

The emerging weed challenge of managing native plant species: what are we doing in New South Wales?

Stephen B. Johnson

New South Wales Department of Primary Industries, Locked Bag 6006, Orange, NSW 2800, Australia
(stephen.johnson@dpi.nsw.gov.au)

Summary Plant species that are native to Australia can be significant weeds of primary production and the environment, both within and outside their endemic ranges. Of the 6049 taxa native to New South Wales, over 165 (2.7%) are considered to be weedy within their indigenous range. With only one exception, none are managed as noxious under the New South Wales *Noxious Weeds Act 1993*.

Two groups of native species are managed as noxious weeds. With one exception, the first group includes a range of 14 tree, shrub, vine and epiphytic species found in northern and eastern rainforests and high rainfall areas. These species are generally of concern outside their endemic range, for example sweet pittosporum (*Pittosporum undulatum* Vent.), some lilly-pilly species (both *Acmena* and *Syzygium* species), bower vine (*Pandorea jasminoides* (Lindl.) Schum.) and staghorn fern (*Platynerium superbum* de Joch. & Hennipman). The exception is coastal teatree (*Leptospermum laevigatum* (Gaertn.) F.Muell.), a species that is invasive in coastal dune areas in New South Wales. The second group are those found (and declared) within their endemic range. Galvanised burr (*Sclerolaena birchii* (F.Muell.) Domin), an early colonising shrub of rangeland throughout western New South Wales, is the only current example.

This paper discusses the use of legislation to enable the management of native plant species, particularly with the *Noxious Weeds Act 1993* and the *Native Vegetation Act 2003* (and associated legislation). The problems encountered are also examined. Importantly, options for the management of native species in New South Wales are suggested so as to address some of the conflicting issues identified. The principles, practices and examples examined in this paper provide essential guidance to the emerging challenges of the management of native plant species across many jurisdictions in Australia.

Keywords Legislation, native vegetation, naturalised, invasive, indigenous, endemic, noxious.

INTRODUCTION

The New South Wales Invasive Species Plan provides an overarching framework for the management of all invasive species, including weeds, in the state (NSW Government 2008). Legislation is one of the tools,

among many broad strategies and management options available to achieve the aims of the Invasive Species Plan. New South Wales Department of Primary Industries is the lead agency for weed management in the state, and in partnership with Local Government enacts the *Noxious Weeds Act 1993* (NWA). Having said this, there are a number of agencies, including New South Wales Department of Primary Industries (DPI), who have responsibility for managing invasive plant species impacting primary industries, the environment, the community and the heritage/culture of all people, often using distinct legislation to help achieve this, and other objectives.

The most recent review of the NWA identified a number of conflicting interactions with other New South Wales legislation (and attendant policies and procedures, Johnson and Lisle 2011). In many cases, legislation enacted since 1993 (when the NWA was enacted) has not thoroughly considered the impact of subsequent legislative requirements on the operations of the NWA. This includes parts of the *Threatened Species Conservation Act 1995* (not discussed further in this paper but see Johnson 2014), the *Native Vegetation Act* (NVA) 2003 and the *Native Vegetation Regulation* (NVR) 2013: acronyms for legislation are generally used throughout this paper for brevity.

This paper discusses the use of legislation to enable the management of native plant species, particularly with the NWA and NVA. There are a number of problems due to conflicting legislative requirements. Options are suggested to address these problems such that the management of native vegetation can be improved. The principles, practices and examples examined in this paper provide essential guidance to the emerging challenges of managing native plant species across Australia.

SOME DEFINITIONS FIRST

- **Plant** Any organism from the Kingdom Plantae (after Raven *et al.* 1987).
- **Weed** A plant growing in the wrong place at the wrong time.
- **Naturalised plant** Plants which ‘reproduce consistently...and sustain populations over many lifecycles without direct intervention by humans

(or in spite of human intervention)' (Richardson *et al.* 2000).

- **Invasive plant** Naturalised plants 'that produce reproductive offspring, often in very large numbers, at considerable distances from parent plants...and thus have the potential to spread over a considerable area' (Richardson *et al.* 2000).
- **Australian native plant** Any taxa belonging to the Kingdom Plantae including: trees (saplings, shrubs, and scrub); understory plants; groundcover plants (any type of herbaceous vegetation); plants occurring in a wetland and any mangrove and sea grass species; that have originated in Australia without human involvement or that have arrived here without the intentional or unintentional intervention of humans from an area in which they are native (adapted from the NVA and Pysek *et al.* 2004).
- **Indigenous plant species** An Australian native plant within its native range.
- **Endemic plant species** Belonging exclusively to a particular locality or region, e.g. Cootamundra wattle (*Acacia baileyana* F.Muell.) is endemic to the Temora and Cootamundra area but is widely cultivated (and naturalised) across New South Wales (RBG&DT 2014).
- **Noxious weed** Any freshwater or terrestrial 'plant declared by an order under section 7' of the NWA: mangroves, seagrasses and any other type of marine vegetation to which section 205 of the *Fisheries Management Act 1994* applies are covered under that legislation.
- **'Feral species' (previously Feral native species)** Section 37 of the NVR defines a 'feral species' (previously Feral Native Species) as a 'species of native vegetation...outside its natural range...or a groundcover' (NVR).
- **'Invasive species' (previously Invasive native scrub)** Section 38 of the NVR defines a declared 'invasive species' (previously Invasive Native Scrub) as 'a species of native vegetation...within its natural range...and...is densely regenerating or is invading plant communities in which the species does not generally occur, which is causing decline in the structure or composition of the vegetation community' (NVR).

PLANT SPECIES IN NEW SOUTH WALES

There are at least 6049 native (G. Chapple, pers. comm. November 2012) and 1648 naturalised (introduced) plant taxa recorded in New South Wales (J. Hosking pers. comm. January 2013). When native Australian plants that are not indigenous to the state but have naturalised in New South Wales (n = 39) and

native Australian plants that are indigenous but have naturalised outside their endemic ranges in New South Wales (n = 62) are added, naturalised plant species growing outside their native range represent 22.4% of the States flora.

Not all naturalised plant species growing out of their native range are invasive. Conversely, native Australian plant species growing within their endemic ranges can be problematic. An analysis of weed species in irrigated and dryland cotton, irrigated rice, dryland cereal and oilseed cropping, and rangeland grazing systems revealed at least 137 distinct Australian native plant taxa that were problematic (Johnson 2014). A further 28 taxa are added when what were 'Invasive Native Scrub' taxa listed under the NVA are considered: that is 2.7% of plants indigenous to New South Wales are recognised as weeds within their endemic ranges.

LEGISLATION FOR MANAGING NATIVE PLANT SPECIES

The Noxious Weeds Act 1993 The main objective of the NWA is to 'reduce the negative impact of weeds on the economy, community and environment' of New South Wales. This and similar jurisdictional legislation seeks to reduce the impact of externalities or external costs. An externality occurs when the actions, or inactions, of individuals impose unintended impacts on others (Blackmore 2008), such as when weeds spread from one property to another property at no fault of, and/or in spite of the second property managers' efforts. Weed declarations best help minimise weed spread (and externalities) when done during the early stages on invasion. In contrast, native plant species within their endemic ranges are unlikely candidates for declaration due to the absence of externalities (Auld and Johnson 2011). The current declaration of galvanised burr, an early colonising shrub of rangeland throughout western New South Wales (in its endemic range) is a historical anomaly.

There should be no restriction on declaring Australian native plant species that have been shown to consistently occur outside their endemic range (at least for the last 50 years) and which demonstrate the characteristics of invasive plants. (This discussion, for brevity, necessarily ignores the spread of native plant species in response to climate change). Declaration of such invasive plants has occurred with 14 tree, shrub, vine and epiphytic species that are not endemic to, but are beginning to invade Lord Howe Island. With one exception, this being coastal teatree (*Leptospermum laevigatum*), a species that is invasive in coastal dune areas in New South Wales, all these species are found in northern and eastern rainforests

and high rainfall areas in eastern Australia, e.g. sweet pittosporum (*Pittosporum undulatum*), some lillypilly species (both *Acmena* and *Syzygium* species), bower vine (*Pandorea jasminoides*) and staghorn fern (*Platynerium superbum*).

The Native Vegetation Act 2003 Of the multiple objectives of NVA are: to manage ‘native vegetation on a regional basis in the social, economic and environmental interests’ of New South Wales; as well as preventing broadscale clearing unless it maintains or improves environmental outcomes, protects and improves native vegetation of high conservation value; and to encourage revegetation.

There is a range of permitted activities under the NVA including the management of ‘feral species’ and ‘invasive species’ (previously Feral Native Species and Invasive Native Scrub, respectively). The ‘removal of noxious weeds under the Noxious Weeds Act 1993’, including native plant species, is one such exemption: these are collectively known as routine agricultural management activities. A Property Vegetation Plan is needed prior to all other clearing.

PROBLEMS ENCOUNTERED

An important overarching principle in the following discussion is that compliance with one piece of legislation should not preclude compliance with all other relevant legislation. Said another way, adherence with one piece of legislation should not result in an offence occurring under another. Conflict arises when this can not reasonably occur.

The exemption under the NVA for plants declared noxious under the NVA appears to eliminate such conflict, yet at least three other issues arise from this exemption: 1) how to best manage Australian native plant species that are not declared noxious; 2) the use of noxious weed declaration as a defense to subvert the intentions of the NVA/NVR; and 3) how best to remove Australian native plant species from noxious weed declaration so that continued best management of the species occurs. These issues will be discussed in more detail below.

Best management of non-declared native plants

There has been a perception that having an Australian native plant species declared noxious would remove many of the difficulties previously associated with listing and managing a species as what was an ‘Invasive Native Scrub’ (with subsequent management only allowed under an Invasive Native Scrub Property Vegetation Plan), or as what was a ‘Feral Native Species’. This perception included a belief that listing a native plant species as a noxious weed was procedurally

and operationally easier. The routine agricultural management activity exemption outlined above then applied. Because of this perception, industry and political lobbying for declarations of native plant species has occurred. This is inconsistent with the principle of an externality for weeds managed under the NVA.

Noxious weed declaration as a legal defense

A small number of legal cases have involved the defendants claim that they were simply removing a noxious weed while (also) either removing (more than the minimum necessary amount of) threatened biodiversity and/or protected native vegetation. Simply, noxious weed declaration should not be seen as a ‘back door’ clearing permit.

Continued management after declaration removal

The removal of an Australian native plant species from noxious weed declaration can result in misunderstandings about the continued best management of the species. For example, the removal of galvanised burr from declaration during the period 1 March 2006 – 1 March 2007 resulted in a number of cases where those removing the species were advised to desist their activities and apply for permission through the processes under the NVA/NVR. This unfortunate, and probably incorrect, advice most likely resulted from a failure to recognise that any plants so removed would have almost certainly have been regrowth and as such would have been exempt from clearing under section 9 of the NVA. Research indicates plants of galvanised burr are short-lived, most dying before four years (Auld 1981 and Auld and Johnson 2011).

OPTIONS FOR MANAGEMENT

Existing and proposed options Natural Resource Management authorities in New South Wales need to broaden community extension practice such that existing legislative provisions are understood, not only in cases of incorrectly using legislative conflict as a defense when illegal clearing has occurred. This was a key point and recommendation from the report of an independent facilitator of the NVR review (Lane 2013). Importantly, the NVA permits the clearing of non-protected regrowth that has grown since 1 January 1990, or 1983 in the New South Wales western division.

Whether the 2013 amendments to the NVR that allow the clearing of both ‘feral species’ and ‘invasive species’ as a conditional routine agricultural management activity within a code of practice will clarify the conflict is unclear. Further analysis of outcomes is needed once: 1) the proposed self-assessable codes (Ministerial orders) are made; and 2) any clearing

approved under Property Vegetation Plans assessed under the 'Environmental Outcomes Assessment Methodology' that is currently being revised occurs.

Alternate options There is at least one alternate solution that would involve amendment to the NVR and maintain the objectives of the NVA/NVR and the NWA. This is to expand the wording applying to an 'invasive species' at section 38, or a 'feral species' at section 37 of the NVR, as appropriate, such that management of certain species would be exempt from the self-assessable codes.

Although less desirable, it may be necessary to amend the NWA to address the issues outlined earlier. If political pressure comes to bear as a result of not being able to manage 'invasive species' through the self-assessable codes and/or the 'Environmental Outcomes Assessment Methodology', it may be necessary for an order under the NWA to list 'invasive species' as locally controlled (and managed) noxious weeds. This action would allow management to be specified so as to prevent the broader suite of environmental degradation issues caused by these invasive plants: actions under a proposed overarching Biosecurity Act may alternately be needed.

PROPOSED PRINCIPLES FOR DECLARING AUSTRALIAN NATIVE PLANTS SPECIES

- 1. Australian native plants that are not indigenous to New South Wales should be considered for declaration**, e.g. water lettuce (*Pistia stratiotes* L.) and umbrella tree (*Schefflera actinophylla* (Endl.) Harms).
- 2. Australian native plants that are indigenous to New South Wales, or endemic to parts of the state, should be considered for declaration, but only where they are not endemic**, e.g. brush cherry (*Syzygium paniculatum* Gaertn.) which is indigenous and endemic to New South Wales; silky oak (*Grevillea robusta* A.Cunn. ex R.Br.) and flame tree (*Brachychiton acerifolius* (A.Cunn. ex G.Don) F.Muell.) both of which are indigenous to parts of New South Wales and Queensland; and sweet pittosporum and white cedar (*Melia azedarach* L.) both indigenous to New South Wales and other parts of Australia; and all recently declared on Lord Howe Island.
- 3. Australian native plants that are indigenous to New South Wales, or endemic to parts of the state, should be considered for declaration in areas inside their indigenous/endemic range** only where the benefits that arise from the management of the species in primary production systems do not result in significant further losses in

conservation of the species in natural ecosystem/s. Assessment methodology is needed in these cases.

ACKNOWLEDGMENTS

Sincere thanks go to Philip Blackmore (New South Wales DPI, particularly for unpublished material), Syd Lisle (NSW DPI), Professor Bruce Auld (NSW DPI and Charles Sturt University), Dr John Hosking (formerly NSW DPI), Dr Pete Turner (NSW Office of Environment and Heritage), Hank and Sue Bower (Lord Howe Island Board), Gary Chapple (Royal Botanic Gardens Sydney), Dr Tony Grice (Commonwealth Scientific and Industrial Research Organisation) and Matthew Baker (Tasmanian Herbarium) for useful information and comments.

REFERENCES

- Auld, B.A. (1981). Aspects of the population ecology of galvanised burr (*Sclerolaena birchii*). *Australian Rangeland Journal* 3, 142-8.
- Auld, B.A. and Johnson, S.B. (2011). The biology of Australian weeds. 57. *Sclerolaena birchii* (F.Muell.) Domin. *Plant Protection Quarterly* 26, 2-7.
- Blackmore, P. (2008). Noxious weeds or just obnoxious? Primefact 254. (NSW DPI, Orange). 3 pp.
- Johnson, S.B. (2014). Native plant species in New South Wales: legislative management and control. (NSW DPI, Orange).
- Johnson, S.B. and Lisle, S.D. (2011). Conflict between the *Noxious Weeds Act 1993* and other NSW legislation. Proceedings of the 16th Biennial NSW Weeds Conference. (NSW DPI, Orange).
- Lane, J. (2013). Native vegetation regulation review. Facilitator's final report. (NSW Office of Environment and Heritage, Sydney).
- NSW Government (2008). New South Wales Invasive Species Plan 2008-2015. (NSW DPI, Orange).
- Pysek, P., Richardson, D.M., Rejmanek, M., Webster, G.L., Williamson, M. and Kirschner, J. (2004). Alien plants in checklists and floras: towards better communication between taxonomists and ecologists. *Taxon* 53, 131-43.
- Raven, P.H., Evert, R.F. and Eichhorn, S.E. (1987). 'Biology of plants, fourth edition', 775 pp. (Worth Publishers, New York).
- RBG&DT, Royal Botanic Gardens and Domain Trust (2014). PlantNET – the Plant Information Network System of the Royal Botanic Gardens and Domain Trust, Sydney, Australia. <http://plantnet.rbg Syd.nsw.gov.au> (accessed 4 May 2014).
- Richardson, D.M., Pysek, P., Rejmanek, M., Barbour, M.G., Panetta, F.D. and West, C.J. (2000). Naturalization and invasion of alien plants: concepts and definitions. *Diversity and Distributions* 6, 93-107.