

Support tools for making better investment decisions about early invaders

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Summary The Victorian Government has designed a package of tools to help public land managers determine weed management priorities. A decision making framework, a series of six guides and the Victorian environmental weed risk database assist public land managers through a logical process to work out the highest priority early invaders to eradicate locally.

The Weeds at the Early Stage of Invasion (WESI) project focuses on high risk invasive plants that threaten biodiversity, and have not become locally abundant and widespread. Project staff work with Department of Environment, Land, Water and Planning (DELWP) and Parks Victoria staff looking after public land anywhere in Victoria.

Using the package will help public land managers make better investment decisions for early invaders and assist with successful localised eradication (extirpation) of high-risk weeds at the early stage of invasion. The tools are available at www.delwp.vic.gov.au/early-invaders.

Keywords Early invaders, environmental weeds, eradication, extirpation, risk.

WESI PROJECT

The WESI project commenced in late 2010 and is currently funded to June 2017. It has been funded through the Weeds and Pests on Public Land (WPPL) Program and had a consistent project team (1.5 full-time-equivalent staff). It has been able to evolve over the project period through adaptive management and with the support of its steering group.

The project was created to help shift some invasive species investment towards early invaders where a better return on outcomes for long-term biodiversity can be gained.

Decision making framework The range of activities that can be carried out during the management of early invaders were grouped logically into a six-step decision making framework.

Once the original framework was formed, it went through continual review and tweaking to improve it.

A very simplified version of the framework outlines the six basic steps (Figure 1), while an expanded

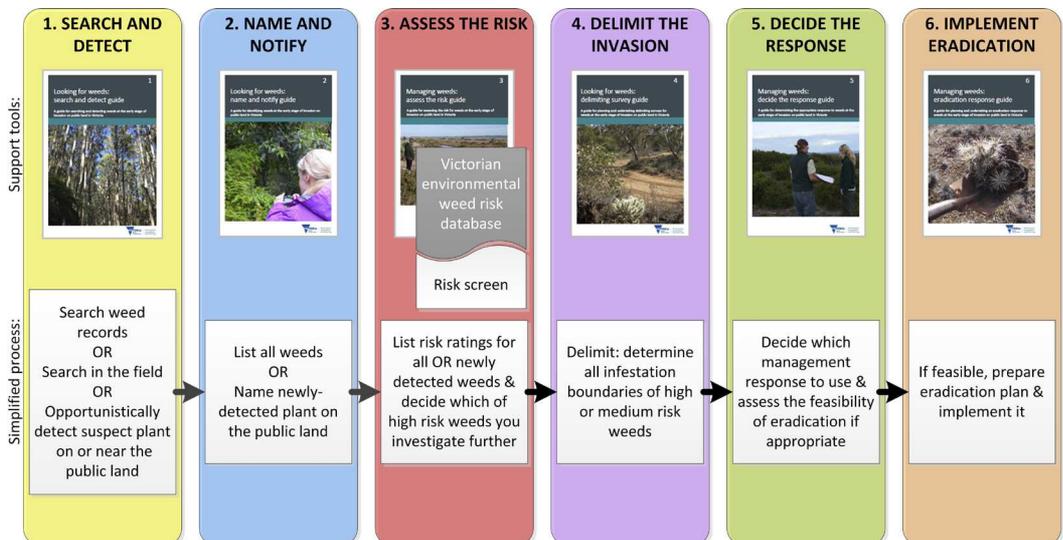


Figure 1. Decision making framework.

version illustrates three scenarios a public land manager might face:

- (a) work out highest priority early invaders on the public land;
- (b) work out what priority a new invader is on the public land; and
- (c) work out highest priority weeds outside the public land to search for within.

EARLY INVADER TOOLS

The WESI project has developed a number of tools to assist in the management of early invaders.

Guide series An existing 'how to' guide appropriate for Victoria to describe how to undertake the various activities described in the decision making framework could not be located within existing literature. There are many papers describing various components or case studies.

To be able to take tools out to field staff that were understandable and practical, it was realised early in the project that new tools needed to be developed. Instead of a large single 'how to' manual, a separate guide that described each step in the framework was created.

Experienced users can use the guides as a refresher for the various activities described, and to extend their knowledge for new information. They can easily select the guide relevant to their needs. Inexperienced weed practitioners can read the guide series in their logical order.

The guides are thoroughly cross-referenced and have a consistent glossary, diagrams and templates across the series. Wellbeing, safety and hygiene for fieldwork are included. The guide series is available at www.delwp.vic.gov.au/early-invaders

Search and detect guide The aim of this guide (Sheehan, James and Blood 2016) is to assist users with the process of searching for and detecting weeds in the early stage of invasion on public land. It can assist in identifying target species and weed spread pathways. It provides advice on looking for weeds opportunistically during the completion of routine tasks, and information on the development of more structured approaches to searching.

This guide helps the user to choose the appropriate search type and method, and contains a ten step guide on how to plan and conduct a search. Search scenarios describe typical situations public land managers will face and the steps to follow with helpful hints. Weed sources and pathways are described to assist thinking about places to search. Templates can be copied or adapted for field recording and specimen collecting.

There is an equipment checklist and many useful information sources and references.

Name and notify guide One of the most common requests staff make is for assistance with weed identification. Helping staff be more able to identify plants will help to reduce barriers to further action or inappropriate actions through misidentifications.

The aim of this guide (Blood and James 2016a) is to assist users with the process of identifying weeds. This guide describes how to record weed information, identify and name weeds, write weed names and who to notify. It contains field recording and specimen collecting templates, and useful information sources and references. A photographing and videoing guide contains many useful hints.

Assess the risk guide The main aim of this guide (Blood, James and Panetta 2016) is to assist users with the process of determining the risk a weed poses at a site.

During the process of bringing together the information for this guide, a large gap was recognised – a way of assessing the risk of a weed at a location in the absence of existing weed risk ratings i.e. a full Victorian Weed Risk Assessment or a rating in one of the five existing environmental weed advisory lists (e.g. Adair *et al.* 2008) for the State.

An **environmental weed risk screen** was developed by Dr F. Dane Panetta (Panetta 2016) to fill this gap (Blood, Panetta and James 2016).

The *Assess the risk guide* explains the risk ratings available, how to use the Victorian environmental weed risk database (see below), and how to use the environmental weed risk screen.

This guide contains the environmental weed risk screen score sheet template and a completed example, and many weed data sources.

Victorian environmental weed risk database To accompany the *Assess the risk guide*, an Excel database was created to bring together two main sources of risk ratings: the full Victorian Weed Risk Assessment scores; and the ratings from the five existing environmental weed advisory lists.

It is a decision support tool that can assist in generating lists of detection priorities for existing and potential species in and around a piece of public land at a particular date, helping to provide a structured approach to detection surveys.

The database is available at www.delwp.vic.gov.au/weed-risk-ratings.

Delimiting survey guide Delimiting (working out how far a weed has spread) is one of the most important activities to complete when considering eradication as a management response. This guide (James and Blood 2016) assists with planning and undertaking a delimiting survey, and analysing and reporting the results. It contains an eight step delimiting survey guide, a search plan template with a completed example, a field recording template and a survey equipment checklist.

A number of pilots were used to formulate and test the instructions including a survey for buffel grass (*Cenchrus ciliaris* L.) and white-spined Hudson pear (*Cylindropuntia pallida* (Rose) F.M.Knuth) in the Victorian Mallee.

Decide the response guide The aim of this guide (Blood and James 2016b) is to assist users with the process of deciding which management approach to take and determine if eradication is a feasible option. It brings together eradication concepts from a number of sources (e.g. Panetta and Timmins 2004, Dodd *et al.* 2014) into a logical process. The user is led through the weed management matrix that draws on risk and delimiting survey information collected already. It then tests the suitability for eradication, and finally uses the feasibility of eradication score sheet.

This guide puts weed eradication into the broader public land management picture and helps the user make decisions in the real world. The guide includes a case study, characteristics of ‘more feasible to eradicate’ weeds, and information resources and references.

Eradication response guide Once eradication is determined to be suitable and feasible for an early invader, this guide (Adair, James and Blood 2016) will help with the development and implementation of a ‘park-scale’ eradication response. This guide provides a summary of the important points that others have learnt in planning or undertaking eradication programs.

The guide describes many treatment techniques, contains an eradication response plan template with a completed example, and a flowchart for choosing appropriate chemicals.

DISCUSSION

The WESI project has and continues to run a number of pilot activities in different parts of Victoria to test and refine aspects of the decision making framework. These include activities in the: Mallee focusing on buffel grass (James, Blood and Raleigh 2016) and white-spined Hudson pear; Wimmera focusing on white-spined Hudson pear, Klein’s cholla (*Cylindropuntia kleiniiae* (DC.) F.M.Knuth), and bridal veil

(*Asparagus declinatus* L.); Central Highlands Eden; Otways Eden; Glenelg Eden; and Tarago Reservoir (Melbourne Water). Future pilots include a Victorian high country pilot.

In September 2015, a pilot Mallee weed identification course was conducted at Mildura focusing on early invaders in the north west of Victoria. Using the positive feedback received, it has provided a model to continue capability building including training activities in other parts of the State. Future training will include additional information on treatment of the featured species.

Each pilot is being evaluated to inform and improve the project and the tools.

The pilots provided an opportunity to help staff understand the decision making framework and content of the guides during development. These and future pilots will continue into 2017. Other capability building activities are being carried out (Blood and James 2016c) including one-on-one and small group activities that focus on skills, knowledge and awareness to assist with the use of the WESI tools. This includes weed identification, reporting weeds, hygiene, surveying in the field, photographing weeds, and using social media. The effective use of technology is an important focus of these activities especially mobile technology.

CONCLUSION

Social media and email are the main communication pathways being used with staff to share information and nudge them to keep using the tools and information available to make better investment decisions. The final evaluation of the project will be made in 2017. It is expected that continued support for staff will be required to adopt and use the tools available.

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