Prioritising Victorian government investment into weed biocontrol

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Summary A decision support framework was developed to help decision-makers prioritise Victorian government investment into weed biological control (biocontrol). The objectives of the framework were to (i) develop a prioritisation system for improving the selection of new weed biocontrol projects in Victoria, (ii) use this framework to guide future investment in biocontrol of priority weeds, and (iii) develop guidelines to assess when investment in research of existing biocontrol programs should end.

The framework comprises two stages:
1. An investment filter to screen out projects not suitable, or ready, for State government biocontrol investment, and
2. A decision support system to assess and prioritise projects that advance through Stage 1.

Stage 1. Investment Filter

The investment filter comprises five stop/go questions:
1. Has a Victorian Weed Risk Assessment (Weiss *et al.* 2004) been conducted?
2. Is it feasible to prevent or eradicate the weed in Victoria?
3. Is it native to Victoria?
4. Is it a declared noxious weed in Victoria?
5. Is there any public benefit from controlling the weed?

Depending on the answers to these questions, a weed biocontrol project submitted for assessment will (i) advance through the filter to Stage 2, (ii) require action before it can be resubmitted for assessment, or (iii) be excluded from assessment and therefore ineligible for State government investment.

Stage 2. Decision Support System

Weeds that advance through the Stage 1 filter are assessed using a decision support system (DSS). The DSS is based on an analytical hierarchical process (AHP) that breaks down complex issues, such as prioritising biocontrol investment, into sets of related criteria (Weiss *et al.* 2004, Saaty 1995). Final scores for each potential project were obtained through weighted scoring of questions (criteria) and groups of questions. The AHP was developed in conjunction with weed biocontrol 'experts' and other stakeholders,

and each of the questions was derived through agreement at one or more workshops or meetings. Once agreement was reached on which questions to address, a decision tree was constructed and intensity ratings (ie. High, Medium, Low) applied. Each of the criteria was compared using the Catchment Decision Assistant©, which provided weightings as an output. Criteria developed were:

a. Benefit from investment
- Where impacts of the weed are significant, how widespread are these impacts?
- Are alternative control measures available, including existing biological controls?
- If biocontrol is successful, what additional resources are required to address other threats?
- What is the potential for the impacts of the weed to become more extensive over the next 10–12 years?

b. Feasibility of biocontrol
- Feasibility of biocontrol was scored according to criteria used by Paynter *et al.* 2009 (Module 3 Impact score and modified questions from Module 2).

c. Cost to the Victorian government
- The total cost of the proposed biocontrol program, from this point forward, was estimated.

d. Industry contribution
- Is industry co-investment likely and is it proportional to industry benefit?

The DSS produced a 'score' between 0 and 1, allowing projects to be ranked according to the score they receive. A final stage in development of the framework was to use the AHP to assess a number of potential projects, and to rank them according to the final scores produced by each assessment. Initial feedback from users of the framework has been positive, and as biocontrol practitioners in Victoria use and become familiar with the system further refinement may be necessary. For example, determining a confidence rating for literature and other sources of information

will aid assessment of projects where information gaps exist.

Importantly, rankings produced by the framework will not produce a final investment decision. Decision-makers must still consider a range of competing priorities, and proposals for the continuation of long-running biocontrol programs must demonstrate a sound return on investment. Nevertheless the framework provides decision-makers with a transparent and useful process for prioritising future investment into weed biocontrol in Victoria.

Keywords   Biological control, prioritisation.

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