

# National Weed Spread Prevention draft action plan

Developed by the  
National Weed Spread Prevention Committee  
July 2006



The spread of Hudson pear (*Cylindropuntia rosea*) by vehicles

(Photo courtesy of the NSW Department of Primary Industries)

# Acknowledgments

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## Foreword

The saying ‘prevention is better than cure’ applies to the management of weeds, just as it applies to the management of all invasive species. Apart from costing Australians millions of dollars each year, weeds cause damage to the natural environment and affect our way of life. The National Weed Spread Prevention Draft Action Plan (the draft action plan), is an important step in addressing this pervasive problem.

Existing measures for the prevention of weed impacts include quarantine, early detection and control programs. However, this draft action plan has been specifically developed to promote better ways of tackling weed spread—a key issue identified in the proposed Australian Weed Strategy (AWS).

This document does not cover the assessment and prioritisation of species with significant pest potential, the management of new weed incursions, the mapping of existing weed infestations, and the harmonisation of relevant legislation; these activities are addressed within the AWS. Instead, it proposes management actions that build on valuable measures already in place to prevent weed spread. It also contains a range of improvements to awareness-raising, procedures, and reporting activities, in order to achieve a consistent and coordinated approach.

The draft action plan was developed by an intergovernmental committee, led by the Department of Natural Resources, Mines and Water (Queensland) with input from a number of community, industry and government representatives throughout Australia. It has the support of the Natural Heritage Trust and the Australian Government Department of Agriculture, Fisheries and Forestry. We commend these organisations for their efforts and thank them for their contribution.

There are no ‘quick fixes’ for the problem of weed spread, but the draft action plan will enable policy makers and planners within government, industry and community organisations to make a start.



Glen Fisher

Chair

National Weed Spread Prevention Committee

# Part 1 Overview

## Summary

The aim of this draft action plan is to reduce the risk of weed spread caused by human activity within Australia.

The rationale for the draft action plan can be summarised in four key statements:

1. Pathways for weed spread need to be identified and addressed.
2. Effective consistent and complementary measures to prevent weed spread need to be developed.
3. Government, industry and communities need to be encouraged and empowered to undertake effective preventative actions.
4. The implementation of strategic actions (primarily 1.3) of the proposed Australian Weed Strategy (AWS) needs to be supported.

Six broad goals have been developed to achieve the aim of the draft action plan:

1. To ensure a consistent and strategic approach to weed spread prevention at local, regional, state and national levels.
2. To develop innovative, practical and cost-effective solutions to minimise weed spread.
3. To provide procedures for effective weed spread prevention.
4. To inform and motivate communities, industries, governments and land managers in order to minimise weed spread.
5. To implement effective measures to minimise weed spread.
6. To monitor, evaluate and report on the effectiveness of weed spread prevention.

The draft action plan identifies several outcomes and management actions in order to meet each goal. It prioritises these management actions and allocates the primary responsibility for the implementation of each one. Key performance indicators and deliverables have been developed to measure how well each goal has been achieved.

In this way, the draft action plan will provide clear direction to all parties involved in addressing the problem of weed spread, enabling them to make the best use of available resources.

## Background

This draft action plan is strongly linked to the AWS and is dependent on stakeholders providing the leadership and the resources necessary for its implementation. It was developed through extensive consultation with industry, community and government, and will enable land managers and stakeholders across these groups to improve their understanding of the complexity of weed spread issues. It will also inform them of the key activities that are required to combat this threat to the environment, industry and the Australian way of life.

The importance of weed spread prevention has grown with the recognition that the spread of most weeds occurs through similar pathways, such as the movement of goods, animals and vehicles contaminated with weed seeds. This recognition mirrors the increase in awareness and management of the spread of other pests and diseases. The techniques that are used to lower the risk of spread from weeds are similar to those used for other pests and diseases.

Currently, the different approaches used by individual states, territories and local governments hinder the management of weed spread. Previous reports and publications have identified the need for a nationally coordinated approach to managing the weed spread issue (AWC 1999; Barker 2005).

## Scope

The scope of this draft action plan is limited to the management of the human-induced spread of weeds within Australia. This action plan is restricted to human caused spread because it is amenable to preventative actions and is the dominant method of long distance and local dispersal for most weed species. It assists in

addressing a number of objectives and strategic actions in the AWS (see Appendix 1). The draft action plan does **not** include management actions for:

- border control (international quarantine)
- weed risk assessment
- detection and incursion response
- survey and mapping
- development and implementation of weed control techniques
- national consistency in legislation
- environmental activity (wind and water)
- wild and feral animal activity.

These actions are being addressed by the AWS and/or other supporting action plans.

## **Context**

### ***Impact of weeds***

Weeds are defined for the purposes of the Australian Weeds Strategy, as plants that require some form of action to reduce their harmful effects on the economy, environment, human health and amenity. Weeds include plants not native to Australia and native plants growing outside their known range.

Weeds have a significantly negative impact on the Australian economy and environment, as well as on human health and amenity. Of the 2810 species of introduced plants now established, 30% are considered to be a major problem for managers of natural ecosystems, and 16% are a major problem for managers of agricultural ecosystems (Groves et al. 2003).

Directly or indirectly, all Australians are affected by weeds. For example, landholders and other land managers incur material and labour costs to control weeds. This brings significant flow-on costs to the Australian public who have to pay higher prices for produce. There are also costs associated with illness caused by highly allergenic weeds, and changes in land and water use due to weed infestations. A recent report published by the Weeds Cooperative Research Centre (CRC) has established that weeds cost Australia \$4 billion per year in lower farm incomes and higher food costs (Sinden et al. 2004). In addition, Australian, state and local governments spend at least \$116.4 million each year on the costs of monitoring, control, management and research on weeds. The study estimated that at least \$19.6 million is spent on weed control in national parks and other conservation areas.

These costs are conservative estimates of the annual costs of weeds and do not include the loss of services from the natural environment, the impact on human health, or the value of the 'volunteer army', which is widely active in weed control around Australia.

### ***Cost effectiveness of prevention***

A recent assessment of the economic impact of government expenditure on weed and pest animal management in Queensland provides justification for weed prevention measures (AEC group 2002). This assessment determined benefit to cost ratios that indicate:

- every dollar invested in pest prevention results in benefits of \$25.60–\$38.30
- every dollar invested in the eradication of a newly established weed results in benefits of \$9.90–\$26.80
- every dollar invested in containment program results in benefits of \$1.70–\$3.10.
- every dollar invested in preventing the spread of environmental weeds in South East Queensland results in benefits of \$1.10–\$1.80.

The assessment found that control of weeds once they are established is less cost effective than prevention or control measures undertaken before they become established. It also found that research, education and awareness activities had high benefit to cost ratios.

### **Community perception**

A survey undertaken by the Queensland Department of Natural Resources, Mines and Water (NRMW) in 2003 indicates that there is a willingness in the community to implement measures to prevent weed spread. It found that 84 per cent of primary producers support the use of a vendor declaration of the weed status of goods, while 91 per cent of respondents agreed with measures to restrict the transportation of material that may contain declared weeds (Oliver and Walton 2004).

### **Weed spread mechanisms**

Weed spread can be defined as the movement and subsequent establishment of a weed species in new areas (Blackmore 2005).

The three main mechanisms of weed spread are:

- physical activity (seeds moved by wind and/or water)
- wild and feral animal activity
- human activity.

Human-induced spread includes the movement of weeds by people, and by the use of items such as vehicles, machinery, domestic animals, grain, and feed that are contaminated. Human-induced spread is seen as the most efficient form of weed spread. This is because seeds are generally moved further and in larger numbers through humans and their activity than by other means. This creates secondary infestations at greater distances from primary infestations, and leads to the form of spread known as jump dispersal (Panetta and Scanlan 1995). Species that can be dispersed in this manner tend to spread at a faster rate than species being dispersed from one location (Auld et al. 1978–79; Moody and Mack 1988; Wilson and Lee 1989).

#### ***What is a pathway?***

The Food and Agriculture Organisation of the United Nations (FAO) has defined a pathway as ‘any means that allows the entry or spread of a pest’ [(FAO) 1990; revised FAO 1995]. For the purpose of the draft action plan, this definition has been revised to ‘any means that allows the spread of a pest within Australia’.

Many pathways have been identified in Australia. The Draft Queensland Weed Spread Prevention Strategy identifies 10 major pathways for human-assisted movement of weeds (Appendix 2).

The Victorian Department of Primary Industries is currently developing a risk assessment approach for assessing weed spread pathways. This work is being done through the Tackling Weeds on Private Land Initiative and contributes to the broader Weed Alert program which defines Victoria's approach to prevention and early intervention.

The project has developed a risk matrix which assesses the introduction and spread pathways against potential industries/organisations associated with the pathways (Appendix 3). To ascertain the risk of spread by an organisation for each pathway, criteria have been developed that will be applied to each cell of the matrix. The criteria attempt to capture the key factors contributing to likelihood of a species moving via a pathway and subsequent incursion. Each criterion has a set of descriptors (High, Medium High, Medium, Medium Low, Low) used to determine the level of risk.

### **Development process**

The development process for the draft action plan was initiated as a response to the outcomes of a national project, which evaluated the effectiveness of weed spread prevention measures (Barker 2004), and involved the following steps:

1. A project officer was appointed and funding obtained through the Weeds of National Significance, Natural Heritage Trust 2003–2006 initiative. In-kind contributions were provided by each state and territory.



2. A National Weed Spread Prevention Committee (NWSPC) was formed with representatives nominated by the Australian Weeds Committee (refer to Acknowledgments page). This committee ceased with the submission of the National Weed Spread Prevention Draft Action Plan to the Australian Government Department of Agriculture, Fisheries and Forestry in July 2006.
3. A consultation process was developed that identified stakeholders (see Appendix 4) and requested their attendance at a series of focus group meetings. The focus groups determined key requirements and provided feedback on a 'model action plan'. The model action plan provided a summary of information on weed spread and on measures identified as being, or potentially being, effective in minimising the risk of weed spread.
4. Fifteen focus group meetings were held across Australia in each state and territory to collect opinions from a range of experts.
5. Focus group feedback was collated and reviewed by the steering committee and the draft action plan was developed.
6. The draft document was cross-referenced with the proposed Australian Weeds Strategy (AWS), to ensure consistency between the two documents and with the seven principles articulated in the AWS.

### ***Key principles of weed management***

The following seven key principles are outlined in the AWS:

1. Weed management is an essential and integral part of the sustainable management of natural resources for the benefit of the economy, the environment, human health and amenity.
2. Combating weed problems is a shared responsibility that requires everyone to have a clear understanding of their roles.
3. Good science underpins the effective development, monitoring and review of weed management.
4. Priorities and investment in weed management must be informed by a risk management approach.
5. Prevention and early intervention are the most cost effective techniques that can be deployed against weeds
6. Weed management requires a coordinated approach involving all levels of government in partnership with industry, land managers and the community.
7. The building of capacity across government, industry, land managers and the community is fundamental to effective weed management.

## **Implementation arrangements**

The development of the draft action plan is a strategic action under the proposed AWS. The Australian Weeds Committee (AWC) will be responsible for overseeing the implementation of the AWS and this draft action plan. It is proposed that the AWC establish an implementation steering committee for this action plan, comprising representatives of the Australian, state and territory governments, and chaired by a member of AWC. The committee will also establish a reference panel consisting of key industry, research and community stakeholders.

## **Part 2 Draft action plan**

## **Introduction**

### ***Aim***

The aim of this national action plan is to reduce the risk of weed spread caused by human activity within Australia.

### ***Rationale***

There are four key reasons for this plan. They are:

1. Pathways for weed spread need to be identified and addressed.
2. Effective, consistent and complementary measures need to be developed to prevent weed spread.
3. Government, industry and communities need to be encouraged and empowered to undertake effective preventative actions.
4. The implementation of the strategic actions of the proposed Australian Weeds Strategy, (primarily strategic action 1.3) needs to be supported.

### ***Structure***

The plan is structured under six headings:

- Coordination and planning
- Innovation
- Procedures
- Motivation
- Execution
- Evaluation and reporting

Each heading relates to a specific goal. These are:

1. To ensure a consistent and strategic approach to weed spread prevention at local, regional, state and national levels.
2. To develop innovative, practical and cost-effective solutions to minimise weed spread.
3. To provide procedures for effective weed spread prevention.
4. To inform and motivate communities, industries, governments and land managers in order to minimise weed spread.
5. To implement effective measures to minimise weed spread.
6. To monitor, evaluate and report on the effectiveness of weed spread prevention.

Key performance indicators and deliverables are listed beneath each goal. These have been developed so that the steering committee can assess how effectively the goals have been achieved.

Each goal is also linked to a number of outcomes and management actions. The responsibility for implementing the management actions has been allocated. They will be implemented in three stages:

- Stage 1 indicates actions required in the first 12 months
- Stage 2 indicates actions required in the first three years
- Stage 3 indicates actions required within five years.

The symbol ● is used in the plan to indicate the stage/s at which the management actions are to occur.

The management actions have also been prioritised according to their relative feasibility and potential benefit. Each priority is allocated a point ranking from 1 (highest) to 5 (lowest).

### ***Case studies***

Each of the goals is accompanied by examples of activities that organisations could undertake in order to achieve the goal effectively.

## **Acronyms and abbreviations**

AWC	Australian Weeds Committee
AWS	Australian Weed Strategy
Com	Community groups and regional natural resource management groups
Coord	Coordinator appointed to assist in implementing the plan
Cte	Committee appointed to manage the implementation of the plan
Gov	Local, state, territory and Australian governments and their agencies
Industry	Individual businesses and industry organisations
NWAC	National Weeds Advisory Committee
Res orgs	Research and development corporations and research providers associated with CRCs, state, territory and Australian governments and non-government organisations

## **Glossary**

Community	The people who live in a common area (at any scale) and are unified by common interests
Government	The body chosen by a community to administer their common interests
Industry	Any economically productive activity; a branch of trade or manufacture
Land manager	Any person with the responsibility for management decisions on a piece of land; either the land owner or an agent of the owner(s)

## Coordination and planning

Goal 1: To ensure a consistent and strategic approach to weed spread prevention at local, regional, state and national levels						
<b>Key performance indicator</b>	The number of identified pathways analysed and prioritised <ul style="list-style-type: none"> <li>• The extent to which all levels of weed management covered in the goal have effective weed strategies in place</li> <li>• The extent to which the different levels are coordinating actions and approaches with each other</li> </ul>					
<b>Deliverables</b>	<ul style="list-style-type: none"> <li>• Committee appointed</li> <li>• Coordinator appointed</li> <li>• Reference group established</li> </ul>					
<b>Outcomes</b>	<b>Management actions</b>	<b>Responsibility</b>	<b>Priority</b>	<b>Stage</b>		
				<b>1</b>	<b>2</b>	<b>3</b>
1.1 Leadership for weed spread prevention is evident at all levels.	1.1.1 Define and promote the direction and responsibilities for weed spread prevention, consistent with this plan.	Cte	1	●	●	●
	1.1.2 Build ownership of weed spread prevention through long-term partnerships between community, industry and government.	Cte	3			●
	1.1.3 Establish effective mechanisms for resolution of conflicts between key stakeholders.	Cte	2		●	●
1.2 Weed spread prevention initiatives are effectively coordinated.	1.2.1 Appoint a dedicated sub-committee to implement the action plan.	AWC	1			
	1.2.2 Seek funding and appoint a dedicated person/s to support the committee in the implementation of this plan.	Cte	1	●	●	●
	1.2.3 Develop a national network of coordinators and key people dedicated to weed spread prevention.	Coord	2	●	●	●
1.3 Major stakeholders are actively involved in the development and implementation of weed spread prevention initiatives.	1.3.1 Establish a reference group of major stakeholders potentially involved in the implementation of this plan.	AWC	1	●	●	●
	1.3.2 Liaise with industry and government to ensure weed spread prevention is represented in biosecurity planning, legislation and practices.	Cte	1	●	●	●
1.4 Planning for weed spread prevention occurs at the property, local, regional, state and national levels.	1.4.1 Integrate weed spread prevention into plans for:	Gov agencies Land managers Industry	3	●	●	●
	• natural resource management					
	• property and land management					
	• weed management					
	• biosecurity					
• infrastructure development						

	<ul style="list-style-type: none"> <li>remediation and rehabilitation</li> </ul>					
	<ul style="list-style-type: none"> <li>natural disaster response</li> </ul>					
	<ul style="list-style-type: none"> <li>waste management.</li> </ul>					
1.5 Pathways are prioritised and management actions identified.	1.5.1 Identify, analyse and prioritise weed spread pathways.	Coord	1	●	●	●
	1.5.2 Identify major sources of spread and appropriate management actions for associated pathways.	Gov, Com & Ind	3		●	●
	1.5.3 Trace the entry and subsequent spread of high-priority new and existing weeds.		1	●	●	●
	1.5.4 Develop management actions for key pathways including:		2	●	●	●
	<ul style="list-style-type: none"> <li>the local spread into high-priority environmental and agriculture areas</li> </ul>	Gov, Land managers, Com & Ind	2		●	●
	<ul style="list-style-type: none"> <li>pathways/corridors into and from priority assets.</li> </ul>	Gov, Com & Ind	5			●
	1.5.5 Identify and map clean and infested areas for priority weed species along key pathways.	Gov, Com & Ind	3			●

Priorities are ranked from 1 (highest) to 5 (lowest)

Timeframes: Stage 1—actions required in the first 12 months

Stage 2—actions required in the first 3 years

Stage 3—actions required within 5 years

### Case study

Queensland has recently released a weed spread prevention strategy. This strategy was developed in consultation with industry, government and the community. For the next five years it will:

- coordinate and prioritise the large range of potential and existing activities identified as useful or necessary to combat weed spread
- encourage and support stakeholders in taking ownership of weed spread prevention issues
- support the implementation of the weed spread prevention objectives of the National Weeds Strategy 1999 and the Queensland Weeds Strategy 2002–06.

## Innovation

Goal 2: To develop innovative, practical and cost-effective solutions to minimise weed spread						
Key performance indicator	The extent to which weed spread is minimised by the solutions developed. The amount of funding allocated to weed spread prevention research.					
Deliverables	A portfolio of weed spread prevention research needs and opportunities.					
Outcomes	Management actions	Organisation	Priority	Stage		
				1	2	3
2.1 Research, which focuses on weed spread minimisation, is undertaken.	2.1.1 Undertake a review of research on weed spread prevention and identify any gaps.	Cte	1	●		
	2.1.2 Develop and promote a portfolio of weed spread prevention research needs and opportunities.	Cte	2		●	●
	2.1.3 Undertake collaborative research and development on weed spread, including the following areas:	Res org Ind, Gov & Com	1	●	●	●
	• vehicle, machinery and equipment design to minimise or eliminate their potential to spread weeds.					
	• sterilants or other agents that inhibit survival and/or germination					
	• minimising weed seed set					
	• factors that hinder or promote the uptake of the weed spread prevention message, including reasons why people do not dispose of weeds responsibly					
	• pathway risk assessments					
	• decontamination methods					
	• best practice spread prevention					
	• options to dispose of weeds responsibly					
	• the economics of weed spread prevention					
• additional research requirements arising from the review.						
2.2 Research findings are incorporated into management actions for weed spread prevention.	2.2.1 Communicate and provide easy access to research findings.	Cte	2	●	●	●

Priorities are ranked from 1 (highest) to 5 (lowest)

Timeframes:      Stage 1—actions required in the first 12 months  
                         Stage 2—actions required in the first 3 years  
                         Stage 3—actions required within 5 years

### **Case studies**

1. Recent research conducted by the Victorian Department of Primary Industries confirms that vehicles, plant and equipment can carry a large number of contaminant species in a variety of locations on the vehicles (Moerkerk 2006). A surprisingly high proportion of passenger vehicles were found to be carrying noxious weeds. The most frequent location for finding noxious weeds in passenger and four-wheel drive vehicles was in the cabin (67%), followed by the engine bay (56%). Noxious weeds were found in all locations assessed.

The study also confirmed that practising good vehicle hygiene and regular cleaning can reduce the risks of spreading weeds, as cleaning the cabin, engine bay, tray, chassis and guards removes a significant number of noxious weed propagules.

2. The problem of the spread of Chilean Needle Grass by slashers has resulted in Victoria (through Royal Melbourne Institute of Technology) and Queensland (through the innovation of a local government officer) modifying slashers to prevent them from spreading material.



## Procedures

Goal 3: To provide procedures for effective weed spread prevention						
Key performance indicator	<ul style="list-style-type: none"> <li>Reduction in number of new infestations and rate of spread of existing infestations</li> <li>The number of industries with guidelines/codes of practice with weed spread prevention provisions</li> <li>The number of nationally agreed procedures for weed spread prevention</li> </ul>					
Deliverables	<ul style="list-style-type: none"> <li>A model national code of practice</li> <li>National protocol/standards for clean down facilities</li> </ul>					
Outcomes	Management actions	Organisation responsible	Priority	Stage		
				1	2	3
3.1 Agreed best-practice hygiene and spread prevention guidelines, standards, protocols and codes of practice.	3.1.1 Develop codes of practice for minimising weed spread, including:					
	<ul style="list-style-type: none"> <li>a national model code of practice</li> </ul>	Coord	1	●		
	<ul style="list-style-type: none"> <li>industry-specific codes of practice.</li> </ul>	Coord, Ind & Gov, Com	2	●	●	●
	3.1.2 Develop protocols for managing high priority weeds, including plants that have economic or rehabilitative importance but are highly invasive.	Coord & Gov	3		●	●
	3.1.3 Develop national protocols and standards for cleaning vehicles, machinery and equipment, and when and where cleaning is required.	Coord	1		●	
	3.1.4 Develop national guidelines for clean down facilities including:	Coord	1	●		
	<ul style="list-style-type: none"> <li>strategic location of new facilities</li> </ul>					
	<ul style="list-style-type: none"> <li>building design and area requirements</li> </ul>					
	<ul style="list-style-type: none"> <li>temporary facilities</li> </ul>					
	<ul style="list-style-type: none"> <li>portable facilities</li> </ul>					
	<ul style="list-style-type: none"> <li>upgrading existing facilities</li> </ul>					
	<ul style="list-style-type: none"> <li>maintaining facilities.</li> </ul>					
	3.1.5 Develop guidelines for the safe disposal or processing of weeds, contaminated material and garden waste, addressing requirements for:	Cte	2		●	
	<ul style="list-style-type: none"> <li>urban areas</li> </ul>					
	<ul style="list-style-type: none"> <li>agricultural areas</li> </ul>					
<ul style="list-style-type: none"> <li>industry</li> </ul>						
<ul style="list-style-type: none"> <li>high-risk weed species.</li> </ul>						

Priorities are ranked from 1 (highest) to 5 (lowest)

Timeframes:     Stage 1—actions required in the first 12 months  
                  Stage 2—actions required in the first 3 years  
                  Stage 3—actions required within 5 years

### **Case study**

Agricultural Contractors of Tasmania Incorporated developed a simple but innovative weed hygiene accreditation system with the assistance of the Tasmanian Government. The system had to have high credibility and value in the market place and low implementation (including minimising the amount of paperwork) and maintenance costs to members (Hanson 2004). The system involves:

- the Code of Practice, which specifies the standards required including: weed identification skills, weed management knowledge, selection and preparation of sites, and hygiene procedures specific to types of vehicles, equipment and implements
- the job sheet, which records weed information and practices relevant to each job. It includes a provision for sign-off by contractor and client
- a compliance agreement that documents audit results and formal accreditation, and involves a two-step audit process.

## Motivation

Goal 4: To inform and motivate communities, industries, governments and land managers in order to minimise weed spread						
Key performance indicator	The number of businesses/organisations in a national contacts register The number of businesses/organisations which have adapted best practice/accreditation procedures over time					
Deliverables	<ul style="list-style-type: none"> <li>A communication plan developed and implemented</li> <li>An accreditation program established</li> </ul>					
Outcomes	Management actions	Organisation responsible	Priority	Stage		
				1	2	3
4.1 Community, industry and government stakeholders have greater awareness and understanding of weed spread issues.	4.1.1 Develop and implement a communication campaign that:	NWAC, Coord	1	●	●	●
	<ul style="list-style-type: none"> <li>targets groups with a high potential to spread weeds</li> </ul>		1	●	●	●
	<ul style="list-style-type: none"> <li>promotes successful compliance activities/programs</li> </ul>		1	●	●	●
	<ul style="list-style-type: none"> <li>highlights the economic and environment value of undertaking hygiene practices</li> </ul>		2		●	●
	<ul style="list-style-type: none"> <li>markets the benefits of cleaning vehicles and machinery</li> </ul>		2		●	●
	<ul style="list-style-type: none"> <li>includes a local government campaign on the actions required to safely dispose of garden, waste and weeds</li> </ul>		3		●	●
	<ul style="list-style-type: none"> <li>may include an advertising component.</li> </ul>		5			●
	4.1.2 Develop education and awareness material including:	Coord	2		●	●
	<ul style="list-style-type: none"> <li>case studies</li> </ul>					
	<ul style="list-style-type: none"> <li>materials that assist in analysing risk and developing plans.</li> </ul>					
4.1.3 Develop processes to promote long-term information flow and allow the rapid distribution of information, including registers and lists of businesses/organisations involved in high-risk pathways to inform them of new detections, biosecurity and plant risk alerts, and changes to weed declarations.	Coord, Gov	2		●	●	
4.2 The community has improved access to training, and education material.	4.2.1 Establish accredited training for: weed identification, spread prevention measures, best practice hygiene practices, inspection procedures and protocols.	Coord, Land managers, Com and Ind	3		●	●

	4.2.2 Make information and material readily accessible to schools, community and industry, including:	NWAC, Coord,	3		●	●
	• weed identification kits					
	• contaminant identification kits					
	• best practice guidelines					
	• information sheets					
	• web-based tools.					
	4.2.3 Include weed spread prevention in existing biosecurity training.	Gov, Com & Ind	4			●
4.3 Incentive programs promote and reward best practice.	4.3.1 Develop and implement practical incentive programs that promote and reward best practice, including:	Gov, Com & Ind		●	●	●
	• accreditation programs to enable weed-free products to be identified and promoted that include:		2		●	●
	• active promotion of accredited suppliers		2		●	●
	• preferred supplier status as prerequisite for government and industry contracts		2		●	●
	• recognition of industries actively working to decrease weed spread		2	●	●	●
	• incentives for private enterprises to establish weed inspection services		5			●
	• incentives for the responsible disposal of weeds and garden waste		5		●	●
	• disincentives to dump waste.		5		●	●
4.4 Legislative requirements for weed spread prevention are complied with.	4.4.1 Determine the effectiveness of compliance and enforcement procedures used in Australia and overseas.	Coord	4		●	
	4.4.2 Examine the feasibility of co-regulation and/or enforceable audit processes to assist in the implementation of guidelines such as industry codes of practice.	Cte	3			●

Priorities are ranked from 1 (highest) to 5 (lowest)

Timeframes: Stage 1—actions required in the first 12 months  
Stage 2—actions required in the first 3 years  
Stage 3—actions required within 5 years

### **Case studies**

1. Evaluation of the education and awareness component of the National Parthenium Weed Strategy indicates that targeted awareness campaigns on weed identification, management and spread prevention are effective. Television and radio community service announcements were used as a highly cost-effective tool for enhancing parthenium weed awareness within regional areas of New South Wales, Queensland and the Northern Territory. The announcements were targeted to ensure that the right message went to the appropriate community. For example, within northern New South Wales/southern Queensland, key messages were about identification and prevention measures. Within Central Queensland, the key messages were integrated management practices and prevention of spread. Very positive community feedback was received for the parthenium display caravans, which were seen as a great concept for providing quick and easy access to identification and management information for parthenium weed. (P Austin, pers. comm. 2006)
2. A recent judgement in the Mungindi Local Court, New South Wales fined a Mungindi grain harvester \$1500 for moving a header from Queensland into New South Wales, without passing a noxious weed seed inspection. In handing down his decision, Magistrate Prowse said that effort must be made to keep parthenium weed out of New South Wales. Headers have been identified as carriers of this serious weed, with thorough cleaning and rigorous border inspection an essential component of the New South Wales Parthenium Weed Strategy.

## Execution

Goal 5: To implement effective measures to minimise weed spread						
<b>Key performance indicator</b>	<ul style="list-style-type: none"> <li>The range of measures implemented to minimise the rate of weed spread and the efficacy of these measures</li> <li>The number of non-government weed inspection providers</li> <li>The number of vendor declaration systems incorporating weed spread prevention</li> </ul>					
<b>Deliverables</b>	<ul style="list-style-type: none"> <li>National inventory of existing public clean down facilities</li> <li>Agreed criteria, standards and procedures documented for inspection providers</li> <li>Report to AWC on the feasibility of a national system of disclosure</li> </ul>					
<b>Outcomes</b>	<b>Management actions</b>	<b>Organisation responsible</b>	<b>Priority</b>	<b>Stage</b>		
				<b>1</b>	<b>2</b>	<b>3</b>
5.1 Management actions in this strategy are resourced.	5.1.1 Promote opportunities for worthwhile investment in weed spread prevention, according to priorities in this plan.	Cte	2	●	●	●
	5.1.2 Identify opportunities for collaborating/partnering and sharing of resources.	Cte	2		●	●
5.2 Best-practice hygiene and spread prevention techniques are undertaken by organisations that have the capacity to spread weeds (including water weeds).	5.2.1 Weed spread prevention is incorporated into existing industry, government and utilities standards, contracts and programs, including vendor declaration and product labelling.	Cte	2		●	●
5.3 A network of strategically located clean-down facilities is developed across Australia.	5.3.1 Identify the location and capability of existing public clean-down facilities.	Cte	2	●		
	5.3.2 Identify resources, including cost-sharing, to build and operate additional clean down facilities.	Cte	3		●	
5.4 A weed/weed seed inspection network is established for: <ul style="list-style-type: none"> <li>vehicles, machinery and equipment (includes recreation), products and materials</li> <li>land</li> </ul>	5.4.1 Develop agreed inspection criteria, standards and procedures.	Coord	2	●		
	5.4.2 Develop a national network of inspection providers, based on a review of existing cost-effective systems and weed spread prevention requirements.	Cte	4		●	●
	5.4.3 Promote and encourage roadside inspection programs including at border crossings.	Govt	4		●	●

5.5 Purchasers and receivers know the weed status of materials, goods and land	5.5.1 Develop and implement a process to inform purchasers of the weed status of land.	Cte, Gov, Com	4			●
	5.5.2 Determine the feasibility of a national declaration system that can be applied to all goods, including a mandatory code of conduct for labelling plants with scientific name.	Cte, Gov, AWC	4			●
	5.5.3 Incorporate, if feasible, weed contamination into existing vendor declaration systems, such as livestock movement and quality control of fodder.	Coord	2		●	●
5.6 Mechanisms are established for reducing weed spread through ecosystem disturbance.	5.6.1 Promote the inclusion of weed spread prevention in:	Gov, Ind, Com	3		●	●
	• environmental planning statutes					
	• infrastructure plans					
	• development applications					
	• environmental impact statements					
	• licences to undertake environmental activities					
	• codes of practice					
	• revegetation and reclamation plans					
• natural disaster response plans.						

Priorities are ranked from 1 (highest) to 5 (lowest)

Timeframes: Stage 1—actions required in the first 12 months

Stage 2—actions required in the first 3 years

Stage 3—actions required within 5 years

### Case study

Australian Agricultural Company (AACo) operates 19 cattle stations throughout the Northern Territory and Queensland, covering an area of 6.6 million hectares. To protect their land from highly aggressive, exotic woody weeds, AACo developed a protocol for internal and external movement of cattle. The protocol ensures that ingested weed seed is not transported by stock. The policy is not seen by managers as a ‘big deal’ and does not require significant financial investment. It also has the additional benefit of reducing carcass shrinkage through stress and time-off feed (White 2004).

## Evaluation and reporting

Goal 6: To monitor, evaluate and report on the effectiveness of weed spread prevention						
Key performance indicator	Monitoring, evaluation and reporting should be comprehensive and provide a basis for strategic planning and investment to minimise weed spread Proportion of management actions (in this plan) resourced/implemented					
Deliverables	Annual reports presented to the Australian Weeds Committee and stakeholders					
Outcomes	Management actions	Organisation responsible	Priority	Stage		
				1	2	3
6.1 Changes in weed spread and the effectiveness of this plan are known.	6.1.1 Establish a review and reporting process for the implementation of management actions in the plan.	AWC	1			●
	6.1.2 Develop criteria for assessing weed spread prevention, consistent with the key performance indicators and deliverables within this plan.	Cte	2	●		
	6.1.3 Regularly assess performance against performance criteria.	Cte	2		●	●
	6.1.4 Collect and make available baseline data for monitoring weed spread.	Coord, Land managers, Com & Gov	4		●	

Priorities are ranked from 1 (highest) to 5 (lowest)

Timeframes: Stage 1—actions required in the first 12 months

Stage 2—actions required in the first 3 years

Stage 3—actions required within 5 years

### Case study

In 2005 a review was undertaken of the Branched Broomrape Eradication Program, a national, cost-sharing, eradication program. Branched broomrape (*Orobancha ramosa* L.) is a parasitic weed of broadleaf native plants and poses an extremely serious threat to agriculture and our native flora. It has been found in South Australia and Victoria. This plant produces massive amounts of dust particle-size seeds that are easily spread. The review and the terms of reference were agreed to by the Australian Weeds Committee and endorsed by the National Resources Policy and Programs Committee. The review involved an examination of records, processes used and outcomes in consultation with the community, industry and government. It recognised that the program, with its prevention of spread component, had made substantial progress towards eradicating the weed and recommended its continuation with a range of improvements.



**Part 3    References and appendices**

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## Appendix1

## Relevant sections of the AWS

Goals	Objectives	Strategic action	
1. Prevent new weed problems	1.3: Reduce spread of weeds within Australia to new areas.	1.3.1: Identify pathways and assess the risk for the spread of weeds within Australia.	
		1.3.2: Develop and implement a national weed spread prevention plan.	
2. Reduce the impact of existing priority weed problems	2.1: Identify and prioritise weeds and weed management problems, and their causes.	2.1.1: Conduct risk analyses of weed species to identify and prioritise for action.	
		2.1.2: Conduct risk analyses of weed management problems and causes to identify and prioritise for action.	
	2.2: Implement coordinated and cost-effective solutions for priority weeds and weeds problems.	2.2.1: Develop and implement plans for the management of the priority weeds and weed problems for action.	
		2.2.2: Develop improved management practices and promote their adoption	
	2.3: Develop approaches to managing weeds based on the protection of values and assets.	2.3.1: Identify the threats posed by weeds to key cultural, environmental and production assets and values.	
		2.3.2: Develop and implement site-led approaches to manage weed threats in relation to key assets and values.	
		2.3.3: Build community capacity for implementation of site-based plans for weed management.	
		2.3.4: Develop and promote best management practices that address weed threats and causes at the landscape level, and remediate the resource.	
		2.3.5: Adopt systems approaches to integrate weed management into production and ecosystem management.	
	3. Enhance our capacity and commitment to solve weed problems	3.1: Raise awareness and motivation to gain commitment from Australians to act on weed problems.	3.1.2: Develop and implement nationally consistent and targeted weed awareness activities.
			3.1.4: Develop and implement incentive programs.
			3.1.5: Develop improved weed spread prevention awareness and actions by industries and the community.
3.2: Strengthen Australia's capacity to address weed problems and improve weed management.		3.2.1: Create opportunities for training and development in weed management skills.	
		3.2.2: Support the operation of networks for community-based, on-ground action.	
		3.2.3: Prioritise weed research needs and identify and facilitate programs to provide new approaches.	
		3.2.4: Researchers and those who fund research give a high priority to weed issues.	
		3.2.6: Provide ready access to high-quality weed management information and knowledge.	
		3.2.7: Identify and reduce barriers to adoption of best practice weed management.	
3.3: Manage weeds within consistent policy, legislative and planning frameworks.		3.3.1: Identify and address weed issues in natural resource, environment and development planning at all levels and implement action.	
		3.3.2: Develop and promote consistent and complementary weed management plans and priorities.	

		3.3.3: Establish nationally consistent legislation to address weed problems.
		3.3.4: Develop and implement a national, uniform weed categorisation system.
	3.4: Monitor and evaluate progress of Australia's weed management effort.	3.4.2: Develop, implement and maintain regular and consistent monitoring of weed distribution, impacts and management.

## Appendix 2 Pathways in the Queensland Weed Spread Prevention Strategy

Pathway	Examples
<b>Transportation over land</b> including all methods of moving across the ground	Agricultural machinery, stock carriers, cars, trucks, buses, all-terrain vehicles, construction equipment
<b>Transportation over water</b> including all methods of moving through the water	Recreational boats and other craft, barges, industrial, tourism, recreational and law enforcement vessels, military craft
<b>Tourism</b> including travel for recreation, business or for relocation	Tourists (including those using air travel), golfers, campers, fossickers, recreational hunters
<b>Movement of plants and plant parts</b> including fruits, vegetables, nuts, roots, seeds, edible flowers; plants 'in trade' (intentionally released—authorised or unauthorised—or escaped)	'Hitchhiker seed' such as weed seeds that have contaminated other seed for sowing or eating or in water, food, growing medium.
<b>Transportation of live food, animals and animal parts</b> including movement of stock and/or their contaminated waste containing viable weed seed from food source	Hitchhiker seed on or in live animals and in water, food, growing media, nesting or bedding.
<b>Plant and aquarium trade</b> including deliberate introductions of plants	Botanical gardens, nurseries, research facilities, public and private plantings, and aquariums/water gardening facilities
<b>Movement of construction and landscape material</b> including extraction	Movement and storage of soil, gravel, sand, mulch and rocks.
<b>Gas, power and mineral resources</b> including mining resources and developing and maintaining movement corridors.	Exploration, survey, movement of material, construction and maintenance of facilities.
<b>Waste disposal</b> including illegal dumping, unsafe disposal and movement of weed waste.	Garden/green waste dumping, composting, mulching.
<b>Ecosystem disturbance</b> including activities promoting environments more suitable for weed establishment.	Vegetation clearing, restoration, forestry, fire management, grazing, agriculture, and extreme weather events (e.g. cyclone, drought).

### Appendix 3 The Victorian Pathway Matrix

Potential weed introduction pathway	Human movement	Deliberate introduction via community	Deliberate introduction via business	Controlled stock movement	Contaminated goods/ produce	Contaminated vehicles	Contaminated equipment	Contaminated aquatic equipment	Waste disposal	Animal movement (other than stock)
Agency										
Nursery and garden industry	<i>yes/no criteria</i>									
Landscaping industry										
Fodder industry										
Grains industry										
Livestock industry										
Seed industry										
Forestry industry										
Mining and exploration industry										
Turf industry: suppliers of seed										
Transport										
Aquarium/pet shops										
Growers										
Bulk suppliers										
Plant research										
Travel/tourism/recreation										
Rural produce merchandisers										
Agricultural service										
Agricultural contractors										

<b>Earth moving</b>										
<b>Hire and resale of machinery</b>										
<b>Linear reserve managers</b>										
<b>Municipal councils</b>										
<b>Catchment management authorities</b>										
<b>Botanical gardens, other plant collections and zoos.</b>										
<b>Community groups</b>										
<b>Property developers/builders</b>										
<b>Fire management</b>										
<b>Defence forces</b>										
<b>General public</b>										

## Appendix 4 Stakeholder organisations

Area	Organisations invited	Accepted
ACT	Plant Health Australia	y
ACT	Vegetation Management Policy Section, Department of Environment and Heritage	y
ACT	Environment ACT	
ACT	Department of Industry, Tourism and Resources	
ACT	Geoscience Australia	
ACT	CSIRO Forestry and Forest Products	
ACT	Australian Aluminium Council	
ACT	Australian Centre for Mining Environmental Research	
ACT	Australian Coal Association	
ACT	Australian Forest Growers	y
ACT	Australian Institute of Petroleum	
ACT	Australian Livestock Transporters' Association	
ACT	Australian Local Government Association	y
ACT	Australian Petroleum Producers and Exploration Association	
ACT	Cattle Council of Australia	
ACT	Cotton Australia Limited	
ACT	Grains Council of Australia	y
ACT	Grains Research and Development Corporation	
ACT	Minerals Council of Australia	
ACT	National Association of Forest Industries Ltd	y
ACT	National Farmer's Federation	
ACT	Seed Industry Association of Australia	y
ACT	Sheepmeat Council of Australia	
ACT	The Environment Management Industry Association of Australia	
ACT	Meat and Livestock Australia	
ACT	Greening Australia	y
ACT	A3P, Australian Plantation Products and Paper Council	y
ACT	Biosecurity Australia	y
ACT	CRC for Australian Weeds Management	y
ACT	Australian Landcare Council	
ACT	CSIRO Entomology Division—Weeds	y
ACT	Aquatic Association	

Area	Organisations invited	Accepted
ACT	National Aquatic Weeds Management Coord/DEH	
ACT	Conservation Volunteers Australia	y
ACT	AQIS	y
ACT	Nursery and Garden Industry Australia	y
NSW	WONS Bitou Bush and Boneseed Steering Committee	
NSW	World Wide Fund for Nature	y
NSW	NSW Department of Primary Industries	y
NSW	New England Weeds Authority	y
NSW	NSW Farmers Association	y
NSW	Gundagai Shire	y
NSW	Goulburn Serrated Tussock Group	y
NSW	NSW Noxious Weeds Officers Association	y
NSW	Nursery and Garden Industry NSW and ACT Limited	
NT	Dept of Planning and Infrastructure—Roads Division	y
NT	Dept of Primary Industries, Fisheries and Mines - Crops, Forestry and Horticulture Division	y
NT	Department of Primary Industries, Fisheries and Mines—Quarantine	y
NT	Department of Business, Economic and Regional Development	y
NT	Department of Environment and Heritage	
NT	Katherine Region Landcare Group	
NT	Roper River Landcare Group	y
NT	Victoria River District Conservation Association	y
NT	Sturt Plateau Best Practice Group	
NT	Barkly Landcare and Conservation Association	y
NT	Centralian Land Management Association	y
NT	Jawoyn Association Aboriginal Corporation	
NT	Northern Land Council	
NT	Tiwi Land Council	
NT	Julalikari Council Aboriginal Corporation	



Area	Organisations invited	Accepted
NT	Wagiman–Guwardagun Ranger Group	
NT	Pine Creek Aboriginal Advance Association	y
NT	Iparpa Valley Landcare Group	
NT	WWF	
NT	Environment Centre NT	
NT	Arid Lands Environment Centre	
NT	Threatened Species Network	
NT	CRC for Australian Weed Management	
NT	Darwin Regional Weed Advisory Committee	
NT	Katherine Regional Weed Advisory Committee	y
NT	Alice Springs Regional Weed Advisory Committee	
NT	NT Agricultural Association	y
NT	Amateur Fisherman's Association Northern Territory	
NT	NT Horticulture Association	
NT	Katherine District Farmers Association	
NT	Rural Area Association	
NT	Northern Territory Cattlemen's Association	y
NT	NT Minerals Council	
NT	Asia Pacific Transport/Railways	
NT	AQIS North Australian Quarantine Services	y
NT	NT Greening Australia	
NT	Landcare Council of the Northern Territory	
NT	Local Government Association of the Northern Territory	
NT	Katherine Town Council	
NT	Specialist Weed Control	
NT	Territory Weed Management	
NT	Charles Darwin University	
NT	Department of Natural Resources, Environment and the Arts	y
NT	Central Land Council	
NT	Indigenous Land Corporation	
NT	Indigenous Coordination Centres	
NT	Northern Australia Indigenous Land and Sea Management Alliance	
NT	Central Land Council	
NT	Anindilyakwa Land Council	
NT	Defence Estate Organisation	

Area	Organisations invited	Accepted
NT	Nursery and Garden Industry Northern Territory	
Qld	AgForce	y
Qld	Alan Fletcher Research Station	y
Qld	Australian Livestock Transporters' Association - Queensland Branch	y
Qld	Burdekin Dry Tropics NRM	
Qld	Cape York Weeds and Feral Animals Program	y
Qld	Central Highlands Development Corporation	
Qld	Central Western Qld Remote Area Planning and Development Board (RAPAD ROC)	
Qld	Civil Contractors Federation Queensland Branch	
Qld	Commerce Queensland	
Qld	Cook Shire	y
Qld	CRC Weed Management	
Qld	CRC for Australian Weed Management	y
Qld	Dalrymple Shire Council	y
Qld	Defence Force Townsville	y
Qld	Department of Natural Resources and Mines	
Qld	Desert Channels NRM Group	
Qld	Eacham Shire Council	
Qld	Ergon Energy	y
Qld	Energex	
Qld	Qld Environmental Protection Agency	y
Qld	Far North Queensland Regional Organisation of Councils	y
Qld	Fitzroy Basin Association, Capricorn Pest Management Group	
Qld	Flinders Shire Council	
Qld	Grainco	
Qld	Herberton Shire Council	
Qld	Lantana National Management Committee	
Qld	Lund Construction	
Qld	National Hymenachne Management Group	y
Qld	National Prickle Bush Management group	y
Qld	Northern Australia Quarantine Strategy (NAQS) AQIS	
Qld	Nursery and Garden Industry, Queensland	
Qld	Parthenium Weed Management Group	y

Area	Organisations invited	Accepted
Qld	Private Forestry Southern Queensland Inc	
Qld	Queensland Cane Growers Council	
Qld	Department of Main Roads	
Qld	Department of Natural Resources, Mines and Water	y
Qld	Qld Interagency Pest Management	
Qld	Queensland Nursery and Garden Industry	y
Qld	Queensland Conservation Council	y
Qld	Queensland Department of Transport	y
Qld	Queensland Fruit and Vegetable Growers Ltd	
Qld	Queensland Macropod and Wild Game Harvesters	
Qld	Queensland Murray Darling Committee Inc	y
Qld	Queensland Parks and Wildlife Service	y
Qld	Department of Primary Industries and Fisheries	
Qld	Queensland Rail	y
Qld	Queensland Resources Council	
Qld	Department of Main Roads	y
Qld	Southern Gulf Catchments	
Qld	Spread Prevention Trainer	y
Qld	Stock Feed Manufacturers - Rocky Agriproducts	y
Qld	Wet Tropics Management Authority	
Qld	Lantana National Management Committee	
Qld	National Aquatic Weeds Management Group	
Qld	National Pond Apple Management Group	
Qld	Rubber Vine Weed Management Group	
Qld	Nursery and Garden Industry, Queensland	
SA	Elders Livestock	y
SA	South Australian Farmers' Federation	y
SA	Local Government Association of South Australia	y
SA	Rural Solutions South Australia	
SA	Landmark	
SA	Rural Solutions South Australia	
SA	Nursery and Garden Industry South Australia Inc.	y

Area	Organisations invited	Accepted
SA	Department for Environment and Heritage	y
SA	PIRSA Livestock	
SA	Transport SA	
SA	South Australian Livestock Exchange	
SA	Department of Water Land and Biodiversity Conservation	y
SA	PIRSA, Plant Health	y
SA	South Australian Livestock Transporters' Association	
SA	Adelaide Mt Lofty Ranges Natural Resources Management Board	y
SA	Kangaroo Island Natural Resources Management Board	
SA	Eyre Peninsula Natural Resources Management Board	
SA	Northern and Yorke Agricultural District Natural Resources Management Board	
SA	Murray and Mallee Local Government Association	
SA	South Australian Murray Darling Basin Natural Resources Management Board	y
SA	Naracoorte Regional Livestock Exchange	y
SA	Mount Gambier Saleyard	y
SA	South East Natural Resources Management Board	y
SA	South East Local Government Association Inc.	
SA	Lucerne Australia	
Tas	National Gorse Management Group	
Tas	Australian Weeds Committee	y
Tas	West Coast Fire and Weed Strategy Group	y
Tas	Tasmanian Farmers and Graziers and national weed advisory committee	y
Tas	Landcare council	y
Tas	National weed advisory committee	y
Tas	Department of Primary Industries and Water	y
Tas	Aurora energy	y
Tas	Nursery and Garden Industry of Tasmania	y
Tas	Northern Tasmanian Weed Group	y

Area	Organisations invited	Accepted
Tas	Nursery and Garden Industry Tasmania	
Vic	National Blackberry Taskforce	
Vic	National Bridal Creeper Steering Committee	
Vic	National Chilean Needle Grass Taskforce	
Vic	Serrated Tussock	
Vic	Victorian Serrated Tussock Working Party	
Vic	Royal Botanic Gardens Melbourne	y
Vic	Department of Primary Industries	y
Vic	Australian Fodder Industry Association	y
Vic	Sustainable Garden Association	y
Vic	Yarra Ranges Shire	y
Vic	Mornington Peninsula Shire	y
Vic	Victorian Catchment	y

Area	Organisations invited	Accepted
	Management Council	
Vic	Department of Sustainability and Environment	y
Vic	National Blackberry Taskforce	y
WA	Shire of Donnybrook	y
WA	Shire of Busselton	y
WA	Shire of Dardanup	y
WA	South West Catchments Council	y
WA	GeoCatch	y
WA	Main Roads Department	y
WA	WA Conservation Council	y
WA	WA Bushcare	y
WA	Environmental Weeds Action Network	y
WA	Oregon State University, Weed Science Society of America	y
WA	Department of Agriculture	y
WA	WA Weeds Society	y