

*154 and 164 Gooseberry Hill Road,
Maida Vale*

Weed Assessment



Prepared for: Department of Biodiversity, Conservation and
Attraction (DBCA)
Perth Hills District
District Nature Conservation Program

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EXECUTIVE SUMMARY

This report has been prepared by Del Botanics on behalf of the Department of Biodiversity Conservation and Attractions (DBCA) to review current weed control priorities for 154 and 164 Gooseberry Hill Road, Maida Vale. The survey area is shown on **Figure 1**.

154 and 164 Gooseberry Hill Road, Maida Vale retains biodiversity values which are threatened by weed invasion. Thirty-two species of weeds have been identified in the study area.

Ten weed species which pose the biggest threat to the biodiversity of the site have been identified. This report outlines priority actions for the control of these weeds.

STATEMENT OF LIMITATIONS

This environmental report has been prepared in accordance with the scope of services set out in the original quotation. In preparing the report, Del Botanics has relied on data, surveys, analyses, designs, plans and other information provided by the Client and other individuals and organisations, most of which are referred to in the report. Del Botanics has not verified the accuracy or completeness of the data to the extent that the statements, opinions, facts, information, conclusions and/or recommendations in the report are based in whole or in part on the data, those conclusions are contingent upon the accuracy and completeness of the data. Del Botanics will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, unavailable, misrepresented or otherwise not fully disclosed.

In accordance with the scope of services, Del Botanics has have relied on publically available data and information supplied by DBCA and have conducted environmental field monitoring in the preparation of the report. The nature and extent of monitoring conducted is described in the report. Within the limitations imposed by the scope of services, the monitoring and preparation of this report have been undertaken and performed in a professional manner, in accordance with generally accepted practices and using a degree of skill and care. No other warranty, express or implied, is made.

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1. INTRODUCTION

1.1 BACKGROUND

This weed assessment covers 154 and 164 Gooseberry Hill Road, Maida Vale. The site is part of the Swan Coastal Plain – Ridge Hill Shelf and consists of the Forrestfield Complex, which can be described as Open Forests and Fringing woodlands (WALGA, 2021).

154 and 164 Gooseberry Hill Road, Maida Vale retains significant biodiversity values. This site has vegetation in predominately Very Good condition. There are areas of localised disturbances; however, for a small area it presents a valuable bushland remnant. Numerous weed species have been identified on the site, which pose a significant threat to these biodiversity values.

The site has one vegetation community recorded, with a high diversity of native flora species and valuable fauna habitat. The vegetation condition ranges from Completely Degraded to Excellent. A high number of tracks and bike jumps were observed during the assessment which have encouraged weed introduction and as a result, these areas have higher weed densities.

There are ten dominant weed species that currently present a significant impact on the site. Although there are other weeds contributing to the condition of the site, the ten dominant weeds are having the greatest impact.

1.2 PURPOSE OF THE REPORT

This report has been prepared by Del Botanics on behalf of the Department of Biodiversity, Conservation and Attractions (DBCA) to review current weed control priorities at 154 and 164 Gooseberry Hill Road, Maida Vale. The assessment was undertaken over the entire site shown on **Figure 1 & 2**. This report provides an indication of where the priority weeds exist on site, this information is shown on **Figure 3**.



Figure 1 - Site Location

1:6000 @A4
0 100 200 m



Figure 2 - Site Area

1:1500 @A4
0 20 40 m

2. EXISTING ENVIRONMENT

154 and 164 Gooseberry Hill Road, Maida Vale occurs on the Swan Coastal Plain (SCP). The SCP extends westwards from the lower edge of the Darling Scarp. The terrain is generally low lying, made up of alluvial and aeolian deposits, including the Guildford, Forrestfield and Southern River soil areas.

In general, the soils become more fertile on the east of the plain, in the zone of transition between the Swan Coastal Plain and the Darling Scarp, locally identified as the ‘foothills’. Wetlands can be found in low lying areas, and water levels are often interlinked to those of the underlying groundwater.

2.1 GEOLOGY AND SOILS

The site is part of the Forrestfield complex which is made up of the laterised foothills of the Darling Scarp and is dominated by gravelly and sandy soils. Imperfectly drained and duplex soil is common throughout this area, particularly in association with alluvial fans and drainage channels. This type of soil occurs throughout Maida Vale and the central parts of Forrestfield and Wattle Grove.

2.2 VEGETATION

The vegetation that occurs on site is part of the Forrestfield Vegetation Complex. The Forrestfield Vegetation Complex ranges from an open forest of Marri (*Corymbia calophylla*), Wandoo (*Eucalyptus wandoo*), Jarrah (*Eucalyptus marginata*) to an open forest of Marri, Jarrah, Sheoak (*Allocasuarina fraseriana*) and Banksia species. Fringing woodland of Flooded Gum also appears in the gullies that cut through this landform.

2.3 LOCAL VEGETATION COMMUNITIES

The survey area, contains one distinct vegetation community. Vegetation community mapping was undertaken on a broad scale whilst undertaking a weed assessment of the site. The vegetation predominately consisted of Jarrah (*Eucalyptus marginata*) Woodland with occasional Marri’s (*Corymbia calophylla*).

2.4 VEGETATION CONDITION

The vegetation condition was rated according to the Vegetation Condition Scale used in the Technical Guidance – *Flora and Vegetation Surveys for Environmental Impact Assessment* (2016). The definitions are described in **Table 1** below.

Table 1: Vegetation Condition Scale (Technical Guidance – *Flora and Vegetation Surveys for Environmental Impact Assessment* (2016)).

Vegetation Condition	South West and Interzone Botanical Provinces	Eremaean and Northern Botanical Provinces
Pristine	Pristine or nearly so, no obvious signs of disturbance or damage caused by human activities since European settlement.	
Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species. Damage to trees caused by fire, the presence of non-aggressive weeds and occasional vehicle tracks.	Pristine or nearly so, no obvious signs of damage caused by human activities since European settlement
Very Good	Vegetation structure altered, obvious signs of disturbance. Disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.	Some relatively slight signs of damage caused by human activities since European settlement. For example, some signs of damage to tree trunks caused by repeated fire, the presence of some relatively non-aggressive weeds, or occasional vehicle tracks
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. Disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.	More obvious signs of damage caused by human activity since European settlement, including some obvious impact on the vegetation structure such as that caused by low levels of grazing or slightly aggressive weeds
Poor		Still retains basic vegetation structure or ability to regenerate it after very obvious impacts of human activities since European settlement, such as grazing, partial clearing, frequent fires or aggressive weeds
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. Disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds at high density, partial clearing, dieback and grazing.	Severely impacted by grazing, very frequent fires, clearing or a combination of these activities. Scope for some regeneration but not to a state approaching good condition without intensive management. Usually with a number of weed species present including very aggressive species.

Completely Degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as ‘parkland cleared’ with the flora comprising weed or crop species with isolated native trees and shrubs.	Areas that are completely or almost completely without native species in the structure of their vegetation; i.e. areas that are cleared or ‘parkland cleared’ with their flora comprising weed or crop species with isolated native trees or shrubs
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In general, the vegetation condition ranged from “Excellent” to “Completely Degraded” in the study area. Vegetation condition mapping is provided on **Figure 3**.



3. SITE ASSESSMENT

The site assessment was undertaken on 31st July 2021. The assessment was undertaken after recent rainfall to best determine new weed germinates on the site.

The vegetation on site is in very good condition with a high diversity of native flora species. The majority of the weeds recorded are along tracks and around the perimeter of the site. There are a number of *Conospermum undulatum* (a Declared Rare Flora species) plants located within the site. Due to the high environmental values of the site, it not recommended to undertake burning as it is likely to increase fuel loading and fire is likely to encourage the germination of grassy weeds. It should be noted that if burning does occur it will provide an opportunity to undertake weed control after the fire. Fire may stimulate further grassy weed infestation. The multiple tracks throughout the site appear to have the biggest impact on the site in regards to weeds, as further areas are disturbed and become bare, more weed species occupy the bare areas.

Weed mapping was undertaken by traversing the site on foot and using aerial photography and GPS locations to determine the areas where weed species occur.

3.1 WEEDS

Thirty-two species of weeds were identified from 154 and 164 Gooseberry Hill Road, Maida Vale, during the site visits, with several posing a significant threat to biodiversity. There are a number of environmental weeds recorded onsite that invade the bushland including *Acacia* spp (Eastern States Wattles), **Watsonia meriana* var. *bulbillifera* (Watsonia), **Ehrharta calycina* (Veldt Grass) and **Hyparrhenia hirta* (Tambookie Grass), which appear to have the greatest impact on this site. No species recorded on site are Declared Pest Plants or Weeds of National Significance. Weed locations are shown on **Figure 4**.

3.1.1 *Weed species Recored on site*

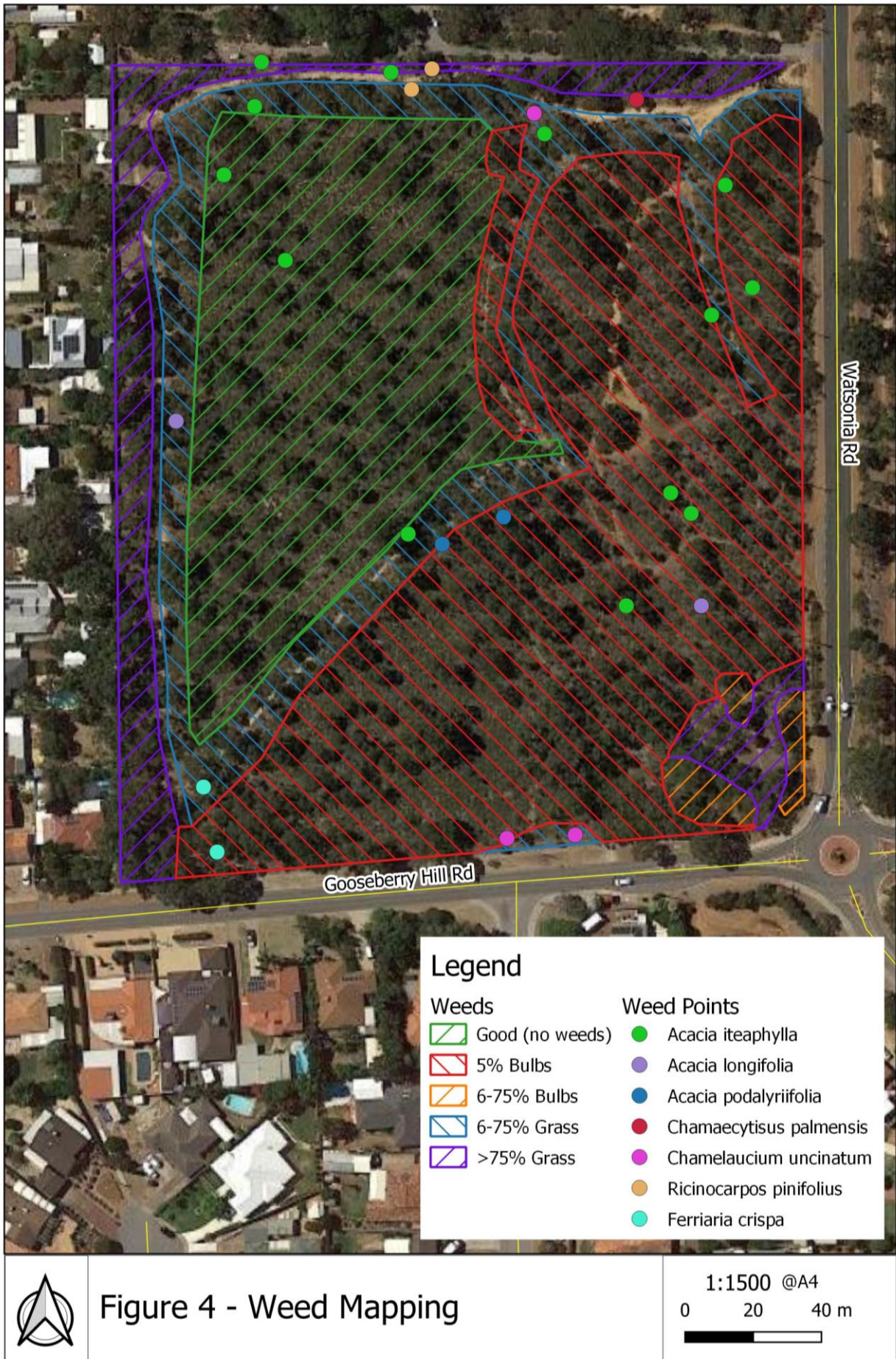
Weed species recorded on this site have been separated into four categories based on each species morphology and family. The four categories are: Grasses, Bulbs, Woody weeds and Herbs. Control and treatment methods have been based on these categories. The following weed species shown in **Table 2** below were recorded on site during the survey.

Table 2: Weed species identified within 154 and 164 Gooseberry Hill Road, Maida Vale

Grasses		
Family	Genus/Species	Common Name
Poaceae	<i>Ehrharta calycina</i>	Perennial Veldt grass
Poaceae	<i>Eragrostis curvula</i>	African Love grass
Poaceae	<i>Hyparrhenia hirta</i>	Tambookie Grass
Poaceae	<i>Ehrharta longiflora</i>	Annual Veldt Grass
Poaceae	<i>Poa annua</i>	Winter grass
Poaceae	<i>Briza maxima</i>	Briza
Bulbs		
Family	Genus/Species	Common Name
Iridaceae	<i>Hesperantha falcata</i>	Hesperantha
Oxalidaceae	<i>Oxalis pes-capre</i>	Soursob
Oxalidaceae	<i>Oxalis glabra</i>	Finger leaf oxalis
Iridaceae	<i>Romulea rosea</i>	Guildford grass
Iridaceae	<i>Gladiolus caryophyllaceus</i>	Pink Glady
Iridaceae	<i>Watsonia bulbifera</i>	Watsonia
Iridaceae	<i>Freesia sp</i>	Freesia
Iridaceae	<i>Ferriaria crispa</i>	Black flag
Woody Weeds		
Family	Genus/Species	Common Name
Polygalaceae	<i>Polygala myrtifolia</i>	Myrtle-leaved milkweed
Fabaceae	<i>Acacia iteaphylla</i> ,	Flinders Range wattle
Fabaceae	<i>Chamaecytisus palmensis</i>	Tagasaste
Myrtaceae	<i>Chamelaucium uncinatum</i>	Geraldton Wax
Euphorbiaceae	<i>Ricinocarpos pinifolius</i>	Wedding Bush
Fabaceae	<i>Acacia podalyriifolia</i>	Silver Wattle
Fabaceae	<i>Acacia longifolia</i>	Sydney Golden Wattle
Herbs		
Family	Genus/Species	Common Name
Asteraceae	<i>Dimorphotheca ecklonis</i>	Veldt Daisy
Tropaeolaceae	<i>Tropaeolum majus</i>	Nasturtium
Asteraceae	<i>Artotheca calendula</i>	Capeweed
Plantaginaceae	<i>Plantago lanceolata</i>	Plantago
Asteraceae	<i>Ursinia anthemoides</i>	Ursinia
Fabaceae	<i>Lupinus costentinii</i>	WA Blue lupin
Asteraceae	<i>Taraxacum officinale</i>	Dandelion
Fumariaceae	<i>Fumaria capreolata</i>	White Fumitory
Solanaceae	<i>Solanum americanum</i>	American Black Nighshade
Rosaceae	<i>Cotoneaster pannosus</i>	Cotoneaster

The site has been mapped based on the cover classes of less than 5%, 6-75% or 76-100%, using the Department of Biodiversity, Conservation and Attractions (DBCAs) Standard Operating Procedure (SOP) No: **22.1 *Techniques for mapping weed distribution and cover in bushland and wetlands.***

These cover classes are very broad but reflect the fact that mapping cover at a broader scale can be very subjective. The classes recommended best capture the general distribution and will provide the most useful categories on which to base management actions. Weed locations based on class covers are shown on **Figure 4.**



Of the 32 species recorded on site ten species have been determined as the most significant in terms of posing the greatest threat and having the potential to make the greatest environmental impact. The top ten weeds are listed below in **Table 3** below.

Table 3: Priority weeds for control at 154 and 164 Gooseberry Hill Road, Maida Vale

Priority ranking	Species	Common Name
1	* <i>Ehrharta calycina</i>	Veldt Grass and
2	* <i>Eragrostis curvula</i>	Love Grass
3	* <i>Hyparrhenia hirta</i>	Tambookie Grass
4	* <i>Watsonia meriana</i> var. <i>bulbillifera</i>	Watsonia
5	* <i>Gladiolus caryophyllaceus</i>	Wild gladiolus
6	* <i>Freesia alba</i> x <i>leichtlinii</i>	Freesia
7	* <i>Ferriaria crista</i>	Black flag
8	* <i>Oxalis pes-caprae</i>	Soursob
9	* <i>Acacia iteaphylla</i>	Flinders Range wattle
10	* <i>Acacia podalyriifolia</i>	Silver wattle

4. PRIORITIES FOR MANAGEMENT

Environmental weed management techniques include prevention, eradication, manual, chemical and biological controls and containment. An adaptive management strategy is most effective for overall site management and restoration of the natural environment. Priorities for weed management are determined by factors such as; impacts on native species particularly threatened or priority flora, fauna or ecological communities; legislative requirements; size of infestations; invasiveness; resources; public safety, and; aesthetics at popular visitor sites.

4.1 FIRE MANAGEMENT

Fire regimes in many parts of Western Australia have altered since European settlement, particularly in areas of high population density. The presence of environmental weeds may then contribute to a fire-weed cycle that is the primary cause of bushland degradation in some areas (Wycherley, 1984).

The causes of the cycle are many and diverse, but some of the key points are:

- Weed species are often advantaged by the burst of nutrients available immediately after a fire.
- Weed species, particularly grass weed species, accumulate biomass rapidly and therefore increase fuel loads and encourage fires more frequently.

- Grass fuels have a different structure to shrub fuels. The grasses have a fine, evenly spread structure, compared with the more heterogenous, discreet structure of native understorey shrubs. This affects fire behaviour and rate of spread, particularly in the initial stages of a fire.
- Weed seeders are usually annuals whilst native seeder species require time between fires to not only to set seed but also to replenish their seed stocks, which may take several years. Frequent fires may deplete native seed stocks and encourage weed seed stocks, which can eliminate the native species from the environment.
- Resprouters can also succumb if the fire interval is so frequent that the root stock resources become depleted.

Weeds can rapidly colonise the open spaces and use the available nutrients released by fire, outcompeting natives. A fire event provides opportunities for weed control through the reduction in weed biomass and the allows the development of a timeline for appropriate weed control measures to treat germinating plants.

5. FUTURE MANAGEMENT AND MONITORING

Future management should apply the following principles to the priority species listed in **Table 2**, as far as is practicable.

- Undertake weed control in the highest conservation value and best condition bushland as a priority.
- Take advantage of opportunities such as fire. Where burns are planned, undertake control of priority weed species before and after a burn, when and where possible.
- Control the most invasive species first.
- Undertake coordinated weed control efforts.
- Control outlying or isolated populations of weeds as a priority.
- Schedule weed control works 3 months in advance where possible. Refer to the management calendar included in this report as **Table 4**.

Table 4: Management calendar showing the optimum time for treatment of each priority species.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Species												
<i>Ehrharta calycina</i> (Veldt Grass)						Y	Y	Y	O	O	O	O
<i>Eragrostis curvula</i> (Love Grass)							Y	Y	Y	Y	Y	Y
<i>Hyparrhenia hirta</i> (Tambookie grass)	Y	Y	Y	O	O	O	O	O	O	O	Y	Y
<i>Watsonia meriana</i> <i>var. bulbifera</i> (Watsonia)									Y			
<i>Gladiolus caryophyllaceus</i> (Wild Gladiolus)							Y	Y	Y			
<i>Freesia alba x leichtlinii</i> (Freesia)						O	Y	Y				
<i>Ferriaria crista</i> (Black flag)								Y	Y			
<i>Oxalis pes-caprae</i> (Oxalis)						Y	Y					
* <i>Acacia iteaphylla</i> (Flinders Range wattle)			Y	Y	Y	Y	Y					
* <i>Acacia podalyriifolia</i> (Silver wattle)	Y	Y	Y	Y	Y	Y	Y	Y	Y			

Legend: Y = Yes, regularly, O = Occasionally.

5.1 MONITORING

Simple and time effective monitoring methods can be used to evaluate management efforts and monitor vegetation condition. The following methods are suggested;

- Set up photo monitoring points to regularly monitor areas of interest such as weed control areas and bushland areas in good or better condition. Photo points should be recorded each season if possible or annually in Spring.
- Update mapping after monitoring to provide an updated area of weed infestations for following years of weed control.

6. ACTION PLAN

When undertaking weed control programmes, the primary guiding principle is to work from areas in the best condition to those in the worst condition, and all works should be undertaken in conjunction with a restoration strategy (Bradley, 1971; Bradley, 1988; Buchanan, 1989).

The vegetation condition map can provide an overall direction for priority weed control actions. Weeds occurring in very good - excellent condition should be treated first and continue works in order of vegetation condition.

Using vegetation condition as a criteria for determining weed control priorities ensures that:

- Very good - excellent condition bushland is maintained;
- Degraded - good condition bushland is enhanced, moved closer to being in very good - excellent condition, and prevented from deteriorating to completely degraded condition bushland;

When working in very good - excellent and degraded - good condition bushland, the Bradley method of weed control is recommended. Essentially, this method involves assisted natural regeneration of native plants from seed banks, rather than the use of replanting programmes.

The top ten weed species listed below in **Table 5** have been assigned a priority to determine which species poses the greatest threat to this site. This should be used in conjunction with the vegetation condition mapping to control the most invasive species in the best condition vegetation. The following Action Plan outlines priority weed control tasks.

Table 5: Action Plan

Species	Priority	Prescription
<i>Ehrharta calycina</i> (Annual Veldt grass)	1	For small infestations, cut out plants ensuring crown removal. Do not slash. Alternatively spray with Fusilade® Forte 13 ml/L or 6.5 L/ha + wetting agent on actively growing and unstressed plants. For generic fluazifop-p (212g/L active ingredient) 8ml/L or 4L/ha +wetting agent. Follow-up in subsequent years. Use unplanned fires to spray regrowth and seedlings within 4-6 weeks of germination.
<i>Eragrostis curvula</i> (Love Grass)	1	Herbicides can be used as part of integrated management, but foliar application should only be conducted when the plant is green and actively growing. Residual herbicides are best applied from July to

		December, as this will prevent seed set in the following summer. Applying herbicides or heavily grazing the fresh regrowth after a cool fire can help to reduce the large tussocks.
<i>Hyparrhenia hirta</i> (Tambookie grass)	1	Extremely difficult to control once established and requires a sustained control program integrating different methods. Cut out small populations, ensuring tiller bud removal. Spot spray larger infestations with 3% glyphosate + 2 ml/L spraytech oil when actively growing (between November and March). Alternatively, slash in spring and spot spray regrowth when 15cm high with glyphosate + spraytech oil. A number of treatments may be required within the one year. Fire events provide the optimum time to undertake control as fire removes biomass, exhausts the soil seed bank and can provide a flush of new growth that allows efficient uptake of herbicides.
<i>Watsonia meriana</i> var. <i>bulbillifera</i> (Watsonia)	2	Wipe individual leaves with glyphosate 10% or spray dense infestations with 2,2-DPA 10 g/L + Pulse®. Apply just as flower spikes emerge at corm exhaustion. 2,2-DPA at 5 g/L+ Pulse® is also quite effective and is appropriate to use when particularly concerned about off-target damage, for example following fire when Watsonia is growing among germinating native seedlings and resprouting native shrubs
<i>Gladiolus caryophyllaceus</i> (Wild Gladiolus)	2	Wipe individual leaves with glyphosate 10 % or spray dense infestations in degraded areas with 1% glyphosate just on flowering at corm exhaustion.
<i>Freesia alba x leichtlinii</i> (Freesia)	3	Spot spray metsulfuron methyl 0.2 g/15 L + Pulse® or 2.5-5 g/ha + Pulse®. Apply just on flowering at corm exhaustion
<i>Ferriaria crista</i> (Black flag)	1	Hand remove very small populations in degraded sites. Sift soil to find all corms. Spray 2,2 DPA 10 g/L + Pulse® when flowering. In degraded sites try glyphosate 1% + metsulfuron methyl 0.2 g/15 L + Pulse®. Takes a number of years to control populations.
<i>Oxalis pes-caprae</i> (Soursob)	3	Spot spray metsulfuron methyl 0.2 g/15 L + Pulse®, or 1% glyphosate. Apply at bulb exhaustion, generally just on flowering. Exercise care if manually removing as physical removal can result in spread of bulbils
* <i>Acacia iteaphylla</i> (Flinders Range wattle)	2	Hand pull seedlings. Fell mature plants. Monitor site for recruitment from seedbank.

* <i>Acacia podalyriifolia</i> (Silver wattle)	2	Hand pull seedlings. Fell mature plants. Monitor site for recruitment from seedbank.
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5. CONCLUSIONS AND RECOMMENDATIONS

Thirty-two introduced weed species were recorded at 154 and 164 Gooseberry Hill Road, Maida Vale. Undertaking priority weed control actions and controlling the most invasive species in the best condition vegetation areas is vital. Fire plays a significant role in the movement of weed species into bushland. Fire can cause massive weed seedling recruitment, creating conditions that allow seedlings to establish early and displace regenerating native species. It is extremely important to make the most of weed control after a fire to control new recruitments of weed germination. The following additional recommendations are made;

- Reduce tracks throughout the area to reduce fragmentation and the spread of weeds;
- Update weed mapping regularly as per recommendations in the report; and
- Undertake weed control priorities in accordance with the Action Plan.

7. REFERENCES

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Environmental Weed Strategy for Western Australia(1999)DPAW

PHOTOGRAPHIC PLATES



Plate 1: >75% Grass Weeds.



Plate 2: 6-75% Bulb infestation



Plate 4: Jarrah Woodland in Very Good



Plate 5: Jarrah Woodland in Good condition with <5% Bulbs