servation and Land Management

WATSNU

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The Newsletter of the Western Australian Threatened Species & Communities Unit

Progress on Threatened Ecological Communities by John Blyth

Inside this issue:

The completion of the Bushplan document in late 1998 (State of Western Australia 1998) was a significant event for the conservation of threatened ecological communities on the Swan coastal plain. This document is the end result of an integrated process of updating recommendations from the System 6 Conservation Through Reserves System report and the Ministry for Planning Urban Bushland Strategic Plan. During the process a number of new occurrences of threatened ecological communities were found. All of the occurrences of identified threatened communities within the area considered under Perth's Bushplan are included in the Perth's Bushplan document (State of Western Australia 1998) and are a focus for protection. The document provides that any proposals likely to affect occurrences of threatened ecological communities will be dealt with through the Bushplan process, coordinated between the Department of Environmental Protection, Ministry for Planning, CALM and the Water and Rivers Commission. The aim of Bushplan is to protect sites listed within the Bushplan Document (State of Western Australia 1998).

Sixteen critically endangered communities identified in the first critically endangered communities project have been nominated by CALM through the ANZECC Endangered Ecological Communities Network to the newly established ANZECC list of Endangered Ecological Communities. Communities on this list are likely to be recommended by the Endangered Species Scientific Sub-committee for listing under the Commonwealth *Endangered Species Protection Act* (1992).

North West Cape Karst Management Advisory Committee

- "The two communities are the Camerons Cave community and the Cape Range remipede community (Bundera Sinkhole)"
- "This habitat supports a rich troglobitic fauna composed primarily of crustaceans, but including two blind fishes"

The management of caves, sinkholes and underground aquifers is becoming increasingly complex in the karst areas of the Cape Range Peninsula. Documented conservation values, including many threatened species, of the Cape Range karst have steadily increased as survey and taxonomic work continues. Two communities characterised by assemblages of invertebrates have recently been classified by CALM as Critically Endangered and are being nominated via the ANZECC process for listing under the Commonwealth Endangered Species Protection Act. The two communities are the Camerons Cave community and the Cape Range remipede community (Bundera Sinkhole).

Camerons Cave (C452) contains both aquatic and terrestrial species and is the first coastal plain cave to contain schizomids. The assemblage is related to that found in caves in Cape Range sensu stricto (papers in Humphreys, 1993), but is quite distinct from it. Most of the troglobitic species found in Camerons Cave are known from nowhere else.

Bundera Sinkhole (C28) on the western coastal plain of the Cape Range Peninsula supports the only known occurrence of the remipede community. The sinkhole provides a ma-

rine water habitat with water low in oxygen below a density induced layer separating surface and deeper waters. This habitat supports a rich troglobitic fauna composed primarily of crustaceans, but including two blind fishes The faunal composition consists of the same groups of crustaceans recorded from anchialine caves of the Bahamas, the Yucatan Peninsula of Mexico, and Cuba. They include cirolanid isopods, atyid shrimp, ostracods, gammarid amphipods, remipedes and thermosbaenaceans.

External pressures on the karst system are increasing, due to expansion of Exmouth, increased demand for water, and limestone extraction. The North West Cape Karst Management Advisory Committee involving District and Regional staff, scientists with specialised expertise, and other stakeholder groups, has been established by CALM and met for the first time in June 1999. It is chaired by Peter Kendrick, CALM's Regional Ecologist in the Pilbara, and Andrew Burbidge is WATSCU's representative. The Advisory Committee will ensure that conservation issues are adequately considered during assessment of development or land management proposals. It will also act as the Recovery Team for the two threatened communities described above and for various threatened species of animals found within these and other caves and underground waters of the Cape Range Peninsula.

For further information contact John Blyth on 94055161 or Email: johnb@calm.wa.gov.au

Listing Threatened Species and Ecological Communities by *Andrew Burbidge*

I find that there's lots of confusion about listing threatened species and ecological communities at the State, national and international levels, so here is a brief overview to try to unmuddy the waters!

WESTERN AUSTRALIA

Section 14(2)(ba) of the *Wildlife Conservation Act 1950* states 'The Minister may, from time to time by notice published in the *Government Gazette*, declare that any fauna specified in the notice is for the purposes of this Act fauna which is likely to become extinct, or is rare, or otherwise in need of special protection...'. Section 23F (2) states 'Where the Minister is of the opinion that any class or description of protected flora is likely to become extinct or is rare or otherwise in need of special protection, he may, by notice in the *Government Gazette* declare that class or description of flora to be rare flora for the purposes of this section throughout the State.'

CALM's Threatened Species Scientific Committee (TSSC) reviews the lists of threatened taxa (species, subspecies and, for plants, varieties) and considers nominations for change at least annually and recommends changes to the Minister. If the Minister endorses the changes, two notices are prepared and published in the *Gazette*. These are the 'Wildlife Conservation (Rare Flora) Notice' and the 'Wildlife Conservation (Specially Protected Fauna) Notice'. The most recent ones were published on 14 July 1998. These notices are usually published annually. As well as listing threatened taxa (ie, those that are 'rare or likely to become extinct', the fauna notice also lists birds protected under international agreement and 'other specially protected fauna'.

As well as recommending listing or delisting of taxa, TSSC also recommends that each threatened taxon be allocated to one of the three IUCN Red List Categories of Threat, ie, Critically Endangered, Endangered or Vulnerable. Taxa that are 'Conservation Dependent' are also recommended by TSSC. At the State level, these categories are used to set conservation priorities; however the categories are used at the national level as well.

At present there is no State legislation covering threatened ecological communities. However, an informal, non-statutory process, including advice from a scientific advisory committee, the establishment of the threatened ecological communities database, and steps for assigning ecological communities to categories of threat, is now in place.

AUSTRALIAN AND NEW ZEALAND ENVIRONMENT AND CONSERVATION COUNCIL (ANZECC)

ANZECC is the Council of Ministers for the Environment from all Australian States and Territories, the Commonwealth and New Zealand, which meets regularly to coordinate national and regional environmental issues. ANZECC publishes national lists of threatened flora and fauna. Once a taxon is listed or de-listed in WA, two ANZECC working groups—FloraNet and FaunaNet—consider changing the ANZECC lists. If the groups consider that a taxon is nationally threatened (changes are usually made only where taxa cross State boundaries) they recommend listing to ANZECC. ANZECC currently lists taxa as 'endangered' or 'vulnerable'; however, the 'critically endangered' category will be added in future.

ANZECC has recently set up an EECNet to recommend a national list of threatened ecological communities. Western Australia has forwarded 18 threatened ecological communities currently ranked as critically endangered to EECNet and in due course they will form part of the first ANZECC list.

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Endangered Cockatoos by Belinda Cale

With funding from the Natural Heritage Trust, recovery plans are being developed for two of Western Australia's endangered cockatoos, Carnaby's Cockatoo and Muir's Corella. Both species of cockatoo are prominent in agricultural areas, and the involvement and cooperation of private landholders will be particularly important if these plans are to be successful. Workshops to discuss possible strategies for the recovery of these species will be held in early July.

Much of the Carnaby's Cockatoo habitat in the wheatbelt region has been cleared or fragmented. Carnaby's Cockatoo feeds primarily on the seeds of native vegetation, and unlike other cockatoos does not feed on cereal crops. Clearing of heathland surrounding breeding sites reduces the availability of food for breeding birds and young. In many woodland remnants, the lack of eucalypt regeneration has led to a loss of hollow-bearing nesting trees. As a result of these changes, Carnaby's Cockatoo has undergone a major decline in range. Although the birds are highly visible in the Perth metropolitan area at certain times of year, these flocks may represent a high proportion of the total population and be comprised of few young birds.

Muir's Corella is confined to a small region from Boyup Brook south to Lake Muir and east to Frankland and Rocky Gully. At present the population is estimated at between 1500 to 3000 birds, and is largely restricted to agricultural properties and adjacent remnant patches of woodland. Muir's Corellas predominately feed on introduced corms and tubers, particularly 'Guildford grass' and oats. Often the corellas will dig up germinating oats or feed on grain in cattle feed-lots. The corella's feeding habits and their tendency to form large flocks can pose problems for farmers.

For further information, contact Belinda Cale on 94055172 or Email: Belindac@calm.wa.gov.au

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COMMONWEALTH ENDANGERED SPECIES PROTECTION ACT

Schedule 1 of the Commonwealth *Endangered Species Protection Act 1992* (ESP Act) includes taxa that are 'endangered' or 'vulnerable' according to definitions in that Act. Any changes to the ANZECC lists are automatically considered by the Endangered Species Scientific Subcommittee, which has the responsibility of recommending changes to Schedule 1 to the Commonwealth Minister. Changes can also be made following public nominations.

Schedule 2 of the ESP Act includes nationally endangered (not vulnerable) ecological communities. Once WA communities have been listed by ANZECC, they will be considered for Schedule 2 of the ESP Act.

INTERNATIONAL

The World Conservation Union (IUCN) publishes 'Red Lists' of threatened plants and animals. Environment Australia advises IUCN of changes to national lists, but IUCN also gets advice from a wide range of Species Survival Commission Specialist Groups and individual scientists. IUCN uses its Red List Categories and Criteria to allocate taxa to categories of threat.

There is no international system for listing threatened ecological communities. Australia leads the world in this area and we are waiting for the rest of the world to catch up!

FUTURE CHANGES

There will inevitably be changes to the procedures outlined above. A 'Biodiversity Conservation Bill', to replace the Wildlife Conservation Act, is in preparation in Western Australia, the Commonwealth has recently enacted its 'Environmental Protection and Biodiversity Conservation Bill' and IUCN is running a series of international workshops to review the Red List criteria.

For further information contact Andrew Burbidge on 94055128 or Email: andrewb@calm.wa.gov.au

Flora Implementation - update

Conostylis micrantha- Small Flowered Conostylis

Small Flowered Conostylis is known from just eight populations west of Mullewa. Most are found on narrow road and rail reserves, many of which are severely degraded. Rabbits appear to be a major concern for the habitat of this conostylis. Although there is little grazing occurring on the plants, there are numerous warrens underneath which could lead to collapsing of areas and destruction of habitat and plants. Fencing, as listed in the Interim Recovery Plan as a recovery action aimed at controlling rabbits, was not feasible due to the large size of the road reserves and constant fence maintenance required. Instead scatter baiting of 1080 oats by the Geraldton's Agricultural WA was undertaken in March 1999 to attempt to reduce rabbit numbers at five of the populations. A following baiting run was also planned for May 1999. This was not possible however, due to continual rainfall, which resulted in a plentiful supply of green feed available for the rabbits. The rabbit baiting will be monitored during the 1999 flowering season from July to August to determine its effectiveness and may then be repeated at the end of this year accordingly.

Symonanthus bancroftii- Bailey's symonanthus

Previous issues of *WATSNU* have told about the new population of *Symonanthus bancroftii* that was discovered by Kim Kershaw (CALM Narrogin District) last year, adjacent to a railway line. One plant, making the total number of known plants two, was discovered during a survey with the Bruce Rock LCDC. Rabbit proof fencing was erected around this new plant in May this year, to prevent accidental destruction or potential grazing from herbivores, such as rabbits and kangaroos. Fencing materials were purchased using funding supplied from the Natural Heritage Trust.

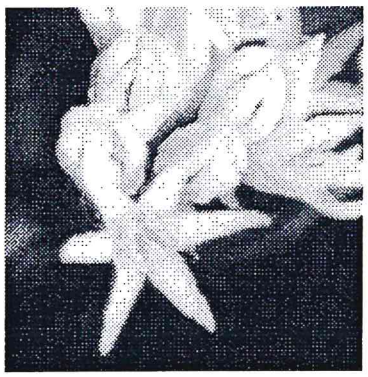
Dryandra ionthocarpa- Kamballup dryandra

The Kamballup Dryandra was discovered in 1987 and consists of two populations, comprising of around 1,000 plants. This species is known from near Kamballup within the Albany District. The Narrogin District discovered a new population in February 1999 at Jingaring Reserve in Narrogin District, well removed from the original population. Alex George has noted that the plants of the new population appear to be lignotuberous, compared to the original population which is fire-sensitive. Alex has recommended that further research is needed to determine whether this population is a separate subspecies, but in the meantime it will be labelled 'Jingaring variant'. Further surveys are planned by the Narrogin District for September to look for any new populations.

Postal drops

Using a concept, which was originally thought of by Ellen Hickman from CALM Albany District, postal drops have been created for three Critically Endangered species. The species are *Drakonorchis drakeoides*, which is found in the Moora and Merredin Districts, *Acacia sciophanes* and *Grevillea dryandroides* subsp. *dryandroides*, both found in the Merredin District. The postal drops are a small double-sided pamphlet, which contain a photograph, description of the species and a reply paid postage address to CALM. Indirectly, postal drops will act as a method for undertaking survey for these species over areas of a large scale, in particular on private property where access may be difficult. They will be sent to private property owners and other public places in the general area of each plant species during its flowering season. It is hoped that people who may have seen the species on their property will report it to CALM. So far this concept has been quite successful in the Albany District with several new populations of the Critically Endangered orchid *Caladenia bryceana* subsp. *bryceana* being discovered.

For further information contact Robyn Phillimore on 94055 165 or Email: Robynp@calm.wa.gov.au



Threatened Flora Markers

Using the artwork of Ellen Hickman (former Albany District Conservation Officer) a new set of posters and dash stickers have now been produced and distributed by WATSCU. Each poster and sticker illustrates threatened flora markers in situ, explains their significance, provides advice on what to do when they are encountered during roadworks and who to contact if more information is required.

It is hoped that these will assist in preventing accidental damage to populations of threatened flora during roadworks. Sets have been sent to relevant CALM Regional/ District offices for distribution to local Shires and other land managers.

Threatened Ecological Communities - Year 2: The Northern Wheatbelt

by Sheila Hamilton-Brown

'Farmers Saving Rare Wetlands' was the theme of the Threatened Ecological Communities (TECs) display at the Wagin Woolorama in March this year. It featured a number of Critically Endangered wetland communities promoting catchment action as the only long-term solution to their conservation. This was an appropriate round off to identifying TECs in the central agricultural region.

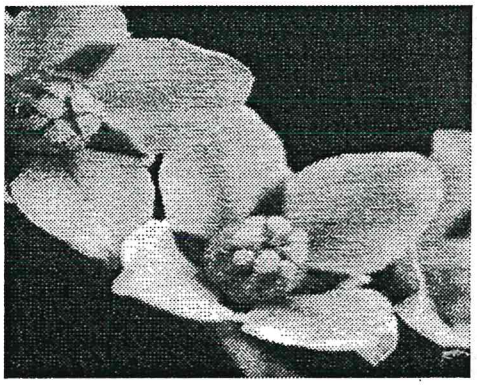
This year finds the project, funded by the Natural Heritage Trust focused on identifying TECs in the northern agricultural region. Fifty-five possible communities have been identified so far, with six nominated as TECs at the two Scientific Advisory Committee meetings held this year. However, four of these were assessed as Data Deficient - mainly due to the lack of information on the extent of these communities elsewhere in the southwest of the state.

Several avenues of information are being followed to attempt to fill in these gaps. For instance, the BankWest *Landscope* Conservation Visa Card Trust Fund has provided funds to seek clarification, in the regional context, of the distribution and conservation status of the herbaceous plant community occurring on bentonite clay playas west of Watheroo. It is anticipated that these four Data Deficient communities, as well as new ones, will be listed at the next meeting in October.

On a more positive note, the Director of Nature Conservation has endorsed the nomination of an additional occurrence of the 'Perched wetlands of the Wheatbelt region with extensive stands of living *Casuarina obesa* and *Melaleuca strobophylla* across the lake floor' community (Toolibin Lake was the only known occurrence). We are currently in consultation with the landholder regarding recovery actions.

A joint paper, written in conjunction with Murdoch University, will be presented at the State Landcare Conference in September. The paper promotes the implementation of recovery actions related to critically endangered communities. It is hoped that this will generate more publicity for the project, and create contacts in the southern Wheatbelt - the focus of the third year. Another field display will be held at the Mingenew Expo in September, with the likelihood of another at Newdegate.

For further information contact
Sheila Hamilton-Brown on 94055167
or Email: sheilahb@calm.wa.gov.au



Scott River Boronia

Scott River Boronia - a puzzle by Rebecca Evans

Boronia exilis is a critically endangered plant species, and as its common name suggests, it grows in the Scott River area near Augusta—or does it? Currently there are six recorded populations of which only one has been relocated recently. This is despite continued searching by CALM staff. All other sites continue to remain a mystery.

This taxon is described as an erect slender-stemmed perennial to approximately 1 m high. The upper leaves are slender, almost round in cross-section, and grow to 1.5 cm long. The pink flowers are seen in September, are much like many other *Boronias* growing in the area, and are borne in clusters at the end of the branches. Each flower has four deep red, woolly sepals and four broadly ovate pink petals. *B. exilis* is similar to *B. juncea*, and particularly to the subsp. *laniflora*. However, *Boronia exilis* is easily distinguished by its strongly fringed staminal filaments, which in *B. juncea* are hairless.

The full description by Paul Wilson occurs in *Nuytsia;* Wilson, P.G. (1998). New names and new taxa in the genus *Boronia* (Rutaceae) from Western Australia, with notes on seed characters. *Nuytsia* 12 (1): 119-154. Given the difficulty in relocating this taxon, it may be more aptly named the Shy Boronia or *Boronia ænigma.*

WATSCU has been developing an Interim Recovery Plan for this taxon with funds from Natural Heritage Trust.

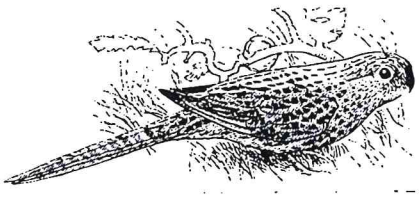
If you think you have seen *Boronia exilis* please contact either Rebecca Evans on 9405 5172 or Email: rebeccae@calmwa.gov.au or your local CALM District office

Searching for Ground Parrots by Allan Burbidge

In recent times, Western Ground Parrots have only been known from Cape Arid National Park, Fitzgerald River National Park and the Waychinicup / Manypeaks area.

Their distribution in Fitzgerald River National Park has been relatively well known, but little information has been available for the other two areas. Because a substantial part of the habitat of the Fitzgerald population was burnt in the extensive wildfires of 1997/98, the need for better knowledge of the other two populations has become more urgent.

Fortunately, a major part of this gap in knowledge has been filled by a recent report by Shapelle McNee. This document, "Report on Western Ground Parrot Survey at Waychinicup and Manypeaks, April to October 1998. Birds Australia, WA Group" is published as a Supplement to *Western Australian Bird Notes* No. 90, June 1999. The survey was funded by WWF, with assistance from the WA Group of Birds Australia and CALM.



Shapelle coordinated a number of surveys at Waychinicup that involved Birds Australia members, CALM staff and other local volunteers. A substantial area was surveyed, and a minimum of 29 birds was recorded in autumn, spread among three sub-populations. More area needs to be surveyed, but a major outcome of Shapelle's efforts has been the formation of a local "Friends" group, who will carry on with this task. At the recent recovery team meeting, it was decided to invite this new group to nominate a representative who will become part of the recovery team.

At Cape Arid the picture is less encouraging - recent opportunistic searches have failed to find Ground Parrots. However, the WA Group of Birds Australia has also obtained funding for survey work in this area. Again, Shapelle will be coordinating these surveys - with a bit of luck, she will be as successful as at Manypeaks. These surveys will commence this spring - if you are interested in assisting, please contact Shapelle via the WA Group office (08 9383 7749) or Allan Burbidge (08 9405 5100).

Allan Burbidge can be contacted on the above number or by Email
allanb@calm.wa.gov.au

South Coast Threatened Birds Recovery Team (SCTBRT) by John Blyth

This team oversees recovery actions for the Western Ground Parrot (Endangered), Noisy Scrub-bird (Vulnerable), Western Bristlebird (Endangered) and Western Whipbird (Vulnerable), and many things are being done to improve the status of these species. The team enjoys strong support from CALM's South Coast, Central Forest and Southern Forest Regions, CALM-Science, Birds Australia and local volunteer conservation groups.

Noisy Scrub-bird. Many research and recovery actions have been conducted for this species from 1961 onwards and the full recovery plan has been in place since 1996. Considerable funding has been provided by the Natural Heritage Trust. The most significant current activity is the continuing reintroduction to the Darling Range, in the same general area that John Gilbert collected the type specimen in 1842. Males have been released at three places: Samson Road within the Alcoa concession area, Falls Brook and the upper Harvey River. Several females have already been released at Samson Road, where at least three males are known to be singing, and no further releases will be made there this year. There is more extensive suitable habitat in the Upper Harvey site, and this may be leading to introduced males continuing to wander, rather than settling at one territory and singing consistently. As a result monitoring is more difficult, although there is recent evidence that at least two males are still present at this site. This winter several more males and several females (to follow the one released there last year) will be released at the Upper Harvey site. There are no plans to release females this year at Falls Brook, where singing males have not been heard for many months, but more males may be released. The reintroduction program is proceeding well, with a probable fourth Darling Range site to be added next year if invertebrate studies and other survey indicate that the habitat is suitable.

The original population rediscovered at Two Peoples Bay appears to have declined in the last year or so, but remains several times larger than when rediscovered in 1961. Translocated populations in the Waychinicup National Park to Mermaid Beach area and Bald Island continue

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Statewide Threatened Ecological Communities by Sally Claymore

This project is supported by funds from the Natural Heritage Trust. Since the last issue of *WATSNU*, 30 possibly-threatened communities have been added to the existing list of 175. Additions to the list were derived from ongoing literature reviews and discussions held with scientists and land managers. Detailed information on the distribution, extent, land tenure, management and threats to specific communities is being collated and documented to enable their assessment. Some of these communities will be investigated in the field this year, with surveys currently planned for the Midwest, Kimberley, and Pilbara Regions.

The main limitation of the study is the lack of sufficient data to assess many of the possibly-threatened communities against the criteria for defining categories of conservation status. The defining characteristics and/or extent of many of the communities proposed for inclusion on the database are not known and require additional research. In the rangelands, the picture is particularly complicated by the broad scale modification of landscapes through grazing and altered fire regimes.

Further research on two communities previously assessed as Data Deficient, and one currently unassessed community, has been funded through Bankwest *Landscope* Conservation Visa Card grants. These communities include: the 'species rich community of intertidal mudflats of tropical Australia' in the West Kimberley, and two subterranean fauna communities in the Pilbara and Goldfields. Fieldwork for these projects is scheduled for 1999, and has already been completed for the subterranean fauna community located in the Goldfields.

A Bankwest *Landscope* Conservation Visa Card grant was also used to fund the construction of an effective barrier gate to protect a critically endangered cave community on North West Cape. CALM District staff and a local cave enthusiast implemented the project.

Work is in progress to prepare the threatened ecological community database for distribution to some CALM District and Regional Offices in 1999.

For further information contact Sally Claymore on 94055 168 or by Email: sallyc@calm.wa.gov.au

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to thrive. A comprehensive census of numbers of Noisy Scrubbirds at all south coast sites will be conducted this year.

Western Bristlebird. Numbers of this species have increased at Two Peoples Bay as a result of the effective fire management there over the last 30 years, but this species remains in a precarious position. Large wildfires, occurring in an unpredictable manner and being very difficult to control, in its other main stronghold, Fitzgerald River National Park, have had an adverse effect on one or more populations of the species. However, significant progress is being made towards improving its status under the current research plan. The most exciting action planned for this year is a translocation, using birds from the healthy Two Peoples Bay population, to the Nuyts Wilderness area of Walpole National Park. Other actions have involved monitoring the number of birds in Fitzgerald River National Park, especially in relation to particular fire regimes, and continuing a fire management program intended to enhance the chances of Bristlebird populations in the Park surviving future wildfire.

Rufous Bristlebird. The western subspecies of the Rufous Bristlebird has not been definitely recorded for over 50 years and is presumed extinct. For this reason it is not one of the species for which recovery actions have been designed, but some time was spent at the last meeting of the SCTBRT discussing knowledge of it. There have been a few tantalising reports in the last 20 years and there is still a considerable amount of the dense coastal scrub on the Leeuwin Naturaliste Ridge that used to be the species' stronghold in Western Australia. The team is going to seek funds to investigate all reported sightings and to conduct surveys, probably involving volunteers in a manner similar to that being done for the Western Ground Parrot (see separate article this issue)

Western Whipbird. The validity of suggested subspecies status for the population at Two Peoples Bay and a few nearby areas needs to be clarified before priorities for recovery actions can be established. Blood samples have been collected and are in Melbourne with Dr Les Christidis for genetic analysis that it is hoped will answer this question. Money for this study has been provided by the Bankwest *Landscope* Conservation Visa Card fund and CALMScience Division. In the meantime, populations in Fitzgerald River National Park are likely to benefit from fire management being conducted for Western Ground Parrots and Western Bristlebirds.

Progress on Conserving Threatened Ecological Communities in the Wheatbelt - Changes at Murdoch University by Stephen Renton

The School of Environmental Science at Murdoch University continues to work with WATSCU in helping to conserve TECs in the wheatbelt in a project funded by the Natural Heritage Trust. Earlier this year Murdoch's research officer attached to the project, Robyn Shaw, left the position, which has since been taken up by myself. The year so far has been filled with a mixture of tasks, including attending the Wagin Woolorama (a very useful exercise in meeting all those involved with and helping the project), continuing the interviewing of landholders and managers with TECs in the Central wheatbelt, as well as beginning the all important analysis of these interviews.

As of May, all of the interviews required with landholders and managers of TECs for the Central wheatbelt had been conducted, the task now is to finish transcribing all 20 odd tapes. Analysis of the interviews transcribed so far is already underway using a qualitative software analysis package called NUD*IST (non-numerical unstructured data indexing searching and theorising). This package enables us to develop and tease out patterns and themes in the data for further analysis - i.e:

- current and/or proposed management actions and strategies being undertaken by the landholders and managers of TECs;
- information (sources, content, delivery) used for this management, and, most importantly;
- the information needed by landholders and managers to help them manage and conserve their TECs in the future.

Although it is too early to discuss the results with any certainty, it is evident that a variety of management actions had been undertaken, with fencing and feral animal control the two more common actions cited thus far. Numerous sources of information including consultants, other farmers, Landcare meetings and field days have been used, while the information needed by landholders and managers varied greatly from hydrological information, to replanting, regeneration, landscape ecology and engineering information.

Other themes being addressed in the analysis include the development and implementation of ecological knowledge, and the methods and aims of learning by landholders and managers over the course of the entire project. We are also looking at the views of landholders on CALM as a government agency. It is anticipated that at least some preliminary results will be finalised by the end of June or early July in time for the next round of interviews in the Northern wheatbelt.

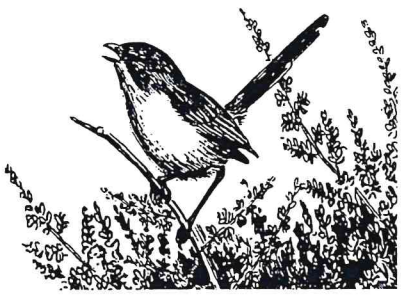
For further information, you can contact Stephen Renton who is a Research Officer, Environmental Science Section, Mudroch University Ph: 9360 6079 or renton@essun1.murdoch.edu.au

Grasswren Interim Recovery Plan by Belinda Cale

The western subspecies of the Thick-billed Grasswren *Amytornis textilis textilis* once extended throughout southern Western Australia. Since the early 1900s the species has become restricted to the Shark Bay region. The impacts of grazing, rabbits and earlier droughts were thought to contribute to the species decline.

In October 1998 a survey of the grasswren was conducted on Peron Peninsula and the adjacent pastoral properties of Nanga, Hamelin, Woodleigh and Carbla, with funding from the Commonwealth Shark Bay World Heritage Property funding program. The aim of this survey was to determine where the grasswrens occurred and gain some information on the vegetation characteristics of grasswren sites. Grasswrens were found throughout Peron Peninsula and Woodleigh Station, but were patichly distributed on Hamelin and Nanga Stations. It was found that the presence of low bushes of a high foliage density was an important determinant of grasswren presence.

With further Commonwealth Shark Bay World Heritage Funding, the findings of this survey will be incorporated into an Interim Recovery Plan for the Thick-billed Grasswren. Anyone interested in being involved in the development of this Interim Recovery Plan can contact Belinda Cale (WATSCU, CALM Woodvale).



Toolibin Lake Recovery Plan—summary of activities completed January-July 1999

by Amanda Smith

Toolibin Lake, situated approximately 250 km south east of Perth, is one of the last existing examples of a wooded wetland once common throughout inland south west Western Australia. Threatened from both saline surface water inflows and rising groundwater, the Lake has received major funding from the State Salinity Action Plan and the Natural Heritage Trust, to implement the Toolibin Lake Recovery Plan.

One of the most exciting projects implemented over the last six months is the extension to the current groundwater pumping program. Eight pumps have been pumping since March 1997, resulting in a drop of water table depths of up to 15m where combined with revegetation zones. Visually, the impact of pumping has become very clear in some areas, with lush new foliage emerging on trees that were previously bare. All existing pumps are on the western side of the lake, and the completion of a digital groundwater model has indicated that additional bores on the east side of the lake are required to protect a larger area of the lake bed. Drilling of five new boreholes, three of which were located in the palaeochannel, was completed in March/April of this year. A contract is now in progress to determine which type of pump will be most suitable for these new boreholes, given the distance and power constraints.

Over the last six months, monitoring within Toolibin Catchment has been upgraded. A joint project with Agriculture WA has resulted in a contract to design and construct an upgrade for the two surface water monitoring stations in the West Toolibin Flats, and to build a new monitoring station in the North East Toolibin sub catchment. Another joint project, this time with the Water and Rivers Commission, has seen the construction of a monitoring station at the diversion channel at Toolibin Lake, providing additional data on the salinity and volume of water bypassing the lake. In late June a professional photographer will commence with a project designed to record the impact of groundwater pumping. The photographs, in each direction at each borehole, will provide a comparison of vegetation condition in future years.

A first draft of the Feasibility Study on Salt Harvesting and Aquaculture in Toolibin Catchment has recently been completed. This report investigates the various methods of salt harvesting and marketing, and also aquaculture species, that may be appropriate at Toolibin Lake. The objective of this project is to develop and test techniques for the disposal of saline effluent that is environmentally safe and that is cost neutral or profitable.

The revegetation program for Toolibin Catchment in 1999 is also well under way. Preplanting preparation such as ripping, mounding, weed control and rabbit control have been implemented. Revegetation works this year will include the establishment of a set of lake bed trials, planting *Casuarina obesa* and *Melaleuca strobophylla* within fenced plots to prevent kangaroo grazing. Additional activities include infill by local school children at the revegetation buffer zone and on the bund, an oil mallee subsidy to catchment landholders, mixed plantings of species tolerant to salt and water logging, and a trial of native perennial grasses. A biodiversity direct seeding trial has also been sown recently, designed to link two nature reserves together. All seed used for the native grasses and direct seeding trial was collected and sorted locally by CALM staff and propagated by the Narrogin Plant Nursery.

Amanda Smith, Recovery Catchment Officer and can be contacted at the CALM Wheatbelt Regional Office. On Ph: 98819223 of Fax: 98813297

Update on *Daviesia cunderdin ms*, Cunderdin daviesia

On April 27th whilst on the way back from the Merredin District Threatened Flora Reovery Team meeting I called in to check on the single known population of the Critically endangered Cunderdin daviesia (*Daviesia cunderdin* ms). I was surprised to see that it was in full flower. I say surprised, because the species has been recorded in the past as flowering in late May-June. It would appear that flowering is stimulated by rainfall and with the good early rains in the Cunderdin area, the flowering of Cunderdin daviesia was given an early start. The attractive red pea-shaped flowers of this species are most striking and literally cover the bush. This makes it stand out in the rather narrow, degrade road reserve habitat in which it grows. Perhaps, future surveys carried out during flowering may uncover more ppulations, as the plant is fairly nondescript when not in flower and could easily be missed.

Ranked as Critically Endangered, Cunderdin daviesia is one of Western Australia's most threatened plant species. An Interim recovery Plan is being prepared for it by CALM and Frank Obbens from the WA Herbarium is conducting weed control and seed germination (stimulation of the soil stored seed bank, using fire) trials on the population. Frank has succeeded in recruiting several seedlings. Currently, just five adult plants and are known from the wild and, as all are reaching senescence, it is important that young plants are produced to replace them.

Andrew Brown

Funding the conservation of Critically Endangered Flora and Plant Communities

by Val English

There are currently around 100 plant taxa that are ranked as Critically Endangered in Western Australia. Commonwealth funding has been made available through Environment Australia for the implementation of recovery actions for 32 of these. To prevent their possible extinction in the wild, these 32 species required urgent management actions such as weed control, fencing, translocation to secure sites, further survey and research into their biology and ecology.

Applications for funding under the Natural Heritage Trust have recently been forwarded to Environment Australia for another series of critically endangered plant taxa. In total, funding was requested to implement recovery actions for 26 plant taxa that occur in CALM's Moora, Albany, Merredin, Southwest Capes, Perth and Esperance Districts. As before, funds have been requested for chemicals to control weeds, fencing materials, to propagate plants to translocate into new areas, to gather information about the biology of each of the plant taxa to improve their future management, and for many other actions.

In addition to the funds requested for individual plant taxa, funds were also requested for the recovery of one critically endangered plant community that contains no less than six critically endangered plant taxa. In this case, it is proposed to integrate the management actions for the habitat of the critically endangered flora (that is, the ecosystem containing the critically endangered plant community), and the individual plant taxa that make up the community. This would ensure funds are used in the most efficient way.

Interim Recovery Plans (IRPs) are currently being completed and prescribe actions required to recover each of the critically endangered plant taxa and plant communities that are included in the funding applications. These IRPs will be forwarded to Environment Australia as part of the funding application. IRPs describe and cost all proposed recovery actions. The plans are routinely drafted by WATSCU staff with input from all stakeholders including recovery teams (if a relevant team exists for the area), community-groups and individuals, and CALM staff that have relevant scientific expertise or will be involved in implementing the plans.

The success or otherwise of funding applications will be known later in 1999.

For further information Val can be contacted on 94055169 or Email: vale@calm.wa.gov.au

WATSCU is growing - welcome to three new staff and goodbye to another

In March, *Sally Claymore* filled the position of Project Officer vacated by Val English. The project, to conserve threatened ecological communities throughout the State (particularly outside the Southwest), is funded by Environment Australia through the Natural Heritage Trust and now in its second year. See article elsewhere in this issue of the work Sally is doing.

Belinda Cale is working with us on a half time basis for 6 months to prepare draft Recovery Plans for two threatened birds, Carnaby's Cockatoo and Western Long-billed Corella (Southern subspecies). This is funded by the Natural Heritage Trust's Endangered Species Program. See articles in this issue of *WATSNU*. A workshop was held in July to develop recovery actions for the species. Recovery Teams have been set up to aid in the preparation of the recovery plans with representatives from Birds Australia, WA Group, CSIRO, WA Museum, Agriculture WA and representatives from a variety of stakeholders within CALM.

Alex Agafonoff has just joined us from CALM Merredin where he was the Conservation Officer. Alex has taken up a new position with WATSCU writing Interim Recovery Plans for Critically Endantered Ecological Communities.

Goodbye and thanks to *Gillian Stack* who departed in April. Gillian's wonderful personality, along with her communication and writing skills were much appreciated throughout her time with us which included the writing of Interim Recovery Plans for threatened flora. Gillian was also instrumental in developing our extensive slide collection. We wish Gillian wonderful times and happy days ahead with her new baby Caelan.

Bankwest *Landscope* Conservation Visa Card Project - 16 Critically Endangered Plant Posters *by Andrew Brown*

Following the process of ranking Western Australia's 350 taxa of threatened flora, 95 have been listed as 'Critically Endangered'. Without urgent intervention, these plants may soon become extinct in the wild.

To prevent this, recovery actions are being implemented by CALM through local Flora Recovery Teams. One important tool to help save these highly threatened plants is community education, so, over time, all critically endangered plants will be featured in a series of posters produced by CALM's Western Australian Threatened Species and Communities Unit, with funding from the Bankwest *LANDSCOPE* Conservation Visa Card. Currently, 29 posters have been produced.

The aim of producing the posters is to provide information that will help people identify the plants, which in turn might lead to the discovery of new populations. It is hoped that the posters will also spread the message about the need to conserve these critically endangered plants, especially by reducing the processes that threaten their survival in the wild. (Many of these processes are the result of human interference such as clearing, road grading, erosion, spraying of herbicides and the introduction of exotic diseases, weeds and animals such as goats, pigs and rabbits.) A greater awareness and understanding will help educate the community about ways to lessen the impact of human activities on the plants.

Each poster illustrates an individual plant taxon and provides information such as its flowering time, habitat, approximate locations, the threats to its survival and the recovery actions that CALM has under way. The posters can be viewed on CALM's NatureBase at: http://www.calm.wa.gov.au/index.html. Once in NatureBase just hit the Plants and Animals icon and go to Critically Endangered Flora Posters.

Further information about these species and other Western Australian plants listed as threatened can be obtained from CALM's new publication *Western Australia's Threatened Flora*, available from CALM and all good bookshops.

The 29 posters are:

Bussell's spider orchid (*Caladenia busselliana* ms)
Chiddarcooping myriophyllum (*Myriophyllum lapidicola)*
Colourful snakebush (*Hemiandra* sp. Watheroo)
Cunderdin daviesia (*Daviesia cunderdin* ms)
Dunsborough spider orchid (*Caladenia viridescens* ms)
Dwarf spider orchid (*Caladenia bryceana* subsp. *bryceana*)
Elegant spider orchid (*Caladenia elegans* ms)
Foote's Grevillea (*Grevillea calliantha*)
Gingin wax (*Chamelaucium* sp. Gingin)
Granite tetratheca (*Tetratheca deltoidea*)
Hinged dragon orchid (*Drakonorchis drakeoides* ms)
Kamballup dryandra (*Dryandra ionthocarpa*)
Majestic Spider Orchid (*Caladenia winfieldii* ms)
Maxwell's Grevillea (*Grevillea maxwellii*)
McCutcheon's grevillea (*Grevillea maccutcheonii*)
Meelup mallee (*Eucalyptus phylacis*)
Metallic-flowered eremophila (*Eremophila veneta*)
Mogumber bell (*Darwinia carnea*)
Norseman pea (*Daviesia microcarpa*)
Northampton Midget Greenhood, (*Pterostylis* sp. (Northampton)
Prickly honeysuckle (*Lambertia echinata* subsp. *echinata*)
Pythara Grevillea (*Grevillea pythara*)
Red snakebush (*Hemiandra gardneri*)
Sargent's Snakebush (*Hemiandra rutilans*)
Scaly-leaved featherflower (*Verticordia spicata* subsp. *squamosa*)
Silky eremophila (*Eremophila nivea*)
Small-flowered conostylis (*Conostylis micrantha*)
Swamp starflower (calytrix breviseta subsp. *breviseta*)
Western prickly honeysuckle (*Lambertia echinata* subsp. *occidentalis*)

For further information contact
Andrew Brown on 94055166 or Email:
andrewbr@calm.wa.gov.au

Translocation of Threatened flora and fauna by Jill Pryde

In the past 12 months the Director of Nature Conservation has approved 26 translocations of threatened flora and fauna. Translocations are carried out in accordance with CALM Policy Statement 29. This Policy applies to all translocations of threatened taxa undertaken by any person anywhere within the State. This also includes translocations of WA flora and fauna outside WA. In many cases, translocations would not be possible without the assistance of organisations such as Perth Zoo and Kings Park and Botanic Garden, with whom CALM has developed collaborative programs. Perth Zoo has set up a thriving captive breeding program, most animals for translocation are bred at the zoo. In the case of flora, Kings Park and Botanic Garden provides expertise in the provision of seed and propagation of threatened plant material. CALM's Threatened Flora Seed Centre also provides much of the material for propagation.

The number of translocations have increased, and in the case of fauna this is largely due to the availability of reconstruction sites in which the original cause of the extinction of some of these species has been ameliorated under the Western Shield Program.

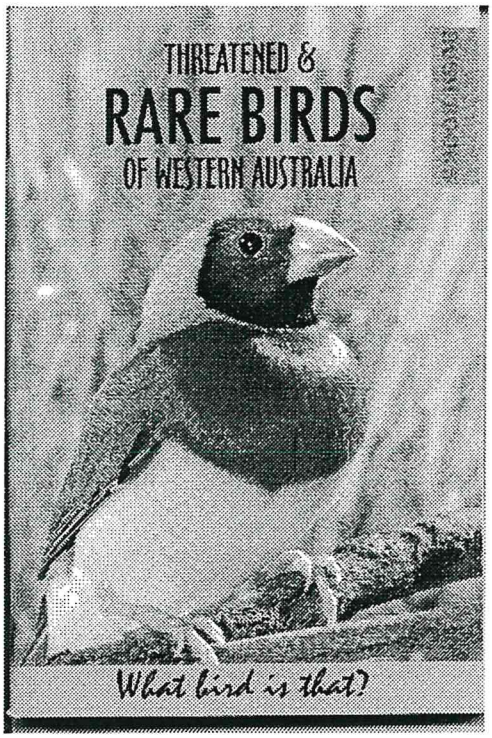
The following table lists introductions/reintroductions/restocking undertaken in the last 12 months.

Organism	Type of introduction	Source of organism	Proponent/s
Grevillea calliantha	Reintroduction	Seeds sourced from original population and raised at Kings Park & Botanic Garden to Water Reserve Cataby	Leonie Monks / David Coates, CALMScience
Lambertia echinata subsp *occidentalis*	Introduction	Seed sourced from original population and raised at Kings Park & Botanic Garden to Treeton Block	Leonie Monks / David Coates, CALMScience and Kim Williams / Andrew Webb, CALM Central Forest Region
Lambertia orbifolia	Introduction	Seed taken from population 2 and raised at Kings Park & Botanic Garden to Narrikup Nature Reserve	Leonie Monks / David Coates, CALMScience, Ellen Hickman, CALM South Coast Region
Daviesia bursarioides	Restocking	Seed collected and raised by Kings Park & Botanic Garden to gravel pit near Three Springs	Leonie Monks / David Coates, CALMScience
Lambertia echinata subsp. *echinata*	Restocking	Seed from population 1a and seedlings raised at Kings Park & Botanic Garden to gravel pit Cape Le Grande NP	Leonie Monks / David Coates, CALMScience
Acacia cochlocarpa subsp. *cochlocarpa*	Reintroduction	Seed from translocation site, raised at Kings Park & Botanic Garden to Gunyidi Nature Reserve	Leonie Monks / David Coates, CALMScience
Acacia aprica	Introduction	Seed from population 5 raised at Kings Park & Botanic Garden to Carnamah Shire Recreation Reserve	Leonie Monks / David Coates, CALMScience
Verticordia fimbrilepis ssp *fimbrilepis*	Introduction	Cuttings taken from Population 3 located at Timber Reserve 1736 and then propagated at Kings Park & Botanic Garden to timber reserve near Beaufort	Mal Graham, Bruce Bone, CALM Katanning
Western Swamp Tortoise	Restocking	Perth Zoo to Twin Swamps and Ellen Brook Nature Reserves	Andrew Burbidge, CALM / Gerald Kuchling, University of Western Australia
Rulingia sp. (Trigwell Bridge)	Reintroduction	Phase 2. Propagated plants to Trigwell Nature Reserve	K Williams / B Fitzgerald, CALM Central Forest Region
Dibbler, *Parantechinus apicalis*,	Introduction	Perth Zoo (founders from Boullanger and Whitlock Islands) to Escape Island, Jurien Bay	Tony Start, CALMScience
Numbat	Reintroduction	Animals sourced from Dryandra Woodland, Boyagin Nature Reserve and Perth Zoo to	Tony Friend, CALMScience
Djoongari (Shark Bay Mouse)	Reintroduction	Captive colony Perth Zoo (founders from Bernier Island) to Heirisson Prong Shark Bay	Keith Morris, CALMScience & Jeff Short, CSIRO
Chuditch	Introduction	Captive colony Perth Zoo to Mt Lindesay	Brent Johnson, CALMScience and Greg Freebury, CALM Walpole District
Djoongari (Shark Bay Mouse)	Introduction	Captive colony Perth Zoo to North West Island, Montebellos	Peter Speldewinde and Keith Morris CALMScience
Chuditch	Introduction	Captive colony Perth Zoo to Kalbarri National Park	Brent Johnson, CALMScience
Grevillea christineae	Introduction	Source plants from Mortlock River Goomalling Shire Reserve to private property nearby	Penny Hussey, CALM Land for Wildlife Coordinator and Botherling Springs Catchment Group
Dryandra iontho-carpa	Introduction	Seedlings raised at Kings Park & Botanic Garden to Kalgan Plains Nature Reserve	Leonie Monks / David Coates, CALMScience
Greater Stick-nest Rat	Reintroduction	Salutation Island to Heirisson Prong, Shark Bay	Keith Morris, CALMScience / Jeff Short, CSIRO
Western Bristlebird	Introduction	Two Peoples Bay/Fitzgerald River NP to Walpole-Nornalup NP	Allan Burbidge, CALMScience
Acacia aprica *Daviesia bursarioides* *Grevillea calliantha* *Lambertia echinata* subsp *echinata* *Lambertia echinata* subsp *occidentalis* *Lambertia orbifolia*	See above	Additional seedlings to be planted in 1999 following the 1998 translocations.	Leonie Monks / Dave Coates, CALMScience

Department of Conservation
and Land Management

Editor: Jill Pryde
WA Threatened Species & Communities Unit
PO Box 51
Wanneroo WA 6946

Phone: 08 94055 128
Fax: 08 9306 1066



A new CALM Bush Book has just been released, titled:

"What bird is that?"

by John Blyth and Allan Burbidge

This is available from CALM or good book stores for $5.95