

Victoria's Noxious Weed Review: Roll out not Fall out

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Summary Weeds are an emotive issue throughout Victoria. The 10 Victorian Catchment Management Authorities (CMAs) have all ranked weeds amongst the top 3 natural resource issues in their Regional Catchment Strategies.

This will be the first systematic review of the noxious weed list in Victoria since 1974. There is the potential that the review will create differences of opinion if community expectations of a favourite weed's ranking are not met. To try and reduce the possible negative impact of the review, consultation, communication and extension with regional staff, CMAs and other stakeholders on the principles and process of the review has been underway since 2002. A communication strategy and extensive consultation and assistance for staff and CMAs are planned over the next year.

The review process is following the principles contained in the Proposed National Technical Specification for Post-Border Weed Risk Management produced by the CRC for Australian Weed Management.

This paper will describe the strategies, issues and difficulties faced in this review.

Keywords Weed Risk Assessment, consultation, implementation, Noxious weed review.

INTRODUCTION

The present noxious weed list in Victoria is outdated. There has not been a systematic review of the weeds since 1974. A minor revision occurred with the proclamation of the new legislation, *The Catchment and Land Protection Act 1994* (CaLP Act) and again in 2003, but most of the weeds have not changed their status for a least 30 years. Through their Regional Weed Action Strategies, the CMAs (Figure 1), have updated their priorities and actions against specific weeds, the legal listings are sometimes inconsistent with these documents. These CMAs also have the responsibility to review, consult with the public, stakeholders and nominate plants for noxious weed declaration.

The Victorian Pest Management Framework – Weed Management Framework (2002) requires a review of the noxious weed list including the economic, environmental and social impacts to be decided by the end of 2005. The CaLP Act, (Section 69) also requires the following information prior to declaration of a weed;

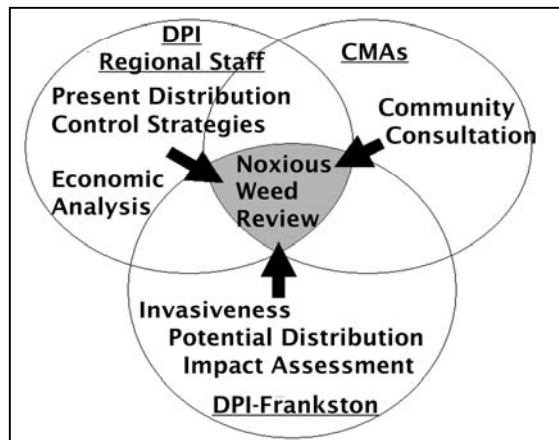
1. an assessment of the extent and severity of the impact of the plant in Victoria; and
2. suggest measures for the management of any infestation of the animal or plant; and
3. an estimate of the cost of these measures and how it might be funded



Figure 1. Victorian Catchment Management Regions.

The noxious weed categories have to be relevant at two different scales, CMA regional and Statewide, depending upon the declared weed category level. Because of the complexity of the issue, a decision support framework, utilising information from weed scientists, regional staff and community consultation (Figure 2) was followed.

Figure 2. Venn Diagram showing inputs into the



Victorian Noxious Weed review.

To deal with the emotive arguments about which weed should be more important than another a decision support system was developed to prioritise any pest plant (Weiss and McLaren, 2002). To be scientifically valid though, any system developed must meet certain criteria (NRC, 2002):

1. It must be transparent, open to review, and have been evaluated by peers.
2. It must have a logical framework that includes independent factors identified by critical observation, experimentation, or both that are important in the invasion process
3. Use of the framework must be repeatable and lead to the same outcome, regardless of whom makes the prediction.

The Proposed National Technical Specification for Post-Border Weed Risk Management (CRC for Australian Weed Management) in addition outlines four main considerations for determining the relative importance of invasive species;

1. How invasive it is
2. The present and potential extent of the species
3. What social, environmental and agricultural values are impacted and,
4. The feasibility of control or Cost: Benefit Analysis

This paper documents the process by which the above criteria were used to review the existing noxious weeds in Victoria and future proclamations.

MATERIALS AND METHODS

Weed Risk Assessment Victoria has developed a risk assessment process, the Pest Plant Prioritisation Process (PPPP, Weiss and McLaren, 2002) that can work independently or utilises a GIS based system to determine resource conditions and then the risk or threat that weeds pose to these values.

This Decision Support System (DSS) is an Expert System relying on multi-criteria analysis/analytical hierarchical process (AHP). The AHP is a method that assists with decisions about priorities using qualitative and/or quantitative information. AHP facilitates effective decisions on complex issues by simplifying and expediting the intuitive decision making process.

Basically the AHP is a method of breaking down a complex unstructured situation into its component parts; arranging these parts into a hierarchical order; assigning numerical values to subjective judgements on the relative importance of each variable; and synthesising the judgements to determine which variables have the highest priority and should be acted upon to influence the outcome of the situation. AHP also provides an effective structure for group decision making by imposing a discipline on the group's thought processes.

Invasiveness Workshops in June 1998 decided on a set of criteria to assess the biological properties of a plant to indicate its potential to be an invasive weed. The criteria to assess potential as an invasive weed are shown below.

Establishment

- Germination requirements?
- Establishment requirement?
- How much disturbance required?

Growth/Competitive Ability

- Life form?
- Allelopathic properties?
- Tolerates herbivory pressure?
- Normal growth rate?
- Stress tolerance?

Reproduction

- Reproductive system?
- Number of propagules produced?
- Seed longevity?
- Reproductive period?
- Time to reach reproductive maturity?

Dispersal

- Number of mechanisms?
- How far do propagules disperse?

Impact A further three workshops in 2002-3 identified criteria to assess potential impact on social, agricultural and environmental values. These are;

Social Values

- How could the weed restrict human access?
- How could this weed reduce the tourism / recreational use of the land?
- Is the plant injurious, toxic, or spines affect people?
- How much damage is done to indigenous or european cultural sites?

Natural Resources

- How could this weed impact on water quality or quantity? (2 questions)
- How could the weed increase soil erosion?
- How could this weed reduce the biomass of the community?
- How could the weed change the frequency or intensity of fires?

Fauna & Flora / Vegetation

How could this weed impact on the vegetation composition on the following:

- a. High value Vegetation?
- b. Medium value Vegetation?
- c. Low value Vegetation?

How could this weed effect the structure of a vegetation community?

How could the weed have on threatened flora spp.?

Threatened Flora & Fauna

How could the weed impact threatened and non threatened fauna spp. (2 questions)?

How could this weed provide benefits or facilitates the establishment of indigenous fauna?

How is the plant toxic, its burrs or spines affect indigenous fauna?

Pest Animal

How could this weed provide a food source or habitat to assist in success of pest animals? (2 questions)

Agriculture

How could this weed impact on the quantity or quality of agricultural produce? (2 questions)

How could this weed affect land value?

How could this weed cause a change in priority of land use?

How does the weed increase the cost of harvest?

Does this weed act as an alternative host or vector for diseases of agriculture?

Distribution Potential distribution is a major factor in comparing the threats posed by weed species (Panetta and Dodd, 1987). The greater the potential distribution of a weed species, the greater the potential impact and management costs. The Victorian criteria for distribution are shown in Table 1. The present Victorian distribution of a plant was estimated from a number of GIS and nonspatial databases. These include Victorian herbarium records, Flora Information Systems, Integrated Pest Management Systems and a 1980 survey of noxious weeds of Victoria. This information was compiled and regional DPI staff had input in updating and validating the data. Potential distribution was estimated for Victoria and CMAs using climate modelling overlaid upon susceptible vegetation and landuse GIS layers as described by Weiss *et al* (2002).

This PPPP is therefore expressed as a hierarchy, the components of which are weighted (using AHP) to allow the determination of a Pest Plant Assessment score for individual species. The Pest Plant Assessment score is expressed as:

$$\text{Pest Plant Score} = \alpha (\text{Invasiveness score}) +$$
$$\beta (\text{Present : Potential Distribution}) + \delta (\text{Impact})$$

(where α , β and δ are the subcomponent's weightings).

Economic Evaluation The economic assessment process outlined by Weiss *et al.* (2002) is a second tier of this prioritisation process and allows for scenario building of different control strategies and the return on government investment in weed control.

Communication Because of the newness of the process, the amount and detail of information, DPI regional staff and members of the CMAs and Victorian

Catchment Management Council have been regularly briefed, since 2002, at presentations and workshops on the process and information outputs of the scientific assessments. A communication and implementation strategy assisted in the delivery of this information.

RESULTS

101 existing declared species were assessed for their invasiveness, impact and distribution. Regional input validated the present distribution and provided expert opinion on impacts of particular species and control options. This information was collated and then disseminated to all organizations involved via the web (NRE Resources on line) and on CD (Weiss *et al*, 2004).

DISCUSSION

The Victorian review of the noxious weeds is part of a three phase process;

Phase 1 reviewing the existing noxious weeds,

Phase 2 assessing the potential for regional priority weeds that are not already declared but identified in Regional Weed Action Plans,

Phase 3 Other proposed species including WONS, AFFA Alert list species, and those nominated by the community through their CMAs.

The scientific assessment of the data produced a ranking of weeds for each of the CMAs. As expected existing high priority weeds (either State Prohibited or WONS) all scored highly. Weeds that scored higher should then be of higher priority for control than lower scored or rank ones.

However recommendations for which declaration category, rely on criteria outlined in the CaLP Act. A summary is shown below;

State prohibited weeds are those that it is reasonable to expect that it can be eradicated from the state. Regionally prohibited weeds are those that it is reasonable to eradicate from the region. Regionally controlled weeds are those where to prevent its spread, continuing control measures are required and Restricted weeds are those where if sold or traded there would be a risk of it spreading within Victoria.

So although a weed may rank highly, such as Serrated tussock and Blackberry in nearly all the CMAs, based on Groves and Panetta (2002) principles, it may not be able to be eradicated. The weed may then be allocated to one of the lower categories, but still be sufficiently resourced. However with limited resources available some existing weed control programs may have to be reassigned to higher priority weeds and these species dropped down the list to the Restricted weed category.

It is unlikely that there will be disagreement about the increased importance of some of the weeds, however

the downgrading of others is more likely to receive negative public comment. To try and manage this “fall out” over the review process, a strong reliance on the scientific assessment, understanding of the process and extension is required. Regional DPI co-ordinators assisting the CMAs in making recommendation are one of the key components in the successful adoption of this review. Communicating preliminary results, involving these co-ordinators in validating information and feedback ensure they support the review.

ACKNOWLEDGMENTS

Many organisations and people assisted in determining the criteria and weightings for invasiveness, distribution and impact. The CRC for Weed Management Systems – Program 1, Parks Victoria, Melbourne Water, Department of Primary Industries – Catchment and Agriculture Services and the Victorian Catchment Management Authorities all played crucial roles within the review.

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Table 1.

Criteria for estimating distribution Statewide and CMA scale. (see attached file)

Rating	Weight	Pres:Pot Ratio	Statewide Descriptive	Regional or CMA Descriptive Rating
Very High	1.00		Infestation(s) that can be eradicated with no chance of reinvasion from outside of area of control (interstate.).	Infestation(s) that are able to be eradicated with no chance of reinvasion from outside of area of control (interstate/ other region etc.)
High	0.85	>1:100,000	Infestation(s) that can be eradicated with some chance of reinvasion, less than 1,000ha in Vic.	Infestation(s) that are able to be eradicated with some chance of reinvasion
Medium High	0.71	>1:10,000	Several or widely scattered small infestations or one large infestation	Several small infestations beyond eradication
Medium	0.57	1:100 - 1:10,000	Several large infestations or lots of multiple widely scattered infestations or a few combinations of both	A large partially dispersed infestation or few widely scattered small infestations
Medium Low	0.42	1:10 - 1:100	Multiple large infestations and multiple small infestations.	Numerous large dispersed infestations or lots of scattered small infestations.
Low	0.28	1:2 - 1:10	The majority of region infested with some large areas still “clean” (more “clean” areas than infested)	The majority of region infested with some large areas still “clean” (more “clean” areas than infested)
Very Low	0.14	< 1:2	The majority of region infested with some smallish areas still “clean” (less “clean” areas than infested)	The majority of region infested with some smallish areas still “clean” (less “clean” areas than infested)
Extremely Low	0	1:1	Reached full potential – but may increase in density within infested area	Reached full potential – but may increase in density within infested area

Table 1. Intensity ratings for evaluating the present compared to the potential distribution of a weed.