

## INDIGENOTES

VOLUME 2, NUMBER 4, APRIL 1989.

### **April Meeting**

Tuesday 18 April at 8 p.m. on the 3rd floor, Ross House, 247 Flinders Lane, Melbourne (between Swanston and Elizabeth Streets). To get in, be on time, or yell loudly as the doorbell doesn't ring on the third floor.

### **Annual General Meeting**

Tuesday 30 May, 8 p.m. Members please put this date in your diary and attend if possible. Important matters regarding amendments to our articles of incorporation are to be discussed, and elections held for office bearers.

**Articles:** Contributions to *Indigenotes* should be sent to the editor, Tony Faithfull, 10 Alsace Street, Brunswick East, 3057 Tel (03) 3860264. The deadline for the May issue is 6 May. See inside for instructions to authors.

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# An IFFA Journal?

By Graeme Lorimer\*

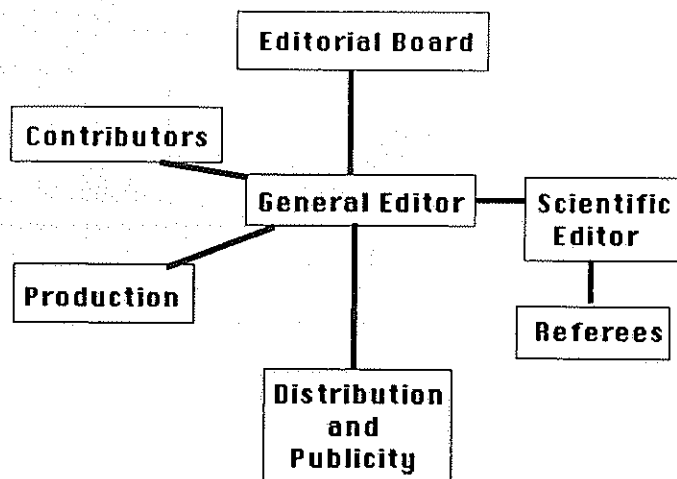
A group of interested indigeophiles met on 22 March to investigate the advisability and feasibility of publishing an IFFA journal. The journal would be more formal and less frequent than *Indigenotes*, and provide an outlet for a range of articles on conservation biology, land management and environmental assessment.

One view expressed was that existing journals (e.g. *The Victorian Naturalist*) adequately serve IFFA's sphere of interest, and that the paucity of published articles in that sphere is essentially due to low motivation on the part of the authors. It was suggested that potential authors should be pressed to write articles and submit them to established publications, so that IFFA could purchase reprints and distribute them widely.

A contrary view was also expressed (notably by yours truly) - that existing publications are not adequate, and that there would not be much (or any) saving of work or money in purchasing and distributing reprints compared with producing a journal ourselves.

To resolve the matter, discussion ensued on how an IFFA journal would be produced, and how often, and what it would contain. The consensus was for an annual (or possibly semiannual) publication at the outset, containing two classes of articles: technical papers subject to peer review, and general articles covering news about such things as revegetation projects, land under investigation, and a list of recent publications of interest. The scope is Australia-wide, appealing to practical biologists, ecologists, land managers and naturalists around the country. A comprehensive mailing list for publicity is essential.

A possible management structure is shown schematically below. Policy would be set by an Editorial Board, directing a General Editor. Scientific articles received by the General Editor would be transferred to a Scientific Editor to organize peer review; general articles would be handled by the General Editor alone. Accepted manuscripts would then be typeset, laid out, proofed and printed under the supervision of the General Editor, who would also oversee distribution and publicity.



It may seem bureaucratic, but desktop publishing systems make it possible for the General Editor to do most of the production him/herself (as with *Indigenotes*), perhaps with typing assistance.

What we need now is a costing, based on (say) a first issue of 100 pages produced using the Environment Centre's desktop publishing system. Income would be from sales and (possibly) page charges.

My gut feeling is that it's a goer.

- **What do you think?**
- **What articles can you contribute?**
- **What should the journal's title be?**
- **Do you have access to "Pagemaker" for IBM?**

Phone me (728 5841) or Tony Faithfull (386 0264) to let us know, pronto! Our next meeting will be on 27th April.

\*42 Gratten Road, Montrose, Victoria 3765.

# IFFA excursion to Gembrook

By Gavin Masters\*

Saturday 4 March proved to be a warm, sunny day. This was just as well for this was the day 27 people, under the leadership of John Reid, set out to discover some of the treasures east of Gembrook in the Black Snake Range. After meeting at Gembrook Community Centre we started off, on this my first IFFA excursion.

The first stop was at Blackboy Road. Here we found an area covered with a forest of Silver-leaf Stringybark (*Eucalyptus cephalocarpa*) and Narrow-leaf Peppermint (*E. radiata*). As these were in flower the canopy buzzed with insect life. Among these an Imperial White Butterfly (*Delias harpalyce*) got our stroll off to a colourful start.

A short distance along the road a creek and surrounding low damp area brought about a change in habitat. Here the dominant species was Scented Paperbark (*Melaleuca squarrosa*). Other species in this riparian environment included ferns and sedges. The most spectacular of these was the Red-fruited Saw-sedge (*Gahnia sieberiana*). Although it no longer carried its red shiny fruit, the flower spike (inflorescence) was still showy, growing to a height of between 3 and 4 metres. These with their attendant Sword-grass Brown Butterflies (*Tisiphone albeona albifascia*) really were a stunning sight.

From here we passed over a small rise, the vegetation changing on the drier, rocky hillside. Here again *E. cephalocarpa* and *E. radiata* formed the canopy although now they were more stunted and straggly. Beneath the trees there was a very dense second storey. Prominent among these shrubs were hakeas. These were of four types:- Yellow Hakea (*H. nodosa*), Silky Hakea (*H. sericea*), Furze Hakea (*H. ulicina*) and Dagger Hakea (*H. teretifolia*).

We eventually reached the target of our walk, a low swampy heath area. This was dominated by Scented Paperbark and Woolly Teatree (*Leptospermum lanigerum*). Between these grew many smaller plants of great interest. Primary among these, and the reason this site had been selected, was Button Grass (*Gymnoschoenus sphaerocephalus*). This species forms large green tussocks above which are the seed heads. These are little round knobs on the end of long flexible stalks which allow them to bob around in the breeze. Also present were Twine-rushes (*Leptocarpus* sp.) with their soft droopy male flower heads and their erect female heads.

As is often the case in swampy soil various carnivorous plant species were present. Of the sundews (*Drosera* sp.) the most noticeable was the Fork-leafed Sundew (*D. binata*). This carries its red tentacles on long Y shaped leaves which can

grow up to 30 cm long. The ones we saw were not this large due to the difficult conditions produced by passing horses. Fairy Aprons (*Utricularia dichotoma*) were also plentiful. These small violet flowered plants belong to the group known as bladderworts. They are so named because they catch their prey - small invertebrates - in tiny spring-loaded bladders, similar to box traps used to capture possums. The traps are approximately 0.5 mm long. Terrestrial species of *Utricularia* have a hood across the door so that when the trap is sprung earth does not enter the trap along with the prey, as the victim is drawn into the trap by suction.

After a very leisurely lunch we proceeded to our next location - Kurth's Kiln on the Tomahawk Creek. Here the forest was Peppermint/Stringybark but now with less *E. cephalocarpa* and more Messmate (*E. obliqua*). This was the typical plant community of the foothills east of Melbourne. The understorey consisted largely of Myrtle Wattle (*Acacia myrtifolia*), Dusty Miller (*Spyridium parvifolium*) and Burgan (*Kunzea ericoides*). Other wattle species were also common, such as Spreading Wattle (*A. genistifolia*), Spike Wattle (*A. oxycedrus*) and Narrow-leaf Wattle (*A. mucronata*).

This walk passed close along the creek where many species of ferns became important. Included were the three local species of Water Ferns (*Blechnum* sp.) and Fan Fern (*Sticherus ?lobatus*). It was interesting to learn the difference between Pouched Coral Fern (*Gleichenia circinnata*) and Scrambling Coral Fern (*G. microphylla*). Also of interest was the presence of Austral King Fern (*Todea barbara*) which is now less common close to Melbourne.

The third and final part of the day involved a spotlighting expedition. In this region, under the guidance of an expert it was hoped that the group would find, among other things, Yellow-bellied Gliders (*Petaurus australis*), Powerful Owls (*Ninox strenua*) and Sooty Owls (*Tyto tenebricosa*). Unfortunately I was unable to participate in this part of the day, however I still left having gained much new knowledge.

## Bibliography

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\*7 Amboina Ave, Mitcham, Victoria 3132.

# Restoration in the USA

By Tym Barlow

*A report on the Society for Ecological Restoration and Management (SERM) conference 'Restoration: the new management challenge', 16-20 January 1989, Oakland, California, USA.*

The enthusiasm, organization and commitment of the people involved in the Society for Ecological Restoration and Management (SERM) shows when they can successfully stage an international conference less than 18 months since the organization's establishment.

Ecological restoration and management is regarded as an 'emerging' discipline in the USA, encompassing the social, scientific and technical aspects of restoring degraded ecosystems to a higher level of ecological integrity. It is closely analogous to the schools of 'landscape ecology' of European origin (c. 1920) and 'ecological horticulture/applied ecology' of LaTrobe University (c. 1980). The principles espoused in all concern the sensitive use of natural resources to counter the ecological decay prevalent in industrialized and developing countries around the world. Proponents rightly assume a sense of self-satisfaction in that whilst their primary concern is to maintain a planet capable of supporting human life, there are additional, altruistic reasons based on quality of (human) life and the right to life of all life-forms. Most accept that the collective right to life surpasses the individual, human or otherwise. In general terms, practitioners of restoration ecology are concerned with a range of issues. The most important are the recovery of populations of rare species, particularly mammals, birds and butterflies, as well as plants, control of feral predators such as the Mongoose in Hawaii, restoration of vegetation communities such as Burr-Oak savanna and Tall-grass prairie, land reclamation after desertification or mining activity, rehabilitation of disturbed sites such as construction sites in natural areas, revegetation programs, the horticultural use of indigenous species and weed control. As an Aussie I had to sit fairly low in the seat when species like Purple Loosestrife (an Australian species now a weed in the US) were being discussed.

There appeared, overall, to be little emphasis on

the actual management of natural areas. This is possibly explained by the fact that North Americans routinely use the term 'preservation' (which, as the keynote speaker suggested, should be relegated to 'the larder, along with the jams and pickles') and that the restoration movement is mainly founded by landscape architects and horticulturalists involved in attempts at reconstructing vegetation communities on previously alienated sites. This is not meant to denigrate, as natural area management interests have their own society and journal - the 'Natural Area Management Society'. I have subscription forms available should anyone be interested.

Papers were presented which covered a diverse range of topics such as "the art of ecological restoration" (it's art, not science!), "computer applications for restoration", "towards an ecological architecture of restoration" and "ethical and philosophical considerations of ecological restoration".

Considerable debate on this issue appears in recent volumes of Restoration and Management Notes, which now acts as SERM's journal.

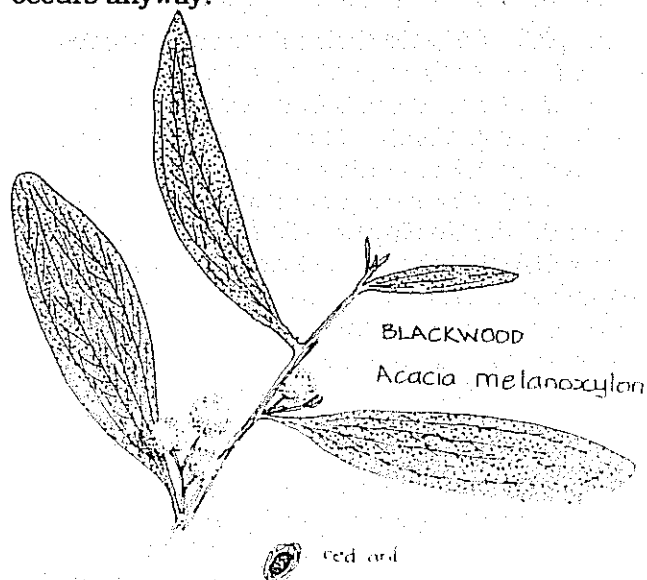
Some papers seemed to be more concerned with semantics rather than useful information. For example, a paper entitled "Air-earth interface (AEI) model for ecosystem restoration and maintenance" discussed the fact that compacted soil surfaces (i.e. air-earth interfaces) tend not to be conducive to plant establishment (ecosystem restoration) but ripping (earth imprintation) helps by converting a smooth-closed AEI to a rough-open AEI drainage. Imagine explaining this to a CEP crew! Another paper entitled "Demographic techniques for monitoring and restoring endangered plants" discussed the importance of counting individuals of an endangered population, especially if one wished to understand the status of the population over time. Perhaps I'm a cynic, but I thought such things to be fairly basic for an international audience.

At the other end of the spectrum some excellent papers were presented concerning the role of mycorrhizal fungi in plant establishment and successional dynamics, and the benefits of utilizing indigenous genetic stock as well as the dangers of using non-indigenous stock especially in natural areas. "Meadow-restoration in the

\* Western Region Commission, Private Bag 10, West Footscray, Victoria 3012.

British midlands" was the title of a paper presented by Grant Jones from the University of Wolverhampton. Techniques there have moved away from the use of seed because of the poor quality and viability of seed, its wide distribution across the country and the unscrupulous activities of some seed merchants (some packets analysed were found to contain 80% w/w in dust, with Italian Rye-grass forming the bulk of the remainder). Instead, they cut from existing meadows (the nearest available) to form round bales which are immediately transported to and unrolled on the new site. Establishment is very successful - all plant species survived the treatment and established at the new site. An unanticipated bonus was the amount of invertebrate fauna which also survived the relocation process.

With a fairly large component of practitioners attending, considerable focus was given to the economics of restoration projects, the evaluation of success (i.e. guidelines for evaluation and criteria to determine success) and the environmental mitigation legislation enacted in some States. This legislation applies usually to wetlands and provides development permission on a wetland if the developer is prepared to mitigate this by establishing or restoring a similar wetland(s) nearby. There was some disquiet expressed amongst the audience about the number of restorationists (often commercial enterprises) claiming success with their projects and thereby propagating the idea that ecosystems can be reconstructed. It is a bit of a "catch-22" in that without the mitigation laws development often occurs anyway.



What is the relevance of all this to the Australian situation? The immense number of people involved in such a large array of activities provides a substantial learning base. Much information is derived from a large number of projects based on trial and error. Tools and techniques are constantly being refined; one consultant I spoke to employs a full-time fitter and turner-come-engineer to develop tools and equipment for the consultancy's use. The same group recently machine harvested 27 tonnes of 'prairie-mix' from plots specifically planted for that purpose! Burning is usually carried out in early spring (where vegetation is winter-dormant). Subsequent growth of native plants is so vigorous that exotic species are easily out-competed. There is a school of thought that successfully-competing exotics should be accepted as inevitable components of natural vegetation which is managed by humans. Fire is regarded as an essential management tool, but depending on the user is not always fully documented and claimed results can be blurred by enthusiasm and naivety.

The vegetation most analogous to the basalt plains Kangaroo Grass grasslands appears to be in the Bluestem (*Andropogon* spp) and Spear-Grass (*Stipa* spp) grasslands of California, experiencing similar climate and most notable, weed invasion problems by familiar plants like Artichoke Thistle, Spear Thistle, Boxthorn, Blackberry, Flatweed and Plantain. The paucity of research and management of these grasslands is also closely analogous to that of the basalt plains. Herbicide and manual weeding are the most commonly deployed control measures. A number of Australian plants behaving in a weedy manner around San Francisco include Blackwood (on nature strips), Kangaroo Apple (in Golden Gate Park), Cootamundra Wattle (on roadsides), Blue Gum seedlings (apparently only growing in plantations) and Sweet Pittosporum (on roadsides). These were noticed during an afternoon's drive around town.

I couldn't help but be impressed by the sheer number of people involved in this field, and the diversity of their interests and activities. Some 450 people attended to hear some 120 papers presented (unfortunately, sessions were run concurrently such that one could only attend

Continued on page 6

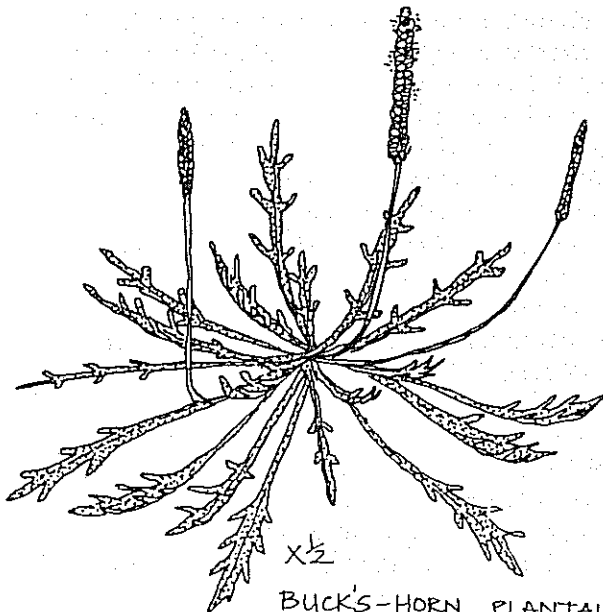
## Restoration in the USA

Continued from page 5

from Israel (1), Britain (1), Canada (3) and Australia (1), whilst approximately 70% were Californian.

There are some salutary lessons for Australians involved in this field, the foremost being the critical need for improved communication and coordination of information. Currently, as far as I know, there is no publication (like Restoration and Management Notes) specifically devoted to this, and one needs to peruse a number of publications to glean relevant information. The second major lesson concerns the degree of academic and professional recognition now bestowed on the field of restoration ecology. Whereas we tend to regard revegetation programmes as a nice way to create jobs, albeit temporary, North Americans tend to recognise the 'restorationist' at the same level as other professionals. I suspect the bottom-line is that this is so only because (as is the case in Europe and Britain) the natural US landscape (especially around settled parts) is so close to obliteration that a large proportion of the population is aware of the problem and the urgency of implementing rectification measures.

DDT could still be bought across the counter in Australia 20 years after its sale was banned totally in the USA (which was still some 10 years after Rachel Carson's book 'Silent Spring' was published); let's hope we can get it together rather quicker in the field of restoration ecology.



x 1/2  
BUCK'S-HORN PLANTAIN  
\* *Plantago coronopus*

## profile:

# MEAFEC

Edited by Dimi Bouzalas

The Mount Eliza Association for Environmental Care began with a fairly small group of concerned citizens in 1971. The Association's membership has greatly increased and now extends to Mornington, Frankston and Hastings. The group has produced an information booklet and promotional brochure which describes its aims and some of its activities.

MEAFEC aims to achieve their objectives by working through rather than against government at local, state, and national levels. The Association is concerned with the environment of Mount Eliza and the immediate neighbourhood but also plays a part in wider issues. It is affiliated to the Australian Conservation Foundation, the Conservation Council of Victoria, the Port Phillip Conservation Council and was one of the first member groups of IFFA.

MEAFEC puts in a great deal of effort to retain for the public, all land which rightfully belongs to the public - beach, bush or other public open space. Various members of the Association are committed to research and prepare written material to protect what remains of the natural areas. MEAFEC is involved in local environmental decision making and is represented on the Frankston Council's Natural Environment Advisory Committee. Submissions have been compiled regarding the foreshore, Kananook Creek and The Pines, and consequently they have had much positive influence with their proposals.

MEAFEC plays an active role in community education and has become a voluntary resource centre for students ranging from primary right through to postgraduate. They are active during events such as Arbor Week and World Environment Day, and take every opportunity to set up their information display or hold a stall. Together with their display they demonstrate propagating techniques and hand out plants grown from seeds and cuttings collected from local reserves. They encourage people to grow plants which are true components of Mount Eliza's floral heritage.

MEAFEC has achieved very pleasing results in several sites around Mount Eliza. They are mainly concentrating on two sites, one being

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# PERSPECTIVES ON ENVIRONMENTAL WEEDS IN VICTORIA

Geoff Carr, Ecological Horticulture Pty. Ltd., Melbourne

## INTRODUCTION

This article presents a brief overview of the role of exotic invasive plant species in Victoria on non-agricultural land. Distinction is not made between weeds on public land versus weeds on private land because weeds are incapable of respecting notional geographic or political boundaries; they threaten a range of conservation, landscape, amenity and economic values on public and private land. In this article emphasis is placed on conservation values.

The weed species discussed here are termed environmental weeds, compared with weeds of agriculture and horticulture. The following definition is used for environmental weeds: *Naturalised, non-indigenous plant species outside the agricultural or garden context which adversely affect the survival or regeneration of indigenous species in natural or partly natural vegetation communities.*

It has been claimed (Carr *et al.* 1986) that environmental weeds constitute the greatest single conservation problem in Australia while Frood and Calder (1987) consider that the introduced taxa represent the greatest of all threats to remaining indigenous ecosystems in Victoria. Almost all types of native vegetation communities in Victoria are being invaded or are likely to be invaded to some extent at some time in the future. This is compounded by possible genetic problems arising from the cultivation of native or exotic plant species. We can expect gross structural and floristic alteration of indigenous plant communities in all parts of the state. Plant communities will become species poor; ultimately indigenous species will be unable to regenerate because of competition with exotic species. We may expect direct threats to the survival of many species of plants and animals, especially those which are presently rare or endangered.

A further problem is the obliteration or obscuring of the natural distribution patterns of some species in the indigenous flora which become naturalized outside their natural geographic range. The taxonomy and natural geographic variation of some plant species (aside from direct threats to their genetic integrity) may also become obscured

by hybridization as a result of the invasion of foreign genes.

These problems are part of a world wide phenomenon of vegetation degradation and destruction caused by human activity - the synanthropization of the world flora - see Holzer *et al.* (1983). Environmental weed invasions have been documented in many parts of the world but have received most attention in South Africa (Macdonald *et al.* 1986).

Granted the conservation and management implications it is astounding that the issue has received so little attention to date in Victoria. Hitherto, mostly anecdotal or generalized accounts of the problem have been published e.g. Arnold (1987), Australian Institute of Agricultural Science (1976), Carr *et al.* (1986), Elliot (1986) and Garnett (1987) and only very few ecological or biological studies on particular weed species have been carried out e.g. McIntyre and Ladiges (1985) (*Ehrhata erecta*); Gleadow (1982), Gleadow and Ashton (1981), Gleadow and Rowan (1982) and Gleadow *et al.* (1983) (*Pittosporum undulatum*); and Weiss (1986) (*Chrysanthemoides monilifera*). There are also a number of unpublished vegetation management studies which deal with environmental weeds e.g. Albrecht (1983), Carr (1987) and McMahon *et al.* (1987). One local (primarily) environmental weed flora has been published (Friends of Sherbrooke Forest and DCFL 1983).

The national ecological and conservation crisis of environmental weed invasion must be addressed at all levels from the Federal Government downwards. It is everybody's problem and demands a massive change in thinking and action. If these changes fail to eventuate very soon much of the biological heritage of Australia - the product of millions of years of evolutionary history - will be irretrievably destroyed.

## SIZE OF THE NATURALIZED FLORA OF VICTORIA

The number of naturalized vascular plants in Victoria is compared with the indigenous flora in Table 1. A considerable discrepancy exists between the number of naturalized species recorded for

# Coming Events

## APRIL

- 15-16 Saturday-Sunday. **Water Rats - Werribee.** Fauna Survey excursion of the Victorian Field Naturalists Club of Victoria. Contact Julian Grusovin (03)543 8627.
- 16 Sunday, 12 noon to 6.00 p.m. **Fund Raising event for Tree Project.** Sherbrooke Community School, 311 Mt. Dandenong Tourist Road, Sassafrass. Contact the Tree Project (03)663 3281.

18 **IFFA meeting.** 8 p.m., 3rd floor, Ross House, 247 Flinders Lane, Melbourne (between Swanston and Elizabeth Streets). To get in, be on time, or yell loudly as the doorbell doesn't ring on the third floor.

- 22 Saturday. **Tall Forest on the Ada River** (Noojee area). Botany group excursion of the Victorian Field Naturalists Club of Victoria. Leader from the Latrobe Valley FNC. Contact Margaret Potter (03)29 2779.
- 26 Wednesday, 5.15 p.m.-6.30 p.m. **The Role of Conservation Officers in Local Government.** Graduate School of Environmental Science, Environmental Forum. Speakers: Ian Stevenson (Mornington), Andrew Shannon (Springvale), Marc Phitzner (Sandringham), Garrigue Pergl (Sherbrook). In the G.S.E.S. seminar room (near the eastern Science lecture theatres). Contact Monash University 565 4000.
- 29 Saturday. **Leadbeaters Possum survey** -Upper Yarra. Fauna survey excursion of the Victorian Field Naturalists Club of Victoria. Leader: Ray Gibson (03)874 4408.
- 30 Sunday, 9.30 a.m. onwards. **Megaplanting at Deep Rock.** 5,000 trees/shrubs to be planted. 250 people needed - rain or shine! The planting is being organized by the Tree Project and will be assisted by the Men of the Trees, the Friends of the Yarra, Australian Trust for Conservation Volunteers, and the Riverland Conservation Society of Heidelberg. Planting will take place at Deep Rock, Yarra Bend Park, Melways reference 2D D5. Contact the Tree Project (03)663 3281.
- 30 Sunday, 10 a.m. **La Trobe University Wildlife Reserves Campus Reserve Project Day:** Woodlands Community Planting. Contact George Paras (03) 479 2871 (work).

## MAY

- 2 Tuesday, 8 p.m. **Fauna Survey Group meeting** of The Field Naturalists Club of Victoria. At the Herbarium Hall, Birdwood Ave., Sth. Yarra. Contact Julian Grusovin (03)543 8627.
- 3 Wednesday. **Stag watching in Healesville Sanctuary** and the Coranderrk Reserve. Meet at main entrance of sanctuary at 5.30 p.m. for a BBQ (BYO food and drink). Stag watch starts promptly at 6.30 p.m. Approximately half an hour observing before dusk and half an hour after dusk. Bring torch and wet weather gear. Contact Karen Roach or Brian Phillips (059)62 4022 (B.H.).
- 6 Saturday. Stag watching in Healesville Sanctuary. (For details see 3 May).
- 8 Monday, 7.30 p.m. **Wilderness Society Information Night.** Special screening of "Escarpement" - a superb film about Kakadu. 59 Hardware St., Melb. 670 5229.

- 11 Thursday, 8.00 p.m. **RCA Roadsides Reserves**, by Graeme Stone. Botany Group meeting of the Victorian Field Naturalists Club of Victoria. At the Herbarium Hall, Birdwood Ave., Sth. Yarra. Contact Margaret Potter (03) 29 2779.
- 13 Saturday. Friends of **Werribee Gorge State Park** and Long Forest Mallee **Activity Day.** Planting, replacing redgum on bridge, barbeque and river track maintenance which involves a beaut walk along the Gorge. Meet at 9.30 at the Werribee Gorge picnic ground. Contact Judy Douglas (053) 672672 (home)
- 13 Saturday. **Leadbeaters Possum survey** - Upper Yarra. Fauna survey excursion of the Victorian Field Naturalists Club of Victoria. Leader: Ray Gibson (03)874 4408.
- 21 Sunday. Stag watching in Healesville Sanctuary. (For details see 3 May).
- 27 Saturday. **Mornington Peninsula.** Botany group excursion of the Victorian Field Naturalists Club of Victoria. Leader: Tom Sault. Contact Margaret Potter (03)29 2779.
- 28 Sunday, 10 a.m. - 12.30 p.m. **Planting commemorating the centenary of the birth of Richard St. Barbe Baker.** This will be part of an Australia wide Planting Day. More details soon.
- 28 Sunday, 10 a.m. **La Trobe University Wildlife Reserves Gresswell Forest Project Day:** Nesting Box Elevation. Contact George Paras (03) 479 2871.
- 28 Sunday. Stag watching in Healesville Sanctuary. (For details see 3 May).

30 Tuesday. **IFFA annual General Meeting.** Members please put this date in your diary and attend if possible. Important matters regarding amendments to our articles of incorporation are to be discussed, and elections held for office bearers.

## JUNE

- 4 Sunday. **Fungi** - Excursion of the Field Naturalists Club of Victoria. Contact Marie Allender (03) 527 2749.
- 5 Monday, 8 p.m. **V.F.T. - Environmental Effects.** General meeting of the Field Naturalists Club of Victoria. Speaker: Eric Quinlan. Herbarium Hall, Birdwood Ave., Sth Yarra. Contact Marie Allender (03)527 2749.
- 8 Thursday, 8 p.m. **Trees, Toadstools Puffballs & Potoroos.** Botany group meeting of the FNCV. Speaker: Tom May. Herbarium Hall, Birdwood Ave., Sth Yarra. Contact Margaret Potter (03) 29 2779.
- 10-12 Saturday - Monday. **Fauna Survey Excursion** of the Field Naturalists Club of Victoria. Campout - Deniliquin, NSW, Northern Hairy-nosed Wombat survey. Contact Julian Grusovin (03)543 8627.
- 24 Saturday. **Fungi - Beenak area.** Botany excursion of the Field Naturalists Club of Victoria. Leader: Tom May. Contact Margaret Potter (03) 29 2779.
- 25 Sunday, 10 a.m. **La Trobe University Wildlife Reserves Campus Reserve Project Day:** Woodlands Community Planting. Contact George Paras (03) 479 2871.
- 27 Tuesday. **IFFA meeting.**
- A large range of activities such as bushwalks and Friends' activities are published by the Victorian National Parks Association in their newsletter. For details contact V.N.P.A. (03) 654 6843.*

# Snippets

## Broombrush cutting destroys mallee wilderness.

Broombrush in Victoria is legally cut by five licences and evidence recently to hand suggests large scale illegal cutting of the resource from public land.

Broombrush (*Melaleuca uncinata*) is harvested from public land in the Big Desert and Sunset Country in the Victorian Mallee. It is used to provide brush fencing and other panel products. Wilderness areas in Victoria are being destroyed for the sake of luxury fencing principally for the Adelaide market. Harvesting from public land in South Australia was banned years ago, and now most of the cutters are exploiting the Victorian public land resource.

As well as creating an extensive unplanned track network, the industry destroys wilderness, spreads weeds and threatens endemic mallee fauna that prefer old stands of broombrush. The Mallee Fowl in particular may be threatened.

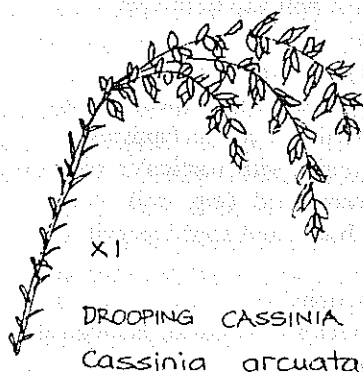
The Wilderness Society recommends that if harvesting is to continue, then it should be on private land plantations as recommended by the Ferguson Report into the Timber Industry (1985). It has recommended that all broombrush harvesting be phased out on Mallee public lands by 1991.

- extracted from *Wilderness News*, March 1989, page 2.

## Bats in Greswell

A recent survey in Greswell Forest (21/3/89) conducted by Cam Beardsell and Martin Schulz of the Arthur Rylah Institute was successful in identifying the presence of 7 species of bats! This is quite significant for an area in the heart of suburbia. The most significant find was the uncommon Broad Nosed Bat. This survey places the Wildlife Reserves "On the map" of zoologically significant sites. Other bat species recorded included White - striped Bat, Lesser Long-eared Bat, Gould's Wattleed Bat, Chocolate Wattleed Bat, Broad Nosed Bat, Little Forest Eptesicus, and Large Forest Eptesicus.

- *Wildlife Reserves Support Group Newsletter*, April 1989.



## Friends Conference

The Fourth Biennial Friends of National Parks Conference was held in the Gramplans on the Labour Day Weekend. Features of the conference were an outstanding talk by Graham Pizze, a choice of excellent workshops, and a talk by Pam Kohring, an organizer of South Australian Friends. The conference resolved to hold a fifth conference on the Labour Day weekend, 1991. The following motions were passed by the conference:

"This conference views with concern the fact that the prime qualification for the appointment of Rangers on conservation reserves is their public relations ability. This conference urges that a knowledge of flora and fauna and an understanding of Parks values should be a major criteria in the selection and training of Rangers."

"Environmental weeds constitute the greatest conservation threat in Victoria on public and private land. Unless this problem is addressed as a matter of urgency there will be a massive loss of vegetation communities and plant and animal species throughout the state. This issue must be given the very highest priority by CF&L in funding and action, including community consultation."

"This conference regards non-returnable food containers and the escalating litter problem resulting as most serious, and requests urgent government action to require compulsory deposits on all metal glass and plastic drink containers."

- *VNPA Newsletter*, Vol 8, No 3, p 1.

## Endangered Species Advisory Committee

The second meeting of the federal Endangered Species Advisory Committee (ESAC) was held in Canberra between 20 and 21 February.

A major effort of this meeting was devoted to developing an outline for "A National Strategy for the Conservation of Species and Habitats Threatened with Extinction". Agreement was reached on budgetary needs for implementation of the Endangered Species Program. \$2 million will be required in the first year to successfully initiate all program components (including funding for NGO networks).

No money has yet been given to enable the implementation to commence, despite numerous promises from politicians. Ecology International urges you to write to Senator Richardson, the Prime Minister, and Senator Walsh, asking that promises be honoured and stressing that \$2 million is needed.

The NGO reps on ESAC are Jamie Kirkpatrick in Hobart (002) 202 101, Phillip Sutton in Melbourne (03) 412 4011, Ian Higgins in Sydney (02) 261 5572, and Liz Bourne in Brisbane (07) 221 0188.

- *Ecology International*, 15/3/89.

Victoria by Forbes and Ross (1988) - about 850 - and the number given here which is based on additional unlogged collections and sight records (mostly by Carr, unpublished data). Additional species native to Victoria but naturalized outside their natural geographic range (Robinson *et al.* 1986), have also been included. As pointed out by Short (1988), botanical collectors often ignore the introduced flora.

Exotic species are being introduced to Victoria continually, especially in a flood of horticultural and agricultural introductions. The naturalized flora will continue to increase. Ross (1976) calculated that an average 5-6 species had been introduced annually since European settlement. On the basis of the figure given here an average of over seven species has been introduced annually.

Table 1. Victorian indigenous and naturalized vascular flora statistics.

No. of species & infraspecific taxa	Indigenous flora <sup>1</sup>	Naturalized flora <sup>2</sup>
Ferns & fern allies	c 120	4 (3.2%)
Conifers	6	12
Monocotyledons	c 860	c.280 (24.5%)*
Dicotyledons	c 2110	c 850 (28.7%)
Totals	3096	1146 (27.0%)

1 - Figures calculated from Forbes and Ross (1988).

2 - Figures calculated from Forbes and Ross (1988) plus about 300 additional species recorded by Carr (unpublished data) and other botanists, especially R. Robinson, D. Albrecht, J. Yugovic, and R. Adair (pers. comm).

\* - Percentage figures refer to percent of combined native and exotic flora.

#### COUNTRY OF ORIGIN AND MODE OF INTRODUCTION OF THE WEED FLORA

Naturalised species come from many countries and predictably these are mostly temperate regions of both hemispheres. Mediterranean climatic regions have provided a large percentage of species, as have the regions from which the traditional garden flora has been culled, especially Europe and eastern Asia. What is often overlooked or under-rated, however, is that a significant proportion, including extremely serious environmental weeds, come from elsewhere in Australia or Victoria (e.g. Gleadow 1982,

Robinson *et al.* 1986, Carr *et al.* 1988, Robin and Carr 1983).

Many species (probably about 30%) were accidentally introduced in various ways, mostly relatively early in the history of European settlement (Parsons 1973). Deliberately introduced species form the bulk of the weed flora. Carr *et al.* (1986) estimated that about 60% of the weed flora was deliberately introduced for ornament and utility but this figure may be closer to 70% now.

Hundreds of species are currently available in the nursery trade (see for example Carr *et al.* 1986, 1988, Robin and Carr 1983, Elliot 1986) and scores of species, often exceedingly serious environmental weeds, are used for soil stabilization, fodder crops, and other agricultural and environmental management applications. Many hundreds of additional species are cultivated and only need an opportunity to 'escape' while there is almost no restriction on the introduction of countless new species. A case in point may be the genus *Erica* which contains some 500 species (Willis 1973). Of the few long cultivated species in Victoria; four are very seriously or potentially serious environmental weeds. Recently *Erica* societies have sprung up and are actively engaged in introducing many new species.

#### BIOLOGICAL AND ECOLOGICAL ASPECTS OF WEEDS

Detailed analyses of the biological and ecological attributes of environmental weeds must be made as a matter of priority and this will yield valuable insights into the types of successful weeds, their rate of spread, communities invaded or likely to be invaded, and control methods as well as species which should be prohibited imports. Aspects of environmental weeds which require investigation include:

- distribution and abundance
- breeding system and pollination biology
- habitat parameters
- life form, longevity and growth rate
- role of vegetative versus sexual reproduction
- seed and vegetative dispersal mechanisms
- regeneration strategies with particular reference to regeneration from seed (e.g. soil stored or canopy stored seed banks and seed longevity
- response to fire
- allelopathic interactions
- susceptibility to various chemical, ecological or mechanical control methods
- predators and pathogens.

## WHAT ARE THE MOST SERIOUS ENVIRONMENTAL WEED SPECIES ?

In Victoria the distribution and abundance of exotic plant species parallels that of the indigenous flora. Some species are restricted to small solitary populations (e.g. *Washingtonia filifera*, Cotton Palm - less than 40 plants (Carr unpublished data). Others are extremely widespread and abundant, occupying all available habitat (e.g. *Hypochoeris radicata*, Flatweed). Many factors are responsible for this uneven distribution and abundance. Some of the more obvious are:

- ecological amplitude (How much habitat is available for the species to occupy?),
- distribution of suitable habitat,
- propagule dispersal capacity,
- availability of dispersal vectors,
- fecundity,
- life form, plant size and age to reproductive maturity,
- time when first introduced,
- places of deliberate introduction,
- disturbance regimes (qualitative and quantitative aspects).

Many naturalized exotic species are not regarded as environmental weeds, either because they are dependent on severely modified habitats or have not yet reached a situation where they can behave as such. Carr and Yugovic (1988) have compiled a preliminary list of about 450 environmental weed species and some of their attributes in Victoria.

Some weeds are much more serious than others because of their broad ecological amplitude, widespread distribution, invasive capacity in the absence of obvious disturbance and rate of spread. The 60 odd most serious of these species are listed in Appendix 1 - data from Carr and Yugovic (1988). The choice is arbitrary in some cases, though there would be general agreement about the inclusion of species such as *Myrsiphyllum asparagoides* (Smilax Asparagus), *Chrysanthemoides monilifera* (Boneseed), *Cytisus scoparius* (English Broom), *Phalaris aquatica* (Toowoomba Canary Grass) and *Pitosporum undulatum* (Sweet Pittosporum). While some species are presently naturalized in very few places in Victoria they exhibit a strong invasive capacity and rapid rate of spread. On present trends they are bound to be the major weeds of the future. A case in point is *Erica baccans* (Berry-flower Heath) which I have only seen naturalized in

several places: near Portland and on the Mornington Peninsula (see McMahon *et al.* 1987) where it is fairly widespread.

A final point is that the control of some weed species e.g. widespread grasses such as *Anthoxanthum odoratum* (Sweet Vernal-grass), except in small, intensively managed situations, is not feasible. In vegetation management studies (e.g. Albrecht 1983, Carr 1987a, Carr *et al.* 1987b, McMahon *et al.* 1987) the species targeted for control or elimination are mostly woody species; this is also emphasised elsewhere e.g. New South Wales (Buchanan 1981) and South Africa (McDonald and Richardson 1986).

## 'OUT OF BALANCE' INDIGENOUS SPECIES

Several indigenous species normally confined to coastal vegetation are rapidly invading and destroying indigenous vegetation inland from the coast. The most significant species involved are *Leptospermum laevigatum* (Coast Tea-tree)(e.g. Burrell 1981, McMahon *et al.* 1987) and *Acacia sophorae* (Coast Wattle)(Cohen 1981, McMahon *et al.* 1987, Carr and Kinhill Engineers in press, A.C. Beaglehole pers. comm.) which is likely to eliminate coastal and near coastal heathlands in the next few decades in south west Victoria.

## PROBLEMS RESULTING FROM HYBRIDIZATION AND 'GENETIC POLLUTION'

Introduced taxa may hybridize with *in situ* indigenous taxa where they are brought into contact by deliberate or accidental introduction. The resultant hybrids can out-compete the indigenous populations and possibly cause their elimination. This is particularly significant in respect of rare species. Foreign provenances of indigenous species, introduced for forestry or other purposes, may cause 'genetic pollution' with unknown consequences (Robin and Carr 1983, 1986).

Highly detrimental hybridization has been reported between the rare indigenous *Grevillea glabella* and exotic taxa at several sites near Melbourne (Robin and Carr 1983, 1986; Carr 1986a) A number of other examples have been recorded, including a massive hybrid swarm between *Acacia mucronata* (native) and *A. longifolia* (introduced) at West Barwon Dam near Forrest (Carr unpublished data).

## EFFECTS ON VEGETATION COMMUNITIES

Probably no Victorian vegetation communities have remained free of weeds, even in the most remote areas. Assuming the availability of propagules the number of species able to establish and increase will depend on many physical environmental variables, the structure and floristics of the vegetation and the quality and quantity of the disturbances. There are however, certain vegetation communities which appear much more prone to invasion than others (e.g. riparian vegetation and coastal shrublands) but this may be partly a function of the number of species available for colonization and frequency of disturbances.

What is clear is that weed invasions over time may eliminate indigenous vegetation as a result of competition. Whole biomes may be eliminated. Numerous vegetation studies have documented these structural and floristic effects of weed invasion e.g. Gullan *et al.* (1980), Carr *et al.* (1987a), McMahon *et al.* (1987). This is illustrated spectacularly in the open grassy woodlands of the You Yang Ranges south west of Melbourne which have been almost totally invaded by *Chrysanthemoides monilifera* (Boneseed) which forms an impenetrable shrub layer up to 3m high. Only scattered emergent trees remain from the original vegetation and these will fail to regenerate, become senescent and ultimately die. If *Chrysanthemoides* was eliminated, its place would be taken by equally devastating invasions of *Myrsiphyllum asparagoides* (Smilax Asparagus), *Ehrhata longiflora* (Annual Veldt-grass) and *Briza maxima* (Large Quaking-grass), very large populations of which already exist.

The You Yangs is a perfect model or microcosm: what has occurred there is likely to happen to most Victorian vegetation. Hundreds of species are available to fill the role of invaders.

## CONSERVATION THREATS TO VICTORIAN PLANT SPECIES

According to data compiled by Gullan *et al.* (in press) on the conservation status of the Victorian vascular flora, about 26% of their approximately 3010 species face conservation problems at the state level. The statistics are as follows: extinct - 35 taxa, endangered - 105 taxa, vulnerable - 297 taxa, depleted - 14 taxa, rare - 361 taxa, which gives a total of 812 taxa. These data represent conservative estimates and in addition very many more species

are regionally rare, endangered or vulnerable in the short or long term.

The reasons why such an astonishingly large number of species are facing conservation problems in Victoria have been discussed by Scarlett and Parsons (1982) and Leigh *et al.* (1984) in a broad context. Weed invasions are included amongst the threats they identify to populations of rare plants, however the full role of weeds as threats to the existence of plant species has not been evaluated. Weeds constitute the most serious indirect long-term threat of all.

Published data concerning individual rare taxa threatened by weed invasions (amongst other factors) are scarce but Victorian examples include *Discaria* (Rhamnaceae) (Lunt 1987), *Olearia* (Asteraceae) (Wisniew *et al.* 1987) and *Caladenia* (Orchidaceae) (Carr 1986, 1987, Carr and Kinhill in press). About half the Victorian orchid flora of about 220 species faces a serious short or long term conservation problem (Carr 1987b) and weed invasions rate as the most, or one of the most, significant threats (Carr unpublished data). This is partly a function of orchid size (small herbs) and scattered distribution, often as small isolated populations.

As with plant communities, rare species are often faced with weed invasions because of management neglect or malpractice e.g. importation of weed seeds on contaminated machinery (Carr and Kinhill Engineers in press).

## CREATION AND EXACERBATION OF ENVIRONMENTAL WEED PROBLEMS BY LAND MANAGEMENT PRACTICES

Man, as the primary dispersal agent, has already deliberately introduced many weed species to Victoria. This raises many questions about the control and management of environmental weeds. If we do not address the issue urgently we can never pretend to be seriously concerned about weed control. We simply must go along the path advocated by Harty (1987) for Illinois *viz* the introduction of a meaningful version of his proposed Exotic Weed Control Act - to ban the sale and planting of all weed species (except in special cases e.g. economic species). This of course demands a radical rethink of most of our perceptions concerning weeds. We must also be prepared to admit, if any progress is to be made, that our record at all levels concerning environmental weeds is one of almost total failure

- either to perceive or address the problem in any meaningful way. Rhetoric will not solve problems.

Land management practices in Victoria include a wide range of environmental practices at all levels that cause and/or exacerbate environmental weed invasions. Some examples illustrate the nature of the problem:

(1) Soil stabilization and revegetation.

- Of the 153 species advocated by Zallar (1980) for soil stabilization at least 51 are serious or very serious environmental weeds; many more are lesser weed species.

- Of the 10 species advocated for coastal erosion control (Hill *et al.* 1985), nine are serious or very serious environmental weeds.

- Species used in ski-slope grooming in alpine Victoria are very serious environmental weeds e.g. *Trifolium repens* (White Clover).

- Importation of weed-contaminated straw to protect exposed soil (e.g. at Point Addis).

(2) Application of fertilizer - especially in the above soil stabilization measures.

(3) Movement of contaminated soil and rock:

- Soil or rock used for fill or horticultural purposes (e.g. Carr *et al.* 1987b).

- Roadmaking - the spread of weeds is apparently never considered during road construction or maintenance but is a major means by which weeds are spread e.g. Anon (1987) and *Allium triquetrum* (Angled Onion) along the Princes Highway east of Melbourne (Carr unpublished data).

(4) Weed seed on contaminated machinery (e.g. *Ehrharta calycina* (Perennial Veldt-grass) at Portland (Carr and Kinhill Engineers in press).

(5) Soil disturbance of all types, especially by machinery and domestic stock.

(6) Mowing of indigenous vegetation (see for example McMahon *et al.* 1987).

(7) Grazing domestic stock on public and private land:

- *Juncus effusus* (Rush) an extremely serious environmental weed in moist alpine vegetation is dispersed by cattle (in dung) and promoted by their disturbance (Carr unpublished data).

- Over 30 weed species have been recorded in cattle dung at Gellions Run (South Gippsland) on public land that is illegally grazed (Carr unpublished data).

(8) Altered hydrological regimes (with or without associated eutrophication) resulting from uncontrolled run-off from roads, buildings and septic tank outlets (e.g. Carr and Robinson 1985).

(9) Imposed fire regimes or lack of fire may promote weed invasion (e.g. McMahon *et al.* 1987).

(10) Recreational activities including off-road vehicles and horse riding may transport seed (Wace 1977) and disturb soil (Carr unpublished data).

## THE FUTURE ?

Unless the massive problem of environmental weeds is addressed urgently and comprehensively we will be wasting our time and money. Without appropriate action several scenarios are possible: mass extinction and/or degradation of plant and animal communities and extinction of many species, or a desperate rear-guard action to preserve dwindling biota in reserves surrounded by a sea of exotic vegetation and subject to a continuous rain of exotic propagules.

We still have time to act, but not much. Action is required at all levels of government (Federal, State, Local), between States and amongst all sectors of society, on all land, public and private. It is everyone's problem and it has highly significant economic, social and conservation consequences.

The following initiatives are essential:

(a) Collation and analysis of all existing data on environmental weeds.

(b) A thorough appraisal of the status of environmental weed invasions throughout the State on public and private land - including distribution and taxa involved.

(c) Identification of the sources of environmental weeds and the ways in which they are spread.

(d) Research into the biology and ecology of environmental weeds.

(e) Research into the control of environmental weeds including biological control.

(f) Rigorous evaluation and overhaul (where necessary) of all aspects of land management in Victoria.

(g) Properly trained botanists at the centre of land management practices.

(h) Stringent screening of all exotic plant imports into Australia and framing of rigorous quarantine

laws and laws to ban the sale or cultivation of environmental weeds.

(i) Massive education programmes at all levels using modern electronic media, and publications on all aspects of environmental weeds including land management prescriptions.

(j) Cessation of grazing in all sensitive areas.

(k) Action on the ground now to tackle existing weed populations.

(l) Study of overseas weed management initiatives especially in South Africa and USA.

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## profile:

Continued from page 6.

Paratea, part of Clipperton Reserve, and the other being the Mooroduc Quarry Reserve. Weed eradication has been a constant task, not only of exotics, but also the vigorous invaders Sallow Wattle and Sweet Pittosporum. Preparation for revegetation, and plantings, have also taken place. The Quarry project is of special interest, involving a professional botanical survey by Geoff Carr. Implementation of his recommendations has been facilitated by funding received from CF&L.

The excellent record already achieved by MEAFEC

has attracted funding and various awards, including a grant which was part of Frankston Council's Tidy Town award. Grants such as these have allowed MEAFEC to purchase a photocopier, propagating equipment, and to produce a high quality brochure.

After putting this article together I wondered how Anne Read managed to facilitate all this and also spare me the time to provide me with information over the phone. Many thanks Anne.

Appendix 1. Some of the most serious and potentially serious environmental weeds in Victoria. Source Carr and Yugovic (1988). Taxonomic nomenclature follows Forbes and Ross (1988).

SPECIES	COMMON NAME	FAMILY
<i>Acacia baileyana</i>	Cootamundra Wattle	Mimosaceae
<i>Acacia decurrens</i>	Early Black Wattle	Mimosaceae
<i>Acacia elata</i>	Cedar Wattle	Mimosaceae
<i>Acacia longifolia</i>	Sallow Wattle	Mimosaceae
<i>Acacia saligna</i>	Golden Wreath Wattle	Mimosaceae
<i>Acacia sophorae</i>	Coast Wattle	Mimosaceae
<i>Agrostis capillaris</i>	Brown-top Bent	Poaceae
<i>Albizia lophantha</i>	Cape Wattle	Mimosaceae
<i>Allium triquetrum</i>	Three-cornered Garlic	Liliaceae
<i>Ammophila arenaria</i>	Marram Grass	Poaceae
<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass	Poaceae
<i>Briza maxima</i>	Large Quaking-grass	Poaceae
<i>Bromus diandrus</i>	Great Brome	Poaceae
<i>Calycotome spinosa</i>	Spiny Broom	Fabaceae
<i>Cestrum elegans</i>	Cestrum	Solanaceae
<i>Chrysanthemoides monilifera</i>	Boneseed	Asteraceae
<i>Coprosma repens</i>	Taupata	Rubiaceae
<i>Coprosma robusta</i>	Karamu	Rubiaceae
<i>Cortaderia selloana</i>	Pampas Grass	Poaceae
<i>Cotoneaster glaucophyllus</i>	Cotoneaster	Rosaceae
<i>Cotoneaster pannosa</i>	Cotoneaster	Rosaceae
<i>Crataegus monogyna</i>	Hawthorn	Rosaceae
<i>Cynara cardunculus</i>	Artichoke Thistle	Asteraceae
<i>Cytisus palmensis</i>	Tree Lucerne	Fabaceae
<i>Cytisus scoparius</i>	English Broom	Fabaceae
<i>Delairea odorata</i>	Ivy Groundsel	Asteraceae
<i>Dipogon lignosus</i>	Dolichos	Fabaceae
<i>Ehrharta calycina</i>	Perennial Veldt Grass	Poaceae
<i>Ehrharta erecta</i>	Panic Veldt Grass	Poaceae
<i>Ehrharta longiflora</i>	Annual Veldt Grass	Poaceae
<i>Eragrostis curvula</i>	African Love-grass	Poaceae
<i>Erica baccans</i>	Berry-flower Heath	Ericaceae
<i>Erica lusitanica</i>	Spanish Heath	Ericaceae
<i>Genista linifolia</i>	Flax-leaf Broom	Fabaceae
<i>Genista monspessulana</i>	Montpellier Broom	Fabaceae
<i>Hakea suaveolens</i>	Sweet Hakea	Proteaceae
<i>Hedera helix</i>	Ivy	Araliaceae
<i>Holcus lanatus</i>	Yorkshire Fog	Poaceae
<i>Hypericum androsaemum</i>	Tutsan	Hypericaceae
<i>Hypericum perforatum</i>	St John's Wort	Hypericaceae
<i>Juncus acutus</i>	Sharp Rush	Juncaceae
<i>Juncus effusus</i>	Rush	Juncaceae
<i>Leptospermum laevigatum</i>	Coast Tea-tree	Myrtaceae
<i>Leycesteria formosa</i>	Himalayan Honeysuckle	Caprifoliaceae
<i>Lonicera japonica</i>	Japanese Honeysuckle	Caprifoliaceae
<i>Myrsiphyllum asparagoides</i>	Smilax Asparagus	Liliaceae
<i>Nassella trichotoma</i>	Nassella Tussock	Poaceae
<i>Oenothera glazioviana</i>	Evening Primrose	Onagraceae
<i>Oxalis pes-caprae</i>	Soursob	Oxalidaceae
<i>Phalaris aquatica</i>	Toowoomba Canary-grass	Poaceae
<i>Pittosporum undulatum</i>	Sweet Pittosporum	Pittosporaceae
<i>Polygala myrtifolia</i>	Myrtle-leaf Milkwort	Polygalaceae
<i>Rhamnus alaternus</i>	Italian Buck-thorn	Rhamnaceae
<i>Rubus procerus</i>	Blackberry	Rosaceae
<i>Rumex acetosella</i> spp. agg.	Sheep Sorrel	Polygonaceae
<i>Salix fragilis</i>	Crack Willow	Salicaceae
<i>Senecio pterophorus</i>	African Daisy	Asteraceae
<i>Solanum pseudocapsicum</i>	Madeira Winter Cherry	Solanaceae
<i>Sparaxis bulbifera</i>	Harlequin-flower	Iridaceae
<i>Stipa neesiana</i>	Spear-grass	Poaceae
<i>Trifolium repens</i>	White Clover	Fabaceae
<i>Typha latifolia</i>	Great Reedmace	Typhaceae
<i>Ulex europaeus</i>	Furze or Gorse	Fabaceae
<i>Vinca major</i>	Blue Periwinkle	Apocynaceae
<i>Watsonia bulbifera</i>	Bulbil Watsonia	Iridaceae