dominant areas, 10 mL Tordon®75-D in early winter gives excellent control of existing plants and has residual activity to control seedlings.

Hares Tail Grass (*Lagurus ovatus*)

DESCRIPTION	
Locations	• Bindaring Park South • Success Hill
Appearance	Hairy annual grass, to 30cm tall. Flowering heads are dense, ovoid, pale green and head at the top of slender stalks, ageing straw-coloured, with long hairs. Flowers during spring and summer.
Habitat	A common weed of sandy soils, especially near the coast.
Comments	Competes with native plants. Native to the Mediterranean.
CONTROL	
Priority	Bindaring Park – **High** Success Hill - **Moderate**
Timing	Jun - Aug
Manual Control	Manually remove individuals. Prevent seed set for 2-3 years by mowing, grazing or cultivation.
Wipe/ Cut Stump	Wicker wipe with 1: 2 glyphosate to water.
Spot Spray	• 10 to 20 mL Fusilade®212 + 100 mL spray oil applied before flowering will provide reasonable control in sensitive areas where there are seedling native or broadleaved plants [1 & 2] • Alternatively, 5 mL glyphosate plus 25 mL wetting agent applied in winter when the grass is in the vegetative stage will provide reasonably selective control in bushland [2] • Use higher rates for higher levels of control in non-selective situations [2]

Hibiscus (*Hibiscus* sp.)

DESCRIPTION	
Location	• Bindaring Park South
Appearance	Small trees or shrubs up to about 4m high. Perennial. Flowers usually solitary.
Habitat	-
Comments	Suspect specimen was planted by neighbouring resident.
CONTROL	
Priority	**Low**
Timing	Aug - Dec
Manual Control	Remove small seedlings by hand.
Wipe/ Cut Stump	No specific information, suggest cutting to near ground level and painting stump with straight glyphosate.
Spot Spray	No specific information, suggest 100 – 150 mL glyphosate sprayed on the foliage of seedlings till run-off.

Japanese Pepper (*Schinus terebinthifolia*)


DESCRIPTION	
Locations	• Bindaring Park North and South • Jubilee Reserve B
Appearance	A tree or shrub with several trunks, 3-6 m tall. The pinnate leaves and leaflets have a red to yellow midrib and smell like turpentine when crushed. Female plants produce clusters of small, bright red berries at ends of branches during winter. Male trees have many small cream flowers in late summer.
Habitat	Common in older suburbs as a street tree and garden specimen. It has escaped from cultivation and forms thickets on disturbed land. Found in damp sites near Geraldton, and on river banks and swampy sites around Perth.
Comments	Smothers native plants. Has the potential to become more widespread. Seed spread by birds. Roots can resprout. Very difficult to control. Can cause health problems in some people.
CONTROL	
Priority	**Moderate**
Timing	Sep - Dec
Manual Control	Remove small seedlings by hand.
Wipe/ Cut Stump	• Inject trunk with 50% glyphosate • Cut to near ground level and treat stump with straight glyphosate within 30 seconds of cutting • Basal bark – triclopyr/picloram (summer)
Spot Spray	Not recommended.

Kikuyu (*Pennisetum clandestinum*)

DESCRIPTION	
Locations	• Bindaring Park North and South • Pickering Park • Success Hill
Appearance	Spreading perennial grass that can form large colonies up to 2m tall. The inflorescences are hidden amongst the leaves, though, when in flower, kikuyu lawns may seem covered in spider threads of protruding filaments. Flowers in summer and apparently does not set seed in Australia.
Habitat	Occurs mainly in highly disturbed areas. Naturalised in swamps and wetlands in the wetter south-west from Dandaragan to Albany.
Comments	Readily escapes from parklands into bushlands. Smothers native plants. Native to East Africa.
CONTROL	
Priority	**High**
Timing	All year round
Manual Control	Rake and remove as much of the kikuyu thatch as possible. Cover the remaining kikuyu in June/July with black plastic held down with rocks or pegs. In summer remove the black plastic, control any live kikuyu runners and seed or plant with native species.
Wipe/ Cut Stump	Not recommended.
Spot Spray	• 100 mL glyphosate + 25 mL Pulse when the grass is actively growing provides the best control. Repeat every 8 weeks or when regrowth reaches about 5 cm tall [1 & 2]. • 10 mL Fusilade® + wetting agent [1] • 10 mL Verdict + 100 mL spray oil [2]

Lantana (*Lantana camara*)

DESCRIPTION	
Location	• Success Hill
Appearance	Evergreen shrub with arching, spreading branches that can form a dense tangled mass over 3m high and wide. The ovate, serrate leaves are rough to the touch. The flowers are arranged in flat heads, pale cream, aging to cerise, and produced in spring and summer. The black berries are edible and are spread by birds.
Habitat	Naturalised in wetter wasteland areas around Perth.
Comments	Native of South America. Several other lantanas are planted in gardens, and may have the potential to become naturalised. Prolific seeder. Releases chemicals in soil that inhibit germination of native seeds. A serious bushland weed in eastern Australia.
CONTROL	
Priority	**High**
Timing	Sep to Nov
Manual Control	Manually remove seedlings.
Wipe/ Cut Stump	Cut stump or basal bark – triclopyr/picloram (summer – autumn).
Spot Spray	• Foliar spray regrowth and small plants under 2 m tall with 150 mL glyphosate when actively growing[(1)]

Marsh Club-rush (*Bolboschoenus caldwellii*)*

DESCRIPTION	
Location	• Bindaring Park South
Appearance	Perennial sedge 0.3 to 1.2 m high. Flowers yellow, brown, produced between August and March.
Habitat	White or grey sand, mud, saline silt, sandy clay. Swamps, drains, brackish river edges, salt marshes.
Comments	Local native species that can be aggressive and overtake waterways and block water flow. Population requires monitoring and possible thinning.
CONTROL	
Priority	**Low**
Timing	Jun-Sep
Manual Control	Dig out small infestations ensuring all tubers and rhizomes are removed.
Wipe/ Cut Stump	No specific information.
Spot Spray	No specific information.

Mile-a-Minute (*Ipomoea cairica*) and Morning Glory (*I. indica*)

DESCRIPTION		
Locations	Mile-a-Minute • Bindaring Park South	Morning Glory • Bindaring Park North and South • Success Hill
Appearance	*Ipomoea cairica* is a hair-less perennial vine with tuberous roots. The young stems are red and the leaves ovate in outline but with five to seven finger-like lobes. Flowers are funnel-shaped, mauve-pink. *I. indica* is similar to the above, but is a softly hairy vine with tri-lobed leaves and bright blue flowers.	
Habitat	Both species and occur as garden escapes on wasteland from Geraldton to Albany, flowering in spring and summer. They are common along rivers and creeks in the Perth area, where they smother fringing trees and shrubs.	
Comments		
CONTROL		
Priority	**Low**	
Timing	All year round	
Manual Control	Hand pull seedlings.	
Wipe/ Cut Stump	Scrape and paint stem with 20% to 100% glyphosate.	
Spot Spray	No specific information. Suggest high rates of glyphosate (ie 200 mL) plus 25 mL Pulse. Cut down large plants and spray regrowth, two or more applications are likely to be required [(3)].	

Narrow Leaf Lupin (*Lupinus angustifolius*)


DESCRIPTION	
Locations	• Broadway Arboretum in Nyibra Swamp • Jubilee Reserve B • Success Hill
Appearance	Naturalised in Western Australia, often on roadsides or sandy bushland adjoining paddocks. Has blue flowers in spring and have leaves divided into a number of finger-like leaflets, each up to 6mm wide. Annual.
Habitat	It is a weed of road verges and woodlands from Geraldton to Albany.
Comments	Competes with natives.
CONTROL	
Priority	**Low**
Timing	Jul-Oct
Manual Control	Manually remove scattered individuals.
Wipe/ Cut Stump	Not recommended.
Spot Spray	• Small areas can be treated with 20 mL Tordon®75-D in early winter leaving a soil residual which will control lupin and other broadleaf seedlings for about a year [(2)]. • In bushland, 10 mL Lontrel® or 1g Logran® are relatively selective [(1 & 2)]. • 0.1 g metsulfuron can also be used but is less selective [(1 & 2)]. • glyphosate is relatively ineffective [(2)]

Narrowleaf Clover (*Trifolium angustifolium*)

DESCRIPTION	
Locations	• Bindaring Park North and South • Jubilee Reserve A and B
Appearance	Erect annual up to 60cm tall, with relatively few, straight, unbranched stems. The large leaves have long, narrow leaflets. The stems are topped by long cylindrical heads of small pink flowers, in spring and early summer.
Habitat	A weed in a wide variety of situations, common along roadsides and tracks in less fertile sites, not common in grazed pastures, throughout the south-west between Perth and Albany.
Comments	No agricultural value. Native to the Mediterranean.
CONTROL	
Priority	**Low**
Timing	Jun - Jul
Manual Control	Remove scattered individuals, pulling from the root crown, before flowering.
Wipe/ Cut Stump	Wipe with 1:2 glyphosate to water.
Spot Spray	• 10 mL Lontrel® + 25 mL wetting agent in early winter before flowering [1 & 2] • 1g Logran® [2] + 25 mL wetting agent • 0.1 g metsulfuron [2] + 25 mL wetting agent • 0.1 g chlorsulfuron [2] + 25 mL wetting agent • In grass dominant areas, 10 mL Tordon®75-D in early winter gives excellent control of existing plants and has residual activity to control seedlings [2].

Nasturtium (*Tropaeolum majus*)

DESCRIPTION	
Location	• Bindaring Park North
Appearance	Annual, or sometimes a short-lived perennial, with sprawling fleshy stems and circular leaves held aloft on long stalks like parasols. The striking, spurred, trumpet-shaped flowers are all shades of red, orange and yellow, produced in spring.
Habitat	A garden escape, it occurs on wasteland and along creeklines from Perth to Albany.
Comments	*Tropaeolum majus* is a hybrid between *T. ferreyrae* and *T. minor*, both native to Ecuador and Peru, and is not known from the wild.
CONTROL	
Priority	**Low**
Timing	Sep – Nov
Manual Control	Manually remove, ensuring the larger roots are also collected and burn. There is typically a large germination of seedlings following the removal of parent plant. These can be controlled by light cultivation or herbicides.
Wipe/ Cut Stump	Not recommended.
Spot Spray	• 80 mL 2,4-DB plus 25 mL wetting agent will provide reasonably selective control in bushland situation [(2)] • Where hormone herbicides can't be used (ie close to gardens, vineyards and orchids), apply 20 mL glyphosate plus 25 mL wetting agent [(2)]

Paspalum (*Paspalum dilatatum*)

DESCRIPTION	
Location	• Bindaring Park North and South
Appearance	Tufted rhizomatous perennial to 1m tall. The inflorescence consists of 2 to 10 pendulous, slender and spreading branches each with 2 rows of small spikelets, produced in spring and summer.
Habitat	A fodder grass, it is found in disturbed claypans (and in natural ones, where it is a serious weed), swamps, lawns, verges and pastures from Kalbarri to Albany and also at the Ord River.
Comments	Native to South America.
CONTROL	
Priority	**Moderate**
Timing	Aug - Nov
Manual Control	Cut out small populations – ensure rhizome removal.
Wipe/ Cut Stump	Cut near ground level and wide with 10% glyphosate (100 mL / 1 L of water).
Spot Spray	• Spray adult plants with 100 mL Fusilade® + wetting agent. Rate can be reduced to 10 mL when spraying seedlings [(1)] • 100 mL glyphosate + 25 mL wetting agent [(2 & 3)]

Perennial Veldt Grass (*Ehrharta calycina*)

DESCRIPTION	
Locations	• Bindaring Park South • Jubilee Reserve A and B • Success Hill
Appearance	Tufted perennial grass to 80cm tall. The inflorescence is a drooping erect panicle of reddish-purple flowers, 7-22cm long. Flowers in spring.
Habitat	Widespread weed of roadsides and bushland on sandy soils, from Geraldton to Esperance and is especially common on the Swan Coastal Plain.
Comments	Serious environmental weed.
CONTROL	
Priority	**High**
Timing	Aug - Sep
Manual Control	Manual remove small populations before seeding, ensuring crown removal. Do not slash.
Wipe/ Cut Stump	Wicker wipe with 1:2 glyphosate to water.
Spot Spray	• 80 mL Fusilade®212 + wetting agent, followup in subsequent years; utilise unplanned fires and spray regrowth and seedlings with 4 – 6 weeks [(1)].

Pigeon Grass (*Setaria palmifolia*)

DESCRIPTION	
Location	• Bindaring Park North
Appearance	Robust, tufted perennial, to 1.5m tall with palm-like leaves to 1m long. The inflorescence is an erect or nodding, loose panicle, with long zig-zagging to straight branches. Flowers in summer.
Habitat	A garden plant, now scattered in disturbed swamps and creeks from Perth to Busselton.
Comments	Minor weed species
CONTROL	
Priority	**Low**
Timing	Jun - Oct
Manual Control	Manual remove small populations before seeding, ensuring crown removal.
Wipe/ Cut Stump	No specific information, suggest wicker wipe with 1:2 glyphosate to water.
Spot Spray	No specific information, suggest 100 mL glyphosate + 25 mL wetting agent applied prior to flowering.

Pimpernel (*Anagallis arvensis*)

DESCRIPTION	
Locations	• Bindaring Park North and South • Broadway Arboretum in Nyibra Swamp
Appearance	Hairless, spreading annual, with more or less square stems, and opposite, ovate, stalkless leaves. The flowers are produced in spring and are about 1cm across, held on stalks above the leaves.
Habitat	Occurs within disturbed sites throughout the south-west, including coastal dunes and limestone.
Comments	Competes with small herbs. Mainly a problem in moist badly disturbed areas when the plants become more vigorous. Therefore only worth controlling in these areas.
CONTROL	
Priority	**Moderate**
Timing	Jul - Oct
Manual Control	Manually remove individuals.
Wipe/ Cut Stump	Wicker wipe with 1:2 glyphosate to water.
Spot Spray	No specific information relating to herbicide control, suggest: • 50-100 mL glyphosate + 25 mL wetting agent • 0.5 g chlorsulfuron or metsulfuron [3]

Prickly Lettuce (*Lactuca serriola*)

DESCRIPTION	
Locations	• Bindaring Park North and South • Broadway Arboretum in Nyibra Swamp • Jubilee Reserve A and B • Pickering Park • Success Hill
Appearance	Summer-growing annual with a short-lived basal rosette of leaves and an erect leafy stem, 1-2m tall, repeatedly branching at the top to form an open pyramid of small yellow flower heads. Stems are prickly, as are the deeply lobed leaves. The leaves tend to be held vertically, orientated north/south or east/west.
Habitat	Found in crops, pastures, along roadsides and on wasteland and in disturbed bushland throughout the south-west especially along bush tracks.
Comments	Occasionally misidentified as skeleton weed. Native to Europe.
CONTROL	
Priority	**Moderate**
Timing	Oct - Dec
Manual Control	Manually remove individuals before flowering.
Wipe/ Cut Stump	Wicker wipe with 1:2 glyphosate to water.
Spot Spray	• 50-75 mL glyphosate + 25 mL wetting agent [3]

Ribwort Plantain (*Plantago lanceolata*)

DESCRIPTION	
Locations	• Bindaring Park North and South • Pickering Park
Appearance	Slightly hairy annual or short-lived perennial with ribbed stems to 1m high in favourable locations, but often shorter. The leaves are lance shaped, much longer than wide, and usually held erect. The inflorescence is a brown cylinder, up to 7cm long.
Habitat	Common on disturbed areas such as sports ovals and roadsides from Perth to Albany.
Comments	Native to Europe and Asia.
CONTROL	
Priority	**Low**
Timing	Oct - Dec
Manual Control	Manually remove individuals before flowering. Ensure tap root is removed.
Wipe/ Cut Stump	Wicker wipe with 1:2 glyphosate to water.
Spot Spray	• Spray in early growth stages with 100 mL glyphosate + 25 mL wetting agent [(1)]

Ryegrass (*Lolium rigidum*)

DESCRIPTION	
Locations	• Bindaring Park North and South • Broadway Arboretum in Nyibra Swamp • Success Hill
Appearance	Annual grass to 1 m tall. The inflorescence is a slender, flat, two-ranked spike, cream to yellowish green in colour, up to 30 cm long. Flowers in spring and summer.
Habitat	An important weed of crops and a widespread weed of islands, coastal sands, disturbed sites and road verges from Shark Bay to Busselton.
Comments	Some of the selective grass herbicides are far better than others in controlling this species. Native to the Mediterranean.
CONTROL	
Priority	**Moderate**
Timing	Jun - Aug
Manual Control	Manually remove small populations. Cut at or slightly below ground level, rarely regrows. Remove any seed heads.
Wipe/ Cut Stump	Wicker wipe with 1:2 glyphosate to water.
Spot Spray	• Spray with 5 mL of Select® (or other grass-selective herbicides ie Fusilade®212, Sertin®, Targa® etc) plus 100 mL spray oil in winter when grass has 2 – 8 leaves. For larger plants, up to flowering, increase rate to 20mL [1 & 2]. • Where populations are resistant to grass selective herbicides, use 10 mL of glyphosate when the ryegrass is still vegetative to the time the seed heads are emerging. Most natives will tolerate this treatment [2]

Small Flowered Mallow (*Malva parviflora*)


DESCRIPTION	
Locations	• Bindaring Park South • Broadway Arboretum in Nyibra Swamp
Appearance	Erect or decumbent annual or perennial, herb 0.05 to 1.2 m high. Very small mauve, pink or white flowers are produced between March/July and November.
Habitat	Occurs mainly in highly disturbed sites.
Comments	Competes with herbs and small shrubs.
CONTROL	
Priority	**Low**
Timing	Aug - Dec
Manual Control	Manually remove small populations before seeding.
Wipe/ Cut Stump	Wicker wipe with 1:2 glyphosate to water.
Spot Spray	No specific information, suggest high rates of glyphosate (ie 100-150 mL) in early growth stages and when actively growing [3].

Soursob (*Oxalis pes-caprae*)


DESCRIPTION	
Locations	• Bindaring Park North and South • Jubilee Reserve A • Success Hill
Appearance	Perennial herb consisting of stalked leaves made up of three heart-shaped leaflets, and many-flowered inflorescences on cylindrical stalks that grow from deeply placed tubers and bulbs. Leaflets often spotted or marked. The bright yellow flowers appear in late autumn and winter.
Habitat	A major weed of crops, pastures, orchards, gardens, roadsides, wasteland and disturbed native vegetation throughout the south-west.
Comments	Competes with and smothers native plants forming large colonies. Toxic. Physical removal can result in spread of bulbils. Native to South Africa.
CONTROL	
Priority	**Moderate**
Timing	July - Sep
Manual Control	Mowing and grazing are generally ineffective. Manual removal very difficult as it requires all the soil surrounding the roots to also be removed to prevent spread of bulbils.
Wipe/ Cut Stump	Wicker wipe with 1: 2 glyphosate.
Spot Spray	• 0.1 g metsulfuron (2) • 0.2 g chlorsulfuron (2) • 100 mL glyphosate (1 & 2)

Sowthistle (*Sonchus oleraceus*) and Prickly Sowthistle (*S. asper*)

DESCRIPTION		
Locations	Sowthistle • Bindaring Park South • Broadway Arboretum in Nyibra Swamp • Jubilee Reserve A and B • Success Hill	Prickly Sowthistle • Bindaring Park North and South • Pickering Park • Broadway Arboretum in Nyibra Swamp • Jubilee Reserve A and B • Success Hill
Appearance	Sowthistles are annual or short-lived perennials with erect, sparsely branched hollow stems producing latex when cut. The flower heads are composed of yellow ray florets, opening in the morning, closing in the afternoon. *Sonchus asper* (prickly sowthistle) is a stout upright annual to 1.5m, with large, leathery leaves with very prickly margins. *Sonchus oleraceus* (sowthistle) is less robust and the leaves are generally flaccid and are weakly prickly or have no prickles at all.	
Habitat	A common weed of pasture and waste land, but also invades bushland particularly in damp areas.	
Comments	Sow thistles flower much of the year but mainly in spring and early summer. Native to Europe, Asia and northern Africa.	
CONTROL		
Priority	**Moderate**	
Timing	May - Aug	
Manual Control	Manually remove isolated plants.	
Wipe/ Cut Stump	Wicker wipe with 1: 2 glyphosate to water prior to budding.	
Spot Spray	• 10 mL Lontrel + 25 mL wetting agent applied at rosette stage [1] • 50-75 mL glyphosate [2 & 3]	

Stagger Weed (*Stachys arvensis*)


DESCRIPTION	
Location	• Pickering Park
Appearance	Weak, hairy annual, with upright stems that bear small, broad leaves with rounded teeth on the leaf margin. The small flowers are pink to purple in small clusters amongst the upper leaves. Flowering in winter and early spring.
Habitat	Widespread in cultivated agricultural and disturbed land, granite outcrops and urban woodlands throughout the south-west.
Comments	Toxic to livestock, causing 'staggers'.
CONTROL	
Priority	**Low**
Timing	Jul - Oct
Manual Control	Manually remove small infestations prior to flowering.
Wipe/ Cut Stump	Wicker wipe with 1: 2 glyphosate.
Spot Spray	No specific information, suggest glyphosate 50 – 75 mL when actively growing [3]

Summer Scented Wattle (*Acacia rostellifera*)*


DESCRIPTION	
Location	• Broadway Arboretum in Nyibra Swamp
Appearance	Dense shrub or tree to 6 m high. Bark is dark grey and fissured on main trunks. Deep yellow spherical flower-heads are produced between July and December and occur in groups of two to seven arranged either side of a central axis.
Habitat	Mainly on consolidated sand dunes.
Comments	Aggressive native coloniser, especially of disturbed or degraded areas.
CONTROL	
Priority	**High**
Timing	Sep - Dec
Manual Control	Manually remove seedlings before seed set, ensuring as much root material is removed as possible. Hand pulled juveniles that have broken off often re-shoot.
Wipe/ Cut Stump	• Cut mature trees to ground level and paint stump with one part glyphosate to two parts water. Monitor for re-spouting (suckering) and for new seedlings. • Basal bark - A mixture of 1 L of Access® in 60L of diesel applied to the lower 50 cm of trucks can be used to individual trees.
Spot Spray	• No specific information, suggest spraying seedlings and juvenile trees with 100 mL glyphosate + 25 mL Pulse until foliage is just wet [(3)].

Tagasaste (*Chamaecytisus palmensis*)

DESCRIPTION	
Location	• Broadway Arboretum in Nyibra Swamp
Appearance	Large shrub or small tree up to 5 m high with weeping branches and greyish green, softly hairy foliage. The leaves are divided into 3 oval leaflets each 10-45 mm long. The scented, white to cream pea flowers are each 12-17 mm long and occur in small showy clusters. The seed pod is flat, 40-50 mm long and 8-12 mm wide. Flowers in winter and early spring.
Habitat	Grown as a fodder plant, it has since become weedy along roadsides, sometimes invading bushland. It is common between Albany and Esperance.
Comments	Seed may remain in the soil for more than 10 years but seedlings rarely establish in dense shade. Native to the Canary Islands.
CONTROL	
Priority	**Low**
Timing	Mar- May, Sep - Nov
Manual Control	Chain and bulldoze trees, burn, than manually remove seedlings.
Wipe/ Cut Stump	Basal bark - A mixture of 1 L of Access® in 60L of diesel applied to the lower 50 cm of trucks can be used to individual trees.
Spot Spray	• Seedlings can be sprayed with 0.5 g metsulfuron + 25 mL Pulse® in spring or autumn [1 & 2]

Tamarix (*Tamarix aphylla*)

DESCRIPTION	
Location	• Broadway Arboretum in Nyibra Swamp
Appearance	Dense, spreading evergreen tree to 10m, often creating dense thickets by suckering. It has a stout trunk, fine, greyish-green linear leaves and spikes of tiny pink flowers in summer.
Habitat	Tamarix is a potentially serious weed of arid zone watercourses, causing alteration of flow and salinisation of the water and seedlings are currently being removed from the Gascoyne River mouth at Carnarvon. It has also recently been noted to be reproducing from seed in the south-west agricultural area.
Comments	A native of North Arica, it is commonly planted as a shade tree in arid areas, and requires a good supply of water. It can spread from the plantings when broken branches take root and if the trees are fertile, masses of seedlings are also produced
CONTROL	
Priority	**High**
Timing	Sep - Nov
Manual Control	Hand pull seedlings. If removing established trees using loaders, tractors, excavators etc, ensure the entire crown and tap root to at least 1m is removed
Wipe/ Cut Stump	• Inject into root crown – neat glyphosate • Cut and paint – 30% triclopyr (ie Garlon®) or Access® 17 mL/L in diesel
Spot Spray	• Basal bark - Access 17 mL/L in diesel applied to the lower 30 cm of trucks can be used to individual trees • Spray regrowth and seedlings once 1 m tall with 100 mL Garlon®

Tangier Pea (*Lathyrus tingitanus*)

DESCRIPTION	
Location	• Success Hill
Appearance	Twining annual herb or climber, up to 3 m high, 2 m in diameter. The leaves have two leaflets and tendrils. Spikes of pink or bright cerise sweet-pea like flowers, 3cm in size.
Habitat	It is a garden escape found between Perth and Albany, and is increasing rapidly on roadsides and other disturbed ground in the Darling Range near Perth, creating a fire hazard when it dies back in summer.
Comments	Native to the western Mediterranean and the Azores.
CONTROL	
Priority	**Low**
Timing	Sep - Nov
Manual Control	Manually remove individuals before flowering.
Wipe/ Cut Stump	Wicker wipe with 1:2 glyphosate to water.
Spot Spray	No specific information, suggest high rates of glyphosate + 25 mL wetting agent when actively growing[3]

Tobacco Tree (*Nicotiana glauca*)

DESCRIPTION	
Location	• Broadway Arboretum in Nyibra Swamp
Appearance	Erect, often spindly, tree-like shrub to 6 m high; the smallest branches often drooping. Branches and leaves hair-less, new growth and inflorescences sparsely hairy. Leaves are bluish-grey, ovate or elliptic, mostly to 13 cm long and to 5 cm wide. Sprays of nodding, tubular yellow flowers held on slender stalks are produced in spring and summer.
Habitat	Usually highly disturbed areas, also a common weed on old building sites.
Comments	Seed appear to remain viable for a considerable length of time.
CONTROL	
Priority	**High**
Timing	Sep - Nov
Manual Control	Remove small plants by hand.
Wipe/ Cut Stump	Cut stump and wipe with 50 – 100% glyphosate.
Spot Spray	• Spray seedlings and juveniles with 100 – 150 mL glyphosate plus wetting agent to runoff [(3)]

Trumpet Vine (*Campsis radicans*)

DESCRIPTION	
Location	• Bindaring Park North
Appearance	Spreading, scrambling or shrubby climber up to 3 m high and 5 to 8 m across. Grows from rhizomes and has orange-red flowers in summer.
Habitat	A garden escape found from Muchea to Bunbury.
Comments	Native to eastern North America.
CONTROL	
Priority	**Low**
Timing	Sep - Nov
Manual Control	Hand pull seedlings.
Wipe/ Cut Stump	Scrape and paint stem with 20% to 100% glyphosate.
Spot Spray	No specific information. Suggest high rates of glyphosate (ie 100 - 200 mL).

Vetch (*Vicia sativa*)


DESCRIPTION	
Locations	• Bindaring Park North and South • Broadway Arboretum in Nyibra Swamp • Jubilee Reserve B
Appearance	Scrambling herb climbing by means of branched tendrils. The leaves are divided like a feather into 3-10 pairs of small narrow leaflets, each 8-30 mm long. There are pink to purple pea flowers, each 1-2 cm long and either single or in few-flowered clusters. The seed pod is narrow, slightly flattened and 3-5 cm long. Flowers in spring.
Habitat	Weed of roadsides, waste land, sometimes invading bushland.
Comments	Native to western Asia, so common may not be practical to control in most instances.
CONTROL	
Priority	**Moderate**
Timing	Jun - Oct
Manual Control	Manually remove small plants in winter prior to flowering.
Wipe/ Cut Stump	Wicker wipe with 1:2 glyphosate to water.
Spot Spray	• In bushland, 10 mL Lontrel® or 1 g Logran® plus 25 mL wetting agent applied in early winter provides reasonable selective control [1 & 2]. • 0.1 g metsulfuron + 25 mL wetting agent, though is less selective than the above [1 & 2] • 50 – 75 mL glyphosate, though relatively tolerant [2 & 3]

Watercress (*Rorippa nasturtium-aquaticum*)

DESCRIPTION	
Location	• Bindaring Park North
Appearance	Perennial aquatic plant, rooting at the nodes of the hollow, angular, hair-less stems. The leaves are mostly to 10 cm long and comprised of 1 to 5 pairs of lobes. White flowers are produced in spring and early summer. The fruits are up to 2cm long, slightly curved; with seeds in two rows on each side of the septum.
Habitat	Found in disturbed wetlands, drains, seepages and creeks from Geraldton to Albany.
Comments	Introduced from Europe, probably for its astringent leaves which used in salads.
CONTROL	
Priority	**Moderate**
Timing	Sep - Nov
Manual Control	Hand pull isolated plants and small infestations.
Wipe/ Cut Stump	No specific information, suggest wicker wipe with 1:2 Roundup® to water.
Spot Spray	No specific information, suggest high rates of glyphosate (ie 100-150 mL) in early growth stages and when actively growing.

Watsonia (*Watsonia meriana*)

DESCRIPTION	
Locations	• Bindaring Park North and South • Success Hill
Appearance	Southern Africa has about 70 species of Watsonia, and so far six, all garden escapes, have been recorded as naturalised in Western Australia. All arise from corms, and form clumps of stiff, sword-shaped, upright leaves. Most spread by seeds and corms. Since they are of garden origin, it is often difficult to place them into exact species. *Watsonia meriana* typically has dull orange flowers, but it may also be white, pink, or purplish red.
Habitat	Tends to grow in sites where the soil dries out in summer, for example, around granite rocks, and in wandoo woodlands. A serious environmental weed, it is found between Perth and Albany.
Comments	
CONTROL	
Priority	**High**
Timing	Sep - Nov
Manual Control	Dig up isolated plants and burn the corms and bulbils. Thick infestations are difficult to control manually.
Wipe/ Cut Stump	Wipe individual leaves with sponge glove with 1 L of glyphosate plus 2 L of water.
Spot Spray	• 100 g 2,2-DPA + 25 mL wetting agent [1 & 2] • In degraded areas use 100 mL glyphosate + 25 mL wetting agent [1 & 2].

Western Blue Lupin (*Lupinus cosentinii*)

DESCRIPTION	
Location	• Success Hill
Appearance	Annual herb, flowers in spring and have leaves divided into a number of finger-like leaflets. Has blue flowers in ring-like arrangements around long main stalks, and 7 to 13 leaflets, up to 1.5cm wide.
Habitat	Mainly in highly disturbed areas. A widespread and serious weed of roadsides, woodlands and heath from Carnarvon to Esperance.
Comments	Competes with native plants. Nitrogen fixing legume.
CONTROL	
Priority	**Moderate**
Timing	Aug - Nov
Manual Control	Manually remove small populations before seeding.
Wipe/ Cut Stump	Wicker wipe with 1: 2 glyphosate to water.
Spot Spray	• Small areas can be treated with 20 mL Tordon®75-D in early winter leaving a soil residual which will control lupin and other broadleaf seedlings for about a year [(2)]. • In bushland, 10 mL Lontrel® **or** 1g Logran® are relatively selective [(1 & 2)]. • 0.1 g metsulfuron can also be used but is less selective [(1 & 2)]. • glyphosate is relatively ineffective [(2)]

Whiteflower Fumitory (*Fumaria capreolata*)

DESCRIPTION	
Locations	• Bindaring Park North and South • Broadway Arboretum in Nyibra Swamp • Success Hill
Appearance	*Fumaria capreolata* is the only fumitory in the State with creamy white flowers. The tips of the petals are a dark, blackish red and its leaves are bright green. As the fruits ripen, their stalks turn downwards - a character that also distinguishes this species from the pink-flowered species. It sprawls and climbs, its stems sometimes reaching 1m in length. Flowers mainly in winter and spring.
Habitat	Occurs mainly in highly disturbed areas. It is commonly associated with settlements from Mullewa to Albany and east to Lake Grace. On the Swan Coastal Plain it is common on wasteland, road verges and shrublands, and on granite rocks in the Darling Range.
Comments	Large colonies suppress native flora.
CONTROL	
Priority	**Moderate**
Timing	Sep - Nov
Manual Control	Small populations can be pulled by hand, best when the plants are large but before seeding.
Wipe/ Cut Stump	Wicker wipe with 1:2 glyphosate to water.
Spot Spray	• 0.1 g metsulfuron + wetting agent [(1)] • 50 - 75 mL glyphosate + wetting agent [(1 & 3)]

Wild Gladiolus (*Gladiolus caryophyllaceus*)

DESCRIPTION	
Locations	• Jubilee Reserve B • Success Hill
Appearance	There are about 200 species of Gladiolus in Africa and the Mediterranean and eight species, all originally introduced as garden plants, have been recorded as naturalised in Western Australia. They all die back each summer to an underground corm. *Gladiolus caryophyllaceus* is spring-flowering, and flowers have an unpleasant smell. Leaves have a distinctive red margin and, in young plants, are twisted spirally in an anti-clockwise direction.
Habitat	Common in urban bushland and Banksia woodlands on the Swan Coastal Plain, extending eastwards to Lake Grace.
Comments	Dies back each summer to an underground corm. Highly invasive although does not appear to displace native plants
CONTROL	
Priority	**High**
Timing	Aug - Nov
Manual Control	Manually remove flower heads of individuals to prevent seeding.
Wipe/ Cut Stump	Wicker wipe with 1: 2 glyphosate to water just on flowering when corm is exhausted.
Spot Spray	• 100 mL glyphosate [(1)]

Wild Melon (*Citrullus lanatus*)

DESCRIPTION	
Location	• Broadway Arboretum in Nyibra Swamp
Appearance	Summer growing annual with long, leafy, trailing stems. The prostrate, bristly stems radiate from a fleshy tap root and bear large, deeply lobed leaves up to 20cm long as well as branched tendrils. The separate male and female flowers, produced in summer and autumn are bright yellow and 3-4cm across. The mature spherical fruit is up to 15cm across, hairy, with mottled green stripes at first, but becoming yellow and hairless with age.
Habitat	Paddocks in agricultural regions, along roadsides and disturbed water courses.
Comments	Native to tropical and southern Africa, wild relative of the water melon.
CONTROL	
Priority	**Low**
Timing	Sep - Nov
Manual Control	Hand pull small infestations and isolated plants. Remove melons from site and destroy.
Wipe/ Cut Stump	No specific information.
Spot Spray	• 120 – 160 mL/ha Garlon®600

Wild Oat (*Avena barbata*)

DESCRIPTION	
Locations	• Bindaring Park North and South • Broadway Arboretum in Nyibra Swamp • Success Hill
Appearance	Tufted annual grass to 1.5m tall. The loosely branched, usually one-sided inflorescence has large drooping, spikelets. The mature seeds are usually straw-coloured. Flowers in spring.
Habitat	Common species in uncropped situations, including roadsides, wasteland and disturbed bushland, occasionally extending into crop margins.
Comments	Easy to control. Native of the Mediterranean.
CONTROL	
Priority	**High**
Timing	Jun - Aug
Manual Control	Manually remove individuals before seeding.
Wipe/ Cut Stump	Wicker wipe with 1:2 glyphosate to water.
Spot Spray	• 5 mL – 10 mL Fusilade®212 or Targa® (or 2 mL Verdict®) plus 100 mL spray oil applied in winter before flowering will provide control with little effect on broad-leaved species [1 & 2] • 100 mL of glyphosate in non-selective situations [2].

Wild Radish (*Raphanus raphanistrum* sp.)

DESCRIPTION	
Locations	• Bindaring Park North and South • Broadway Arboretum in Nyibra Swamp
Appearance	Annual herb, up to 1m tall characterised by a basal rosette of stalked leaves which are lobed or toothed. The leaves and stem usually bear bristly hairs and the petals are pale yellow, white or occasionally purple to lilac, 15-20mm long, often with dark veins. Flowers throughout the year but mainly in spring. On ripening, the fruit breaks into single-seeded sections.
Habitat	Scattered around settlement sites from Exmouth to Geraldton and a very common agricultural, horticultural and roadside weed from Geraldton southwards.
Comments	Native to Europe, economically one of the most important weeds of cropping in Western Australia. Typically does not usually invade bushland.
CONTROL	
Priority	Bindaring Park – **Low** Broadway – **High**
Timing	Jun - Sep
Manual Control	Manually remove small populations before seeding.
Wipe/ Cut Stump	Wicker wipe with 1: 2 glyphosate to water.
Spot Spray	• In bushland situations, fairly selective control can be achieved with 0.1 g Eclipse® or 0.5 g Logan® plus 100 mL of spray oil. 10 mL Brodal® is often added to this mix to provide short term residual control of seedlings [(2)]. • 100 mL glyphosate prior to flowering [(1 & 2)]

Yellow Serradella (*Ornithopus compressus*)

DESCRIPTION	
Locations	• Jubilee Reserve A and B • Pickering Park
Appearance	Sprawling grey-hairy annual herb with leaves divided into 7 to 18 pairs of narrow leaflets. Yellow Serradella has stalked headlike clusters of yellow pea flowers and narrow, but compressed, seed pods.
Habitat	Have become weeds along roadsides, particularly in wetlands.
Comments	
CONTROL	
Priority	**Low**
Timing	Jun - Jul
Manual Control	Hand pull scattered infestations before flowering.
Wipe/ Cut Stump	Wicker wipe with 1: 2 glyphosate to water.
Spot Spray	• In bushland, 10 mL Lontrel® or 1 g Logran® plus 25 mL wetting agent applied in early winter provides reasonable selective control [(2)]. • In grass dominant areas, 10 mL Tordon®75-D in early winter gives excellent control of existing plants and has residual activity to control seedlings [(2)].

Unknown Species 1

DESCRIPTION	
Location	• Bindaring Park North
Appearance	2m tall broad leaf herb. Flower type unknown.
Habitat	Moist shaded understorey, near waterways.
Comments	Aggressive spread of plants suggest this species to be a high priority to control.
CONTROL	
Priority	**High**
Timing	Jul - Nov
Manual Control	Manual remove small populations before seeding.
Wipe/ Cut Stump	Wicker wipe with 1: 2 glyphosate to water.
Spot Spray	No specific information, suggest 100mL glyphosate

Unknown Species 2

No picture available

DESCRIPTION	
Location	• Bindaring Park South
Appearance	Prostrate creeper, dark green stems, leaves usually less than 2cm in length. Inconspicuous flowers.
Habitat	-
Comments	Garden escape plant, commonly used in hanging baskets. Hardy. Broken part of plant may resprout.
CONTROL	
Priority	**Low**
Timing	Aug - Dec
Manual Control	Remove entire plant from site and destroy.
Wipe/ Cut Stump	Not recommended.
Spot Spray	Not recommended.