



Pest Plant Assessment and Noxious weed Review

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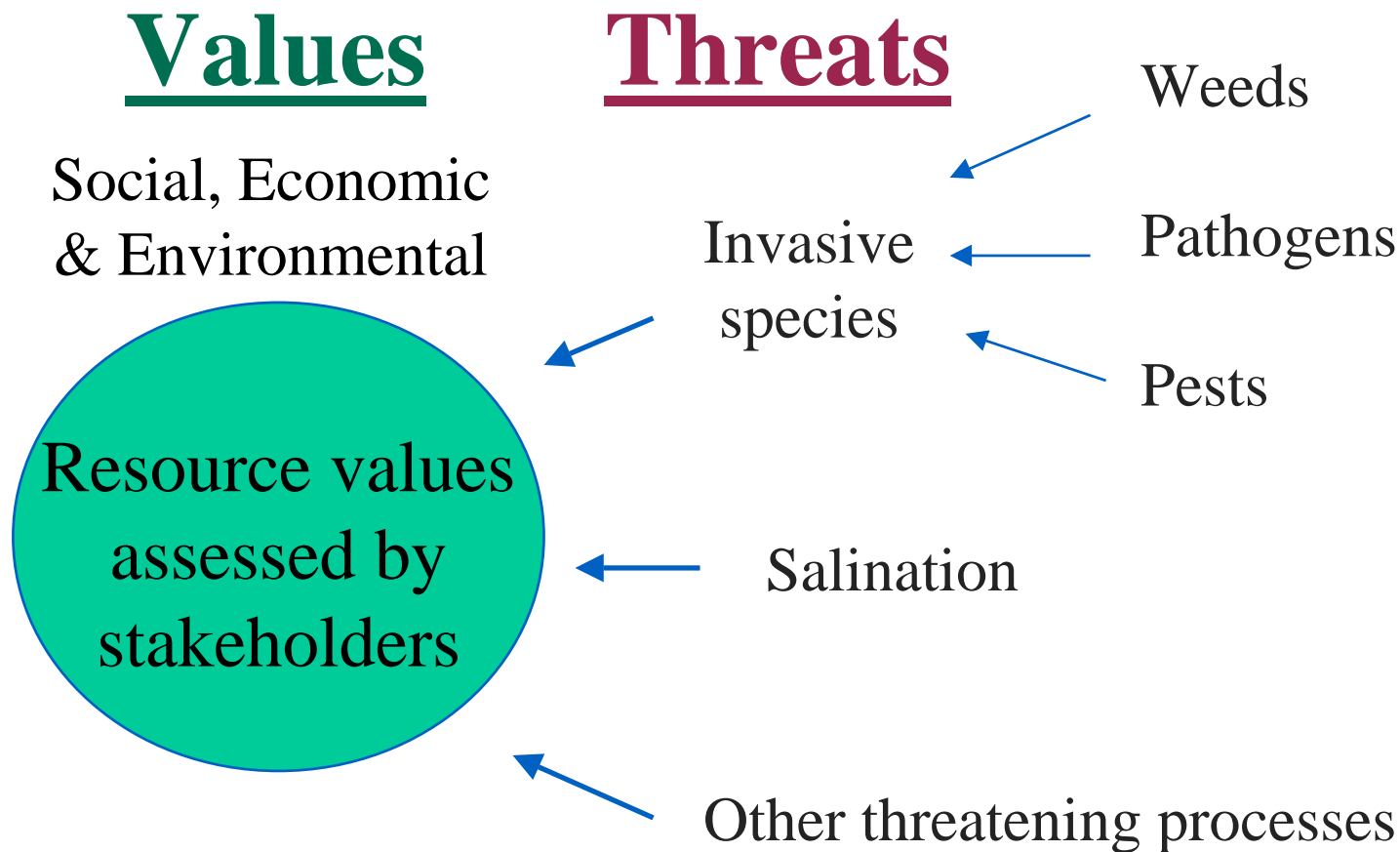
Catchment and Land Protection Act 1994

“...only recommend a plant... has or may have the potential to become, a serious threat to primary production, Crown land, the environment or community health in Victoria”

Victoria's Pest Management: A Framework for Action (NRE, 2002)

Pest Management Principle:

“The threat and risk posed by new species with pest potential...
...needs to be **assessed** based on risk analysis with the **assessment** of
risk undertaken before applying resources to major control or
eradication programs”.



Issue

Large number of weeds

(>1200 already naturalised - 40,000 awaiting arrival !)

How to direct resources/ prioritise weeds.

Projects

- Prioritise new and emerging weeds
- Review noxious weeds
- Prioritise weeds based on impact for different land managers

About Catchment Decision Assistant

Catchment Decision Assistant

Version 3.0.9

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Melbourne Australia



This program has been created as part of the Catchment and Water Decision Support System. A Joint project between the Department of Natural Resources and Environment, Victoria and the Department of Geomatics, University of Melbourne. Funded by Natural Heritage Trust, Commonwealth of Australia and the State of Victoria

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OK

System Info...



Department of
Natural Resources
and Environment

Decision Support Systems

- Help break down complex decisions
- Captures the expertise of specialists
- Identify information gaps
- Transparent system
- Provides framework for group decision making
- Enables quantitative and qualitative analysis

A Science based system must satisfy three general criteria.

1. Must be transparent, open to review, peer evaluated
2. Logical framework
3. Must be repeatable with same outcome by different users

THREE MAIN PRINCIPLES

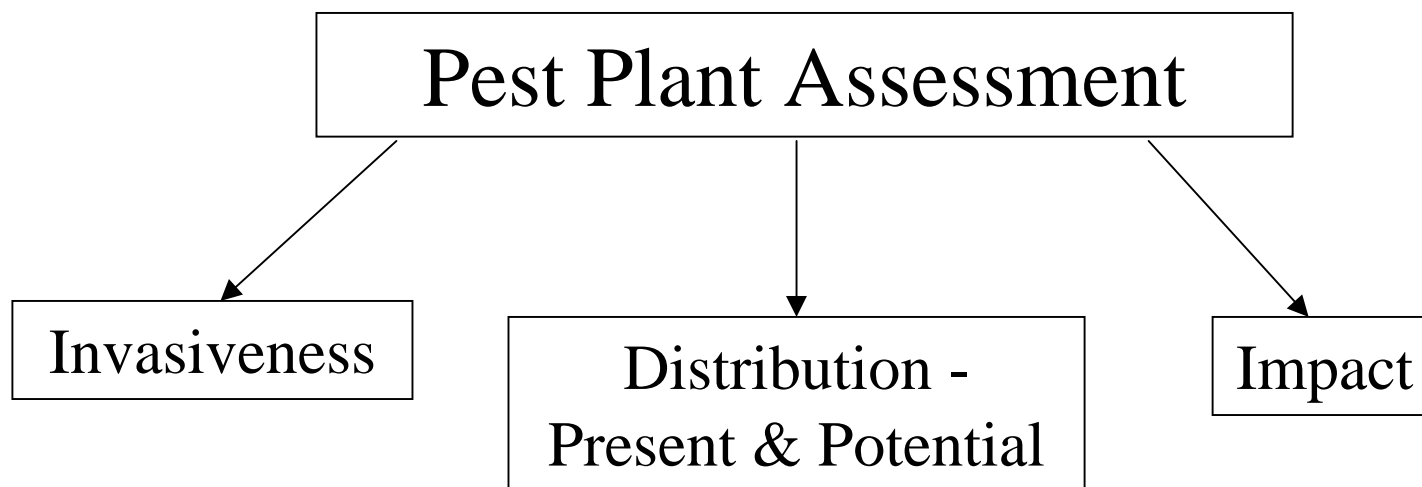
One weed is more important than another because;

1. Fast spreading - More Invasive
2. Is presently localised - but could spread much further
3. Impacts more on social, environmental and agricultural values

Then Feasibility or Cost : Benefit Analysis

Agreed Draft National Technical Specifications - CRC, National Weeds Strategy, Australian Weeds Committee

Victoria's Pest Plant Assessment Process



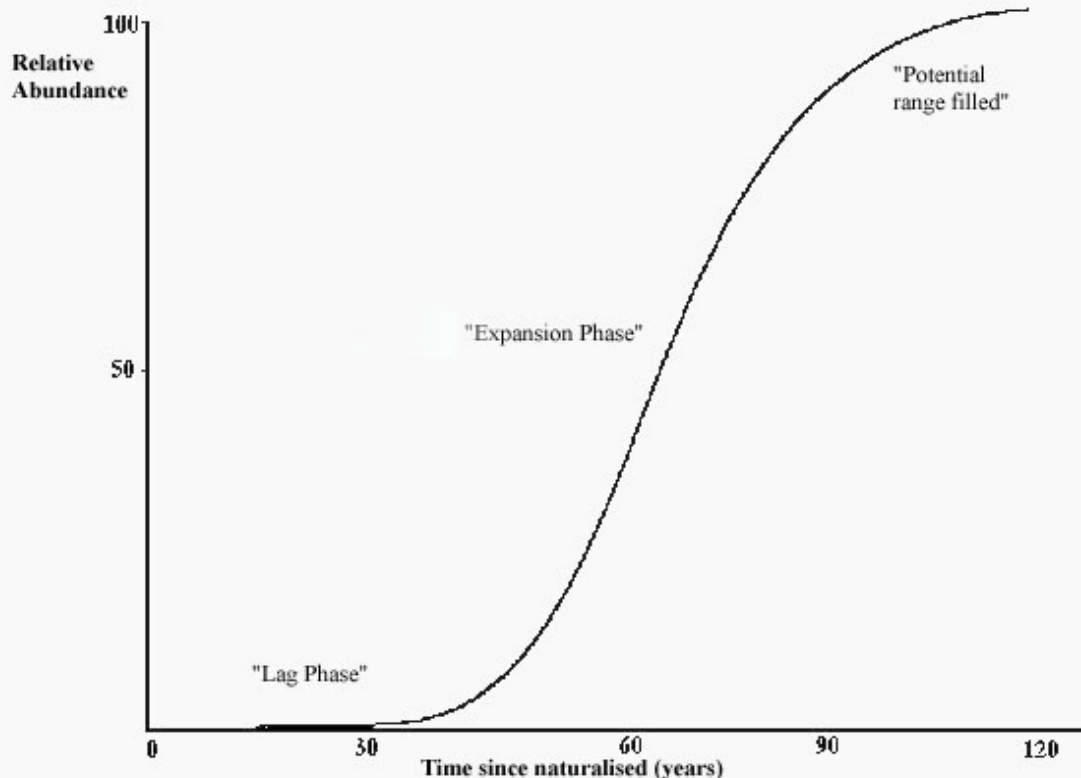
Pest Plant Score = α (Invasiveness score) + β (Present: Potential Distribution) + δ (Impact)
(where α , β and δ are weightings of the subcomponents).

WHAT MAKES A PLANT MORE WEEDY?

THREE MAIN PRINCIPLES

One weed is more important than another because;

1. Fast spreading - More Invasive

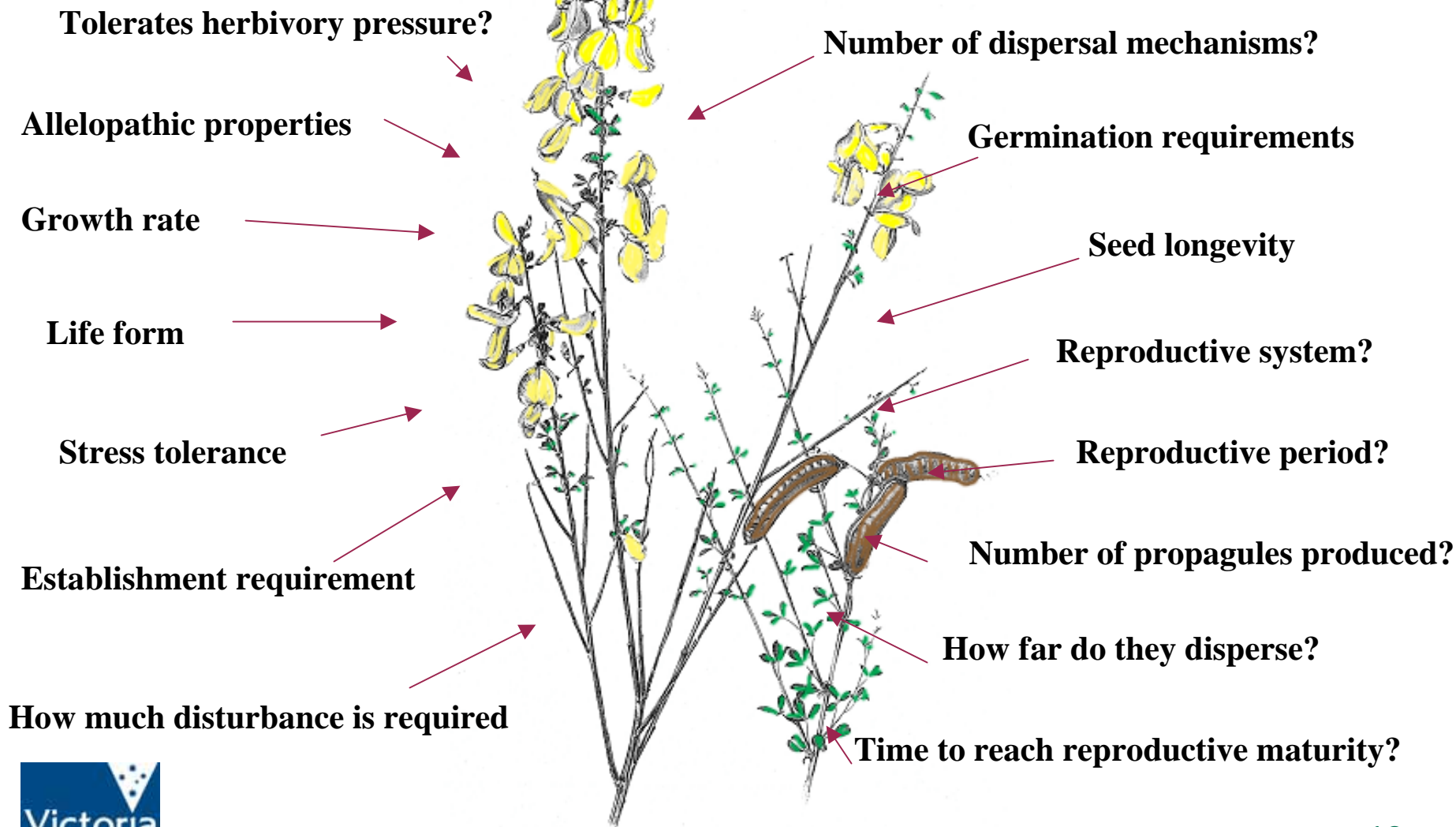


Invasiveness

- 15 questions , Score 0-1
- Higher the score - faster the spread = steeper gradient

eg Serrated Tussock 0.76
Golden Thistle 0.50

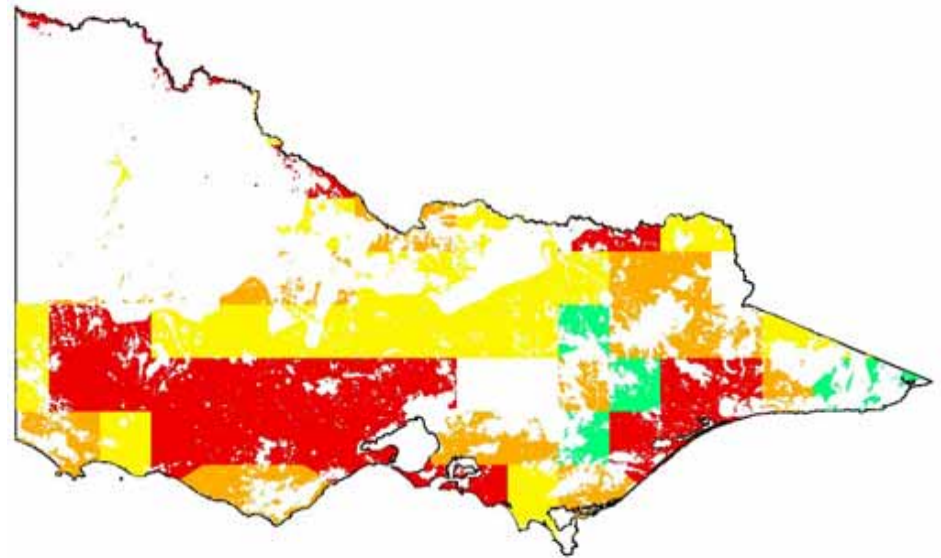
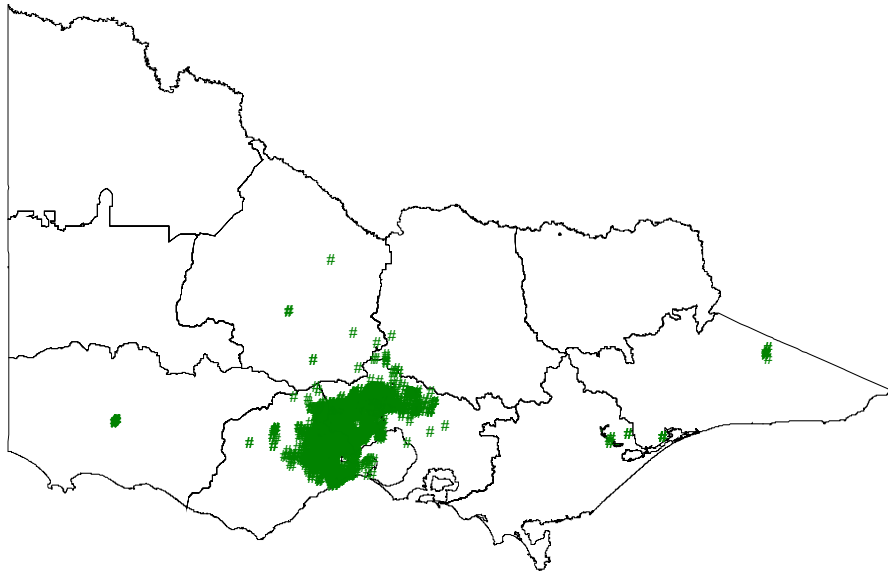
15 questions about the biological properties of the plant.



WHAT MAKES A PLANT MORE WEEDY?

THREE MAIN PRINCIPLES

2. Is presently localised - but could spread much more



Present and Potential distribution of Serrated Tussock

WHAT MAKES A PLANT MORE WEEDY?

THREE MAIN PRINCIPLES

3. Impacts more on social, environmental and agricultural values

26 Impact Criteria - Social, Fauna & Flora, Natural Resources & Agriculture



Recreation

1. Restrict human access?
2. Reduce tourism?
3. Injurious to people?
4. Damage to cultural sites?

Abiotic

5. Impact flow?
6. Impact water quality?
7. Increase soil erosion?
8. Reduce biomass?
9. Change fire regime?

Community Habitat

10. Impact on composition
 - (a) high value EVC
 - (b) medium value EVC
 - (c) low value EVC
11. Impact on structure?
12. Effect on threatened flora?

Fauna

13. Effect on threatened fauna?
14. Effect on non-threatened fauna?
15. Benefits fauna?
16. Injurious to fauna?

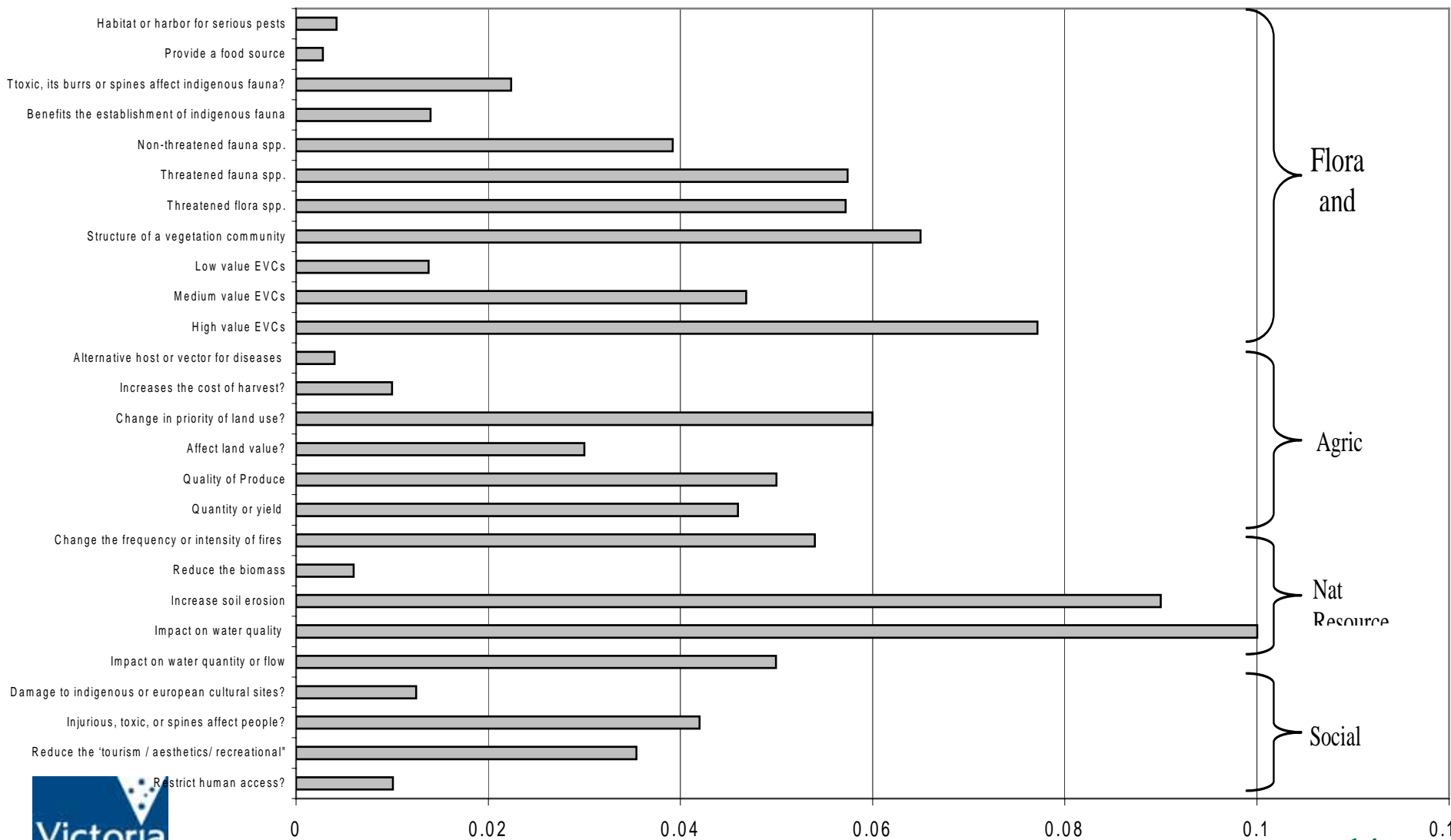
Pest Animal

17. Food source to pests?
18. Provides harbor?

Agriculture

19. Impact yield?
20. Impact quality?
21. Affect land value?
22. Change land use?
23. Increase harvest costs?
24. Disease host/vector?

Impact Criteria Weights

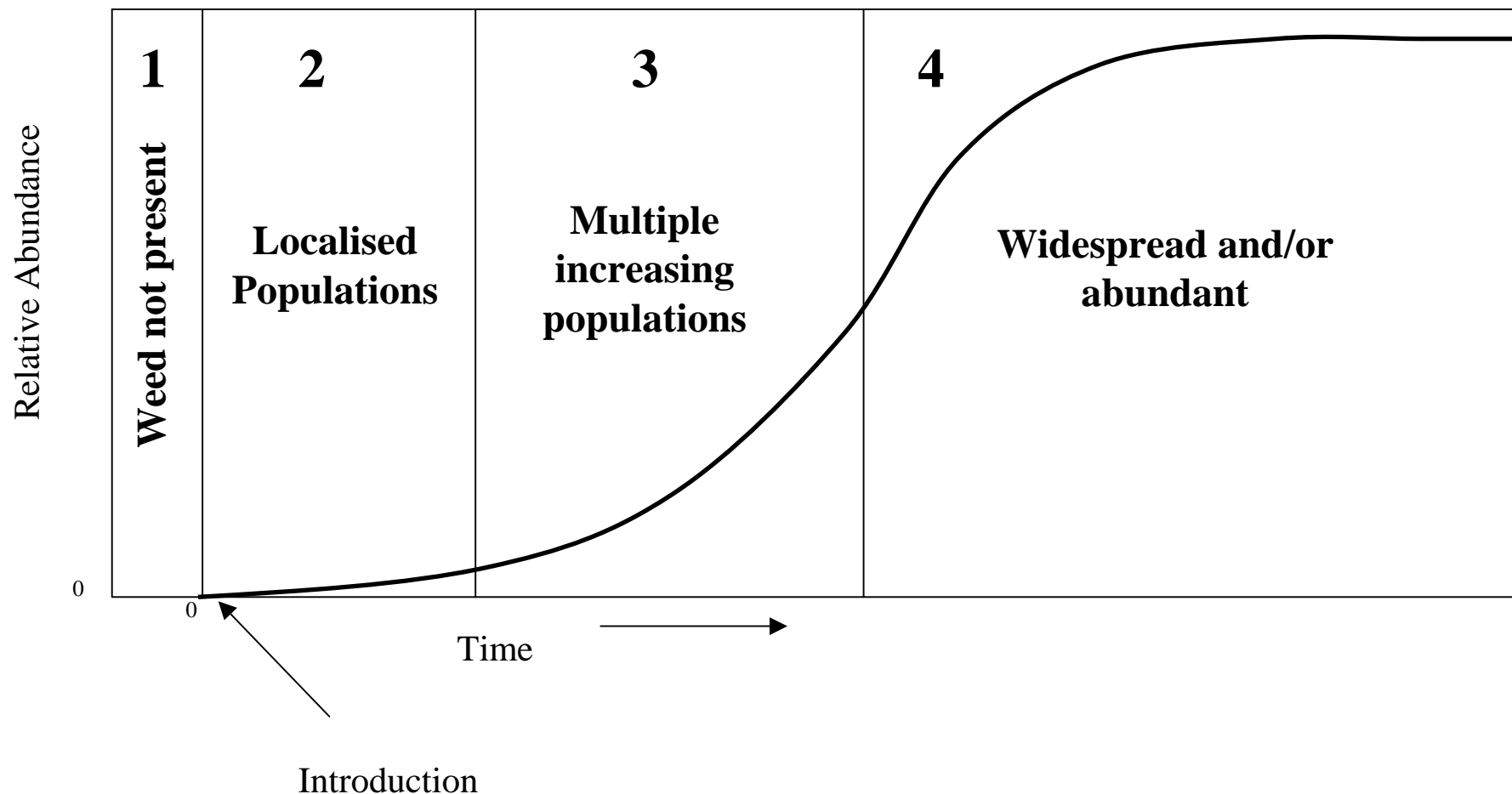


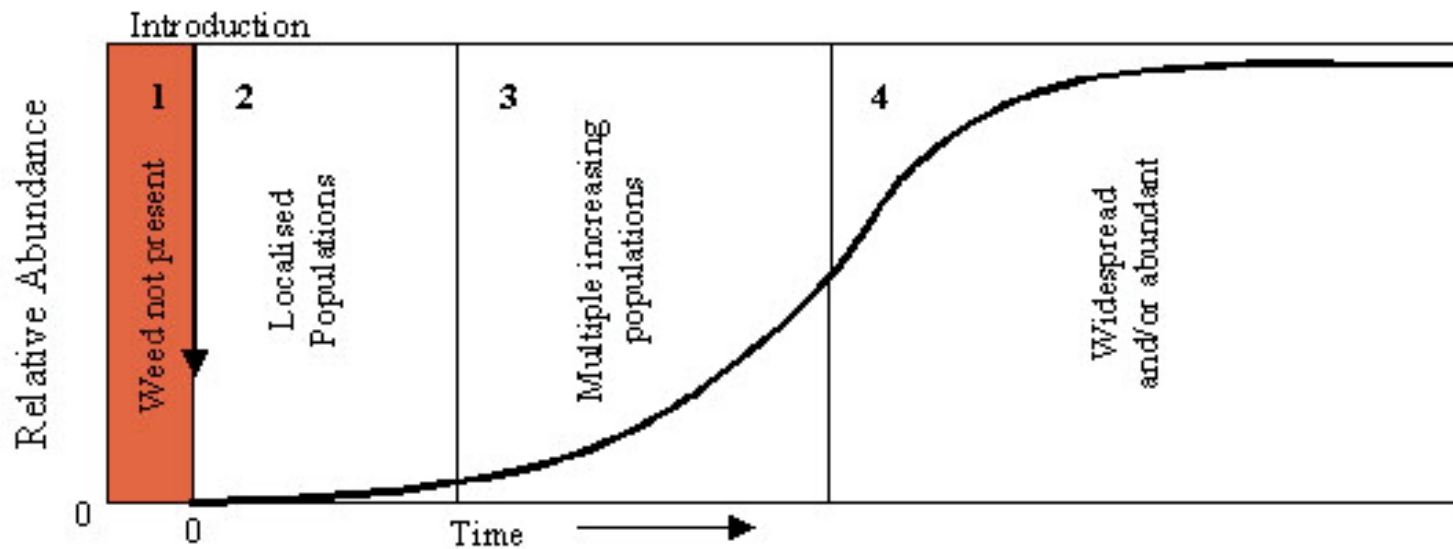
Invasive
Potential &
Potential
Distribution

	IMPACT		
	High Impact	Moderate Impact	Low Impact
V Highly Inv & High Potential	Level 3	Level 3	Level 2
High Inv and High Potential	Level 3	Level 2	Level 2
Mod Inv and Potential	Level 2	Level 2	Level 1
Mod Inv and Low Pot (or vice versa)	Level 2	Level 1	Level 1
Low Inv and Potential	Level 1	Level 1	Level 1

Level 3 = highest response, 1 = lowest

Process of weed invasion



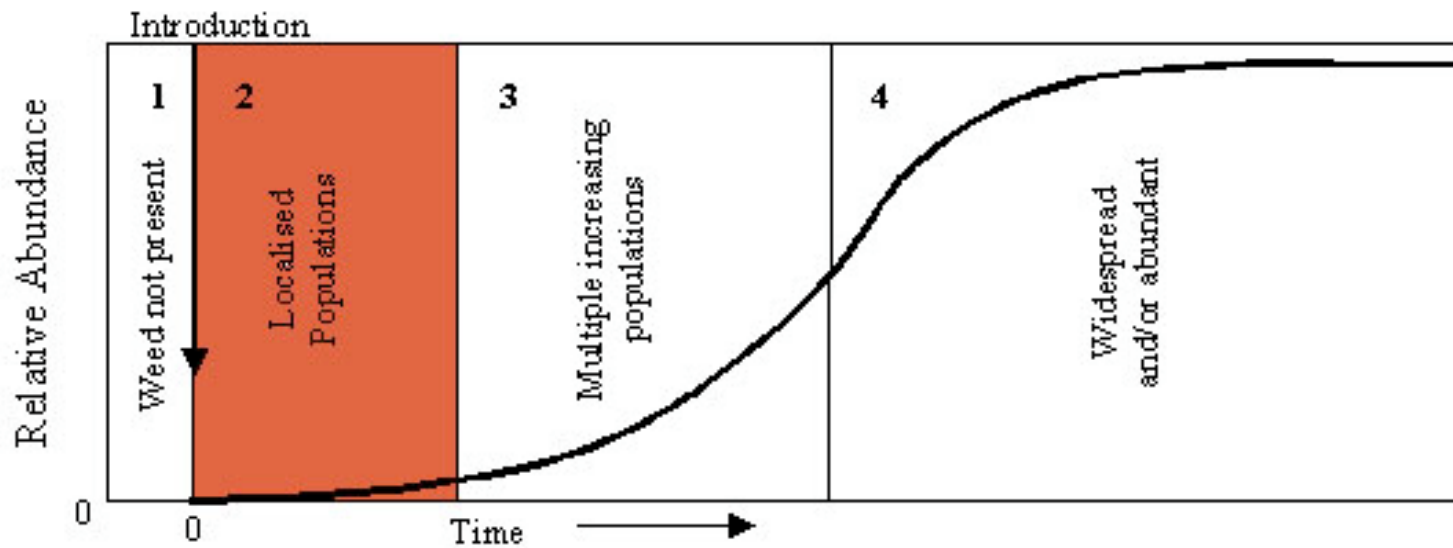


Pre Entry Strategy

Government involvement;

Pre-entry weed risk assessment - based on probability of it being a serious weed -

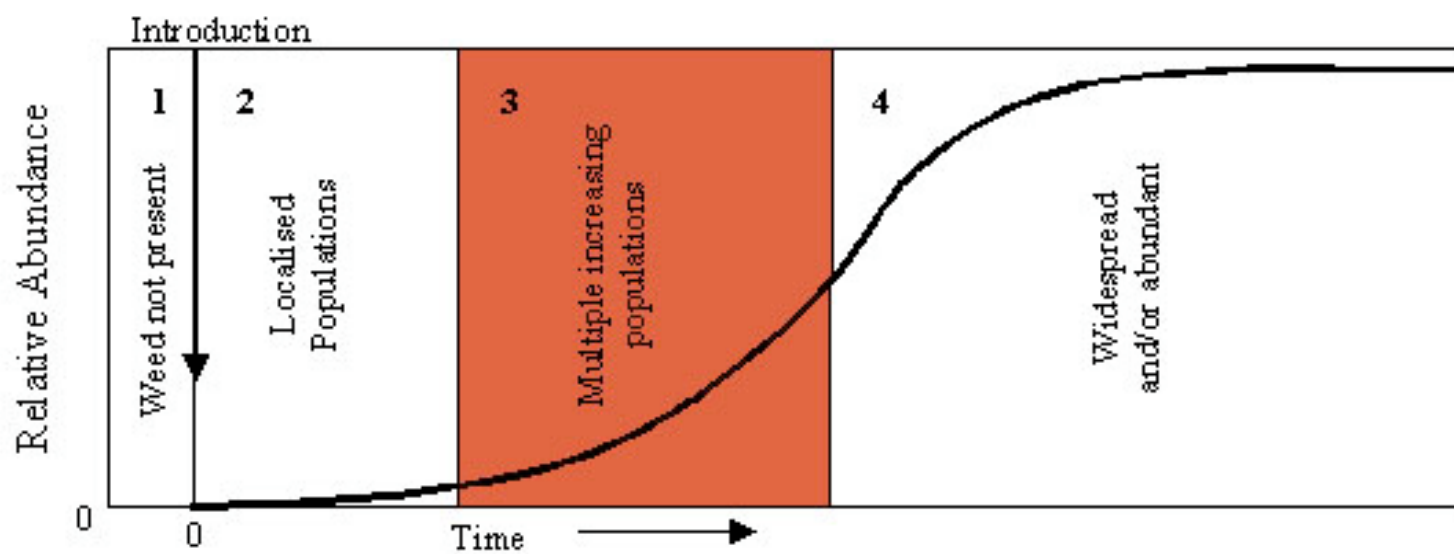
- Previous history of a weed elsewhere
Global Compendium of Weeds (over 40,000 species)
- Climate compatibility



New Introduction

Government involvement;

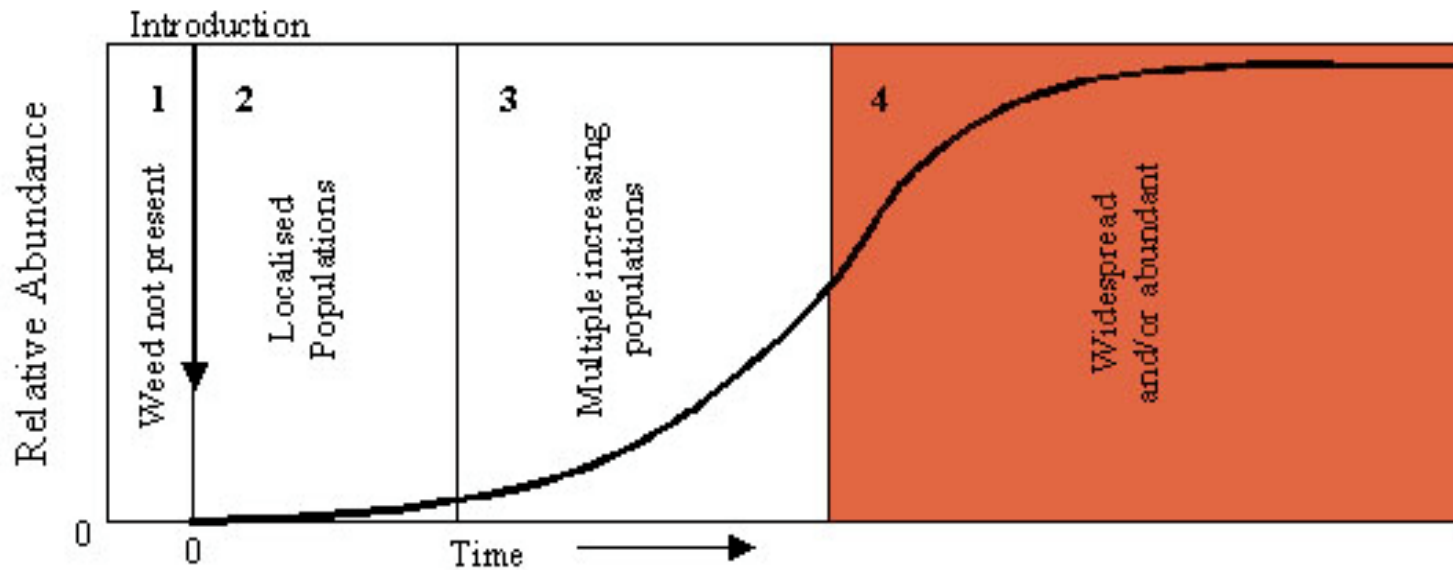
- Finding new weed incursions
- Aiming at eradication of new weed incursion
- Limiting the spread of more widespread or minor weeds
- Extension program - WEED ALERTS



Expanding

Government involvement;

- Possible enforcement of control
- Biological control
- Research into control methods
- Extension programs - Awareness of control methods

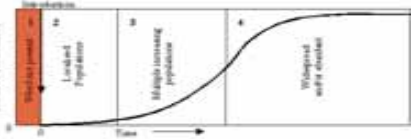
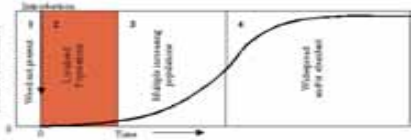
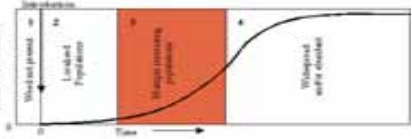
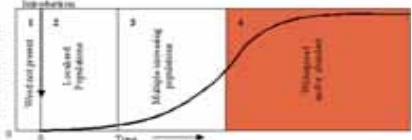


Widespread

Government involvement;

- Biological control
- Research into control methods
- Developing integrated management systems.
- Extension programs - Awareness of control methods

Government Control Options

	Infestation	Control Strategy					Outcomes		
		Quarantine	Extension	On-Ground works	Compliance	Research and Technology Development			
	1 <i>Pre-entry</i>	✓	+	✓			== Prevention		
	2 <i>New Introduction</i>	✓	+	✓	+	✓	== Protection/ == Eradication		
	3 <i>Expanding</i>			✓	+	✓	+	✓	== Protection / == Reduction
	4 <i>Widespread</i>			✓		+		✓	== Reduction



State Prohibited weeds

- It does not occur in Victoria; OR
- It occurs in Victoria but it is reasonable to expect that it can be **eradicated from the State**

Eradication principles - CRC Weed Management - Program 1

- Total area is less than 100 ha (sometimes >1,000 ha)
- The weed occurs at three or fewer locations
- The weeds location is easily accessible
- The weed is readily detectable
- *The weed is not being traded by nurseries*
- *Longevity of seed (extends eradication timeline)*



State Prohibited weeds

- It does not occur in Victoria; OR
- It occurs in Victoria but it is reasonable to expect that it can be **eradicated from the State**



Regionally Prohibited weeds

- It is not widely distributed throughout the region; AND
- It is capable of spreading further in the region; AND
- It is reasonable to expect that it can be **eradicated from the region**



Regionally Controlled weeds

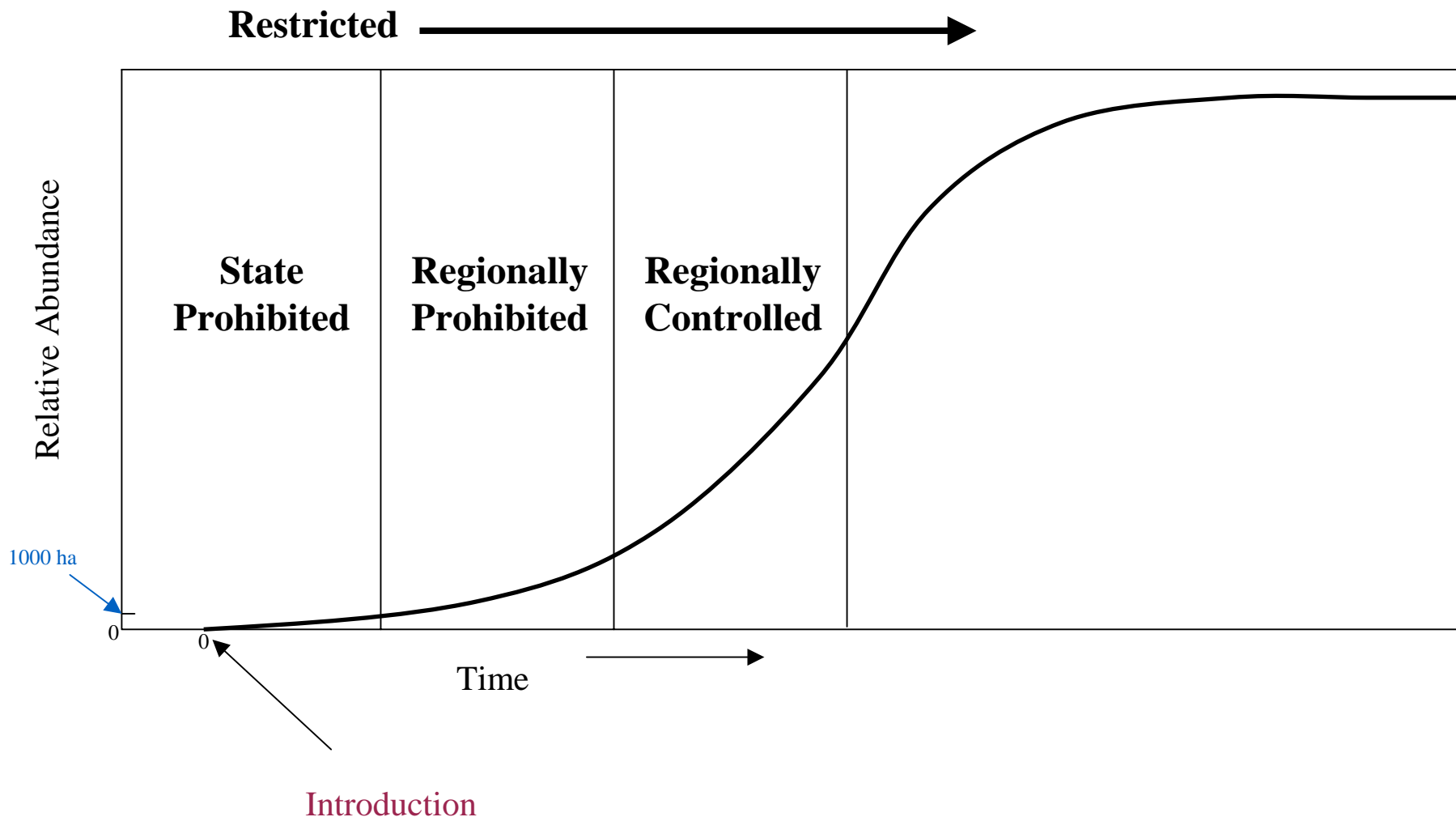
- It occurs in the region; AND
- It is capable of spreading further in the region and should be stopped from doing so; AND
- To prevent its spread, continuing control measures are required



Restricted weeds

- It is a serious threat to primary production, Crown land, the environment or community health in another State; AND
- Has the potential to spread into and within Victoria; AND
- If sold or traded in Victoria there would be a risk of spreading to Vic and other states

Process of weed invasion



- Invasiveness
 - Present: Potential Distribution
 - Impact
- Overall Pest Plant Score

Give Ranking per CMA
of all Noxious weeds -101 spp

Next step 2004 - 05 / 06

look at proposed new
additions to noxious weed &
WONS

Cortaderia selloana
Salix alba
Salix cinerea
Salix babylonica
Salix x rubens
Ailanthus altissima
Chrysanthemoides monilifera
Cotoneaster glaucophyllus
Coprosma repens
Dipogon lignosus
Hypericum androsaemum
Leycesteria formosa
Lonicera japonica
Rhamnus alaternus
Sollya heterophylla
Ulex europaeus
Ligustrum vulgare
Lycium ferocissimum
Marrubium vulgare
Myriophyllum aquaticum
Mysiphyllum asparagoides
Nassella neesiana
Nassella trichotoma
Opuntia ficus-indica
Opuntia robusta
Opuntia stricta
Oxalis pes-caprae
Oxylobium lanceolatum
Paspalum dilatatum
Pennisetum clandestinum
Phalaris aquatica
Physalis viscosa
Pinus pinaster
Pinus radiata

Information on decision making available to others.

NRE Resources online

<http://www.nre.vic.gov.au/web/root/Domino/vro/vrosite.nsf/pages/vrohome>

- VRO HOME
- USING VRO
- SITEMAP
- VRO SEARCH
- MAP SEARCH
- FEEDBACK



Pest Plants

A weed is a plant that establishes itself outside its normal environment. Weeds can broadly be grouped as 'Environmental' weeds or 'Agricultural' weeds, reflecting their potential to disturb natural and/or agricultural systems. Many weeds may be both environmental and agricultural. Exotic weed species have been estimated to comprise some 28% of Victoria's flora species (Carr et al, 1992).

- [1800 Distrib](#)
- [Current Distrib](#)
- [Potential Distrib](#)
- [Pest Plants Refer](#)
- [Pest Plants - Invasiveness Assess](#)



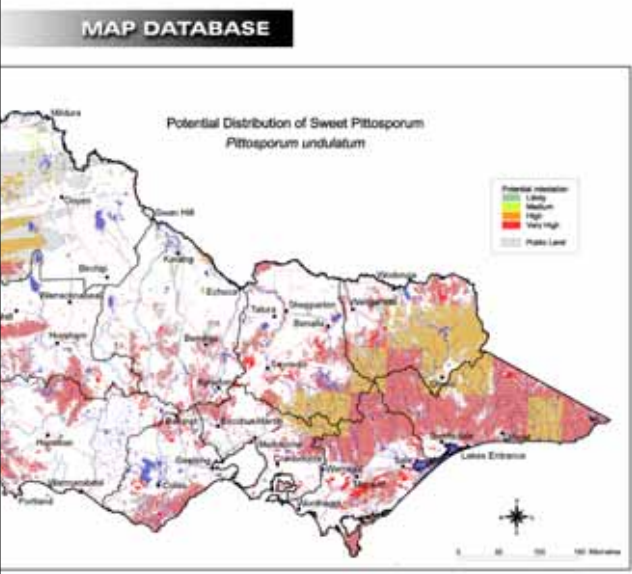
 PPIA report .pdf
(Adobe pdf 925 Kb)

Natural Resources

- Climate
- Landform
- Landuse
- Soil
- Water
- Biodiversity
- Vegetation
- Land & Water Management
- Investing in Land & Water

Environmental weeds are weeds that threaten natural ecosystems (e.g. reduce biodiversity). They are capable of invading native pla

QUESTION	COMMENTS	REFERENCE	RANK
Establishment:			
Germination requirements?	"Seeds germinate at any time of the year but mostly in autumn and winter."	F&C (1992) p. 112	H
Establishment requirements?	"Occurring in or near open pasture and lightly timbered areas."	F&C (1992) p. 112	MH
How much disturbance is required?	"Invades native grasslands, grassy woodlands, dense forests and rocky shrublands."	Moya (2001) p. 73	MH
Growth/Competitive:			
Life form?	Perennial tussock-forming grass	F&C (1992) p. 112	MH
Allelopathic properties?	No Allelopathic properties described.	"	L
Tolerates herb pressure?	"The plant is eaten by sheep and cattle only if nothing else is available."	F&C (1992) p. 113	H
Normal growth rate?	"Most seedlings that establish in a dense stand of <i>B. stricta</i> or in a vigorous improved pasture are killed by competition in the first or second spring or summer". Seedlings not killed by competition will grow as fast as comparable grasses in the rangelands."	Campbell & Veale (1993) p. 190	MH
Stress tolerance to frost, drought, salinity, etc?	"Tolerates, fire, drought and frost."	Ilford (2001) p. 48	MH
Reproduction:			
Reproductive system?	"Reproduces by seed."	F&C (1992) p. 112	ML
Number of propagules produced?	"Seed production is prolific and a hectare of dense tussock growth is estimated to produce more than 24 tonnes of seed per year". "Large vigorous plants can produce 100,000 seeds annually". (Moya 2001) p. 75"	F&C (1992) p. 114	H
Propagule longevity?	"Some seeds remain dormant in the soil for up to 15 years, poorly more". "Seed in a forest that had no fresh seed added for 15 years had a germination capacity of 80%". (Campbell & Veale 1993) p. 194."	F&C (1992) p. 114	ML
Reproductive period?	"Two to three year period for many years producing new flowering stems and some new leaves each year."	F&C (1992) p. 113	MH
Time to reproductive maturity?	"Plants rarely flower in the first year but continue vegetative growth until the second summer when flowers and seeds are usually produced."	F&C (1992) p. 112	MH
Dispersal:			
Number of mechanisms?	See 'dispersal' section."	F&C (1992) p. 113	MH
How far do they disperse?	"The seed head breaks off near the base of the plant and may be blown considerable distances, even up to several kilometres."	F&C (1992) p. 113	H



WEED RISK ASSESSMENT is an IMPERFECT WARNING SYSTEM

Some species have;

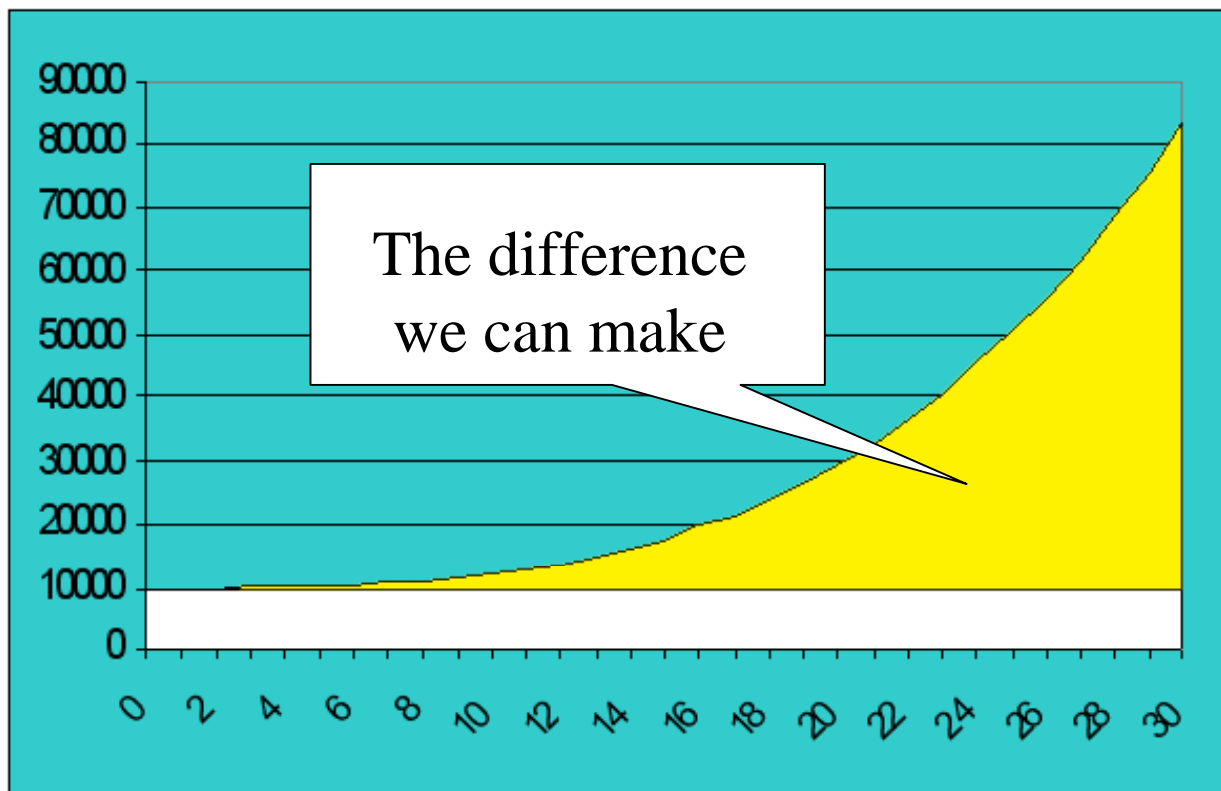
- Little biological information known
- Distribution data limited
- Limitations in Climatic modelling
- Difficulty in predicting uncertainty

“.. its probably the best we are going to get” (Hughes and Madden 2003)

What is the difference we can make!

- Evaluation of government investment in pest management.
- Return to the community in savings to control cost of pests continuing to spread.
- Allows for different control strategies to be economically assessed.

Economic Evaluation



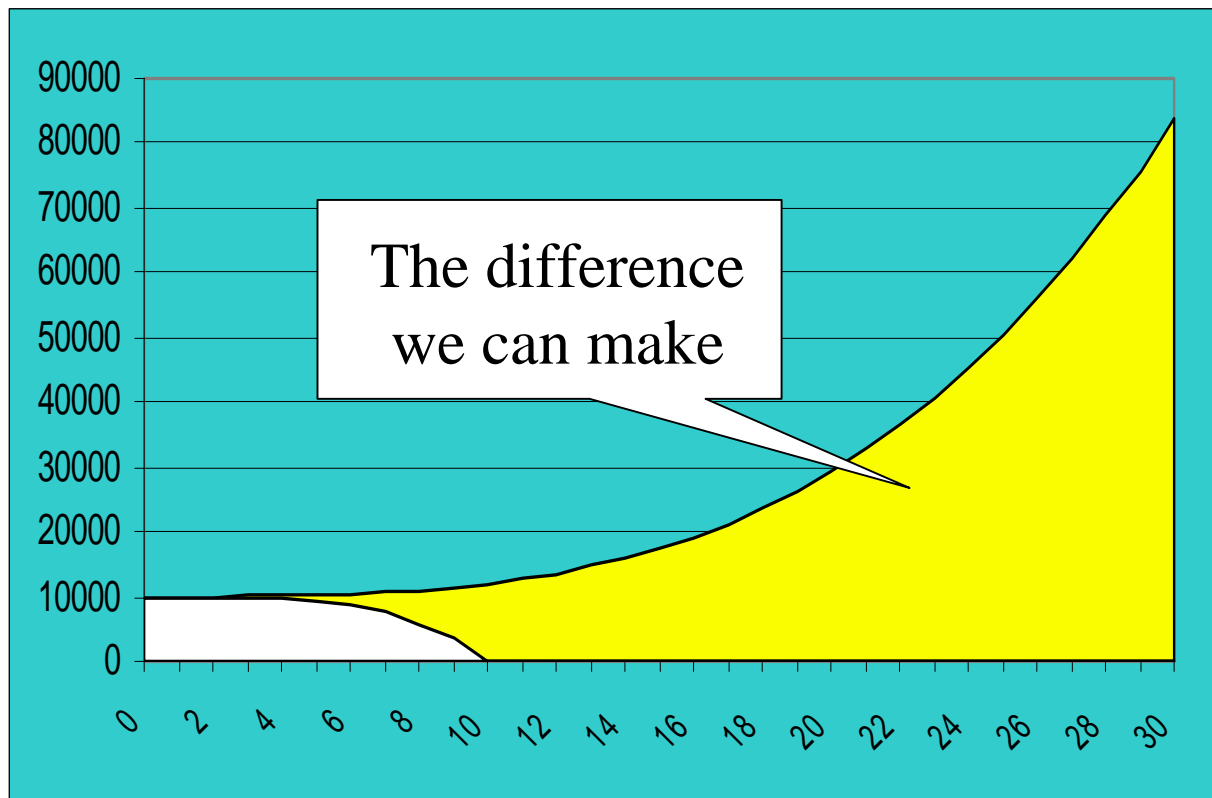
Govt intervention (Awareness, Control and Enforcement Strategy - maintain over 30 years)

Cost to government = **\$259,400** over 30 years

Land managers costs = **\$3.5 M** (Saving of \$4.9M)

Benefit of **\$17 for every \$1** spent by government

Economic Evaluation



Govt intervention (Awareness, Control and Enforcement Strategy - eradicate it over 10 years)

Cost to government = **\$532,000** over 30years

Land managers costs = **\$1.4 M** (Saving of \$7.1M)

Benefit of **\$12 for every \$1** spent by government

3-Way Process

Review is complex process and requires input from the
3 main participants

