Port Phillip and Western Port

Invasive Plants & Animals Strategy

State Government Victoria

Port Phillip & Westernport CMA

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Regional Steering Group for the development of the Port Phillip and Western Port Invasive Pest Plant and Animal Strategy:

David Mifsud and Adam Kay (DPI)
Penny Gillespie and Owen Gooding (DSE)
Peter Rennick (Parks Victoria)
Karyn Hunter (Melbourne Water)
Jacquelyn Ross, Emmaline Froggatt and Mark Smith (PPWCMA)

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1 Executive Summary

This strategy addresses Invasive Plant and Animal (IPA) management in the Port Phillip and Western Port region. It lays out the principles and logic that government agencies, industry and the community can use to take a strategic and coordinated approach.

This strategy is not intended as an operational document to describe annual IPA works programs. Instead, it sets objectives and broad actions for region-wide IPA management and proposes a system to monitor, evaluate and report on the progress of major programs.

The regional objectives for pest management within the strategy are:

Objective 1

Implement coordinated, cooperative and effective management of invasive plants and animals across the region.

Objective 2

Prevent the introduction and establishment of new high risk invasive plants and animals.

Objective 3

Eradicate, contain or prevent further spread of established infestations of high risk invasive plants and animals.

Objective 4

Address the risks of impacts of invasive plants and animals on the priority environmental and agricultural assets.

Objective 5

Improve management of invasive plants and animals through effective monitoring, evaluation and reporting.

Fifteen actions have been proposed to achieve these Objectives in Chapters 5, 6, 7 and 9. The design and implementation of integrated, place-based programs for management of invasive plants and animals, plus regional examples, are outlined in Chapter 8.

2 Introduction

2.1 About this strategy

Invasive plants and animals (IPAs) are having pronounced environmental, social and economic impacts in the Port Phillip and Western Port region. IPAs impact on many people, businesses and natural environments in the rural and urban parts of this region.

Five government agencies with IPA as part of their core business are the Department of Primary Industries (DPI), the Department of Sustainability and Environment (DSE), Parks Victoria, Melbourne Water and the Port Phillip and Western Port Catchment Management Authority (PPWCMA). These agencies jointly developed this strategy.

In developing this strategy, the agencies recognise and support the efforts that landholders, Landcare groups, local governments and the broader community are undertaking to control IPAs that are a priority in their local area.

2.2 Scope of the strategy

This strategy addresses IPA management in the Port Phillip and Western Port region. It lays out the principles and logic that government agencies, industry and the community can use to take a strategic and coordinated approach.

The principles and logic used in this document follow the Victorian Government's Invasive Plants and Animals Policy Framework (DPI, 2010a). This framework, also known as the 'bio-security approach', is a strategic approach to IPA management, adopted by State Government as an effective way to plan, manage and invest public funds in invasive species control (for more information see Chapter 3).

This strategy will assist in the achievement of the following outcomes:

- Prevention of the entry and establishment of new high risk IPAs;
- Eradication of high risk IPAs in the early stage of establishment;
- Containment of high risk IPAs that are of limited distribution;
- Protection of key biodiversity and other natural resource assets within the region by reducing the impact of IPAs.

The region's 'assets' are the biophysical or physical elements of the environment that warrant protecting because they provide social, economic and/or environmental services.

This strategy identifies priorities for investment in IPA management, with a focus on future allocation of public funds. It seeks to achieve benefits to the broader Victorian community from the management of IPA.

The IPAs considered by this strategy are those that are, or can be, declared under the Catchment and Land Protection Act 1994 (CaLP Act), and that meet the definition of invasive species under the Victorian Invasive Plant and Animal Policy Framework. The definition of an invasive species under this framework is '*…mammals, amphibians, reptiles, birds and both terrestrial and freshwater plants, that are not indigenous to Victoria*.'

It should be noted that over-abundant native species are managed under the Wildlife Act 1975 and invasive marine species are dealt with under the Fisheries Act 1995. Both are beyond the scope of this strategy.

This IPA Strategy has a lifespan of 5 years. It replaces the Port Phillip and Western Port Rabbit Action Plan 2003 (PPWCMA, 2003a) and Port Phillip and Western Port Weed Action Plan 2003 (PPWCMA, 2003b). It does not replace Wild Dog Action Plans; existing plans remain current throughout the state.

This strategy is not intended as an operational document to describe annual IPA works programs. Instead, it sets objectives and broad actions for region-wide IPA management and proposes a system to monitor, evaluate and report on the progress of implementation of publicly funded programs.

2.3 Aims of this strategy

Improvements in the coordination and prioritisation of investment in and management of IPA in the Port Phillip and Western Port region are the primary aims of this strategy. The strategy will advance the coordination and prioritisation of efforts between government, industry and the community.

The strategy also aims to help land managers and the broader community to understand the logic and framework that have led to the objectives and actions. This strategy is an introduction and guide to the biosecurity approach and how it can be applied at a State, regional and local level.

2.4 The Port Phillip and Western Port region

The Port Phillip and Western Port region includes Port Phillip Bay and Western Port and their associated catchments, along with French and Phillip Islands (PPWCMA, 2004). It covers an area of approximately 1.3 million hectares and contains metropolitan Melbourne, which is home to 3.9 million people, more than two-thirds of Victoria's population.

The features of the region include:

- Around 45% of the area is farmland accommodating some 4,000 enterprises producing food and fibre worth over $1 billion annually (PPWCMA, 2004). Grazing is by far the largest industry by area (67.5%) but intensive animal, vegetable and dairy industries are the most important contributors to the region's economy.
- It has a diverse range of natural ecosystems with more than 1,860 species of native flora and more than 600 species of native vertebrate fauna. Around 340 flora and 160 fauna are considered by DSE to be rare or threatened, including Victoria's faunal emblems, the Helmeted Honeyeater and Leadbeaters Possum.
- About 39% of the area retains its locally indigenous vegetation, including some rare and endangered vegetation types, such as native grasslands.
- The region's parks and reserves, including 8 National Parks, 6 State parks and 8 marine protected areas, support the native flora and fauna, and provide highly valued recreation and tourism areas.
- The region's water storage and waterway system provides potable supply for 75% of Victoria's population and many other economic, social and environmental benefits. There are over 8,000 kilometres of waterways and more than 900 wetlands, 3 of which are listed as Wetlands of International Importance under the Ramsar Convention on Wetlands.
- There are many sites of cultural significance including important indigenous sites, such as stone quarries, coastal shell middens and hundreds of scar trees scattered across the region, geological formations such as the Organ Pipes and Werribee Gorge, significant landscapes and vegetation of local and introduced species.
- Many people and organisations play a part in the ongoing management of the region's assets, including numerous Government agencies, 38 municipalities, various non-government organisations, agricultural and industry bodies and over 500 volunteer Landcare and community groups.

2.5 Threats from invasive plants and animals in the region

IPAs pose a major threat to the region's natural assets. Their impact usually results in undesirable change and lessening of the social, economic and environmental values.

Agricultural weeds compete with crops and affect quality and yield of produce. They reduce the carrying capacity of pastures. In both cases their control increases the cost of production. Weeds that invade native habitats alter the species composition, the rate, spread and intensity of fire, the abundance of native vegetation communities, and the habitat for native animals. Some weeds can cause human health problems, such as Parthenium Weed (*Parthenium hysterophorus*) and Perennial Ragweed (*Ambrosia psilostachya*) (Fig. 1) for asthma and other respiratory problems. Some water weeds, such as Water Hyacinth (*Eichhornia crassipes*) (Fig. 2), degrade the quality of waterways.

Fig. 1 - Perennial Ragweed (Photo: provided by DPI)

Fig. 2 - Water Hyacinth (Photo: provided by DPI)

Fig. 3 - European Red Fox (Photo: provided by T Bloomfield)

Pest animals have a significant impact on primary industries through direct loss of productivity and cost of control by land managers. Well-known problem species include European Red Fox (Fig. 3) and European Rabbit (Fig. 4). Foxes prey on livestock (mainly lambs) and poultry while rabbits compete with livestock for pasture and damage soil cover and composition.

Fig. 4 - European Rabbit warren (Photo: provided by S McPhee)

Pest animals are also a significant threat to biodiversity through competition, predation, habitat destruction and through the spread of diseases. Small native mammals, ground-nesting birds and some small reptiles are particularly susceptible to predation by foxes and feral cats. Rabbits and feral pigs have a significant impact on native habitat preventing the regeneration of native plants, spreading weeds and causing soil damage and erosion.

3 Framework for Invasive Plant & Animal management

3.1 Legislative and policy framework

There are a number of policies and plans from Federal and State legislation and from local planning strategies and management plans that are relevant for the management of IPAs (Appendix I). In Victoria, the CaLP Act has the primary legislative role in the management of IPAs.

Under the CaLP Act, noxious weed species are divided into 4 categories:

- 'State prohibited' weeds are those species that either do not occur in Victoria but pose a significant threat were they to enter, or are present in small numbers, pose a serious threat and can reasonably be expected to be eradicated from the State as a whole. The Victorian government is responsible for their eradication.
- 'Regionally prohibited' weeds are those species which are not widely distributed in a region, but are capable of spreading further and could be eradicated in that region. In the early stages of range expansion, eradication of a pest may be feasible. Land managers must take reasonable steps to eradicate Regionally prohibited weeds in relation to their land.
- 'Regionally controlled' weeds are widespread species in that region. Land managers must take all reasonable steps to prevent the growth and spread of these weeds in relation to their land.
- 'Restricted' weeds are deemed a serious threat to primary production, Crown land, the environment or community health and have the potential, if sold or traded, to spread within or from Victoria. There are no legal requirements to eradicate or control restricted weeds growing on land; however they cannot be traded, transported or spread in Victoria.

DPI takes into account the Weeds of National Significance (WONS) status of a species when reviewing noxious weeds under the CaLP Act. There are currently 20 WONS weeds listed. Unless classified as a State prohibited weed individual landowners and managers are ultimately responsible for managing these weeds.

In regard to invasive animals the CaLP Act establishes the following categories:

- 'Restricted' pest animals are species that are not established in the wild in Victoria; however they are, or have the potential to become a serious threat to primary production, Crown land, the environment or community health in Victoria. Examples of high risk invasive animals detected in the wild include Red-eared Slider Turtle and Grey Squirrel. Examples of other high risk invasive animals of concern include Asian Black Spined Toad (see Case Study 1), Japanese Fire Bellied Newt, and Boa Constrictor. The importation, keeping, breeding and trading of restricted pest animals is illegal and penalties apply. Occurrences of restricted pest animals, in the wild or being illegally kept, should be reported to DPI.
- 'Established' pest animals are species that are established in the wild in Victoria and are a serious threat to primary production, Crown land, the environment or community health in Victoria. Landowners have the responsibility to take all reasonable steps to prevent the spread of, and as far as possible eradicate, established pest animals on their land. It is not possible to eradicate these pest animals from the state, therefore asset protection is the most effective approach to minimise their threat on high value assets. Examples of species established in the wild include rabbits, foxes, wild dogs, feral goats, and feral pigs.

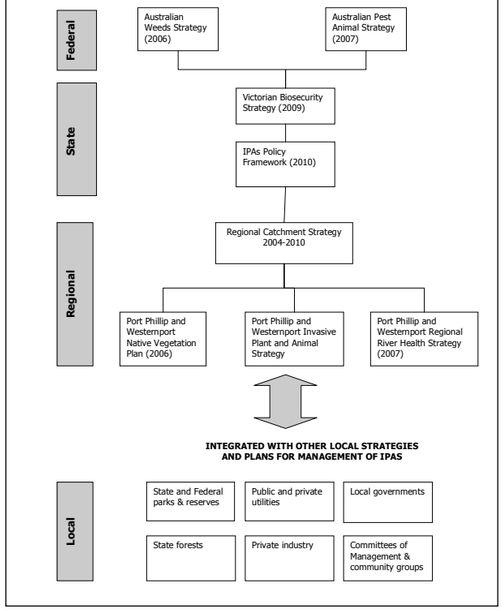
There are other non-declared animals, such as deer and feral cats that also threaten the region's assets in some locations.

The relevant legislation is taken into account by the key State, regional and local strategies and plans for IPA management as illustrated in Figure 5. The third edition of the Port Phillip and Western Port Regional Catchment Strategy (RCS) is under development and will replace the existing RCS (PPWCMA, 2004). The renewed edition of the RCS will reflect the priorities of the 'bio-security approach'.

There are a number of local strategies and plans used by land managers to guide the management of IPAs on private and public land. Some local governments have environmental strategies underpinned by specific weed and pest animal management strategies.

These outline local government's commitment to manage pests on municipal land and to provide guidance to other land managers on how they can meet their responsibilities. Several of the region's parks and reserves managed by State agencies, such as Parks Victoria, also have strategies to control IPAs.

Fig. 5 - Key Federal, State and regional policies, strategies and plans relevant to management of invasive pest plants and animals



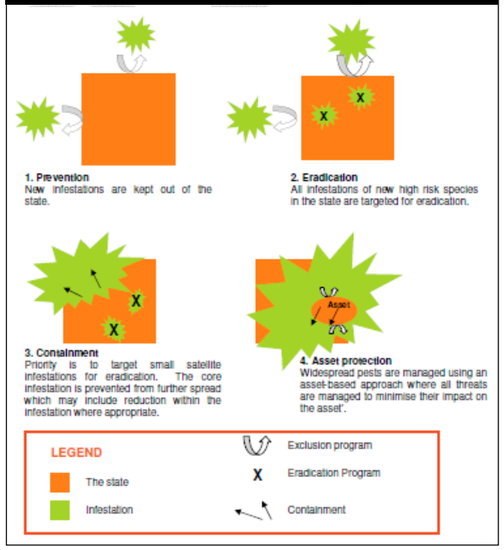
3.2 Biosecurity approach to invasive plant and animal management

Under the biosecurity approach to IPA management, the Victorian Government prioritises efforts to prevent new invasive species from establishing within the State of Victoria. A greater return on investment is achieved by focusing on prevention and eradication at the early stages of invasion compared to containment, reduction and localised asset protection once an invasive species is widespread (Fig 6 & 7).

The Victorian Government also recognises the importance of undertaking work on established IPA's when required.

In the following explanation of the biosecurity approach (Fig 6) there is a focus on how it applies at the State-wide and regional scale. The principles are a useful guide for private and public land managers who are dealing with IPA management at a local scale. Whether a particular invasive species is declared under the CaLP Act or not, land managers should consider if the most cost-efficient approach to management is about prevention, eradication or containment.

Fig. 6 - Approaches to management at different stages of invasive species invasion (Source: Invasive Plants and Animal Policy Framework, DPI [2010b])



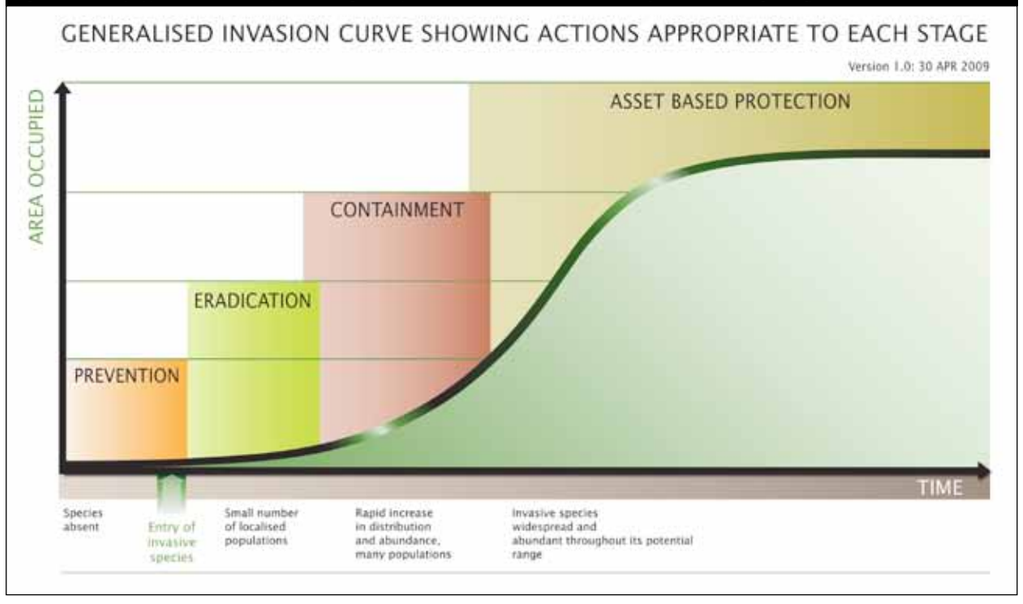
IPA programs can be planned and undertaken using a 'species-led' approach, prioritising one species above another on the basis of the risk it poses to economic, environmental and social values. 'Prevention' is a cost-effective approach that involves minimising the movement of new IPA species into the state by all potential pathways. New IPA species problems can emerge from a range of sources including commercial trade (eg nurseries, pet shops and stock/fodder contamination) and changing environmental conditions (eg fire, drought and climate change). The introduction of IPAs can occur via a variety of pathways including natural migration, hitchhiking in cargo, contaminants in fodder and hay or spread by vehicles, stock or people.

'Eradication' may only be practical at the very early stages of entry. If a species is identified early, eradication can be almost as cost effective as prevention. The aim of this approach is to eradicate the infestation whilst the abundance and distribution of the species are very low.

The principal aim of 'containment' is to prevent the spread of an invasive species beyond the boundary of its current infestation. This may involve reducing the species' abundance and extent within the containment area to prevent further spread. Containment programs may be expensive and on-going, so they should focus on very high impact invasive species. From a state-wide perspective, the control of Regionally prohibited weeds falls within this management approach.

Once a pest becomes widespread and containment is no longer possible, focus shifts to protecting the region's priority assets. An asset-based approach requires identification of the regional assets most in need of management programs that include appropriate pest control. Pest management should be considered as part of a holistic approach to maintaining or restoring asset condition. The asset-based approach also encompasses the application of prevention, eradication and containment activities at local scale.

Fig. 7 - Biosecurity approach to invasive species management (Source: Invasive Plants and Animal Policy Framework, DPI [2010b]).



4 Strategy's objectives

The regional objectives for IPA management within this strategy are:

Objective 1	Implement coordinated, cooperative and effective management of invasive plants and animals across the region.
Objective 2	Prevent the introduction and establishment of new high risk invasive plants and animals.
Objective 3	Eradicate, contain or prevent further spread of established infestations of high risk invasive plants and animals.
Objective 4	Address the risks of impacts of invasive plants and animals on the priority environmental and agricultural assets.
Objective 5	Improve management of invasive plants and animals through effective monitoring, evaluation and reporting.

These objectives are the subjects of the remaining sections of this strategy.

5 Responsibilities, Coordination, Cooperation & Partnerships

Objective 1 Implement coordinated, cooperative and effective management of invasive plants and animals across the region.

5.1 Roles and responsibilities of the regional government agencies

There are several agencies with responsibilities for managing IPAs for public benefit in the Port Phillip and Western Port region:

Department of Primary Industries

- Participate as member of the Regional Invasive Species Management Working Group.
- Statewide lead for policy development and implementation for IPA.
- Enforcing provisions of the CaLP Act aligned to state-wide and regional IPA management priorities (e.g. property inspections, extension and compliance programs for the management of priority invasive species on private land).
- Lead role in delivery of private land programs.
- Identification and risk assessment of new high-risk IPAs.
- Contributing data for strategy monitoring, evaluation and reporting.
- Prevention and preparedness to manage new incursions of high-risk IPAs.
- Surveillance programs for early detection of new high-risk IPAs.
- Respond to new high-risk IPAs into Victoria (State prohibited weeds and new high-risk invasive animal species treated for eradication on private and public land).
- Monitoring distribution and abundance of priority IPAs.
- Provision of technical and best-practice advice on the prevention and management of invasive species declared under the CaLP Act.
- Assisting the development and function of industry stewardship and quality assurance programs.

Department of Sustainability and Environment

- Participate as member of the Regional Invasive Species Management Working Group.
- Management of Crown land reserves and State forests.
- Lead role in delivery of IPA control programs on public land and completing the monitoring and reporting of activities involved with this regional strategy.
- Contributing data for strategy monitoring, evaluation and reporting.
- Facilitate IPA control to enhance the survival of isolated populations of threatened species.
- Oversight of policy implementation regarding IPA control to protect biodiversity on public land.
- Support of IPA management programs, such as the Weeds and Pests Initiative and the Good Neighbour Initiative.

Parks Victoria

- Participate as member of the Regional Invasive Species Management Working Group.
- Management of National parks, State parks and conservation reserves.
- Contributing data for strategy monitoring, evaluation and reporting.
- Delivery of IPA programs in parks and reserves.

Port Phillip and Westernport CMA

- Participate as member of the Regional Invasive Species Management Working Group.
- Strategic planning and coordination for natural resource management in the region.
- Reporting on the condition of the region's natural resources.
- Community awareness raising/education on natural resource management issues.
- Provision of advice to the Minister on recommendations for the declaration or revocation of invasive species under the CaLP Act.

Melbourne Water

- Participate as member of the Regional Invasive Species Management Working Group.
- Contributing data for strategy monitoring, evaluation and reporting.
- Management of Melbourne's water supply catchments and dams, removes and treats most of Melbourne's sewage and manages rivers, creeks and major drainage systems in and around Melbourne.
- Melbourne Water has the same land management responsibilities as other land owners and managers under the CaLP Act.

Local Government

- Councils have several responsibilities relating to IPA management. As large landholders they have the same duty-of-care responsibilities as other land managers under the CaLP Act.
- Contributing data for strategy monitoring, evaluation and reporting.
- Councils implement the Planning and Environment Act 1987 and with other organisations, develop and implement planning schemes.

VicRoads

- VicRoads maintains highways and declared main roads including all aspects of managing the road reserve, including invasive species control. As land owners, they have the same duty-of-care responsibilities as other land owners and managers under the CaLP Act.
- Contributing data for strategy monitoring, evaluation and reporting.

VicTrack

- VicTrack is responsible for the state's rural railway reserves including the management of invasive species on those reserves. As land owners, they have the same duty-of-care responsibilities as other land owners and managers under the CaLP Act.
- Contributing data for strategy monitoring, evaluation and reporting.

All other land managers must also deal with IPAs on their land appropriately and not cause impact to others, and undertake required actions for IPAs declared under the CaLP Act.

Effective partnerships for IPA management

Developing partnerships is critical to the success of invasive pest management programs. IPAs spread across property boundaries and can be introduced and spread via many commercial business activities.

The benefits of partnerships for IPA management can include:

- Sharing of knowledge;
- Sharing of resources;
- Minimising management costs;
- Coordinating operational activities for more effective invasive species management.

It is important that regional Government agencies recognize the contribution of community groups, Indigenous people, Landcare, business and private landholders in IPA management and continue to cultivate relationships and support them.

To improve the coordination of pest management across the region, it is proposed that a Regional Invasive Species Management Working Group be established and include representatives of DPI, DSE, Parks Victoria, Melbourne Water and the PPWCMA. The Working Group should be in existence at least for the life of this strategy to ensure coordination of invasive species management. The Working Group should annually:

- Review and evaluate IPA programs undertaken;
- Share information and evaluate planning for potential future programs;
- Identify trends for invasive species and their impacts on assets, and
- Identify emerging threats.

The task of convening and executively supporting the Working Group, and coordinating the implementation, monitoring and review of this strategy is an important and ongoing task. This task is estimated to require at least 0.5 FTE of staffing, however funding for this role has not yet been secured. The funding of this role should be a priority for government investment in this region because it will lead to substantial benefits in the cooperation between agencies and the delivery of major IPA programs.

Action 1	
Establish a Regional Invasive Species Management Working Group to engage with other major land managers in the region and report annually on the progress of government funded programs for management of invasive plants and animals.	
Partners	DPI, DSE, Parks Victoria, Melbourne Water, PPWCMA, other State Government land managers, local government & industry

Action 2	
Facilitate partnerships and programs for species-led and asset-based management of invasive plants and animals.	
Lead Role	Regional Invasive Species Management Working Group
Partners	Other public and private land managers & community

6 Prevention, Eradication & Containment of Invasive Plants & Animals

Objective 2	Prevent the introduction and establishment of new high risk invasive plants and animals.

Objective 3	Eradicate, contain or prevent further spread of established infestations of high risk invasive plants and animals.

There is a constant threat of introductions of new pest species that could establish themselves and have substantial impacts on the Port Phillip and Western Port region. Melbourne ports, interstate transport links, and associated transport infrastructure act as points of entry and major pathways for the introduction and spread of new and establishing pests. When this is coupled with a large resident population, a high incidence of private urban land with public land and a thriving trade in exotic pets and garden plants, there is a heightened recognition of the threat of IPAs naturalising within the region.

Generally, high risk invasive plant and animal incursions that are considered preventable or eradicable are managed on a state-wide basis by DPI. DPI's prevention and eradication programs aim to prevent high risk invasive plants and animals from establishing in Victoria and, where identified, are actively managed towards eradication. To achieve these goals DPI works collaboratively with interstate agencies, Australian Quarantine and Inspection Service (AQIS), research organisations, industry groups and herbaria to share information, improve procedures and processes, detection and identification.

An example of this approach is Victoria's Branched Broomrape (*Orobanche ramosa*) prevention program. Biosecurity South Australia identified linked properties within Victoria through potentially contaminated machinery or stock for future DPI surveillance. This helps prevent the introduction and establishment of this high-risk species to Victoria's agricultural industries. This type of approach to prevention is illustrated in more detail in Case study 1 – Asian Black Spined Toad.

Case Study 1: Asian Black Spined Toad - prevention

The Asian Black Spined Toad (*Duttaphrynus melanostictus*) is listed by AQIS as one of the ten most unwanted pests in Australia. The Black Spined Toad is a carnivore, competes with native frogs and toads for food and habitats, and is likely to carry exotic parasites or diseases. The Black Spined Toad is found in China, southern Asia, India, Pakistan, Nepal and Indonesia. Because it tolerates cooler climates it poses a greater threat of establishment in Victoria than its close relative the Cane Toad (*Rhinella marinus*).

Individuals of this species are often intercepted at ports around Australia. In June 2009 a live Asian Black Spined Toad was found in a shipping container at New Plymouth, New Zealand. Because the container had recently departed from Lang Lang, Victoria Australia's Department of Primary Industries (DPI) conducted an investigation.

Shipping records established that the container departed from Germany, docked at Malaysia then Lang Lang in Victoria before reaching New Zealand. Because the investigation was not able to conclusively establish where the toad began its journey, an intensive survey of the Lang Lang area

Fig. 8 - Asian Black Spined Toad

was conduced by DPI throughout the summer of 2009/10. No evidence of the Asian Black Spined Toad has been found.

This case study illustrates the risk of international and interstate trade as a key pathway for the inadvertent entry of IPAs to the Port Phillip and Western Port catchment. With large volumes of trade passing through the catchment, prevention, early detection and eradication of species such as the Asian Black Spined Toad are vital to protecting the region's environmental assets.

Fig. 9 - The distribution of State prohibited weed species in Victoria as of 30 June 2010 (Source: Integrated Pest Management System, DPI)

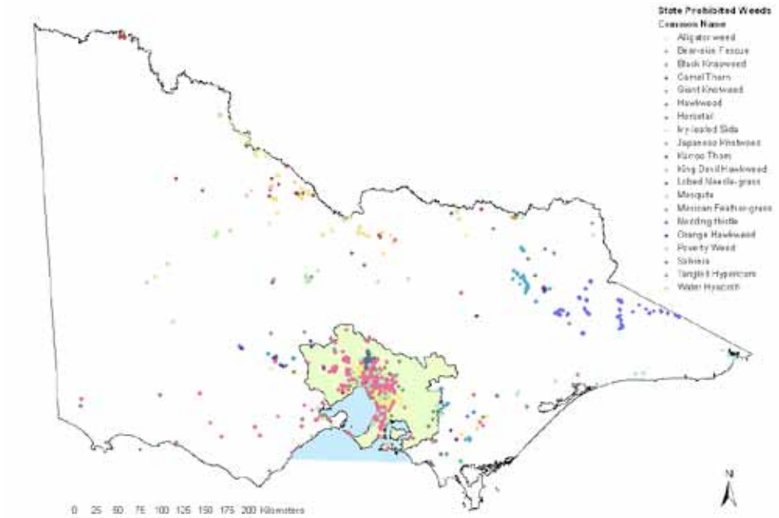
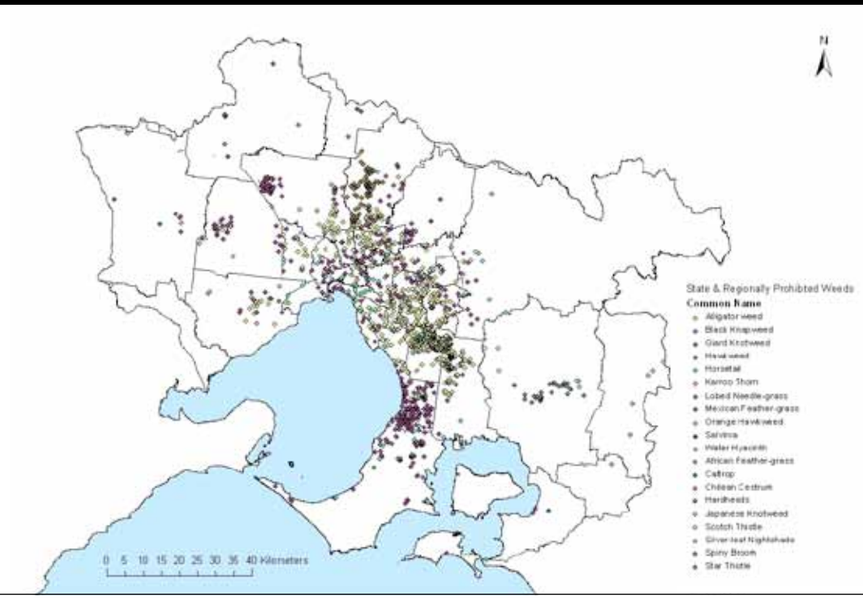


Fig. 10 - The distribution of some key State prohibited and Regionally prohibited Weed species in the Port Phillip and Western Port as of 30 June 2010 (Source: IPMS, DPI)



Twenty five species are classified as State prohibited weeds (Appendix II) (Fig. 9 & 10). As guided by the CaLP Act these are managed towards eradication by DPI. Four of these weeds, Parthenium Weed (Fig.11), Alligator Weed (*Alternanthera philoxeroides*) (Fig. 12), Mesquite (Prosopis spp) and Salvinia (*Salvinia molesta*) (see case study) are also WONS.

A number of State prohibited weeds are currently not found in Port Phillip and Western Port region and several species are limited to isolated locations, for example Japanese Knotweed (*Fallopia japonica*) (Fig. 13). Species such as Alligator Weed and Mexican Feather Grass (Fig. 14) are recorded more widely across the region.

Fig. 11 - Parthenium Weed (Photo: provided by DPI)

Fig. 12 - Alligator Weed Infestation (Photo: provided by DPI)

Fig. 13 - Japanese Knotweed (Photo: provided by DPI)

Fig. 14 - Mexican Feather Grass (Photo: provided by DPI)

Case Study 2: Salvinia - eradication

Salvinia (*Salvinia molesta*) is a highly invasive aquatic weed with the ability to spread very quickly, where one pair of fronds can start a whole new infestation. Salvinia is a fern that can rapidly invade waterways and dams and clog infrastructure should it enter the storm water system. It grows best when water temperatures are between 18°C and 28°C and can cover an entire dam surface in a matter of weeks. As a result it is a Weed of National Significance species and is declared a State prohibited weed in Victoria.

Salvinia originates from Brazil and has been distributed worldwide for use in the aquarium trade. Salvinia has infested waterways in NSW and QLD. Salvinia is not established in Victoria but in recent years in the Port Phillip and Westernport Catchment a small number of new infestations have been identified. Department of Primary Industries has traced these infestations back to residential garden ponds. Trace back and forward investigations form part of the DPI awareness, surveillance and control program to manage Salvinia in Victoria.

In 2010, an isolated infestation was detected in a closed dam system in Kangaroo Ground north-east of Melbourne. In this case, a small number of plants were placed in a dam as contaminants and

Fig. 15 - Salvinia Plant (Photo: provided by DPI)

spread to cover the 0.9ha dam in a matter of weeks. The landowners had unsuccessfully attempted to manually remove the Salvinia before contacting DPI for assistance. Best Practice Management control was undertaken by DPI involving a combination of chemical treatment and manual removal followed by an extensive delimiting survey of surrounding properties. Eradication has been successful, with no plants observed since the treatment. Trace back investigations by DPI revealed the plants originated in a backyard pond in Greensborough.

Without intervention this highly invasive species has the potential to dominate many of Victoria's waterways and cause damage to Victoria's environment, economy and social lifestyle.

Under the CaLP Act, the region through the PPW-CMA recommends to the Minister for Agriculture which plants should be declared noxious weeds, and the categories in which they should be placed. Plants which have been proclaimed noxious under the Fisheries Act 1995 are also included. The process that has been used in the last few years to generate those recommendations is called the 'Victorian Noxious Weeds Review'.

In this region, the process is led by DPI with assistance from PPWCMA, and includes community consultation and expert opinion on candidate species, a 'Weed Risk Assessment' analysis, a state-wide consistency check by a multi-agency panel, a submission of recommendations to the Minister, and finally the publication of declared noxious weed species in the Victorian Government gazettes. The Review is ongoing and the list of declared weeds may change over time.

In the Port Phillip and Western Port region, there are currently 116 weed genera or species listed as noxious weeds under the CaLP Act (Appendix II) (Government Printer for the State of Victoria 2010). The list includes the 25 State prohibited weeds mentioned above, 21 Regionally prohibited weeds, 50 Regionally controlled weeds and 20 Restricted weeds.

Regionally prohibited weeds include a number of species that are found in other parts Victoria but, while present, are not strongly established in the Port Phillip and Western Port region (Fig 10). For example Skeleton Weed (*Chondrilla juncea*) is a pest of crop land and pastures and has become an important and widespread weed in wheat belt areas. It also invades Mallee shrubland and lowland grassland and grassy woodland. Silverleaf Nightshade (*Solanum elaeagnifolium*) is another weed species of annual crops and pasture but is not a weed of natural ecosystems.

Other Regionally prohibited weeds, such as African Feather Grass (*Pennisetum macrourum*), are emerging agricultural weeds in the region but also have the potential to infest many natural ecosystems. African Feather Grass is a spring and summer growing grass of poor pastures but invades lowland grassland and grassy woodland, riparian vegetation, and freshwater wetlands.

Five of the Regionally controlled weeds, Blackberry (*Rubus fruticosus*), Bitou Bush (*Chrysanthemoides monilifera ssp. rotundata*), Boneseed (*Chrysanthemoides monilifera ssp. monilifera*), Gorse (*Ulex europaeus*) and Serrated Tussock (*Nasella trichotoma*) are also WONS. Serrated Tussock is the focus of a major containment program being run by the Victorian Serrated Tussock Working Party (see Case Study 3). The remaining WONS in the current noxious weeds list, such as Bridal Creeper (*Asparagus asparagoides*), Cabomba (*Cabomba caroliniana*), Willow spp and Chilean Needle Grass (*Nassella neesiana*), occur in the region as Restricted weeds.

DSE has compiled advisory lists of environmental weeds to help land managers who are focussing on protection of a particular asset (DSE, 2009a-d). Environmental weeds may or may not be currently declared under the CaLP Act but can pose a serious threat to native vegetation and biodiversity. Other native species can also be weeds of natural ecosystems, where they are not locally indigenous to an area and have potential to damage the local plant community (eg. *Sweet Pittosporum, Pittosporum undulatum*).

Case Study 3: Serrated Tussock - Statewide Containment

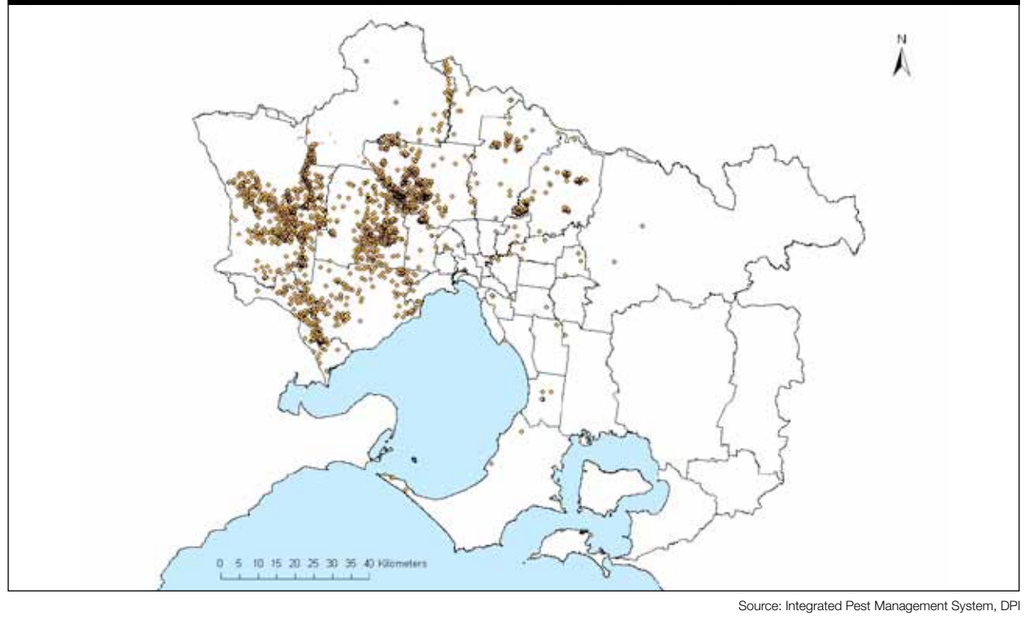
Serrated Tussock is a WONS species and a Regionally controlled weed in the Port Phillip and Western Port region. It is regarded as one of the worst weeds in Australia because of its invasiveness, potential for spread, and economic and environmental impacts. It is a perennial grass covering 1.1 million hectares across Australia; mainly New South Wales and Victoria. In Victoria Serrated Tussock has been recorded in most regions, with the most severe infestations, are in the Port Phillip and Western Port, and Corangamite catchments. If left unmanaged, Serrated Tussock can greatly reduce productivity of grazing lands and impact on biodiversity values, displacing native vegetation.

Serrated Tussock has the ability to survive and spread under extreme temperatures, low rainfall and low soil fertility. With its prolific seed production and ability to spread by wind, livestock, machinery and transport networks, it is well suited to rapidly advance across temperate zones of southern Australia.

To prevent Serrated Tussock spreading further into areas suitable for its establishment, the DPI in partnership with the Victorian Serrated Tussock Working Party implements a state-wide containment approach. This project aims to contain the core infestation, preventing further spread, through the management of a containment line. Properties falling within the containment line are the focus of surveillance. Landholders will be assisted to recognise and manage Serrated Tussock. Where infestations are detected within the containment line, landholders are required to undertake annual control to prevent seeding, reduce infestation size and density annually. Any infestations detected outside the containment line are the highest priority for control and further surveillance around the infestation. Where landholders' efforts fail to meet legislative requirements, compliance action is undertaken to ensure spread is prevented.

As illustrated in Figure 16 below, in the Port Phillip and Western Port region, Serrated Tussock has its core infestation on the basalt plains west of Melbourne.

Fig. 16 - Current distribution of Serrated Tussock in PPW region, as of 30 June 2010 (Source: Integrated Pest Management System, DPI)



Source: Integrated Pest Management System, DPI

Invasive animal species classified as 'established' pests under the CaLP Act should be controlled, or their spread in the wild should be prevented. The main pests in the Port Phillip and Western Port region are the fox and rabbit. Species not currently listed under the CaLP Act but considered as major pest animals include feral cat and deer (Cervidae species). Feral pigs and goats are isolated in their regional distribution but can have a severe impact on native habitats locally.

It is the responsibility of all land managers in the region to comply with the CaLP Act and be aware of their management responsibilities for the declared noxious weeds (Appendix II) and established invasive animals.

Environmental weeds and some pest animals (eg European red fox and feral cat) are listed as potentially threatening processes for native flora and fauna under the Flora and Fauna Guarantee Act 1988 (FFG). While not legally binding, the FFG action statements provide land managers with a choice of procedures that can be used for the management of potentially threatening processes.

The Actions related to Objectives 2 and 3 are:

Action 3	
Undertake risk assessments of potential new high risk invasive plants and animals and their possible pathways of spread.	
Lead Role	DPI
Partners	All other land managers

Action 4	
Conduct consultation and weed risk analysis to inform recommendations for new declarations to the Minister	
Lead Role	DPI
Partners	All other land managers

Action 5	
Develop and implement strategies to reduce the risk of introduction, and where appropriate eradicate new high risk plants and animals.	
Lead Role	DPI
Partners	DSE, Parks Victoria, other State government agencies, local government & private land managers

Action 6	
Implement inspection, extension and compliance programs to contain and where possible eradicate Regionally prohibited weeds.	
Lead Role	DPI
Partners	DSE, Parks Victoria, other State government agencies, local government & private land managers

Action 7	
Undertake works to eradicate Regionally prohibited weeds, minimise the spread of Regionally controlled weeds from public land, and prevent the spread, and as far as possible eradicate, established pest animals.	
Partners	DSE, Parks Victoria, other State government agencies, local government & private land managers

Action 8	
Conduct community engagement and awareness programs to gauge community concern and gather feedback on new high risk invasive plants and animals.	
Lead Role	DPI
Partners	DSE, Parks Victoria, PPWCMA, other State government agencies & local government

7 Protect the Region's Priority Assets from Invasive Plants & Animals

Objective 4 Address the risks posed by invasive plants and animals on priority environmental and agricultural assets.

There are many IPAs established in this region that have a negative impact on environmental assets and productive systems, including agriculture. To ensure the effective allocation of resources, it is important to continually assess where the best benefit and return for investment in IPA management will be achieved.

Each year the RISWG will conduct a review of publicly funded IPA programs in the region and provide advice on future investment by:

- Gathering the relevant and up-to-date information on natural assets as outlined in the Regional Catchment Strategy, Regional Healthy Waterways Strategy, Regional Native Vegetation Plan, and other relevant plans.
- Analysing other relevant information including up-to-date data on pest distribution, density and trends, reports on recent pest management projects and initiatives and information on emerging pests, to gauge the current risks to natural assets posed by pests.
- Receiving presentations from each major agency on (a) that agency's own priorities and programs for pest management and (b) that agency's view of the regional priorities for the future effort in pest management to enhance regional coordination and overall effectiveness of pest management, and (c) specific proposals.
- Evaluating the proposals using a decision tool such as INFFER to gauge the value of the assets at risk from pests, the scale of the risk, the likelihood of success of the proposals in addressing the risks and the cost-benefit ratio.
- Presenting a progress report and findings to DPI and participating agencies, including suggestions on priorities for the allocation of resources and effort in IPA management.

Work to improve and refine the data and assessment to accurately determine high value assets, risk and appropriate IPA activities is ongoing. In the meantime, some of the environmental assets and productive systems for which ongoing risk assessment should be undertaken in regard to IPA impact are outlined below.

Action 9	
Conduct a review of the publicly funded IPA programs in the region and provide advice to program investors regarding future allocation of public funds.	
Lead Role	Regional Invasive Species Management Working Group
Partners	DSE, Parks Victoria, other State government agencies, local government & private land managers

7.1 Native Vegetation

Fig. 17 - Native grasslands on the Victorian Volcanic Plain

A priority in this region is to protect high value native vegetation from degradation by IPAs, especially weeds. It is important to address existing infestations of invasive species and to protect these areas from new infestations. This can involve working beyond the boundaries of a patch of native vegetation to include neighbouring land and will often require a collaborative and tenure-blind approach in order to achieve effective IPA management.

Some examples of threats to high value native vegetation in this region are described below.

Native grassland on the Victorian Volcanic Plain

Native grassland in the western parts of the region is now listed as a critically endangered ecological community under the Australian Government's Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). As a consequence of agriculture and other development, at least 95 percent of the original grasslands have been cleared or severely altered. Intact examples are rare and highly vulnerable to degradation from weed infestations and rabbits. Some of the weed species that pose immediate and substantial threat to these native grasslands are African Feather Grass, Mexican Feather Grass and Serrated Tussock. It is essential that weed management in remnant native grasslands be integrated with works in neighbouring grazing and cropping land to ensure these highly invasive species do not spread. It is also important to make sure that weed or rabbit control techniques (e.g. controlled burns or baiting respectively) do not detrimentally affect the habitat and survival of the native animals.

Native woodlands in parks and reserves.

Some of the parks and reserves in the region hold particularly valuable representations of endangered native woodland communities such as Plains Grassy Woodland, Grassy Woodland, Swampy Woodland and Floodplain Riparian Woodland. These woodlands can be found in parks that are frequently visited and highly valued from social and recreational perspectives; for example Plenty Gorge Park, Yarra Valley Park, Churchill National Park and Lysterfield Park. These parks also provide habitat for numerous endangered flora and fauna species.

Unfortunately, these parks are at risk of degradation due to invasive weeds and rabbits. The proximity to urban areas and the high number of visitors can cause weed species to be introduced or spread. Some of the weed species that pose a significant threat to the environmental values of these parks are Bridal Creeper, Blackberry, Cape Broom (*Genista monspessulana*), Boneseed and Sweet Pittosporum.

The following actions encourage collaborative and integrated effort to protect native vegetation from IPAs:

Action 10	
Support private land managers to conduct integrated IPA management programs within and near high value native vegetation.	
Lead Role	DSE
Partners	DPI, PPWCMA, Melbourne Water, Parks Victoria, local governments, Landcare and private land managers.

Action 11	
Conduct integrated IPA management programs within and near high value native vegetation on public land.	
Lead Role	DSE and/or Parks Victoria
Partners	All public land managers including DPI, local governments, Melbourne Water, friends groups and neighbouring private land managers.

7.2 Waterways, wetlands and estuaries

Fig. 18 - Spartina Infestation (Photo: provided by DPI)

This region's waterways, wetlands and estuaries are a high priority for protection from the impacts of IPAs.

Some examples of threats to waterways and wetlands in this region are described below.

- The waterways in and around Melbourne are particularly vulnerable to the introduction of weed species and can be efficient pathways for the spread of weeds along the waterways and beyond. The potential for weed introductions and spread is high because of the large number of people who visit these waterways and prevalence of associated inappropriate practices, such as dumping of aquarium contents or accidental transportation by boats. Weed species known to be a problem in urban waterways include Water Hyacinth, Alligator Weed and Salvinia. These weeds can rapidly cover and block waterways, shading out any submerged plant life and impeding oxygen exchange, making the water unsuitable for fish and other animals. Severe infestations can block irrigation, cause flooding, pollute drinking water, and prevent recreational activities such as swimming, fishing and boating.
- Western Port is a wetland of international importance recognised under the Ramsar Convention of Wetlands. The shoreline provides important habitat for local shorebirds and migratory waders, and some threatened mammals such as the Southern Brown Bandicoot (*Isoodon obesulus obesulus*) and Swamp Skink (*Egernia coventryi*). IPAs that infest this wetland include weeds such as Bridal Creeper, African Box Thorn (*Lycium ferocissimum*), Sea Spurge (*Euphorbia paralias*) and Ricegrass or Spartina (*Spartina anglica*), and pest animals such as foxes, rabbits, feral cats and black rats. Invasive plants out compete the native plants directly affecting the saltmarsh and fringing vegetation including threatened species such as Yellow Sea Lavender (*Limonium australe*). Weeds also degrade the habitat relied upon by native animals for their food, shelter and breeding. Invasive animals, such as rabbits, destroy the native vegetation while others like foxes prey directly on native mammals and shorebirds.

The following action encourages collaborative and integrated effort to protect the region's waterways, wetlands and estuaries from IPAs:

Action 12	
Coordinate integrated IPA management programs on private and public land to protect the environmental, social and economic values of waterways, wetlands and estuaries.	
Lead Role	Melbourne Water
Partners	DPI, DSE, PPWCMA, Parks Victoria, local governments, Landcare and private land managers.

7.3 Native Animals

This region is home to many native animal species that have been declared threatened, partly due to the predation or habitat degradation caused by IPAs. To protect native animals, it will be important to develop programs that incorporate tenure blind, collaborative and integrated IPA management.

Some examples of threats to native animal species and populations are described below.

- The Southern Brown Bandicoot is listed as nationally endangered under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999. Loss of habitat and predation primarily by foxes and feral cats, are the biggest threats to this native marsupial. Private and public land managers would ideally adopt an area-wide, cooperative approach in which control techniques are applied in a synchronised way across all bandicoot habitat and surrounding farmland.
- Hooded Plovers (*Thinornis rubricollis*) are found on the region's coastline and are listed as threatened under the Flora and Fauna Guarantee Act. They feed and nest on beaches where they are susceptible to human disturbance, introduced predators, habitat modification and dogs. Foxes, feral cats, silver gulls, ravens and other scavengers are the main predators. A key measure is to ensure the Hooded Plover's feeding and nesting areas are retained in natural conditions with minimal disturbance from predators and human activities. For example, fox and feral cat programs implemented on public coastal land and the neighbouring private and public land would benefit the Hooded Plover.

Fig. 19 - Southern Brown Bandicoot (Photo by M. Legg)

Fig. 20 - Hooded Plover (Photo by G. Ehmke)

Action 13	
Coordinate integrated IPA management programs to protect threatened native animal species on private and public land.	
Lead Role	DSE
Partners	DPI, PPWCMA, Parks Victoria, local governments, Landcare, non-government organisations and other land managers.

7.4 Primary Production

This region includes a wide range of agricultural industries from intensive industries such as horticulture and broiler chicken production, to less-intensive farms such as dairy and fruit growing, to 'extensive' industries such as grazing. These agricultural industries are often affected economically by damage caused by IPAs and costs incurred in attempting to control them.

Although there may be some failures of control or cases of neglect in regard to control of IPAs, most sectors of primary production are well supported by knowledge, tools and services to manage relevant IPAs. The commercial rewards from optimising production yield and quality is usually enough incentive for best practice management of IPAs at the property level. However one area for improvement is the application of an area-wide approach in which neighbours agree to plan and implement a cooperative IPA program.

These programs should be long-lasting and sustainable, and therefore benefit all participants. Public amenity and environmental assets can also benefit because of more effective and cost-efficient outcomes. This would be particularly apt for highly mobile invasive animals such as foxes and rabbits. In this region, the Nillumbik Rabbit Action Group is an example of a coordinated rabbit control program. There is an opportunity to develop more of these types of programs and synchronise them with similar endeavours on neighbouring public or private land aimed at protecting environmental assets.

The following action encourages collaborative and integrated effort to protect the region's primary production from IPAs:

Action 14	
Engage primary production industries in broad-scale and on-going IPA management programs	
Lead Role	DPI
Partners	Industry bodies, local governments, private land managers & other government agencies

8 Integrated, Place-Based Approaches to Management of Invasive Plants & Animals

Programs addressing IPAs should be designed and implemented to protect high value environmental assets and productive systems. It is intended that cooperation and collaboration will occur between the DPI, DSE, Parks Victoria, Melbourne Water, local governments and other land mangers to ensure the programs deal with the threat of pest infestations in a tenure-blind and holistic manner. This approach is particularly important for IPA management because:

- Many IPAs threaten more than one asset type. For example, Serrated Tussock is a serious weed of native grasslands and exotic pastures. Foxes predate on native animals and livestock.
- IPAs often spread and move across property boundaries and land tenures.
- An area-wide approach involving many stakeholders is likely to have the most effective impact. IPA control programs are most effective and cost-efficient when all local land managers acknowledge the pest issues more broadly than just their own property and cooperate with others in their management.

The design and implementation of programs to protect environmental assets and productive systems should consider the following actions:

- Establish a collaborative process to plan and implement area-wide IPA management with all relevant land managers.
- Apply the biosecurity principle of prevention and eradication at the local scale. For example, ensure consideration of the eradication of newly identified, high risk weeds with limited distribution.
- Apply best-practice control techniques for each invasive species and, where relevant, multi-species targets.
- Plan and budget for monitoring, reporting, evaluating and improvement. This should include measures of control implemented and the status of values that are targeted for protection. As part of continuous improvement, it is important to re-assess risk to assets across the region and adjust programs and locations accordingly.
- Plan and budget for on-going financial support for programs to ensure a lasting effect.
- Undertake communication activities to increase community awareness of, and stewardship for, the benefits of the program.

Below are examples of how the asset-based approach to pest management can be applied. These examples illustrate good practice management, based on the asset-based approach, for integrated, multi-asset, multi-tenure, multi-species programs.

(i) Port Phillip Bay Western Shoreline Wetlands

The Port Phillip Bay Western Shoreline wetlands includes Pt Cook Coastal Park-Cheetham Wetlands, RAAF Williams - Point Cook Commonwealth Area, Werribee River Regional Park, Western Treatment Plant, the lower reaches of Skeleton Creek, Little River and Werribee River, The Spit Nature Conservation Reserve, part of Point Wilson Commonwealth Area and private land (Fig. 21).

Natural Values:

- The area contains a number of wetlands including the Port Phillip Bay (Western Shoreline) and Bellarine Peninsula Ramsar site. The Ramsar site is one of eleven wetlands of international significance in Victoria, listed under The Ramsar Convention Manual: a guide to the Convention on Wetlands (Ramsar, Iran 1971).
- The area's natural values also include saltmarsh communities, feeding and roosting areas for migratory waders, and habitat for threatened species.
- Twenty-two flora and eighty fauna species, all considered 'threatened' under the Victorian Flora and Fauna Guarantee Act 1988 (FFG) have been recorded in the area.
- Sixteen species have been listed under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) as a 'threatened species'. These include a number of seabirds as well as the critically endangered Orange-bellied Parrot (*Neophema chrysogaster*), which uses the saltmarsh within the site as winter feeding grounds. The Growling Grass Frog (*Litoria raniformis*) is resident at the Western Treatment Plant.
- Inland areas contain significant expanses of native pasture and grassland, referrable to 'Natural Temperate Grassland of the Victorian Volcanic Plain', which is listed as 'critically endangered' under the EPBC Act.
- The Werribee River and Little River are associated with important migratory wading bird habitat and significant native vegetation, such as the remnant river red gums. The lower Werribee River is home to a range of fish species.

Fig. 21 - Port Phillip Bay Western Shoreline Wetlands

Cultural values:

- The coast to the east of the Werribee River is Country is of interest to Wurundjeri and Boonwurrung people, whereas the area west of the river is traditional Country of the Wathaurong/ Wathaurung. There are burial sites, middens and artefacts along the coastal areas within the Ramsar site that are significant for these Indigenous people. The Aboriginal Cultural Heritage Act 2006 must be considered when planning large scale weed removal or feral animal works, especially if it involves any soil disturbance.
- There are a number of community groups that have an interest in the ecology of the site. These groups are involved in restoration activities, monitoring and community education; the natural values of the site are of significance to members.

Social and recreation values:

- The proximity of the area to Melbourne means that the area is a popular site for recreation and tourism. Bird watching, fishing and sightseeing are common activities. The Port Phillip Bay Western Shoreline wetlands are a significant area for recreation such as fishing and boating

Economic values:

- The Western Treatment Plant processes 52% of Melbourne's sewage, 415 million litres a day. It serves 1.6 million people in the central, northern and western suburbs of Melbourne. Some of the treated effluent is recycled for use by local customers, including the intensive vegetable growing area at Werribee South.
- Water is extracted from the lower Werribee River to supply the intensive vegetable growing area at Werribee South.

Threats:

1. Pest plants.

The most serious established environmental weed species for this area include African Boxthorn, Serrated Tussock, Artichoke Thistle (*Cynara cardunculus*), Spiny Rush (*Juncus acutus*), Fennel (*Foeniculum vulgare*), Gorse (*Ulex europaeus*), Pampas Grass (*Cortaderia selloana*), Tall Wheat Grass (*Lophopyrum ponticum*) and Mirror Bush (*Coprosma repens*). Some of these weeds out compete native saltmarsh plants, the favoured food of Orange-bellied Parrot.

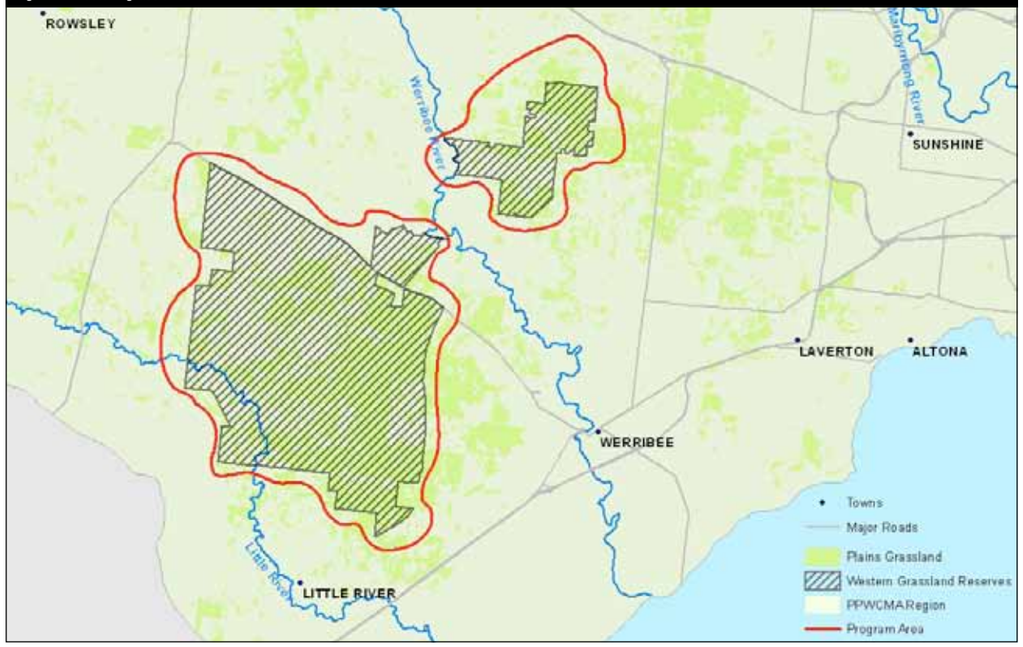
2. Pest animals.

Rabbits, foxes and cats are the main pest animals in the area. Rabbits are widespread through coastal and inland areas where they reduce native plant cover and increase erosion by their digging and burrowing. Burrowing also causes structural damage to water channels at the Western Treatment Plant. Foxes are widespread. Together with feral cats (and domestic cats from adjoining residential areas) foxes kill many waterbirds. Uncontrolled domestic dogs cause disturbance to shorebirds, using up energy stores needed for return migration.

The asset protection program:

- An alliance of public and private land managers was formed to oversee an integrated, multi-tenure works program for invasive plants and animals.
- Parks Victoria, PPWCMA and DSE lead a team of land managers that includes Melbourne Water, Wyndham and Hobsons Bay City Councils and Department of Defence.
- The program implements a 3-year management plan aimed at protecting environmental, social and economic values from the high priority invasive plants and animals.
- The program undertakes an area-wide management program for foxes, rabbits and feral cats. Controls for these species are implemented simultaneously.
- A community awareness campaign emphasises the area's natural values and the benefits the pest program provides. The campaign includes an education program on the responsible pet ownership of domestic dogs and cats.
- Rigorous monitoring and evaluation of the pest management works and community awareness campaign will be used to continuously improve the program.
- The project partners seek on-going financial support for the pest management program. This includes provision for financial and technical support for land managers to control high risk environmental weeds (i.e. weeds not identified by the CaLP Act).

Fig. 22 - Western grasslands



(i) Western Grasslands

A significant area of natural grasslands still remains on the volcanic plain to the west of Melbourne, largely in the Wyndham and Melton Shires (Fig. 22). The Victorian Government has identified 15,000 ha of these grasslands to become two new Western Grassland Reserves.

Natural Values:

- The 'Natural Temperate Grasslands of the Victorian Volcanic Plain' are listed under the EPBC Act as a 'critically endangered ecological community'. These grasslands are also listed as 'threatened' under the Victorian FFG Act 1988.
- The area is one of the largest left in the world containing such a high concentration of remnant Natural Temperate Grasslands. These grasslands are characterised by Kangaroo Grass (*Themeda triandra*), Wallaby-grass (*Danthonia spp.*) and Spear-grasses (*Austrostipa spp.*) interspersed with an array of other plants, most notably the broad-leaved native herbs.
- Other important habitat types occur in the area including ephemeral wetlands, waterways, Red Gum swamps, rocky knolls and open grassy woodlands.
- Several listed (EBPC and/or FFG) rare or threatened species live in the area. Species include the Golden Sun Moth (*Synemon plana*), Striped Legless Lizard (*Delma impar*), Growling Grass Frog, Spiny Rice-flower (*Pimelea spinescens subspecies spinescens*), and Button Wrinklewort (*Rutidosis leptorrhynchoides*).

Cultural values:

- The Werribee Plains were inhabited, used and managed by indigenous people. The Registered Aboriginal Party for much of this area is the Wathaurong (or Wada wurrung) (west of Werribee River).
- Several remaining campsites and numerous artefacts attest to significant occupation. As well as utilitarian sites, at least one significant cultural site is known: the Wurdi Youang stone arrangement, located on Aboriginal land.
- Agricultural land use has left a legacy with heritage value, notably the network of dry stone walls and other stone structures that were built largely between 1850 and 1870.

Economic values:

- Dryland cropping and grazing are predominant land uses in the area.

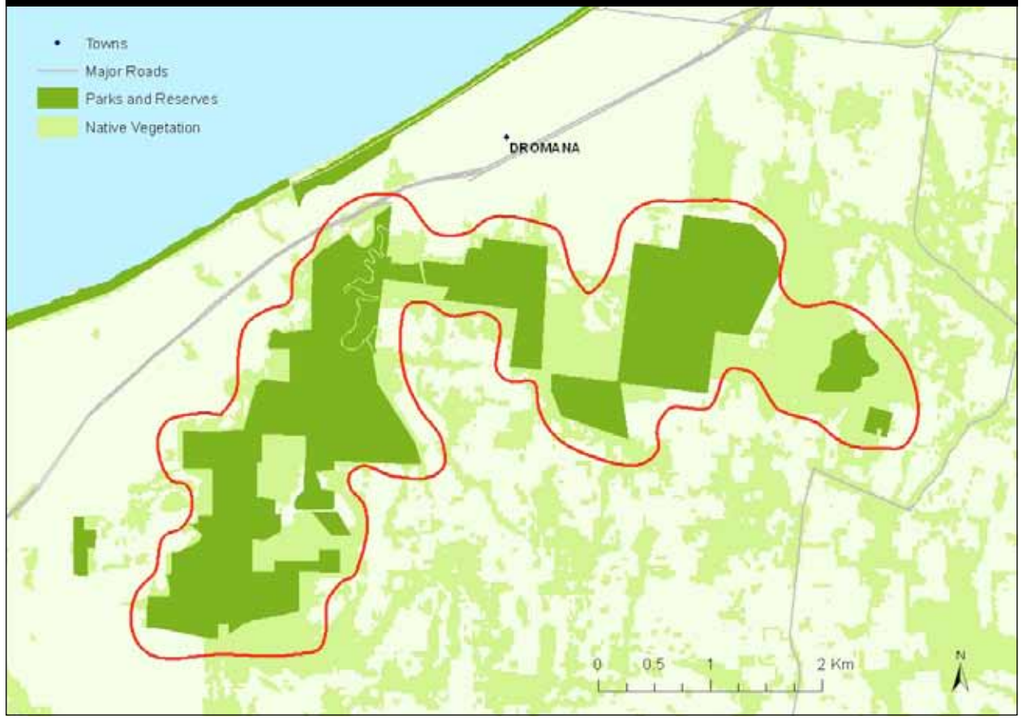
Threats:

- Pest plants. Weeds out-compete native grassland flora and degrade habitat for native fauna. Important weed species include Cane Needle Grass (*Nasella hyalina*), Serrated Tussock, Chilean Needle-grass (*Nassella neesiana*), Gorse (*Ulex europaeus*), Paterson's Curse (*Echium plantagineum*) and Artichoke Thistle (*Cynara cardunculus*).
- Pest animals. Grazing by rabbits, in some areas, has the potential to reduce native plant cover and increase erosion by their digging and burrowing. Burrowing also causes structural damage to water channels.
- Human management. Indiscriminate weed control leading to off-target damage of native flora, incorrect fire management, soil and plant disturbance through ploughing or de-rocking, and over grazing are all activities that can degrade the grasslands.

The asset protection program:

- A partnership was formed between DSE, DPI, Wyndham City Council, Melton Shire Council, Moorabool Shire Council, Hume City Council, City of Greater Geelong, PPWCMA and Parks Victoria to conduct an integrated, multi-tenure program for invasive plants and animals in the western grasslands area.
- The program pays special attention to the formation of the Western Grassland Reserves. An inter-agency working group has been formed to ensure a coordinated approach.
- An initial 3-year project plan aims to protect the grasslands from invasive plants, rabbits and inappropriate land practices.
- The program undertakes a community awareness and education campaign to promote the natural values of the grasslands and the methods of protecting them.
- Incentives, such as rate rebates and grants, are provided to private land managers. The rebates and grants are for works to protect the grasslands and include control of environmental weeds on priority locations within the grasslands.
- Ongoing monitoring, evaluation and reporting on the works programs feeds into continuous improvement of the program's design and delivery.

Fig. 23 - Arthurs Seat Escarpment



(iii) Arthurs Seat Escarpment

The Arthurs Seat Escarpment area includes parts of Arthurs Seat State Park and is on the Mornington Peninsula (Fig. 23).

Natural Values:

- Arthurs Seat Escarpment is a well-known landscape feature and tourist destination. It has significant environmental value due to the extent and condition of the native vegetation in the area. Arthurs Seat Escarpment is one of the largest remaining areas of intact vegetation on the Mornington Peninsula.
- The Escarpment contains a significant diversity of habitats. The high level of biodiversity is due to changes in elevation from near sea level to 314m. The area has a number of Ecological Vegetation Classes classified as 'vulnerable' (e.g. Damp Heathy Woodland, Lowland Forest) or 'endangered' (e.g. Grassy Woodland, Swamp Scrub).
- Four threatened flora species are located in the area. Two of these are EPBC listed; Purple Eyebright (*Euphrasia collina subsp. muelleri*) and Clover Glycine (*Glycine latrobeana*). Other significant flora includes Green Leek-orchid (*Prasophyllum lindleyanum*), Hooker Fescue (Austrofestuca hookeriana), Showy Podolepis (*Podolepis jaceoides*) and Mountain Greenhood (*Pterostylis alpine*). More than 25 flora species found in the Park may be considered rare or uncommon to the Mornington Peninsula.
- The area has a diverse range of native fauna species including Koala, Tree Goanna (*Varanus varius*), Southern Emu Wren (*Stipiturus malachurus*) and Wedge-tailed Eagle (*Aquila audax*). Several threatened species have been recorded in the area, including Southern Brown Bandicoot, Lewin's Rail (*Lewinia pectoralis*) and Powerful Owl (*Ninox strenua*).

Cultural values:

- The Bunurong clan, Burinyung-Bulluk, occupied the southern section of the Mornington Peninsula. The Peninsula contains a wide range and large number of Aboriginal archaeological sites. However, most of these are along the coastal fringe; only one site is recorded in Arthurs Seat State Park (Site Register, Aboriginal Affairs Victoria). This may reflect the lack of archaeological survey and recording in the area.

Heritage values:

- The Escarpment has seen a variety of uses since the Mornington Peninsula was settled. Timber harvesting was common in the early days of settlement and the surrounding range was cleared for grazing and orchards. Before Arthurs Seat was reserved for public purposes (the Government had bought back many blocks by the mid-1970s), the area was under threat from residential development and quarrying.
- Historic places include Seawinds Gardens, Arthurs Seat and the OT Dam area. Seawinds was developed in the 1940s and features William Ricketts' sculptures, sheltered lookouts and attractive trees, lawns and gardens.

Economic values:

- Commercial tourism operations in the Arthurs Seat Park include the chairlift and associated facilities. The summit area includes a small craft cottage and tower lookout.
- Arthurs Seat Park attracts 700,000 visitors annually. The summit area is one of the most popular attractions on the Mornington Peninsula, it has 600,000 visitors each year.
- The number of international tourists is expected to increase as facilities and services are enhanced, particularly in the summit area.

Threats:

- There are a number of serious pest plants that require on-going management including Blackberry, Coastal Tea Tree (*Leptospermum laevigatum*), Sweet Pittosporum, Boneseed, Sallow Wattle (*Acacia longifolia*), and Bluebell Creeper.

The asset protection program:

- Mornington Peninsula Shire and Parks Victoria formed a partnership to oversee an integrated, multi-tenure works program for invasive plants.
- Others involved in the project are DSE, Melbourne Water, Peninsula Bird Observers Club, Bunurong Land Council and Boon wurrung Foundation.
- The partners aim to develop and implement a 4-year management plan to protect high quality environmental and social values from invasive plants.
- Surveys will be conducted to identify and locate significant flora and fauna species and habitat used by the fauna as well as cultural heritage sites to inform the design of works programs.
- Monitoring, evaluation and reporting of the works program will inform the continuous improvement of the program.
- Information about the program will be distributed to the general public and neighbouring land managers by the use of media and public meetings. Communications will emphasise good weed control and awareness of likely weed invasion pathways.

9 Monitoring, Evaluating and Reporting

Objective 5 Improve management of invasive plants and animals through effective monitoring, evaluation and reporting.

On an annual basis the Regional Invasive Species Management Working Group will:

- Coordinate the monitoring, evaluating and reporting on the overall effort towards, and success in achieving, the objectives and actions set out in the strategy. Monitoring, evaluating and reporting on this strategy is aligned to, and directed by existing frameworks established by agencies in the region.
- Assess and report on the publicly funded IPA focussed programs as outlined in Chapter 7.
- Invite other land managers, including various State government agencies, local governments and industry to share information and explore new partnership opportunities for the improvement of invasive species management in this region.
- Promote better cooperation and coordination in IPA management across the region.
- Provide a report on the progress towards achieving the strategy's objectives and aims to all partners.

Action 15	
Monitor, evaluate and report on progress toward the objectives and actions in this IPA strategy	
Lead Role	Regional Invasive Species Management Working Group
Partners	State government agencies, local government & private land managers

10 References

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11 Appendices

11.1 Appendix I : Legislation, policy and strategies applicable to invasive plant and animal management.

The legislative policy and strategy documents identified in the following table, modified from MCMA (2009), are all relevant to the management of invasive species.

A) Commonwealth	
Legislation	**Context Summary**
Quarantine Act 1908	The Commonwealth agency Quarantine and Inspection Service (AQIS) established under the Quarantine Act manages quarantine controls at our borders to minimise the risk of exotic pest, animals, pest plants and diseases entering the country. The risk assessments of importing individual species are undertaken by Biosecurity Australia.
Environment Protection and Biodiversity Conservation Act 1999 (EPBC)	The EPBC Act provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places which are defined in the Act as matters of national environmental significance. Threat Abatement Plans are generated under the EPBC Act to provide for the research, management, and any other actions necessary to reduce the impact of a listed key threatening process on native species and ecological communities. Plans have been developed for a number of species, including foxes, rabbits, feral cats, 'unmanaged' goats and feral pigs.
Agricultural and Veterinary Chemicals Administration Act 1992	This Act provides for controls in relation to the evaluation, registration, and use of agricultural chemicals including pesticides for the control of pest plants and animals. This Act is complemented by State legislation relating to the use, application, and sale of agricultural chemicals.
Strategy	**Context**
Australian Weeds Strategy	The AWS has three overarching goals: - To prevent the development of new weed problems. - To reduce the impacts of existing weed problems of national significance. - To provide the framework and capacity for ongoing management of weed problems of national significance
Australian Pest Animal Strategy	The strategy addresses the undesirable impacts caused by pest exotic vertebrate animals (mammals, birds, reptiles, amphibians, and fish) in Australia, and preventing the establishment of new exotic vertebrate pests. The strategy is based on 12 key principles. It also recognises that some species may also have positive impacts, so that management of these species will need to consider both kinds of impacts.

B) State	
Legislation	**Context Summary**
Catchment and Land Protection Act (1994) (CaLP Act)	The CaLP Act provides the power to declare noxious invasive plants and invasive animals if the Minister is satisfied that the species has or has the potential to become a serious threat to primary production, Crown land, the environment, or community health.
Flora and Fauna Guarantee Act (1988) (FFG Act)	The FFG Act aims to guarantee that all Victorian taxa of flora and fauna can survive, flourish, and retain their potential for evolutionary development in the wild. Invasive plants and invasive animals present a major threat to flora, fauna and natural communities. Environmental weeds and some pest animals (eg feral cat) are listed as potentially threatening processes for native flora and fauna under FFG. FFG action statements provide land managers with a choice of procedures that can be used for the management of potentially threatening processes.
National Parks Act (1975)	The Act requires national and State parks to be managed in a manner that protects natural condition of the park. Managers are required to eradicate or control exotic species in all parks managed under the Act.
Sustainable Forests (Timber) Act (2004)	The Sustainable Forests Act (2004) inserted new clauses into the Forests Act (1958) including the provision for the use of fire to control pest plants and animals in State Forests, National parks and protected public land. Fire may also be used to protect and enhance the ecology of these lands.
Conservation Forests and Land Act (1987)	This Act enables the Minister to establish Codes of practice including eradication and control procedures for pest plants and animals. The Act also provides for the establishment of land management cooperative agreements including the provision of grants and rate relief.
Crown land Reserves Act (1978)	The Act provides for the permanent or temporary reservation and management of Crown Lands for a range of public purposes. Committees of management are appointed to manage, improve, maintain, and control the land for the purposes for which it was reserved.
Land Act (1958)	The Land Act requires lessees and holders of agricultural licenses to control and keep the licensed land free of invasive animals and invasive plants.
Fisheries Act (1995)	Aquatic flora and fauna species may be declared noxious under the Fisheries Act.
Road Management Act (2004)	Provides for the management of the road reserves including the protection of significant roadside vegetation. It provides for the preparation of voluntary roadside management plans. At least nine acts make provision for the management of invasive plants and invasive animals along roadsides. These include the CaLP Act, Forests Act 1958, Transport Act 1983 and the Country Fire Authority Act 1958.

State	
Legislation	Context Summary
Water Act (1989)	The purpose of the Water Act is to provide means for the protection and enhancement of the environmental quality of waterways and for the protection of catchment conditions. This includes controls on the introduction of exotic species and the protection of land and waterways.
Wildlife Act (1975) and Domestic (Feral and Nuisance) Animals Act (1994)	These Acts are aimed at protecting the community, wildlife and environment. They promote responsible ownership of dogs and cats; outline penalties for not properly managing dog and cat interaction with wildlife; and management actions that may be undertaken by an authorised officer to control dogs or cats found at large.
Local Government Act (1989) and Planning and Environment Act (1987)	These Acts provide opportunities for local councils to become involved in and enforce weed and pest animal control through local laws and planning permit conditions.
Agricultural and Veterinary Chemicals (Control of Use) Act (1992) and Agricultural and Veterinary Chemicals(Victoria) Act	These Acts complement Commonwealth legislation on the registration of agricultural chemicals including the use, application and sale of pesticides used for the control of pest plants and invasive animals.
Policy	Context
Invasive Pest Plant and Animal Policy Framework	The policy provides a revision of the Victorian Pest Management Framework.
Code of Practice for timber production (2007)	A mandatory requirement of the code is to identify and mitigate against potential threats such as invasive plants, pest and pathogens.
Environmental Policy for Victoria's State Forests	The Policy identifies the seven objectives for the management of State forests in Victoria.
Sustainability Charter for Victoria's State Forests	The charter sets objectives for the sustainability of public native forests and the timber harvesting industry on public land in Victoria. It has strong links with the Environmental Policy for Victoria's State Forests.
Code of Practice for Fire management on Crown Land	The Code requires that wherever possible the introduction and spread of pest plants and animals is to be avoided or addressed within appropriate timeframes by effective machinery hygiene practices.

State	
Strategies	Context
Biosecurity Strategy for Victoria	The strategy covers threats to primary industries, the environment, social amenity and human health, across Victorian public and private land, freshwater and marine habitats, caused by plant and animal pests and diseases, and invasive plants and animals. The strategy focuses on new and emerging threats.
Victorian Biodiversity Strategy	Victoria's Biodiversity Strategy fulfils commitments in the national strategy for the Conservation of Biodiversity and requirements under Victoria's FFG Act 1998.
Guidelines	Context
Guidelines and Procedures for managing environmental impacts of invasive plants on public land in Vic 2007	The Guidelines propose a priority setting framework for managing the environmental impact of invasive plants and gives highest priority to new and emerging invasive plants and the next priority to protecting the highest value assets at greatest risk
Other State	Context
Securing our natural future: A white paper for land and biodiversity at a time of climate change	The White Paper is a long-term, strategic framework to secure the health of Victoria's land, water and biodiversity in the face of ongoing pressures and a changing climate over the next fifty years.
C) Regional	
Strategies	Context
Port Phillip and Western Port Regional Catchment Strategy 2004-2009	The Port Phillip and Western Port RCS is the region's overarching strategy for natural resource management. The following documents are sub-strategies of the RCS.
Port Phillip and Western Port Native Vegetation Plan 2006	The Port Phillip and Western Port NVP is a strategic guide for regional native vegetation management to achieve a reversal of the long-term decline in the extent and quality of native vegetation leading to a 'Net Gain'.
Port Phillip and Western Port Regional River Health Strategy 2006	This strategy identifies waterway values (catchment based), threats to waterway values, and actions to address these threats. It provides a five-year blueprint for Melbourne Water, the Port Phillip and Westernport CMA, councils, community groups and environmental and industry associations to work together to improve our rivers and creeks.

11.2 Appendix II : List of declared noxious weeds in Port Phillip and Western Port region

The following table contains weed species in the Port Phillip and Western Port region that were gazetted under the CaLP Act (Government Printer for Victoria 2010). The table displays each gazetted weed, their noxious weed category, and listings as a very high risk environmental weed (DSE 2009 a-e) and/or Weed of National Significance.

S=State Prohibited; P=Regionally prohibited; C=Regionally controlled; R=Regionally restricted.

Common name	Weed species	Category of noxious weed species gazetted under CaLP Act	Very high risk environmental weed	Weed of National Significance (WON)
African Boxthorn	*Lycium ferocissimum*	C	•	
African Daisy	*Senecio pterophorus*	C		
African Feather-grass	*Pennisetum macrourum*	P	•	
African Love-grass	*Eragrostis curvula*	C	•	
Alligator Weed	*Alternanthera philoxeroides*	S	•	•
Amsinckia	*Amsinckia spp.*	C		
Angled Onion	*Allium triquetrum*	R	•	
Apple of Sodom	*Solanum linnaeanum*	C		
Artichoke Thistle	*Cynara cardunculus*	C		
Athel Pine, Tamarisk	*Tamarix aphylla*	R		•
Bathurst Burr	*Xanthium spinosum*	C		
Bear-skin Fescue	*Festuca gautieri*	S		
Bindweed	*Convolvulus arvensis*	C		
Black Knapweed	*Centaurea nigra*	S		
Blackberry	*Rubus fruticosus*	C		•
Boneseed/Bitou bush	*Chrysanthemoides monilifera*	C	•	•
Branched Broomrape*	*Orobanche ramosa*	S		
Bridal Creeper	*Asparagus asparagoides*	R	•	•
Buffalo Burr	*Solanum rostratum*	P		
Cabomba	*Cabomba caroliniana*	R	•	•
Californian/Perennial Thistle	*Cirsium arvense*	C		
Caltrop	*Tribulus terrestris*	P		
Camel Thorn	*Alhagi maurorum*	S		
Californian / Perennial Thistle	*Cirsium arvense*	C		
Caltrop	*Tribulus terrestris*	P		
Camel Thorn	*Alhagi maurorum*	S		
Cape Broom/ Montpellier Broom	*Genista monspessulana*	C	•	
Cape Tulip (one-leaf)	*Moraea flaccida*	C		
Cape Tulip (two-leaf)	*Moraea miniata*	C		
Chilean Cestrum	*Cestrum parqui*	P		
Chilean Needle-grass	*Nassella neesiana*	R	•	•
Devil's Claw (Purpleflower)	*Proboscidea louisianica*	P		
Devil's Claw (Yellowflower)	*Proboscidea lutea*	P		
Dodder	*Cuscuta spp.*	C		
English Broom	*Cytisus scoparius*	C	•	
Fennel	*Foeniculum vulgare*	R	•	
Flax-leaved Broom	*Genista linifolia*	C	•	
Giant Knotweed	*Fallopia sachalinensis*	S	•	
Giraffe Thorn	*Acacia erioloba*	S		
Golden Thistle	*Scolymus hispanicus*	C		
Gorse/Furze	*Ulex europaeus*	C	•	•
Great Mullein	*Verbascum thapsus*	R		
Hardheads/ Russian Knapweeds	*Rhaponticum repens*	P		
Hawkweed	*Hieracium spp.*	S	•	
Hawthorn	*Crataegus monogyna*	C	•	
Hemlock	*Conium maculatum*	C		
Hoary Cress	*Lepidium draba*	C		
Horehound	*Marrubium vulgare*	C	•	
Horsetail	*Equisetum spp.*	S	•	
Hymenachne/ Olive Hymenachne	*Hymenachne amplexicaulis*	R		•
Illyrian Thistle	*Onopordum illyricum*	P		
Ivy-leafed Sida	*Malvella leprosa*	S		
Japanese Knotweed	*Fallopia japonica*	S	•	
Japanese Knotweed hybrid	*Fallopia x bohemica*	S		
Karoo Thorn	*Acacia karroo*	S	•	
Khaki Weed	*Alternanthera pungens*	P		
Lagarosiphon	*Lagarosiphon major*	S		
Lantana R	*Lantana camara*	R		•
Lobed Needle Grass	*Nassella charruana*	S	•	
Marijuana	*Cannabis sativa*	S		
Mesquite	*Prosopis spp.*	S		
Mexican Feather Grass	*Nassella tenuissima*	S	•	
Mimosa	*Mimosa pigra*	R		•

Common name	Weed species	Category of noxious weed species gazetted under CaLP Act	Very high risk environmental weed	Weed of National Significance (WON)
Nodding Thistle	*Carduus nutans*	S		
Noogoora Burr/ Californian Burr	*Xanthium strumarium*	C		
Onion Weed	*Asphodelus fistulosus*	R		
Ox-eye Daisy	*Leucanthemum vulgare*	C		
Pampas Lily-of-the-Valley	*Salpichroa origanifolia*	C		
Parkinsonia	*Parkinsonia aculeata*	R		•
Parthenium Weed	*Parthenium hysterophorus*	S		•
Paterson's Curse	*Echium plantagineum*	C		
Perennial Ragweed	*Ambrosia psilostachya*	S	•	
Pond Apple	*Annona glabra*	R		•
Poverty Weed	*Iva axillaris*	S		
Prairie Ground Cherry	*Physalis hederifolia*	C		
Prickly Acacia	*Acacia nilotica subsp. Indica*	R		•
Prickly Pear (drooping)	*Opuntia monacantha*	C		
Prickly Pear (erect)	*Opuntia stricta*	C		
Ragwort	*Senecio jacobaea*	C		
Rubber Vine	*Cryptostegia grandiflora*	R		•
Saffron Thistle	*Carthamus lanatus*	C		
Salvinia	*Salvinia molesta*	S	•	•
Sand Rocket/Sand Mustard	*Diplotaxis tenuifolia*	C		
Scotch/Heraldic Thistle	*Onopordum acanthium*	P		
Serrated Tussock	*Nassella trichotoma*	C	•	•
Silverleaf Nightshade	*Solanum elaeagnifolium*	P		
Skeleton Weed	*Chondrilla juncea*	P		
Slender/Shore Thistle	*Carduus tenuiflorus/C.pycnocephalus*	C		
Soldier Thistle	*Picnomon acarna*	P		
Soursob	*Oxalis pes-caprae*	R	•	
Spear Thistle	*Cirsium vulgare*	C		
Spiny Broom	*Calicotome spinosa*	P		
Spiny Burr Grass/ Gentle Annie	*Cenchrus longispinus*	P		
Spiny Emex	*Emex australis*	P		
Spiny Rush	*Juncus acutus*	C	•	
St Barnaby's Thistle	*Centaurea solstitialis*	P	•	
St John's Wort	*Hypericum perforatum*	C		
St Peter's Wort	*Hypericum tetrapterum*	C		
Star Thistle	*Centaurea calcitrapa*	P		
Stemless Thistle	*Onopordum acaulon*	P		
Stinkwort	*Dittrichia graveolens*	C		
Sweet Briar	*Rosa rubiginosa*	C		
Tangled Hypericum	*Hypericum triquetrifolium*	S		
Thorn Apple (Common)	*Datura stramonium*	C		
Thorn Apple (Long-spine)	*Datura ferox*	C		
Thorn Apple (Recurved)	*Datura inoxia*	P		
Topped Lavender	*Lavandula stoechas*	R		
Tree of Heaven	*Ailanthus altissima*	C		
Tufted Honeyflower	*Melianthus comosus*	C		
Tutsan	*Hypericum androsaemum*	C		
Variegated Thistle	*Silybum marianum*	C		
Viper's Bugloss	*Echium vulgare*	C		
Water Hyacinth	*Eichhornia crassipes*	S	•	
Wheel Cactus	*Opuntia robusta*	P		
White Crack Willow	*Salix x rubens*	R		
Wild Garlic	*Allium vineale*	R		
Wild Mignonette	*Reseda luteola*	R		
Wild Teasel	*Dipsacus fullonum*	C		
Wild Watsonia	*Watsonia meriana var. bulbillifera*	C	•	
Willows**	*Salix spp.*	R	•	•

* Branched Broomrape is also a declared exotic disease under the Plant Health and Plant Products Act 1995.

** Except Salix alba var. caerulea, Salix alba x matsudana, Salix babylonica, Salix X calodendron, Salix caprea 'Pendula', Salix matsudana 'Aurea', Salix matsudana 'Tortuosa', Salix myrsinifolia and Salix X reichardtii.