

A national approach to weed categorisation and management

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Summary The Australian Weeds Committee (AWC) has sought to develop and implement a national, uniform weed categorisation system as identified in the Australian Weeds Strategy. This system has the potential to ensure that finite resources are targeted at species that pose the greatest threats to Australia, as well as promulgating improved statutory restrictions on the import and sale of potentially invasive species in a nationally consistent manner. A national system of categorisation has been in place for non-indigenous vertebrate animals for 20 years and has been highly effective. Moves are underway to standardise biosecurity arrangements in Australia under AusBIOSEC and this project will bring management of weeds into line with other invasive organisms. The Queensland Department of Primary Industries and Fisheries received funding from the Federal Government's 'Defeating the Weeds Menace' program to develop a national system of weed management categories on behalf of the AWC. The project expects to: (a) develop a system of generic weed management categories which are in accord with the proposed AUSBIOSEC arrangements, including management objectives for each category (i.e. how species in each category should/could be managed), and (b) develop and apply a rapid weed risk assessment/prioritisation tool to assign an initial list of 250 species to their appropriate categories. A national workshop was held to seek agreement on the national categories and their selection criteria. This project does not commit the Commonwealth, State or Territory governments to adopt its outcomes but provides a national system that can be publicly debated, refined and further considered by all stakeholders.

Keywords Weed risk management, noxious weeds.

INTRODUCTION

There is increasing demand for state and territory pest management agencies to harmonise their statutory approaches to the management of weeds, especially their lists of declared weeds and the processes by which these lists are created and maintained. These processes typically include an assessment of the weed's risk or impact, an evaluation of the feasibility of control or management, determination of options and goals and

finally assignment to a management class supported by legislation.

The Australian Weeds Committee (AWC) maintains a database of the noxious weeds and declared plants across all eight Australian State jurisdictions. This list includes 45 entire or partial genera and 416 species or subspecies. Of these only three genera and 17 species are declared in all eight jurisdictions.

The Environment, Communications, Information Technology and the Arts Reference Committee of the Australian Senate in its 2004 report 'Turning back the tide – the invasive species challenge', proposed three lists: A National Quarantine list; a National Alert List and a National Control List that could encompass all types of invasive species including marine, land and aquatic, animals, insects and diseases.

In 2005 the Australian Biosecurity Group (an alliance of CRCs and the World Wildlife Fund) went one step further and proposed that each species in the above three national lists would need to be listed in one of five uniform State/Territory Control Classes: Quarantine and Eradication; Containment; Control; Restricted and Regional declaration.

The Nursery and Garden Industry Australia Invasive plants policy position (2006) looks for 'A set of agreed lists used at each level to identify invasive plants' and 'One consistent, reliable and independent weed risk assessment process used at all levels'.

These developments have occurred in parallel to the development of AusBIOSEC by the Australian Ministerial Councils. Since 2003, the Commonwealth, State and Territory governments, industry, landholders and other key stakeholders in primary production and the environment have been developing an overarching framework of common principles and guidelines to enable biosecurity arrangements to be applied consistently across Australia.

The Australian Weeds Strategy's Action 3.3.4 is to 'Develop and implement a uniform national weed categorisation system' (NRMCC 2006).

DISCUSSION

National significance criteria The first National Weed Strategy introduced the concept of Weeds of National Significance (WONS) (Thorpe and Lynch

2000). These weeds have significant current distribution and impact across Australia. Weeds in this category have received significant national resources through Natural Heritage Trust and Defeating the Weed Menace (DWM) programs facilitating the development of national strategies, action plans, containment lines, local control programs and biological control.

The AusBIOSEC's 'triple bottom line' criteria consider the impact of a pest on (a) natural environment and ecosystems; (b) people, including public health and human infrastructure; and (c) primary production and business. These broad criteria are further subdivided. For example, the natural environment criterion includes sub criteria of impacts of the pest on (i) nationally important species; (ii) ecologically valuable species; (iii) nationally important places; (iv) ecologically important places; and (v) extensive impacts. A species is considered nationally significant if it meets at least one of the subcriteria.

Weed risk assessment (WRA) is the evaluation or estimation of the actual or potential impact and distribution of a weed species. There are a number of different systems used in Australia e.g. the border system used by Biosecurity Australia (Pheloung *et al.* 1999) and the state systems such as that of Victoria (Weiss and McLaren 2002) or South Australia (Virtue 2004). These WRA systems operate in differing legislative contexts with differing output expectations. These differences lead to difficulties in comparing a weed's risk in differing jurisdictions, difficulties in data sharing and differences in a weed's legislative status across Australia, and a perceived lack of transparency in the assessment process. The Northern Territory and New South Wales are adopting versions of the South Australian WRA system.

Feasibility of control Coordinated control programs aim to achieve specific eradication or containment objectives within a defined area be it continental, regional or local. These objectives are achieved through actions to locate and treat infestations and restrict propagule movement. The feasibility of a coordinated control program for a particular weed species needs to be assessed before the expenditure of public monies or restraint on trade or any legislative obligation is placed on land managers. The feasibility of initiating such a program includes assessing the current and potential distribution and number of infestations; ease of detectability of the plant; treatment costs and effort; and the expected duration of the program (Panetta and Timmins 2004).

Weed risk management (WRM) brings together the estimation of the weed risk posed by a plant and the feasibility of its control to categorise and prioritise the species and to assign various treatment actions or options. These actions may involve activities at local, regional or national scales and involve eradication or containment programmes, targeted management, biological control programmes down the scale to simple monitoring or even no action.

The National Post-Border Weed Risk Management Protocol (Virtue *et al.* 2006) is the generic guide to the development of a post-border WRM decision framework. It includes key criteria that should be considered in assessing and comparing risks posed by different plant species and the feasibility of managing these species through coordinated control programs. This national protocol relates to the decision support systems for determining: species for inclusion in (or removal from) noxious weed lists; priorities for eradication or containment programs; priorities for prevention of and early intervention against new weed incursions; plant species with existing or potential commercial uses which pose a weed risk and require active management to limit their spread from plantings; and priorities for investment into research and extension leading to improved weed management.

Weed categories Weed in Australia have been categorised based on: the industry or sector affected such as agricultural, pasture, crop or environmental; their ecology (e.g. ruderal); their habitat requirement (e.g. aquatic); or by the management actions that are required by legislation for their control.

Each state or territory has legislative categories for weeds (e.g. in Queensland – Class 1, 2 or 3) with each having differing obligations and control objectives. Each state and territory has its own 'process', now normally based on a scientific, evidence-based WRA, by which plants are considered for declaration as a noxious or declared weed in that jurisdiction.

'Sleeper weeds' have recently received much attention. These currently have limited distribution in Australia and have predicted high future impacts. These weeds are potential eradication targets that will return a high benefit (Brinkley and Bomford 2002). Weeds that are 'new incursions' can be the subject of nationally cost-share funded eradication programs. These weeds required declaration across all jurisdictions in support of the national eradication programs.

Groves *et al.* (2003) categorised more than 2700 naturalised plant species in Australia into groups that reflected major or minor threats to natural ecosystems

or agriculture. Their categories reflected existing extent of problem within each state, whether the weed was being controlled or eradicated, noxious status, habitat-specific, potential to spread, harbouring of insects or diseases and toxicity.

The National Post-Border Weed Risk Management Protocol (Virtue *et al.* 2006) defines some *de facto* categories on the basis of similarity of actions described for combinations of level of weed risk and feasibility of control (i.e. high feasibility plus high risk equals a potential eradication target).

AusBIOSEC covers prevention, surveillance, preparedness, response to, and recovery from, new incursions and outbreaks of pests. It also covers ongoing management of established invasive species. A national workshop in August 2007 considered earlier proposals to the AWC for four to five weed management categories in light of the scope of AusBIOSEC.

Species list The 250 plant species used in this project were derived from the AWC's noxious weed list of Australian States and Territories plus (a) naturalised species with agricultural or environmental impacts of four or five (Groves *et al.* 2003); (b) species mentioned as having or potentially having an impact in an Industry Biosecurity Plan; (c) The Environmental Alert List; (d) the NAQS target list (both existing and proposed); (e) the agricultural sleeper weeds (Brinkley and Bomford 2002); (f) the Victorian Alert Weeds; (g) the noxious or quarantine weeds of Australia's trading partners such as the USA, New Zealand, EU, RSA; (h) weeds in the Invasive Species Specialist Group 100 worst invasive alien species; (i) potential containment or eradication targets identified in Csurhes and Edwards (1998) or Groves *et al.* (2003); (j) official targets for biological control in Australia.

This list of over 1500 species was refined by considering only species that had already undergone a WRA using a recognised tool; had an existing potential distribution model using either CLIMATE or CLIMEX; and potentially fell into each of the proposed categories.

Future developments The finalised categories with selection criteria and with their illustrative lists of 250 species will be presented to the AWC for further consideration.

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