



Acacia brunioides

Australian Native Plants Society (Australia) Inc.

ACACIA STUDY GROUP NEWSLETTER

Group Leader and Newsletter Editor
Bill Aitchison
13 Conos Court, Donvale, Vic 3111
Phone (03) 98723583

Seed Bank Curator
Victoria Tanner

Email: acaciastudygroup@gmail.com

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perhaps particularly special to you?

The Melbourne International Flower and Garden Show was held in late March, and I had the opportunity to visit it. One thing that impressed me this year was the apparent increase in the number of Australian native plants in the various displays. It was, in fact, reported in the Melbourne Age newspaper that “the most common plant at the show this year was the kangaroo paw, while, on the tree front, *Eucalyptus polyanthemos*, with its coin-shaped, blue-grey juvenile leaves, also appeared in lots of gardens.” Wattles also featured in a number of gardens, not in flower at this time of year, but included for their attractive foliage. For example, one of the displays featured *Acacia covenyi* and *Acacia cognata* dwarf 'Bronze Cascade'.

I have had a query from a member regarding *Acacia aphanoclada* (Nullagine Ghost Wattle), just a general question but also regarding availability of seed or plants. Does anyone have any experience with this wattle? It is not one that I am familiar with.

I am sure that many Study Group members will be familiar with the weedy nature of a number of *Acacia* species, and a significant part of this newsletter comprises a thought provoking paper written by Geoff Carr on this subject – thank you to Geoff. I would welcome any feedback on Geoff's paper for inclusion in our next newsletter.

Bill Aitchison

Note: If you wish to view or download previous Study Group Newsletters, they are available on the Study Group website.

The address is:

<http://anpsa.org.au/acaciaSG>

From The Leader

Dear Members

Later this year the ANPSA Biennial Conference is being held in Albany, Western Australia. I am looking forward to catching up with a number of our Study Group members at the Conference. I was asked whether our Study Group would set up a display at the Conference, and I responded by saying yes. However, I think that from a practical point of view the only thing we can do is to set up a display board with some photos of *Acacias*. In this regard, whilst I have a lot of *Acacia* photos, I think it would be good to include photos from a number of Study Group members. Hence, if you have a photo of an *Acacia* that you think would be of interest and suitable to include in our display, could you forward it to me (if you email to me the image, I can then arrange to have it printed). And could you also let me know what the image is and why it is

Welcome

A special welcome to the following new members to the Study Group.

Sama Sivaji, Tara, Qld
Anne U'Ren, Omeo, Vic

From Members and Readers

In our recent Newsletter No. 142 (September 2018) I referred to *Acacia gittinsii* and how I had admired a specimen growing in a nearby garden. **John Thompson (Hampton, Vic)** shares my enthusiasm, and recently sent me a photo of a plant flowering in his garden.



Acacia gittinsii

Photo: J Thompson

By the time you receive this newsletter it may be too late, but in case it is not – if anyone is interested in buying a bush block in Queensland, Victoria Tanner's brother is selling his rural block - see <https://www.realestate.com.au/property-acreage+semi-rural-qld-yengarie-130590274>.

Ray Turner (Cranbourne South, Vic) advises that his daughter recently came across some chainsaw carvings of two black cockatoos, carved on an Acacia stump.

The following report relates to these carvings situated in the Maroondah City Council area, east of Melbourne.:

“In an area known for its significant trees, the loss of a mature Acacia to lightning strike might have been cause for regret. But working with the local community Council engaged sculptor Rob Bast to produce a lasting tribute to the fauna of this historically and ecologically important part of Maroondah. The result is two magnificent black cockatoos, hewn into the stump of the old tree. You can find these birds in Longview Rd, just south of Pleasant Rise.”



Les Pedley 1930-2018

Many Study Group members will be aware of the work that **Les Pedley** did on Acacia. Les was a long-time botanist at the Queensland Herbarium, but sadly passed away on 27th November 2018.

New species – *Acacia corusca*

This is a recently described new Acacia species from the Pilbara region of north western Australia, being found east-northeast of the town of Newman. It is not a common plant, with a total of 567 plants having been recorded from three populations covering approximately 8.1 hectares. It is listed as Priority One under Conservation Codes for WA Flora.

It is a multi-stemmed shrub or small tree 1.5-4m high. It has narrowly elliptic green to dark green phyllodes 38-72mm long and 4.1-8.7mm wide. Its inflorescences are simple or vestigial racemes and flower spikes densely arranged.

Flowering has been observed from mid-autumn to late winter and fruiting from late winter to mid spring.

The epithet is from the Latin *corusca* (to flash, glitter or shimmer), in reference to the shimmering effect of the dark green foliage on windy days (this character was valuable in locating populations of the plant from a distance, especially on typically exposed hill slopes). It has been given the common name Shimmer Wattle.

Reference:

Bull J.P., Dillon S.J. & Brearley (2019) *Acacia corusca* (Fabaceae: Mimosoideae), a new species from the Pilbara bioregion in north-western Australia *Nuytsia* 30:19-22

Acacia chinchillensis

by Warren and Gloria Sheather

This is part of a series of articles by Warren and Gloria Sheather on interesting species in our Study Group Seed Bank.

Acacia chinchillensis is another interesting wattle that appears in the Seed Bank List.

A. chinchillensis is a small, spreading shrub. The leaves are bipinnate and an attractive silvery grey. The foliage is similar in appearance to that of *Acacia polybotrya* but the leaflets, in the case of *A. chinchillensis*, are smaller.

Flowers are held in globular heads. They are bright yellow and appear from July to September when they cover plants. The silvery grey foliage provides an eye-catching contrast to the blooms. A light prune after flowering is appreciated.

A. chinchillensis is a small, attractive ornamental shrub. Both foliage and flowers are attractive features.

We remember this wattle from Mount Annan Botanic Garden, Sydney. During a visit, some decades ago, we came across a flowering specimen of *A. chinchillensis*. We were so impressed that we still remember this striking wattle.

The species name refers to Chinchilla, a town in southern Queensland, near where the species occurs.

Propagate from seed and probably cuttings. We find that wattles with small bipinnate leaves take kindly to propagation from cutting.

We have had success germinating seed acquired from the seed list. After treating in boiling water there was a 90% success with seeds germinating in about 4 weeks.



Acacia chinchillensis in Alan Gibb's garden (in mid September)
Photo Bill Aitchison

Acacia triptera

by Warren and Gloria Sheather

This is part of a continuing series of articles on wattles of the Northern Tablelands of NSW.

This species is one of the 60 or so wattles that occur on the Northern Tablelands of NSW.

Acacia triptera is known as the Spurwing Wattle and is found in Queensland, NSW and Victoria. This prickly species will grow into a spreading shrub about two metres tall and the same width.

The phyllodes are decurrent (in line with the stem giving a ribbed appearance), flat, curved and crowned with a very sharp point. There is a gland at the base of each phyllode. New growth is purplish.

Bright yellow flowers are held in rod-shaped clusters. They cover plants in spring and are carried for many weeks.

In some areas of the Northern Tablelands, particularly around Copeton Dam, the Spurwing Wattle forms dense impenetrable thickets. The prickly growth provides safe nesting sites for small native birds.

A. triptera, in our experience, does not require pruning. Plants develop, without resorting to secateurs or pruning saws, into dense, prickly, colourful shrubs.

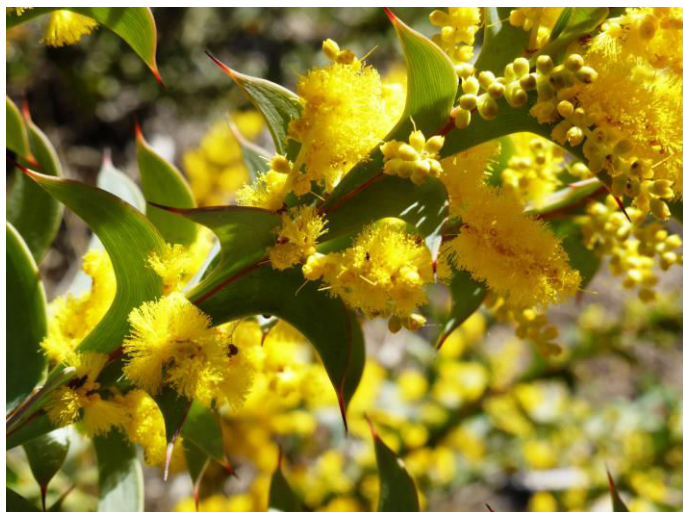
Acacia triptera is too spiky for cultivation in suburban gardens. This species would be ideal for rural properties and incorporated in shelterbelts, windbreaks and bird-friendly gardens.

The species was named in the early 1800s from material collected in the Arbutnot Range. The first European to sight

and explore the area was John Oxley in 1818 who named the range the Arbutnot Range. The Aboriginal name Warrumbungles means 'crooked mountains' and is now the accepted name.

The species name refers to the three wing-like arrangements of the phyllodes.

Propagate from seed that needs to be soaked in boiling water before sowing.



Acacia triptera

Photo W & G Sheather

Kangaroo

By D H Lawrence

Published in 1923

I have never read this novel, and maybe not been aware of it, until I received a recent note from **Ian Campbell (Sydney)**. Ian wrote as follows:

“This refers to the English writer, DH Lawrence’s use of the term ‘mimosa’ to refer at times in his 1923 novel, *Kangaroo* to what we in Australia would only call ‘wattles’ or ‘acacias’. I have reviewed my late grandfather’s photo essay (1921) to locate any references he made to ‘mimosa’. There are none. Campbell (1921) refers only to ‘wattles’ and as an equivalent, ‘Australian acacias’. It is clear to me that Lawrence, at times, used the term ‘mimosa’ to refer to what, in botanical terms, was known in Australia - and the UK as ‘*acacia dealbata*’. The common name at that time, circa 1921-22, in Australia was ‘silver wattle’. I believe Lawrence, when faced with the ‘dilemma’ of terms to use about the Australian bush had in mind his European/UK readership. But also the common name for ‘*acacia dealbata*’, used then in the UK and Europe, specifically Italy/France, was ‘mimosa’. In fact, the *current* website (2019) for the Royal Horticultural Society (UK) still refers to the *primary* common name for ‘*acacia dealbata*’ as ‘mimosa’, but with the *secondary* (other) common name for UK as ‘silver wattle’, following Australian practice.

I believe, also, Lawrence would have seen in central Italy circa 1920s ‘*acacia dealbata*’ in many areas planted for their display and used for cuttings. (Interestingly, also a 2016 web-based recipe for ‘Italian Mimosa cake’, in the article it states that in 1946 the first International Women’s Day in Italy apparently had the ‘mimosa’ ie the *acacia dealbata*, as its floral symbol because of its yellow flowers and the fact that the flowers bloom in central Italy in the beginning of March). I therefore assume that the *acacia dealbata* had spread through some areas of central Italy from initial seeds in Kew to such an extent that it was regarded as ‘part of the landscape’. Why was it called ‘mimosa’? In part, because the botanical name for the ‘family’ *within which ‘acacia’ is a genus is/was called*, following Linnaeus, ‘Mimosaceae’. There was no reason for Italian or English common name usage to adopt the ‘colonial’ common name of ‘wattle’ - from the ‘wattle and daub’ associations, but rather to adopt a variant of the ‘botanical family name’ ie Mimosaceae’. Also, the yellow ‘so-called’ ‘mimosa’ was seen in Europe as related botanically to ‘mimosa’ the pink flowering tree with leaves that respond to ‘touch’, which are similar in shape to ‘*acacia dealbata*’.”

Upon receiving Ian’s note, I found a digital version of Lawrence’s book (freely available on the Internet and fully searchable). A search of the terms wattle and mimosa confirmed that Lawrence used both terms in his book.

A couple of extracts from the book appear below:

“The bush was in bloom, the wattles were out. Wattle, or mimosa, is the national flower of Australia. There are said to be thirty-two species. Richard found only seven as they wandered along. The little, pale, sulphur wattle with a reddish stem send the lovely sprays so aerial out of the sand of the trail, only a foot or two high, but such a delicate, spring-like thing. The thorny wattle with its fuzzy pale balls tangles on the banks.”

“By the stream the mimosa was all gold, great gold bushes full of spring fire rising over your head, and the scent of the Australian spring, and the most ethereal of all golden bloom, the plummy, many-balled wattle, and the utter loneliness, the manlessness, the untouched blue sky overhead ..”

Ian has also drawn our attention to a recent 2015 book written by David Game, titled *D. H. Lawrence’s Australia – Anxiety at the Edge of Empire*. Ian commented as follows on a reference to Wattle Day:

“A few quick additional notes. It is interesting that Lawrence refers in his novel to ‘Wattle Day’. As part of his Australian sojourn and when he lived at Thirroul near Wollongong from 29 May to 10 August 1922, he did apparently visit Sydney on 1 August 1922 ie ‘Wattle Day’. (Ref Chronology in Game, p. xviii-xix). We know that in 1916 NSW changed its ‘Wattle Day’ date from the previous agreed 1 September as per Melbourne. Had Lawrence not been in Sydney on 1 August 1922 he would never have experienced such, as by 11 August he had left Australia bound for San Francisco.”

Australian Acacia species make very good weeds, at home and abroad

by Geoff W Carr

Ecology Australia, 88B Station Street, Fairfield, Victoria 3078 (gcarr@ecologyaustralia.com.au)

1. Introduction

The very large genus *Acacia* (the largest plant genus in Australia) has some 1468 species worldwide, 78% (1053) of which are Australian (Mabberley 2017). New species and subspecies continue to be described, predominantly from Western Australia. It is no wonder that the genus has such a devoted following, as exemplified by members of the *Acacia* Study Group of the Australian Native Plants Society. Like other members I always look forward to the Newsletter, which brings us much useful and interesting information and is a forum to communicate views and perspectives. The issue I raise in this article is the role of *Acacia* species as environmental weeds, and as growers and promoters of *Acacia*, the part we may inadvertently play in this extraordinarily significant conservation issue, an issue we cannot afford to ignore.

Environmental weed invasion is a **premier conservation issue** in Australia, along with invading exotic animals, as we have known for 40 years since it was raised by the Australian Institute of Agricultural Science in a ground-breaking little book published in 1976. Since then a voluminous and ever-growing literature has appeared on multiple aspects of the problem in Australia and around the world. *Acacia* are among the most successful and damaging of all weed species, in their own native land and overseas where they were taken for ornament and amenity. These naturalised weedy *Acacia* species are mostly garden escapees, that is they have jumped the garden fence as it were, and have established self-sustaining populations. *Acacia* species are by no means the only environmental weed species that have escaped cultivation, and of the 850 odd environmental weed species in Victoria (Carr et al. 1991, White et al. 2017) about 70% have come from horticulture as deliberate introductions. *Acacia* are not alone in the environmental weed contingent that has Australian origins; other catastrophically invasive Australian plant species include *Pittosporum undulatum* (Sweet Pittosporum), *Billardiera fusiformis* (Bluebell Creeper), and *Leptospermum laevigatum* (Coast Tea-tree). The list is a long and growing one.

In this article I examine the *Acacia* flora of Victoria to illustrate the nature and dimensions of the problem, the impacts of invading *Acacia*, and what we may do, at least to get our own *Acacia*-loving houses in order.

2. *Acacia* in Victoria

In Victoria we are mightily blessed with access to an excellent modern flora, the best in Australia and notable by any criterion. The four-volume handbook *Flora of Victoria* was published in the 1990s and is now freely accessible online from the National Herbarium of Victoria. It is periodically updated as new information comes to hand. With 123 indigenous species and subspecies, Victoria has 11.7% of all Australian *Acacia*. Currently the *Flora* treats 44 *Acacia* taxa (species, subspecies and varieties) as exotic or indigenous but naturalised in parts of the state not within their natural pre-European distribution. The list of naturalised Victorian *Acacia* is given in Table 1.

Table 1. Exotic and indigenous *Acacia* species naturalised in Victoria

Sources of information: Online *Flora of Victoria* and G. Carr (unpubl. data)

Key

- + available from the *Acacia* Study Group seed bank list 2018
- * Non-Victorian species
- (*) Victorian species naturalised outside their pre-European range

	Botanical name	Common name	Natural distribution
+ *	<i>Acacia acuminata</i> subsp. <i>acuminata</i>	Raspberry Jam Wattle	WA
+ *	<i>Acacia anceps</i>	Port Lincoln Wattle	WA, SA
+ *	<i>Acacia baileyana</i>	Cootamundra Wattle	NSW
+ (*)	<i>Acacia boormanii</i> subsp. <i>boormanii</i>	Snowy River Wattle	Vic, NSW
+ (*)	<i>Acacia brachybotrya</i>	Grey Mulga	Vic, SA, NSW
+ *	<i>Acacia cardiophylla</i>	Wyalong Wattle	NSW
+ (*)	<i>Acacia cognata</i>	Narrow-leaf Bower-wattle	Vic, NSW

+ *	<i>Acacia cultriformis</i>	Knife-leaf Wattle	NSW, Qld
+ (*)	<i>Acacia cupularis</i>	Cup Wattle	Vic, SA, WA
+ *	<i>Acacia cyclops</i>	Western Coastal Wattle	WA, SA
+ (*)	<i>Acacia dealbata</i> subsp. <i>dealbata</i>	Silver Wattle	Vic, Tas, NSW, ACT
+ *	<i>Acacia decurrens</i>	Early Black-wattle	NSW, ACT
+ *	<i>Acacia elata</i>	Cedar Wattle	NSW
+ *	<i>Acacia elongata</i>	Swamp Wattle	NSW, ?ACT
+ *	<i>Acacia extensa</i>	Wiry Wattle	WA
+ (*)	<i>Acacia euthycarpa</i> subsp. <i>euthycarpa</i>	Wallowa	Vic, SA
+ *	<i>Acacia fimbriata</i>	Fringed Wattle	NSW, Qld
+ (*)	<i>Acacia floribunda</i>	White Sallow-wattle	Vic, NSW, Qld
+ (*)	<i>Acacia howittii</i>	Sticky Wattle	Vic
+ *	<i>Acacia iteaphylla</i>	Flinders Range Wattle	SA
+ (*)	<i>Acacia leprosa</i>	Cinnamon Wattle	Vic, NSW, Tas, Qld
+ (*)	<i>Acacia longifolia</i> subsp. <i>longifolia</i>	Sallow Wattle	Vic, NSW
+ (*)	<i>Acacia longifolia</i> subsp. <i>sophorae</i>	Coast Wattle	Vic, SA, Tas, NSW, Qld
+ *	<i>Acacia mollifolia</i>	Velvet Wattle	NSW
+ (*)	<i>Acacia myrtifolia</i>	Myrtle Wattle	Vic, SA, WA, Tas, NSW, Qld
+ (*)	<i>Acacia nanodealbata</i>	Dwarf Silver-wattle	Vic
+ (*)	<i>Acacia notabilis</i>	Mallee Golden Wattle	Vic, SA, NSW
+ (*)	<i>Acacia obtusifolia</i>	Blunt-leaf Wattle	Vic, NSW, Qld
+ (*)	<i>Acacia pendula</i>	Weeping Myall	Vic, NSW, Qld
+ *	<i>Acacia podalyriifolia</i>	Queensland Silver Wattle	NSW, Qld
+ (*)	<i>Acacia pravissima</i>	Ovens Wattle	Vic, NSW
+ *	<i>Acacia prominens</i>	Gosford Wattle	NSW
+ (*)	<i>Acacia provincialis</i>	Wirilda	Vic, SA
+ (*)	<i>Acacia pycnantha</i>	Golden Wattle	Vic, SA, NSW, ACT
+ (*)	<i>Acacia rigens</i>	Nealie	Vic, SA, WA, Qld, NSW
+ *	<i>Acacia rostelifera</i>	Summer-scented Wattle	WA
+ (*)	<i>Acacia rupicola</i>	Rock Wattle	Vic
+ *	<i>Acacia saligna</i>	Golden Wreath Wattle	WA
+ *	<i>Acacia schinoides</i>	Frosty Wattle	NSW
+ *	<i>Acacia spectabilis</i>	Mudgee Wattle	NSW, Qld
	(*) <i>Acacia</i> sp. aff. <i>rigens</i> (Gerang Gerung)	Smooth Nealie	Vic
	(*) <i>Acacia subporosa</i>	Bower Wattle	Vic, NSW
+ (*)	<i>Acacia terminalis</i>	Sunshine Wattle	Vic, NSW, Tas
+ *	<i>Acacia vestita</i>	Hairy Wattle	NSW

3. Factors that help make *Acacia* species such successful invaders

Acacia is among the most successful genera of invasive woody plants in Australia and abroad in comparable climates. There are various intrinsic and extrinsic factors that may aid invading *Acacia*. Intrinsic (or inherent) factors are those to do with the biology and ecology of a particular species that favour weedy behaviour, while extrinsic factors can be environmental, but importantly also, social and political factors.

Intrinsic factors include:

- Rapid growth rates, with flowering at a young age
- Large seed crops produced
- Frequently self-fertile, that is plants are capable of setting seed when self-pollinated (though cross-pollination generally better for reproductivity). This means that a single individual can be the founder of a new population
- Seeds of great longevity (many decades) in a soil-stored seedbank
- Capacity for long-distance dispersal of seeds after ingestion by birds; birds eat the seeds for the lipid-rich aril, and later void the seeds.

Extrinsic factors include:

- Horticultural merits of a massive genus, coupled with the general ease of cultivation and propagation and wide availability in the nursery industry, through private trade and via commercial seed suppliers (social and environmental factors)
- Enhanced pollination by exotic insects, i.e. the Honeybee (*Apis mellifera*) (environmental factors)
- Enhanced seed dispersal by:

Motor vehicles, a very highly significant vector, with seeds picked up by tyres, undercarriage etc., and later deposited. This explains why so many populations of weedy *Acacia* start as roadside colonisers.

Native bird species (the natural dispersers) that have prospered under European settlement, such that they are now much more abundant than previously; examples include Ravens, Wattle-birds, Silver-eyes, Australian Magpies, Silver Gulls and Currawongs.

Exotic bird species that function as very efficient and often abundant dispersers; examples include Common Starling, House Sparrow, Common Blackbird and Common Myna.

Environmental dispersal mechanisms.

- Unnatural vegetation and soil disturbance regimes favouring recruitment of *Acacia* (germination and establishment) as a result of human activities, domestic stock and feral animals, particularly rabbits (social and environmental issues)
- The failure of any government or government agency to regulate the cultivation and trade of the most disastrously weedy *Acacia* species in the flora (unlike many exotics), notably Coast Wattle/Sallow Wattle (*Acacia longifolia* subsp. *longifolia* and *A. longifolia* subsp. *sophorae*). The preferred model: ignore and present the problem as someone's fantasy (political factors).
- Pervasive ignorance of this issue at all levels of society (social factors).

4. *Acacia* and fire

Acacia species have become pre-eminently adapted to fire over their long evolutionary history – to survive, regenerate or recruit following fire. Central to this fire response is, in most species, a very long-lived soil-stored seed bank. The size of the standing crop of *Acacia* plants in the population may be dwarfed by the dimensions of this seed bank. A vast, extremely dense population of recruits may result when the site is burnt, typically with the death of the fire-sensitive adults and any juvenile plants in the population. In these species, populations tend to be even-aged. Examples in Victoria include *Acacia verticillata* and *A. pycnantha*.

From the viewpoint of evaluating weediness in *Acacia* species, the standing crop of *Acacia* plants at a particular site may not be a good indication of the real situation. While few invading plants may be seen at the site, the post-fire response may yield orders of magnitude more plants stimulated to germinate by the fire. This indicates that a species may be much more invasive than otherwise apparent before fire caused mass recruitment. Such is likely to be the case with exotic *Acacia* species in the beautiful native woodlands around the National Botanic Garden, Canberra, where weediness of *Acacia* species that have 'escaped' the Botanic Garden was evaluated. If the role of fire is not considered in such situations, an unrealistic view of weediness is likely to result.

5. Impacts of invading *Acacia*

As weeds, *Acacia* are no different in principle to other weed species in their environmental impacts, which are numerous, often synergistic, and fairly poorly documented, at least in Australia. While we have fairly scant quantitative data on invading *Acacia* in Australia, there is abundant empirical evidence of their impacts. These are outlined below.

Destruction of indigenous biota

Environmental weed invasions directly or indirectly destroy vegetation, fauna habitats and populations of plant and animal species. Numerous vegetation types, populations of plants and animal species, and whole species face the threat of extinction. Plants and animals of the invaded community are often said to be 'displaced' by weeds, as if they can up-shop and move somewhere else; they are destroyed, not displaced.

Fuel loads

As trees or shrubs, invading *Acacia* can dramatically elevate fuel loads in the invaded vegetation by several orders of magnitude. This particularly applies to the 'take-all' shrubby species, notably *Acacia longifolia* subsp. *sophorae* which, at the invasion end-point, forms a very dense monospecific stand. When burnt by wildfire or prescribed fire, the fuel load produces such an intense fire that the soil is completely sterilized (to a considerable depth) killing all soil-stored seed banks of numerous indigenous species - from which populations would ordinarily recover post-fire.

There are very obvious and very serious social and economic implications of elevated fuel loads for safety of people and property in this new, climate-induced era of more frequent, more intense and more extensive fires.

Water-use

Elevated water-use by invading *Acacia*, that is above the level of water use of vegetation that was invaded, is an increasingly serious issue, exacerbated as it is by climate-change impacts: declining rainfall, more frequent and severe drought, increased evaporation, and extreme temperatures. A telling example of water-use impacts was witnessed by me at Point Danger near Portland, Victoria over c. 10 years in the 1980s and 1990s. Here *Acacia longifolia* subsp. *sophorae* invaded and destroyed short, highly species-rich heathland and reduced the water tables in seasonal wetlands formerly surrounded by the heathland. The *Acacia* was then able to invade and destroy the wetlands and all their flora and fauna. The suite of vegetation and fauna habitats destroyed was of very high conservation significance. This is a hidden but highly significant issue being played out in numerous locations over vast areas.

Hybridisation

Hybridisation in *Acacia* is no novelty and many hybrid combinations have been recorded. In naturalising *Acacia* we have several situations involving hybridization: hybridisation involving two naturalised species brought together for the first time, and hybridisation between an in situ indigenous population and naturalised species. Examples are given in Table 2. At West Barwon Dam in the Otway Ranges, planted *Acacia longifolia* subsp. *longifolia* has hybridised with in situ indigenous *A. mucronata* subsp. *longifolia*, resulting in a huge hybrid swarm. This is classic genetic pollution – integration of foreign genes into the gene-pool of an indigenous species.

The same *A. longifolia* hybrid is becoming more frequent in the Grampians, as is *A. longifolia sens. lat.* x *A. oxycedrus*, with potentially harmful implications. In the Grampians this hybridization is good evidence that the *A. longifolia* parent does not belong (see below). If it were native in the landscape *A. longifolia* would not be throwing up these hybrid novelties.

Table 2. Hybrids between in situ natural *Acacia* populations and introduced *Acacia* species, and where both parents are exotic (G. Carr pers. obs.)

Note: In situ *Acacia* species given in **bold**

Hybrid combination

Acacia baileyana x *A. dealbata* subsp. *dealbata*
Acacia decurrens x *A. baileyana*
Acacia longifolia sens. lat. x *A. floribunda*
Acacia longifolia subsp. *longifolia* x *A. longifolia* subsp. *sophorae*
Acacia longifolia sens. lat. x ***A. mucronata* subsp. *longifolia***
Acacia longifolia sens. lat. x ***A. oxycedrus***
Acacia howittii x ***A. paradoxa***

Masking natural distribution

Where *Acacia* species invade a state or territory outside their normal pre-European distribution as a result of human intervention, there is a risk of losing sight of historical knowledge of the *original distribution*. Invading *Acacia* look like good indigenous species, don't they?

This problem is not hypothetical; it has borne bitter fruit. Because *A. longifolia sens. lat.* was collected in the northern Grampians in the early 1900s, it was construed as locally indigenous rather than a garden-escape by a work-experience student (!) several decades ago, commissioned to enquire into whether or not the species belonged in the Grampians (and whether it should be controlled). The rest is history; catastrophe ensued because management was able to justify inaction – it's all part of God's handiwork isn't it?

Elevated nitrogen

As nitrogen fixers (via bacteria in root nodules) invading *Acacia* (as with many legumes) elevate nitrogen levels in the soil. It benefits them but also makes the site much more prone to invasion by other weed species, notably by exotic grasses, when the *Acacia* population is controlled.

Ecological dystopias

Invading species often cause a complicated cascade of environmental dysfunction relating, among other factors, to water-use, nutrient cycling, altered fire regimes and promotion of other harmful organisms.

6. What are the weedy *Acacia* in Victoria?

At least 44 *Acacia* are naturalised in Victoria as exotics from other Australian states and territories or naturalised outside their native pre-European distribution in Victoria (Table 1). Their impacts as environmental weeds vary from relatively benign, as so far revealed by their behaviour, to environmentally catastrophic. *Acacia* species number among the worst environmental weeds in Australia and in many countries, e.g. South Africa and in the Mediterranean region.

The 10 weediest species as determined by Carr et al. (1992), White et al. (2017) and Carr (unpubl. data) are given in Table 3. However, a few caveats are in order: some of the species that are currently considered fairly benign may reveal themselves to be worse weeds as they become more effective invaders; species may be naturalised somewhere in Victoria but are yet to be collected or recorded; species undoubtedly are yet to become naturalised from the large pool of cultivated species could act as sources of propagules.

Of the list in Table 3, two *Acacia* taxa stand out as preeminently and catastrophically invasive on a very wide scale, compared with other weedy *Acacia*: *Acacia longifolia* subsp. *longifolia* and *Acacia longifolia* subsp. *sophorae* and their hybrids. No worse environmental weed species exists in Victoria and few approach it in the scope and severity of its impacts on biodiversity and ecosystem function, plus direct economic impacts (e.g. cutting *Acacia longifolia* subsp. *sophorae* off roadsides over thousands of kilometers annually; reduction of water tables affecting river and stream recharge). Tens of thousands of hectares of woodland and heathland have been destroyed by invading *Acacia longifolia sens. lat.* and tens of thousands more are being destroyed. The net outcome for the vegetation being invaded is annihilation, as the flora of the site is driven to extinction – **no indigenous species remain** – and the *Acacia* forms an impenetrable monospecific shrubland or scrub. The invasion of the Grampians (Gariwerd) exemplifies this process. Vast areas of the Grampians National Park have been invaded over the last 50 years or more, and *A. longifolia sens. lat.*, on current trends, will destroy most vegetation communities, fauna habitats and plant and

animal species in this extraordinarily significant, highly biodiverse bioregion. The problem was essentially ignored by management agencies for decades, to the point where the *Acacia* has become intractable from a management viewpoint. This scenario is being played out over huge tracts of western Victoria.



Acacia longifolia subsp. *sophorae* near Roses Gap in the Grampians where many hundreds of hectares of native vegetation are being annihilated by this species. Photo: Geoff Carr.

Table 3. The ten worse weedy *Acacia* species in Victoria

Source: Carr et al. (1992), White et al. (2017), G. Carr (unpubl. data)

Botanical name	Common name	Natural distribution
<i>Acacia baileyana</i>	Cootamundra Wattle	NSW
<i>Acacia cyclops</i>	Western Coastal Wattle	WA, SA
<i>Acacia decurrens</i>	Early Black-wattle	NSW
<i>Acacia elata</i>	Cedar Wattle	NSW
<i>Acacia floribunda</i>	White Sallow-wattle	Vic, NSW, Qld
<i>Acacia longifolia</i> subsp. <i>longifolia</i>	Sallow Wattle	Vic, NSW
<i>Acacia longifolia</i> subsp. <i>sophorae</i>	Coast Wattle	Vic, SA, Tas, NSW
<i>Acacia pravissima</i>	Ovens Wattle	NSW, Qld
<i>Acacia provincialis</i> †	Wirilda	Vic
<i>Acacia saligna</i>	Golden Wreath Wattle	WA

† Often called *Acacia retinoides*, the name applied here *A. provincialis* is a species that was described in 1927; *Acacia retinoides* is a South Australian endemic.

7. The responsible horticultural citizen

Our activities as horticulturalists, whether growers of *Acacia* or any other plants, do not exist in a vacuum, quarantined from the rest of the world; potentially negative environmental impacts may accrue from our activities. The central proposition of responsibility as horticultural citizens is to do no harm, specifically harm to the environment in its broadest sense. The kinds of harm resulting from horticulture can include:

- Unacceptable use of non-renewable resources, which depending on context, may include rocks, sand, soil, water and many other products for which the environment plays a price (e.g. mining, quarrying, brush fencing, wood, fossil fuel)
- Unwise use of pollutants and toxins (e.g. herbicides, and fertilisers causing nutrient enrichment of waterways).
- Cultivating species that can ‘escape’ to become environmental weeds.

The last point is our immediate concern, and as members of the **Acacia Study Group** we are, I believe, morally and ethically bound to:

- Refrain from cultivating, distributing or promoting seriously invasive weedy *Acacia* species
- Remove weedy *Acacia* species from the Acacia Study Group seed bank (43 of the 44 naturalised species in Table 1 are on the current 2018 seedbank list)
- Encourage others to do the same
- Develop and implement a policy to guide the use of *Acacia* and appropriate responses to weedy species.

Acknowledgments

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Books

Flora of the Hunter Region – Endemic Trees and Larger Shrubs

**By Stephen Bell, Christine Rockley and Anne Llewellyn
Published by CSIRO Publishing March 2019
RRP \$79.99**

This new publication described 54 endemic trees and large shrubs of the Hunter Region of NSW. For each species, detailed information is provided including a botanical description, common name, location of type specimen, etymology, distribution, habitat, flowering period, key diagnostic features and conservation status. Each species is beautifully illustrated with a full page of colour artwork, depicting key diagnostic features.

Of the 54 species included in the book, there are 8 species of *Acacia* viz, *Acacia alaticaulis*, *A. bulgaensis*, *A. dangarensis*, *A. fulva*, *A. kulnurensis*, *A. piligera*, *A. serpentinicola* and *A. wollarensis*.

Seed Bank

A list of species in our Seed Bank appeared in our Study Group Newsletter No. 143 (December 2018).

Although we do purchase some seed from commercial sources, we also rely upon donations of seed. If you are able to help with any seed donations they would be very welcome (we would ask you to post any donations to Bill Aitchison, who will forward them on to our Seed Bank Curator, Victoria Tanner). It also helps enormously if you are able to clean, sort and label the seed correctly. Also, we would like to have provenance information for all seed in the seed bank – so if you donate any seed, could you also provide any information you have in relation to provenance.

Our thanks to Joanna McLachlan for a recent donation of seed.

The procedure for requesting seed from the Seed Bank is as follows. Study Group members are entitled to lodge up to 3 orders per member per year, with 10 packets maximum in each order (negotiable). There is a charge of \$4 in relation to each order, to cover the cost of a padded post bag and postage. The \$4 may be paid in stamps or by direct credit to our Group's bank account. Requests for seed may be lodged in either of the following ways:

1. By email to our Study Group email address, acaciastudygroup@gmail.com (emails to this address go directly to both Victoria and Bill Aitchison). If you make a request by email, you will also need to make the necessary payment by one of the above methods. If you are paying by stamps, these should be mailed to Bill Aitchison, 13 Conos Court, Donvale, Vic 3111
2. By mail (enclosing stamps if required). These requests should be posted to Bill Aitchison (address as in the previous paragraph). Bill will then advise Victoria of the request.

We would like to maintain some data on your results in propagating seed from the Seed Bank. We would therefore ask if you could provide a report on your results, recording information on species, number of seeds sown, number germinated and days after sowing.

Study Group Membership

Acacia Study Group membership for 2018/19 is as follows:

\$7 (newsletter sent by email)

\$10 (hardcopy of newsletter posted in Australia)

\$20 (hardcopy of newsletter posted overseas)

Subscriptions may be sent to:

Bill Aitchison, 13 Conos Court, Donvale, Victoria 3111

Subscriptions may also be paid directly to our Account at the Bendigo Bank. Account details are:

Account Name: ASGAP Acacia Study Group

BSB: 633-000

Account Number: 130786973

If you pay directly to the Bank Account, please advise us by email (acaciastudygroup@gmail.com).