

INDIGENOTES



Hymenanthera dentata
Drawn in ink by Shirley Diez

Sydney IFFA meeting report:

Conservation Genetics. What does it mean? How can we use it?

This subject provided a stimulating topic for discussion from Derek Spielman, Chief Veterinary Officer at Taronga Zoo.

There are an estimated 10 million species of plants, animals and micro-organisms, of which 8.5 million are not identified. The mushrooming human population and the rapid rate of destruction of much of the earth's natural habitats has caused the extinction and near extinction of many animal and plant species. Some scientists predict a "demographic winter" of 500-1000 years during which most of the tropical habitats will be destroyed.

Conservation groups are attempting to save as much of the existing biota as they can, and to do this most effectively with very little resources requires an understanding and the implementation of correct genetic theories to their conservation strategies.

Why conserve?

Why bother with conservation? The enormous scale of extinctions and habitat destruction are the overriding factors fuelling the conservation movement. The real long term benefits of conserving nature are in being able to satisfy the deep, genetically programmed needs that people have to experience the natural world.

Evolution

The gene pool is the total of all the genotypes in a population. For evolution to occur within a species the gene pool must include genetic variation. Most natural populations possess a great deal of genetic variation. The ability of species to survive depends on their capacity to evolve. A conservation programme must provide an evolutionary potential to allow survival in the long term.

Conservation genetics

The experience of animal breeders has shown that selection can balance genetic drift if the rate of inbreeding per generation is no more than 1%. This has become the basic rule of conservation genetics and provides the basis for calculating the minimum population size consistent with the short term preservation of fitness: an effective population size of 50.

Coadaptation and population boundaries:

Local populations often adapt to the local environment, particularly if dispersal is limited. Hybridisation between different local populations can sometimes destroy locally adapted gene complexes. For example, when the Tatra Mountain Ibex in Czechoslovakia became extinct, ibex were successfully transferred from nearby Austria. Some years later, Bezoars from Turkey and the Nubian Ibex from the Sinai were added to the Tatra herd. The resulting fertile hybrids rutted in early autumn instead of winter, and the kids were born in February, the coldest month of the year, causing the

entire population to become extinct.

Very large populations have very stable gene pools. For example, if a species had a large population on the Australian mainland and on Tasmania during the last ice-age which is now divided by Bass Strait, the evolutionary short time of separation may not have resulted in any detectable genetic change in either population from the original or from each other in both populations remained large. If there are no genetic barriers between them, there would be no justification in regarding them as separate species or subspecies and exchanges between them would have no genetic consequences.

Another factor is the extent of the gene pool. Extreme examples are birds which migrate between the Arctic and the Antarctic each year. Unless there are strong segregating forces (e.g. restricted breeding site), the species must be regarded as a single population. At the other extreme are plant species which demonstrate reproductive impairment if crossed with conspecifics growing only 50 metres away. Similarly, some frog species show complete reproductive incompatibility with conspecifics from isolated ponds less than a kilometre away.

Outbreeding depression

Hybridisation between different locally adapted populations can cause an outbreeding depression: embryonic death, stillbirths, decreased fertility. In species with wide dispersal outbreeding depression is unlikely except over vast distances, but in species with more localised dispersal the probability of outbreeding depression is higher. Therefore it is probably wiser to choose individuals from the same geographic region for enriching captive or wild populations in species with limited dispersal. There are populations with large genetic distances having no observed outbreeding depression.

Translocation programmes

Many natural habitats have become fragmented, dividing many species into subpopulations. Small groups result in greater genetic divergence between them but less within each subpopulation, increasing inbreeding depression. These small populations are more likely to become extinct, eventually leading to the extinction of the entire species.

This can be stopped or even reversed by increasing gene flow between populations: the re-establishment of 'corridors' between isolated habitats and the transfer of individuals between otherwise separated populations making them an interbreeding unit. The larger effective population will be less likely to become extinct.

Objections have been made to such genetic transfers:

1. Contamination of the natural integrity of the endemic gene pool: this is of concern for taxonomic enquiry. However many of the gene pools can not be

regarded as pristine. Re-establishing gene flow may not only improve the chances of survival, it may stabilise the gene pool and maintain the species in a more "natural" state than if no genetic management was undertaken.

2. The risk of spreading disease. This risk can be avoided by effective quarantine procedures.

The design of a translocation programme depends on its objectives, which might include:

1. the re-introduction of a species into part of its former distribution after habitat rehabilitation;
2. the introduction of a species into an apparently suitable habitat outside its historic range;
3. adding individuals to increase a remnant population;
4. adding individuals to substitute for lost natural gene flow.

For reintroduction within a species' former distribution the use of pre-adapted stock from adjacent populations is recommended. If this is not possible, if the habitat is permanently altered, or if the introduction is outside the species' natural range, stock with maximum variability should be used. This can be achieved by extensively crossing representatives of the entire gene pool.

If substituting for lost gene flow into a relatively large population, the source of the stock is not as significant. If introduced stock possesses alleles (variants of individual genes) beneficial in the new environment, they may persist and spread through the population without detrimental effects. If the immigrant genotypes are detrimental, selection pressures will hamper their spread and possibly eliminate them depending on the number and severity of disadvantages they confer.

Implications for bush regeneration

Many habitats have changed greatly over the past 200 years. This may be a result of human intervention as evidenced in the increased water/nutrient flow in bushland or natural changes (e.g. climatic). Whatever the cause, the question regarding the feasibility of maintaining the bushland in its original state still remains. What constitutes the 'original' state, or are the conditions so altered that indigenous species are less likely to survive or fare as well? Is it a matter of preserving the integrity of the genotype (preservation) or encouraging genetic variation? It depends on your objective, viewpoint and on the resources available. From a genetic conservation point of view genetic variation and the subsequent survival of the species is paramount.

As genetic variation is an essential feature of species survival, this has important implications for seed collectors in bush regeneration. It necessitates seed be collected in an area as large and diverse as possible. The extent of the area will vary depending on the method for seed dispersal and the ease of the gene flow.

For example, seeds dispersed by birds can be distributed as widely as between Sydney and Wollongong.

To ensure variation seed also needs to be collected from as many "wild growing" plants as possible. They should not be gathered from a favourite or easy to access site, nor should they be picked from only the well laden or easy to reach specimens. Plants chosen for regeneration need to be chosen in equal numbers from each donor plant and these should be identified so different plants can be used in following years. It also requires identification of each donor plant at the seed, germination and seedling stage.

It is also important not to just select seed from the "good looking" specimens. Such plants may be in this condition because they are responding to certain favourable environmental conditions present at the time. If these conditions change in any way so may their ability to survive. It may be, for example, the more wizened looking plant is better able to survive heavy rains and high winds. Similarly, choosing only the plants which grow well in nurseries means selecting only those plants which look healthy in the nursery means selecting only those plants which grow well in nursery conditions. They may not do as well in the bush.

The key overall factor is to use plants with the greatest amount of genetic diversity as possible, without focusing on a particular plant or group of plants at any stage.

The next Sydney IFFA meeting will be held on Monday 7 December at 7.30 pm at the Maiden Theatre, Mrs Macquarie Road, The Royal Botanic Gardens. Judy Fakes from Ryde College of TAFE will speak on 'The health of trees and its significance to our bushland'. All welcome.

Indigenous Nurseries Network

A recap of the Network's activities over 1992

By Sue Mills

Approximately eighteen months ago IFFA hosted a series of workshops entitled 'Seed collection and horticulture of indigenous plants - Strategies, standards and future directions'. These workshops were convened to address issues of common concern regarding conservation and propagation imperatives for the horticulture of indigenous plants. Graeme Lorimer succinctly captured these concerns and said "In some areas revegetation cowboys are raping the natural vegetation of its seed; genetic time bombs are being set by growers with no understanding of genetics; money is being wasted on plants of the wrong species or provenance; and the industry is getting a bad name in some quarters because of sloppy practises".

The response of indigenous seed collectors, plant growers and others to the workshops was strong enough to warrant the establishment of a subgroup of IFFA to specifically address issues raised. The issues and other activities so far have included:

1. NRCL - At a meeting with a representative from the Natural Resources Conservation League (NRCL) INN members expressed concern about NRCL's continuing sale of environmental weeds, sale of indigenous plants to retail outlets who are generally unable to verify provenance, and pricing policy - leaving smaller nurseries unable to compete. Although it is difficult to influence such large organisations in the short term, we were assured that at least NRCL would begin to act on the first two.

2. Overcollection of seed from remnant vegetation is of ongoing concern. A recent meeting with Matt White from the Department of Conservation and Environment (now Department of Conservation and Natural Resources - DCNR) identified some strategies which could be put in place. Unfortunately Matt was moved to a different area before these could be followed up. If over this collection season you note any overcollection of seed and/or other abuse of remnant vegetation please report it to the the regional or central DCNR offices or to the Network who can then pursue any problems with the Department.

3. We have written and produced a pamphlet for use by nurseries outlining why indigenous plants are important and includes a list of nurseries in the greater Melbourne area where indigenous plants can be found. A reissue of this is now available and a similar pamphlet for rural Victoria is on the drawing board. Please contact us for a copy or multiple copies are available at cost price (about 7c each).

4. A funding submission has been sent to the Department of Planning and Housing (Area Improvement Program) for \$10,000 to produce a brochure along the same lines to the above but including a map and detailed information on remnant vegetation, soil types, geology and nursery locations in Melbourne. The submission has been recommended for funding by the

now defunct Labor Govt. We are still waiting to hear from the Libs.....

5. We held a very successful display at the Ringwood Wildflower Show surprising thousands of people with the beauty and diversity of indigenous plants.

6. At a recent meeting Lincoln Kern spoke about the accreditation of organic food growers and the relevance this might have for indigenous plant growers. I have a feeling that we are not quite ready for this step but perhaps for the future?

7. A questionnaire has been developed and sent to around 75 nurseries in Victoria. These nurseries undertake at least some indigenous plant propagation, seed collection or both. We are interested primarily in developing a profile of such nurseries and seed collectors and further extending the network. To date about one third of nurseries have completed the questionnaires and more are dribbling in. Hopefully the January edition of Indigenotes will report on the results. For those of you who have received a questionnaire and not returned it we'd love some more back. If you did not get one but feel like filling out forms please ask.

8. As nursery people would be aware, there is a Department of Primary Industry levy of 2.5% on all pots purchased. This levy is supposedly directed toward horticultural promotion and research. The levy is passed on to two organisations for dispersal - the Horticultural Research and Development Corporation and the Australian Horticultural Corporation. Recently one of our member nurseries wrote to the above requesting assistance with funding for a booklet which we believe clearly fell within the promotional category for which the levy is collected. They were informed that indigenous plants are 'non-commercial' and therefore not within the funding guidelines. It has been difficult to find out exactly what the guidelines are and the criteria under which the funds are made available. I have written to the Minister asking for copies of guidelines and criteria so that we can help nurseries to recoup some of the levy money. If indigenous plants do not fall within guidelines, we are asking for exemption from the levy.

Finally, INN membership has been steadily increasing and currently has about 30 members - about one third of indigenous nurseries identified. New members are welcome as are suggestions for directions we should be taking in 1993. Thanks to all those who helped and participated throughout the year, happy seed collection and propagation season and see you next year.

Using indigenous species for alpine rehabilitation

by Warwick Papst¹ and John Morgan²

Indigenous versus exotic species

There are many areas of disturbance in the alps that require rehabilitation. The construction of roads, ski fields and other tourist facilities create areas of bare soil that need to be stabilised and revegetated to control erosion. Rehabilitation also aims to restore natural ecosystems.

The traditional 'alpine mix' contains seed of exotic grass and clover species bred in New Zealand or American highland areas. These species germinate quickly and grow rapidly given favourable soil conditions and sufficient mineral fertiliser. But they do not provide long-term stable vegetation as areas sown with 'alpine mix' are prone to invasion by a host of weeds, and being exotic species they are incompatible with the conservation of natural areas.

Indigenous alpine species are adapted to Australian alpine climatic and soil conditions and do not need fertiliser. Initially they may be slow growing but their growth habits, combined with the large amounts of plant-matter they produce, provide optimal catchment protection. Mature stands of indigenous species form a stable vegetative cover, they are not readily invaded by weeds and they provide an attractive wildflower display which is important for tourism.

Using indigenous seed on the Bogong High Plains

Research on indigenous species suitable for rehabilitation on the Bogong High Plains commenced in the early 1980s. Ledge Grass (*Poa hothamensis*) was found to be highly suitable as it produces large amounts of highly viable seed which germinates readily. It is also rhizomatous and a natural coloniser of bare ground.

Over the past four summers a total of 150 kg of Ledge grass seed, and smaller amounts of seed from other grasses, forbs and shrubs was harvested from Falls Creek ski slopes by rangers, resort workers, scientists and volunteers. More than 80 kg of seed has now been sown on sites ranging from badly eroded ski slopes at Mt. Hotham to road batters in ski resorts and a ski trail through the Alpine National Park. Seedling germination, establishment, survival and growth on the sites, some with minimal soil, is encouraging. Each site will be monitored during the coming

summers to assess plant establishment and growth and to further refine rehabilitation methods.

Cultivating alpine species for seed production at low elevations

This is a potential method for producing larger quantities of seed more cheaply than harvesting in the alps. In April 1990 trials commenced at Ovens Research Station in north-eastern Victoria to investigate seed production of alpine species under cultivation. Ledge Grass is the major species in the trials but other grasses and wildflowers have been progressively added.

Results so far show that some Ledge Grass plants produce enormous quantities of highly viable seed whilst others produce little or no seed. Trials to select and breed plants with desirable attributes commenced in early 1992. Similar methods have been used by CSIRO scientists to develop a strain of Wallaby Grass (*Danthonia richardsonii*) for revegetation in lowland areas. The suitability of resultant plants to survive and reproduce in the alps, as well as to produce seed under cultivation, will need to be carefully assessed.

Future work

Developing a comprehensive set of techniques for alpine rehabilitation will require trials across a range of ecosystems and alpine environments. Tasks include selecting species with rehabilitation potential for each situation and continuing research on seed production and germination requirements of species chosen. Methods for rehabilitating wetlands and other fragile communities are particularly important.

An important step in 'spreading the word' about indigenous species will be taken in late February 1993 when the Dept. of Conservation and Natural Resources and the Australian Alps Liaison Committee sponsor an Alpine Rehabilitation Course which will cater for rangers and field staff from throughout the Alpine National Parks. At the same time, volunteers are invited to assist with harvesting seed of Ledge Grass, forbs and shrubs at Falls Creek. If you would like to be involved please contact Warwick Papst - phone (03) 479 1230 - facsimile (03) 471 0191.

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Victorian Marine Macroalgae

By Dr Julie Phillips*

Knowledge of the marine algal communities along the Victorian coast is limited to a few publications which only describe patterns of zonation (Bennett & Pope 1953, King *et al.* 1971). Little information is available on the structure or the determinants (recruitment, competition, herbivory) of the communities. In this paper, the common algal assemblages found on the open coasts in the Melbourne region are described.

The gently sloping sedimentary rock platforms along the Victorian coast provide a good substratum for the attachment of macroalgae. The platform surface is frequently pitted with depressions and seawater remains there during low tide reducing the effects of aerial exposure on the intertidal algae. One of the most diverse intertidal platforms in the Melbourne area is Glaneuse Reef at Point Lonsdale (the reef to the west of Lighthouse Reef). Glaneuse Reef is part of the Harold Holt Marine Park and algae should not be removed from the park. Lighthouse Reef at Point Lonsdale and the platform at Sorrento Back Beach (also marine parks) are less diverse as the platforms are slightly above low tide mark resulting in a poorly developed lower eulittoral zone.

Upper sublittoral zone

Kelps (*Macrocystis angustifolia*, *Ecklonia radiata* (order Laminariales) and *Phyllospora comosa* (order Fucales)) are the dominant species of the zone. They often form a dense canopy. Below the canopy, the rocky substratum is frequently covered by a luxuriant growth of algae. The algae belong to two different ecological groups: species which have an exclusively subtidal distribution and those which also occur in the intertidal zone. Exclusively subtidal algae include *Dictyopteris acrostichoides* which attains lengths of 80cm and can form extensive meadows, *Zonaria turneriana* which often grows near the holdfasts of *Macrocystis angustifolia* and many species of red algae as *Plocamium* spp. Species of *Caulerpa*, *Cladophora*, *Ulva*, *Halopteris*, *Cystophora* and *Cladostephus* are common in both the upper sublittoral and intertidal zones. Thalli of *Caulerpa* spp. are actually one very large multinucleate cell, even when they are one metre in length! *Caulerpa* has a fascinating mode of reproduction. The entire protoplast of the thallus is converted into gametes and when these are released simultaneously, only the thallus cell walls remain. Imminent gamete release is foreshadowed by the uniformly green thallus

forming a netlike pattern on its surface.

The Sublittoral Fringe

The bull kelp, *Durvillaea potatorum* is the dominant alga in the sublittoral fringe on rough water coasts. The zone comprises an often dense canopy of *Durvillaea* fronds and a substratum of large patches of rock covered only with encrusting coralline red algae and scattered patches of macroalgae as *Chaetomorpha coliformis*, *Halopteris* spp., *Laurencia* spp. and *Gelidium glandifolium*.

Lower Eulittoral Zone

This zone is best developed on rock platforms which gently slope into the sea at low tide mark (e.g. Glaneuse Reef, Point Lonsdale). In such localities the algal assemblages may be diverse with *Sargassum* spp., *Halopteris* spp., *Zonaria angustata*, and *Cystophora* spp. being abundant.

Mid Eulittoral Zone

The brown alga *Hormosira banksii* covers large areas of the rock platform in the zone. The coralline red alga *Corallina officinalis* and small individuals of *Cladophora prolifera* are understory species below the dense *Hormosira* canopy. Among the large patches of *Hormosira* are relatively bare areas colonised by usually monospecific patches of the turf red alga, *Gelidium pusillum*, the green sea lettuce *Ulva rigida*, the winter-spring seasonal green alga *Bryopsis vestita* and the winter-spring seasonal brown algae *Scytosiphon lomentaria*, *Petrospongium rugosum*, and *Splachnidium rugosum*. *Bryopsis*, *Splachnidium* and *Scytosiphon* have life histories involving an alternation between a macrothallus which is common during the winter-spring period and a microthallus which occurs during the rest of the year.

Intertidal algae are susceptible to desiccation when they are exposed to the drying effects of the sun and wind during the daylight low tides of summer. Thick carpets of *Ulva*, common to many intertidal platforms at the beginning of summer, are destroyed (thalli are bleached white) during periods of aerial exposure. Some *Hormosira* thalli are "burnt" (orange and black areas are observed on fronds) and subsequently die. During summer there is a marked reduction in intertidal algal biomass, just at the time of year when good weather and low tides encourage excursions across rock platforms. However, the very low tides of January and February allow access to the deep rockpools and platform regions of the upper sublittoral zone with their great algal diversity.

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Algal indicators of pollution

A good understanding of algal community structure especially detailed knowledge of variations in species diversity and abundance between localities as well as seasonal and temporal fluctuations is required before the effects of pollution can be identified by the presence or absence of certain algal species. The impact of low levels of pollution are currently difficult to assess while the more marked effects of large scale pollution (e.g. sewer outfalls) are easier to identify.

Melbourne Water have been monitoring the sewer outfall at Boag's Rocks 7 km north-west of Cape Schanck since 1980. (Brown *et al.* 1990). A survey conducted before the outfall commenced effluent discharge showed that the rock platform had a similar algal flora to adjacent localities (Manning 1979) and to what has been described above. After the commencement of discharge, the algal community at Boag's Rocks underwent marked changes in species composition and abundance. *Durvillaea*, *Hormosira*, and *Corallina* completely disappeared and have not recolonised there in the intervening years. The sublittoral zone is completely devoid of algae. The intertidal zone is covered by the turf algae, *Gelidium pusillum*, *Ulva rigida* and *Ceramium flaccidum*.

Gelidium pusillum and *Ulva rigida* are common components of unpolluted sites therefore their presence does not necessarily indicate pollution. *Ceramium flaccidum* is recorded only from polluted localities and it may well prove to be a good indicator of pollution. Turf algae are regarded as characteristic of stressful environments but the stress may also originate from natural sources (grazing pressure, desiccation).

The influence of the sewage plume which travels in a south-easterly direction from the outfall is still apparent at a site nearer to Cape Schanck and 4 km from the outfall. Small patches of *Hormosira* are found in the intertidal zone but the species never forms the extensive cover characteristic of non-polluted sites. *Durvillaea* is still absent from the sublittoral fringe but patches of red macroalgae are common. Turf algae (*Gelidium pusillum*, *Ulva rigida*, *Ceramium flaccidum*, *Corallina officinalis*) predominate in the intertidal zone.

On current knowledge, the absence of the brown algae *Hormosira* and *Durvillaea* together with the dominance of turf algae appear to indicate severe

pollution (lowered salinity, elevated nutrient levels, possible toxic substances) associated with large quantities of sewage effluent.

References

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Secrecy cancels Kennett's "mandate"

On Friday 2 October, the day before the 1992 State Government election, an edited transcript of the following letter from a coalition of leaders of concerned environmental groups appeared in *The Age*. Following the victory of the Kennett-led Liberal Party, CCV published in its newsletter *Environment Victoria* the complete letter together with Mr Kennett's reply:

Dear Mr Kennett,

Victorians have been waiting for the Coalition's policies on forests, mining, planning, and water for months. Now, under pressure, you have released these policies just 3 days before the election. Yet, according to your environment spokesperson, Mr Birrell, policies on forests and water were completed in June. (The Age, 17 June 1992). We are alarmed at many of the proposals in the policies released today. We are still waiting for the Coalition's energy policy. Through this delay, the Coalition has treated the electorate with contempt. The lack of time for public debate means that you cannot claim to have public support for your policies in these crucial areas should the Coalition win the election.

Yours sincerely,
Linda Parlane, Conservation Council of Victoria,
Doug Humann, Victorian National Parks Association,
Tim Fisher, Australian Conservation Foundation,
Fenella Barry, The Wilderness Society.

The reply:

Dear Ms Parlane,
Thank you for your letter of 30th September regarding our policies.

Your comments are noted, but we strongly disagree with your expressed views - as obviously does the majority of Victoria.
Yours sincerely
Jeff Kennett.

Coming events:

14 December: Franklin 10th Anniversary Celebrations. Actions in the city. For more information contact The Wilderness Society in your state.

Workshops/Talks

- 24 November, Tuesday 6.30pm. **Wilderness Action Group.** TWS invites you to go along and learn how to play an active roll in protecting our environment with other like-minded people. 59 Hardware St, Melb. TWS (03) 670 5229.
- 1 December, Tuesday 8pm. **Polar Dinosaurs of Victoria** by Dr Tom Rich. Organised by Fauna Survey Group. National Herbarium. Contact Felicity Garde (03) 808 2625.
- 10 December, Thursday 8pm. **The biogeography & adaptations of Australian Alpine Flora** by Dr Malcolm Calder. Botany group (of FNCV) meeting. National Herbarium. Contact Joan Harry (03) 850 1347.
- 21 December, Monday 8pm. **Big Desert**, an illustrated talk by Ian Taylor, and Christmas break up. Organised by the Society for Growing Australian Plants - Vic. SGAP-Vic extends a hearty welcome to all. National Herbarium, Birdwood Ave, Sth Yarra. Enid Bowman (03) 882 5297.
- 18 January, Monday 8pm. **The Victorian Salinity Problem**, an illustrated talk by Phil Dyson. Organised by the Society for Growing Australian Plants - Vic. Herbarium, Birdwood Ave, Sth Yarra. Enid Bowman (03) 882 5297.

Excursions and field trips

- 28 Nov, Sat. **Alpine flora and their adaptations:** Botany Group (of Field Naturalist's Club of Victoria), excursion to **Lake Mountain.** Joan Harry (03) 850 1347.
- 29 Nov, Sun. **Walk, Talk & Gawk: Western Grasslands** with James Ross (03) 650 8296 (B).
- 5 Dec, Sat. **Leadbeaters Possum survey** with Fauna Survey Group. Ray Gibson (03) 874 4408.
- 6 Dec, Sun. **On the trail of butterflies** - daytrip organised by Field Naturalists Club of Victoria. Led by Pat & Mike Coupar. Contact Dorothy Mahler 850 9379 or 435 8408.
- 26 Dec - 1 Jan. **Jilpanger scrub** - Fauna Survey Group Christmas camp. Flora & Fauna survey. Felicity Garde (03) 808 2625.
- 28-29 Nov, Sat-Sun. **Mount Buffalo** with Euroa Environment Group. Overnight camping at Lake Catani, day walks to explore the numerous walking tracks with beautiful wildflowers,

spectacular views and delightful snow grass plains. Enquiries: Shirley Saywell (057) 95 2022.

Restoration Activities

November

- 21 Sat 9.30am. **FO Werribee Gorge & the Long Forest Mallee.** Fence removal, plant potting and book delivery. Judy Douglas (053) 67 2672.
- 22 Sun 10am-1pm. **Friends of Merri Merri Park.** Activity day & Xmas party. Melways map 30, ref C9. Barb Miles (03) 482 1618.
- 25 Wed, 10am-3pm. **FO the Yarra** Galatea Pt, Mel 2D, D7. Judy (03) 347 2252. Also on Sun, 13 Dec.
- 26 Thurs. **FO Warrandyte SP** propagation day. This event takes place every Thursday. Other revegetation activities on weekends. Ian or Margaret Burke (03) 844 2659.
- 27-29 Fri-Sun. **FO Marine Parks** with the **Department for Conservation and Natural Resources** will be mapping the distribution of *Spartina*, the estuarine weed in Anderson Inlet. Staying at Inverloch. Nicci (03) 596 6379.
- 28 Sat 10am-12noon. **Sandringham Community Nursery** - volunteers propagation activities. Sandringham Council Depot, enter Reserve Rd or Talinga Rd. This is on every Thursday and Saturday.
- 29 Sun 10am-1pm. **Nunawading Indigenous Plants Project.** Nunawading Council Horticultural Centre. 82 Jolimont Rd., Forest Hill. Margaret Witherspoon 878 5998.
- 28 Sat 2pm. **Friends Of Sherbrooke Forest.** Vivien Freshwater (03) 754 3093. Other FOSF activity on Wed, 9 Dec.
- 29 Sun 10am. **FO Wildlife Reserves** - La Trobe Uni. George Paras (03)479 2871.
- 29 Sun 11am-4pm. **FO Royal Park West.** Mel 29, C12. Take turnoff from Manningham/Oak Sts, Parkville and continue 200m to carpark. Seed collection time for grasses and numerous herb species (followed by AGM). Adam Muyt (03) 386 7491.

December

- 5 Sat 9-9.30 start. **FO Organ Pipes.** Robert Bender (03) 499 2314. Also on 19 Dec.
- 5 Sat. **FO French Island.** Going out to Tortoise Head - great place for birds and weeding! Fay or Clive Gordes (03) 772 9668.
- 5 Sat 10am. **Green Link Box Hill.** Activities day. These events are also held every Mondat and

Tuesday morning, with Monday being Nursery work. Council Nursery in Nelson Street, Box Hill, further details, contact Minette (03) 898 1364.

- 5 Sat. **FO Gellibrand Hill Park.** Jenny Caddaye (03) 744 6093.
- 6 Sun 10am. **FO the Helmeted Honeyeater.** Meet at the Yellingbo depot. Mark Ashby (059) 66 2681.
- 6 Sun 9.30am. **FO Buckley Falls.** Tony Woolford (052) 43 6340.
- 6 Sun 12-3pm. **Earthcare StKilda.** Neil or Rob (03) 536 1490 (W).
- 6 Sun 1pm. **FO Langwarrin Flora & Fauna Reserve.** Anne Read (03) 787 2034.
- 12 Sat. **FO Dandenong Ranges NP.** Contact Graham Barstow (03) 758 6935.
- 12 Sat. **FO Nepean Parks.** Meet at Seawinds. Contact Bill Nicholson (059) 81 1605.
- 13 Sun 9.30am. **Stony Ck weeding group.** Mark Gardner (03) 844 3799 (H), 844 2659 (W).
- 13 Sun 10am. **URAGE** (Upwey Regional Action Group for the Environment). Weeding to restore indigenous vegetation along Ferny Creek. Rob Stevens (03) 754 3792.
- 13 Sun 10am-1pm. **FO Braeside Park** working bee. (Also on Sun 27 Nov.) Ron Pearson (03) 584 7443.
- 13 Sun 3-5pm. **Green Link Camberwell.** Seed collection & weed maintenance. Meet at the corner of Dion St & Welfare Pde; Melways map 60, ref E7. Dianna Burgess (03) 809 2092.
- 13 Sun. **FO The Point.** Contact Stuart Sherrin (059) 84 1953.
- 13 Sun. **FO Brisbane Ranges NP & Steiglitz Park.** Contact Nola Haines (052) 29 6388.
- 13 Sun. **FO Brisbane Ranges N.P. & Steiglitz Park.** Nola Haines (052) 29 6388.
- 19 Sat. **FO Churchill N.P. & Lysterfield Lake Park.** Neal Smith (03) 873 2635.
- 19 Sat. **FO Bradshaw Park.** Propagation &/or weeding day. 580 2573.
- 19 Sat 1.30-4pm. **Mount Eliza Association for Environmental Care.** Follow-up on Moorooduc Quarry Reserve revegetation work. Mel 106, A7. Also on Sunday, 10am-12.30pm. Anne Read (03) 787 2034.
- 19 Sat. **FO Churchill NP & Lysterfield Lake Park.** Contact Neal Smith (03) 873 2635.
- 19 Sat. **FO Werribee Gorge SP & the Long Forest Mallee.** Contact Judy Douglas (053) 67 2672.

- 20 Sun 10am **Men of the Trees.** Deep Rock, Yarra Bend Park; Melways map 2D, ref D6. Minette Russell Young 898 1364.
- 20 Sun. 10am-12noon. **Brunswick Tree Group** Moonee Ponds Ck. Eric Ward (03) 388 2123.

The **Australian Trust for Conservation Volunteers** offer a wide variety of restoration activities throughout most of Australia. For further information contact ATCV: National Headquarters in Ballarat: (053) 33 1483.

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 VNPA on (03) 650 8296.

Thank you to all the people who contact us regarding on-coming events their groups are organising. If other people wish to have their events covered, please get in touch with Dimi Bouzalas, (03) 386 0264

Visitors/participants are welcome to all events listed in Indigenotes.

.....
● The editorial team from
● *Indigenotes* wishes IFFA
● members a prosperous seed
● collecting season, a merry
● Christmas and happy relaxing
● with a few cool drinks!
● See you next year! (There's no
● December issue of *Indigenotes*)
●



Two new introduced sedges (Cyperaceae) in Victoria

By Val Stajsic and David Albrecht*

We have recently confirmed the identity of two introduced sedges lodged at the National Herbarium of Victoria (MEL) in the past two years. The species, *Trianoptiles solitaria* and *Isolepis sepulcralis* are both indigenous to southern Africa and would seem to have the potential to become environmental weeds in particular ecological situations.

Trianoptiles solitaria (C.B. Clarke) Levyns

This species was first collected by Jeff Yugovic and John Westaway in October 1989 from Koonung Creek, Balwyn (Melways reference 46J2). This remains the only known occurrence of this species in Australia.

T. solitaria is one of three species of *Trianoptiles* that are endemic to the Cape Province of South Africa. The genus is thought to be most closely related to the genus *Carpha* (Levyns, 1943).

T. solitaria is a distinctive species that vegetatively resembles *Schoenus latelaminatus* (Medusa Bog-rush). As there is no description of this species in the Australian literature we here provide a brief diagnosis with accompanying illustration (fig. 1).

Leafy tufted annual herb to c. 20 cm high with angular to flattened flowering stems usually equal to or shorter than the leaves. The leaves are dense, hairless, smooth to touch and lack a ligule. The species is diagnostic in possessing two kinds of spikelets, bisexual aerial spikelets and more or less subterranean female spikelets. The fruits produced from the aerial spikelets are three-angled, densely pitted, c. 2 mm long and surrounded by three narrow hairy scales each with a long central bristle and two smaller lateral bristles at the apex. The fruits produced from the subterranean spikelets resemble bulbils or tubers and are slightly longer and broader than the aerial fruit and lack the three scales.

The species occurs in a municipal reserve on a degraded seasonally moist hill slope that originally would have supported *Eucalyptus melliodora*

woodland. The associated species are a mixture of indigenous and exotic species including *Schoenus apogon* (Common Bog-rush), *Caesia calliantha* (Blue Grass-lily), *Drosera peltata* ssp. *peltata* (Pale Sundew), *Themeda triandra* (Kangaroo Grass), *Romulea rosea* (Onion Grass), *Trifolium repens* (White Clover), *Holcus lanatus* (Yorkshire Fog), and *Anthoxanthum odoratum* (Sweet Vernal-grass).

Although reference to the natural habitat in South Africa is scant, the available literature suggests that it is characteristic of places that are damp during the winter months. It appears that the flowering period in Melbourne extends from August to

* National Herbarium of Victoria
Birdwood Avenue, South Yarra 3141.

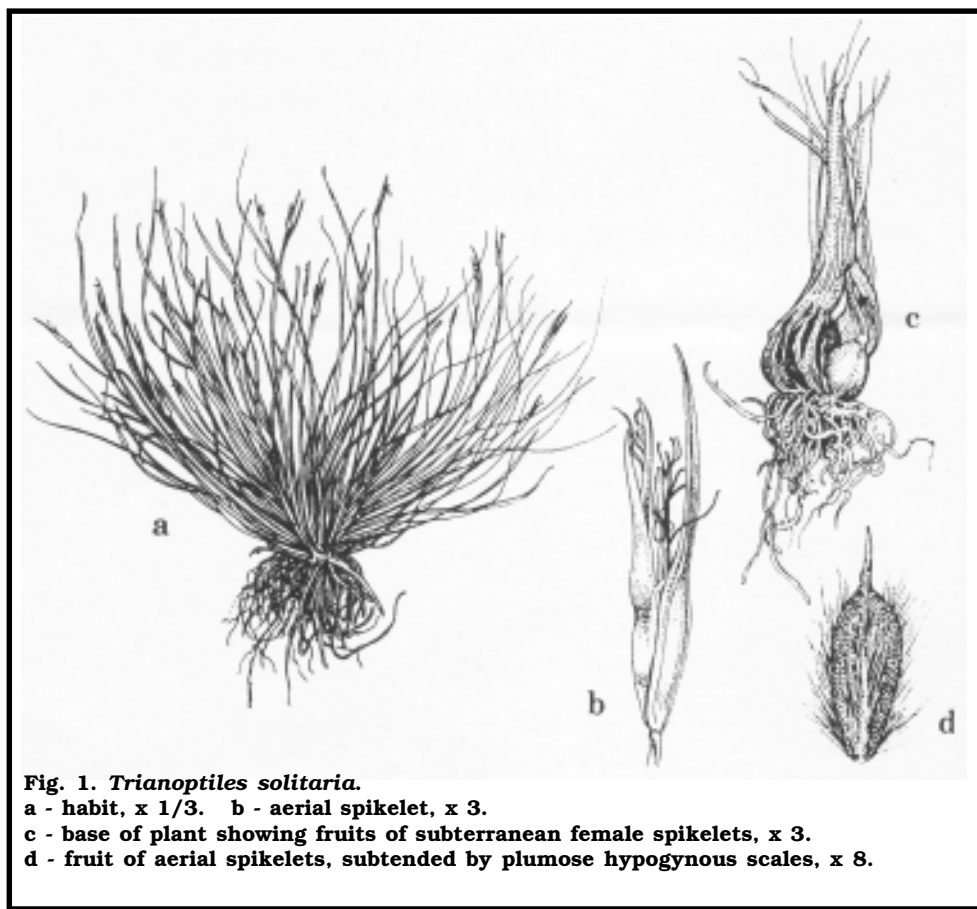


Fig. 1. *Trianoptiles solitaria*.

a - habit, x 1/3. b - aerial spikelet, x 3.

c - base of plant showing fruits of subterranean female spikelets, x 3.

d - fruit of aerial spikelets, subtended by plumose hypogynous scales, x 8.

October, which corresponds with the South African populations (Adamson & Salter, 1950).

At the Koonung Creek site *T. solitaria* is locally abundant over an area of about 0.1 ha. The species is unquestionably naturalised at the site. When the population was examined by one of us (VS) in September 1992 numerous seedlings were observed, which presumably germinated during Autumn-Winter 1992. The density of soil-stored fruit was also found to be high and there is undoubtedly great potential for the fruit to be dispersed beyond this site if attached to machinery or footwear. Given the invasive potential of this species it is imperative that control measures are undertaken immediately. The most effective means of eradication would seem to be the repeated use of a translocated herbicide to ensure that each subsequent generation is destroyed and soil stored fruit depleted.

T. solitaria is not available in the horticultural trade and the mode of introduction remains an enigma.

***Isolepis sepulcralis* Steudel**

This species is indigenous to eastern and southern Africa and Madagascar, with introduced occurrences in Tristan da Cunha, St. Helena, New Zealand and Australia. In Australia it was hitherto known only from the North and Central Coast botanical regions of New South Wales (Wilson, 1981).

The first Victorian collection was made in early 1992 from the Box Hill community nursery where it was growing as a weed in pots. No further collections have been lodged at MEL.

With the inclusion of *I. sepulcralis* there are 22 species of *Isolepis* in Victoria, of which 19 are indigenous. The other introduced species, *I. hystrix* (Awned Club-rush) and *I. prolifera* (Club-rush), are also native to southern Africa.

Characteristic features of *I. sepulcralis* are its densely tufted habit; filiform flowering stems usually to c. 16 cm long (but in New Zealand occasionally to 30 cm (Healy & Edgar, 1980)) with 1-3 spikelets; small acute glumes (0.5-1 mm long) with the sides conspicuously 3-4-nerved; 1-2 stamens; 3-fid style; and unequally triquetrous,

minutely roughened, dark brown to blackish nuts, 0.4-0.6 mm long.

Macroscopically *I. sepulcralis* is not easily distinguished from several native fine-stemmed species of *Isolepis*, and microscopic examination of the above diagnostic characters is essential for positive identification (see also Wilson, 1981).

According to Minette Russell-Young (pers. comm.) this species has been present in the nursery for several years. Although it has not been seen growing in the surrounding nursery yard, pots distributed from the nursery for revegetation projects may have contained plants or fruit and therefore new occurrences may be expected.

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- Wilson, K.L. (1981) A synopsis of the genus *Scirpus sens. lat.* (Cyperaceae) in Australia. *Teloepa* 2 (2): 153-172.

ACKNOWLEDGEMENTS

Thanks to Anita Barley for the illustration.

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Notes on the Status of an invasive Australian Tree fern (*Cyathea cooperi*) in Hawaiian rain forests

Reprinted from *The Fern Society of Victoria Inc. Newsletter* 14:9 102-104.

*It being reported during the August meeting of the Fern Society that the Australian rainforest Silky Oak (*Grevillea robusta*) has been declared a noxious weed in Hawaii gave added interest to the above title of a paper in a recent issue of the "American Fern Journal". The paper was written by staff members from two Hawaiian National Parks, the National Tropical Botanical Gardens and the Biology Department of California State University after the completion of a study on the distribution of *Cyathea cooperi* in the Haleakala National Park on Maui Island.*

The following article summarises extracts from the paper, giving the background to the study and the main findings. The paper quotes extensive references, including personal communications with some well-known Australian fern authorities.

Tree ferns occur predominantly in two families, Cyatheaceae (700 species) and Dicksoniaceae (300 spp.), and less commonly in other families, e.g. Blechnaceae, Dryopteridaceae and Thelypteridaceae. In the Hawaiian Islands, native tree ferns occur in the families Dicksoniaceae with 5-6 endemic species in the genus *Cibotium*, Blechnaceae with 4-6 endemic species in the genus *Sadleria* and Dryopteridaceae with several small species.

Tree ferns in the large cosmopolitan genus *Cyathea*, known in Hawaii as Australian tree fern, have been in cultivation in the Hawaiian Islands since at least the 1960's as ornamentals in homes and botanical gardens. *Cyathea* is widely planted as it is a hardy, attractive tree fern, evocative of tropical settings and is faster growing and more tolerant of warmer, drier conditions than the native Hawaiian tree ferns. Hawaii's "Australian tree fern" has long been identified in Hawaiian botanical literature and the horticultural trade as *Cyathea australis*. Recently, however, the widely planted species in Hawaii and California was identified as *Cyathea cooperi*. The similar *C. australis* is also present in Hawaii but is limited to botanical gardens and a few private collections. *C. australis* is a subtropical to warm temperate species growing in subtropical rainforest and tall *Eucalyptus* forests. It is much slower growing than *C. cooperi*.

Cyathea cooperi is native to Queensland where it

occurs in gullies in rainforests. In its native habitat, *C. cooperi* acts as a pioneer, occurring along edges and in light gaps as well as along road cuttings and stream courses. It has become naturalised in south-eastern Australia in the Sydney region since 1942 and in Western Australia at Bedfordale. Elsewhere, *C. cooperi* is naturalised on Mauritius Island in the South Indian Ocean where it has, especially in the last decade, invaded relatively undisturbed low stature rain forest and disturbed native heathlands and is replacing the native species *Cyathea excelsa* and *C. bourbonica*.

Cyathea cooperi is now naturalised in Hawaii on the islands of Kauai, Oahu and Maui, occurring prolifically in disturbed rain forest, in wet areas and along road cuttings. All plants on Kauai are thought to have come from five planted in a garden in the 1970's and those on Oahu resulted from an escape from an arboretum. The largest known invasive populations occur in the rainforests on Maui and one in the Haleakala National Park was studied to provide data for control efforts.

Twelve contiguous plots each 20 m square were marked out and surveys made of the number, size and distribution of the plants of *C. cooperi* in them. In total 747 plants were found ranging in height up to 4 metres, although 59% were less than 0.25m. Some 77% were terrestrial, 20% grew on fallen logs and 3% were epiphytes on other plants. The paper contains analyses of the data in much greater detail and for a number of other factors.

The densest stands were conspicuously lacking in understorey species diversity and biomass. This was thought to be probably due to the thick layer of fibrous roots at the soil surface, extending up to five metres from large plants.

In Hawaiian rain forests, trunks of native tree ferns act as important sites in maintaining high local species diversity and as germination and establishment sites for larger tree and shrub species. *Cyathea cooperi* was found not to support the dense growth of epiphytic native species. An earlier study found more than ten times as many epiphytic native individuals growing on the trunks of native *Cibotum* tree ferns as on the trunks of *C.*

cooperi.

The greatest threat posed by *C. cooperi* to Hawaiian forests is displacement of native species where the fern achieves high densities. *C. cooperi* is a fast-growing species once established, capable in its native habitat of growing up to one metre per year. Allowing for establishment times, it was estimated that the plants in the survey area were 6-15 years old. During this period, feral pigs were uncontrolled in the area and their extensive and repeated turning of the ground probably facilitate establishment of the *C. cooperi*. Even though pig populations were greatly reduced during the 1980's, *C. cooperi* continues to spread rapidly, perhaps due to abundant local spore production. *C. cooperi* produces spores more abundantly than other Australian species of *Cyathea*.

Although fern species are not commonly considered aggressive weeds, *C. cooperi* is proving to be an invasive, disruptive species capable of radically modifying its habitat. In its native range plants reach heights over 12 metres with fronds up to 6 metres long. With this growth potential the population in the study area would eventually gain almost complete dominance of the site. The presence of substantial numbers of large plants shedding spores would make invasion of surrounding forests likely.

Another factor indicative of the invasive potential of *Cyathea cooperi* is its ability to disperse and establish across long distances into montane forests. The study site was some 12 kilometres from the nearest plant nursery, so the spores were presumably carried there by winds. It is too early in the history of the invasion of this species to determine its eventual distribution and abundance. However, enough is known to suggest that without some mitigative factor its impacts will be quite substantial. The species is moderately tolerant of dry conditions but is most prolific in wetter sites, especially those where ground disturbance is present.

Other species of *Cyathea* are present in Hawaii as ornamentals but are not known to be naturalised. Within the Haleakala National Park an attempt is being made to control *C. cooperi* before it becomes established even more extensively. Larger plants area being felled and their growing tips severed,

while smaller plants are removed entirely.

The authors concluded by recommending "that *Cyathea cooperi* be recognised as an aggressive alien species in native Hawaiian ecosystems and controlled where encountered" and also "that *C. cooperi* be designated by the State of Hawaii's Department of Agriculture as a Noxious Weed and its horticultural trade be discontinued"

The editor of the Fern Society of Vic. Newsletter commented in the newsletter that a botanist friend from Queensland who was in Hawaii recently commented that Cyathea cooperi is seen "everywhere" there now.



Changes in The Department

The Kennet government has just renamed the Victorian Department of Conservation and Environment to the Department of Conservation and Natural Resources. After a debilitating time for all staff under Minister Crabb, and only a brief respite under Barry Pullen, it looks bleak again for staff.

Indigenotes invites its readers to submit articles or snippets on changes happening in the Department. Better still, perhaps a member closer to the action might like to become a regular commentator...

Snippets:

New IFFA Member Profile

Phil Watson, Superintendent Of Parks in the City of Clarence in Tasmania, has recently joined IFFA on behalf of his employer. His position includes the usual urban horticultural focus but he also manages 7000 ha of Natural Areas including Waverly Flora Park and other Coastal Urban\Rural reserves. Phil works with several local schools on curriculum projects that focus on the natural areas and has organised the city's Urban Bushland Programme for two years running. The programme involves the public in management activities while sharing knowledge about the local flora and fauna. The council also runs a seedbank and indigenous nursery producing close to 40,000 plants a year. We congratulate Phil on his excellent projects to date and hope that his IFFA membership and Indigenotes provides some inspiration and information that will help him continue the good work.

Sydney Weed list

A list of Sydney's major weeds and weeds found in bushland which are still grown in gardens and often sold in nurseries is available from:

The Secretary, Australian Association of Bush Regenerators, P.O. Box 83, Mt Kuringai NSW 2080.

Source: Bush Management News Sheet Mar-Jul 1992

Controlling *Tradescantia*

Wandering Jew (*Tradescantia albiflora*) is a common weed in urban garden and bushland situations. Tordon® 50D is registered for control in summer crops but is considered unsuitable for urban use.

Thirteen herbicide treatments were screened and the most effective herbicide was glyphosate. Four months after a single treatment the best control was a 50% reduction in the weed. This was given by both rates of glyphosate with Pulse® or with the ropewick treatment. The spray treatments without Pulse were significantly less effective. Glyphosate with Ethokem® was only half as effective as with Pulse resulting in a 25% reduction. (from Trounce, R.B. 1991. Controlling Wandering Jew - *Tradescantia albiflora* in urban landscapes. Newsletter of the Weed Society of NSW, **91:3** Sept 30 1991.)

Source: Bush Management News Sheet Mar-Jul 1992

Update for Native Trees and Shrubs of South-eastern Australia

Author Leon Costernans advises that since his "big" book was published in 1981, there have been many changes in botanical names, and new species described. Leon has produced a supplement of amendments to botanical names, and brief descriptions of newly described species for the book's area. Single copies of this supplement (which can be photocopied) may be obtained by sending a standard long envelope, self-addressed and stamped (45c) to Leon Costernans, Science Education, Monash University (Frankston Campus), Frankston Vic 3199.

- source: VNPA Newsletter

New Wildflower Book for the Coast

The VNPA has just published another wildflower book photographed and written by Ian McCann. The Coast (and Hinterland) in Flower features coastal plants of dunes and heathlands as well as many inland species found south of the Princes Highway. It covers a comprehensive range of plants from daisies and lilies to mintbushes and banksias. There are 372 colour photographs included and each caption includes the common and scientific names, their family and their flowering times. It is a total of 120 pages and is a handy size for using in the field. It is available from the VNPA at 10 Parliament Place, Melbourne, R.R.P. \$17.95.

Native Grasslands Field Guide

The National Trust has recently published the Field Guide to Victoria's Grasslands by Neville Walsh, Steven Wallbrink and Keith McDougall. It is a pocket sized book with photographs and descriptions of 121 species. It also includes several chapters on the conservation, management and restoration of grassy ecosystems as well as a comprehensive bibliography.

The book was intended to be an introduction to grassland plants but it is far from comprehensive and has many shortcomings. It describes many common species but omits many of these in order to include several rare and endangered ones. This would make it difficult to identify many commonly seen plants; I don't see a great advantage in this system if the book is meant to be a field guide. The authors do admit this shortcoming but state that each major genus is represented so that a user can potentially identify most plants to genus level with the book.

The photographs are another major shortcoming because many do not show leaves, other distinguishing characteristics and often no overall view of the plant. However, the descriptions are reasonably extensive and often compensate for the lack of detail in the photos.

Despite the limitations detailed above the book would be useful as an introduction to native grasslands and grassy woodlands and many relevant management issues. It would be a good gift to any budding naturalist among the grasslands that are left but reasonably experienced types would probably find it to be of very limited use. It may also prove useful in focussing more public attention on the plight of our native grassland ecosystems. It is available from the National Trust at their shop on Parliament Place in Melbourne or other good bookstores for \$17.95.

- Lincoln Kern

Beware the saltbush

"Kochia"

Whilst in WA attending a meeting of the Council for Australian Weed Societies David McKenzie was privy to the latest addition to the weed list: Kochia (*Kochia scoparia* syn. *Bassia scoparia*). It just goes to show the care that is needed in selecting new plants for saline areas. The Dept of Food and Agriculture in Victoria have indicated that they know of no plantings of Kochia in Victoria.

This is a timely reminder that when seeding plants from overseas, importers should take particular care to check the weedy attributes of the plant as well as its usefulness. Kochia is a chenopod, a native to both Europe and Asia. It was first found in Australia in Perth when a seed merchant introduced the plant as an annual forage species for salt affected land. In 1990 it was planted on 9 farms and a further 50 used it in 1991. After planting, Kochia began to spread onto adjoining roadsides and into non-saline paddock sites. The tumbleweed habit of the plant allows it to spread over large distances in a short time.

A review of the literature revealed that the plant was a toxic, allelopathic weed of many crops in the USA, Canada, Argentina and parts of Europe. In the USA it is resistant to triazine and the sulfonyl urea herbicides. In light of Kochia's potential threat to WA agriculture it was declared noxious in April 1992.

Enquiries to David McKenzie or Anne-Marie Tenni (03) 412 4171 for a copy of the APB Infonote No 33/92, Agdex 647 on Kochia.

Source: Alien 8: 5.

Environmental Weed Book Finally Released

Environmental Weed Invasions In Victoria: Conservation and Management Implications by Geoff Carr, Jeff Yugovic and Kim Robinson has finally been released for your reading pleasure. Many of the issues discussed in it and the weeds listed are well known to Indigenotes readers but this book will prove essential as a written reference. A reference that is necessary to help raise the awareness of the massive problem of environmental weeds with management authorities and the general public. The book describes the environmental weed flora, the different types, their origins and dispersal mechanisms as well as the risks they pose. An overview of environmental weed management in Victoria is also included: who's doing what. Recommendations are also made for future directions in managing environmental weeds across the state. The bulk of the book is a list of 584 environmental weeds with heaps of relevant information included. The reference section is also incredibly extensive. This invaluable book of 78 pages is available from the National Trust's Save the Bush Project at 4 Parliament Place, Melbourne 3002 (please use the full title of the project if paying by cheque) for \$12 if picked up at the office or \$15 by post.

Peninsula Plants released

This book, *A field guide to the indigenous plants of the Mornington Peninsula*, is yet another excellent addition to your library, even if you don't live on the Peninsula. The information on many plants would be relevant across Victoria. The book's focus is on indigenous plants that are suitable for cultivation and how to use them in a home garden. It still includes more than enough information to make it a very useful field guide. It covers most common species on the Peninsula but only includes three grasses and no orchids, probably its' only weak point.

The plants are grouped according to type, e.g. tree, shrub, etc. Each entry includes an explanation of what the scientific name means (this detail can be a great memory aid), a detailed description of the plant and information about flowering times, the vegetation community and habitats where it can be found, and cultivation requirements.

The drawings are excellent and add a beautiful dimension to the book. Each one includes flower parts and often the whole plant, enabling the reader to visualise what the plant looks like in the wild and what effect it would create in the home garden.

The authors, Kathie and Peter Strickland, bought a farm on the Peninsula some years ago and there was almost no native vegetation left on the land. They wanted to revegetate with local indigenous plants and found that there were none available commercially. They then began to collect from nearby remnants and grow their own plants. They eventually started the Kareelah Bush Nursery at Balnarring which specializes in indigenous plants. The book is available by contacting the nursery at P.O. Box 31, Balnarring, 3926, Ph. (053) 83 5801.

Spartina info.

A second seminar on Spartina (an introduced grass invading intertidal areas in Victoria) was held on 13 June 1992. The aim was to inform the community of the work that had been done since the last seminar in May 1991 and to proceed with the mapping program for Andersons Inlet and the Marine and Coastal Parks of South Gippsland.

Proceedings from the 1991 conference "The Sea has weeds too" are available from Kim Robinson on (03) 412 4452.

Source: Alien 8: 5&8.



IFFA activities:

IFFA (Vic)

Next meeting:

Tuesday 24 November at 8 pm at the Herbarium Hall, Birdwood Ave, South Yarra (Melways map 2G ref 12A). Members please bring something of interest (perhaps some slides or prints, or specimens, or books or reports or ideas even to tell us about) All welcome.

Committee meeting:

Tuesday 1 Dec at Michele and Peter's, 2/81 Alexandra Ave, South Yarra. 6.30pm onwards.

Christmas breakup:

Sunday 13 December 3pm onwards at Yarra Bend Park on the opposite bank of the Yarra from the Studley Park Boathouse. Drive in along Yarra Bend Road off Heidelberg Road right to the furthest end of the loop. (Melways map 2D E8) Long walk at 3.30; another shorter walk at 7. BYO food and drinks.

Val Himmelreich, previously an IFFA committee member, whilst assisting at the Grasslands Conference lost her house and possessions to a fire. As a fundraising effort by IFFA, Christmas trees (weeded *Pinus radiata*) will be available at the breakup, and profits donated to Val. For other donations, whether financial or goods please contact Michele (03)8674173. For Christmas trees contact Roger (03)3721582.

SPIFFA

Southern Peninsula IFFA will meet on Mon 7 December Waterfall Gully Cnty Centre, Cnr Bayview Rd and Nixon St, Rosebud South at 7.30 pm. Social end of year gathering. All welcome. Contact Mark Adams (059)851122.

NSW activities:

Next meeting:

Monday 7 December at 7.30 - 10pm at the Maiden Theatre, Mrs Macquarie Road, The Royal Botanic Gardens. Judy Fakes from Ryde College of TAFE will speak on 'The health of trees and its significance to our bushland'. All welcome. Contact Sally Fisher (02)9706486 (work), Penny Brown or Andrew McGahey (02)9133681 (work)

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Contents:

Sydney IFFA meeting Report: Conservation genetics. What does it mean? How can we use it?	2
Indigenous Nurseries Network: A recap of the Network's activities over 1992.	4
Using indigenous species for alpine revegetation	5
Victorian Marine Macroalgae	6
Coming Events:	8
Two new sedges (Cyperaceae) in Vic	10
Notes on the status of an invasive Australian tree-fern (<i>Cyathea cooperi</i>) in Hawaiian rain forests.	12
Snippets: New IFFA member profile, Sydney weed list, Controlling <i>Tradescantia</i>, Update for <i>Native Trees and Shrubs of South-eastern Australia</i>, New Wildflower book for the coast, Beware the saltbush "Kochia", <i>Spartina</i> info., <i>Peninsula Plants</i> released, Environmental Weed book released.	14

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Contributions to *Indigenotes* should be sent to the editors — the deadline for the next issue will be 8 January.

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