

SHIRE OF ESPERANCE

ENVIRONMENTAL WEEDS STRATEGY

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1.0 EXECUTIVE SUMMARY

There will be four main components to the implementation of the Shire of Esperance Environmental Weeds Strategy. These are:

1. Priority Environmental Weeds and Specific Weed Programs
2. Priority Bushland Reserves and Road Reserves and their Management
3. Supporting Active Community Groups to Remove Weeds
4. Improved Procedures and Guidelines for Weed Control on Council Land

2.0 INTRODUCTION

This strategy has been developed for the Shire of Esperance as a framework to assist in the control and management of environmental weeds across the municipality. The Shire of Esperance Environmental Weeds Strategy prioritizes a number of weed species and shire managed roadside and bushland reserves due to the large amount of land the Shire of Esperance is responsible for and the limitations on resources to effectively control weeds across this area.

Vision of Strategy

To control environmental weeds in high priority Shire of Esperance reserves and support community groups actively involved in weed control in Shire of Esperance reserves.

2.1 Objectives of Strategy

1. To improve the condition of remnant bushland in priority Shire of Esperance reserves through the control of environmental weeds and other prevention related activities;
2. To encourage and assist with organisations, groups and individuals actively involved in the removal of weeds on Shire of Esperance managed land;
3. To control Declared Weeds and Pest Plants on land vested with the Shire of Esperance;
4. To provide information to the general community on the control of environmental weeds within the Shire of Esperance;
5. To eradicate populations of new environmental "alert weeds" that may occur on Shire of Esperance vested lands;
6. To minimise the impact of road works and maintenance on the spread of weeds;
7. To ensure that the Shire of Esperance is aware of or works collaboratively with National, State, Regional and Local initiatives addressing environmental weed management

3.0 BACKGROUND

3.1 Locality and Climate

Shire of Esperance is located 725kms south east of Perth in Western Australia. The shire covers an area of 42,450km² and extends from the township of Munglilup, 110kms west of Esperance to Israelite Bay in the Great Australian Bight, 200kms east of Esperance and just north of the Salmon Gums township over 150kms to the north.

The estimated population of the Shire of Esperance is 14,500 with the majority residing within the main township of Esperance. The predominant industries in the Shire of Esperance are broadacre agriculture (grain growing, sheep and cattle) and tourism. The smaller industries of exporting and importing various commodities (Esperance port), service industry, forestry and fishing also occur in the region.

The Shire of Esperance manages over 380 reserves with an unknown number of bushland reserves as part of this. The Shire also manages and maintains over 4498kms of sealed and unsealed roads and roadside reserves.

Esperance has a Mediterranean climate with mid to hot, dry summers and cool wet winters. The average annual rainfall is 619 mm with over 68% of the rainfall falling between May and October with the wettest month being July. The average maximum summer temperature is 26°C and the average maximum winter temperature is 18°C (BOM, 2008).

3.2 Development of Shire Weed Strategy

The Shire of Esperance Environmental Weeds Strategy is a project funded by the Federal Government's Natural Heritage Trust (NHT) through the regional group South Coast Natural Resource Management (NRM). The impetus for the project came out of the Invasive Species Programme of South Coast NRM, who saw a need for strategic direction in weed management within the Shire of Esperance to assist the local Esperance Weeds Action Group (EWAG) and the local government to work cooperatively

This strategy has been modelled on the City of Albany Weed Strategy (City of Albany, 2005). Extensive input has also been provided from government agency staff (DAFWA, DEC), Shire of Esperance staff, South Coast NRM staff and community groups and individuals.

3.3 Relationship to Other Strategies

There are various local, regional, state and national strategies that relate to weed management in some way and their relationship to this strategy is outlined in Table X.

Table X: Relationship of Environmental Weed Strategy to other Strategies

Strategy/Plan	Relationship
LOCAL STRATEGIES & PLANS	
Shire of Esperance Local Planning Strategy (2008)	This document does not specifically discuss weeds as an issue within the shire but the strategy outlines the shire's intentions to protect biodiversity values. This document supports the Shire of Esperance Local Planning Scheme No. 23
Shire of Esperance Strategic Plan	<p>The Environment section of the Shire of Esperance Strategic Plan states that the shire will:</p> <p>53. Endeavour to maintain and protection natural vegetation on road verges and disused gravel pits</p> <p>c) Investigate opportunities to develop partnerships with AGWA, APB and farmer's groups for the management of road verges with particular emphasis on rabbits and other feral animals, weeds and salinity.</p> <p>d) Map the spread of weeds and dieback on road verges and develop a plan for the management of these issues</p>
Esperance Coastal Management Plan (2002)	<p>The main coastal weeds listed under this plan were African Boxthorn, Marram Grass, Pyp Grass, Sea Spurge, <i>Cotyledon orbiculare</i>, Victorian Tea Tree, Rose Pelagonium, Bridal Creeper, Caltrop, Dune Daisy, Fleabane and Brassicas (radish, turnip, mustard).</p> <p>The relevant recommendations under Section 5.28 Weeds are:</p> <ul style="list-style-type: none"> • Educate and train staff and community groups in weed identification and eradication methods • Support the development of specific programs for the identification and eradication of particular weeds on coastal reserves • Undertake an education program to encourage Esperance residents to properly dispose of their

	<p>garden waste in provided bins or at the Wylie Bay tip site</p> <ul style="list-style-type: none"> • Encourage the use of indigenous coastal plants in landscaping on the coast to reduce the potential for weed escapees • Continue the caltrop eradication program within the Esperance township • Continue the Pyp Grass eradication trial program at Chapmans Point <p>The Esperance Coastal Management Plan also guides the management of various coastal camping reserves mapped for weeds as part of this plan, including Munghlinup Beach and West Beach to Twilight Beach.</p>
<p>Survey of Roadside Conservation Value in the Shire of Esperance (2006)</p>	<p>This report covered the surveying (from 1999 to 2002) of the weed infestation level and other attributes of vegetation conservation values for all 3717kms of Shire of Esperance roadside bushland reserves (both sides of every road in the shire). This data was also mapped into a GIS system and is held by DEC and the Shire of Esperance.</p> <p>The six weeds surveyed along roadside reserves were African Lovegrass, Veldt Grass, Victorian Tea Tree, Wild Radish, Bridal Creeper and African Boxthorn.</p> <p>The level of weed infestation was recorded as light (<than 20% weeds), medium (20 to 80% weeds) or heavy weed infestations (> than 80% weeds). The results were found to be 7.1% high, 24.8% medium and 65.6% of light infestations (plus 2.5% of no data for some reserves).</p> <p>The occurrence of specific weeds along roadsides in the shire was found to be:</p> <p>Victorian Tea Tree – 751kms Boxthorn – 91kms Bridal Creeper – 420kms Wild Radish – 508kms African Lovegrass – 4990kms Veldt Grass – 1605kms Other Weeds – 2821kms</p>
<p>Discovering Monjingup Report (1994)</p>	<p>The Discovering Monjingup Report is a reserve management plan for the Lake Monjingup Nature Reserve and many of the recommendations for weed control have been implemented and the weed burden on the reserve has been reduce, although not entirely eradicated. The management committee</p>

	of the reserve have recently received funding to update and reevaluate the direction of management of the reserve and its functions.
REGIONAL STRATEGIES	
Southern Prospects Regional Strategy 2004 – 2009	<p>This regional strategy guides the South Coast NRM (previously SCRIPT) on strategic areas to focus on and targets to achieve in expenditure of government environmental funding across the South Coast region.</p> <p>RBT Reduction in extent and occurrence of ecologically invasive species by 2025, with quantifiable target set by 2006.</p>
Southern Shores 2001 – 2021 (2001)	<p>This document covers issues relating to coastal and marine planning and management across the south coast region (South Coast NRM area) and is being reviewed in 2008. The recommendations specific to weed management for local government's (section 9.4) in the 2001 report are to:</p> <ul style="list-style-type: none"> • Undertake weed surveys and mapping of all coastal land and islands • Address the impacts of weeds on indigenous flora and fauna during all surveys • Determine the impacts of removal of weeds on indigenous flora and fauna during all surveys • Develop weed management strategies for all coastal land and islands • Seek funding for the implementation of weed management strategies when fully developed • Raise community awareness about weed introduction caused by disposal of garden refuse in coastal reserves, particularly those reserves directly adjacent to residential areas or which may have significant conservation value • Education and train staff and community in weed identification and eradication methods • Make information available to land developers concerning weeds of concern in an area and information on how to eradicate or prevent their spread • Encourage the use of indigenous coastal plants in landscaping on the coast to reduce the potential for weed escapees • Support the activities of Weed Action Groups and other community groups involved in weed control or eradication activities • Recommend necessary modification to weed management practices in light of research findings
STATEWIDE	

STRATEGIES	
Weed Plan for Western Australia - State Weed Plan (2001)	
Environmental Weed Strategy for Western Australia (1999)	
NATIONAL STRATEGIES	
Australian Weeds Strategy (2007)	<p>This document supersedes the National Weed Strategy (2001). Implementation of the Australian Weeds Strategy involves achieving the following goals</p> <ul style="list-style-type: none"> • National Weed Awareness Action Plan (to raise awareness of the pathways for weed spread) • National Weed Spread Prevention Action Plan (to prevent the spread of weeds) • Priority Weeds and Weeds of National Significance <p>There are currently twenty (20) Weeds of National Significance (WoNS) and eleven (11) of these occur in Western Australia. Of these WONS only Bridal Creeper (<i>Asparagus asparagoides</i>) is well established in the Shire of Esperance. that includes weeds that are already established and causing significant agricultural and environmental damage.</p> <p>The criteria used to determine the list was:</p> <ul style="list-style-type: none"> ○ the invasiveness of a weed species ○ a weed's impacts ○ the potential for spread of a weed ○ socio-economic and environmental values.



3.4 Definitions of Weeds

A weed is an exotic or native plant species that colonises and persists in an ecosystem in which it did not previously exist and has an impact or potential to have impacts on the economy, the environment, human health and amenity.

Weeds are among the most costly environmental threats in Australia and it is estimated the agricultural impact of weeds on the Australian economy is in the order of \$4 billion per annum (NRM Ministerial Council, 2006).

Environmental Weeds

Alert Weeds

An alert weed is a plant species that is in the early stages of establishment and has the potential to become a significant threat to biodiversity and a weed if they are not managed. In 2000, a list of 28 non-native weeds that have established naturalised populations in the wild have been placed on the National Environmental Alert List (Appendix X). The Alert List is based on the weed posing a high or serious potential threat to the environment, having limited distribution within Australia at present and being amenable to successful eradication or containment programmes.

There are no known weeds on the Alert List that occur within the Shire of Esperance, but the following species (Table X) have the potential to become established in the shire.

Table X: Potential Alert List Species That Could Establish in Shire of Esperance

Name	Notes
Horsetails <i>Equisetum spp.</i>	Is toxic to livestock and can reduce yields of canola and cereal crops
Kochia <i>Bassia scoparia</i>	Introduced in WA in 1990 as a forage and revegetation plant. It was widespread in SW of W.A. including Esperance plains and Mallee sub-regions. It was eradicated and there have been no new plants found since 2000.
Karoo Thorn <i>Acacia karroo</i>	South African wattle that has the potential to invade bushland in SW of W.A.
False Yellowhead <i>Dittrichia viscosa</i>	Established in Albany, Mt Barker, Denmark, Walpole and Mount Meanypeaks
Holly Leaved Senecio <i>Senecio glastifolius</i>	Found in Albany, especially at Mt Clarence and Mt Melville

Sleeper Weeds

Sleeper weeds are plants that appear benign for many years, but which may suddenly spread rapidly following certain natural events such as flood, fire, drought, climate change, or change in land or water management. Sleeper weeds are not always recognised as a significant problem, as they are generally only present in small areas but pose a potentially significant threat to industry (eg. agriculture), people or the environment. In 2003 a list of 17 potential sleeper weeds was released (Appendix X).

None of the weeds are presently known to occur in either the Shire of Esperance or Western Australia

3.5 Legislation Relevant to Shire Weeds Strategy

There is a number of pieces of legislation relevant to the Shire of Esperance Environmental Weed Strategy (Table X), but the one that has the most relevance is the soon to be implemented Biodiversity Agricultural Management (BAM) Act 2007.

Table X: Legislation Related to Weed Management

Jurisdiction	Relevant Legislation
National	Environment Protection and Biodiversity Conservation Act 1999 Quarantine Act 1908
Western Australian	* Agriculture and Related Resources Protection Act 1976 * Plant Diseases Act 1989 Local Government Act 1995
Local	Any local laws made regarding Pest Plants

* both to be replaced by Biodiversity Agricultural Management Act 2007

Declared Plants

Some weeds are of particular concern and, as a result, have been listed for priority management or “declared” and their management enforced with legislation.

A declared plant in Western Australia is any plant listed under the Agriculture and Related Resources Protection Act 1976. These weeds are “declared” because of their potential to impact negatively on the environment and agriculture. Declared Plants are often noted by the abbreviation – DP.

The Agriculture and Related Resources Protection Act 1976 has been reviewed and will soon be replaced by the Biosecurity and Agricultural Management Act 2007 (BAM Act). The BAM Act will strengthen the powers of government authorities to control declared plants and other aspects of biosecurity.

The BAM Act 2007 was passed by the Western Australian Parliament in October 2007. The regulations relating to the Act are being developed and are expected to be complete by about July 2009 and gazetted following a community consultation process (T.Richmond, pers. comm., 2008).

When this occurs the *Agriculture and Related Resource Protection Act 1976* and the *Agriculture Protection Board Act 1950* plus 15 other Acts will be repealed. The Agriculture Protection Board (APB) will officially be replaced by a 15 person Biosecurity Council and will be advised by regional Biosecurity Groups, which are yet to be formed.

The Declared Plants List is a list of select weeds and the level to which they are to be controlled (ie control category) within each shire in Western Australia (Table X for current

control categories and Table X for future control categories). The Declared Plant list is available for download from the DAFWA website at <http://www.agric.wa.gov.au>.

Landholders, including government bodies, are obliged to control declared plants on their land at their own expense. For example the Shire of Esperance is required to remove any declared plants on shire-managed land as soon as possible including pathways, recreational, roadside and bushland reserves. The Department of Agriculture and Food Western Australia (DAFWA) enforces this and can issue notices for the removal of the declared plants and take action if the removal is not carried out.

Table X: Control Categories for Declared Plants under the Agriculture and Related Resource Protection Act 1976

Control Category	Definition
P1	PREVENTION - Prohibits movement of plants or their seeds within the State. This prohibits the movement of contaminated machinery and produce including livestock and fodder.
P2	ERADICATION - 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 - Control infestation in such a way that prevents the spread of seed or plant parts within and from the property on or in livestock, fodder, grain, vehicles and/or machinery. Treat to destroy and prevent seed set all plants.
P4	CONTAINMENT - 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.
P5	SPECIAL ACTION ON PUBLIC LAND - Infestations on public lands must be controlled.

Table X: Control Categories for Declared Plants under the Biosecurity Agricultural Management Act 2007

Control Category	Definition
1	EXCLUSION – covers declared pest which are not yet present in an area and therefore need to be prevented from entering that area.
2	ERADICATION – covers declared pests which are present in an area where eradicating them appears feasible.
3	MANAGEMENT – covers declared pests which are present in an area where eradication is not feasible, but where control is necessary. Control could mean reducing the numbers, distribution or minimising the spread of declared pests and the harm they do.

There is currently known to be seven (7) declared weeds in the Shire of Esperance (Table X), of which three (3) are definitely known to occur on shire-vested land. There is likely to be other declared weeds that could occur in the shire in the future that are not currently in the table.

Table X: Declared Plants Known to Occur in the Shire of Esperance in last 10 years

Declared Plant	Control Category	Known to Occur on Shire of Esperance Land
Cotton Bush <i>Gomphocarpus fruticosus</i>	P1, P4	Yes
Paterson's Curse <i>Echium plantagineum</i>	P1	Yes
Cape Tulip <i>Moraea flaccida</i> & <i>M. miniata</i>	P4	?
Doublegee <i>Emex australis</i> & <i>E. spinosa</i>	P5	?
Stemless Thistle <i>Onopordum acaulon</i>	P1, P4	Yes
Saffron Thistle <i>Carthamus lanatus</i>	P4	?
Skeleton Weed <i>Chondrilla juncea</i>	P1, P2	No

Pest Plants

A Pest Plant is a weed listed by a local government under a local law, in accordance with the Local Government Act 1995 and with powers under Section 109 of the Agriculture and Related Resources Protection Act 1976. The ability of local governments to make local laws for pest plants will also be covered under Section 193 of the new BAM Act 2007.

Pest Plants can be prescribed by a local government authority as any weed in that district, other than a declared weed, that in its opinion, is likely to adversely affect the environment of the district, the value of property in the district or the health, comfort or convenience of the inhabitants of the district.

The Shire of Esperance previously had a Local Law 26 that listed African Boxthorn (*Lycium ferocissimum*), Umbrella Sedge (*Cyperus eragrostis*), Doublegee (*Emex australis*) and Turnip Weed (*Rapistrum rugosum*) as pest plants but it was repealed. The only relevant plants that could be considered a genuine pest plants on this list would be African Boxthorn and Doublegee. The other two plants are not considered "serious" environmental weeds in the Shire of Esperance that could be adequately controlled.

4.0 PRINCIPLES OF BEST PRACTICE WEED MANAGEMENT

The Shire of Esperance and any associated volunteers groups need to aim to adopt the below principles wherever possible when planning and implementing weed control work.

4.1 Bradley Method of Bush Regeneration

The Bradley Method of Bush Regeneration (Bradley, 1997) works on three general principles, which are:

- Work outwards from good bush areas towards areas of weeds;
- Make minimal disturbance to the environment; and
- Let native plant regeneration dictate rate of weed removal.

Other important points highlighted include:

- Don't start on large weed infestations unless you are sure you will get back to do the follow-up work (removing parent plants may create light and space for hundreds of new weeds);
- Many plants require 3 years or more of control; and
- Aim for control, not eradication and tipping the balance in favour of the local native plants.

4.2 Prevention

The principle of "Prevention" is to prevent the establishment of a new weed species in areas that are free of that particular weed. This can be done by:

- Ensuring early detection of the new weed;
- Ensuring early removal of the new weed, as it is more cost effective and manageable than allowing the weed to establish over a larger area;
- Ensuring hygiene procedures (e.g. clean down vehicles, tools, shoes) are carried out between jobs to reduce the risk of weed spread between sites;
- Check materials for weed seeds before they are bought onto site e.g. paving materials, timber;
- Avoid bringing soil, gravel or mulch from elsewhere onto a site;
- In the season immediately following a fire, control weeds to prevent and reduce the germination of new weed seedlings;

4.3 Limit the Spread

The principle of "Limit the Spread" is to minimise the spread of existing weeds to other areas. This can be done by:

- Leaving the weed material on site (where possible) to minimise spread of seed;
- Removing weed material so as to minimise spread of seed and dispose of at appropriate site;
- Mulching or shredding weed material on site to reduce the viability of the weed seeds;
- Ensuring hygiene procedures (e.g. clean down vehicles, tools, shoes) are carried out to ensure machinery is weed free;

- Keep soil disturbance to a minimum to minimise conditions for the germination of wind dispersed weed seeds;
- Avoid working in areas where weeds are actively shedding seed;
- Control weeds in the season immediately following a fire to prevent seed set in established weeds and reduce germinating weed seedlings;
- In the season immediately following a fire, control weeds to limit the seed set in established weeds;
- Excluding dispersal agents from spreading the weed (eg. vehicles, people, animals) by erecting barriers, fencing and signage

4.4 Assist Natural Regeneration and Revegetation

Natural regeneration of native bushland can be assisted through carefully targeted weed removal and management practices that favour the regeneration of native plant species so that they can compete against the weeds. Native plants can also be encouraged to germinate through use of smoke products eg. smoked water.

Revegetation programs, particularly direct seeding, can assist in bolstering the effectiveness of weed management programs by replacing removed weeds with local native plant species. Only local provenance plants and seed should be used in revegetation projects to minimise the introduction of weed species into the area.

4.5 Understand the Weed When Considering Control Options

Understanding the biology of the weed species and focusing on how the weed reproduces and spreads can help in devising a successful weed control program. The questions that need to be asked before commencing a control program are:

- When is it actively growing?
- When is it flowering and seeding?
- How long do seed or other propagules remain viable in the soil?
- How does it respond to fire?
- What are the vulnerable times in the life cycle?
- Is there a preferred time for chemical control? (Brown and Brooks, 2002)

There are numerous weed management techniques available including physical, mechanical, chemical and biological (see Table X), but the best method to select is one or a combination of methods that best achieves the weed from spreading and reproducing with the given the funds and labour available.

4.6 Recording and Monitoring

It is a good idea to keep a record of works programs over time and associated costs. It should include a record date, time and type of works carried out including details of methods used, hours worked and site conditions (Brown and Brooks, 2002).

Monitoring of weed populations that have been controlled can assist in determining the effectiveness of the management programs, the impact on surrounding bushland and the

regeneration of the native vegetation over time. The results of the monitoring can be used to adapt future weed management programs and practices.

Table X: General Methods of Control of Environmental Weeds

Control Technique	Description	Suitable for...	Benefits	Problems
Physical				
Hand Pulling	Pulling seedlings by hand	<ul style="list-style-type: none"> Seedlings 	<ul style="list-style-type: none"> Effective at removing small weed populations Can be used selectively to remove weeds from vegetation with minimal disturbance Ideal for sensitive area of areas where vegetation would be disturbed by other methods 	<ul style="list-style-type: none"> Labour intensive Ineffective for large areas of weeds and rapidly colonizing weeds
Digging	Using hand tools to remove root matter e.g. shovel, pick axe	<ul style="list-style-type: none"> Tubers, corms, bulbs eg. Cape Tulip 	<ul style="list-style-type: none"> Removing root matter that may not otherwise be Lower cost than other methods 	<ul style="list-style-type: none"> Labour intensive Disturbing soil can lead to further weed invasion
Ring barking	Cutting away a strip of bark around the trunk e.g. 10cm strip	<ul style="list-style-type: none"> Trees that do not reshoot and have one main trunk 		<ul style="list-style-type: none"> Labour intensive
Flower & Seed Removal	Removing flower heads after flowering (dead heading) & removing seed	<ul style="list-style-type: none"> Any weeds that reproduce by seed eg. Spiny Rush, Cumbungi, Bullrushes 	<ul style="list-style-type: none"> Limits 	<ul style="list-style-type: none">
Mechanical				
Mowing, Slashing &		<ul style="list-style-type: none"> Open areas with minimal native 	<ul style="list-style-type: none"> Time efficient Can cover large areas 	<ul style="list-style-type: none"> Can inadvertently damage surrounding native

Brushcutting		<p>vegetation</p> <ul style="list-style-type: none"> • Areas dominated by grass weeds, bulbs or corms 	<ul style="list-style-type: none"> • Low labour requirement • Minimises fire hazard from weeds • Can minimise seed set and plant growth if repeated several times during the growing season • Can be used in conjunction with other techniques for effective control eg. chemical control 	<p>vegetation</p> <ul style="list-style-type: none"> • Not very selective • Not suitable for sensitive areas or those with dense remnant native bushland
Cultivation & Scalping		<ul style="list-style-type: none"> • Large clear areas being prepared for seedlings or direct seeding 		
Mulching & Shredding	Mulching weeds on site e.g. specialised cutting head on an excavator	<ul style="list-style-type: none"> • Large dense stands of woody weeds e.g. Victorian Tea Tree 	<ul style="list-style-type: none"> • Time efficient • Mulching on site suppresses weed germination 	<ul style="list-style-type: none"> • Costly • Difficult to engage contractors for small areas • Potential fire hazard
Chemical				
Spraying	Treating the leaves of the weed with herbicide	<ul style="list-style-type: none"> • Large dense populations or resprouting weeds • Broadleaf, Annual, Sedges, 	<ul style="list-style-type: none"> • Not suitable for large trees or succulents 	

		creepers, shrubs and grass weeds		
Wiping	Applying chemical using a handheld wand or sponge or wiper attached to a machine	<ul style="list-style-type: none"> For weed populations in sensitive areas eg. Bullrushes 	<ul style="list-style-type: none"> Targets weeds with minimal impact on native vegetation 	<ul style="list-style-type: none"> Very labour intensive
Basal Bark				
Stem Injection	Injecting herbicide directly into stems of trees	<ul style="list-style-type: none"> Species that root sucker 	<ul style="list-style-type: none"> Increases successful weed kill as chemical is delivered directly to the weed core 	<ul style="list-style-type: none"> Very labour intensive
Cut Stump	Weeds can be felled then immediately painted with a systemic herbicide	<ul style="list-style-type: none"> Shrubs, trees and creepers 		<ul style="list-style-type: none"> Falling limbs and trees can cause damage to surrounding vegetation
Scrape and Paint				
Drill and Fill				
Frilling				
Slash and Spray				
Biological				
Leafhoppers		Targets Bridal Creeper		
Leaf Rust Fungus		Targets Bridal Creeper		
Flea		Targets Paterson's		

		Curse		
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5.0 COMMUNITY CONSULTATION AND PRIORISATION PROCESS

The community consultation for the Shire of Esperance Environmental Weed Strategy was focused around two community consultation workshops.

5.1 Workshop 1

An initial workshop (Workshop 1) was held on the 19th of February 2008 and the people who attended represented various government agencies and community groups (Appendix X, Table x).

The main outcomes of the workshop were the:

- Identification of the main environmental weeds in the Shire of Esperance;
- Identification of biodiverse shire reserves that could be mapped for environmental weeds
- Prioritization of six (6) shire reserves to be mapped for environmental weeds
- Identification of biodiverse and important road reserves that could be mapped within the Shire of Esperance
- Prioritization of three (3) road reserves for environmental weed mapping

There are estimated to be over 100 weed species that occur within the Shire of Esperance (Appendix 1). The list of weeds in Appendix 1 was utilised as a starting point during Workshop 1 to determine what participants and other contributors thought were the worst environmental weeds in the Shire of Esperance (Appendix X).

5.2 Prioritisation Process

Following Workshop 1, the list of main environmental weeds (Appendix X) was prioritised to form a final list of 10 weed species on which to focus. The Top 10 Weed List was achieved by using the Randall Weed Scoring System. This scoring system uses the three aspects of weed invasiveness, weed impact and weed distribution to give a final score which can be used to rank environmental weeds.

$$\text{Randall Weed Score} = \text{invasiveness} + \text{impact} + \text{distribution}$$

A South Coast NRM project run by Sally Peltzer of DAFWA, Albany had already undertaken ranking of environmental weed species across the south coast region using the Randall Weed Scoring System. The scores for weed invasiveness and weed impact determined in this ranking process, were used for the prioritisation of weeds for the Shire of Esperance, but different scores were attributed and scored for the weed distribution aspect of the total score. The distribution was scored based on the weed species distribution within the Shire of Esperance boundaries and this was done in consultation with Coral Turley of the Esperance Weeds Action Group.

A number of bushland reserves were also identified during Workshop 1 (Appendix X) but only shire vested reserves and those with known priority or declared weed species were selected.

The reserves were prioritized using simple criteria as very little data existed for some reserves and therefore little was known about the biodiversity value of these bushland areas. There was better data known about shire managed coastal reserves and it was determined that at least two inland bush reserves, one in the mallee and one on the sandplain, be selected to ensure a good cross section of vegetation types and potential weed species.

The reserve selection criteria used was:

- ⇒ *Quality of Vegetation* (10 points max) – Excellent (8-10pts), Fair/Good (5-7pts), Poor (2-4pts), Very Poor (0-1pt)

- ⇒ *Capacity to Manage Weeds* (10 points max) – Active (8-10pts), Regular (5-7pts), Occasional (2-4pts), None (0-1pt)

- ⇒ *Other Threatening Processes* (5 points max) – fire (1pt), Flood/waterlogging (1pt), Feral Animals/Grazing (1pt), Vehicles/Motorbikes (1pt), Roadworks/Erosion/Disturbance (1pt), Nutrients (1pt), Disease/Fungi/Parasites (1pt), Salinity (1pt), Rubbish (1pt), Recreation (1pt)

5.3 Workshop 2

The final workshop (Workshop 2) was held on the 9th of September 2008 with some of the previous workshop attendees, plus others (Appendix X, Table X).

The main outcomes of the workshop were:

- Informing participants of the ten (10) priority weeds selected
- Informing participants of the six (6) shire bushland reserves and three (3) road reserves mapped for weeds
- Informing participants of the current expenditure on weeds, shire staff and volunteers involved in weed removal and management
- Discussing opportunities and ideas for the Shire of Esperance and volunteer groups to increase financial resources, human resources and improved procedures to ensure improved weed management in the local government area.

6.0 PRIORITY ENVIRONMENTAL WEEDS

The Top 10 Priority Environmental Weeds for Shire of Esperance selected were:

- Spiny Rush
- Geraldton Carnation Weed
- Pyp Grass
- Victorian Tea Tree
- African Boxthorn
- Watsonia Species
- African Lovegrass
- Cumbungi
- Caltrop
- Acacia pycnantha and other Eastern states wattles

The following information provides a background to the biology, distribution and control methods for each priority species. At the end of the descriptions about priority weeds, is information on timing and control methods for the known declared weeds found in the Shire of Esperance (Table X).

6.1 *Spiny Rush*

Botanical Name: Juncus acutus

Other Names: Sharp Rush, Cultivation Rush

Family: Juncaceae

Origin: Native of Europe, African and North America

History: Unknown

Plant Characteristics: A perennial rush that can grow to 1.6m high. It forms a dense clump with cylindrical sharp-pointed leaves. The brown flowers from

in a cluster at the end of the stems with a sharp-pointed bract sticking out (Hussey et al, 1997).

Dispersal: spread by seed, particularly by seed contaminated mud attached to vehicles and animals.

Distribution: found in low-lying damp, low fertility areas such as coastal flats, disturbed saline areas and can invade lowland grasslands and grassy woodland, riparian vegetation and fresh or saline wetlands.

Control Methods and Timing:

6.2 Geraldton Carnation Weed

Botanical Name: *Euphorbia terracina*

Other Names: False Caper and Terracina Spurge

Family: Euphorbiaceae

Origin: Native to the Mediterranean

History: Unknown

Plant Characteristics: Upright perennial that grows to 1m high and is supported by a vertical taproot. Shrub-like herb consists of several green to reddish, slender leafy stems which branch at the top to produce 4 to 5 flower stems. Flowers are yellow/green cup like structures, quite distinct from the bright green leaves.

6.3 Pyp Grass

Botanical Name: *Ehrharta villosa*

Family: Poaceae

Origin: native to South Africa

History: introduced as a sand binder and beach rehabilitation plant in 1960 – 1980's. Introduced into the Esperance region for this same reason.

Plant Characteristics: A perennial grass with a creeping rhizome and cane-like stems that grows to 1.5m tall. The inflorescence is a slender panicle of purplish flowers that appear during spring and summer.

Dispersal: by wind?

Dispersal: seed

Distribution: found in south-western Western Australia, Victoria, South Australia and New South Wales. Common and serious weed that predominately occurs in W.A. from Geraldton to Esperance on coastal heath, tuart woodlands, grazing land and road verges (Hussey et al., 1997). It is common on sandy soils particularly in shallow soils that have a high calcium carbonate content.

Notes: the whole plant exudes a toxic milky sap when cut. Geraldton Carnation Weed was previously a declared plant, but now just a pest plant

Control Methods and Timing:

Distribution: Widespread on eastern states beach but predominately found on beaches in W.A. between Jurien Bay and Albany. Pyp grass is a rampant coloniser of disturbed areas and can limit seedling growth and out compete bushland or coastal vegetation and become the dominant species.

Control Methods and Timing:

6.4 Victorian Tea Tree

Botanical Name: *Leptospermum laevigatum*

Family: Myrtaceae

Origin: Australian plant native to Victoria

History: introduced into W.A. as a garden plant

Plant Characteristics: It is a small shrub or large tree to 5m. It has small white flowers and opposite, oblong-lanceolate leaves.

6.5 African Boxthorn

Botanical Name: *Lycium ferocissimum*

Family: Solanaceae

Origin: native to South Africa

History: Introduced as a hedgerow plant in the mid 1800's.

Plant Characteristics: a woody, thorny shrub reaching up to 4 metres in height that can grow on a range of soil types and has an extensive root system. It has fleshy, glossy leaves that are rounded at the top and taper to the base. It also has sharp spines on the stems that can injure people and animals and protects the plant from grazing livestock. The main flowering period is over summer, however it can occur through most of the year. The small flowers are white with a purplish base. The fruit consists of small red berries that contain numerous small seeds.

Dispersal: Seed is dispersed via the wind and also by via earthmoving equipment or machinery eg. road maintenance and construction.

Distribution: It is spreading rapidly along road verges between Jurien Bay and Esperance and invading coastal health and woodlands on sandy and lateritic soils.

Control Methods and Timing:

Dispersal: mainly from seed as birds eat the mature berries and distribute the seed.

Distribution: widespread in each state in Australia and New Zealand. In Western Australia it is mainly found between Geraldton and Eucla and on the Recherche Archipelago islands off Esperance where it interferes with seal breeding. It is common along foreshores, roadsides, reserves and other areas where rubbish has been dumped or birds have carried the seed (Hussey et al., 1997)

Notes: Considered a pest plant in some areas

Control Methods and Timing:

Physical Control: Hand removal (wearing protective gloves) or digging plant out. Cut & paint, basal bark painting or praying for larger plants. New seedlings are likely and suckers may arise from the base of the plant or the roots and will need follow-up work. Sprayed plants may leaf up again several times before finally dying.

6.6 *Watsonia Species*

Botanical Name: *Watsonia species* with six known species occurring in Western Australia

Other Names: Bulbil Watsonia, Wild Watsonia

Family: Iridaceae

Origin: native to South African and evolved on disturbed land near Cape Town.

History: introduced to Australia as a garden ornamental and became widespread as a fashionable garden plant in the 1940s.

Plant Characteristics: *W.bulbillifera* (Bulbil Watsonia) has dull orange flowers that appear in late spring. When in fruit it

forms many small corms at each node up the flowering stalk.

Dispersal: spreads by corms and bulbils moved by earth moving equipment and water, especially along rivers, wetlands and roadside table drains.

Distribution: serious environment weed in south-western Western Australia from Perth to Albany, southern South Australia, southern Victoria and coastal New South Wales. The plant seen in the Esperance region is believed to be *Watsonia bulbillifera* and is only known in two locations (one being Stearnes Rd where it was mapped).

Control Methods and Timing: Best controlled between August and October.

6.7 *African Lovegrass*

Botanical Name: *Eragrostis curvula*

Family: Poaceae

Origin: native to South Africa

History: Was originally introduced as a pasture grass, but *E.curvula* is unpalatable to stock.

Plant Characteristics: Tufted, tussocky, perennial grass that grows up to 1.5m tall. Has greyish-green leaves and the leaf tips are often curly and inrolled. Seeds are cream to brown and about 1mm long. It flowers during spring and

summer and the inflorescence is a contracted panicle of greenish-purple or blackish flowers to 40cm long.

Dispersal: The seed is spread on mud by vehicles and animals

Distribution: Found in Western Australia from Carnarvon to the Nullarbor. Widespread on road verges and disturbed ground and aggressively invades bushland and agricultural land. In the Shire of Esperance Roadside Survey (2002) it was determined that 4990kms of roadside reserve was infested with African Lovegrass.

Control Methods and Timing:

6.8 Cumbungi

Botanical Name: *Typha species*, either *T.orientalis* or *T.domingensis*

Other Names: Bullrush or Cat's Tail (*T.orientalis*), Yanget (*T.domingensis*)

Family: Typhaceae

Origin: *Typha orientalis* is from Malaysia and New Zealand and probably native to the eastern states of Australia but is introduced to Western Australia. *Typha domingensis* is native to all states of Australia.

History:

Plant Characteristics: A tall, upright aquatic perennial that is 2-3m in height. The leaves grow in bunches from below water level and are connected by a rhizome. They flower from November to January and the inflorescence is a dense dark brown velvety spike with the male flowers on top and female below. The seeds germinate from December to April in mud or under water. The leaf blade ranges from 14mm wide (*T.orientalis*) to 8mm wide (*T.domingensis*).

Dispersal: New plants come from the germination of seed carried by the wind

6.9 Caltrop

Botanical Name: *Tribulus terrestris*

Other Names: Cat-head, Bindii, Puncture Vine

Family: Zygophyllaceae

or in mud on the feet or birds, livestock, humans or machinery.

Distribution: Cumbungi grows in fresh or brackish slow-moving or stationary water up to 2m deep. It is an aggressive colonizer of disturbed wetlands and slow moving river foreshores.

Control Methods and Timing:

Physical: Slashing while seed head is still green gives some control but repeated slashing is necessary to maintain control.

Cut plant 50-150mm below water level and drown the plant – can be difficult to do. Best done when flowering around January and follow up cutting needs to take place at 4 to 6 week intervals.

Chemical Control: spray herbicides when actively growing and before seed is set

Best controlled from November to December.



Origin: Native of the Mediterranean

History:

Plant Characteristics: Caltrop is a prostrate annual with pinnate leaves, small yellow flowers (less than 1cm) and very spiny fruits.

Dispersal: the spiny fruits get dispersed on the tyre treads of vehicles and on the feet of humans and livestock

Distribution: Caltrop is a troublesome weed of wasteland, agricultural land and recreation areas. It is widespread in the Kimberley and arid zone and is spreading along roadsides in the south-west. It is predominant within the townships of Esperance and Salmon Gums, but its

6.10 Golden Wattle and other *Acacia* sp (eastern states)

Botanical Names: *Acacia pycnantha* (Golden Wattle), *Acacia decurrens* (Early Black Wattle), *Acacia iteaphylla* (Flinders Range Wattle), *Acacia longifolia* (Sydney Golden Wattle), *Acacia baileyana* (Cootamundra Wattle)

Family: Mimosaceae

Origin: Golden Wattle is native to New South Wales, Victoria and South Australia. Early Black Wattle is native to New South Wales. Flinders Range Wattle is native to South Australia. Sydney Golden Wattle is native to eastern Australia. Cootamundra Wattle is native to New South Wales.

History: All the invasive eastern states wattles are garden escapees. *Acacia pycnantha* has also been planted mistakenly in tree planting programs instead of *Acacia saligna*.

Plant Characteristics:

A.pycnantha is an upright, tree that grows to 8m. The leaves are broad-lanceolate in shape and are often curved into a sickle shape. The flowers are golden-yellow and occur in sprays in early

spread elsewhere within the shire is unknown.

Notes: Stock grazing on Caltrop can suffer from photosensitisation, staggers and nitrate poisoning.

Control Methods and Timing:

Hand Removal of plants and seeds. Chemical spraying. Exclusion of vehicles.

spring. It is sometimes confused with *Acacia saligna*.

A.decurrens is a tree that grows to 10m, with dark, grey bark. The bright green bipinnate leaves are up to 15cm long. The bright yellow, globular flower heads are produced during winter.

A.iteaphylla is a dense, large shrub to 4m. The narrow-linear leaves are grey-green to 14cm long, with one prominent vein and usually a slightly curved tip. The flowers are lemon-yellow, globular and in small sprays from the leaf axils.

A.longifolia is a dense shrub or small tree to 10m with dark grey bark. The flower heads are cylindrical yellow flower spikes that grow singularly or in pairs from the phyllode axils.

A.baileyana is a bushy shrub or tree to 10m with smooth grey bark and delicate-looking, silvery or blue-grey bipinnate leaves to 5cm long. It produces golden-yellow globular flower heads in winter.

Dispersal:

Distribution: Golden Wattle is found between Perth and Albany, particularly on roadsides, invading bushland and as tree plantings. It is widespread within the Shire of Esperance. The other wattle

species are found in more defined localities in the shire including South Coast Highway (*A.decurrens*), Merivale Road (*A.iteaphylla*) and Helms Arboretum (*A.pycnantha*, *A.decurrens*, *A.iteaphylla*, *A.longifolia* and *A.baileyana*)

Notes: *A.pycnantha* is Australia's flora emblem.

Control Methods and Timing:

Fire: In large dense stands a hot fire can be used to kill old trees.

Control before flowering in June

Table X: Weed Control Timing and Methodology for Declared Weeds

Environmental Weed	Weed Type	Month/s for Control	Method of Control	Notes
Cotton Bush	Declared Weed		Hand Removal	
Paterson's Curse	Declared Weed	October/November		
Cape Tulip	Declared Weed			
Doublegee	Declared Weed	June/July	Chemical	Seedbank can persist for over 4 yrs
Stemless Thistle	Declared Weed			
Saffron Thistle	Declared Weed			
Skeleton Weed	Declared Weed			

7.0 PRIORITY BUSHLAND RESERVES AND WEED MAPPING

The priority bushland reserves selected were:

Reserve Name	Justification for Selection
Coramup Creek Reserves (R40216 & R15239)	<ul style="list-style-type: none"> • Adjoins DEC managed, RAMSAR listed Lake Warden Wetlands Reserve and weeds have potential to have an impact on the adjoining remnant vegetation and fauna habitat. • Upper Coramup Creek Reserve bushland is in moderate condition • Situated on primary Coramup Creek river foreshore • High community use by surrounding small landowners • Potential to involve Esperance Small Land Owners Group
Dalyup River Pioneer Reserve (R23570)	<ul style="list-style-type: none"> • Inland bushland reserve, approx 5kms upstream from RAMSAR listed Lake Gore • Situated on primary Dalyup River foreshore • Recent mapping of Spiny Rush has undertaken by Esperance Weeds Action Group on this reserve • Past interest in this reserve by Esperance Bay Historical Society
Lake Monjilup Nature Reserve (R23043)	<ul style="list-style-type: none"> • Discovering Monjilup Report (1994) guides management for this reserve and an update to this management plan is to be undertaken shortly • Caretaker paid to actively manage this reserve • Has its own shire budget for reserve management • Lake Monjilup Community Development Group guide management and undertake work days including weeding with the Friends of Lake Monjilup • High visitor usage and recreational use • High level of biodiversity and knowledge of existing flora and fauna
Munglinup Beach Reserve (R32337)	<ul style="list-style-type: none"> • Esperance Coastal Management Plan (2002) guides management for this reserve • Caretaker paid to actively manage camping numbers on this reserve • Oldfield Landcare Group and Munglinup District Development Association both actively involved in managing this reserve and having work days • High biodiversity value and little weed encroachment on reserve • Large bushland area with good connectivity to other bushland reserves
West Beach to Twilight Beach (R41141, R25891,	<ul style="list-style-type: none"> • Esperance Coastal Management Plan (2002) guides management for these reserves

R4180)	<ul style="list-style-type: none"> • Has its own shire budget for reserve management • High visitor usage and aesthetic values • Shire of Esperance (garden crew) and Esperance Weeds Action Group have controlled some environmental weeds on these reserves
Salmon Gums Townsite (some small shire reserves including recreation facilities and amenities, R30224, R19422, R42317, R29096, R27786)	<ul style="list-style-type: none"> • Small, inland mallee township with extensive bushland (mostly vacant crown land) surrounding town and good connectivity • Potential for community interest and action through the Salmon Gums Development Group • Some control of caltrop undertaken in town by proactive community members • Weeds impacting on recreational facilities in the town • Shire of Esperance (garden crew) visit town twice a year and have potential to control environmental weeds

7.1 Coramup Creek Reserves

Location & Size

Upper Coramup Creek Reserve (R15239) is 28.2 hectares. The reserve is bounded by Quarry Road and Hills Road (unmade, 4WD track) on the eastern edge of the township of Esperance.

The Lower Coramup Creek Reserve (R40216) is situated directly south of the Upper Coramup Creek Reserve, but is separated by private Location 408 (Esperance Egg Farm). It covers an area of 30.8 hectares. It also adjoins a DEC vested reserve.

The adjoining reserve (R25883) to the east of the Upper Coramup Creek Reserve is vested as a quarry and is leased to a private company for quarrying granite rock and commonly referred to as the Readymix Quarry.

Site History

Upper Coramup Creek Reserve has been vested with the Shire of Esperance since 1914 for the purpose of Water. The vesting purpose was changed in 1980 to Parkland. It includes approximately 0.7kms of the primary tributary of Coramup Creek.

The Lower Coramup Creek Reserve was vested with the Shire of Esperance in 1987 for the purposes of Public Recreation and some of the reserve was previously private property. It includes approximately 1.5kms of the primary drainage course of the Coramup Creek.

Management Issues

Victorian Tea Tree, Bulrushes, Bridal Creeper, various annual weeds and grasses are the main weeds impacting

the Upper Coramup Creek Reserve. The weed burden across the reserve, however, is moderate and mostly along the existing tracks and roads.

It is also suspected that dieback (*Phytophthora* sp.) may be present in the northern portion of the Upper Coramup Creek Reserve, although this has not been confirmed.

The Lower Coramup Creek Reserve has been heavily impacted by weeds including African Boxthorn, African Lovegrass, Victorian Tea Tree, Paterson's Curse, Bulrushes and various annual weeds and grasses. Overall the reserve has a very high weed burden and is in poor condition.

The Lower Coramup Creek Reserve is adjoined by numerous small land holdings and this adjoining landuse in some areas is exacerbating the weed burden on the reserve. The uncontrolled access of 4WD vehicles and motorbikes is also having a detrimental impact on the reserve.

MANAGEMENT TASKS

- Weed removal program for Paterson's Curse on Coramup Reserves (URGENT)
- Weed removal program for African Boxthorn, Bulrushes, Victorian Tea Tree and African Lovegrass on Coramup Reserves (HIGH PRIORITY)
- Weed removal program for other mapped weed species on Coramup Reserves (MODERATE PRIORITY)
- Map occurrence of *Phytophthora* dieback on Coramup Reserves (URGENT)

- Method of containment and /or treatment of dieback (HIGH PRIORITY)

7.2 Dalyup River Pioneer Reserve

Location and Size

The Dalyup River Pioneer Reserve is located on Location 49, Murrays Road in the locality of Dalyup, approximately 40kms west of Esperance. The reserve is 22.6 hectares in size.

Site History

The reserve was used in the early 1990's by some church groups for camping purposes and a place to take youth groups. In 1993 the reserve was the subject of a proposed youth camping facility that led to the Shire of Esperance seeking vesting of the adjoining unvested Reserve 3815 (vested for the purpose of water). The Shire determined not to lease the area for a youth camping facility.

In 1996 the Shire of Esperance obtained vesting of the whole 22.6 hectares of land and it was officially named the Dalyup River Pioneer Reserve. The whole reserve was vested for the purpose of Recreation.

In 1996 a plaque was located on the Dalyup River Pioneer Reserve to commemorate 100 years since the Rowse family took up adjoining farmland in the area around 1896.

In 2002 the Esperance Bay Historical Society approached the Shire about upgrading the reserve and installing additional picnic facilities, walk trails and an adequate carpark, but this has not been undertaken.

Management Issues

The reserve has been adversely affected by weeds following the 1999 and 2000 flood events along the Dalyup River. With

particular note is the occurrence of African Lovegrass along the river foreshore and Bridal Creeper. There is also an area of Freesias on part of the reserve that are understood to have been planted by some of the original settlers. The weed burden across the reserve is moderate and mostly confined to an area within 50m of the river foreshore.

Sheep were noted grazing on the reserve and belong to the adjoining small landowner.

MANAGEMENT TASKS

- Removal of sheep grazing on Dalyup River Pioneer Reserve (URGENT)
- Weed removal program for African Lovegrass and Freesias on Dalyup River Pioneer Reserve (HIGH PRIORITY)
- Weed removal program for other mapped weeds on Dalyup River Pioneer Reserve (MODERATE PRIORITY)

7.3 Lake Monjingup Nature Reserve

Location and Size

Reserve 23043. The reserve is 99.4 hectare.

Site History

Land near Lake Monjingup was first vested with the Shire of Esperance in 1950 for the purposes of gravel and grazing. In 1993 various reserves including Peace Park and Lake Monjingup itself were added to the reserve to form a 99.4hectare reserve called the Lake Monjingup Nature Reserve. The area was vested for the purpose of Recreation, Parkland and Tourism and is an A class nature reserve

Active management by the Shire of Esperance commenced after the 1994 production of the "Discovering Monjingup Report". A management group called the Lake Monjingup Development Community Group was also formed at this time and headed by the then shire ranger, Mr Brian Warren. Mr Warren is currently the honorary caretaker of the reserve.

Management Issues

The Lake Monjingup Nature Reserve has a few weeds including Bridal Creeper, Bulrushes and various annual grass weeds. Active management of Bridal Creeper has been undertaken through the release of Leafhoppers in 1999 and the leaf rust fungus in 2000. Both biological controls have assisted in reducing the prevalence of Bridal Creeper on the reserve, although it still occurs. Overall the reserve has a medium to low weed burden.

The Lake Monjingup Nature Reserve – Stage 2 has some Cotton Bush on it, a

declared weed. This was not mapped as all of the plants had recently been removed. Regular busy bees held in the last few years have assisted in reducing the prevalence of this weed, but the removal of the weed is still ongoing.

MANAGEMENT TASKS

- Weed removal program for Cotton Bush by volunteers at Lake Monjingup Nature Reserve needs to be continued with financial assistance from Noxious Weed Budget (URGENT)
- Weed removal program for Bulrushes at Lake Monjingup Nature Reserve (HIGH)

7.4 Munmlinup Beach Reserve

Location and Size

Munmlinup Beach Reserve is 495 hectares in size and is an A Class reserve situated 105km west of Esperance on the boundary of the shire.

Site History

The reserve has been vested with the Shire of Esperance since 1973 for the purpose of Recreation. A further area that included the Munmlinup Beach campsite was added in 1985. In 2005 the reserve purpose was changed from Recreation to Camping and Recreation with the power to lease to allow for community management of the area. The reserve adjoins the Oldfield Inlet and contains large areas of pristine and unique flora and fauna.

The Munmlinup Beach campsite at the southern end of the reserve, close to the beach has been used as an informal campground for over 30 years. Swimming classes are held each summer at the beach, which attracts many local farming families. The Munmlinup Beach campsite has been under community management since arrangements were made in 2003 with the Wallefeld family that own the nearby Munmlinup Beach Caravan Park. The local Oldfield Landcare Group and Munmlinup District Development Association (MDDA) have also been instrumental in obtaining grants, undertaking busy bees and maintaining the beach campsite in conjunction with the Shire of Esperance.

Facilities have been greatly improved since 2001 and camping numbers are limited to protect the surrounding coastal environment. Designated campsites,

signage, toilets, showers and a walk trail have all been upgraded on the reserve over the proceeding eight years.

Management Issues

The weed burden on the reserve is very low, with the main environmental weed being Pyp Grass. It is believed that the Pyp Grass was planted in the 1970's or early 1980's to assist in stabilising the shifting dunes around the campsite. The Oldfield Landcare Group and the Shire of Esperance are to carry out some Pyp Grass eradication as part of a Southern Incentive Grant from SCRIPT (now South Coast NRM) received in 2007.

Beach

7.5 West Beach to Twilight

Location and Size

Reserve 41141 is 82.7 hectares and covers the Dempster Headland area and part of West Beach.

Reserve 25891 is 69.8 hectares and includes part of West Beach, Chapman's Point, Blue Haven, Salmon Beach and part of Fourth Beach.

Reserve 4180 is 1257.8 hectares and includes Fourth Beach and Twilight Beach.

Site History

Reserve 41141 has been gazetted and managed by the Shire of Esperance since 1989 for the purpose of Park and Recreation. The Dempster Headland area is a noted tourist spot as it provides a good vantage point over Esperance. It includes a lookout and walk trails and is used by both walkers and runners. It is also occasionally used for abseiling. West Beach is also included on this reserve and is one of the most visited beaches in the shire, due to its proximity to a residential area. Activities include dog walking, swimming and surfing.

Reserve 25891 includes a number of beaches from West Beach to Fourth Beach and is gazetted for recreation. The Shire of Esperance originally gazetted it in 1961 for a holiday campsite. The beaches in this reserve are also used for dog walking, fishing, swimming and surfing.

The Shire of Esperance gazetted reserve 4180 in 1931 for the purpose of a "Common". It includes Fourth Beach and Twilight Beach, both of which are popular with swimmers, surfers, windsurfers and tourists

Management Issues

Overall the beach reserves between West Beach and Twilight Beach have a high weed burden. The main weeds present are Pelagonium, Pyp Grass, Marram Grass, Dune Onion Weed, Sea Spurge, Geraldton Carnation Weed, Victorian Tea Tree and African Boxthorn.

7.6 Salmon Gums Townsite

Location and Size

The townsite of Salmon Gums is located 106 km north of Esperance on the Coolgardie-Esperance Highway.

The Salmon Gums Townsite was selected as it was one of the most weed-infested areas in the mallee and it was considered important that some mallee vegetation was represented as part of the priority reserves list.

The majority of remanent vegetation around the township of Salmon Gums is vacant crown land and unvested. There are a number of reserves vested with the Shire of Esperance including R30224 (Golf Course), R19422 (Showground and Racecourse, used by Golf Club), R42317 (Caravan Park), R29096 (disused Stockyards) and R27786 (Recreation, Gun Club and Bushfire Brigade Site).

Site History

The townsite of Salmon Gums was proposed in 1910 and eventually gazetted in 1925 in the same year as the Esperance to Salmon Gums section of railway was opened. The town is named

Salmon Gums after the belt of *Eucalyptus salmonophloia* trees that dominate the area around the townsite.

Salmon Gums was originally a township of the Shire of Dundas until 1989 when the local government boundaries changed and it became part of the Shire of Esperance.

The Salmon Gums Development Group is an overarching group for the township that represents various community groups in the area. In 2006 the group was supportive of shire staff's intentions to develop a 5-year plan for the township but the planning is yet to take place.

Management Issues

The Salmon Gums townsite was not mapped for weeds but the main environmental weeds of concern to occur around the township are Caltrop, Prickly Pear, Paterson's Curse, Saffron Thistle and Gazanias. Members of the Salmon Gums Development Group have undertaken some removal of Caltrop in the town as part of the Tidy Towns competition and other recreational events.

8.0 PRIORITY ROAD RESERVES AND WEED MAPPING

8.1 Twilight Beach Road and Eleven Mile Beach Road

Twilight Beach Road (0180) is a sealed 17.83km long road from Hardy Street to Eleven Mile Beach Road. The length of the road was mapped from the Albany Street carpark at West Beach to Eleven Mile Beach Road. The Shire of Esperance manage this road.

Eleven Mile Beach Road (0114) is a sealed 12.23km long road from Eleven Mile Beach to Pink Lake Road and was mapped for its full length. The Shire of Esperance manages Eleven Mile Beach Road.

INSERT MAP

8.2 Stearnes Road and Bukenerup Road

Bukenerup Road (0248) is 5.88km long, starting at South Coast Highway and ending at Old Shark Lake Road. Only the formed part of the road coming off South Coast Highway was mapped. This mapping was done on the sealed section (up to Stearnes Rd) and the unsealed section until it turns into a 4WD track. The middle portion of the road is unmade and is a 4WD track only. The upper end of the road was not mapped for weeds. The Shire of Esperance manages Bukenerup Road.

Stearnes Road (0249) is 4.67kms long, starting at Bukenerup Road and ending at the Coolgardie-Esperance Highway. The road is sealed in its entire length and is managed by the Shire of Esperance

INSERT MAP

Harbour Road

Harbour Road is 5.8kms long, starting at Norseman Road and ending at The Esplanade. The road is sealed in its entire length and is managed by Main Roads WA.

INSERT MAP

9.0 SPECIFIC WEED CONTROL PROGRAMS

Prioritizing Weed Control

It is essential that weeds are controlled in the following order in order to maximise resources and make difference in the management of weeds across the shire.

1. Declared Weeds (Section X.X)
2. Priority Environmental Weeds (Section X.X)
3. Weeds of National Significance (Appendix X)
4. Weeds on the National Environmental Alert List (Appendix X)
5. Other Environmental or Agricultural Weeds (Appendix X)

Esperance Weed Action Group

The Esperance Weed Action Group (EWAG), established in 1994, is the most active community group in the area of weed management and they have some programs to control specific weeds.

An annual caltrop competition has been run by EWAG over the summers of 2006/2007 and 2007/2008 to try to eradicate caltrop from the township of Esperance with the primary focus on Harbour Road. In the 2008 competition just over 1000 kilograms of caltrop plant material and seed was collected by school children, adults, volunteer and corporate organisations and prizes were awarded to the winners in each category. Volunteers of EWAG also undertake further control of caltrop outside the competition times.

Victorian Tea Tree has been targeted by EWAG and various methods have been trialled to eradicate this woody weed. The group has just completed a South Coast NRM funded project to trial different methodologies to effectively control Victorian Tea Tree.

The discovery of Spiny Rush along the West Dalyup River in 2007, led EWAG to map the extent of the newly invader along the West Dalyup and Dalyup River.

Other weeds that have been actively removed or controlled by EWAG on an ad hoc basis since their inception are:

- various eastern states Acacia at the DEC managed Helms Aboretum
- Tambookie Grass
- African Boxthorn within the township of Esperance
- Castor Oil Plant
- Bridal Creeper

South Coast NRM

The future funding of weed management by the regional body, South Coast NRM, will target a number of key environmental weeds that are considered the greatest threat to

biodiversity across the region. The weed priorities were developed by Sally Peltzer (DAFWA, Albany) in consultation with weed action groups and other relevant stakeholders.

10.0 FINANCIAL AND HUMAN RESOURCING

10.1 Shire Staffing

There is a current gap in the ability of existing shire staff to adequately deal with issues arising from the management of weeds on shire reserves, particularly those outside the Esperance townsite.

Currently the arrangements are:

Parks and Garden Crew: deals with weeds when there is a complaint or their attention is sought to a certain area (normally within the Esperance townsite). They visit other townsites within the shire approximately twice a year and deal with weed issues that exist within the townsites at this time, even though it may be a less effective time to deal with the weeds. There are two staff that are trained in weed control and herbicide application that principally undertake this work.

Rural Road Crew: deals with construction and maintenance of the shire's vast road network. There is currently one staff member, Rural Technical Officer on the bitumen crew, that undertakes some weed control on road reserves, especially declared weeds.

Manager for Health and Environment: has the responsibility of dealing with all shire bushland and coastal reserves as time allows. Visits and active management of reserves occurs when funds and time allows. Majority of reserve management is mainly done when there is an issue.

Rangers employed by the Shire of Esperance manage specific coastal reserves and undertake activities such as collection of camping fees, rubbish removal, cleaning of facilities and minor maintenance. They do not presently have the training or knowledge to undertake weed identification or eradication on reserves.

10.1. Reserves Officer

There appears to be a need to engage an employee or possibly a contractor, as a Reserves Officer, to undertake active management of all undeveloped or semi-developed coastal, roadside and bushland reserves (excluding cleared reserves such as public toilets, parks, sporting grounds and the like).

The main tasks a Reserves Officer could undertake would be:

1. *Weed Management* – including removal of declared weeds and weeds considered a priority under this strategy
2. *Fire Management* – liaising with Fire and Emergency Services and rangers regarding fuel loads on reserves

3. *Feral Animal Control* – including removal of feral animals from shire reserves, liaising with concerned landowners adjoining shire reserves, liaising with staff who implement the wild dog and starling control programs
4. *Biodiversity Management* – ensuring information flow regarding rare or priority flora and fauna on shire reserves, particularly roadsides
5. *Infrastructure Upgrades* - programs to upgrade or maintain infrastructure on semi-developed reserves
6. *Community Groups* - liaising with groups and caretakers about specific reserves e.g. Lake Monjینگup, Mount Ridley, Munglinup Beach and others
7. *Other Government Departments* – liaising with organizations such as Landgate regarding changes to reserves, Department of Agriculture and Food W.A., Department of Environment and Conservation, South Coast NRM, Water Corporation and others
8. *General Complaints/Enquiries* - about reserves e.g. power to lease, grazing and others

A Reserves Officer would alleviate much of the shire's internal cross department management of semi-developed or undeveloped reserves. Various staff within the departments of Community Services, Development Services and Engineering Services currently deal with different aspects of reserve management and this does not promote continuity or consistency of management. A Reserves Officer would compliment the work done by shire rangers on coastal reserves and to some degree alleviate the pressure on these staff to be the hands on managers for every reserve in the shire. It is envisaged that such a staff member would be involved in hands-on operations.

10.2 *Advisors*

There is a significant number of Natural Resource Management staff that could assist by providing technical advice on weed management or assisting in establishing links with community groups interested in weed management (Table X).

Table X: Contacts for Weed Management Advice

Name	Position	Organisation
Suzanne Compagnoni		Department of Agriculture and Food WA, Esperance
TBA	Invasive Species Coordinator	South Coast NRM, Albany
Robyn Cail	Biodiversity Officer	South Coast NRM, Esperance
Dylan Gleave	Coastal and Marine Facilitator	South Coast NRM, Esperance
Graham Blacklock	Weed Action Group Advisor	Department of Agriculture and Food WA, Kojonup

10.3 *Financial Resources*

The Shire of Esperance has allocated \$18,245 towards weed control within the Shire of Esperance for 2008/09 (Table X). The three items of expenditure currently for weed control in the Shire of Esperance are Declared Weeds (\$7999), Lake Monjینگup Weed

Control (\$1300) and Caltrop Control (\$8946). This is an increase from the 2007/08 year when \$16877 was spend on weed control. This budget is comparatively small considering the Esperance Weeds Action Group, a volunteer community group, spent \$9368.

Table X: Shire of Esperance Expenditure on Weed Control

Item	Actual Expenditure 2007/08	Proposed Expenditure 2008/09
Declared Weeds	7724	7999
Lake Monjilup Weeds	464	1300
Caltrop	8689	8946
TOTAL	\$16877	\$18245

Table X: Esperance Weeds Action Group Expenditure on Weed Control

Item	Actual Expenditure 2007/08
Spiny Rush	570
Victorian Tea Tree	6000
Caltrop	2798
TOTAL	\$9368

Table X: Proposed Expenditure for the Shire Weed Strategy for next five years

Proposed Expenditure	2008/09	2009/10	2010/11	2011/12	2012/13
Staff					
Reserves Officer (fulltime)		55000	56000	57000	58000
On-Ground Weed Control					
Caltrop Control *	8946	9000	9200	9400	9600
Victorian Tea Tree					
Declared Weeds (Noxious Weeds budget)	7999				
Environmental Weed Control Shire Reserves		5000	5000	5000	5000
Environmental Weed Control Roadsides		2500	3000	3500	4000
Tools/Equipment		8000	5000	3000	3000
Contracted Services					
Tree felling, chipping, mulching					
Spraying Weeds					
Support of Volunteers					
Public Liability Insurance		500	500	500	500
Training Courses		1000	1000	1000	1000

Chemicals		3000	3000	3000	3000
Fuel		2000	2000	2000	2000
Tools/Equipment		1500	1500	1500	1500
Printing (posters/brochures)		1000	1000	1000	1000

* Caltrop control should be extended to Salmon Gums townsite as well as Esperance townsite

10.4 Funding Grants

There are presently limited opportunities to obtain funding grants for on-ground weed control and management unless it is incorporated as an overall management plan for an area.

Caring for Country is federal government funding that has replaced the previous funding called the Natural Heritage Trust (NHT), which concluded on the 30th of June 2008. The first round of Caring for Country closed in August 2008 but was mostly aimed at maintenance funding until 30th June 2009. It is not clear at this stage how much or what programs will be covered under the Caring for Country program that will assist in environmental weed management but in 2009 some more concrete information will be announced. The funds are still likely to be directed through regional groups, which in the Esperance region, is the South Coast Natural Resource Management body.

There are numerous grants available and they regularly change guidelines and names (often during changes of government). The Green Guide can be a good source of information or the website XXX

10.5 Corporate Funding Opportunities

Suggestions for the Shire of Esperance or volunteer groups to approach for corporate funding for weed management include:

- BHP Billiton Community Grants
- Esperance Port Authority Community Grants

The Shire of Esperance Community Development Grant is open to volunteer and community groups and could be applied to for weed control. The applications generally close in early May each year.

RECOMMENDATIONS

- Investigate potential to employ a fulltime Reserves Officer to assist in weed management control in the Shire of Esperance

11.0 STRATEGIC APPROACHES FOR IMPROVED WEED MANAGEMENT

11.1 *Environmental Code of Conduct*

One of the main shire activities that increases weed proliferation and spread is caused by road maintenance and construction and associated works. This is mostly due to the disturbance of the soil that can release dormant weed seeds and increase weed seed germination. The Shire of Esperance can assist in reducing the impact of road works on the weed burden by making changes to their practices, the timing of operations and an awareness of different weed species.

An overall Environmental Code of Conduct could be implemented for the following activities to reduce the introduction and spread of weeds on roadsides and in bushland reserves:

- road construction and maintenance
- parks and gardens construction and maintenance
- gravel and lime pit construction and rehabilitation
- fire access tracks and fire management
- bushland and coastal reserve management and maintenance
- other works and activities on shire vested lands (carparks, pathways, buildings, utilities, clearing, wildflower picking, burning etc..)

This code of practice would not just be restricted to weed management but could cover various environmental aspects such as management of dieback, drainage, erosion, fire and vegetation clearing.

The Environmental Code of Conduct would be expected to meet the requirements of existing and future state and federal legislation e.g. clearing for gravel pits under Environmental Protection Act, weed control under BAM Act. The City of Albany has an Environmental Code of Conduct (2006) and the Shire of Chittering has a Code of Practice for Roadside Conservation in Road Construction and Road Maintenance (2001).

An Environmental Code of Conduct would need to select priority road reserves due to the extensive nature of the large road network managed by the Shire of Esperance.

Environmentally Sensitive Areas Register

- *Areas Registered on the Register of National Estate for Natural Values*
- *Declared Rare or Priority Flora* e.g. sections of road reserve denoted by yellow rare flora markers or "hockey sticks" or bushland reserves
- *Known or Potential Habitat of Threatened Fauna* eg. Banksia thickets for Carnaby's Cookatoos
- *Wetlands on the List of Wetlands of International Importance or the Directory of Important Wetlands in Australia* eg. Lake Warden, Lake Gore, Monjilup Lake
- *Priority Road Reserves* eg. flora roads, priority roads under this strategy and roads as having high conservation value under Roadside Conservation Committee report

- *Public Drinking Water Source Areas*
- *Conservation Estate* eg. national parks and nature reserves
- *Significant Aboriginal Sites* e.g. Mt Ridley
- *Phytophthora Dieback Free Areas*

11.2 Declared Pest Rates for Weed Management

Under the new Biosecurity Agricultural Management (BAM) Act 2007 a recognised Regional Biosecurity Group (RBG) can consider imposing a Declared Pest Rate (DPR) throughout an area, subject to ministerial support. There is presently no Regional Biosecurity Group for the Esperance region, but it is likely that it will be formed in 2009 and the Shire of Esperance has the opportunity to be an associate member. For example the Shire of Esperance could request that the RBG impose a DPR for the whole Shire of Esperance for Paterson's Curse (a declared pest plant). Once this is implemented the Shire could then draw matching dollar-for-dollar contributions from the state government for the control of Paterson's Curse. This rating only applies to declared pests (animals and plants). The RBG's could also target non-declared pests (eg. priority weed species listed in this report), but cannot use DPR funds for this purpose. This rating mechanism will become possible in mid 2009 once the regulations for the BAM Act are finalised.

11.3 Weed Management Training

Specific weed management training will be required for road crew and parks and gardens staff to ensure active management and successful removal of weeds on shire land.

An in-house training session can be created that focuses on the known declared weeds that occur in the shire and the ten priority weed species listed in this report. The training session needs to include weed identification (photos), example plants, areas at risk, when the weed is to be controlled (time of the year) and the method of control (eg. Spraying, slashing, chain sawing, hand removal).

Additional training maybe be needed to ensure staff are able to safely control weeds, such as herbicide handling, chainsaw operation and others. Staff also need to ensure they are adhering to the soon to be introduced Herbicide Handling Protocols (??).

Need to conform with the Pesticides Code of W.A.

11.4 Pest Plant Local Law

The Shire of Esperance has the capacity to prescribe any known weed, other than an already Declared Weed, a Pest Plant under a local law. This means that the landowner must control the nominated Pest Plants and the shire has the delegated powers to ensure the removal of the Pest Plant from both crown land and private property (see section X.X for further information).

The Shire of Esperance presently has no local laws relating to the control of pest plants. Examples of other local government pest plant local laws (ie. Rockingham and Kwinana) are found at the end of the document (Appendix X).

11.5 Strategic Planning and Town Planning

Areas to include weed management in the Shire of Esperance Local Town Planning Scheme

The Shire of Esperance Strategic Action Plan 2007 – 2027 needs to include some additional actions in the Environment section under the component on Vegetation Protection. These could include:

- *
- *
- *

11.6 Prohibited List of Weed Species for Developers, Nurseries and Landscapers

The introduction of some of the environmental weeds into the Shire of Esperance is occurring because of ill-selected choices of plant species for the landscaping of new developments. The planning staff at the Shire of Esperance do not have all the necessary weed knowledge or any guiding documents to assist them when assessing landscaping plans as part of a develop application.

It would be advisable to create a Prohibited Plant Species List for proposed developments, local nurseries and shire landscaping works that could be used to guide some of the decision makers who may not have this knowledge. The Prohibited Plant Species list should include the ten selected priority weed species, all declared weed species, plus other plants deemed to be environmental weeds in the Shire of Esperance. It is suggested that this list be compiled by Shire of Esperance staff including Manager for Health and Environment and the garden Horticulturist in conjunction with the Esperance Weeds Action Group (EWAG).

11.7 Recording and Reporting Weed Management

It is important that the removal of weeds, particularly the declared and priority weeds are recorded and monitored. A simple recording sheet can be established that records information about the weed that has been controlled (Appendix X). This information can then be stored electronically by inputting it into a GIS system on an annual basis. The collection of this data will have the following benefits:

- Other shire staff, councillors and adjoining landowners (e.g. DEC) can easily access information when requested
- A record of chemical applications undertaken in case of occupation health and safety issues or complaints from adjoining landowners

- A record of the control of declared weeds for the Department of Agriculture and Food WA, if a pest plant notice was issued
- Ability to revisit an exact location to determine the success of the weed control methods used
- Ability for different staff members to undertake the weed control if records kept of previous treatments and weed locations
- Historical information gathered on the location of declared and priority weeds that can be used to demonstrate the effectiveness of the control method or complete eradication of a weed from a certain area

RECOMMENDATIONS

- Formulate an Environmental Code of Practice for road, gravel pit, parks and gardens construction and maintenance activities and fire access track and reserve management to minimise the introduction and spread of environmental weeds (SoE, SHORT)
- The formulation of an Environmental Code of Practice be included as an action in the Shire of Esperance Strategic Action Plan (SoE, MEDIUM)
- Investigate the introduction of a Pest Plant Local Law for the Shire of Esperance, under the Biosecurity and Agricultural Management Act 2007
- That a Prohibited Plants List be compiled by Shire of Esperance staff and Esperance Weeds Action Group to guide planning officers, developers and landscapers to select plants appropriate to the shire and not introduce unwanted weed species (SoE, MEDIUM)
- Establish a weed identification training session for road crew, parks and gardens staff and rangers based on the known declared species and priority species listed in this report (SoE, SHORT)
- Ensure adequate chainsaw and chemical handling training and equipment is available to the relevant Shire of Esperance work staff for weed control (SoE, MEDIUM)

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APPENDIX 1: KNOWN ENVIRONMENTAL AND DECLARED WEEDS OF THE SHIRE OF ESPERANCE

BOTANICAL NAME	COMMON NAME	FAMILY	AAPR DECLARATION	WONS
CREEPERS				
<i>Asparagus asparagoides</i>	Bridal creeper	Asparagaceae		WONS
<i>Dipogon lignosus</i>	Dolichos pea	Fabaceae		
<i>Ipomea indica</i>	Blue morning glory	Convolvulaceae		
<i>Tropaeolum majus</i>	Nasturtium	Tropaeolaceae		
GRASSES				
<i>Anthoxanthum odoratum</i>	Sweet vernal grass	Poaceae		
<i>Avena spp</i>	Wild oat	Poaceae		
<i>Bromus diandrus</i>	Great brome	Poaceae		
<i>Cortaderia selloana</i>	Pampas grass	Poaceae		
<i>Cynodon dactylon</i>	Couch	Poaceae		
<i>Ehrharta sp</i>	Perennial veldt grass	Poaceae		
<i>Ehrharta villosa</i>	Pyp grass	Poaceae		
<i>Eragrostis curvula</i>	African lovegrass	Poaceae		
<i>Holcus spp</i>	Fog Grass	Poaceae		
<i>Hordeum leporinum</i>	Barley grass	Poaceae		
<i>Hyparrhenia hirta</i>	Tambookie Grass	Poaceae		
<i>Lagurus ovatus</i>	Hares tail grass	Poaceae		
<i>Lolium rigidum</i>	Annual ryegrass	Poaceae		
<i>Paspalum dilatatum</i>	Paspalum	Poaceae		
<i>Paspalum vaginatum</i>	Saltwater couch	Poaceae		
<i>Pennisetum clandestinum</i>	Kikuyu	Poaceae		
<i>Phalaris minor</i>	Lesser canary grass	Poaceae		
<i>Stenotaphrum secundatum</i>	Buffalo grass	Poaceae		
<i>Vulpia spp</i>	fescues/silvergrass	Poaceae		
HERBS				

<i>Acetosella vulgaris</i>	Sorrel	Polygonaceae		
<i>Agapanthus praecox</i>	Agapanthus	Amaryllidaceae		
<i>Agave americana</i>	Century plant	Agavaceae		
<i>Allium triquestrum</i>	Three cornered garlic	Alliaceae		
<i>Anagallis arvensis</i>	Pimpernel	Primulaceae		
<i>Arctotheca calendula</i>	Capeweed	Asteraceae		
<i>Asphodelus fistulosus/Trachyandra divaricata</i>	Onion weed/Dune onion weed	Asphodelaceae		
<i>Aster subulatus</i>	Bushy starwort	Asteraceae		
<i>Brassica tournefortii</i>	Mediterranean turnip	Brassicaceae		
<i>Carduus pycnocephalis</i>	Slender thistle	Asteraceae		
<i>Carpobrotus edulis</i>	Hottentot fig	Aizoaceae		
<i>Carthamus lantanus</i>	Saffron Thistle	Asteraceae	DP – P1, P3, P4	
<i>Centaurea melitensis</i>	Maltese cockspurr	Asteraceae		
<i>Chasmanthe floraqbunda</i>	African Cornflag	Iridaceae		
<i>Chenopodium album</i>	Fat hen	Chenopodiaceae		
<i>Chenopodium murale</i>	Creeping saltbush	Chenopodiaceae		
<i>Chlorophytum sp</i>	Spider plant			
<i>Cirsium vulgare</i>	Spear thistle	Asteraceae		
<i>Citrullus/Cucumis</i>	Melons	Cucurbitaceae		
<i>Conyza bonariensis/albida</i>	Fleabane	Asteraceae		
<i>Cotyledon orbiculata</i>	Cotyledon	Crassulaceae		
<i>Cynara cardunculus</i>	Artichoke thistle	Asteraceae		
<i>Cyperus brevifolius</i>	Mullumbimby couch	Cyperaceae		
<i>Cyperus congestus</i>	dense flat-sedge	Cyperaceae		
<i>Cyperus rotundus</i>	nut grass	Cyperaceae		
<i>Dimorphotheca ecklonis</i>	African Daisy	Asteraceae		
<i>Echium plantagineum</i>	Paterson's curse	Boraginaceae	DP – P1, P3, P4	
<i>Emex australis</i>	Doublegee	Polygonaceae	DP – P5	
<i>Euphorbia paralias</i>	Sea spurge	Euphorbiaceae		
<i>Euphorbia terracina</i>	Geraldton carnation weed	Euphorbiaceae		
<i>Freesia hybrid</i>	Freesia	Iridaceae		

<i>Gazania linearis</i>	Gazania	Asteraceae		
<i>Gladiolus undulatus</i>	Wavy gladiolus	Iridaceae		
<i>Gynandris setifolia</i>	Thread Iris	Iridaceae		
<i>Homeria sp</i>	Cape Tulip	Iridaceae	DP - P1, P3, P4	
<i>Juncus acutus</i>	Spiny rush	Juncaceae		
<i>Juncus bufonius</i>	Toad rush	Juncaceae		
<i>Lachenalia reflexa</i>	Lachenalia	Hyacinthaceae		
<i>Limonium lobatum</i>	Statice	Plumbaginaceae		
<i>Lupinus cosentinii</i>	Sandplain lupin	Fabaceae		
<i>Lythrum hyssopifolium</i>	Lesser loosestrife	Lythraceae		
<i>Mentha pulegium</i>	Pennyroyal	Lamiaceae		
<i>Mesembryanthemum nodiflorum</i>	Ice plant	Aizoaceae		
<i>Oenothera sp</i>	Evening Primrose	Onagraceae		
<i>Opuntia stricta</i>	Prickly pear	Cactaceae		
<i>Oxalis spp</i>	Oxalis	Oxalidaceae		
<i>Pelargonium capitatum</i>	Rose pelargonium	Geraniaceae		
<i>Phytolacca octandra</i>	Inkweed	Phytolaccaceae		
<i>Poraxis bulbifera</i>	Harlequin flower	Iridaceae		
<i>Rapistrum rugosum</i>	Turnip weed	Brassicaceae		
<i>Romulea rosea</i>	Guildford grass	Iridaceae		
<i>Rumex crispus</i>	Curled dock	Polygonaceae		
<i>Senecio spp</i>	Senecio	Asteraceae		
<i>Sisymbrium orientale</i>	Indian Hedge mustard	Brassicaceae		
<i>Sonchus oleraceus</i>	Sowthistle	Asteraceae		
<i>Sonchus sp</i>	Prickly sowthistle	Asteraceae		
<i>Trifolium spp</i>	Clovers	Fabaceae		
<i>Typha orientalis</i>	Cumbungi	Typhaceae		
<i>Vigna radiata</i>	Mungbean	Fabaceae		
<i>Watsonia barbonica/marginata/meriana</i>	Watsonia spp.	Iridaceae		
<i>Watsonia bulbifera</i>	Bulbil Watsonia	Iridaceae		
SHRUBS				
<i>Coleonema album</i>	Diosma	Rutaceae		

<i>Genista spp.</i>	Broom	Fabaceae		
<i>Gomphocarpus fruticosus</i>	Narrow leaved Cottonbush	Asclepiadaceae	DP – P1, P3, P4	
<i>Lantana camara</i>	Lantana	Verbenaceae		WONS
<i>Leonotis nepetifolia</i>	Lions tail	Hydrophyllaceae		
<i>Lycium ferocissimum</i>	African Boxthorn	Solonaceae		
<i>Polygala myrtifolia</i>	Polygala	Polygalaceae		
<i>Rubus spp.</i>	Blackberry	Rosaceae	DP – P1, P2, P4	WONS
<i>Solanum nigrum</i>	Blackberry nightshade	Solonaceae		
TREES				
<i>Acacia dealbata</i>	Silver wattle	Mimosaceae		
<i>Acacia pycnantha</i>	Golden wattle	Mimosaceae		
<i>Agonis flexuosa</i>	Peppermint	Myrteaceae		
<i>Chamaecytisus palmensis</i>	Tagasaste/Tree lucerne	Fabaceae		
<i>Cotoneaster pannosus</i>	Cotoneaster	Rosaceae		
<i>Lavatera arborea</i>	Tree Mallow	Malvaceae		
<i>Leptospermum laevigatum</i>	Victorian tea tree	Myrtaceae		
<i>Melaleuca armillaris</i>	Bracelet honey myrtle	Myrtaceae		
<i>Pinus pinaster</i>	Pinaster pine	Pinaceae		
<i>Pinus radiata</i>	Radiata pine	Pinaceae		
<i>Ricinus communis</i>	Castor oil plant	Euphorbiaceae		
<i>Schinus terebinthifolia</i>	Japanese pepper	Anacardiaceae		

APPENDIX 2: DECLARED WEEDS FOUND IN SHIRE OF ESPERANCE

Cotton Bush
Paterson's Curse
Cape Tulip (1 leaf & 2 leaved)
Stemless Thistle
Saffron Thistle
Skeleton Weed

Download descriptions & info from Weeds Australia website (except Stemless Thistle). Stemless Thistle on http://members.iinet.com.au/~weeds/western_weeds/asteraceae_six.htm

APPENDIX X: MAIN ENVIRONMENTAL WEEDS IDENTIFIED AT WORKSHOP 1

Common Name	Botanical Name
Caltrop	<i>Tribulus terrestris</i>
Victorian Tea Tree	<i>Leptospermum laevigatum</i>
Asparagus species (inc Bridal Creeper)	<i>Asparagus asparagoides & other Asparagus species</i>
African Boxthorn	<i>Lycium ferocissimum</i>
Tagasaste	<i>Chamaecytisus palmensis</i>
Golden Wattle & other eastern states Acacia sp.	<i>Acacia pycnantha & Acacia sp.</i>
Pelargonium	<i>Pelargonium capitatum</i>
Pyp Grass	<i>Ehrharta villosa</i>
African Lovegrass	<i>Eragrostis curvula</i>
Tambookie Grass	<i>Hyparrhenia hirta</i>
Watsonia species	<i>Watsonia sp.</i>
Cumbungi	<i>Typhus orientalis</i>
Spiny Rush	<i>Juncus acutus</i>
Pinus species	<i>Pinus pinaster & Pinus maritana</i>
Morning Glory	
Dolichos Pea	<i>Dipogon lignosus</i>
Geraldton Carnation Weed	<i>Euphorbia terracina</i>
Gazanias	
Fleabane	<i>Conyza bonariensis</i>
Prickly Pear	<i>Optunia stricta</i>
Century Plant	<i>Agave americana</i>
Thistle Family	
Castor Oil Plant	
Freesias	
Onion Weed	

APPENDIX 3: BUSHLAND RESERVES IDENTIFIED AT WORKSHOP 1

Reserve Name and Number	Weeds Known to Occur	Shire Vested Reserve?
Dalyup River Pioneer Reserve (Reserve 23570)	Spiny Rush, Freesias, Lovegrass	Yes
Munglinup Beach (Reserve 32337)	Prickly Pear?, Pyp Grass	Yes
Oldfield Estuary/ Munglinup River Park (Reserve 31759)	Prickly Pear?	No
Duke of Orleans Bay Regional Park (Reserve 41097)	Victorian Tea Tree, Boxthorn, African Lovegrass	Yes
Coramup Creek Reserve (Reserve 40216)	Cumbungi, kikuyu, Paterson's Curse	Yes
West Beach to 11 Mile Beach Reserve	Pyp Grass (Chapmans Point, Twilight), Marram Grass (Twilight), Pelagonium, Boxthorn (Blue Haven, Observatory, Hughes Steps/West Beach)	Yes
Salmon Gum's townsite	Caltrop, Paterson's Curse, Saffron Thistle, Prickly Pear, Gazanias	Some
Grass Patch Townsite	Saffron Thistle?, Lovegrass	Some
Israelite Bay (R3805)	Bridal Creeper, Century Plant	Yes
Kennedy's Beach	Unknown	Yes
Lake Monjینگup (R23043)	Bridal Creeper, Cotton bush, Victorian Tea Tree, Kikuyu, Lovegrass, Veldt grass, Wild Oats, Paddy Melons	Yes
Mt Ridley (R13486)	None known	Yes
Robert's Swamp (R26912)	Veldt Grass	Yes
Scaddan townsite	Paterson's Curse	?
Campbell's Road Reserve (Coramup Creek) R14159	Veldt Grass, African Lovegrass, Victorian Tea Tree, Pines	No
Bandy Creek Reserve (near Boat Harbour)	Unknown	Yes
Dempster Headland (mainly R41141)	Unknown	Yes
Thomas River (enclave)	Unknown	Yes
Alexander Bay	Unknown	Yes
Coomalbidgup Swamp (R24633)	Veldt grass	Yes
Condingup Townsite & Condingup Lake (R27785)	Unknown	Some
Pink Lake (R2242)	Victorian Tea Tree	Yes

APPENDIX X: EXAMPLE OF PEST PLANT LOCAL LAWS

LOCAL GOVERNMENT ACT 1995

AGRICULTURE AND RELATED RESOURCES PROTECTION ACT 1976

CITY OF ROCKINGHAM

PEST PLANTS LOCAL LAW 2000

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SCHEDULE 1—PEST PLANTS

SCHEDULE 2—PEST PLANT NOTICE

LOCAL GOVERNMENT ACT 1995
AGRICULTURE AND RELATED RESOURCES PROTECTION ACT 1976

CITY OF ROCKINGHAM

PEST PLANTS LOCAL LAW 2000

Under the powers conferred by the abovementioned Acts and under all other powers enabling it, the Council of the City of Rockingham resolved on 28 November 2000 to make the following local law.

PART 1—PRELIMINARY

1.1 Citation

This local law may be cited as the City of Rockingham Local Government Pest Plants Local Law 2000.

1.2 Repeal

The City of Rockingham Local Law relating to Pest Plants published in the *Government Gazette* on 7 June 1985 is repealed.

1.3 Definitions

In this local law, unless the context otherwise requires—

“**district**” means the district of the local government;

“**local government**” means the City of Rockingham;

“**pest plant**” means a plant described as a pest plant by clause 2.1 of this local law;

1.4 Application

This local law applies throughout the district.

PART 2—DESCRIPTION OF PEST PLANTS

2.1 Description of Pest Plants

Every plant described in Schedule 1 to this local law is a pest plant.

PART 3—SERVING OF NOTICES

3.1 Serving of Notices

(a) The local government may serve on the owner or occupier of private land within the district a duly completed notice in the form of Schedule 2 to this local law requiring the destruction, eradication or otherwise control of any pest plant on that land.

(b) A person served with a notice under sub clause (a) shall comply with that notice within the time and in the manner specified therein.

PART 4—OFFENCES

4.1 Penalties

(a) Where a person fails to comply with a notice served under clause 3.1 of this local law, the local government may—

(i) without payment of any compensation in respect thereof, destroy, eradicate or control, as the case may be, any pest plant the destruction, eradication or control of which was required by the notice; and

(ii) recover in a court of competent jurisdiction from the person to whom the notice is directed, the amount of the expense of such destruction, eradication or control.

Schedule 1
PEST PLANTS

Common Name	Scientific Name
Caltrop	<i>Tribulus terrestris</i>
Apple of Sodom	<i>Solanum hermannii</i>

Schedule 2
PEST PLANT NOTICE

No.:

To
(Full name)

of
(Address)

You are hereby given notice that under the City of Rockingham Pest Plants Local Law 2000 you are required to
.....
(here specify whether required to destroy, eradicate or otherwise control)

the pest plant—
.....
(Common Name) (Scientific Name)

on
(here specify the land)

of which you are the
(owner or occupier)

This notice may be complied with by
.....
(here specify manner of achieving destruction, eradication or control)

Such measures shall be commenced not later than
(date)

and shall be completed by
(date)

Upon failure to comply with this notice within the times specified, the local government may destroy, eradicate or control, as the case may be, any specified pest plant at your expense, and if necessary recover the same in a court of competent jurisdiction.

Date of service of notice

.....
Signature of authorised person

Dated 19 December 2000.
The Common Seal of the City of Rockingham was affixed by authority of a resolution of the Council in the presence of—

C. S. ELLIOTT, Mayor.
G. G. HOLLAND, Chief Executive Officer.



LOCAL GOVERNMENT ACT 1995
AGRICULTURE AND RELATED RESOURCES PROTECTION ACT 1976
Town of Kwinana
Pest Plants Local Law

In pursuance of the powers conferred upon it by the above-mentioned Act and all other powers enabling it, the Council of the Town of Kwinana hereby records having resolved on 8 October 2003 to make the following local law.

Citation

1. This local law may be cited as the Town of Kwinana Pest Plants Local Law.

Interpretation

2. In these local laws, unless the context otherwise requires -
"district" means the district of the Town of Kwinana
"local government" means the Town of Kwinana
"pest plant" means a plant described as a pest plant by clause 4 of these local laws.
3. These local laws apply in respect of the district.
4. Every plant described in the First Schedule of these local laws is a pest plant.
5. The local government may serve on the owner or occupier of private land within the district, notice requiring him/her to destroy, eradicate or otherwise control any pest plant on that land and any person so served shall comply with that notice within the time and in the manner specified therein.
6. Where a person fails to comply with a notice under clause 5 of these local laws served upon him/her, the local government may -
 - (a) without payment of any compensation in respect thereof, destroy, eradicate or control, as the case may be, any pest plant the destruction, eradication or control of which was required by the notice; and
 - (b) recover in a court of competent jurisdiction from the person to whom the notice is directed, the amount of the expense of such destruction, eradication or control.

**First Schedule
Pest Plants**

Common Name	Scientific Name
Arum Lily	<i>Zantedeschia aethiopica</i>
Bridal Creeper	<i>Asparagus asparagoides</i>
Blowngrass	<i>Lachnagrostis filiformis</i>
Bulrush	<i>Typha orientalis</i>
Caltrop	<i>Tribulus terrestris</i>
Cape Tulip	<i>Homeria species</i>
Caster Oil Bush	<i>Ricinus communis</i>
Carnation Weed	<i>Euphorbia terracina</i>
Cottonbush	<i>Gomphocarpus fruiticosus</i>
Dock	<i>Rumex species</i>
Doublegee	<i>Emex australis</i>
Evening Primrose	<i>Oenothera species</i>
Gladiolus	<i>Gladiolus caryophyllaceus</i>
Lovegrass	<i>Eragrostis curvula</i>
Pampus Grass	<i>Cortaderia selloana</i>
Patterson's Curse	<i>Echium plantagineum</i>
Pigface	<i>Carpobrotus edulis</i>
Thistle	<i>Carduus or Cirsium species</i>
Veldt Grass	<i>Ehrharta calycina</i>

Dated this eighth day of October 2003.

The Common Seal of the }
Town of Kwinana was }
hereunto affixed }
in the presence of : }

**J H D SLINGER, JP
MAYOR**

**C OUGHTON
ACTING CHIEF EXECUTIVE OFFICER**

APPENDIX X: WEEDS OF NATIONAL SIGNIFICANCE (WONS)

COMMON WEEDS	BOTANICAL NAME
Alligator Weed	<i>Alternanthera philoxeroides</i>
Athel Pine or Tamarisk	<i>Tamarix aphylla</i>
Bitou Bush/Boneseed	<i>Chrysanthemoides monilifera</i> ssp <i>rotundata</i> and ssp <i>monilifera</i>
Blackberry	<i>Rubus fruticosus</i> aggregate
Bridal Creeper	<i>Asparagus asparagoides</i>
Cabomba	<i>Cabomba caroliniana</i>
Chilean Needle Grass	<i>Nassella neesiana</i>
Gorse	<i>Ulex europaeus</i>
Hymenachne	<i>Hymenachne amplexicaulis</i>
Lantana	<i>Lantana camara</i>
Mesquite	<i>Prosopis</i> species
Mimosa	<i>Mimosa pigra</i>
Parkinsonia	<i>Parkinsonia aculeate</i>
Parthenium Weeds	<i>Parthenium hysterophorus</i>
Pond Apple	<i>Annona glabra</i>
Prickly Acacia	<i>Acacia nilotica</i>
Rubber Vine	<i>Cryptostegia grandiflora</i>
Salvinia	<i>Salvinia molesta</i>
Serrated Tussock	<i>Nassella trichotoma</i>
Willow	<i>Salix</i> spp.

APPENDIX X: ALERT LIST FOR ENVIRONMENTAL WEEDS

COMMON NAME	BOTANICAL NAME
Blue Hound's Tongue	<i>Cynoglossum creticum</i>
Cutch Tree	<i>Acacia catechu</i>
Karoo Thorn	<i>Acacia karroo</i>
Chinese Violet	<i>Asystasia gangetica</i> ssp. <i>micrantha</i>
Barleria or Porcupine Flower	<i>Barleria prionitis</i>
Kochia	<i>Bassia scoparia</i>
Heather	<i>Calluna vulgaris</i>
Siam Weed, Chromolaena	<i>Chromolaena odorata</i>
Blue Hound-s-tongue	<i>Cynoglossum creticum</i>
Cyperus Sedge	<i>Cyperus teneristolon</i>
White Spanish Broom/ White Broom	<i>Cytisus multiflorus</i>
False Yellowhead	<i>Dittrichia viscosa</i>
Horsetails	<i>Equisetum</i> spp.
Senegal Tea Plant/Temple Plant	<i>Gymnocoronis spilanthoides</i>
Hawkweed/Orange Hawkweed	<i>Hieracium aurantiacum</i>
Chinese Rain Tree/Chinese Flame Tree/Flamegold/Golden Rain Tree/Flame Golden Rain Tree	<i>Koelreuteria elegans</i> ssp. <i>formosana</i>
Lachenalia/Yellow Soldier	<i>Lachenalia reflexa</i>
Lagarosiphon	<i>Lagarosiphon major</i>
Lobed Needle Grass	<i>Nassella charruana</i>
Cane Needle Grass	<i>Nassella hyalina</i>
Pelargonium/ Garden Geranium	<i>Pelargonium alchemilloides</i>
Leaf Cactus/ Blade Apple	<i>Pereskia aculeate</i>
Uruguayan Rice Grass	<i>Piptochaetium montevidense</i>
Praxelis	<i>Praxelis clematidea</i>
White Weeping Broom/White Spanish	<i>Retama raetam</i>

Broom	
Holly Leaved Senecio	Senecio glastifolius
Laurel Clock Vine/Thunbergia	Thunbergia laurifolia

APPENDIX X: LIST OF SLEEPER WEEDS

Common Name	Botanical Name	Category
Common Crupina	<i>Crupina vulgaris</i>	1
Parodi Spike Rush	<i>Elocharis parodii</i>	1
Uruguayan Ricegrass	<i>Piptochaetium montevidense</i>	1
Chinese Violet	<i>Asystasia gangetica ssp. micrantha</i>	2
Chilquilla	<i>Baccharis pingraea</i>	2
Mallee Cockspur	<i>Centaurea eriophora</i>	2
Lobed Needle Grass	<i>Nassella charruana</i>	2
Meadow Parsley/ Water Dropwort	<i>Oenanthe pimpinelloides</i>	2
Taurian Thistle	<i>Onopordum tauricum</i>	2
Pannicle Jointvetch	<i>Aeschynomene paniculata</i>	3
Badhara Bush	<i>Gmelina elliptica</i>	3
Creeping Yellow Cress	<i>Rorippa sylvestris</i>	3
Giant Tropical Salvia	<i>Brillantaisia lamium</i>	4
Chilean Dodder	<i>Cuscuta suaveolens</i>	4
Orange Hawkweed	<i>Hieracium aurantiacum</i>	4
Snakecotton	<i>Froelichia floridana</i>	4
Square stalked St John's Wort	<i>Hypericum tetrapterum</i>	4

Notes:

Category 1 – species that are considered to have been eradicated but are recommended for ongoing field monitoring

Category 2 – species for which recent field surveys are complete and which are recommended for immediate eradication

Category 3 – species considered suitable for eradication but for which field surveys on distribution are recommended to confirm feasibility of eradication

Category 4 – eradication is desirable but probably not feasible, for which field surveys on distribution are recommended to confirm this assessment

APPENDIX X: LIST OF WORKSHOP ATTENDEES

Table X: ATTENDANCE LIST FOR WORKSHOP 1 - 19TH FEBRUARY 2008

NAME	ORGANISATION	ROLE
Coral Turley	Esperance Weeds Action Group	Volunteer
Robyn Cail	South Coast NRM	Biodiversity Officer
Ian Hartley	South Coast NRM	Small Landholders Project Officer
Paul Clifton	Shire of Esperance	Manager of Health & Environment
Mark Habreneckt	Shire of Esperance	Garden Crew Supervisor
Suzanne Hill	Department of Agriculture & Food WA	Biosecurity Officer
Grahame Blacklock	Department of Agriculture & Food WA	?

Table X: ATTENDANCE LIST FOR WORKSHOP 2 – 9TH SEPTEMBER 2008

NAME	ORGANISATION	ROLE
Coral Turley	Esperance Weeds Action Group	Volunteer
Robyn Cail	South Coast NRM	Biodiversity Officer
Ian Hartley	South Coast NRM	Small Landholders Project Officer
Paul Clifton	Shire of Esperance	Manager of Health & Environment
Suzanne Compagnoni	Department of Agriculture & Food WA	Biosecurity Officer
Eric ?		Landowner, Coramup Creek
Garry English	South Coast NRM	Chairman
Brian Warren	Lake Monjigup Community Development Group	Caretaker
Rani Stewart	South Coast NRM	Natural Resource Management Officer
Cindee Hage	South Coast NRM	Lake Warden Catchment Officer

