

# factsheet

## Alternatives to bird-dispersed weeds

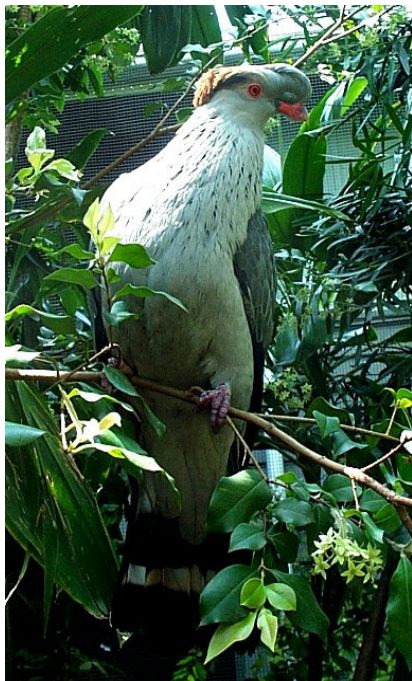
### Weeds of National Significance



### Background

This factsheet suggests how fleshy-fruited weeds can be replaced by fleshy-fruited native plants as a food source for birds.

This information is aimed at gardeners and land managers who have both weed infestations and concerns over the fate of animals that now use the fruit resources of the weeds following weed removal.



Fruits of the weed camphor laurel (*Cinnamomum camphora*, Lauraceae) are thought to be vitally important in supporting populations of several rainforest pigeons, such as this topknot pigeon.  
Photo: Austin O'Malley

**Project:** selecting weed replacement plants for use by frugivorous birds

**Location:** North Qld rainforests, south-east Qld, north-east and coastal NSW, Victoria and southern SA.

**Participants:** Carl Gosper, Independent researcher (ex-CRC post-doc), Gabrielle Vivian-Smith, Eve White, Tanya Grimshaw (Qld Dept of Natural Resources & Water)

### The problem

Weeds (often also referred to as invasive or alien plants) are an important conservation and economic problem worldwide.

In Australia, it is estimated that 28 000 species of plants have been introduced from other parts of the world, and over 2500 of these have become established in the wild (about 10% of the total Australian flora).

Weeds are a large economic cost to Australian agriculture, threaten the integrity of many of our natural places and are a threat to biodiversity.

Most of these introductions have been deliberate, with the majority having been for horticultural and ornamental purposes, particularly for use in gardens.

While weeds often have negative impacts on natural ecosystems, there are also cases where weeds appear to benefit native species, or at least provide support for them in highly disturbed landscapes.

Fruit of fleshy-fruited weeds can be important foods for native fruit-eating birds, and these birds then often contribute to further weed invasion by dispersing seeds.

In eastern Australia, for example, fruits of the weed camphor laurel (*Cinnamomum camphora*, Lauraceae) are thought to be vitally important in supporting populations of several rainforest pigeons.

Stands of camphor laurel can also increase the recruitment of native fleshy-fruited plants, by attracting fruit-eating birds that then spread the seeds of native plant species.

Positive ecological contributions by weeds can be a source of conflict in conservation management.

Should the weeds be removed, or should they be retained because they support native animals?

### WoNS

Australia has 20 Weeds of National Significance (WoNS); identified on the basis of their invasiveness, impacts, potential for spread and socioeconomic and environmental values.

Five of these provide fleshy fruited food widely used by birds:

- bitou bush and boneseed (*Chrysanthemoides monilifera* ssp. *rotundata* and *C. m.* ssp. *monilifera*)
- blackberry (*Rubus fruticosus* aggregate)

- bridal creeper (*Asparagus asparagoides*)
- lantana (*Lantana camara*)
- pond apple (*Annona glabra*).

## A solution

The provision of alternative (or replacement, if combined with weed control) food resources for birds is one approach to minimise the impacts of control of fleshy-fruited weeds.

Providing these alternative resources aims to:

- conserve populations of native fruit-eating birds in the event of loss of food resources following control of fleshy-fruited weeds
- favour the seed dispersal and recruitment of native plants rather than weeds
- reduce weed seed dispersal by promoting native plants that act as effective competitors for seed dispersal services (ie those provided by fruit-eating birds).

## Selecting replacement plants

A variety of plant and fruit traits, such as fruit size and structure, fruit colour and fruiting season, are known to affect the food choices of birds.

Using these traits, we can identify which native plants have similar fruits to a particular weed.

These native plants should then provide alternate food to a similar suite of native fruit-eating birds, thus supporting these birds in the event of the weed's removal.

For each of the fleshy-fruited WoNS, a number of native plant species have been identified that have very similar fruits (Table 1).

As indicated, the native species considered have been drawn from a core region of the current distribution of the weed.

## Responsible use

In providing alternative food resources for birds to reduce their reliance on weed fruit, a number of important ecological issues should be considered.

The usual ecological restoration principles apply (similar principles could be followed for gardens as well, although possibly less strictly):

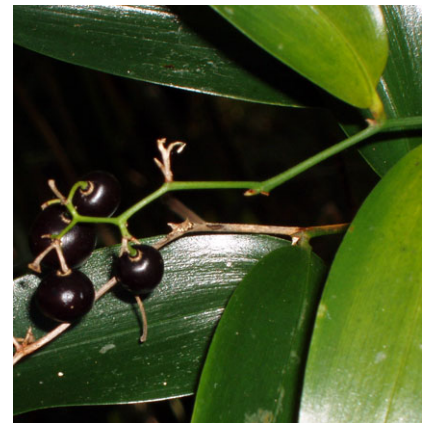
- use locally native species from local seed sources
- use species ecologically appropriate for the site in question.

Natural regeneration should also be harnessed wherever possible, as birds are very adept at dispersing the seeds of favoured native food plants to weedy sites.

Replacement plants should be provided over an appropriate time and spatial scale relative to the loss of resources from weed control.

For birds, incremental weed removal and replacement is the most likely to provide the continuous resources required to support resident fruit-eating birds by allowing time for new plants to mature and produce fruit, even if this is sub-optimal from a weed management perspective.

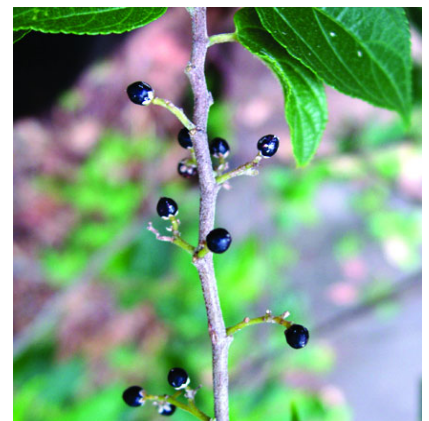
## Native alternatives



Fruit of scrambling lily (*Geitonoplesium cymosum*).  
Photo: Carl Gosper



Fruit of ruby saltbush (*Enchylaena tomentosa*).  
Photo: Carl Gosper



Fruit of native peach (*Trema tomentosa* var. *viridis*).  
Photo: Carl Gosper

**Table 1. Native plant species with similar fruits to each of the fleshy-fruited Weeds of National Significance. Native plants were selected from a core region of each weed's distribution.**

Weed	Bitou bush ( <i>Chrysanthemoides monilifera</i> ssp. <i>rotundata</i> )	Boneseed ( <i>Chrysanthemoides monilifera</i> ssp. <i>monilifera</i> )	Blackberry ( <i>Rubus fruticosus</i> aggregate)	Bridal creeper ( <i>Asparagus asparagoides</i> )	Lantana ( <i>Lantana camara</i> )	Pond apple ( <i>Annona glabra</i> )
Region	Coastal NSW	Southern SA	Victoria	Southern SA	NE NSW and SE Qld	North Qld rainforests
Alternative native plant species listed in order of suitability	Sweet sarsaparilla ( <i>Smilax glycyphylla</i> )#	Spiny fan-flower ( <i>Scaevola spinescens</i> )#	Molucca bramble ( <i>Rubus moluccanus</i> var. <i>trilobus</i> )#	Sea box ( <i>Alyxia buxifolia</i> )	Native peach ( <i>Trema tomentosa</i> var. <i>viridis</i> )#	Mountain gardenia ( <i>Attractocarpus fitzalanii</i> ssp. <i>tenuipes</i> )
	White bolly gum ( <i>Neolitsea dealbata</i> )#	Weeping emubush ( <i>Eremophila longifolia</i> )#	Native raspberry ( <i>Rubus parvifolius</i> )#	Shiny ground-berry ( <i>Acrotriche patula</i> )#	Climbing panax ( <i>Cephalalaria cephalobotrys</i> )#	<i>Austrobaileya scandens</i>
	<i>Vitex trifolia</i> var. <i>trifolia</i>	Water bush ( <i>Myoporum montanum</i> )	Hairy appleberry ( <i>Billardiera scandens</i> )#	Golden heath ( <i>Styphelia adscendens</i> )	Ruby saltbush ( <i>Enchylaena tomentosa</i> )#	Star apple ( <i>Chrysophyllum roxburghii</i> )
	Celerywood ( <i>Polyscias elegans</i> )#	Turkeybush ( <i>Eremophila deserti</i> )	Kangaroo apple ( <i>Solanum aviculare</i> )#	Climbing lignum ( <i>Muehlenbeckia adpressa</i> )	Tree heath ( <i>Trochocarpa laurina</i> )#	Niadoa ( <i>Desmos wardianus</i> )
	<i>Myoporum boninense</i> ssp. <i>australe</i>	Nitre bush ( <i>Nitraria billardierei</i> )#	Scrambling lily ( <i>Geitonoplesium cymosum</i> )#	Desert jasmine ( <i>Jasminum lineare</i> )	<i>Jasminum dallachii</i> #	Scrub ebony ( <i>Diospyros hebecarpa</i> )
	Tree heath ( <i>Trochocarpa laurina</i> )#	Ruby saltbush ( <i>Enchylaena tomentosa</i> )	Inland pigface ( <i>Carpobrotus modestus</i> )	Fleshy mistletoe ( <i>Amyema miraculosum</i> ssp. <i>boormanii</i> )#	<i>Jasminum didymum</i> ssp. <i>racemosum</i> #	Broad-leaved ebony ( <i>Diospyros maritima</i> )
	Brush muttonwood ( <i>Myrsine howittiana</i> )#	<i>Cassutha peninsularis</i> var. <i>flindersii</i>	<i>Sarcozona praecox</i>	Ruby saltbush ( <i>Enchylaena tomentosa</i> )#	Prickly supplejack ( <i>Ripogonum discolor</i> )	<i>Fitzalania heteropetala</i>
	<i>Embelia australiana</i>	Leafless currant bush ( <i>Leptomeria aphylla</i> )	Desert jasmine ( <i>Jasminum lineare</i> )	Water bush ( <i>Myoporum montanum</i> )	Red ash ( <i>Alphitonia excelsa</i> )#	Claudie mangosteen ( <i>Garcinia dulcis</i> )
	Rough-leaved elm ( <i>Aphananthe philippinensis</i> )#	Common boobialla ( <i>Myoporum insulare</i> )#	Rose-leaved bramble ( <i>Rubus rosifolius</i> var. <i>rosifolius</i> )#	Nitre bush ( <i>Nitraria billardierei</i> )#	Poison pimelea ( <i>Pimelea neo-anglica</i> )#	Mountain mangosteen ( <i>Garcinia gibbsiae</i> )#
	Hairy psychotria ( <i>Psychotria loniceroides</i> )	Coast ballart ( <i>Exocarpos syrticola</i> )	Karkalla ( <i>Carpobrotus rossii</i> )	Riverine flax-lily ( <i>Dianella porracea</i> )	Brown beech ( <i>Pennantia cunninghamii</i> )#	China pine ( <i>Goniothalamus australis</i> )#
	Amulla ( <i>Eremophila debilis</i> )	Spiked sour-bush ( <i>Choretrum spicatum</i> )	Sea box ( <i>Alyxia buxifolia</i> )	Native raspberry ( <i>Rubus parvifolius</i> )#	White bolly gum ( <i>Neolitsea dealbata</i> )#	White-flowered melodinus ( <i>Melodinus acutiflorus</i> )
	Beach alectryon ( <i>Alectryon coriaceus</i> )	Sticky boobialla ( <i>Myoporum viscosum</i> )	Desert cucumber ( <i>Zehneria micrantha</i> )	Sandalwood ( <i>Santalum spicatum</i> )#	Whalebone tree ( <i>Streblus brunonianus</i> )#	Murpe ( <i>Melodinus bacellianus</i> )
	Green tamarind ( <i>Elatostachys nervosa</i> )	Golden heath ( <i>Styphelia adscendens</i> )	<i>Acrothamnus hookeri</i>	Mallee riceflower ( <i>Pimelea microcephala</i> )#	<i>Embelia australiana</i>	<i>Melodinus forbesii</i>
	Sea-berry saltbush ( <i>Rhagodia candolleana</i> )	Streaked dodder-laurel ( <i>Cassutha peninsularis</i> var. <i>peninsularis</i> )	Large dodder-laurel ( <i>Cassutha melantha</i> )	Berry saltbush ( <i>Atriplex semibaccata</i> )#	<i>Olex stricta</i>	Mapoon ( <i>Morinda reticulata</i> )
	<i>Olex stricta</i>	Box mistletoe ( <i>Amyema miquelii</i> )#	Emubush ( <i>Eremophila longifolia</i> )#	Box mistletoe ( <i>Amyema miquelii</i> )#	Stiff jasmine ( <i>Jasminum volubile</i> )#	Finger cherry ( <i>Rhodomyrtus macrocarpa</i> )

**Table 1 cont. Native plant species with similar fruits to each of the fleshy-fruited Weeds of National Significance. Native plants were selected from a core region of each weed's distribution.**

Weed	Bitou bush ( <i>Chrysanthemoides monilifera</i> ssp. <i>rotundata</i> )	Boneseed ( <i>Chrysanthemoides monilifera</i> ssp. <i>monilifera</i> )	Blackberry ( <i>Rubus fruticosus</i> aggregate)	Bridal creeper ( <i>Asparagus asparagoides</i> )	Lantana ( <i>Lantana camara</i> )	Pond apple ( <i>Annona glabra</i> )
Region	Coastal NSW	Southern SA	Victoria	Southern SA	NE NSW and SE Qld	North Qld rainforests
Alternative native plant species listed in order of suitability	Pearl vine ( <i>Sarcopetalum harveyanum</i> )	Grey mistletoe ( <i>Amyema quandong</i> )	Nitre bush ( <i>Nitraria billardierei</i> )#	Australian boxthorn ( <i>Lycium australe</i> )	Giant pepper vine ( <i>Piper novae-hollandiae</i> )#	Ivorywood ( <i>Siphonodon membranaceus</i> )#
	Currant bush ( <i>Carissa ovata</i> )#	Pale-leaved mistletoe ( <i>Amyema maidenii</i> )	<i>Billardiera macrantha</i> #		White supplejack ( <i>Ripogonum album</i> )#	Strychnine bush ( <i>Strychnos lucida</i> )
	<i>Notelaea ovata</i>	Dwarf cherry ( <i>Exocarpos strictus</i> )	Pale appleberry ( <i>Billardiera versicolor</i> )#		Blunt-leaved steelwood ( <i>Toechima dasyrrhache</i> )	<i>Uvaria concava</i>
	Whip vine ( <i>Flagellaria indica</i> )	Fleshy mistletoe ( <i>Amyema miraculosum</i> ssp. <i>boormanii</i> )	Dwarf geebung ( <i>Persoonia amaepuce</i> )#		Small-leaved condoo ( <i>Planchonella cotinifolia</i> )	Orange jacket ( <i>Xylopiia maccraeae</i> )
	Native peach ( <i>Trema tomentosa</i> var. <i>viridis</i> )#	Desert jasmine ( <i>Jasminum lineare</i> )	<i>Persoonia confertiflora</i> #		<i>Guilfoylia monostylis</i> #	
	Sarsaparilla ( <i>Smilax australis</i> )#		Mountain kangaroo apple ( <i>Solanum linearifolium</i> )		5-leaf water vine ( <i>Cissus hypoglauca</i> )#	
	<i>Hodgkinsonia ovatiflora</i> #		<i>Pimelea drupacea</i>			
			Tree violet ( <i>Melicytus dentatus</i> )#			

# Plant whose fruit are used by bird species that also eat the weed's fruit.

### Further resources

The method used to select plants and the ecological basis for replacement plants: Gosper, C.R. and Vivian-Smith, G. (2006). Selecting replacements for invasive plants to support frugivores in highly modified sites: A case study focussing on *Lantana camara*. *Ecological Management and Restoration*, 7:197-203.

Gosper, C.R. & Vivian-Smith, G. (2007). *Replacing weeds with native plants to support fruit-eating birds: a guide to plant selection*. CRC for Australian Weed Management. [www.weeds.crc.org.au](http://www.weeds.crc.org.au)  
Gosper, C.R., Stansbury, C.D. and Vivian-Smith, G. (2005). Seed dispersal of fleshy-fruited invasive plants by birds: contributing factors and management options. *Diversity and Distributions*, 11:549-558.

Additional general information on weed problems, ecological restoration and Australian plants:  
CRC for Australian Weed Management: <http://www.weeds.crc.org.au>  
Society for Ecological Restoration: <http://www.ser.org>  
Society for Growing Australian Plants: <http://asgap.org.au/>

**For further information visit the Weeds CRC's website: [www.weeds.crc.org.au](http://www.weeds.crc.org.au)**

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