Victoria’s noxious weed review: roll out not fall out

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

A systematic review of the noxious weed list in Victoria is currently being conducted. This is the first review since 1974. There is the potential that the review will create differences of opinion. To reduce the possible negative impact of the review, species assessments, extensive consultation and extension about the process of the review has been underway since 2001.

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 describes the strategies, issues and difficulties faced in this review.

Keywords Weed risk assessment, consultation, implementation, noxious weed review.

INTRODUCTION
The main Victorian weed policy document, The Victorian Pest Management Framework – Weed Management Framework (Anon 2002), requires the Catchment Management Authorities (CMAs) to review the noxious weed list, including the economic, environmental and social impacts, by the end of 2005.

CMAs were established by the Victorian government in 1997 under The Catchment and Land Protection Act 1994 (CaLP Act), as community-based organisations responsible for integrated planning and coordination of land and water management in each of the State’s catchment-based regions (Figure 1). The CMAs under the CaLP Act have the responsibility to review, consult with the public and other stakeholders and nominate plants for noxious weed declaration.

The present noxious weed list in Victoria is outdated. There has not been a systematic review of the weeds since 1974. Minor revisions and additions occurred with the proclamation of the CaLP Act in 1994 and again by the Department of Primary Industries (DPI) and the CMAs in 2003, but most weeds have not changed their declaration status.

The CMAs through their Regional Weed Action Strategies, have since 2000, updated their priorities and actions against specific weeds. These regional weed priorities are sometimes inconsistent with the current declaration status of those weeds.

Prior to a weed’s declaration, the CaLP Act (Section 69) also requires an assessment of the extent and severity of the impact in Victoria and suggested measures and costs for the management of the plant.

To support the review and to ensure all relevant issues are dealt with, a decision support framework was utilised. The framework (Figure 2) ensured input from weed scientists and regional staff, as well as having community consultation.

Figure 1. Victorian Catchment Management Regions.

Figure 2. The inputs into the Victorian Noxious Weed Review.
To ensure objective decisions were made in the prioritisation of pest plants, a decision support system was developed and utilised (Weiss and McLaren 2002, Weiss et al. 2004). This process followed the Proposed National Technical Specification for Post-Border Weed Risk Management (CRC for Australian Weed Management), which outlines four main considerations for determining the relative importance of invasive species. These are:
• how invasive the weed is;
• the present and potential extent of the species;
• the social, environmental and agricultural values impacted; and
• the feasibility of control or cost:benefit analysis.
The Victorian decision support system meets the above requirements. This paper documents the process by which the above criteria were used to review and justify weed declarations in Victoria.

REVIEW PROCESS STAGE 1
Victoria has developed a risk assessment process, the Pest Plant Prioritisation Process (PPPP) (Weiss and McLaren 2002). The PPPP is a decision support system relying on a multi-criteria analysis/analytical hierarchical process (AHP). The AHP assists with decisions about priorities using qualitative and/or quantitative information and 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 weighting the components to determine which variables have the highest priority. The three components, invasiveness, impact and distribution, each sit above a hierarchy of criteria and intensity ratings. Criteria for evaluating these components were developed, grouped into similar themes and assigned weightings according to their perceived importance.

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 requirements?
Disturbance requirements?

Growth/competitive ability
Life form?
Allelopathic properties?

Tolerates herbivory pressure?
Normal growth rate?
Stress tolerances?

Reproduction
Reproductive system?
Propagule production?
Seed longevity?
Reproductive period?
Time to reproductive maturity?

Dispersal
Number of mechanisms?
How far do propagules disperse?

Impact A further three workshops with stakeholders in 2002–3 identified criteria to assess potential impact on Victorian social, agricultural and environmental values. Those criteria are shown below.

Social values
Ability to restrict human access?
Ability to reduce tourism/recreational use?
Injurious, toxic to people?
Damage is done to indigenous/cultural sites?

Natural resources
Impact on water quality or quantity?
(two questions)
Ability to increase soil erosion?
Ability to reduce biomass?
Effect on frequency or intensity of fires?

Fauna and flora/vegetation
Impact on vegetation composition of:
a. high value vegetation?
b. medium value vegetation?
c. low value vegetation?
Effect on vegetation structure?
Effect on threatened flora spp.?

Threatened flora and fauna
Effect on threatened and non-threatened fauna spp. (two questions)?
Benefits to indigenous fauna?
Injurious or toxic to indigenous fauna?

Pest animal
Food source or habitat for pest animals?
(two questions)

Agriculture
Effect on the quantity or quality of agricultural produce? (two questions)
Effect on land value?
Change in priority of land use?
Effect on harvesting costs?
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 geographic information system (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 overlayed upon susceptible vegetation and landuse geospatial layers as described by Weiss et al. (2002). A ratio of present area from input by regional staff and the predicted potential area was used to obtain the intensity level for distribution.

The final weed score is obtained by multiplying the score for each component by its weighting to obtain a value between 0 and 1. The higher the score, the greater the risk potential of a species. The Pest Plant Assessment score is expressed as:

\[
Pest\ plant\ score = \alpha \ (invasiveness\ score) + \beta \ (present:potential\ distribution) + \delta \ (impact)
\]

(\textit{where }\alpha, \beta \text{ and } \delta \text{ are the subcomponent’s weightings}).

**REVIEW PROCESS STAGE TWO**

An economic assessment process (Weiss et al. 2002) was utilised in a second stage of this prioritisation process. This process 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 and 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. To date 101 existing declared species have been assessed for their invasiveness, impact and distribution.

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**Table 1.** Intensity ratings for evaluating the present (pres) compared to the potential (pot) distribution of a weed.

<table>
<thead>
<tr>
<th>Rating</th>
<th>Weight</th>
<th>Pres:Pot Ratio</th>
<th>Statewide descriptive</th>
<th>Regional or CMA descriptive rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very high</td>
<td>1.00</td>
<td>&gt;1:100,000</td>
<td>Infestation(s) that can be eradicated with no chance of reinvasion from outside of area of control (interstate.)</td>
<td>Infestation(s) that are able to be eradicated with no chance of reinvasion from outside area of control (interstate/ other region etc.)</td>
</tr>
<tr>
<td>High</td>
<td>0.85</td>
<td>&gt;1:10,000</td>
<td>Infestation(s) that can be eradicated with some chance of reinvasion, less than 1000 ha in Vic.</td>
<td>Infestation(s) that are able to be eradicated with some chance of reinvasion</td>
</tr>
<tr>
<td>Medium high</td>
<td>0.71</td>
<td>&gt;1:10,000</td>
<td>Several or widely scattered small infestations or one large infestation</td>
<td>Several small infestations beyond eradication</td>
</tr>
<tr>
<td>Medium</td>
<td>0.57</td>
<td>1:100 – 1:10,000</td>
<td>Several large infestations or lots of multiple widely scattered infestations or a few combinations of both</td>
<td>A large partially dispersed infestation or few widely scattered small infestations</td>
</tr>
<tr>
<td>Medium low</td>
<td>0.42</td>
<td>1:10 – 1:100</td>
<td>Multiple large infestations and multiple small infestations</td>
<td>Numerous large dispersed infestations or lots of scattered small infestations</td>
</tr>
<tr>
<td>Low</td>
<td>0.28</td>
<td>1:2 – 1:10</td>
<td>The majority of region infested with some large areas still ‘clean’ (more ‘clean’ areas than infested)</td>
<td>The majority of region infested, with some large areas still ‘clean’ (more ‘clean’ areas than infested)</td>
</tr>
<tr>
<td>Very low</td>
<td>0.14</td>
<td>&lt;1:2</td>
<td>The majority of region infested with some smallish areas still ‘clean’ (less ‘clean’ areas than infested)</td>
<td>The majority of region infested, with some smallish areas still ‘clean’ (less ‘clean’ areas than infested)</td>
</tr>
<tr>
<td>Extremely low</td>
<td>0.14</td>
<td>1:1</td>
<td>Reached full potential – but may increase in density within infested area</td>
<td>Reached full potential – but may increase in density within infested area</td>
</tr>
</tbody>
</table>
DISCUSSION

The scientific assessment of the data produced a ranking of weeds for each of the CMAs. As expected, State Prohibited species all scored highly. Weeds that scored higher should then be of higher priority for control than lower scored or ranked ones. However, recommendations for which declaration category applies rely on criteria outlined in the CaLP Act. A summary is shown below.

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

Although a weed may rank highly, such as serrated tussock (*Nassella trichotoma* (Nees) Hackel) or blackberry (*Rubus* spp.) in nearly all the CMAs, it may not be able to be eradicated, based on the principles of Groves and Panetta (2002). 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 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 coordinators assisting the CMAs in making recommendations are one of the key components in the successful adoption of this review. Communicating preliminary results to and involving these coordinators in validating information and feedback will ensure they support the review. The community consultation process will run up to October with recommendations going to the Minister in November. It is expected that the scientific assessment and the trained DPI regional coordinators will play a crucial role in managing community expectations about the lowered status of some widespread weeds.

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. Thanks to the anonymous reviewers whose comments and suggestions improved the paper.

REFERENCES


