

RESEARCH NEWS

The Newsletter of the Research Division of the Department of Conservation and Land Management

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No: 7/91

September 1991

OUTSIDE COVER

FLORA OF THE RECHERCHE ARCHIPELAGO THE 1991 AUSTRALIAN GEOGRAPHIC EXPEDITION

GREG KEIGHERY, JULY 1991

PREVIOUS STUDIES

The first botanical collections from the Recherche were made by the French in 1792, followed by the English in 1802. However, the first systematic attempt to survey the flora of the Archipelago was undertaken by the Australian Geographical Society in November 1950. They were able to collect extensively on 20 islands and listed 275 species of vascular plants as occurring on these islands.

Since this expedition Goodsell et al. (1976) have re-collected on Woody Island, during the spring of 1975. Abbott and Black (1978) collected on Mondrain, Woody, Salisbury and Wilson Island. Hopkins (*pers. comm.*) has studied Salisbury Island. Brown et al. (1984) have undertaken extensive pre and post fire studies on Middle Island (and collected on Goose Island).

These published and unpublished studies have now recorded 378 species (235 on Middle Island alone!) of vascular plants from the Archipelago, of which 61 are naturalized aliens. Surveys have been undertaken on 21 islands.

THE 1991 EXPEDITION

The expedition was able to land on 13 islands to study the flora. Of these, New Year, Anvil, Spindle, Six Mile Rock, Bellinger, Wickham and Taylor Island had not previously been studied.

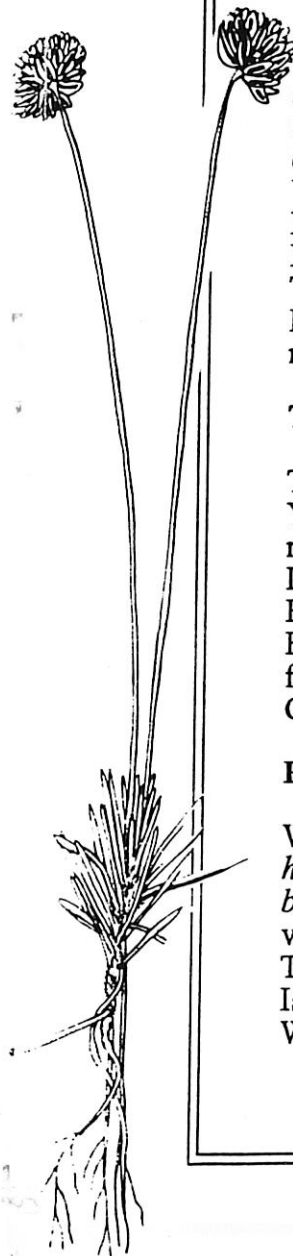
Landings were also made on Daw, Middle, North Twin Peak, Mondrain, Sandy, Hook and Wilson Island.

Further information on the flora lists for the six previously unstudied islands and for Wilson Island (where numerous new records were noted) can be obtained from Greg Keighery.

RESULTS

We recorded six species (*Chamaescilla corymbosa*, *Wilsonia backhousei*, *Wilsonia humilis*, *Calandrinia corrigioloides*, **Corrigiola littoralis* and **Monadenia bracteata*) not previously listed for the Archipelago. This raises the known vascular flora to 384 species.

The *Wilsonia backhousei*/*W. humilis* vegetation association found on Bellinger Island has not previously been recorded on any other island in the Archipelago. Wilson Island, was previously studied by Abbott and Black (1978) who recorded



40 species of vascular plants. We recorded 63 species from the island, a 57% increase. It would appear, from a number of unidentifiable fragments that a spring survey would result in further new records.

The expedition recorded an additional 9 species (*Stipa flavescens*, *Parietaria debilis*, **Stellaria media*, **Euphorbia paralias*, *Lavatera plebeia*, *Melaleuca pubescens*, *Solanum simile*, *Gnaphalium indutum* and *Gnaphalium sphaericum*), on Daw Island, compared to those listed by Willis raising to known flora to 55 species. One species *Spinifex hirsutus* was not relocated, it has apparently become extinct on Daw Island since 1950.

Only one new record *Eriochilus dilatatus* was made for Mondrain Island.

Twelve new species (*Isopogon tridens*, *Petrophile teretifolia*, *Atriplex cinerea*, *Disphyma clavellatum*, *Lepidium foliosum*, *Drosera glanduligera*, *Acacia nigricans*, **Euphorbia paralias*, *Lavatera plebeia*, *Melaleuca lanceolata*, *Daucus glochidiatus*, **Pseudognaphalium luteo-album*) were recorded for Sandy Hook Island, raising the number of species recorded for the island to 112.

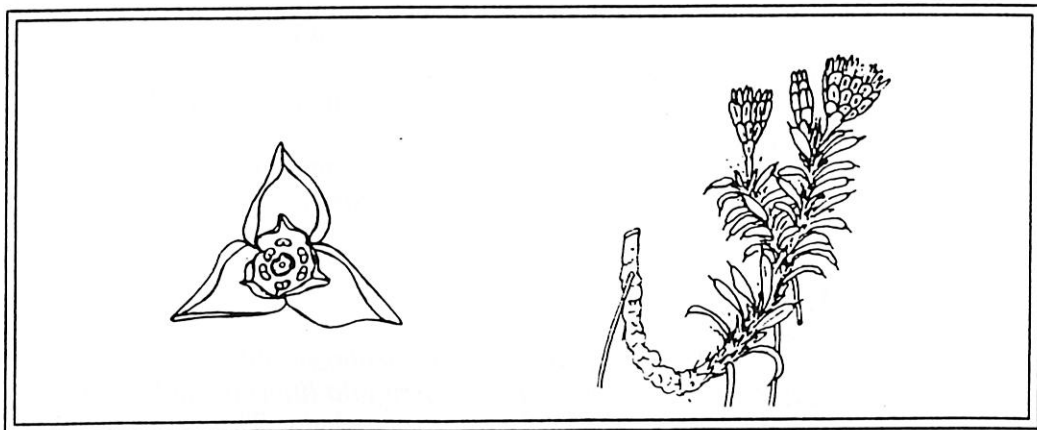
One other interesting observation was that Willis found the littoral alien, *Euphorbia paralias* (Sea Spurge) only on Middle

Island. Whereas 40 years later all ? islands with beaches throughout the Archipelago has this species on them.

The expedition found that the severe summer temperatures (up to 45°C) and prolonged drought resulted in numerous deaths of the native vegetation on the shallow soils surrounding granite hills on all islands visited, from Daw to Woody. These deaths were recorded and photo points taken to monitor recovery.

REFERENCES

- Abbott, I. and Black, R. (1978). An ecological reconnaissance of four islands in the Archipelago of the Recherche, Western Australia. *Journ. Roy. Soc. Western Australia* 60 : 115-126.
- Brown, J.M., Hopkins, A.J.M., Trudgen, M.E. and Weston, A.S. (1984). Regeneration after fire in 170 year old vegetation on Middle Island, South Western Australia. *Medecos IV*, Proceedings. Ed. B. Dell. Perth, pp 18-19.
- Goodsell, J., Tingay, A. and Tingay, S.R. (1976). A Resource Survey of Woody Island, Archipelago of the Recherche. Report 21. Dept. Fisheries and Wildlife, Perth.



	ISSUE	DEADLINE	DISTRIBUTION
DEADLINE FOR NEXT			
ISSUE	OCT 91	28 OCT 91	LATE OCT

RDPG

Extract from RDPG Minutes of meeting held on 15 August 1991

Budget

It was reported that Research Division has managed its budget well. John Byrne was very pleased with the management of Research Division's accounts and it was agreed that credit must go to all Program Leaders and Admin Assistants for their skilful management of the year's finances. Particular thanks go to John Dorlandt and Peter Heslewood.

Oracle

Research Division will now receive monthly reports on their financial situation through this system, however for the first few months there will be a few teething problems.

Safety inspection of Manjimup and Como Research Centres

This has been carried out.

The Herbarium has to now follow suit.

Communications Plan

The Division will be preparing a Communications Plan with help from Ray Bailey of Corporate Relations.

Research Plan

The Research Plan has been completed and is now in print. It is expected to be available early next month.

Overview of CALM Internal Workshop - Improving Vegetation Cover in Rural Areas

Ian Abbott who chaired this workshop reported that the stated aim was achieved with a good attendance from relevant people, but overall, not a good attendance.

Attendance of staff at Research Division Seminars

A new point is to be included in the Annual Review Guidelines (Communication) in that Research Division staff are expected to attend a reasonable proportion of Research Division seminars.

PC Replacement Policy

A PC replacement policy has almost been finalised. Possible suggestions forwarded were (i) the possibility of computer leasing (T Start to look into); and (ii) using the *Research News* as a trading post.

Funds for Conservation Entomology

Matt Williams has received money from the Contingency Fund to continue his work on Butterflies.

Acting Ecologist - Northern Forest Region

Jeni Alford will be taking up this position from September 1991, whilst Sue Moore is on study leave. Bill Muir will be joining Research, based at Woodvale, to replace Jeni.

New staff member

Liz Barbour has been contracted for 12 months to work on Blue Gums. Liz will be based at Kings Park (Lab) and Como from the end of September/early October.

The next RDPG meeting will be held at the Manjimup Research Centre on Thursday 17 October 1991.

LIBRARY NEWS

Inter-library loans:

Good news for all inter-library loan users. Last spring the library reluctantly imposed a \$5.00 charge for each inter-library loan to cover the cost of this vital service. At a recent meeting of the CALM Corporate Executive it was agreed that \$3,000.00 would be made available to the library budget for inter-library loans. This translates to the first 20 inter-library loans per person being provided free this financial year.

TREECD Many CALM researchers will have used the Commonwealth Agricultural Bureau's (CAB) CD-ROM facilities at the WA Department of Agriculture. CAB have recently produced TREECD which is a set of compact discs covering CAB indexes back to 1939. The publications covered are Forestry Abstracts, Forest Products Abstracts and Agroforestry Abstracts. The CALM Corporate Executive have agreed that funds should

be made available for the library to purchase both the CD-ROM hardware and the 1939-1990 disks. It is proposed to locate the system at the Como branch library. This system will make literature searches on forestry related topics much easier than at present. In particular, historical data will be readily available with TREECD.

It is envisaged that the Branch Librarian at Como would be able to conduct searches on request and send the results, on disk, to any CALM office.

Elaine Davison
Principal Research Scientist

Mineral Exploration in an Environmentally conscious society.

Summary of a Seminar held on 15-16 August and presented by the Geological Society of Australia and Australian Institute of Geoscientists and sponsored by the Association on Mining Exploration Companies

The seminar was attended by 150-160 people from the mining industry, exploration companies, consultants and government. Twenty three papers were presented over the two days, including two invited papers from CALM:

Frank Batini - Legislation regulated by CALM

Greg Keighery - Impact on exotic plants on native ecosystems and how to limit their spread during exploration.

Other papers dealt with community relations, environmental impact assessment, legislation limiting environmental impacts by within industry regulation, dieback, weeds, successes-failure, rehabilitation and towards an environmental code of conduct.

The major outcome of this meeting was an agreement that an Environmental Code of practice for Mineral Exploration was needed and will be developed, along the lines of the Code of Conduct for Mineral Exploration on Pastoral Leases. This is now being developed.

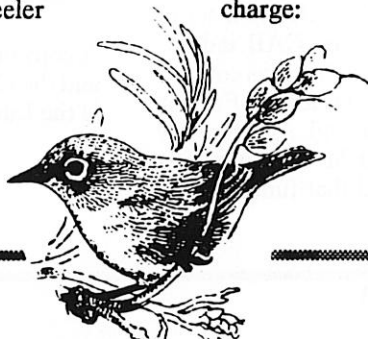
A copy of the Conference proceedings and the *Code of Conduct* will be placed in the Library.

Greg Keighery

Research Project Plans

The following Research project Plans have been approved for this month.

<p>No: 32/88 Title: Fire effects on desert vertebrates - influence of fire season Officer-in-charge: D Pearson</p>	<p>No: 113/91 Title: Flora of the Walpole-Nornalup National Park Officer-in-charge: JR Wheeler</p>	<p>No: 121/91 Title: Book on pollination of Western Australian Orchids Officer-in-charge: S Hopper</p>
<p>No: 33/88 Title: The impact of fire and edaphic factors on the vegetation and flora of Queen Victoria Spring Nature Reserve Officer-in-charge: D Pearson</p>	<p>No: 114/91 Title: Conservation status of butterflies in Western Australia Officer-in-charge: MR Williams</p>	<p>No: 122/91 Title: Systematics of Kangaroo Paws and related plants (Haemodoraceae subfamily Conostyloidoideae) Officer-in-charge: S Hopper</p>
<p>No: 37/88 Title: Traditional Aboriginal fire use in the Western Desert Officer-in-charge: D Pearson</p>	<p>No: 115/91 Title: The clarification of the taxonomy of <i>Tegicornia</i> and some sections in the genus <i>Halosarcia</i> (Chenopodiaceae) Officer-in-charge: P Wilson</p>	<p>No: 123/91 Title: Wildlife Management Program for <i>Anigozanthos pulcherrimus</i> and <i>Macropidia fuliginosa</i> Officer-in-charge: S Hopper</p>
<p>No: 88/91 Title: Fire spread patterns in semi arid lands Officer-in-charge: L McCaw</p>	<p>No: 116/91 Title: The taxonomy of the <i>Helipterum</i> - <i>Helichrysum</i> group (Asteraceae) in Australia Officer-in-charge: P Wilson</p>	<p>No: 124/91 Title: Orchids in major WA Conservation Reserves Officer-in-charge: S Hopper</p>
<p>No: 90/91 Title: Simulated herbivory on foliage of <i>Eucalyptus globulus</i> (manual defoliation) Officer-in-charge: I Abbott</p>	<p>No: 117/91 Title: Research curation of the family Rutaceae in the WA Herbarium Officer-in-charge: J Armstrong</p>	<p>No: 125/91 Title: Systematics and biogeography of Western Australian eucalypts Officer-in-charge: S Hopper</p>
<p>No: 105/91 Title: Granulated herbicides to control weeds in <i>Eucalyptus globulus</i> plantations Officer-in-charge: R Fremlin</p>	<p>No: 118/91 Title: Preparation of "Flora of Australia" contributions Officer-in-charge: T Macfarlane</p>	<p>No: 126/91 Title: Systematics of selected Western Australian orchids (<i>Caladenia</i> and allied genera). Officer-in-charge: S Hopper</p>
<p>No: 110/91 Title: Effect of ectomycorrhizas on survival and growth of karri seedlings on a clearfelled karri coupe Officer-in-charge: P Hewett</p>	<p>No: 119/91 Title: Taxonomy and Phylogeny of Rutaceae Officer-in-charge: J Armstrong</p>	<p>No: 127/91 Title: Rare Flora Management Plan for the Moora District Officer-in-charge: S Patrick</p>
<p>No: 112/91 Title: Flora writing pilot project, the genus <i>Agonis</i> (Myrtaceae) Officer-in-charge: JR Wheeler</p>	<p>No: 120/91 Title: Rare and poorly known WA eucalypt survey Officer-in-charge: S Hopper</p>	<p>No: 128/91 Title: Population biology and conservation genetics of <i>Acacia anomala</i> Officer-in-charge: D Coates</p>



RESEARCH PROJECT PLANS ...Cont.

No: 129/91 Title: Population biology and conservation genetics of <i>Banksia verticillata</i> Officer-in-charge: D Coates	No: 130/91 Title: Population biology and conservation genetics of <i>Stylidium coroniforme</i> Officer-in-charge: D Coates	No: 131/91 Title: Population biology and conservation genetics of <i>Banksia brownii</i> Officer-in-charge: D Coates	No: 132/91 Title: Population biology and conservation genetics of <i>Banksia cuneata</i> , <i>Banksia oligantha</i> and <i>Banksia ilicifolia</i> Officer-in-charge: D Coates	No: 133/91 Title: Biosystematics and evolution in <i>Stylidium</i> Officer-in-charge: D Coates	No: 134/91 Title: Field surveys and conservation status of rare and threatened flora Officer-in-charge: D Coates	No: 135/91 Title: Conservation status of members of the family Rhamnaceae Officer-in-charge: B Rye	No: 136/91 Title: Taxonomic studies in the Lyperaceae Officer-in-charge: B Rye	No: 137/91 Title: Taxonomy of the Liliaceae Officer-in-charge: B Rye	No: 138/91 Title: Taxonomic revision of <i>Beaufortia</i> R.Br. Officer-in-charge: AA Burbidge	No: 139/91 Title: Taxonomy of selected WA grasses Officer-in-charge: T Macfarlane	No: 140/91 Title: Taxonomy of Pultenaea and other legume genera Officer-in-charge: T Macfarlane	No: 141/91 Title: Taxonomic research on Liliaceae sens. lat. and related monocots of W.A. Officer-in-charge: T Macfarlane	No: 142/91 Title: Assessment of the nomenclatural problems associated with names on schedule "Protected Flora Declared as Rare Flora - Item 2 Taxa Presumed to be Extinct" Officer-in-charge: K Kenneally	No: 143/91 Title: Botanical survey of Greenough District Officer-in-charge: K Kenneally	No: 144/91 Title: Flora of Australia : <i>Acacia</i> Officer-in-charge: B Maslin	No: 145/91 Title: Generic status of <i>Acacia</i> : an assessment Officer-in-charge: B Maslin	No: 146/91 Title: Taxonomy of <i>Acacia tumida</i> and its allies Officer-in-charge: B Maslin	No: 147/91 Title: <i>Eucalyptus globulus</i> tree improvement Officer-in-charge: T Butcher	No: 148/91 Title: Effect of ripping on <i>Pinus radiata</i> growth on Blackwood Valley soils Officer-in-charge: J McGrath	No: 149/91 Title: Effect of various rates of Phosphorus fertilization on the growth of young <i>Pinus ra;diata</i> on the South Coast Officer-in-charge: J McGrath	No: 150/91 Title: Effect of timing of fertilization on nutrient absorption and annual growth patterns of <i>Pinus radiata</i> on the south Coast Officer-in-charge: J McGrath	No: 151/91 Title: Effect of interaction between Nitrogen, Phosphorus and Potassium on the growth of young <i>Pinus radiata</i> on the South Coast Officer-in-charge: J McGrath
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TIME MANAGEMENT SEMINAR - ORGANIZING YOURSELF

To be held at Woodvale on Friday 1 November 1991.

Staff have indicated recently their interest in attending the above Seminar. There are still some vacancies if any staff would like to attend.

Scientific and Technical Publications

The following have recently been approved for submission for publication:

Author(s): WL McCaw and RH Smith
Title: Seed release from *Banksia Baxteri* and *Hakea crassifolia* following scrub-rolling and burning
For submission to: J. Royal Society WA

Author: ME Tucek
Title: Knot size and associated distribution of degraded timber in Karri
For submission to: WURC Technical Report No. 35

Author(s): NL McKenzie and NJ Hall
Title: The biological survey of the Eastern Goldfields of Western Australia
For submission to: Records Western Australian Museum suppl.



Author: BL Shearer
Title: (1) Dieback caused by *Phytophthora* species
 (2) Control of *Phytophthora* species in native communities with phosphorous acid
 (3) Aerial canker fungi threaten *Banksia coccinea*
For submission to: Symposium Abstract

Author: GJ Keighery
Title: An introduction to the Flora of the Nullarbor
For submission to: Proceedings ASGAP Biennial Conference

Author(s): I Abbott, P Van Heurck, T Burbidge & M Williams
Title: Damage caused by insects and fungi to eucalypt foliage in Mediterranean forest of Western Australia: spatial and temporal patterns
For submission to: Australian Journal Ecology

Author: RT Wills
Title: Pathogenic fungi threaten the conservation of ecosystems in the southwest of Western Australia
For submission to: Symposium Abstract

Author: BR Morgan and BL Shearer
Title: Survival of *Phytophthora cinnamomi* zoospore cysts in bauxite soils and a coastal sand in Western Australia
For submission to: Abstract of 8th Australian Plant Pathology Conference

Author: I Abbott
Title: Biogeography of grasses (Poaceae) on islands of South-western Australia
For submission to: Australian Journal Ecology

NEW POLICY STATEMENT AND ADMINISTRATIVE INSTRUCTION

New Policy Statement No. 15, Community Involvement and Administrative Instruction No. 31, Operational Guidelines for Public Participation in Planning and the Management of Advisory Bodies has been released.

The new policy supersedes previous policies 15, Public Participation; 4, Department Advisory Committees; and 32, Volunteers. - These are to be destroyed and replaced with the new.

Similarly, the Administrative Instruction supersedes the May 1987 version which should also be destroyed.

If you wish to obtain your own copy - please ring Jill/Christine at Woodvale.

A WORD FROM THE SCIENTIFIC EDITOR

ANNUAL REPORT 1990/91

Eight scientific and technical papers were published by CALM Research Division in the year 1 July 1990 to 30 June 1991 (not including WURC Reports): 1 Research Bulletin, 1 Technical Report, 4 Occasional Papers and 2 Wildlife Management Programs - a combined total of approximately 400 printed pages.

In the same period 15 new manuscripts (1154 pages) were submitted for Departmental publication and one was withdrawn.

At 30 June 1991 12 manuscripts (8787 pages) were at various stages in the editorial process.

The amalgamation of some scientific and technical papers into a CALM research journal has been approved in principle: details have not yet been finalized.

NEW PUBLICATIONS

Two recently published papers are now available from Stores:

Wildlife Management Program No. 7 The Chuditch (*Dasyurus geoffroii*) by M. Serena, T.R. Soderquist and K. Morris.

Occasional Paper 3/91 Management Proposals for the Montebello Islands and Surrounding Waters by K.D. Morris.

Marianne Lewis



SEMINAR

Wednesday 16 October 1991

Nature conservation in Western Australian spinifex deserts

presented by Andrew Burbidge

The sandy and stony deserts of Western Australia that are dominated by spinifex (*Triodia* and *Plectrachne* species) grasslands and which cover about half of the State will be described and illustrated.

No major changes in abundance have been reported for plants, reptiles or frogs since European settlement. Some birds, e.g. the malleefowl, have disappeared from the deserts and others, e.g. the southern stone curlew, have declined in abundance.

One third of the species of mammals that occurred in the deserts are locally or totally extinct; all these lie within the critical weight range (CWR), i.e. they have a body weight between 35 g and 5 500 g. No comparable area anywhere else in the world has suffered such a dramatic reduction in its mammal fauna in such a short time and in the absence of obvious vegetation changes, such as clearing or desertification.

Several hypotheses have been advanced to explain the decline in mammals. Three general hypotheses will be discussed: changed fire regimes following the movement of Aborigines to settlements, competition from introduced herbivores such as rabbits, and predation by introduced carnivores such as the feral cat and red fox.

Current CALM research into desert fire regimes will be briefly described and the reasons behind plans to experimentally re-introduce locally extinct mammals to the Gibson Desert Nature Reserve will be outlined.

Venue: CALM Manjimup Regional Office
Brain St
Manjimup

Time:
7.00 pm



SEMINAR

Thursday 17 October 1991

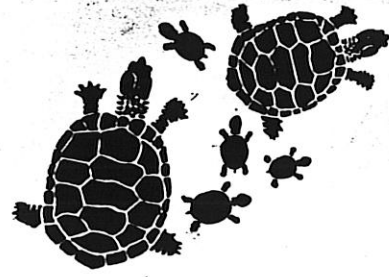
Pathogenic fungi threaten the conservation of ecosystems in South-West Western Australia

presented by Ray Wills

Field studies to assess the impact of pathogenic fungi on native vegetation have been undertaken throughout south-west Western Australia. The soil-borne fungus, *Phytophthora cinnamomi*, has long been recognised as a serious threat to conservation in Western Australia. A study of plant communities in the Stirling Range National Park assessed 330 species for susceptibility to *P. cinnamomi*. One third were found to have at least some individuals in a population killed by the fungus. The Proteaceae were particularly sensitive in *P. cinnamomi* with 84% of species assessed for susceptibility affected by the fungus. More recently, a new fungal threat to conservation has emerged. Several aerially-dispersed, canker-causing fungi have infested many native plant communities along the south coast of Western Australia. The cankers, especially the fungus *Botryosphaeria ribis*, have caused extensive damage to large stands of vegetation. Plots are currently being established in the Fitzgerald River National Park to examine the impact of the cankers. Of the 240 species assessed so far, 46% of species from a range of families appear to be susceptible. The Proteaceae suffered the greatest impact with 52 species (82% of Proteaceae assessed) suffering substantial damage, many plants being killed. In large areas of the southwest, the Proteaceae are the most abundant plant group and so provide the fundamental elements of many plant communities. Notably, many species of Proteaceae (eg. Banksia, Grevillea, Dryandra) have large flowers that are pollinated by nectar-eating birds or mammals. The destruction of large numbers of proteaceous species by these pathogens may cause animal populations to dwindle as the nectar sources on which these animals rely are eliminated.

Venue: Como Training Centre
CALM
Hayman Road, Como

Time: 3.00pm



SEMINAR

Friday 1 November 1991

Application of DNA Fingerprinting to conservation studies in Western Australia

presented by Graham Hall

The term DNA fingerprinting was coined in 1985 by Alec Jeffries of Leicester University to describe the uniquely individual pattern of bands identified using a DNA probe. The pattern of bands is inherited in a Mendelian fashion and can be used to generate pedigrees.

In the past six years the technique has had a major impact in medical and forensic science and is being increasingly used in conservation studies.

But what is the technique and how can it be applied to the management of rare and endangered species? Is it being used in Western Australia, and by whom?

This seminar seeks to provide some answers by outlining the methodology and applications of DNA fingerprinting. Examples will include the use of the technique in studies on captive and wild rare and endangered vertebrates and the application to enforcement work.

Venue: Wildlife Research Centre
CALM
Ocean Reef Road (near Joondalup Drive)
Woodvale

Time: 3.00pm