What weeds? Stop weed evasion now!

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Summary There is an urgent need to re-appraise existing legislation at national and state levels to include new, aggressively invasive landscape-dominating woody weeds. Present legislation is not flexible enough to allow regulation of new weed threats. In addition, sufficient research has not been done to determine which woody weeds are serious threats at regional levels. This needs further attention because woody weeds can diminish the present capacity of vegetative communities to compete, contributing to their decline and threatening their survival.

A new approach toward protecting remaining biological values must be developed before further devastating losses to biodiversity occur. At a regional level, present regulations should be amended to include recently discovered landscape-altering weeds, including native species establishing outside of their natural range. Consideration should be given to a permitted list approach as a new tool for weed legislation.

Keywords Woody weeds, coast wattle, white list, black list, permitted list, biodiversity.

INTRODUCTION

Nelson township is situated in Victoria on the Glenelg River estuary amongst a unique set of varied habitats within a limestone karst ecosystem that extends the length of Discovery Bay in far south west Victoria and across into the south east of South Australia. This area has unique habitats ranging across a multitude of ecological vegetation classes, including extensive stringybark (*Eucalyptus baxteri* (Benth.) Maiden & Blakely ex J.M.Black) forests, wet and dry heathlands, riparian and estuarine habitats, and the Long Swamp wetlands. Dunes form an extensive coastal habitat supporting migrating shore-bird breeding, on a dynamic coastline fronting the Southern Ocean.

Apart from extensive environmental changes, Nelson has also changed demographically in the past 200 years. Bulldozing for farmland and pine plantations has adversely altered coastal and forest habitats (Clode 2006). Many farming families have left the area. By the 1980s Nelson's dominant demographic component became retirees, many of whom volunteer their efforts to remove weeds and restore degraded habitats.

Frustrations have emerged among the volunteers around the inability to source funding or take action on newly invasive woody weeds in the local region, due to those weeds not being listed as noxious under current legislation.

DISCUSSION

Since the 1970s the limestone karst region encompassing Discovery Bay has been under attack from woody weeds, principally coast wattle (*Acacia longifolia* (Andrews) Willd. subsp. *sophorae* (Labill.) Court), and more recently regionally significant invasive woody weed species such as Italian buckthorn (*Rhamnus alaternus* L). Displacement of endemic native species by invasive cohorts, particularly in the Long Swamp-Glenelg estuary wetlands and adjoining hinterland, has been rapid, widespread and enduring. Reasons are complex and invite further research (Costello *et al.* 2000).

The question arises: what factors have caused coast wattle to encroach on these coastal wetlands from its locally extant primary dune habitat? Unlike coast tea-tree (*Leptospermum laevigatum* (Gaertn.) F.Muell.), which has established far west from its Western Port/Port Philip Bay coastal fringes into South Australia, there are a number of factors involved. These need best to be understood in context of the Victorian *Flora & Fauna Conservation Act 1988*, which continues to protect coast wattle as an endemic species. Pollen cores indicate coast wattle as sparse in wetland peats prior to pine plantings in the 1960s (Head 1984).

It is reasoned that coast wattle has spread from its primary dune habitat due to marram grass (*Ammophila arenaria* (L.) Link) plantings in the 1930s to stabilise dune blow-outs. Coast wattle moved inland, likely being spread by animals and birds via seeds, and eventually cross-bred with Sydney sallow wattle, which was being grown as a horticultural amenity plant. Both parents are prolific seed producers. Coast wattle out-competes nearly all canopy emergents, including moonah (*Melaleuca lanceolata* Otto), she-oak (*Allocasuarina verticillata* (Lam.) L.A.S.Johnson) and woolly tea-tree (*Leptospermum lanigerum* (Sol. ex Aiton) Sm.). In addition, the decade-long drought may have advantaged coast wattle invasion in all wetland areas, further drying out these strategically important biodiverse habitats, and threatening

endangered orchids and allied ephemerals. Unconfined aquifer flows to replenish Long Swamp wetlands have diminished due to recent blue-gum (*Eucalyptus globulus* Labill. subsp. *bicostata* (Maiden, Blakely & Simmonds) J.B.Kirkp.) plantings throughout the region, further increasing coast wattle encroachments into former wetlands.

Coast wattle alters normal native seral vegetation sequences by suppressing dormancy of the soil seed-bank, because of the phyto-toxins (allopathy) released from all of its vegetative parts and alters microbial diversity within sandy soil profiles (Marchantea *et al*. 2008). The longer coast wattle persists in its invaded area, the greater the biodiversity loss (McMahon *et al.* 1994). When grazing is removed from once-productive farmlands, coast wattle appears to invade rapidly, spread mostly by birds: it can cover many meters per year. All these circumstances have contributed to this previously innocuous plant being able to invade across a far wider range, as plant checklists indicate (Beauglehole 1984), and it is still advancing on many fronts.

Nelson Coastcare and allied regional groups have been unable to access necessary funds to tackle coast wattle or other rampant weedy natives like, coast tea-tree, sweet pittosporum (*Pittosporum undulatum* Vent.) and Western Australian blue-bell creeper (*Billardiera fusiformis* Labill.). In addition, because they are considered 'natives', despite their invasiveness and habitat-altering capabilities, they cannot be removed without acquiring special permits, which is a difficult process. New, aggressive regional weeds such as Italian buckthorn and polygala (*Polygala myrtifolia* L.) are also not listed as noxious weeds under relevant state or federal legislation. Many grant applications by community groups for woody weed removal must include a declared noxious species, otherwise the applicants do not meet the funding requirements. As a consequence, Nelson volunteer groups who are mostly retirees are not physically able to complete all necessary weed removal, and cannot access funding that is needed to contract weed removal work. Thus, the volunteers are disheartened by the obvious anomalies between weed invasion and the current noxious weed lists.

Further impediments to volunteer participation include inability to source funding for follow-up re-growth maintenance, which is largely overlooked, further exacerbating weed re-establishment. In future, funding must include on-going maintenance works.

The Glenelg Hopkins Catchment Management Authority has achieved remarkable success in re-vegetation works, including winning the International Riverprize. Its programs however, are similarly hampered by the status of current legislation (e.g. the Victorian *Conservation and Land Protection Act* or the *Flora and Fauna Conservation Act*), because of the inability to address new serious weed threats that are not already listed as noxious.

The 2008 Victorian Department of Sustainability and Environment's excellent publication 'Advisory list of environmental weeds of coastal plains and heathy forests bioregions' ranks 243 weeds against five key weediness attributes, with 1 being most severe in impact. The very high risk weeds include coast wattle ranked 2, bluebell creeper at 1 (same ranking as bridal creeper (*Asparagus asparagoides* (L.) Druce)), coast tea-tree as 12, sweet pittosporum at 4, polygala at 12 and Italian buckthorn at 10. The World Wildlife Fund Australia also considers coast wattle as an environmental weed and lists the other species above as very high risk weeds. It also advises that all these species are freely available from nurseries.

It is estimated that weeds cost the Australian agriculture $4 billion annually, with a likelihood of a similar cost to the environment; around 400 native plants and animals are at extinction risk, and garden plants which have 'jumped the garden fence' account for 65% of weeds in the environment (State of the Environment 2011). Until recently, Nelson township has been a source of garden plants escaping into surrounding public lands.

Both Western Australia and neighbouring South Australia have acknowledged and are addressing emerging woody weeds in strategic management projects. South Australia currently has legislation pending that declare many of the same woody weeds that are besieging the Nelson region.

Government agencies are obliged to construct their research so that it correctly informs government policy setting. Currently research and funding priorities are directed primarily at the agricultural sector, leaving environmental protection, including habitat restoration initiatives inadequately financed. And all of these constraints are operating under the actuality of climate changes that may be already altering the function of native ecosystems.

The question then becomes: how and what can be done to recover sensible, science-based, objective policies to prevent further damage to our besieged habitats and ecosystems? The use of a precautionary approach is currently being promoted by many weed managers, which proposes a white list (or permitted list) of plants, based on risk assessing plants before their use is permitted. This is aligned to applying the precautionary principal and aims to promote a fundamental change in how weeds are managed.

Because prevention is better, and more cost effective, than cure, a permitted list is seen as a means of

preventing the use of invasive plant species in future. Predicting which species will become invasive before they are allowed into the environment must surely lessen costs compared to the high costs of eradication or ongoing weed control.

With around 9000 weeds to contend with but only a few hundred subject to legislation, a permitted list would complement the existing 'black list' approach that has so far failed to keep pace with new weed invaders, let alone addressing already established naturalised weeds.

CONCLUSION

Newly emerged weeds and existing ones such as coast wattle, require an innovative, more effective approach to manage their invasiveness. A process such as a permitted list should be explored and where considered relevant, implemented by governments to aid community volunteers and other agencies to more effectively combat the battle against weeds.

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