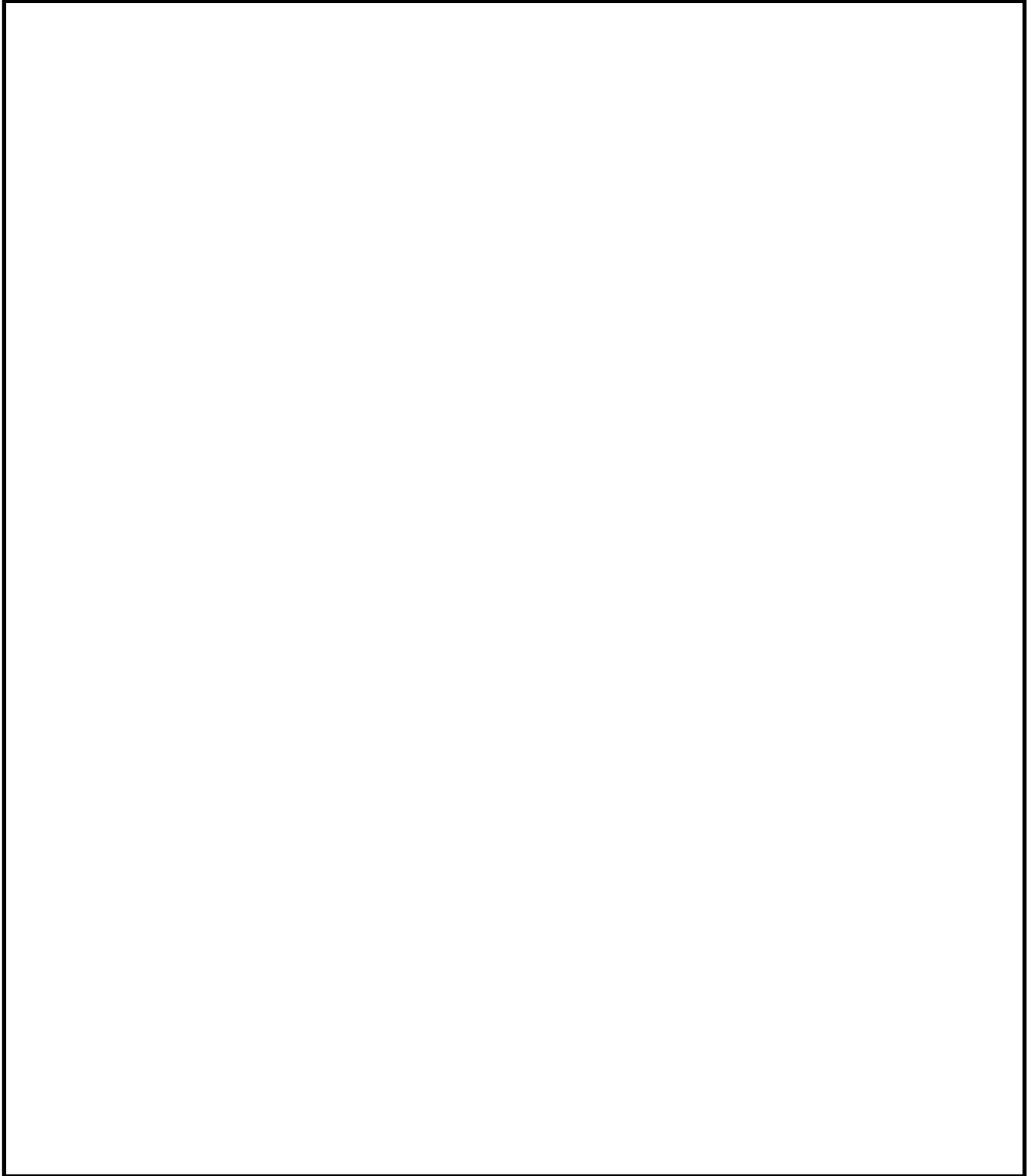


# INDIGENOTES



See back cover for description

# *Cotula coronipifolia*: Return of a Native

By Nick Romanowski

Many people working with indigenous plants probably haven't even realised that there was ever any doubt that Waterbuttons (*Cotula coronipifolia*) was not an Australian plant, but for the last two editions of *A Census of the Vascular Plants of Victoria* (published by the National Herbarium in Victoria) there has been a deadly little asterisk next to it's name which has branded it as yet another exotic weed. As a result, it has almost been ignored in wetland work in this state except as another problem to be dealt with, and is also left out of *Flora of Melbourne* (edited by SGAP Maroondah, second edition Hyland House in 1993).

As a result of my current work on a manual for wetlands regeneration and habitat, I recently followed up several widespread species which have been (or are presently) regarded as Australian plants, looking at why they are suspected as introductions by some botanists. I first spoke to Surrey Jacobs (at the Sydney Herbarium) who continues to treat Waterbuttons as an Australian plant in his publications. He was kind enough to look up some of the earliest references on this species for me, and these very strongly suggest that it was here a long time before any European ships put in. For a start, it was first collected by Robert Brown around 1802, a remarkably early date if it was just an aquatic weed.

More suggestive still was it's natural range, which at the time of von Mueller (around 1852) was much the same as it is today. If Waterbuttons was such a fast-spreading weed that it had already occupied it's present large range in around 50 years, why had it not spread any further after that time? This is certainly inconsistent with the behavior of any other aquatic weeds which have been confirmed as aliens.

I next spoke to Helen Aston at the Victorian Herbarium who wasn't sure how Waterbuttons had come to be declared exotic, but was kind enough to follow up the relevant literature for me. All that could be found was a 1984 article on *The Introduced Elements of the Flora of Southern Australia* (P.M. Kloot in *Journal of Biogeography* 11: pages 63-78). This article looks at a few plants with peculiar ranges which suggest that they are exotic, but merely lists Waterbuttons as a South African plant without giving any evidence.

In fact, this species occurs on many continents and islands, and long has been recorded as native

to New Zealand, parts of South America and even Europe. A wide distribution of this kind is easy to understand when you consider that Waterbuttons has been recorded as growing in water nearly twice as saline as the sea! This tolerance to salt means that it would be perfectly possible for pieces to float indefinitely across oceans, until they arrived in a suitable situation for establishment. As the plant is brittle and broken pieces put out roots readily while floating, it is not hard to see that it could easily have arrived without human intervention at any time in the last few million years.

Armed with this information, I then approached the editor of *A Census of the Vascular Plants of Victoria*, Jim Ross, to ask if he knew of any strong evidence that Waterbuttons was introduced. As he deals routinely with thousands of botanical names each year he was unable to tell me offhand, but the evidence I had been supplied with as proof of indigenous populations of this species was impressive enough that he went back through his original files. The mystery was solved instantly - the asterisk shouldn't have been there, and there was just an error which dropped in somewhere between his original records and the final, printed version.

I am happy to be able to report that *Cotula coronipifolia* is no longer regarded by any botanists with a specialist interest in wetland flora, as anything but a genuine Australian plant. This is good news indeed; the difference between treating it as an unmanageable weed and an important habitat plant is tremendous, and a habitat plant it most certainly is. Although we are a long way from any detailed knowledge of wetland plants and their role as habitat, my own observations have shown me that Waterbuttons forms suitable shelter for many breeding frogs, fishes and invertebrates, and that the plants and their seeds are fed upon by many birds and probably a variety of other animals too. It will thrive in high salinities and nutrient-rich waters, making it an excellent prospect for artificial water-treatment wetlands. It is these very desirable qualities which have led to it being suspected as a possible weed, so I'd like to extend a warm welcome back to one of our most decorative wetland plants.

# Action Page:

## Government puts all of Victoria's most rare and threatened plants and animals at risk with a decision to allow marble mining in a unique and nationally significant plant community at Marble Gully in East Gippsland

The Minister for Natural Resources, Mr. Geoff Coleman, and the Secretary of the Department of Conservation and Natural Resources, Mr. Alan Thompson, are set to issue a permit under the Flora and Fauna Guarantee Act which will allow mining within the critical habitat of a unique Silurian Limestone Pomaderris Shrubland vegetation community which is listed under the act. The permit will allow the taking of protected flora and fauna and will set an extraordinary precedent for 'taking' other endangered species. The decision flies in the face of scientific views that to disturb the vegetation community will threaten the existence and survival of one of Victoria's truly unique plant communities.

Although only 40 hectares in size, the site contains the largest known occurrence of this type of shrubland in Australia and contains at least 8 rare and threatened plants including the nationally endangered Marble Daisy Bush. It is also a feeding site for the threatened Glossy Black Cockatoo. The plant community and the daisy bush are listed under the FFG and the cockatoo has received a preliminary recommendation for listing. The site is also specifically mentioned under an FFG listed Potentially Threatening Process "Soil and vegetation disturbance as a result of marble mining". In its final recommendation for this listing the Scientific Advisory Committee responsible for assessing and listing species under the FFG Act, states: "Because of its rarity, any disturbance to or loss of any part of the community would threaten its survival."

The Marble Gully Shrubland Community is of extraordinary biological significance and the recommendations of the Scientific Advisory Committee make it blindingly clear that to disturb it is to put it at risk. What is also clear is that by allowing this mining, the government is setting a dread-

ful precedent for the critical habitat of endangered species to be available for development. It is also sending out a message that no endangered species or community is 'guaranteed' protection under the FFG Act.

The Department of Conservation and Natural Resources has designed conditions which they say will protect the plant community but these are little more than guidelines and do not address the central issue of any disturbance at all putting it at risk. This is one important example of there being no acceptable compromise.

The Flora and Fauna Guarantee Act was passed unanimously by the Parliament in 1987, and this is a real test of the government's commitment to it. If this is a signal of how the government intends to protect endangered plants, animals and communities and to reduce threats to them in the future then our threatened species lists look set to keep growing.

The issue is so important that the National Threatened Species Network, the Australian Conservation Foundation, The World Wide Fund for Nature, Environment Victoria and the Victorian National Parks Association have joined forces and taken the unprecedented step of calling for an 'Interim Conservation Order' under the Guarantee Act.

You can help protect the Marble Gully Site:

Let your local MPs and the media know that you see this as a test of the government's commitment to the Flora and Fauna Guarantee Act and to protecting threatened plants and animals in Victoria.

If you would like to help protect Marble Gully, ring Felicity on (03) 650 8296.

**Felicity Faris**  
**National Threatened Species Network**  
**(Vic)**

**Cotula coronopifolia continued:**

# Slow-Motion Explosion: The Exponential Spread of Exotic Species

By David Schneider

Some of the best botanical minds in the USA convened recently to discuss a dirty business: invasive non-native plants and how to kill them. Such plants are also called non-indigenous species (NIS), noxious vegetation, or plain old really horrible weeds. The symposium was convened by the Californian Exotic Pest Plant Council (CalEPPC).

Given the sort of problems facing the planet and its inhabitants these days, weeds might not seem like a big deal. Ozone depletion, global warming, overpopulation, toxic wastes, nuclear weapons - these are the big issues, equivalent perhaps to self-inflicted strangulation or gunshot wounds to the body of the earth. By comparison, the movements of alien species of plants, animals, and microbes hardly seem worthy of notice. But they are much more like tooth decay (or, some would say cancer), developing slowly over a long period of time. One day they emerge as a crisis - painful and expensive and potentially insoluble. Untreated, they threaten and then destroy entire systems.

What is a non-indigenous species, and what exactly makes it invasive?

Plants and animals are assumed to have a place of origin, a locus in which they fit as part of an ecological web. When a species wanders beyond the bounds of its original system and finds residence in another ecosystem, it is regarded as "non-native".

If the second system is similar to the first, an alien species may adapt well to conditions in its new home, and compete successfully with native species for available resources. In fact, non-native species often have a distinct advantage over natives in that they don't have predators in the new system.

The theory runs that plants and animals not only evolve in a particular system, they *coevolve* in that system with other species. In an uncontaminated ecosystem, as elsewhere, there is no such thing as a free lunch; more importantly, in such a system, every species literally *is* another species lunch. When a species is introduced into a new system,

however, there may not be anything eating it for a while. Without predation to keep it in check, the new species may multiply rapidly and overrun the locals.

Because ecology is complex and interconnected, the alterations invasive species make to a system are not always obvious, nor are they predictable. Beyond changing the look and sounds of an area, alien species can fundamentally alter the supply of resources and the movement of the elements.

Plants that drink a lot of water - like the Eurasian salt cedar or tamarisk (*Tamarix chinensis*), which absorbs about 200 gallons per day - can seriously draw down the water table, eliminating ponds and streams, as well as the insects and animals that depend upon them. Such plants can bring up and deposit new sets of chemicals on the surface of the soil, thus fundamentally changing its composition, and the very shape of the land can be radically altered by new courses of erosion resulting from exotic vegetation. The established natural patterns of fire - its frequency and ferocity - are also redirected by the dominance of a new type of vegetation, as dramatically demonstrated by the role of the Australian eucalyptus in the Oakland Hills inferno of 1992.

Right now every American state in the contiguous forty-eight suffers a problem with invasive species of plants and animals. The discussion of "suffering" is from purely human perspective at this point, and what it really means is that invasive species are costing people a lot of money - so much money, in fact, that the federal government has taken notice of the problem, and issued a rather grim report through its Office of Technology Assessment (OTA). The report, *Harmful Non-indigenous Species in the United States*, conservatively estimates that the US economy has lost billions of dollars.

Information is still sketchy, but it is widely agreed the costs will only rise. "A worst case scenario for fifteen potential high-impact NIS puts forth another \$134 billion in future economic losses. The figures represent only a part of the total documented and possible costs - they do not include a large number of species known to be costly but for which little or no economic data were available,

eg., non-indigenous agricultural weeds. Nor do they account for intangible, nonmarket impacts."

Some non-native species are famous: the Africanized "killer bees" (*Apis mellifera scutellata*), now entering the US southwest; kudzu (*Pueraria lobata*) strangling hill and dale from Florida to Pennsylvania; the zebra mussel (*Dreissena polymorpha*), clogging waterways in and around the Great Lakes (and as a result of the great floods of 1993, the upper Mississippi River as well). Problems surrounding treatment of the "med-fly" (Mediterranean fruit fly, *Ceratitis capitata*) are even thought to have forced a Californian governor from office.

Other alien species are less well known, but equally devastating. A ranching family in southern Oregon, for instance, abandoned a 10,000 acre spread recently because the land had become infested with leafy spurge (*Euphorbia escula*). A particularly vigorous weed - it can germinate from eight feet below the ground - spurge can make cultivation of land impossible, it's noxious to livestock, and no one yet knows how to get rid of it. Some early results of experiments with biological control seem promising, but these will take some time to develop.

On public lands as well, where the business at hand is neither agriculture nor industry, but preservation and recreation, invasive species cost money. Everglades National Park spent \$16,500 an acre eliminating Christmas berry (*Schinus terebinthifolius*) from a 60 acre site, and *Melaleuca quinquernervia*, an invasive Australian tree, is spreading there at an average of 41 acres per day (D'Antonio and Dudley 1993).

The Bureau of Land Management estimates that it loses 2,300 acres per day to weeds on BLM land alone. In a real way, such invasions corrode the very reasons for having park lands.

Compounding the invasive species problem is the quality and quantity of information on the subject. The OTA report counts at least twenty federal agencies dealing with some part of the NIS problem. But at the federal level (and this is true as well at the state level) communication between agencies is incomplete, and reaction is disorganized. For one thing, plants and animals do not recognize human-imposed borders, or agency divisions. States' standards for importation of species also vary wildly, and enforcement of such laws as do exist is spotty at best. In summary, no co-ordinated legislative response to the problem exist yet, and the governmental efforts that are in place are admittedly ineffectual. Even the formation of grassroots (no pun intended) citizen's groups lag behind. At this writing, only five or so states can boast groups like CalEPPC.

## History

Given the current dismal state of affairs, one might reasonably ask how things got this way. Plant and animal species have travelled the globe from their beginnings, colonising whatever territory they could, but it was not an easy business. Natural barriers isolated ecosystems from one another, and created highly specific local conditions. Currents of wind and water, the shifting of land masses, and vast cyclic migrations have for most of the world's history been all the transportation there was for living forms. The advent of human beings has accelerated the process of invasion enormously and selectively.

As humans themselves have spread out over the planet they've tended to take with them the plants and animals they knew and loved - principally, species of economic value. The current problems with invasive species in the US can be traced largely to their importation by European and Asian immigrants over the past four hundred to five hundred years. A particular set of weeds, the plantains (*Plantago* spp.) were called "White Man's Foot-step" by Native Americans because the weeds so directly followed habitation of land by Europeans.

Not all imports have been bad news: wheat, soybeans and cattle are often cited as examples of successful species transplantation (although when considering more than simple dollar amounts, the benevolence of their impact is highly questionable).

Sometimes a species brought in escapes its original confines - jumps the fence, so to speak, and multiplies. Pesky garden snails are a good example, established in this country repeatedly by people who had only culinary plans in mind. Starlings, a pervasive bird in the US, were supposedly brought to New York by an adventurous entrepreneur in for a Shakespeare festival near the turn of the century. The legend is that the man wanted all the birds the bard mentioned on hand. After the shows, the starlings took off and multiplied. In fact, several attempts to introduce the birds into the US were made, but the story is instructive: starlings now inhabit every part of the country and have forced native species out of their habitats.

It is the same with plants. An overwhelming number of species now considered to be dangerous noxious weeds have been available in seed catalogues, and continue to be. Scotch broom, for instance (*Cytisus scoparius*), runs rampant on the West Coast, and is classified by concerned folks as one of the most important wildland weeds to

control, yet you can still buy it cheaply at almost any nursery.

An impressive range of unintentional, or accidental, vectors for species movement also exists. In the days before extruded PVC peanuts, excelsior, or even wadded-up newspaper, people often packed their possessions in plant matter. When a traveler later unpacked and tossed the padding out to rot, durable seeds would be free to travel on. Seeds also travelled well in the hooves, hairs, hides and stomachs of large animals like horses and cattle, creatures that were themselves frequently transported long distances. Stowaway rodents and reptiles found their way to US shores on ships, then disembarked and spread out. With increased globalization of trade and transport today, the problem is ever more serious.

But even with dozens of alien species running loose, an invasion is not a foregone conclusion. The pressures of coevolution under a particular set of geologic and climatic conditions produce ecosystems that are delicately balanced, yet often (though not always) tough, and resistant to intrusion. For a truly successful species invasion, a degraded ecosystem is best.

Clearing land for urban, suburban or agricultural development, harvesting large tracks of forest for timber, heavy and repetitive grazing, monocultural crop rotation, cumulative use of fertilizers and pesticides, the damming of streams, fire suppression - any of these would qualify as damaging to an ecosystem, and would leave such a system impaired, vulnerable to attack.

## What Can Be Done

The OTA report and articles like this one are part of a dawning consciousness of the problems invasive species pose. One of the most important things to do, painful though it may be, is to increase awareness. This is because problems with NIS exist on so many levels, involve so many kinds of jurisdictions that blanket recommendations have little practical value. Quick understanding and a massive, widespread response offer what hope there is in working with invasive species.

This is not to say that legislative involvement is of no use. Governments at the federal, state, county, and local levels need explicit policies with regard to the movement, sale, and propagation of alien species, and the policies that are already in place - screening of imports at borders, for instance - need to be tightened considerably. The OTA report acknowledges that although some laws are on the books, the gaps in the legal net are more impressive.

It is in tackling the actual problems of present-day invading species that the questions get truly prickly. The basic approach is to go out there, hunt them down, kill them, and make sure they don't come back. This is not always possible, and realistic workers often aim at simple containment. But as anyone knows who's volunteered under the inspiring flag of habitat restoration, you spend a lot of time killing things. It can feel a bit like biological racism: "This doesn't belong here. It should stay in its own place."

When the physical work begins, the issues become even more poignant: squads of hunters fanning out to erase a population of feral pigs (as has been done with great success on some of California's Channel Islands, for instance) pits the habitat people against the animal rights people. And pigs are one thing, but what about deer? Or wild goats? Or cats?

In the plant realm, the questions are usually mostly practical - how to kill, rather than if. The use of herbicides triggered one of the hottest discussions of the CalEPPC symposium. Many of the participants - inveterate plant people - had only a few years ago fought the herbicide industry tooth and nail, on principle. Now lots of these same people just want better, safer chemicals. Not a universally adopted solution by any means, herbicides still present what one participant called *ôa* cure better than the disease.

Biological control of invasive species offers seductive prospects for cleaning up ecological messes, but it's also very tricky, usually involving the importation of another (potentially invasive) species. The testing and cross-checking that must be done before releasing one species to eradicate a second makes the process time consuming and expensive.

There are always the manual methods - pulling weeds and chopping trees. Teams form constantly around the country to rid an area of this or that invader. If the work is slow, it's still social and satisfying to participants, and ultimately quite effective. Without the co-operation of local people, few legislative or technological efforts can succeed.

Although this piece has focused mostly on the US, and mostly on the consequences of invasive species for humans, the problem can be seen from much broader perspectives. As invasive species move around the world, forcing less hardy natives to extinction, the world's gene pool is diminished. The full arguments for preserving biodiversity are outside the scope of this piece, and have already been made by several brilliant scientists, E. O. Wilson most notably. The point is that with a reduced number of species, any system is more vulnerable to change - a climate change, for instance, or a change in the composition of the

atmosphere.

In grappling with invasive species, it's important to remember that the plants and animals have done nothing wrong: they're simply carrying out their biological imperatives, using humans and human folly to spread, as they have used other methods in the past. It is we humans who have meddled most aggressively here, and as the plants and animals go silently to extinction, we must also face the drastic consequences.

Books:

Ecological Imperialism (The Biological Expansion of Europe, 900-1900): A. W. Crosby. 1986, Cambridge University Press.

The Ecology of Biological Invasions of North America and Hawaii: H. A. Mooney and J. A. Darke, Editors. 1986, Springer-Verlag, New York.

Harmful Non-Indigenous Species in the United States: U.S. Congress, Office of Technology Assessment. 1993, U.S. Government Printing Office. (A very good 57 page summary is also available free from OTA.)

Weeds and What They Tell: Ehrenfried E. Pfeiffer. 1950, Bio-dynamic Farming and Gardening Association.

Articles:

D'Antonio, Carla and Dudley, Tom L., 'Alien Species', *Pacific Discovery*, Summer 1993, Vol. 46, #3.

Devine, Robert, 'Botanical Barbarians', *Sierra*, Jan-Feb 1994. Vol. 79, #1.

Mack, R.N., 1990 'Catalogue of Woes', *Natural History*, March 1990.

## How to Help

Contact one of the following EPPC (pronounced "epsie") groups:

EPPC c/o Sandra Vardman, Dade County Dept. of Parks and Recreation, Natural Areas Management, 22200 SW 137 Avenue, Goulds, FL 33170.

CalEPPC c/o Sally Davis, 448 Bello Street, Pismo Beach, CA 93449.

TenEPPC c/o Brian Bower, 4824 Torba Drive, Nashville, TN 37204.

PNWEPPC, 4409 SW Obsidian, Redmond, OR 97754.

For electronic information on invasive species, look in the conference plants.exotic on the EcoNet, an environmental computer network that is part of the Institute for Global Communication: 18 DeBoom St., San Francisco, CA 94107; 415/442-0220; to sign up: 415/322-9289. Contact Steve Harris at [sharris@igc.apc.org](mailto:sharris@igc.apc.org)

**Source: Whole Earth Review, Issue No. 83, June 12, 1994**

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# Coming Events:

**For IFFA events see back cover**

## Conferences/Workshops/Talks

- 20 Sun November. Men of the Trees Annual General Meeting. 2pm. Guest speaker is Mr Russell Costello, the Project Officer for the State Environmental Protection Policy for the Yarra Catchment, who will speak about the impact of the S.E.P.P. on the management of the Yarra Catchment. The meeting will be preceded by a planting and barbecue at 12.30 pm. Venue: Yarra Bend Park Headquarters. Melway map 2D G4. Contact Minette Russell Young on (03) 898 1364.
- 24 Thur November. Herons, Bitterns and Egrets. 8pm. A study meeting organised by the Bird Observers Club of Victoria. The talk will be presented by Fred Smith. Venue; Library, BOCA Headquarters. Enter from the rear of 183 Springvale Rd, Nunawading. A light supper is provided at the end of the session. Bookings essential. Cost \$5.00 BOCA members, \$10.00 non-members. For further information contact BOCA (03) 877 5342.
- 16 January 1995 Cultivation of Pea-flower Plants 8pm. Guest speaker Dr Max McDowall will present a talk to the Society for Growing Australian Plants. Venue: National Herbarium Hall, South Yarra. Contact Enid Bowman (03) 882 5297.
- 26 February - 1 March 1995 First International Urban Parks and Waterways Best Practice Conference. The Australian Quality Council and Melbourne Parks and Waterways have joined forces to hold the first International Conference on best practice in urban parks and waterways management. Themes include: managing and planning recreation setting beyond 2000, customer focus/service, managing and structuring a best practice business. Take the opportunity to share ideas with other professionals from all over the world, and to develop an understanding of how to apply quality management and best practices. To register write to Parks and Waterways Conference, Australian Quality Council, PO Box 60 Kew East, VIC 3102, or phone (03) 816 6814.
- 10 - 12 May, 1995. LOCALINKS. The National Conference on Local Environmental Action, Melbourne. A forum for people interested and involved in action for sustainability at the local level. Inquiries to Context Pty Ltd (03) 380 6933, fax (03) 380 4066.

## Excursions and Field Trips

### November

- 20 Sun Wildflowers of Warrenbayne State Forest. There are hectares of flowering grevilleas and pea-

bushes and half the world's population of the newly-described Euroa Guinea Flower. Includes delightful little creeks and waterfalls as well as the flowers. It will be a great day. Organised by the Euroa Environment Group. Meet at Euroa Secondary College wildflower garden at the rear of the college. For more information contact Ray Thomas (03) 499 3085 or Shirley Saywell (057) 952 022.

- 27 Sun Open Day at Mackinnon Nature Reserve "Mooramong" 12 - 4 pm. Observe and learn about threatened plants and animals of the Western Plains, and of efforts to restore their habitat in the "War of the Weeds". Join a guided tour through the historic "Mooramong" Homestead - with a flourish of Hollywood Art Deco. Observe waterbirds from the tranquillity of the bird hide. Enjoy a BBQ lunch and refreshments. Play tennis or swim in the pool, or simply stroll through the parklands. Mooramong Rd runs north off the Glenelg Hwy, 4km west of Skipton. æMooramongÆ is about 8 km off the highway. Admission: Adults \$4.00, Conc \$3, under 15 free. Contact (053) 406 558.
- 27 Sun Urban Woodland Forest Walks. 2.30 - 4.30pm. Take a walk on the wildside through MelbourneÆs indigenous forests and then join us for a BBQ. Organised by the VAEE. Venue: Wildlife Reserve, La Trobe University. For further details contact John Rathjen (03) 459 0222 or George Paras (03) 479 1284. Bookings are essential.
- 29 Sat - 1 Mon (Dec) Fauna Survey at Jilpanger Scrub. Jilpanger scrub is a pristine piece of bushland past the Grampians. Organised by the Fauna Survey Group of the Field Naturalists Club of Victoria. Contact Ray White (03) 379 3602 for details.

## December

- 3 Sat & 4 Sun. Fauna Survey at Cranbourne Botanic Gardens. Survey is organised by the Fauna Survey Group of the field Naturalists Club of Victoria. Contact Felicity Garde on (03) 818 4684 for details.
- 3 Sat & 4 Sun. Wildflowers of Mt Buffalo. The diversity of vegetation includes delightful alpine grasslands and sphagnum moss bogs, graceful snow gum woodlands, tall alpine ash forests, natural rock gardens and soft lush peppermint forests. Lots of easy walking and incredible views! Those who wish to make a weekend of it may camp at Lake Catani camping ground on the mountain. ThereÆll be abseiling for all ages and standards on the Saturday. Come on day or both. A great outing for families. Organised by the Euroa Environment Group. For more details contact Ray Thomas (03) 499 3085 or Shirley Saywell (057) 952 022.

## January

- 14 - 16 Family Weekend Camp by the Howqua River. Organised by the Euroa Environment Group. Just under Mt Buller and The Bluff, the Howqua River runs clean and clear right near your tent. You can swim, fish, canoe or just relax. A walk to the alpine zone where the flowers are in spring blossom still, is part of an experience not to be missed! For further details contact Ray Thomas (03) 499 3085 or Shirley Saywell (057) 952 022.

## Restoration Activities

### November

26 Sat FO Sherbrooke Forest. End of year BBQ lunch and Project Afternoon at Coles Ridge. Meet at 12 noon at the boom gate at the Southern end of Grants Picnic ground (75 K4). BYO food and drink. After feeding and socialising we will walk into the work site at 2pm, so come then if you can. It will make it for lunch. Ivy, holly, viburnum, pittosporum all await workers' hands. Christmas cheer. Contact Jeff Preston (03) 755 2602.

### December

1 Thu FO Warrandyte State Park Nursery activities. 10am. Every Thursday. Everyone is welcome - experience not necessary. Nursery activities continue December to February holiday period. Activities also on Thursday afternoon include walks, project work, afternoon tea. Further details contact Kym Docwra (03) 876 3807.

1 Thu Sandringham Community Nursery. 10am - 12pm. Volunteer propagation activities at Sandringham Council Depot. Enter from Talinga Road. These propagation days are on every Thursday and Saturday. Contact Lisa Carty (03) 584 5255.

3 Sat Greenlink Box Hill 10am. Activity days also every Monday and Tuesday. Activities include planting, mulching, and weeding. The venue is often the Council Nursery in Nelson St, Box Hill, but it would be wise to ring and check. For further details contact Minnette Russell Young on (03) 898 1364.

3 Sat FO Braeside Park Community Nursery. 10am - 12 noon. Volunteer propagation activities every month on the 1st Saturday, 1st Monday, 3rd Friday and 3rd Sunday. The community nursery is in Braeside Metropolitan Park. For further details contact Ron Pearson on (03) 584 7443.

3 Sat FO Gellibrand Hill Park. Project day. Country fair. Meet at the Workcentre. Contact Lindley McKay (03) 374 2369. Christmas breakup on Sat 10th at Woodlands Homestead, 12 noon.

7 Wed FO the Helmeted Honeyeater. 10am. Healesville nursery activity day. Park in the main carpark at Healesville Sanctuary. The receptionist at the gate will give you directions to the community nursery. Contact Gaye (059) 648 350.

10 Sat FO French Island State Park. Project day at Tortoise Head. Revisit the scene of one of our earliest and most difficult projects - the planting of native trees to stem erosion. Also removal of cape wattle. Departure from Stony Point will be on the 9am ferry. Please notify Francis three days in advance so transport to the island can be arranged. Contact Francis Garner (03) 784 4213.

10 Sun FO Organ Pipes National Park. Project day. Meet information centre. Contact Carl Rayner (03) 337 4936.

11 Sun Urag 10am. (Upwey Regional Action Group for the Environment) Project Day. Weeding of ivy,

blackberry, wandering jew. Planting and restoration of indigenous vegetation along ferny creek. Meet cnr Deans and Morris Rd, Upwey (74 K12). Contact Rob Stephens (03) 751 2407.

11 Sun Greenlink Camberwell. 3-5pm. Seed collecting, planting and weeding in Welfare Pde. Meet cnr Dion St and Welfare Pde (60 E7). Contact Diana Burgess (03) 809 2092.

11 Sun FO the Helmeted Honeyeater 10am. Revegetation day. Meet at Rangers office, Yellingbo State Nature Reserve, Macclesfield Rd (119B F11). BYO lunch if you would like to stay until about 2pm. Contact Gaye on (059) 648 350.

11 Sun FO the Yarra 10am. Meet at Galatea Point, Kew (2D D7). Revegetation activities. For further details contact Judy (03) 347 2252. Also Wednesdays.

17 Sat FO Bradshaw Park 9am. Propagation, watering and Christmas break up party. For more information contact Dave Bainbridge (03) 580 5992.

18 Sun Men of the Trees. Planting day at Yarra Bend Park. Melways map 2D D6. For further details contact Minnette Russell Young (03) 898 1364.

**Thank you to everyone who has sent us information regarding their group activities. If you would like to have your coming events covered in Indigenotes please contact Elissa Kerassitis on (03) 1116.**

# The Vegetation Management Database

## Ver 9.01A

### Now Available

This program aims primarily to simplify the process of recording:

- the characteristics of a site;
- what vegetation occurs on that site, and
- what events (eg. fire), or management actions (eg. weed control) occur on that site.

Using this system is simple. Enter a site to the site database. Then move to the species database to tag those species found at the site concerned. The tagged species are then written to the population file. Record abundance values, assign a management code and/or make ongoing notes about each population in the memo field for that record.

You can flag populations that are suitable for seed collection. Weed control planning, and seed collection scheduling can be much simplified through use of the various reporting routines available.

Obtain from: This is shareware - that is you may try the program before you buy. To obtain a copy, send \$10 (to cover disks/postage etc.) to:  
Pacific Horticultural Services  
15 Hotham St.  
Seddon 3011

OR, copy a friends' disks. You can install multiple times from a single set of disks. Until you register, the program is limited to 5 site records and up to 50 distribution records. Help files are well developed, and a full manual comes with the program on disk.

To register, run the "Create Registration Form" option with your printer switched on. Send this form to the above address with \$100 to receive a registration number. Once registered you may

enter unlimited site and distribution records. Registration entitles you to run one installation.

CUSTOMISATION, or additional requirements/developments, and general enquiries please call Ken Gunn on (03) 689 6789.

INSTALLATION: Place one of the two disks into your floppy, change to that drive and type "install" - press enter. You will be prompted for the second disk.

#### SYSTEM REQUIREMENTS:

##### RAM

The program will need at least 2 megabytes of RAM, with optimum performance with 5 meg of RAM (less RAM causes the program to cache to disk slowing down some operations). A 386 or better is required. (Speed would be the main prob with a 286.)

##### HARD DISK

The program requires 6 megabytes on disk. This figure includes:

3,400k for the C:\flora subdir (reference files - species list of Victoria etc.)

2,000k for the C:\florprog subdir (program files), and

400k for the C:\fdata subdir (empty dataset - you may use multiple datasets, and switch between them).

5,800k Total disk space required. > 6 MEGS.

# IFFA (NSW) MEETING REPORT: October 1994 **Native Vegetation along the banks of the Hawkesbury-Nepean River**

Doug Benson, Senior Plant Ecologist with the Royal Botanic Gardens, Sydney, spoke on "Native Vegetation and rehabilitation along the banks of the Hawkesbury-Nepean River". He has produced numerous vegetation maps, surveys and studies on the significance of native bushland areas, whilst working for the R.B.G. In 1993, he produced "A Strategy for the Rehabilitation of the Riparian Vegetation of the Hawkesbury-Nepean River" with Jocelyn Howell, commissioned by the Sydney Water Board and funded by the Special Environmental Levy. Jocelyn has worked in the Ecology Section at R.B.G. since 1987, collaborating with Doug on surveying, mapping and writing about the native vegetation of the Sydney region.

The Hawkesbury floodplain was the first part of the Australian continent to be cleared of vegetation, and has borne nearly two centuries of human impact. The "Strategy" aims to look at the nature of the original landscape, the changes that have been wrought upon it, the present condition and deficiencies, and what can be done using plant materials to improve the biological qualities and character of the floodplain and riparian zone.

Doug took us on a visual trip, via slides and maps, of the different areas traversed by the study. Starting with the Upper Nepean River, through the Camden-Cobbity floodplain, Bents Basin Gorge, Wallacia floodplain, Nepean Gorge, Penrith floodplain and we ended up on the Richmond - Windsor floodplain. He talked about the existing vegetation, weed and native, the fifteen plant communities involved with different soil types i.e. ten Alluvium, four Alluvium/Sandstone and one Sandstone, and why there was a need for rehabilitation of the river system.

It is now up to the Hawkesbury-Nepean Management Trust to implement the report.

Doug's talk was well received by an appreciative audience, and copies of the report are available through R.B.G. Bookshop in Sydney.

Sally Fisher  
(See page 16 for info about the Dec. meeting.)

## Snippets **Privatisation of Vicflora Nurseries**

The Minister of Natural Resources, Mr. Geoff Coleman, today endorsed the selection of the Natural Resources Conservation League as the preferred tenderer for the Vicflora Wail Nursery.

The Natural Resources Conservation League is a not-for-profit association which has a long and distinguished history in the promotion of conservation and sustainable land management in Victoria. The League currently operates three nurseries, at Springvale, Cranbourne and Rochester and is developing another in Gippsland. To complement these services, the League operates extension and education programs.

The appointment of the League will ensure the continued production of high quality plants revegetation programs in Western Victoria. This is an excellent result for the Wail Nursery, for CNR, and for the community.

The next step in the privatisation process is to finalise the sale agreement and to work out a process for a smooth changeover of the Wail Nursery operations to the new owner.

Negotiations over sale of the other Vicflora Nurseries are continuing. Initial offers received were not considered adequate and further time has been provided to enable late entrants to the process who are interested in the Mildura and Creswick Nurseries to evaluate the businesses.

Alan Thompson, Secretary, DCNR

Source: DCNR Newsgram: A message from the Secretary 15/94

## **Research: English Ivy Control**

Often used as a wall or trellis cover, English Ivy (*Hedera helix*) is sometimes a nuisance in the landscape. A study by Jeffrey Derr, an associate professor of plant pathology at Virginia Polytechnic Institute and State University, Blacksburg, has shown that single applications of Roundup, Weedar 64, Banvel, or Garlon 3A at rates used for landscape weed control will not control English Ivy.

Instead, Derr recommends two applications of Weedar 64. Unfortunately, the double dosage may also injure other plants, so this may not be a practical solution for many landscapes.

A second application of Roundup did reduce English Ivy shoot weight, but complete control was not obtained. Shoot growth was only slightly affected by two applications of Banvel and Garlon 3A.

Source: *Journal of Environmental Horticulture through American Nurseryman* Sept. 1 1994

## **Localinks Conference**

LOCALINKS, the National Conference on Local Environmental Action, will be held in Melbourne on 10-12 May, 1995. It will bring together people already involved in local action for environmental sustainability, those who are interested in making a start and others who can help. It will be an opportunity for local government,

community groups and businesses to showcase their achievements and share ideas to stimulate debate and further action.

LOCALINKS will include a core of stimulatory plenary sessions presented by important Australian and international speakers. Workshop sessions, displays and short talks presenting local experiences will ensure there is plenty to interest all participants. Topics will include:

- **environmental management** (catchments, waste, greenhouse - energy and transport, rivers and coasts, cities, biodiversity, air and water quality)
- **making links** (local government-community communications, information technology, international programs, integrated planning, state of the environment reporting)
- **people and the environment** (volunteers, health, greening local economies, heritage, culture and tourism, mediation and conflict resolution)

For more info, contact the conference planners, Context Pty. Ltd., Ph. (03) 380 6933 or fax (03) 380 4066.

## Environment Defenders Office

The Environment Defenders Office (EDO) is a service that has been in existence since 1991. The EDO is an independent community legal service providing advice for environmental issues which are of public concern. They are able to inform people of their rights and by providing an understanding of our planning and legal system, are assisting people to tackle environmental issues of concern. The EDO is currently operating two days a week, Wednesday and Friday with a staff of two. An advisory service is provided on Wednesday staffed by volunteer solicitors.

The Environment Defenders Office have provided support for numerous issues of environmental concern. EDO has recently:

- assisted Coburg residents opposed to wood waste burning at a Coburg site.
- been involved in the Anglesea heathland dispute providing support for environmental and resident groups.
- worked with Greenpeace to access legal support for Westernport groups opposing expansion of oil storage facilities at Crib Point.
- begun working with the Wilderness Society to access legal support to protect old growth forests of East Gippsland.

As can be seen, the EDO provides an extremely valuable and necessary support service, both for local community groups as well as environmental groups. We should ensure that they continue to exist and expand their services.

The EDO office welcomes volunteers and any offers of support. Contact Mandy Bathgate, EDO administrator on (03)328 4811. Offices are at 446 Victoria St, North Melbourne, above the North Melbourne Legal Service.

## Maria Belvedere Call for Grant

## Applications: ACT Grasslands Research

The Wildlife Research Unit, ACT Parks and Conservation Service has received funding to carry out research that will aid the conservation of lowland native grassland in the ACT region. In the Recovery Plan prepared in 1991 and revised in 1992, priority research requirements were identified for the threatened community. Further research in the region has modified the original priorities.

Grant applications are invited for any of the research topics listed below. Other research topics will be considered also.

### Specific Topics:

1. Regional overview of native grasslands (Review of past studies, systematic survey of region and remote sensing techniques.)
2. Management effects on ecosystem processes
  - Grazing effects and Rehabilitation
3. Alternative trapping methods for the Striped Legless Lizard, *Delma impar*

### General High Priority Areas

1. Nationally threatened species (Habitat usage, management studies, factors influencing distribution based on present habitat and historical processes.)
2. Ecosystem Studies (Studies of the interrelationships between flora, fauna and variables.)
3. Management (Studies of the impacts of different management techniques.)
4. Survey Work (Surveys for threatened and uncommon species.)

### Lower Priority Areas

1. Other grassland invertebrates and vertebrate habitat studies.
2. Taxonomic studies.
3. Co-evolution research.
4. Computerised plant or invertebrate identification.
5. Field guide to plants.

Proponents will develop a proposal and budget, have up to a two year time frame but may be structured in stages, and should not exceed \$10,000 in any one year. In an application of three to five pages, please indicate: 1) Topic, 2) Background Information, 3) Aims, 4) Methods, 5) Expected outcomes, 6) Time frame of project, 7) Details of research organisation, person doing study, supervisor's name and contact details, and 8) Budget details.

For further information contact: Sarah Sharp, Grasslands Project Officer, ACT Parks and Conservation Service, Ph. (06) 207 2125, Fax (06) 207 2122, P.O. Box 1119, Tuggeranong ACT 2901. Applications are to be submitted by COB, 5 December 1994.

# Book Review: What Seed Is That?

By Neville Bonney (Greening Australia S.A.)

Well, at last another book that provides more than a brief overview on seed collection. "What Seed Is That?" is a field guide to the identification, collection and germination of native seed in South Australia. Although aimed at South Australia the book is also relevant to western and north-western Victoria as many of the species dealt with are also found in those areas. The book will also be of interest to people involved in seed collection and propagation of indigenous species. The author Neville Bonney, has had over 30 years experience with the collection and propagation of native plants.

## Snippets Continued:

### **Candlebark Community Nursery**

The former Arrabri Committee Nursery (ACN), attached to the Arrabri Community House in the City of Croydon, Victoria, has been forced by circumstances to forge out on their own and separate themselves from the community house and the Council. They have renamed themselves, they are now the Candlebark Community Nursery, and will continue to strive to achieve the following goals:

- 1) To foster community awareness of indigenous plants;
- 2) To support the creation, regeneration, expansion and preservation of wildlife habitat;
- 3) Provide educational and social activities to learn and share skills with individuals and community groups and
- 4) To support the effective management of Australian flora and fauna.

The group of volunteers that originally started the nursery several years ago are starting from scratch, material-wise, but go on to a new stage of development with a great deal of experience and enthusiasm to achieve their admirable goals within their region. They need support to carry on...to extend your ACN membership to the new organisation or start a new membership contact: Debbie McGrath, Secretary, Candlebark Community Nursery, P.O. Box 269, Kilsyth Victoria 3137, Ph. (03) 720 6141.

The general information section covers: the general principles involved in seed collection and germination of Australian native plants, information on plant identification and contains a number colour photos of seeds, fruits and vegetation from the region. However, written information tends to be brief and some of the colour photographs are of poor quality.

The bulk of the book provides information on 275 plant species, covering 120 plants genera, with one page given to each species. Species covered include trees, shrubs and ground flora species. For each species there is an actual scale line drawing (by Anne Miles) of flowers, leaves, fruits and seeds. Notes are provided on each species, with information covering:

- plant description and distribution
- flowers and flowering times
- seed collection hints, description of fruits and seeds
- seed collection times
- germination techniques
- habit, ecology and conservation status

The section is very well presented and provides a great deal of valuable information on the species covered. However, a few of the seed collection and propagation hints are vague or confusing. For, example, in the general text we are told to collect only mature fruit, yet later we are told to collect immature fruits for some species, in some cases, without clear guidelines as to at what stage. On the propagation side, for many species no clear idea is given as to what germination rates would be expected under the germination techniques outlined.

The final section of the book is an excellent feature and contains over 220 colour photos of native seeds. However, for some reason the seeds are photographed in a transparent gel which detracts from the presentation.

A final concern with the book is its size as a field guide and its inaccessibility in terms of price. Government funded publications, that provide valuable information should be priced to give the public every encouragement to buy the book. A smaller, less produced publication would probably have been more appropriate.

### **Reviewed by Murray Ralph**

The book is available from Greening Australia (SA), GPO Box 9868, Adelaide, 5001, Phone (08) 207 8757 for \$33 per copy including postage and handling. The Greens Bookshop will also consider ordering copies if requested.

## Books:

# Flora of Victoria: Volume 2

The first volume of the Flora of Victoria was published in 1993. As 1994 draws to a close the second volume of the four volume series is about to be published. Titled *Flora of Victoria Volume 2, Ferns and Allied Plants, Conifers and Monocotyledons*, Editors N.G. Walsh and T.J. Entwisle, this is the first of the series of descriptive keys to the State's vascular flora.

The two volumes of A Handbook to Plants in Victoria, Willis (1970, 1973) updated the work of Ewart's Flora of Victoria (1931) and these handbooks have served the botanists and naturalists of Victoria well. Now it has come the turn of these handbooks by Jim Willis to be updated by the Flora of Victoria.

There is a feeling of *deja-vu* while reading the foreword to Willis, Volume 1. The need to update Ewart's flora, brought about by taxonomic revision, new records and knowledge and the spread of exotic species, is the same now and no doubt will be again one day in the future.

The second volume of the Flora of Victoria is a hefty tome weighing in at around one thousand pages. An indication of the botanical activity that has gone on in Victoria in the last two decades.

The sequence for families of flowering plants follows Cronquist (1981) and for ferns and allied plants follows the system proposed for the Flora of Australia. As stated in the introduction, the order of genera and species within families is based upon grouping together morphologically similar entities as an aid to identification. This may reflect natural relationships within and between groups. The priority has been to provide a practical rather than phylogenetic arrangement. Family and genera descriptions are generally applicable however species descriptions are based on herbarium specimens and field observations of Victorian plants.

Naturalized taxa are defined as "those which freely reproduce and grow outside a crop, plantation or garden." Horticultural and agricultural weeds have been treated in the same way as naturalized exotics to increase the utility of the flora.

The keys are a dichotomous type: choice leads to either the next couplet or the family, genera or species of the plant being identified. In contrast to the Flora of Australia the couplets are directly underneath each other making it easier to use.

Distribution maps accompany all the species

descriptions. Each rectangular grid represents 10 minutes of latitude and longitude about (19 x 15 Km). In addition to the maps, species distribution is given by reference to the 16 natural regions of Victoria (Conn 1993) and the A-Z grid letter code of Willis (1970, 1973).

Illustrations are in the main of fresh, dried or spirit preserved material of Victorian origin. With 16 pages of colour paintings by Anita Barley.

The descriptions of families and genera contain information on etymology, taxonomic features, distribution and selected references. A comprehensive index of all plant names and glossary of terms and references is included.

A valiant and commendable effort has been made by the authors to make the keys as easy as possible to use. Where possible, reliance on single diagnostic features or those only seen under high magnification have been minimized. The glossary is an invaluable aid in deciphering some of the unavoidable terminology used in botanical description. The illustrations throughout the volume also provide valuable help in this regard.

Having read through a range of the descriptive keys it is apparent that their development has drawn on botanical experience with a practical approach for the user. Some of the previously difficult to identify groups now are markedly improved and easier to understand.

In difficult families such as Juncaceae and Cyperaceae the inclusion of illustrations of inflorescences and individual parts such as utricles and nuts are a most welcome addition. Although not all species are drawn, the illustrations may help by eliminating potential species when attempting to use the key and in visualising the written descriptions. The notes on identification features for the Juncaceae are of valuable assistance. In the ecological notes accompanying the *Juncus* species descriptions reference is made to similar taxa with comments to help aid in their separation.

Reading through the volume several points came to mind;

One of these was the importance of lodging material at the National Herbarium to provide a picture of species distribution as accurate as we can for plants in the State. Being currently employed at Yarra Bend Park I was interested to read in the notes on *Lamarckia aurea*, a reference made to an

isolated occurrence at Studley Park Kew, as it is usually a weed recorded for the north and west of the state. [A booklet by David Albrecht on the collection and preservation of plant specimens in Victoria is available from the National Herbarium of Victoria.]

Permits are required for the taking of flora from public land and information on how to apply is available through the Arthur Rylah Institute. Contact the National Parks Service for land managed under the National Parks Act.

The issue of environmental weed invasion was brought into focus when in the notes on *Agrostis capillaris* var. *capillaris*, Brown-top bent. It was commented that it is "occasionally used in seed mixes for soil stabilisation, particularly in the alps". Dissemination of information to land managers and the public about weed invasion is essential to the future health and well-being of the Victorian flora.

To this end lodgement of specimens of weeds is a vital task in which all of us as land managers can assist. This will help to ensure plants being recorded in future editions of "A Census of the Vascular Plants of Victoria" and perhaps in the remaining volumes of the Flora of Victoria.

The on-going nature of botanical work is raised several times in the text with reference to genera

and species in need of revision. It is hoped that this work will be able to be carried out enabling a more complete picture of the flora.

While this volume won't be carried around in the backpack, a niche that the two volumes of Willis will fill. It is a long awaited and essential reference for all with an interest in the flora of Victoria.

Congratulations to all involved in the project.

**The preview copy of the Flora of Victoria Volume 2 was reviewed by Peter Tucker.**

**It can be purchased for \$140 (or \$150 mailed within Australia) from the Royal Botanic Gardens Bookshop or from bookshops, including the Greens Bookshop for \$165 (10% discount for members) until December 31 when the prices will rise even higher, \$15 and \$30 respectively.**

# IFFA activities:

## IFFA (Vic)

### New meeting venue:

RAOU Headquarters, 415 Riversdale Road  
Hawthorn East, Melways 45 H 12  
The building is on the north side of Riversdale Road a few hundred metres west of Camberwell Junction; you'll recognise the building by the big Emu on the side and the sign saying "Australian Bird Research Centre." It's on a tram line and a short walk from Camberwell Station. This could be our permanent meeting venue; please come along, see what you think and tell us your opinion.

### Next meeting:

Tuesday 29 November at 7:30 pm at the RAOU. Peter Higgins of the Royal Australian Ornithologists Union will speak on the "*Handbook of Australian, New Zealand and Antarctic Birds* (HANZAB) project", a monumentally significant venture to publish (in five volumes) the definitive account of the birds of this region. Two volumes have been published already and they have gotten excellent reviews. Peter is one of the co-ordinating editors of the HANZAB project which involves a team of ornithologists in a model of co-operation between professional and amateur ornithologists. All welcome.

### Committee meeting:

The Committee meeting is now the second Monday of every month. Contact any committee member for the location in December.

### SPIFFA

Contact Mark Adams (059)851122.

### Indigenous Nurseries Network subcommittee:

Contact Murray Ralph (03) 419 3040 or Sue Mills (03) 383 2937.

## NSW activities:

### Next meeting:

Monday 5 December 1994 7.30 - 10.00pm. Subject: "**Management of marine reserves and rock platforms**", presented by Gary Henry, Principal Manager, Recreational Fisheries, NSW Dept. of Fisheries. Gary will show lavish slides of the world of the intertidal zone invertebrates of the NSW coast, identify problems that occur here and discuss management programs set for protected areas by the NSW Department of Fisheries. In the Maiden Theatre, Mrs Macquaries Rd, Royal Botanic Gardens Sydney. Contact Sally Fisher (02)9706486 (work).

**Front Cover:** A drawing from "The Flowers of Toohey Forest" the 1995 calendar from the Toohey Forest Protection Society, Brisbane, QLD. Artwork by Nola Jefferys. To purchase their calendars, at \$5.00 each and support their work contact the Secretary, Shirley Walton on (07) 848 1036.

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### Office Bearers:

**President:** Roger Jones, 106 McConnell St., Kensington 3031. (03) 372 1582 (ah).

**Vice-President:** Peter Tucker, (03) 482 2344(bh) and (03) 510 1034(ah).

**Secretary:** Karen Lester, (03) 386 5235(ah).

**Membership Secretary:** Lynlee Smith, P.O. Box 328, Clifton Hill 3068. (03) 499 3085(ah).

**Treasurer:** New Treasurer still needed!

**Committee members:** Sharon Mason (03) 386 5235(ah), Geoff Carr (03) 481 7679(bh) and (03) 380 8582(ah), Greg Bain (03) 563 5617(ah) and David Lockwood.

**Editorial team:** c/o P.O. Box 228, Preston, Victoria, 3072.

Editor: Lincoln Kern, (03) 4814682 (ah).

Coming Events: Elissa Kerassitis (03) 379 1116(ah).

Contributions to *Indigenotes* should be sent to the editors — the deadline for the next issue will be January 13.

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