



A critically threatened ironstone community joins the conservation estate ~ by Neil Gibson

On the small remaining patches of ironstone in the Busselton area is found one of the most threatened plant communities in Western Australia. Prior to European settlement over 2000 ha of this community type was found along the base of the Whicher Range and extending out across the coastal plain; today there is less than 70 ha remaining, most having been cleared for agriculture. The importance of this community has only been recognised in recent years with the detailed surveys of the plant communities of the Swan Coastal Plain involving CALM, the Conservation Council and Wildflower Society volunteers.

This community occurs on thin red clay soils sitting on massive ironstone. How these sheets of laterite form is still not understood but rich soils, the winter flooding due to their low position in the landscape and the harsh baked nature of these sites following the summer drought has resulted in the evolution of a most unusual and fascinating community. Not only is the combination of plants making up

this community unusual but 13 plant species are entirely restricted to these ironstone soils and a further three are largely restricted to it. Of the 13 ironstone endemics eight are currently listed as Declared Rare Flora and more have been recommended for listing.

With so little of this community remaining the most serious threat is further land clearance. Only 14 ha of this community is currently in public ownership in 11 separate patches ranging in size from 0.2 ha to 9.4 ha. These patches

occur in road reserve, rail reserves and State Forest, none are currently in Nature Reserves or National Parks.

This unsatisfactory situation will very soon be changed for the better. CALM is just completing arrangements to buy, with financial assistance from Environment Australia, one of the three remaining large blocks of this community which is privately owned. The block on the corner of Gale and Treeton Road covers some 12.5 ha and is in excellent condition with a well developed shrubland that has not been burnt or grazed for a long time. At least four of the 16 species restricted to these ironstones are known to occur on the block and more are expected to be found with further survey.

The acquisition of this block is an important milestone for both species and community conservation. Thanks are due to all the previous owners of this block who over the last 150 years have been responsible for the care of this outstanding piece of our national heritage which will shortly join our conservation estate.

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RECOVERY TEAM ANNUAL REPORTS

Annual Reports of Recovery Teams have been submitted to CALM's Corporate Executive and, where Commonwealth funding is provided, to Environment Australia.

Summaries of these reports are reproduced below:

Gilbert's Potoroo

Considerable progress has been made during 1996. Funding continued from Environment Australia's Endangered Species Program. Further survey and tracking has increased our knowledge of the wild population and shows some indication of habitat preferences.

The captive colony is steadily growing and regular monitoring has been introduced to ensure animal health is maintained.

Breeding in April and May confirmed that *Potorous gilbertii* exhibits embryonic diapause. The gestation period appears to be shorter than that observed for *P. tridactylus*.

Twelve animals are now in the colony with a new pouch young expected soon.

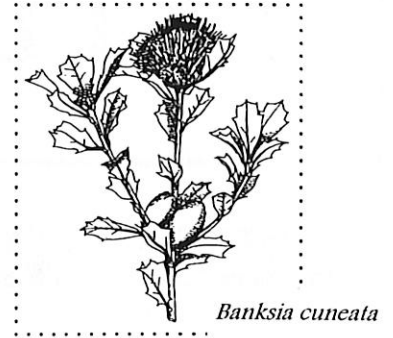
Genetic studies have confirmed the species status of *P. gilbertii*.

A captive management plan has been prepared and this is now being incorporated into a draft Interim Recovery Plan. A husbandry manual is also in preparation.

At this time *P. gilbertii* is still only known from the Mt Gardner area of Two Peoples Bay Nature Reserve.

Albany District Threatened Flora

The Albany District Threatened Flora Recovery Team is continuing to review and carry out the management actions arising from the management plan for the Declared Rare and Poorly Known Flora in the Albany District, and the Interim Recovery Plans (*in prep.*) for the species identified as Critically Endangered.



Banksia cuneata

allocate funding to the following:

- Hold a Recovery team meeting in February 1997.
- Continue with land acquisition.
- Monitor the rabbit eradication program by 1080 trails, Phostoxin, and warren destruction.
- Monitor the effect of planting koala feed trees at Lazeaway population number 8 to control rising ground water level at population number 8A.
- Enhance populations 1,5,8 and 10. Carry out seedling planting of *B. cuneata* and scrub species.
- Enhance populations as described in the Draft "Translocation proposal for *Banksia cuneata*".
- Place photograph in the Cuballing, Brookton and Quairading Shire Office for public information.
- Monitoring and reporting.
- Assess recruitment or population decline in all populations.
- Monitor and report of the 1995 establishment of seedlings at Stacey's property
- Complete one media release concerning the recovery program of *B. cuneata*.
- Continue research project on the pollination biology of *B. cuneata*.
- Obtain research report into the genetic variability of *B. cuneata* from Ms Tina Maguire, University of Adelaide.

Matchstick Banksia

Funding from the Commonwealth Government's Endangered Species Program continued in 1996, allowing for the implementation of recovery strategies for the long term protection of eleven populations of the Matchstick Banksia (*Banksia cuneata*).

Funding provided the following recovery actions:

- Acquire land for conservation of *B. cuneata* - partially completed.
- Maintain rabbit proof fencing on major populations - ongoing.
- Rabbit control baiting programs on all populations - ongoing.
- Control salinity on populations at threat - ongoing.
- Improve the habitat of populations - ongoing.
- Collect seed for permanent storage - completed.
- Monitor and survey populations - ongoing with report early 1997.
- Research Pollination Biology - ongoing with report due early 1997.
- Seedling planting - as per species Translocation Proposal. In 1997, it is proposed to

Moora District Threatened Flora

In July 1996 the Moora District Conservation Officer was appointed. The role of the Conservation Officer is to implement the management program for declared rare and poorly known flora in the Moora District. It is a three year program federally funded by Environment Australia with the objective to ensure the continued survival of endangered populations in the wild through appropriate management.

The Threatened Flora Recovery Team has been formed, and the inaugural team meeting held.

The draft Wildlife Management Program is undergoing a final edit before CALM's Corporate Executive and Ministerial approval is granted. Publication of the Plan is intended during 1997.

Interim Recovery Plans (IRPs) have been written for ten of the Critically Endangered species in the Moora District. Recovery actions recommended in the IRPs for the ten Critically Endangered species are either completed or are in the process of being carried out. A further six species are having preliminary research carried out on them prior to having IRPs written for each.

A number of Priority plant species in the District have been surveyed this year to update their conservation status.

Western Ringtail Possum

The preparation of an Interim Recovery Plan (IRP) for the Western Ringtail commenced during the year, with a draft being circulated among Team members and amendments suggested by Team members being incorporated. The Team plans to complete the IRP during 1997 and seek the approval

of CALM's Director of Nature Conservation.

A Translocation Proposal for the Western Ringtail was approved in July 1996. Rehabilitated derelict animals, which were held by wildlife carers in Busselton and Bunbury, were to be released in Lane-Poole Conservation Park, near Dwellingup. Two releases were proposed: at Leppers Gully and near the Conservation Park - Keats Forest Block boundary. Lane-Poole Conservation Park is currently subject to fox control via Operation Foxglove, a Western Shield project.

Numbat

The Numbat Recovery Plan aims to maintain the three numbat populations judged to be self-sustaining in 1994 and to increase the number of self-sustaining populations to at least nine, by reintroduction to former habitat. Funding continued from the Environment Australia.

The three existing populations are at Dryandra Woodland, Perup Nature Reserve/Kingston State forest and Boyagin Nature Reserve, and these are monitored annually. Population indices for these three areas in 1996 indicated decreases in numbers at all sites. Intensive monitoring of radio-collared animals at Dryandra did not reveal unusually high mortality rates, although cat predation was relatively more important than in other years. The growth rate of young at Dryandra, as well as at the three other sites where young were captured, was much lower than usual, however. The climate in the south-west of Western Australia was unusual in 1996 in that the winter rains did not start until July and cool wet weather persisted throughout spring and into December. Termite availability in spring is likely to be lower under these conditions and this would result in food shortages for lactating females and hence low growth rates in their young.

Low food availability may also explain the lower numbers recorded in the three existing populations. Population monitoring regimes will be continued in 1997.

Monitoring of radio-collared animals at reintroduction sites at Tutanning, Batalling, Dragon Rocks, Yookamurra and Karakamia continued in 1996. During the last 2-3 years, this project has been plagued by unreliability of radio-collars used. Use of a new more reliable type of radio-collar in 1995 and 1996 has greatly improved our ability to monitor the early stages of translocations. In 1996, there has been a consolidation of reintroduced populations, as numbat sightings become more common in several of the translocation sites, particularly Batalling and Yookamurra. At Tutanning, monitoring has moved to the second phase, with the first annual driven survey carried out in 1996.

During 1996, a new translocation site was established according to the Numbat Recovery Plan at Dale Conservation Park in the northern jarrah forest, approximately 50 km from Perth. Baiting is carried out over this area of the forest at either two or four times a year. A release site was selected and twenty numbats captured at Dryandra were released there on 5 and 6 December 1996. The second translocation to Dragon Rocks Nature Reserve was carried out when 17 numbats from Dryandra were released there on 10 and 11 December 1996.

No breeding was recorded in the captive colony at Perth Zoo during 1996. A new captive breeding research program has commenced there in an effort to solve problems that prevent breeding in some years.



Noisy Scrub-bird

Most of actions in the Noisy Scrub-bird Recovery Plan were attended to during 1996. However, there was no translocation due to the lack of a suitable release site. The search for new release sites continued during the year but this is necessarily a slow process since sites need to be examined in some detail before their suitability can be ascertained. Leaf litter invertebrates were used as a method for comparing potential release sites. Sorting the large number of samples from the Mt Gardner leaf litter invertebrate study, which forms the basis of this method, took considerable time this year but is now complete.

It was a particularly good year for publicity and information about the Recovery Plan and it has benefited from the continuing public exposure and general interest in Two Peoples Bay. Funding continued from the Commonwealth's Endangered Species Program.

The Noisy Scrub-bird Recovery Plan was published in 1996. This was done concurrently with the Two Peoples Bay Management Plan and the two Plans were launched by the Minister for the Environment, Peter Foss, at an official ceremony in June.

Djoongari

This report documents the fifth year of implementation of the Djoongari (Shark Bay Mouse) recovery plan.

Financial support continues from Environment Australia's Endangered Species Program and CALM. The Bernier Island population was monitored twice

and is maintaining distribution and abundance. The Doole Island population was monitored twice and the population seems to be recovering from its previous low numbers. Heirisson Prong was monitored once with no Djoongari being captured over 1580 trap nights. A summary document covering work done on the Djoongari Recovery Plan has been produced and was submitted to Environment Australia in October 1996.

Thevenard Island Mouse

Actions implemented for the management of the short-tailed mice on Thevenard Island continued throughout 1996.

Genetic analyses identify two unique taxa within the *L. lakedownensis* group. House mice continue to remain higher in abundance than short-tailed mice on Thevenard Island throughout the year. The feral cat was removed from Serrurier Island early in 1996 and a translocation of short-tailed mice to Serrurier Island was successfully completed in October. A Recovery Plan for the Pilbara Short-tailed Mouse will be prepared in 1997.

Rose Mallee

Due to the shortage of staff at the Moora District over the first period of the year, operational work has been limited. However, the CALM Moora District has now appointed a Conservation Officer, Rebecca Wolstenholme who took up her position in July. Funding continued from Environment Australia's Endangered Species Program.

The following implementation actions of habitat protection and population enhancement continued:

- Maintenance of the rabbit - proof fencing of the nature

reserve has been carried out.

- Rabbit baiting of the reserve was undertaken in March.
- Firebreak construction and maintenance occurred in February.
- Population survival monitoring was conducted May 1996.
- Weed control was carried out at the planted sites.
- Seed has been taken out of storage from the Threatened Flora Seed Centre and issued to RGC Mineral Sands at Eneabba for propagation.

Toolibin Lake

In 1996 the momentum for recovery, established in 1994 and continued in 1995, was maintained. Major achievements included:

- The continuation of the urgent, short term, salt amelioration works. The final stages of the groundwater pumping infrastructure will be completed early in 1997 with pumping due to commence in March 1997.
- Good local rainfall tested the by-pass channel and water control gates. For the first time in many years, only good quality water flowed into the Lake.
- Revegetation and remnant vegetation protection programs continued in the catchment.
- Consultants completed drafts of a monitoring report which will form a sound basis for future monitoring.
- Commencement of new revegetation schemes involving production species such as melaleuca.

The value of the Recovery Team and Technical Advisory Group as forums for decision making and developing inter-disciplinary action has continued. Funding continued from Environment Australia's Endangered Species Program.

Western Swamp Tortoise

It is a pleasure to report that during the past year there has been considerable progress towards implementing the actions contained in the Western Swamp Tortoise Recovery Plan and that implementation continues to be on schedule. Funding continued from the Commonwealth's Endangered Species Program. Highlights of the year included:

- Monitoring of the population at Ellen Brook Nature Reserve shows a gradual increase in the number of tortoises over the past decade, but most of these are juvenile animals. The increase has been sustained since the fox-proof fence was constructed around the tortoise habitat in the reserve in 1990.

- Perth Zoo currently holds 151 tortoises comprising 13 males, 14 females and 124 juveniles. The total number of eggs obtained in 1996 was 49, from which 38 animals successfully hatched, a hatching rate of around 80%. Thirty six of the hatchlings have survived their early development. Forty-one eggs were recovered from Zoo stock in 1997 and are being artificially incubated. Six eggs from a Twin Swamps Nature Reserve female were also obtained, giving a total of 47 eggs obtained in 1996. At the time of writing, five eggs had been found no longer to be viable

- Groundwater was pumped to North West Swamp, Twin Swamps Nature Reserve in early July and again from early to late-November.

- Of the 45 tortoises translocated to Twin Swamps Nature Reserve in 1994, 1995 and 1996, 23 were known to be alive in 1996 and five were known to be dead or were returned to captivity because of injuries sustained from predation by ravens. Other animals may be alive but were not located during the year. This is a satisfactory result.

- Following significant predation of translocated tortoises by ravens at Twin Swamps Nature Reserve in 1995, a raven control program was approved and initiated in 1996. Seven ravens were destroyed. Raven predation and damage to translocated tortoises in 1996 was lower than in 1995, but was still at unsatisfactory levels.

- During 1996, the Recovery Team began re-writing the Western Swamp Tortoise Recovery Plan for the period 1998 to 2002. This will be finalised during 1997.

- Discussions between the Recovery Team and the Federal Airports Corporation resulted in agreement that the Team would prepare a detailed proposal to re-introduce Western Swamp Tortoises to Perth Airport.

Swan Region Threatened Flora and Communities

The Recovery Team met twice in 1996 and now includes representatives from all three districts, local government and a community groups representative.

CALM commenced development of the Threatened Flora Management System which will provide a method of assessing threatened flora searches in proposed operations areas and include a database of location and management of all known populations of threatened flora and ecological communities.

In 1996 emphasis has been placed on discovering populations of Priority Species to clarify their status. In summary, 76 new populations of 15 Priority species were found. Significant discoveries included two large populations of *Dryandra aurantia* (P1). Numerous finds, of in some cases large populations, of other species (notably *Thysanotus fastigiatus*, *Conostylis pauciflora* subsp *euryrhipis* and *Parsonsia*

diaphanophleba) will result in recommendations to change their conservation status.

Despite the emphasis on Priority Flora, 36 new populations of 4 species of DRF were discovered in 1996. Of note is the discovery of 29 populations of the critically endangered species *Thelymitra dedmaniarum* (1172 plants) by Volunteer Fred Hort, and 7 populations (2375 plants) of *Chorizema varium*. In addition 41 populations (14 species) of the 359 DRF populations (42 species) known in the Swan Region, or slightly over 11%, were resurveyed.

Draft Interim Recovery Plans for 3 Critically Threatened flora species recorded from the region have been prepared and implementation has commenced. Other management actions carried out through 1996 have ranged from installation of roadside markers, weed control, liaison with other agencies through to ex-situ propagation and storage of germ plasm. Les Robson continued monitoring of Swan Region's fire research plots. Kings Park and Botanic Garden and CALM established smoking trials to encourage the regeneration of *Lechenaultia laricina* seedlings.

The Kings Park and Botanic Garden research project on threatened flora species (mostly orchids) found within the Perth metropolitan area is progressing well. This work entails establishing methods for long-term storage of germ plasm, growing the species in vitro and soil, genetics analysis, translocations of species and increasing public awareness of threatened species and the values of bushland in the metropolitan area.

The advisory group for the threatened ecological community project has reviewed the status of the ecological communities and there are now 9 Critically Endangered, 4 Endangered and 6 Vulnerable communities recorded within the Swan Region. WATSCU are providing funding to continue the TEC project for another year. This will ensure that TECs continue to obtain a high profile and that the progress made on the conservation

of these areas continues. Neil Gibson is carrying out a survey of floristic communities (similar to the Swan Coastal Plain project) on the Darling Scarp.

Another two recovery teams for threatened ecological communities in the State have been set up, for "Holocene Dune Swales" and "Lake Richmond thrombolite community of coastal freshwater lakes". Draft Interim Recovery Plans have been written for both.

Protection of TECs was increased with the purchase of two occurrences, the vesting of another with the NPNCA and proposals to purchase two other occurrence of TECs put up to the Conservation Lands Acquisition Committee.

Western Bristlebird

Research during the year has revealed that there was no significant difference in response from playback on home range boundaries compared with playback from within the home range. Western Bristlebirds are more likely to approach the source of a known (their own or a neighbour's) than an unknown call. This is in contrast to many species of birds, which are equally or more likely to respond to a stranger. This may be because bristlebirds have overlapping home ranges, and are freque

Attempts to catch Western Bristlebirds are more likely to be successful if attempts to attract a given individual utilise a call which is known to that individual.

Geocrinia

1996 marks the completion of a number of major actions identified in the plan, including publication of the Recovery Plan and Landholders Recovery Kit and commencement of a new 3 year research program into determining the population viability of existing sites. This will assist the team to evaluate of the viability and likely outcomes prior to undertaking

a translocation program. In the interim period the team has entered a monitoring, refinement and review phase with the aim of ensuring the continuance of the existing populations. Funding continued from Environment Australia's Endangered Species Program.

Major goals for 1997 will be:

- Where landholders are supportive and funds permit, expand the conservation fencing program.
- Continue the population and fire ecology monitoring programs.
- Review the captive breeding program.
- Review the communications plan and commence implementation of the next phase.
- Maintain an effective pig control program.

Dibbler

The focus of the project will move from mainland to island populations in 1997. Therefore this report summarises all the work done on the mainland since the project commenced in January 1995 so that current knowledge of the species on the mainland will be in one document.

Fieldwork comprised twenty seven field trips to resurvey sites where dibblers had been caught before and seek new populations where the habitat appeared suitable. There are still many unsurveyed areas (particularly along the south coast) where the habitat seems to be suitable for dibblers. We first trapped a dibbler in the Fitzgerald River National Park (FRNP) in November 1995 after 22,357 trap nights. Thirty one more have since been tagged there. Several have been recaptured. Dibblers are probably widespread within the FRNP, although their distribution may be transient and patchy and populations may persist at low densities. Further work on dibbler distribution within the park

will require considerable time and effort. It will be constrained by huge tracts of dense vegetation and access rules imposed to curtail spread of die-back diseases of plants caused by Phytophthora.

On the mainland dibblers are difficult to study because they occur at low density and populations seem to be transient, abandoning some sites for years. They are so mobile that radio tracking is ineffective and other methods of following individuals have failed. In the last 20 years most sites have experienced drastic changes because of plant diseases and/or severe wildfire. Critical habitat requirements remain unclear but several significant trends are emerging. They occur in a broad range of floristic communities. Earlier studies suggested they required vegetation more than 25 years old, but they have now been caught at sites burnt seven years previously, albeit near older vegetation.

The two island populations were visited four times in 1995 and twice in 1996. Males did not experience the complete, synchronous die-off at the end of the breeding season that Dickman had recorded in past years (and synchronous male die-off did not occur in the FRNP population in 1996). Male die-off, at least on the islands, may be linked to high population densities. The population on Boullanger Island is smaller than Dickman estimated in the late 1980s. A paper detailing these findings is being prepared.

Habitat management is an important action for dibbler recovery on the islands. Issues include human (including researchers) disturbance, interactions with house mice, burrowing seabirds, weeds, fire and protection from invasion by feral predators. Aspects of the interaction between dibblers, weeds, seabird burrows and mice are among issues that require more research. Next year the project will concentrate on recovery of the island populations.

A grant from the BankWest Landscape Conservation Visa Card funded a study of the genetic status

of dibblers but the results were inconclusive because technical difficulties were not resolved.

A variety of media opportunities were taken. The main aims were to promote the project to scientific groups and the general public. We also brought dibblers to the attention of rural communities (particularly the residents of Jurien) and sought public involvement in the work.

Chuditch

This report covers the fifth year of implementation of the Chuditch recovery plan. Financial support continued from Environment Australia's Endangered Species Program, CALM, Perth Zoo and Department of Defence.

Satisfactory progress has been made on all actions and a five year review was prepared for Environment Australia on which decisions relating to future funding will be based. Studies into the impact of prescribed burning regimes and timber harvesting on Chuditch and other threatened mammals continued in the jarrah forest of south west WA. All impact treatments have now been implemented. Sampling up to 12 months post impact suggest that none of these disturbances have had a detrimental impact on Chuditch abundance or condition. Population monitoring continued at Mundaring, Batalling and Kingston as well as at several sites in the northern jarrah forest as part of the research associated with Operation Foxglove. The captive breeding program continued successfully at Perth Zoo and 43 young were weaned during the year. Monitoring of the reintroduced population at Julimar continued and the more intensive ground fox control appears to have contributed to the spread of Chuditch to peripheral areas. Work in the wheatbelt concentrated on planning and implementing a translocation to Lake Magenta Nature Reserve. Monitoring up to four weeks post release indicates that Chuditch were establishing successfully.

Corrigin Grevillea

This year's annual report addresses the progress on the main components of the *Grevillea scapigera* recovery process and summarises the work performed during 1996, the second year of the recovery plan. Funding from Environment Australia's Endangered Species Program continued.

The main actions for the period include:

- Population enhancement
- Habitat enhancement
- Monitoring of extant and newly created populations
- Research
- Long term conservation and ex situ conservation
- Public education and creation of phytosanitary guideline.

Southern Forest Region Threatened Flora

The Southern Forest Region Threatened Flora Recovery Team has worked on the review of the status of approximately 160 taxa in the Region.

File information and herbarium records have been collated for most of the taxa and field work, which includes relocation, revisit, collection and documentation has commenced. A number of taxa have already been deleted from the original list; focussing on 132 which will need observation and management. Taxonomic problems are being assessed for a number of taxa. A formal species description has been published for *Anthocercis sylvicola*, and a number of other species listed in a recently published volume of *The Flora of Australia*.

Ongoing work should result in publication of a Management Program during 1997.

Central Forest Region Threatened Flora

All State Operations Headquarters and Central Forest Region data are now on file. WA Herbarium (WAHerb) data, Woodvale data and data from Ken Atkins for 38 DRF and 145 priority 1,2 & 3 species have been collected and collated (1600+ records).

A preliminary draft of species information has now been prepared by our contractor.

Katanning District Survey of 94 Priority Flora Species

Field surveys to confirm existing collection sites has begun utilising Katanning District staff and Volunteers. Considerable work has been done to collect, collate and organise existing data on priority species to base our search strategy on.

Over 25 populations have been resurveyed by staff or volunteers with full report forms completed. Surveys now include sampling of soil for PH and salinity levels. Field kits now include GPS units to ensure accurate site references, salinity & PH kits, and extensive support information for completing reports.

As anticipated there is an increased level of volunteer activity in the District. Regular field trips and workshops combining both staff and volunteers have occurred throughout the year. Data and samples are presented in a standard format and are of high quality. Providing a GPS unit to the groups has lead to accurate lat/long recording, which in the past has not always been the case.

Resurveys of all the populations of both *Eremophila veneta* and *Acacia leptalea* in the Katanning District have been completed this year, a total of six separate populations spanning over approximately 100 ha.

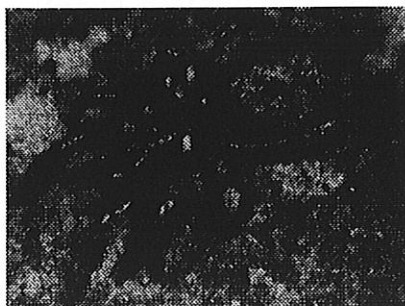
The status of the Trapdoor Spider Genus *Moggridgea* in the Stirling Range National Park

In 1995 the Scientific Ranking Panel ranked two species of spiders, *Moggridgea* sp. (Stirling Range) and *Teyl* sp B.Y. Main 1953/2683, to be 'Critically Endangered'. The panel adopted the threat categories used by the World Conservation Union when the ranking was carried out. CALM is committed to developing Interim Recovery Plans (IRPs) for taxa ranked in this category and as a result assistance was provided to the Western Australian Museum to carry out surveys to enable us to gain better knowledge of the species' distribution, habitat and conservation requirements.

For *Moggridgea* sp. (Stirling Range) the following information was sought:

- What is the current distribution and abundance of the species?
- How can the burrows be distinguished from other mygalomorphs?
- How should the populations be monitored?
- What management actions are necessary?

Dr Mark Harvey from the Western Australian Museum with Dr Barbara York Main from the Department of Zoology, The University of Western Australia, recently completed the survey. Their report, "The status of the Trapdoor Spider genus *Moggridgea* in the Stirling and Porongurup Ranges" has now been received by CALM. Information provided in it will enable the development of an IRP and will aid CALM's South Coast Region to manage the sites where this spider occurs.



Female *Moggridgea* sp.

Recommendations from the report follow:

- Exclude fire (where possible) from known sites recognised as possessing viable populations.
- Adopt a fine-scale habitat approach to conserving populations.
- Monitor several sites in the Stirling and Porongurup Ranges.
- Explore nominated potential sites.
- Investigate further the specific status of all known populations.
- Consider supporting a researcher to study further the biology and persistence of *Moggridgea* in the Stirling and Porongurup Ranges, compare the status of such populations with *M. tingle*, and search other possible sites in the south-west forests.

The report on *Teyl* sp. will be available soon.

UPDATE ON NIGHT PARROT

The night Parrot remains an enigma: the only species whose very survival remains doubtful for which an interim recovery plan has been written. The emphasis of the IRP is to continue seeking reports of possible sightings of Night Parrots, investigate those sightings, confirm the probable location of a population, and learn the best ways to keep finding them.

Accordingly, following a quite convincing report from the Canning Stock Route in June 1996, in the general area of a number of accepted historical reports over the last 30 years, an expedition was arranged in November 1966. The trip was designed on the assumption, based on historical records, that Night Parrots would visit waterholes during hot weather. We concentrated on mist-netting, listening and spotlighting around isolated waterholes, close to previous reported sightings. Further information was gathered from discussion with members of the Aboriginal community at Punmu, and direct searching was conducted to find waterholes, dense spinifex, and potential feeding areas.

Unfortunately no signs of Night Parrots were seen or heard, so most of the aims of the trip were not achieved. The historical evidence for Night Parrots being observed most at waterholes remains convincing, but it is likely that a combination of water and available food is a key factor. The seeding spinifex which was presumably abundant when the June sighting was made had disappeared by the time of our expedition.

During the three year life of the IRP we will continue trying to conduct one or more field trips per year to search likely places for Night Parrots. Provided the species is not yet extinct, even negative results gradually build up more insight into how to search for it. Future trips will concentrate on areas from which recent and historical reports have come and where a combination of water, food and hot conditions are combined.

John Blyth

FINAL REPORT FOR THREATENED ECOLOGICAL COMMUNITY PROJECT



The project to identify and suggest ways to conserve threatened ecological communities in the south west of the state has been completed, and the final report and recommendations have been endorsed by CALM's Corporate Executive. The initial two year project was funded by Environment Australia's National Reserves System Program. Interim Recovery Plans are now being drafted, with funds from CALM's Threatened Species and Communities Unit, for communities identified as critically endangered in the initial project.

The project was completed with the help of a scientific advisory group, and with public input through two workshops. A set of procedures for identifying and ranking communities that are threatened was developed during the project. This included a series of categories of threat similar to those used for species; presumed totally destroyed, critically endangered, endangered, vulnerable, data deficient, lower risk and not evaluated. These categories are defined using criteria that describe the historical level of loss, the extent of the community remaining and the likely future decline.

Of the 110 ecological communities from the list of those that are possibly threatened, 38 have been entered on a database

that was specifically designed for the project by private consultant Simon Woodman.

The communities entered on the database were assigned to a category of threat by the scientific advisory group. Sixteen of these communities were assessed as critically endangered, seven as endangered, ten as vulnerable and five as data deficient. These categories also help rank the communities for priority for conservation actions. For example, actions for critically endangered communities would be seen as more urgent than those for endangered communities.

A series of general recommendations for the conservation of threatened ecological communities (TECs) were included in the final report to Environment Australia. These basically provide a framework for developing policy for protection of threatened ecological communities. A set of recommendations was also made for conservation of specific TECs. These include proposals for the formation of Recovery Teams and the writing of Recovery Plans; liaising on management of TECs; conservation management of TECs on lands vested in CALM; and acquisition of areas as conservation reserves if effective management seems unlikely.

Many of the communities entered on the database occur on the Swan Coastal Plain; and most of the plant communities in this area were identified using information in the report "A Floristic Survey of the southern Swan Coastal Plain" by Neil Gibson, Bronwen Keighery, Greg Keighery, Allan Burbidge and Michael Lyons.

Many ecological communities in other parts of the state such as the wheatbelt couldn't be assessed due to lack of information. The Kimberley, Pilbara and Murchison regions, and other parts of the state were not considered in this part of the project and need to be studied in the future.

Many conservation actions for threatened communities have begun as a result of this project. Two areas containing critically endangered TECs have been purchased jointly by CALM and Environment Australia, and another property is under negotiation. Recovery Teams have been established for Sedgeland in Holocene Dune Swales - a plant community that occurs at Becher Point; and for the Lake Richmond thrombolite community at Rockingham. A number of Interim Recovery Plans are also being drafted for other communities identified as critically endangered. Threatened Ecological Communities are also being included in planning by CALM at Regional and District levels; and in State and Metropolitan Planning by Department for Environmental Protection (DEP) and Ministry for Planning (MFP).

Although some actions towards conserving TECs identified as critically endangered have been achieved in this project, many other communities require emergency actions to ensure they are protected. The completion of the project, and the recommendations held in the final report should help provide a framework for achieving the conservation of threatened communities into the future.



Toolibin Lake

Val English

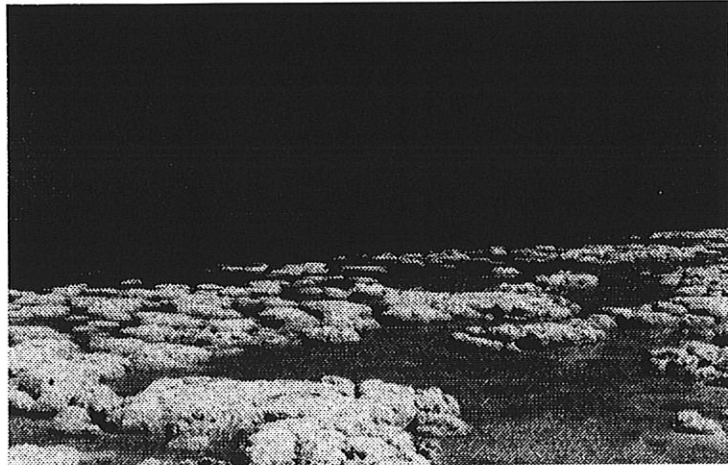
New Lake Richmond recovery team

The latest recovery team to be established for a threatened ecological community is for the 'thrombolite community of coastal freshwater lakes', known only from Lake Richmond in the heart of Rockingham. As might be expected for such an urban wetland, the processes which threaten its survival are many and various. The make-up of the recovery team has been designed to ensure that the necessary expertise and interests are represented. The team consists of: David Mitchell (Chair), John Blyth, Stuart Halse and Val English (CALM), Anne Goodale, Bob Goodale (Naturalists Club of Kwinana/ Rockingham/ Mandurah), Brian Loughton (Water Corporation), Michael Allen (Waters and Rivers Commission), John Tucker (City of Rockingham), Linda Moore (Ministry for Planning, microbial expert).

One of the current issues likely to affect the lake and its biota are proposed major housing developments nearby. One developer owns one quarter of the lake bed and a significant proportion of the vegetated surrounds of the lake. While environmental assessment of that developer's proposal is occurring, representatives of the developer's environmental consultant and the DEP are being invited to meetings of the recovery team. Other people attend as specific issues require special information or attention by operational personnel.

The critically endangered nature of this community was recognised during the threatened ecological communities project (see item in this issue by Val English). It is only the third critically endangered community for which a recovery team has been established (Toolibin Lake and the Holocene Dune Swales are the other two).

Western Australia is proving to have a remarkably high number of examples of microbial communities which form structures such as stromatolites (layered, laminar structure) and thrombolites (non-layered, 'clotted') structure. The



*Thrombolites
at
Lake Clifton*

microbial communities involved with such structures vary depending on the conditions of their particular wetland. The threatened ecological communities project identified four microbial communities as being threatened, with the one in Lake Clifton also on the southern Swan coastal plain. In the more populated parts of the State, including Lakes Richmond and Clifton, these communities face a variety of threats which include: human disturbance, the structures being interesting to walk on and prone to damage; nutrient enrichment and the ensuing blanketing by green algae; other changes in water quality such as increasing salinity; and changes to

the hydrological regime, which could include too much or too little water.

It is no coincidence that the three communities for which recovery teams have been established are wetland communities of one kind or another, or that the issues to be dealt with are especially complex. Wetlands, by their very nature, are attractive for many development activities and susceptible to impacts resulting from activities within their catchment. Recovery planning will be an important mechanism to conserve the most threatened of these rich and diverse ecosystems.

John Blyth

Commemorative Birth Certificates - helping Western Australian threatened flora and fauna!

The Threatened Species series of a new range of birth certificates have been most popular since their release in September last year. This was an initiative by the Registrar General's Office of Western Australia.

A trust fund has been set up and 5% of the proceeds from the sale of these certificates goes to CALM and Perth Zoo, who in turn use the funds to help finance threatened species conservation projects.

These are very attractive certificates, especially designed for framing with two choices of colour (pink and blue) and a choice of two designs depicting some of Western Australia's flora and fauna. An information brochure with details on some of the work being carried out in the fight to save threatened species is included with the Certificate.

The new Certificates are available when registering your new baby or can be purchased retrospectively.

INTERIM RECOVERY PLANS FOR CRITICALLY ENDANGERED PLANT SPECIES



In late 1995, the Minister for the Environment endorsed the ranking of 46 Western Australian threatened plant and animal taxa as 'critically endangered' using the IUCN 1994 Red List categories and criteria. Thirty-eight of the taxa were plants.

Very few of these 38 taxa had Recovery Plans or Interim Recovery Plans (IRPs) in place. With the aid of a special grant from CALM (from AMRAD licence fees) and with financial assistance from Environment Australia's Endangered Species Program, WATSCU have been preparing IRPs for critically endangered plants and helping CALM's Region and District staff commence the implementation of recovery actions.

Most of the IRPs have been completed and will be published during 1997. Many of the urgent recovery actions have also been implemented and work on desirable recovery actions has commenced for some taxa.

The following summaries relate to just a few of our critically endangered plants.

Silky Eremophila *Eremophila nivea*

This Eremophila is only known from 5 small populations north of Three Springs. One population of this species, which grows on a narrow road verge and extends into the neighbouring farmland, urgently needs to be fenced. A recent application for funding from World Wide Fund for Nature was approved. As a result of this funding the Australia Trust for Conservation Volunteers (ATCV) in conjunction with CALM in Moora will be fencing this population in August.

Stirling Range Dryandra *Dryandra montana*

Spraying of Phosphonate as a control measure for Dieback was undertaken at Bluff Knoll in 1996. These initial trials on *Dryandra montana* were considered a success and so a larger scale project was set up. In April and May of this year aerial spraying of approximately 30 ha of areas within the Stirling Range National Park which contains several Critically Endangered species, was undertaken. Adverse weather conditions tested everyone's patience during the operation, but eventually successful spray runs were completed. The effectiveness of the operation will be monitored over the next few years.

McCutcheon's Grevillea *Grevillea maccutcheonii*

The next stage in the recovery of *G. maccutcheonii* has been to undertake smoking trials on soil underneath adult plants, to encourage any soil stored seed to germinate. Kings Park & Botanic Garden established a 1 x 1m plot, which was smoked in autumn this year. They will monitor this plot over the next year to see whether any seedlings establish. Monitoring of the seedlings which established after the area was fenced last year show 12 out of the 15 new seedlings survived the first summer.

Cinnamon Sun Orchid *Thelymitra dedmaniarum*

Fred Hort, a Conservation Volunteer, undertook extensive searches for this species in Spring 1997. With help from Les Robson, Kim Kershaw and various others,

Cinnamon Sun Orchid:

Fred managed to locate 16 new populations containing over 1000 plants. This increases the chances of the Cinnamon Sun Orchid surviving in the wild. In addition a research student from Kings Park & Botanic Garden, Andrew Batty, has undertaken a PhD study on this species, and results from his work should aid in the recovery of *T. dedmaniarum*.

Yornaning Wattle *Acacia insolita* subsp. *recurva*

This sub species was ranked as critically endangered in 1995 as there was only one known population. Recently the Threatened Flora Seed Centre and WATSCU set up a research program for this species to find out why it doesn't produce ample seed after having so many buds. The answer to this will hopefully be known by the end of this year. In setting up the research program the number of individuals of this species was found to be in excess of 300 instead of 151 as previously thought.

Kambellup Dryandra *Dryandra ionthocarpa*

Despite extensive searches this species is still only known from two small populations on the one reserve. Fire breaks have been cleared around the reserve and an area on the southern boundary of the reserve has been burnt to reduce the chance of a wildfire occurring. A tree buffer will be planted soon to reduce the amount of weed invasion from the neighbouring farm into the northern population of the Dryandra.

RUFOUS HARE-WALLABY WORKSHOP



workshop was held at CALM's Wildlife Research Centre on 18 March 1997 to recommend to CALM's

Director of Nature Conservation the source and destination of Rufous Hare-wallabies (*Lagorchestes*

hirsutus) for translocation programs to mainland south-western Australia and to islands off Western Australia. Attendees were from CALM, CSIRO Division of Wildlife and Ecology, Perth Zoo, Macquarie University, Edith Cowan University and Curtin University. The Northern Territory Parks and Wildlife Commission was invited to send a representative, but was unable to do so.

Recent taxonomic research by Dr Jackie Courtenay suggests that there were four subspecies of *L. hirsutus*. The nominated subspecies, from the south-west of Western Australia, is extinct. The un-named central Australian subspecies (the Mala) is extinct in the wild and is one of the most threatened mammal taxa in Australia, existing only as 146 captive animals. The two other extant subspecies are each restricted to a single island in Shark Bay - one on Bernier Island (*L. h. bernieri*) and one on Dorre Island (*L. h. dorreae*).

The workshop considered the available scientific data on the three extant taxa and current draft proposals for translocations in WA.

A summary of the recommendations follows:

- 1 The most urgent conservation action is to extend the numbers and range of the central Australian subspecies. Predator-free islands offer the best opportunity to re-establish this taxon in the wild. The best island available is Trimouille Island in the Montebello group, off the Pilbara coast. This action should be given a very high priority.
- 2 Translocation to mainland south west Western Australia. All available mainland sites are a theoretical possibility for any

subspecies. A pragmatic view is that the two Shark Bay sites (Heirisson Prong and François Peron National Park) should be used for the Shark Bay island subspecies (one to each site) while the sites in the south west should be used for the central Australian subspecies. 1080 tolerance of the Mala is fairly high and this should present no problems.

- 3 Where there is genetic variability, as in the central Australian subspecies, translocation strategies should be designed to maximise retention of that diversity. Where there is little genetic diversity, as in the two island subspecies, consideration could be given to increasing genetic diversity in translocated populations by cross breeding.
- 4 No additional populations of *L. h. bernieri* and *L. h. dorreae* should be established on islands.
- 5 Mitochondrial DNA and micro-satellite research should be conducted to confirm the taxonomic relationships of the subspecies. It is preferable that this be done before translocations to the mainland are carried out.
- 6 Any future proposed translocations to the western deserts should be of the central Australian subspecies. Any translocations to Dirk Hartog Island should be from either or both Bernier and Dorre islands. Mixing of these subspecies should be contemplated only if supported by cross breeding studies.
- 7 CALM and PWCNT should revise the Mala Recovery Plan to reflect the above recommendations.

Welcome to Lloyd

Lloyd Van der Wallen, who is visiting WATSCU, is a Technical Officer employed within the Threatened Species Unit of New South Wales National Parks and Wildlife Service (NSW NPWS). Lloyd was awarded the John Barker Threatened Species Scholarship which is available to Technical Officers throughout NSW NPWS. The Scholarship aims for greater understanding of threatened species issues within Australia through liaison with other State Government agencies carrying out similar functions. Lloyd is keen to observe and study, in particular, the District Threatened Flora Management Program process, preparation of ecological community Recovery Plans (RPs) and Interim Recovery Plans (IRPs) and translocation of threatened species, especially Project Eden.

Lloyd will be presenting a seminar in September on NSW approaches to threatened species and community conservation.

Changes in staff

We welcome two new consultants to WATSCU.

Leonie Monks and Gillian Stack joined WATSCU in March to help implement and coordinate the critically endangered plant project.

Leonie will be coordinating the implementation of urgent management actions for critically endangered plant species. The actions are highlighted in Interim Recovery Plans (IRPs) as they are prepared and completed for each of these species. Leonie will also be required to prepare full Recovery Plans for some species of which IRPs exist. Gillian is collating information on and writing IRPs for Western Australian plant species ranked as Critically Endangered.

Leonie graduated from Curtin University in 1994 with a BSc (Hons) in Environmental Biology. She then commenced an MSc, also at Curtin, studying the Conservation Biology of three species of rare *Dryandra*, including the Critically

Endangered *Dryandra ionthocarpa* and is due to finish in December 1997.

Gillian graduated from Murdoch University in 1994 with a BA in Psychology and Communication Studies. She is currently working on a project unit that will complete a Graduate Diploma in Landcare. Gillian was a volunteer with WATSCU for several years and accompanied Emma Holland and Kim Kershaw (previous WATSCU personnel) on various field trips. Gillian was also instrumental in setting up WATSCU's Slide Directory.

PUBLICATIONS

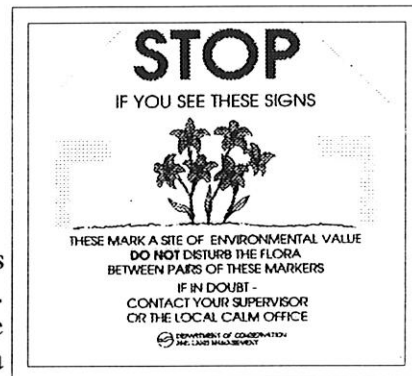
The 1996 Action Plan for Australian Marsupials and Monotremes, edited by Stephanie Maxwell, Andrew A Burbidge and Keith Morris for the IUCN/SSC Australasian Marsupial and Monotreme Specialist Group

Copies of the Action Plan can be ordered through:
The Botanical Bookshop, PO Box 351 Jamison ACT 2614
Available on the Internet at
<http://www.anca.gov.au/plants/threaten/marsup1.htm>

(an article about this publication will be published in the next edition of CALM's *Landscape* magazine.)

Protecting our endangered flora by observing this sign

Attractive new dashboard stickers and posters with plants encased with yellow roadside markers have just been produced. The sticker is designed to inform people of the significance of the yellow hockey stick markers which identify sites where flora MUST NOT be disturbed.



The idea to produce dashboard stickers was first raised by Dr Ken Atkins (Wildlife Branch) and Charlie Broadbent (Busselton District). WATSCU then developed the idea. Posters and the stickers will be circulated to relevant people within CALM, especially in Districts where DRF occurs. Vehicles used to undertake work near a DRF site will display these stickers. The posters will be displayed in CALM offices. Shire councils, Main Roads WA, Bush Fires Board and Westrail will also be asked to take part in this worthwhile scheme.

WATSNU

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