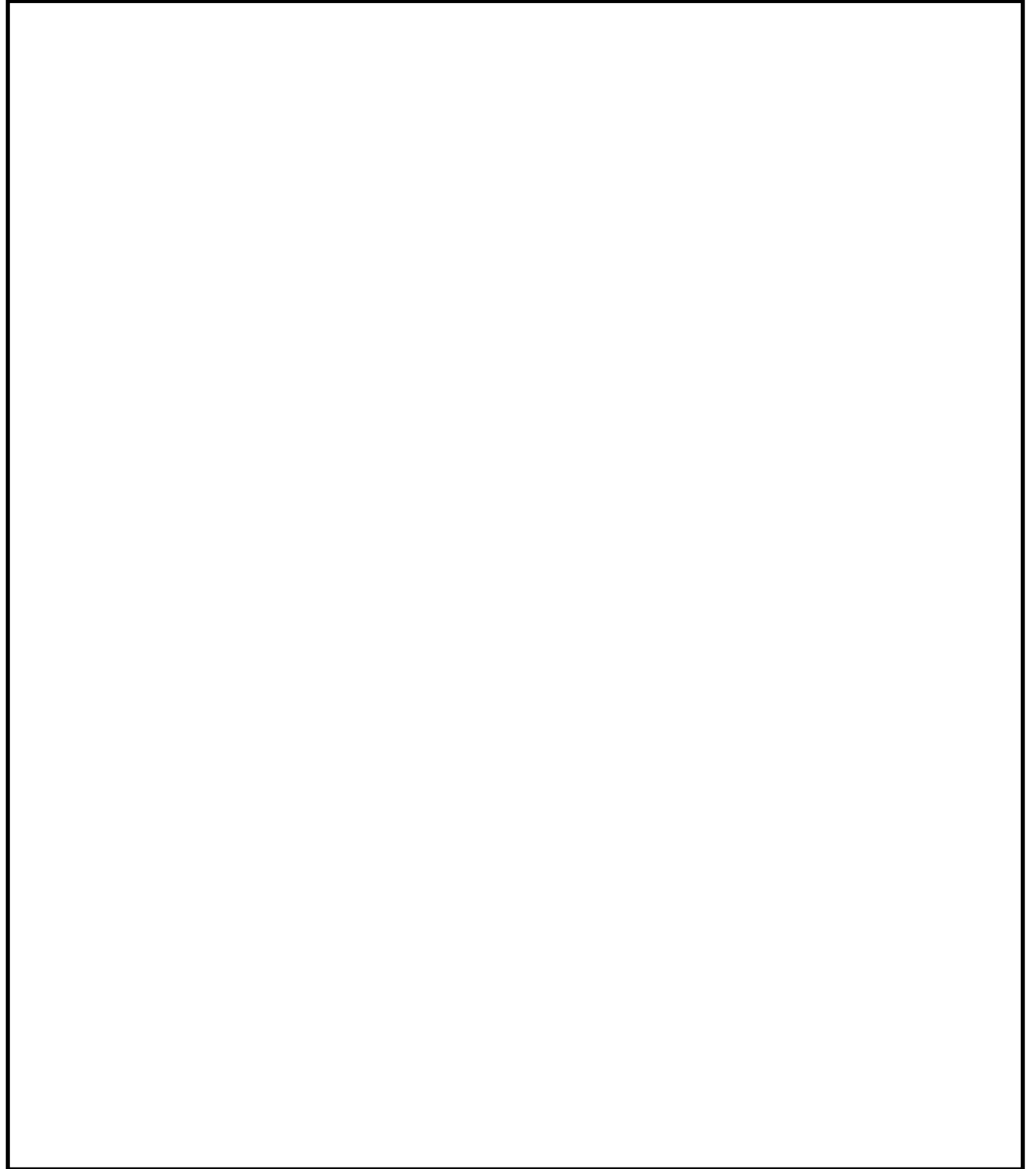


INDIGENOTES



A plethora of provenances

By Ian Lunt¹

Despite the diversity of issues in local conservation and revegetation, one question keeps recurring, demanding closer attention - "what is a local provenance?" Recent articles in *Indigenotes*, by Mike Cooper and Nick Romanowski, have discussed this issue at length. Usually people question the word *local* rather than *provenance*, and discuss things like "how local is local?", "how can we define local?", or perhaps, "what practical approaches can we use in the absence of a definition?" The term provenance is rarely questioned, so presumably everyone knows it means.

Not long ago, a friend asked me, "what is a provenance"? Not, "what's a *local* provenance", but just "what's a *provenance*?". I gave a simple answer, something like, "a provenance is a group of sites, in which the plants possess (or are thought to possess) a consistent genetic composition". Knowing this wasn't the best of responses, I started thinking, what do we mean by provenance?

The Concise Oxford Dictionary gives a simple definition: provenance means "place of origin". Foresters and agriculturalists have long used the term in this way. A provenance was simply the locality from which the seed (or cutting) was collected. In *The Genetic Resources of the Victorian Eucalypts*, Leon Pederick asserts, "The term 'provenance' refers to the seed source of any given seedlot or plants".

Unfortunately, we usually use the term "provenance" to mean something far more elusive than just the "collection site". A recent *Indigenotes* article by Mike Cooper, *Seed of Local Provenance*, provides a useful summary of the diversity of ideas held by local restorationists, as shown by the following quotes.

"The geographical nature of a provenance is very difficult to determine."

"...there is no guarantee that any pooled seed is from a single provenance, and we should call it merely local seed."

"Natural gene pools extend to include many provenances and cover quite large areas."

"Gene pools may have a greater geographical extent than a single provenance and gene dispersal and interchange probably occurs between widely separated provenances."

"... hardy local [plant] pioneers.... would be subject to strong selection pressures, the local gene pool would be altered, and the local provenance would evolve."

The five quotes illustrate that provenance is used in a number of different ways, and is not solely concerned with locality or seed source. Instead, it is intimately concerned with genetic composition (usually *implied* genetic composition).

The statement - "*The geographical nature of a provenance is very difficult to determine*" - seems consistent with the rough definition I proposed above (i.e. a provenance could be a collection of sites in which the plants are thought to have a consistent genetic composition). If so, then the statement could be re-written as, "The geographical nature of a *consistent gene pool* is very difficult to determine." The statement is obviously about genes, not collection sites, as the "geographical nature of a seed source" can easily be determined from any map.

The second statement - "*there is no guarantee that any pooled seed is from a single provenance, and we should call it merely local seed*" - uses provenance in the same way as the first quote. Again, the author clearly doesn't just mean a "collection site" as the statement, "*there is no guarantee that any pooled seed is from a single collection site*", makes little sense. By definition, pooled seed must come from a number of collection sites.

The two statements - "*Natural gene pools extend to include many provenances and cover quite large areas*", and "*Gene pools may have a greater geographical extent than a single provenance and gene dispersal and interchange probably occurs between widely separated provenances*" - use the term provenance differently from my earlier description. These statements imply that a provenance is just a small part of a "gene pool". So what is meant here? At least two interpretations are possible.

Firstly, in this context, provenance could simply mean a *region*. Many people use the word provenance to refer to plants in distinctive geomorphological regions, such as "basalt plains provenance" or "coastal sands provenance". If so,

the statements could be re-phrased as, "Natural gene pools extend to include many *regions*", and "Gene pools may have a greater geographical extent than a single *region*." The quotes clearly don't refer to an entire gene pool, or a single collection site.

An alternate interpretation is that a "gene pool" is being pictured as a widespread, continuous population, gradually varying in genetic composition. (A *cline* is a morphological manifestation of such a pattern). By this interpretation, different provenances might represent a series of arbitrarily defined zones along the continuum (like cline forms).

The final quote - "*hardy local [plant] pioneers [colonising a bare gravel pit]... would be subject to strong selection pressures, the local gene pool would be altered, and the local provenance would evolve*" - carries a different perspective from the regional approach adopted earlier, in that it explicitly refers to a fine-scale, local mosaic.

The term *local provenance* is often used in this way, to imply that, "local means here, right here, and nowhere else". Implicit in this usage is the belief that every plant is better adapted to the very spot where it grows than it is to any other nearby spot. (This assumption is often difficult to maintain on genetic or ecological grounds). A regional perspective of the term provenance, as given in the earlier quotes, must encompass innumerable such "micro-provenances", if such things commonly exist.

So what do we mean by provenance? The term seems to mean whatever we want it to mean: a collection site, a population, a cline-form, a geomorphological region, an arbitrarily defined part of a gene pool, or perhaps an entire gene pool. Unfortunately, no two meanings are the same, and all have different implications and assumptions, some of which are ecologically unsustainable.

However, despite the apparent diversity of meanings, all of these ideas have one common denominator. Attempts to save "local provenances" are based on a desire to save genetic diversity. All of the approaches represent attempts to understand, interpret and conserve patterns of genetic composition.

Unfortunately, limited information is available on patterns of genetic variation in plants, and the available data demonstrates an extraordinarily wide range of possibilities. More importantly, since we cannot measure genetic composition in the field, we have to devise practical, seat-of-the-pants alternatives.

The concepts of collection site, population, cline

form or region are all practical, but imperfect, surrogates for the elusive reality of genetic composition. We can't see genes, but we can locate populations, we can identify regions, map habitats, and so on. Unfortunately, these surrogates have all become confounded under the one label - provenance - even though they don't all mean the same thing. In reality, some probably bear little resemblance to the patterns of genetic composition which we strain to decipher.

So where do we go from here? Is provenance anything more than a wobbly handle, on which we hang poorly articulated notions of genetic variation? Perhaps a simple way to avoid the problem (rather than solve it) is simply to throw the word away. If we mean locally collected seed, then we can just say "local seed" (as Mike Cooper suggested). At least everyone knows what we mean, and no-one is alienated by the grandiose, pseudo-scientific term. If we mean a plant population, a gene pool, a collection site or a region, then we can simply refer to a *population, gene pool, collection site, or region*. All of which are very different things.

This avoidance response might make debates easier to follow, but it still doesn't address the fundamental issues. We do need to develop practical approaches to dealing with provenance issues in the field. But as a first step, we need to refine our terms. We can't properly communicate, or make progress in a serious debate, if we use the same words to mean different things at different times. Perhaps this article will help to illustrate how plagued we are by a plethora of provenances.

References

- Cooper, M. (1995). Seed of local provenance. Putting forward arguments for the use of local seed in land rehabilitation programs. *Indigenotes* 8(1), 5-7 & 10.
- Pederick, L. A. (1976). "The Genetic Resources of the Victorian Eucalypts". (Forests Commission Victoria: Melbourne).
- Romanowski, N. (1995). Wetland plants and local provenance. *Indigenotes* 8(3), 4-7.

1. School of Botany, LaTrobe University, Bundoora, 3083.

Union St Bush Park Progress Report

April 1995

Many months ago some Brunswick Councillors called a neighbourhood meeting on Moonee Parade near Jewel Crescent. Among matters discussed were the condition and use of Moonee Parade, which remains as it was, and the future development of land beside the creek.

Moonee Ponds Creekside Revegetation 1993-95

In West Brunswick, where the Tullamarine freeway crosses a sweeping turn in the Moonee Ponds Creek, lies a half crescent of land, 150 metres long where once the creek flooded.

The land is bounded on one side by the concrete drain the creek has become and on the other by a slope which steepens as the crescent narrows to cliffs, atop which remain 37 species of plants indigenous to the site and some re-introduced.

In 1993 revegetation began beside the creek after construction of a fence to exclude cars.

The Plan

The intention was to model planting on the river red gum wood land at Galatea Point in Yarra Bend Park. It was intended to plant scattered gums in small mulched bedswith tussock grass and mat rush nearby. A line of tussock grass was to be planted as barrier to weed invasion from the slope. The area between plants was to be mowed by Council workers and enrichment planting and spread of tussock grass was to be encouraged some years after initial plantings.

The Actions 1993-94

Following its reformation with building rubble and clay during construction of the freeway the land had been subjected to regular mowing and the dominant plants were Kikuyu and Couch grass. Some parts were bare having being scalped when the MMBW was building a new sewer. Green areas were sprayed with glyphosate in Autumn 1993 and the area later was ripped to remedy soil compaction.

In September children from the nearby South-West Brunswick Primary School came along and planted tussock grasses, flax lilies, gums and wattles.

Planting diverged from the plan resulting in too few tussock grasses being planted along the Northern edge, where a strip had been rotary hoed to ease the work load.

Over the summer little growth was apparent, no mowing was done. Seed from Silky Blue grass and Windmill grass collected along the creek were scattered about. The following April 1994 a bare clay area, free from top soil or any weed growth was selected to test establishment of grass planted from "speedling trays". In an area 4x4 metres square, half of which was covered in mulch, Weeping grass was planted at 9 per square metre in both mulched and mulch free areas.

The Results

By late February 1995 the weeping grass was well established. No difference in those in the mulched and bare areas were apparent apart from a few paspalum seedlings.

Mulch around the gums and grasses planted eighteen months before had suppressed growth from seed, while the tube stock was flourishing with the tallest trees exceeding two metres. Between the beds weeds had grown. Most noticeable and extensive were wire weed and thistles but as well there were patches of paspalum and millet grasses. Numerous patches of kikuyu and couch had re-appeared but the hoed strip remained weedless.

In the Spring wallaby grass seedlings were noticed. Mostly these came from one bristly wallaby grass plant which had turned up amongst the tussock grasses. A Spring count gave 460 seedlings which had in turn had set seed by February. Scattered windmill and silky blue grass plants had appeared and in places were abundant putting on a fine show and two two chinese scrub bushes had arrived from blown seed.

Management in 1995

From the Spring of 1994 volunteers undertook hand weeding to reduce competition to emerging grasses. Additional planting has now increased the number of species to 20 including prickly shrubs for bird shelter.

The plan for the coming year is to continue weeding and watch for the emergence of wallaby and tussock grasses over the Winter in the hope these will cover the ground and greatly reduce weed growth.

Creekside Plants

Windmill Grass -	<i>Chloris truncata</i>
Tussock Grass -	<i>Poa labillardieri</i>
Silky Blue Grass -	<i>Dicantheum sericeum</i>

Bristly Wallaby Grass -	<i>Danthonia setacea</i>
Spiny Headed Mat Rush -	<i>Lomandra longifolia</i>
River Red Gum -	<i>Eucalyptus</i> <i>camaldulensis</i>
Manna Gum -	<i>Eucalyptus</i> <i>viminialis</i>
Silver Wattle -	<i>Acacia dealbata</i>
Black Wattle -	<i>Acacia mearnsii</i>
Chinese Scrub -	<i>Cassinia arcuata</i>
Weeping Grass -	<i>Microlaena</i> <i>stipoides</i>
Kidney Weed -	<i>Dichondra repens</i>
Pale Flax Lily -	<i>Dianella longifolia</i>
Hedge Wattle -	<i>Acacia paradoxa</i>
Tree Violet -	<i>Hymenanthera</i> <i>dentata</i>
Kangaroo Apple -	<i>Solanum aviculare</i>
Slender Speedwell -	<i>Veronica gracilis</i>
Native Raspberry -	<i>Rubus parvifolius</i>
Prickly Moses -	<i>Acacia verticillata</i>
Sweet Bursaria -	<i>Bursaria spinosa</i>

You are welcome to join our regular working bee at Union St West Brunswick overlooking the Moonee Ponds Creek. Our main activity is weeding to give some space for indigenous plants to grow in. Please bring gardening gloves and a weeding tool - a small chisel is ideal if you do not feel comfortable with something heavy. We work on the third Sunday of each month from 10.00 am to 12ish.

Brunswick Tree Group

meets to bring back the bush at
Union St., Moonee Ponds Creek
3rd Sunday
10 am - 12 noon

16 Apr 1995
21 May 1995
18 Jun 1995
16 Jul 1995
20 Aug 1995
17 Sep 1995
15 Oct 1995
19 Nov 1995
17 Dec 1995
21 Jan 1996
18 Feb 1996

Enquiries to:

Eric Ward
(Convenor, Brunswick Tree Group)
388 2123 or 388 0411
119 Edward St, Brunswick 3056

From the Editor:

I recently returned from the National Treefest in South Australia, on 30 March and 1 and 2 April. The whole event was designed for the average person to find out more about revegetation, agroforestry, landcare and more. The need for indigenous seed was emphasised in every relevant

presentation, and clearly a new idea to many in attendance. There was also quite a bit for more informed people if you chose the options carefully.

I've included two items in Snippets gathered from the event. The Bushcare program seems to be taking off; read more about on page 12. I've also borrowed a bit on native grasses and their direct seeding from John Stafford; I didn't get to do the field tour but it certainly sounded interesting to me. I've reprinted the text here because it highlights the actual methods, rates and timing of works to re-establish native grass. I hope it's all useful.

We have got yet another article on the issue of seed provenance in this issue. This is all well and good but what about the other issues we could be discussing. I received no written responses, by the time of printing, to the open letter to Greening Australia Victoria and on the general issue of the "restoration industry". How about other issues...let's continue to use this newsletter as the forum it has been and could be.

I also neglected to print the original publishing of the article by Mike Cooper on seed provenance in the January 1995 issue. It was originally published in the *Australian Journal of Soil and Water Conservation* in November 1994. I apologize to that journal for my oversight in the rush of editing time.

John Sago and Adam Muyt have started to do much of the typing for Indigenotes. Thanks!

Lincoln Kern

Drawing by Sharon Mason.

Coming Events:

For IFFA events see back cover

Conferences/Workshops/Talks

- 23 April Sunday 1pm to 5pm New Techniques for Establishing Aquatic Vegetation using Jute mat. This workshop will be presented by Mark Adams and will include hands-on demonstrations in the nursery and two wetland site visits. Meet at Local Native Flora Nursery, Limestone Rd., Boneo. Cost: \$15 and \$8 concession. Contact for bookings: Mark Adams (059) 851 122.
- 1 May Monday. 7:30 pm. Public Meeting on the Merri Creek Concept Plan, with a presentation by Rod McLennan, Manager of the Merri Creek Management Committee. Oldis Avenue Kindergarten, corner Oldis Ave. and Bastings St., Northcote. Contact: Ray Radford, FO Merri Cr., (03) 419 3613.
- 2 May Tuesday. Striped Possums. 8pm. A talk presented by Dr. Kath Handasyde of the University of Melbourne, to members of the Fauna Survey Group, Field Naturalist club of Australia. Venue: Herbarium Hall, Birdwood Ave, South Yarra.
- 7 May Sunday. 2pm. Natural History in Antarctica. Speaker John Mitchell will be presenting a talk to the Field Naturalists Club of Victoria's General Monthly Meeting. Venue: Herbarium Hall, Birdwood Ave, South Yarra. Contact Noel Schleiger (03)435 8408 for details.
- Tue 9 & Wed 10 May Greening Australia presents: After Dieback!? A state-wide conference redressing rural tree decline in NSW. From Deniliquin to Holbrook, Armidale to Moree, many people throughout NSW have been expressing their concern, and asking about rural tree decline. This conference may provide some of the answers to this complex issue. Presentations, poster displays & theatre will cover a broad range of significant aspects of tree decline & dieback, including: causes, research, remnant vegetation, corridors, windbreaks, shelter belts, farm forestry, habitat, Koorie perspective and much more. Venue: Civic Theatre, Orange, NSW (cnr Byng St & Lord's Pl). For enquires regarding the program contact Greening Australia SW Slopes (069) 218 202 or for registration contact Greening Australia NSW (02) 550 0720. Registration fee of \$75 includes sessions, proceedings, Teas, 1 lunch and dinner.
- 11 May Thursday. 8pm. Introduction to Botany Group Research Programs and Launch of a new pamphlet: "An introduction to Botanical Surveying". Mark Jenkins, Noel Schleiger, John Julian, etc, will introduce the research projects currently being undertaken by the Botany Group of the Field Naturalists Club of Victoria. Fire and plants at Cranbourne Botanic Gardens, Fungi survey at Wattle Park and the effects of Boneseed pulling at Seawinds. The panel will also talk about undertaking your own surveys and how to record your observations systematically. A new pamphlet and record sheets will be available on the night. Venue: Herbarium Hall, Birdwood Ave, South Yarra. Contact Noel Schleiger (03)435 8408.
- Wed 10 to Fri 12 May LOCALINKS. The National Conference on Local Environmental Action, Melbourne. Radison Hotel, Melbourne. Presented by the Office of the Environment Department of Conservation and Natural Resources, Victoria. Conference topics will include: Managing our environment, Making links and People and the Environment. Inquiries to conference planners: Context Pty Ltd (03)380 6933.
- 19 May Fri What Future is there for the Koalas of Raymond Island? 8pm. A Seminar presented by the Bairnsdale & District Field Naturalists Club. Raymond Island's koalas attract considerable popular interest, and rumours are rife about the status of the island's Koalas. Are the koalas multiplying and destroying their habitat, or are they dying out from disease? Koala expert, Dr. Peter Mitchell has conducted population counts and used radio tracking equipment to study koala behaviour. Come and hear the real koala story and separate fact from fiction. The seminar is free and all are welcome. Venue: Bairnsdale Neighbourhood House, Dalmahoy St (behind the railway station).
- 28 May Sun Growing wild foods, fibres & medicines. A seminar presented by Greening Australia Victoria. The seminar will discuss indigenous species appropriate for cultivation, harvesting, identify potential markets for indigenous plant products and contribute to the development of a network of growers. Bookings essential. Cost \$35, concession \$12, GAV members \$8. For further information or copies of the GAV Training and Seminar program contact Mary at GAV (03)654 1800.
- 26-29 September 1995 at Townsville, Queensland. Conference on 'Wetlands for Water Quality Control'. Contact: Water Industry Training Association (Qld): phone (07) 224 2647 or fax (07) 224 7999.
- 18 Wed Oct Compulsory competitive tendering & the environment. A seminar presented by GAV. An opportunity to produce performance indicators for environment contracts, discuss the effects of CCT on the quality of environmental management, and examine ways of achieving quality and cost-effectiveness through CCT. Cost \$35, Concession \$12, GAV members \$8. For further information, or copies of the GAV 1995 Training & Seminar Program contact Mary at GAV (03)654 1800.

Excursions and Field Trips

- 6 Sat May Leadbeaters Possum Stagwatch. A survey and spotlighting evening organised by the Fauna survey group of the Field Naturalists Club of Victoria. This will be the last one for the season. Contact Ray Gibson on (03) 874 4408 for details.
- 6 Sat May Birdwatching at Braeside Metropolitan Park. 10.30am. Enjoy a spot of birdwatching with Ian Endersby in the Park's Wetland, Woodland and Heathland. A general interest outing organised by the Field Naturalist Club of Victoria. Meet at the Education Centre. Contact Noel Schleiger (03) 435 8408 for further details.
- 27 Sat May Survey of Cranbourne Botanical Gardens. The Field Naturalists Club of Victoria will be undertaking a general surveying and monitoring of indicator species (*Banksia marginata*) in order to plan the next burn site. It will be a full day so BYO

lunch. Meet at the Cranbourne Botanic Garden's Ranger Office, Cranbourne. Contact Dr. Noel Schleiger (03)435 8408 for details.

Restoration Activities

April

30 Sun FO Royal Park West 10am. Project day. Planting, direct seeding trials and weed control. Melway 29 C12. Contact Mick Arundell on (03)380 8075.

May

1 Mon FO Braeside Park Community Nursery. 10am - noon. Volunteer propagation activities also on Sat 6th, Fri 19th and Sun 21st. Contact Ron Pearson (03)584 7443.

4 Thu FO Warrandyte State Park 10am. Nursery activities every Thursday. Everyone welcome, experience not necessary. Thursday afternoon activities include Walk, Project, Afternoon tea. Also building activities 10am - 12.30pm. every Thursday. For more details contact Co-ordinator Margaret Burke (03)844 1060, Propagation Manager Cathy Willis (03)844 1841 or Building Committee member Ian Burke (03)844 1060.

6 Sat Greenlink Box Hill 10am. Activity days also every Monday and Tuesday. Activities include planting, mulching and weeding. The venue is often the council nursery in Nelson St, Box Hill, but it's best to ring and check. Contact Minette Russell Young (03) 898 1364.

6 Sat FO Gellibrand Hill 9.45 am. Project Day. Contact Mark Corr (03)557 2783.

13 Sat Knox Environment Society 10am - 1pm. Planting day to increase habitat of Threatened Swordgrass Brown Butterfly. Wicks Reserve, Basin-Olinda Rd, The Basin. Meet at carpark (Melways 65 J8). Bring gloves. Contact Peter Steller (03)762 3560 AH.

13 Sat FO French Island 9am. Blackberry eradication in Fern Tree Gully, French Island. We will usually departing from Stony Point on the 9am ferry. Please contact Francis Garner (03)783 4213 at least three days before the Project day to obtain full details of activities and to make travel arrangements.

13 Sat Wurundjeri Garden 10am - noon. This Koorie food garden by the Yarra in Hawthorn has been established for four years. Meet Glen Avon Road (45 A11). Planting and weeding. Contact Dorothy Sutherland (03)347 2252.

14 Sun Greenlink Camberwell 3-5pm. Revegetation activities at the Welfare Pde Indigenous Flora Reserve, Burwood. Meet at the corner of Welfare Pde and Bath Road (Melways map 60 F7). Contact Diana Burgess (03)809 2092.

14 Sun FO the Yarra 10am. Project day. Handweeding and revegetation activities. Meet at Galatea Point (2D D7). Also Wednesdays at 10am. Contact Judy Rutherford (03)347 2252.

14 Sun URAGE 10am. Project day. Weeding of ivy, blackberry and wandering jew. Planting of indigenous grasses and restoration of indigenous vegetation along Ferny creek. Meet cnr Deans and Morris Rd., Upwey (74 K12). Contact Rob Stevens (03) 754

3792.

14 Sun FO Sherbrooke Forest: Mapping Survey Day. Meet at 9:30 am outside Grant's Picnic Ground Kiosk. Mapping weeds on their GIS system...

15 Mon Men of the Trees 10am. Planting day at Yarra Bend Park, Melways map 2D D6. Contact Minette Russell-Young (03)898 1364.

20 Sat FO Bradshaw Park 10am. Planting day at Bradshaw Park, White Street, Mordialloc.

20 Sat FO Werribee Gorge & Long Forest Mallee. 9.30am. Serrated Tussock Awareness Day. Following a brief talk from a guest speaker about Serrated Tussock, we will distribute information leaflets describing the problem weed to residents in Long Forest. Those not involved in the 'door to door' bit can join in the fun? and 'tug some tussock' from nearby infested areas. Bring along: car, walking shoes, note-pad and pencil, mattocks, gloves (sense of humour) and lunch. Contact Janet Leversha (053)67 4229.

21 Sun Brunswick Tree Group 10am - noon. Project day. Contact Eric Ward (03)388 2123.

21 Sun Meander 10am. A group caring for the Menzies Creek and Emerald Tourist Track. Weeding, planting and track work in the creek reserve. Meet A'Vard Picnic ground (125 F12). Contact Kate Forster (059)685 828.

27 Sat FO Organ Pipes National Park. 10am. Project day. For details contact Carl Rayner on (03) 331 2810.

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

Don't forget that Arbour Week is on from the 8th - 14th of May!

Thank you to all the people who contact us regarding on-coming events their groups are organising. If you wish to have your events covered, or you can see corrections that need attention please get in touch with Elissa Kerassitis on (03) 596 8127.

(Sincere apologies to those groups I wrongly listed under last issues' "Restoration activities" as having their project days on Sunday 16th of April (Easter). I hope no-one was inconvenienced as a result - Elissa.)

Books:

New Edition of Seed Collection Book from Murray Ralph

'Seed Collection of Australian Native Plants for Revegetation, Tree Planting and Direct Seeding' has been produced to overcome the distinct lack of information that currently exists on seed collection of native plants. The second edition has been significantly expanded to cover native seed collection in all areas of temperate Australia.

Topics covered in the book include:

1. Why Collect Seed Locally and Where to Collect Seed
2. Guidelines for Seed Collection
 - Permits
 - Care of Natural Vegetation
 - Genetic Considerations
 - Labelling and Plant Identification
3. What and When To Collect
 - Seed and Fruit Development
 - Types of Fruits and Seed
 - Timing of Seed Collection
4. How To Collect Seed
 - Tall/Medium Trees
 - Small Trees/Medium Shrubs
 - Medium/Small Shrubs
 - Groundflora Species
 - Native Grasses
5. Seed Handling and Storage

Specific collection details are given for over 300 different native plant genera and collection times for over 950 species are outlined.

'This excellent book is by a highly experienced practitioner of the subject.' Rodger Elliot (author of the 'Encyclopedia of Australian Plants' - *The Age*).

'Germination of Native

Australian Plants' book also available now

With increasing community recognition of the many problems associated with past clearing of native vegetation, interest in the propagation of local native plants has dramatically increased over the past few years. This has led to a greater diversity of native plant species being grown, including native grasses, aquatics, lilies and herbaceous.

However, in many cases the information on propagation of these species has not been widely available. This booklet has been produced in response to this lack of information, outlining techniques utilised in the germination of native plant seed. The first chapter outlines why local native plants should be grown. The second chapter examines seed germination, viability, dormancy and treatments used to overcome seed dormancy. The third chapter provides specific details on the germination of over 500 native species and genera.

Murray Ralph has been involved with seed collection and propagation of local native plants for over ten years and worked for organisations such as CSIRO, Greening Australia and the National Trust. He is currently running a consultancy business, Bushland Horticulture and teaching bush restoration and horticulture.

Both books are available from the Greens Bookshop on Flinders Street or directly from the author, Murray Ralph, 15 King William St., Fitzroy, Victoria 3065
Drawings by Gavan Moorhead, on this page and in the books.

Geographic Information System (GIS) Handbook for Local Government

This 129 page document was specifically for local government. The report covers many issues that Councils' need to address when establishing their own GIS. Cost: \$45.00, send to LGAT, 1521R, Hobart, Tasmania 7001.

Source: Local Environs, Newsletter of the Municipal Conservation Association, 6(1) March 1995

Action Page:

Mineral Exploration on Mt. Piper

Mt. Piper, the magnificent butterfly habitat near Broadford, is again under threat from mineral exploitation. An application for mineral exploration was granted, commencing on 4th November 1994 for an area including Mt. Piper. It appears that the Dept. for Conservation and Natural Resources (DCNR) has compromised, because Mt. Piper is not listed under the Flora and Fauna Guarantee Act, only it's butterfly community, and DCNR is allowing exploration on foot, on Mt. Piper.

BHP has thoroughly explored Mt. Piper and included drill core sampling on a small-grid line on the mountain itself, doing unknown damage to the community, and causing obvious degradation and disturbance to the mountain. Surely BHP's findings would be more conclusive than any on-ground geological fossicker.

One reason put forward as to the reason why mineral exploration will be allowed is that the habitat is not listed as "critical", Mt. Piper is listed only as an "education reserve".

A recommendation for the listing of the habitat of Mt. Piper and its surrounds as critical habitat has been with Minister Coleman, awaiting his "pleasure" for 3 to 4 years. In fact since the passing of the FFG Act, no recommendations for listing of areas as Critical Habitat have been ratified. One could ask why?

In the meantime rights for mineral exploration have been granted. Why? We have asked why concessions have been granted and what gain there is to risk Mt. Piper's habitat and its nationally recognised Butterfly Community.

We urge those concerned by these events to write to papers and ministers voicing your concerns.
Source: Broadford Environmental Action Movement Newsletter, No. 1, 1995

LCC Proposed Recommendations Marine and Coastal Special Investigation

The proposed recommendations for the Land Conservation Council's Marine and Coastal Special Investigation are now available. These recommendations outline proposals for the use of public land along the coast, and the coastal marine waters and seabed of our bays, inlets,

estuaries and territorial waters to 5.5 km offshore. The Gippsland Lakes and land within cities and rural cities are excluded from the investigation.

Submissions Invited

Submissions are now invited from interested persons and bodies concerning the use of public land along the coast and for Victorian marine waters. These submissions will be considered by the Council when making its Final Recommendations. Written submissions must be lodged on or before THURSDAY 6TH JULY 1995 and be addressed to the Secretary.

The recommendations may be inspected at the Dept. of Planning and Development Library, 477 Collins St., Melbourne, at regional offices of the Dept., public libraries along the coast and at Municipal Offices.

Copies of the Recommendations may be purchased over the counter for \$5.00 from Information Victoria Bookshop, 318 Little Bourke St., Melbourne; Dept. of Planning and Development Bookshop (same address as above); the Outdoors Information Centre, 240 Victoria Pde., East Melbourne; many DCNR regional offices; Phillip Island Info. Centre and Flagstaff Hill Maritime Museum, Warnoombool. Mail orders, at a cost of \$8.50, may be addressed to Information Victoria, 318 Little Bourke, Melbourne. For credit card purchases call (03) 651 4100.

Mr. G. Blackman, Secretary
Land Conservation Council
1st Floor, 477 Collins St.
Melbourne 3000
Telephone: (03) 628-5142
Source: The Age 11 April 1995

Maritime Accidents and Pollution: Impacts on the Marine Environment from Shipping Operations

Paper for Public Comment

You are invited to comment on the Australian and New Zealand Environment and Conservation Council's paper on *Maritime Accidents and Pollution: Impacts on the Marine Environment from Shipping Operations*. This paper outlines the approach and the actions of Environment Ministers and agencies in addressing maritime accidents and pollution issues, to be carried out in close collaboration with appropriate maritime authorities. Copies of the paper and further information are available from the contact person within your State or Territory below.

Written Comments should sent to:
Secretariat, ANZECC Maritime Accidents and

Pollution

Implementation Group, c/o Environment Protection Agency
40 Blackall Street, Barton ACT 2600 Fax: (06) 274 1230.

The closing date for comments is 14 July 1995.

Consultative Forums

A series of half day Consultative Forums (9am-1pm) will be held in all Australian capital cities to promote and facilitate considered comment on the issues raised in this paper. Forums are free, but you must register your attendance by the 8 May 1995 with your State/Territory contact person below.

State	Contact/Phone	Venue/Date
VIC	Sarah Bloustein (for copy of paper) (06) 274 1051	
	Annette Humphries (for forum registration) (03) 628 5904	Melbourne 16 May

Source: The Age 1 April 1995

Snippets:

International Networking for Long Term Ecological Monitoring

The first international meeting to focus exclusively on long-term ecological research networking was convened by the U.S. Long-term Ecological(LTER) Network in Estes Park, Colorado in the United States, September 23-24, 1993. Thirty-nine scientists and administrators representing 16 countries participated. Each country representative reported briefly on long-term ecological research projects and networks, highlighting the potential value of international exchange.

Following an exercise in which participants identified issues of common concern to the global long-term ecological research community, five focus groups were organized to formulate plans for immediate and long-term action.

For more information on ILTER activities or for a copy of the complete report from the September 1993 ILTER Summit:

LTER Network Office

206/543-4853

Office@LTERnet-edu0

Source: from the Internet...

Killing Weeds With Steam

A new chemical-free method of weed control for Councils and land managers was recently launched in Australia. The Waipuna (a Maori word which translates literally as 'pure spring water') weed control system uses heated water to destroy weed growth on roadside verges, parklands, stream reserves and agricultural and domestic situations and can be used in total safety to the operator, the community and the environment.

Independent investigation has shown this weed management system to be as effective in weed control as the leading herbicide currently used extensively by local government.

The system is a self-contained, computer-controlled unit which is readily mounted on a light truck. It is designed for use on all soft tissue weeds using a hydro-thermal process, where pressurised water is pumped through a heating chamber and applied, using hoses and spray lances directly to weeds. Leichhardt Municipal Council (Sydney) and Brisbane City Council are already using this innovative system.

Source: Local Environs, Newsletter of the Municipal Conservation Association, 6(1) March 1995

Editor's Note: I spoke with a person from Leichhardt

Drawings by Sharon Mason.

Council about this system as well. The general feeling was that it wasn't as effective as it could have been because too much was expected of the equipment and it wasn't well integrated into a weed management program. The unit was performing well in some situations, for weeds on hard surfaces, annual weeds and other soft weeds, but poorly on bigger weeds, perennials in particular. It sounds like it could be one more effective tool for weed control, allowing less herbicide use, but will certainly not be effective in all situations.

Tax Deductions for Landcare Projects

The Australian Taxation Office spread the message that "Landcare is good news at tax time" during a recent seminar held at Alcoa Landcare Education centre, Warrambeen.

More than 30 accountants from regional centres in Victoria's south west joined departmental field officers and tax office representatives in discussing record keeping and sales tax implications for landcare activities. Recent changes to section 75D of the Taxation Act allow for 100% deductability in the year of expenditure for a range of land degradation measures.

The landcare taxation seminar was the brainchild of Agriculture Victoria's David Buntine who is often asked by farmers about the tax implications of landcare activities. "In many cases we refer them to their accountants, but accountants may not fully understand the on-ground peculiarities that often exist" said David. "So we brought the field officers and accountants together at Warrambeen along with people from the tax office to tease out some of the more difficult scenarios."

The historic surrounds of the landcare education centre, which has been redeveloped from bluestone shearers quarters as part of the Alcoa Landcare project, provided an appropriate ground for the seminar.

Peter Trahar from the small business unit of the Tax Office enjoyed the interaction. "The changes to section 75D have only recently come into effect so we are all feeling our way a bit" said Peter. "The seminar allowed us to sort out any of the confusion people might have in interpreting the guidelines."

Peter's address was aided by a series of slides provided by Graeme Anderson from the Department of Conservation and Natural Resources, which showed typical land degradation problems. This provided a good opportunity for the accountants and tax office staff to get a first hand understanding of the land degradation problems facing

the farming community. "The seminar has certainly helped the landcare advisory officers in the region and gauging from the questions asked by the accountants, it has cleared up a few hazy areas for them too," said David.

Peter and his colleagues gave details on how the Act should be applied and the type of documentation needed. Of particular interest was the procedure to deal with grants or incentives received by a farmer to assist with land degradation works. "If farmers have received incentive money, they need to deduct the amount of the grant from the total cost of the job before making the claim" explained Peter.

Source: Alcoa Landcare Project Quarterly Report, No.3, December 1994

Landcare: Tax Implications

Many farmers are still not aware that activities such as fencing eroded or saline areas, subdividing paddocks on soil type and replanting high groundwater recharge areas to trees, are deductible.

Section 75D of the Taxation Act states that primary producers and other businesses earning income from the use of rural land are entitled to claim an outright deduction (100% write-off in the year of expenditure) for certain capital expenditures associated with landcare.

These include:

- * the eradication of animal or weed pests.
- * measures to prevent or combat land degradation, eg. soil conservation earthworks, tree planting for salinity and erosion control and regeneration of

native vegetation.

- * erection or modification of fences to assist reclamation of degraded areas.
- * erection of land class fencing in order to prevent degradation - in accordance with an approved management plan.
- * construction of drainage works for control of salinity and to assist drainage control.

As with other tax deductions, claimants need to retain evidence of expenditure such as receipts, photos and contracts. However, it is not necessary to produce these with the tax return. In the event of an audit evidence will be required showing the operation was carried out and costed.

For further information call the Melbourne branch of the Tax office on 03 285 1153.

Source: Alcoa Landcare Project Quarterly Report, No.3, December 1994

The Bushcare Story

BUSHCARE is a new program to save South Australia's rapidly disappearing remnant vegetation.

It was conceived by Andrew Allanson, of the Trees For Life program, in response to his on-site observation of the alarming rate at which patches of remnant vegetation are degrading to the point of local species loss. The causes include weed invasion, rabbit damage and human destruction. The problem extends from near Adelaide to all corners of the state.

Apart from the intrinsic value of native vegetation and the need to save it for its own sake, there is a practical reason for TFL's concern. The scheme in which TFL supplies free native plants to landholders uses seed collected from remnant vegetation only. The resulting plants are returned to areas as close as possible to the original seed source. The demise of a species in an area removes that plant from a landholder's choice. Without urgent action to halt this accelerating loss, appropriate revegetation will become impossible - by TFL or anyone else.

BUSHCARE is the answer. Volunteers (Bushcarers) undertake to repair and restore a patch of bush. The patches may be on roadsides, in council reserves and eventually the scheme will extend to private holdings. TFL locates salvagable patches, signs up carers, trains the carers in weed eradication, helps them prepare a management plan, trains them in plant re-establishment and provides them with the equipment to do the job.

The eradication of rabbits is a crucial part of the process, both to allow the survival of new regenerating plants and to ensure that neighbouring properties are protected from infestation. Map-

ping of warrens and monitoring to detect re-infestation ensures that sites are kept rabbit free. Regular visits to each site by TFL staff ensure that the work proceeds effectively and that the carers' expectations are being met.

A pilot program of 29 sites in 6 council areas is currently underway. This is designed to work the bugs out of the system, establish the practicality of the scheme, and verify the cost parameters. Funding for the 29 sites has been provided by six councils involved, Save The Bush, and the Native Vegetation Council. The 6 councils are Mitcham, Noarlunga, Happy Valley, Light, Wakefield Plains and Mallala.

No more sites will be started until the results of the pilot are clear at year-end. Then in 1996, providing funding can be arranged, the scheme will be extended to twenty more councils and 120 more sites. Over the following four years coverage will extend throughout the state and establish a further 400 sites.

John Bradsen, chairman of the Native Vegetation Council, one of the prime supporters of the scheme, sees BUSHCARE as having great potential in the battle to save South Australia's (and Australia's) disappearing remnant vegetation. "The essential element in a project of this scale and urgency is a substantial and continuing contribution of energy by a large number of volunteers. Trees For Life has a proven record of ability to attract volunteers and manage their efforts. We have every confidence that they will make a success of BUSHCARE."

The Local Government Association actively supported and helped initiate the pilot programme and believes that its extension to all council areas is essential. President John Dyer said "the character of each district is closely allied to the form of its natural vegetation. To restore and maintain that character it is important that we act now, before it is too late to save the remnant vegetation that still exists. It is the only source of seed for local landholders to use in their revegetation programmes.

The scheme has the support of the South Australian Farmer's Federation. Chairman of the Farmer's Natural Resources Committee, Michael Gaden said "Farmers will strongly support this scheme. TFL does a great job for farmers and any project to help maintain the sources of seed used for revegetation has our support. We hope the pilot programme will eventually be extended to include management advice and volunteer help for private landholders also. Farmers own important areas of remnant vegetation and many would welcome outside help in its management."

Interested? Call us at Trees For Life on (08) 207 8787 for more information.

Source: From a flyer obtained at the National TreeFest 1995, South Australia.

TreeFest 1995 Native Grasses Tour

The Treefest 95 Native Grasses Tour [led by John Stafford of the East Torrens Animal and Plant Control Board] introduced participants to several native grasses that are somewhat representative of over 1000 species native to Australia. Each grass is being cultivated as a seed producing crop by the East Torrens Animal and Plant Control Board for use in land rehabilitation projects.

The three most relevant species under propagation include:

Kangaroo grass (*Themeda triandra*)

This grass does not stand heavy grazing in southern latitudes but is useful for replenishing and managing ground cover in conservation areas. Burning in spring favours this grass. In the Adelaide Hills the first evidence of natural regeneration is usually seen on the steep north facing slopes.

It is a difficult plant to propagate on a large scale. It has non-synchronous seed development and any interruption of the natural ripening process contributes to seed dormancy. Propagation is achieved by harvesting the complete culms (to minimise seed dormancy) when the optimum amount of mature seed is in the panicle. This is usually when the first seeds ripen in December.

The culms are immediately taken to the seeding site and spread over the ground in light latice sufficient to produce 5-10 plants per sq. m. No ground preparation is required for this seeding operation. Hydrosopically activated awns work the seed out of the panicle and finally into crevices in the soil.

Approximately 9 months later in early spring when there is sufficient herbaceous weed growth present, the site is sprayed with glyphosate and 4kg/ha active atrazine. Several weeks later when the weed growth has cured it is burnt. Under warm conditions the first *Themeda* seedlings appear 7 days after the burn and in the absence of weeds, usually grow well with good moisture reserves in the soil.

Wallaby Grass (*Danthonia caespitosa*)

A winter active perennial that under favourable conditions, can remain green in summer. *D. caespitosa* is perhaps the most widespread and valued pasture grass of this very useful genus. It is very often the first native species to recolonise

degraded sites.

Danthonia can be readily propagated by seed. A mechanical stripper built by the East Torrens Animal and Plant Control Board has proved to be very effective in harvesting the seed in floret form. This is harvested in mid-November, spread on a shed floor to dry and then cleaned by shaking through a 5mm sieve.

Establishing *Danthonia* seed sources in East Torrens has largely been confined to encouraging natural regeneration on the hills face adjacent to Adelaide. By controlling *Scabiosa atropurpurea* with applications of 50g/ha of metsulfuron methyl product, *D. caespitosa* has rapidly established as the dominant plant.

Weeping grass (*Microlaena stipoides*)

Found in damper areas of southern Australia. A rhizomic perennial that grows well as an understorey plant. Although some growth is made in winter it is most active in spring and responds well to any rains in summer. It can withstand very sustained grazing and has a high nutritional value. It is a very useful species for lawns.

Propagation can be achieved by dividing the rhizomes (up to 100 divisions per plant) or by its readily harvested seed. Seed usually matures in December (sometimes earlier) and subsequent crops may be produced during summer and even into autumn if adequate moisture is available.

At East Torrens, *Microlaena* seed is stripped, dried and cleaned in the same manner as *Danthonia*. Good swards have been established by carefully preparing a weed free seed bed with 4 applications of glyphosate through spring/summer/autumn. Seed is sown in late autumn by broadcasting over uncultivated ground at the rate of 10 kg/ha of stripped floret seed.

In the cooler months of the year *Microlaena* seed will take 4 weeks to begin to germinate and another 4 weeks to complete germination. This delay in germination permits an application of glyphosate to be made to control post-sowing/pre-emergent weeds. Post-emergent applications of metsulfuron methyl at 7g/ha have been used to control soursob and 50g/ha in summer to control plantain.

Tour Sites:
(included to highlight examples of the methods and scheduling)

Creek Bank, Piccadilly Valley

An extremely modified site where market gardening has been practised for many years with heavy use of fertilisers and summer irrigation. A stream bank rehabilitation trial has been established as

part of a water quality control program.

Works Timetable

- 10/6/94 Microlaena was sown at the rate of 20kg/ha onto relatively bare ground.
- 20/6/94 Site hand sprayed with glyphosate at 1:100 in water.
- 22/9/94 Broadleaf weeds sprayed with metsulfuron methyl at 10g/ha.
- 11/11/94 Glyphosate applied to grassy weeds with a wick wiper.
- 9/1/95 Broadleaf weeds sprayed with metsulfuron methyl at 50g/ha.

Packer Property, Forest Range

The site was cultivated as an apple orchard for 100 years. The trees were cleared in 1991. The area sown with Microlaena was approximately 8,000 m².

Works Timetable

- 22/10/93 Application of 7 litres of glyphosate.
- 29/11/93 Control burn to remove ground cover.
- 10/1/94 Application of 6 litres of glyphosate.
- 19/1/94 Application of 6 litres of glyphosate.
- 1/6/94 Broadcast 8 kg of Microlaena seed over site.
- 20/6/94 Application of 8 litres of glyphosate.
- 22/9/94 Application of 5.5g of metsulfuron methyl.
- 11/11/94 Application of glyphosate by wick wiper to some grassy weeds.
- 9/1/95 Application of 40g of metsulfuron methyl.

Source: National Treefest March/April 1995, Field Tours Booklet

Catchment and Land Protection Boards

The establishment of the new Catchment and Land Protection Regional Boards provides an exciting avenue by which Landcare and Farmers Federation groups alike can make a direct contribution to the identification of regional priorities for environmental protection for consideration in the Regional Catchment Strategy.

This strategy will be produced according to the C & LP Boards business Plan. This plan is a document which the Boards are required to submit to the Minister for Natural Resources within six months of their establishment.

The Regional Strategy will outline the priorities for funding allocations to land management groups, the DCNR and DAV. It will identify the areas in which the resources are to be used for the purposes of land and water management which will best afford the protection of the specific environment within that region. For this reason it is important that Landcare, VFF and other groups are pro-active in making representations to the boards regarding their concerns over issues such as weed infestation, wild animals and other land/water degradation issues. Representatives will ensure that the real concerns of the people which land and water management decisions are going to affect, are given due consideration in the formation of the Strategy.

Please contact your local DCNR office or the Victorian Farmers Federation on (03) 2075555 to obtain the details of how you can have input into your regional C & LP Board.

Source: Trunkline, No. 47, February 1995

Editor's Note: This lecture series looks like a great introduction to the natural history of the Sydney region and the restoration efforts that are happening. Maybe Melbourne could use a similar series...

IFFA activities:

IFFA (Vic)

Meeting venue:

RAOU Headquarters, 415 Riversdale Road
Hawthorn East, Melways 45 H 12 It is on the north
side of Riversdale Road a few hundred metres west of
Camberwell Junction.

Next meeting:

Tuesday 25 April, 7:30 pm at the RAOU.
Terry White, of the Stream Watch Project
at Melbourne Parks and Waterways, will
speak on the Stream Watch Project.

The project is about getting help from the commu-
nity to accumulate information about the water
and habitat quality, and more..., of our streams.
Everyone welcome!

Committee meeting:

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

SPIFFA

Contact Mark Adams (059)851122.

Indigenous Nurseries Network subcommittee:

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

NSW activities:

Next meeting:

In the Maiden Theatre, Mrs Macquaries Rd, Royal
Botanic Gardens Sydney. Contact Sally Fisher (02)
9706486 (work).

Membership

IFFA membership costs
\$40 for non-profit organizations,
\$50 for corporations,
\$25 for individuals and families,
or \$20 concession.

**Membership includes
11 issues of Indigenotes per year.**

*Memberships should be sent to the
Membership Secretary.*

*Include your name,
address and phone numbers,
and a bit about yourself.*

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**Contributions to Indigenotes should be sent to the
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8th.**

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