WEEDS

WEEDY NATIVES IN WESTERN AUSTRALIA

Greg Keighery

Introduction

When weeds are mentioned, we automatically think of exotic species introduced from overseas that are completely out of place in Western Australia. Occasionally we include eastern states' species, such as Victorian tea tree. However, any plant outside the checks and balances of its natural habitat can potentially be a weed and WA native species are no exception. Currently there are 71 species of WA natives that have documented feral populations and some are already serious weeds of the natural environment

Another important issue is that although our understanding of the distribution and ecology of many native taxa has improved greatly over the past 50 years, weedy populations of native species can lead to an erroneous impression of the true native ranges of species. For example the highly restricted *Reedia spathacea* has a planted population at Hamel, on the Swan Coastal Plain, giving an apparent several hundred kilometre range extension for this rare species. Similar issues can be noted in the south coast endemics *Kennedia nigricans* (weedy populations on the Swan Coastal Plain), *Hakea laurina* (jarrah forest and Swan Coastal Plain), and the listing of a feral population of *Melaleuca diosmifolia* in the Stirling Ranges as a new record for this priority species.

I have been preparing an annotated list of the populations and collections of the 71 weedy natives to enable allocation of populations to native and feral (especially in FloraBase), so that native weeds are recorded as such, an example of the text is given in the adjoining box.

Native weeds range from the aquatic Indian water fern (*Ceratopteris thalictroides*) and waterlillies (*Nymphaea macrosperma*) introduced into pools at Millstream early last century to tall trees such as warty yate (*Eucalyptus megacornuta*) introduced to the Kings Park arboretum in the 1960s and invading surrounding bushland before its removal in the 1990s. They come from 23 families and 36 genera with the 'weediest' genera being *Acacia* (9 species that are weedy), *Callitris* (5), *Calothamnus* (6), *Eucalyptus* (5), *Hakea* (5) and *Melaleuca* (5).

Most serious weeds

The most serious native weeds have the capacity to completely alter the structure of communities that they invade and include: *Ceratopteris thalictroides*, peppermint (*Agonis flexuosa*), Geraldton wax (*Chamelaucium uncinatum*), rock she-oak (*Allocasuarina huegeliana*), *Eucalyptus megacornuta*, Rottnest tea tree (*Melaleuca lanceolata*) and ribbed hakea (*Hakea costata*).

An example of a serious native weed is *Melaleuca lanceolata* in Kings Park where roadside plantings of this species have resulted in a dense monoculture in banksia woodland after fires have killed the adults and stimulated germination of seedlings. These dense stands have virtually no understorey species present in what is normally species-diverse open woodland.

How can we spot potential weeds?

It would appear that very weedy species are those that are easily grown from seed, set copious amounts of seed, respond well to fire to aid invasion and are re-seeders rather than slow growing resprouters. Some future major native weeds in this category

Hibbertia cuneiformis (Labill.) Sm. Cutleaf Hibbertia

NATURAL DISTRIBUTION: Esperance Sandplains, Swan Coastal Plain, Jarrah Forest, Warren IBRA Regions.

WEEDY DISTRIBUTION: Swan Coastal Plain IBRA Region.

HABITATS: Banksia woodland, coastal heath, *Eucalyptus rudis/Melaleuca preissiana* woodland..

FIRST RECORD: Hollywood Reserve, Nedlands, G.J. Keighery 16675 (PERTH).

OTHER RECORDS: Blue Gum Lake, K. Brown 505; Piney Lakes Reserve, Melville, G & B Keighery 1316, Pinnaroo Cemetery Bushland, G. Keighery 17313 , Kings Park, G. Keighery 17104, Woodvale Nature Reserve, G. Keighery 17311 (PERTH).

NOTES: Keighery (1998) discussed how this species planted as an amenity species in the Naval Base on Garden Island was self seeding into disturbed bushland. The species is also considered a potentially serious bushland weed in Eastern Australia (Elliot and Jones, 1990). Appears to be spread into bushland by birds consuming the orange fleshy seed coat in garden or amenity plantings.

continued on page 5

WEEDS

continued from page 5

weedy natives

may include *Homalanthus novo-guineensis*, *Acacia celastrifolia* and *Calothamnus quadrifidus*, all of which are widely planted or used as revegetation.

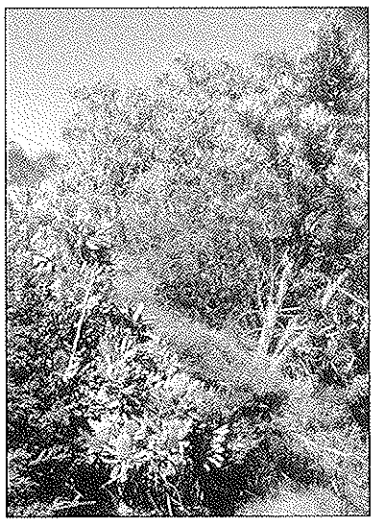
Invasion process

Over 95 % of the 71 native species recorded as weeds were deliberately introduced into bushland areas, or spread from adjoining plantings.

Unintentional spread

The other 5% of weedy native species arise from several causes, chiefly movement of soil along transport corridors or with roading materials, which have spread some lateritic hills species such as blue leschenaultia (*Lechenaultia biloba*) into Shenton Bushland, a coastal plain reserve.

Plants also respond to changed conditions and, like animals, spread into new areas when opportunity and habitats are presented. Vehicles are spreading native plants into new areas, for example speargrass (*Austrostipa tenuifolia*) has been introduced by vehicles into Woodvale Reserve during the past five years and is beginning to spread via mowing of the verges in late spring to reduce fire risk. It is probably also an introduction to Kings Park as it was not recorded in detailed surveys previously and is currently restricted to road and trail verges. The perennial form of bottlewashers (*Ptilotus polystachyus*) is a common weed of old paddocks and road verges. It has become more frequent in many reserves on the Swan Coastal Plain over the past 20 years. Like speargrass, this species is probably expanding its range into the higher rainfall areas of south western WA. It is dispersing naturally via wind, by grading and by vehicles. Tarweeds (*Boerhavia* species) are also spreading in a similar fashion from the arid zone into the wheatbelt.



In this Perh roadside planting, the northern sandplain lignotuberous form of Banksia menziesii *has been planted next to the local tree form. There is obvious potential for hybridisation. Photo: G. Keighery*

There are several tropical taxa with sporadic records from the Perth Region. These include *Glinus lotoides* (Molluginaceae), *Pseudoraphis spinescens* (Poaceae), *Ottelia ovalifolia* var. *chrysobasis* (Hydrocharitaceae) and *Epaltes australis* (Asteraceae). While some of these such as *Pseudoraphis* appear to have been recently introduced into Herdsman Lake Regional Park, there is no obvious method of introduction of the other three whose populations occur in natural bushland.

While it is important to document this spread, there is perhaps little point in actively opposing it, unlike the invasive natives which are adversely affecting bushland areas.

Genetic pollution

Weeds can threaten another level of biodiversity, genetic diversity, by mixing local and introduced gene pools. Although poorly documented there are already several examples of mixing of gene pools between local and non local forms (or even species). For example, tuart (*Eucalyptus gomphocephala*) seed produced by trees in Kings Park has many hybrid genes present, apparently because of extensive crossing to many species planted in the Botanic Gardens and along the road verges. Marri (*Corymbia calophylla*) has hybridised extensively with red flowering gums (*C. ficifolia*) in Kings Park. This is the result of extensive plantings of red flowering gums as avenue trees during the 1920s for the centenary celebrations of Western Australia in 1929. Local and non-local forms of Geraldton wax have hybridised at Bold Park, potentially leading to the loss of the local form, the Wembley wax.

Future

Currently some horticulturalists and reserve managers are advocating using species from 'drier' regions for revegetation in the light of climate change predictions. However, many of the serious bushland weeds documented here are from 'wetter' regions than the areas they are affecting, suggesting that such moves are premature and could potentially cause serious weed problems in remnant bushland. We lack the ecological understanding of what limits the ranges of most of our native species to begin such potentially damaging and expensive experiments.

With increasing attempts to restore, rehabilitate and revegetate disturbed areas of WA, it is vital that we understand the natural distribution and ecology of our native flora. This enables the use of local provenance material that should minimise the actual and potential introduction of potentially damaging weedy taxa that can alter the local bushland habitats, fire regimes or even cause the loss of local forms through hybridisation.

Greg Keighery is a Principal Research Scientist at DEC's Woodvale Research Centre. Weeds are one of his research interests.