

GREAT HUEGELII HUNT~SPRING 2004

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Over 15 areas with similar habitat that had not had *C. huegelii* recorded before were searched resulting in the discovery of FIVE new populations

Surveys for the Declared Rare Flora *Caladenia huegelii* (Grand Spider Orchid) ~ Emma Adams

Commonly known as the Grand Spider Orchid, the Declared Rare Flora *Caladenia huegelii*, is a magnificent native terrestrial orchid that grows from 25-70cm tall.

As of 2003, the Grand Spider Orchid was known from 35, mainly small, populations, many of which are threatened by continuing urban development.

Due to small population size, threats from clearing, and habitat degradation, the species was declared as Rare Flora in 1990 under the *Wildlife Conservation Act 1950*, and ranked as Critically Endangered in 2004. It is also ranked Endangered under the *Environment Protection and Biodiversity Conservation Act 1999*.

In September and October this year CALM carried out a survey for the Grand Spider Orchid. The aims of the survey were to re-assess known populations of *C. huegelii* and to survey additional areas, in order to identify new populations of this important species, and confirm bushland areas where it is not found.

The survey was carried out by CALM regional staff, with assistance from volunteers within other areas of CALM, staff from the Botanic Gardens and Parks Authority, and volunteers from the community.

During the two months over 30



Caladenia huegelii
 Photo: Andrew Brown

known populations were searched from The Vines down to Dawesville, and after a search effort of over 440 person hours, more than 800 *C. huegelii* plants were located.

Of the number of extant populations known in 2003, a third of these still had *C. huegelii* plants present, a third recorded no plants flowering but the populations probably still exist, and a third are

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Scott Ironstone acquisition ~ Val English

Areas of ironstone associated with unusual plant communities occur in a number of wetland areas in the southwest of Western Australia. These include the Scott River area, Gingin, Eneabba and Busselton. Each of these areas contains communities that are characterised by different plant species.

Soils-mapping of the Scott River Plains indicates that the original extent of the ironstone in the area was about 1780 hectares. Only about 360 hectares has not been cleared for agriculture or other purposes, however, and this represents a loss of 80% of this highly restricted plant community.

Botanists Dr Neil Gibson, Greg Keighery and Bronwen Keighery have completed a detailed analysis of the flora and vegetation of the Scott Coastal Plain. They subsequently published work that identified the plant associations of the Scott Ironstone areas as very unusual and as containing a suite of plant taxa that are endemic to them. Three Declared Rare Flora (DRF) and six other plant species on CALM's Priority list occur in the Scott Ironstone areas and were noted in these studies. One of the DRF and two of the Priority flora are endemic to the Scott Ironstone ar-

reas, so the conservation of the ironstone habitat is crucial for their survival.

The remaining areas of the Scott River Ironstone Association are under threat from clearing, die-back disease, grazing, too frequent fire, road maintenance, weed invasion and hydrological changes. This plant community was listed as an 'Endangered threatened ecological community' in 2001.

Until very recently, about 200 ha of the remaining area of the Scott Ironstone Association was on private lands, with the remainder occurring on public lands managed by local government or CALM.

Until September this year, the largest areas of the Scott Ironstone vegetation held on private land were managed by BHP Titanium Minerals. These occurrences cover about 90 ha. In September 2004, as part of the Company's Beenup Mine rehabilitation project, BHP donated a 150 ha parcel of land that contains the 90 ha of the Scott Ironstone Association to the State for future reservation. The area also contains three Declared Rare Flora: *Darwinia ferricola*



Scott River boronia
Photo: Diana Papenfus

(Scott River bell), *Lambertia orbifolia* subsp Scott River Plains (Scott River round-leaf honeysuckle) and *Boronia exilis* (Scott River boronia). The site is recommended to become a Class A Nature Reserve for 'Conservation of Flora and Fauna'. The inclusion of this large area of the community in the conservation reserve system will be a significant gain for the protection of this unusual and highly threatened community.

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likely to be extinct.

Over 15 areas with similar habitat that had not had *C. huegelii* recorded before were searched resulting in the discovery of five new populations consisting of 52 plants.

While the number of extant populations from 2003 was reduced, the number of plants was doubled. A troubling statistic though, is that 86% of the 800 plants recorded are located

within two populations, both of which are threatened by mining and development. In addition, of the 14 populations where plants were recorded in this survey, nine had fewer than 10 plants. This emphasises how fragile the status of this species is, and the importance of not only protecting the remaining populations, but also of finding new populations.

Additional spring surveys will be carried out in 2005 to repeat and build on the efforts of this year.

A big Thank You goes out to everyone involved in this year's survey, and we hope that we can have an even bigger search team for next years "Huegelii Hunt", to help save this precious orchid.

Emma Adams is based at CALM's Swan Region and can be contacted on (08)9368 4399 or email: emmaa@calm.wa.gov.

New Forest Black Cockatoos Recovery Team ~ John Blyth

At the February 2004 meeting of the WA Threatened Species Scientific Committee the Vulnerable Baudin's Black Cockatoo (*Calyptorhynchus baudinii*) was recommended for upgrading of threat status to Endangered and the unlisted Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) was recommended for listing as Vulnerable.

Both of these species face a variety of threats, and have declined in range by 25-30% as a result of clearing of the margins of the forests for agriculture in the early 1900s. Recent research on these two species has shown that their breeding rate is very slow, with each pair of Baudin's Cockatoo's raising on average only 0.6 offspring per year, and apparently only 10% of the pairs of Red-tailed Black Cockatoos breeding in any one year! Equally importantly, it is becoming clear that two new or enhanced threatening processes now have the potential to affect both species more than has previously been understood. These two threats are competition for nesting sites (especially from feral honeybees) and potential reduction in food resources as a result of climate change.

With Baudin's Black Cockatoo already listed under the Commonwealth EPBC Act, CALM was able to obtain Natural Heritage Trust funding for writing an interim recovery plan (IRP) for that species. Because distribution, threats and management actions required are similar for the two forest black cockatoos, a single plan to deal with both species is being drafted. Tamra Chapman of CALM's Wildlife Branch, supervised by Dr Peter Mawson, is writing the new IRP.



Forest Red-tailed Black Cockatoo Photo: CALM

The draft recovery plan is likely to incorporate about ten actions that will be implemented to improve the conservation status of the two species of forest black cockatoos. These actions include developing and implementing methods for: protecting fruit crops against Baudin's Cockatoos without killing birds; controlling feral honeybees; and managing logging so that impact on forest cockatoos is minimized. Various research projects will also be conducted to provide sufficient knowledge to improve our capacity to manage these two threatened cockatoos.

The establishment of a Forest Black Cockatoos Recovery Team has been approved by the Acting Director of Nature Conservation. The Recovery

Team will be chaired by Mark Garkaklis, Regional Ecologist of Swan Region, and have membership from Birds Australia, WA Fruit-growers Association, WA Museum, Water Corporation and relevant branches and regions within CALM. The first meeting of the Recovery Team was held on December 3rd 2004, and providing input to the draft IRP was a major task for that meeting.

John Blyth is Acting manager of WATSCU and can be contacted on (08) 94055161 or email: johnbl@calm.wa.gov.au

New occurrences of shrublands of limestone ridges added to Threatened Ecological Communities database ~ Melissa Hoskins



Limestone ridges Photo: Melissa Hoskins

Melaleuca huegelii – *M. acerosa* (currently *M. systema*) shrublands of limestone ridges is classified as an ‘endangered’ threatened ecological community (TEC). Known as Swan Coastal Plain community type 26a in the 1994 report ‘A floristic survey of the southern Swan Coastal Plain’ by Neil Gibson and others, it occurs on massive limestone ridges north of Perth, and a few small areas south of Perth near Lake Clifton.

This floristic community com-

prises thickets, heaths or scrubs dominated by two species of melaleuca: chenille honeymyrtle (*Melaleuca huegelii*) and honeymyrtle (*M. systema*); or parrotbush (*Dryandra sessilis*), over spider net grevillea (*Grevillea preisii*), pajang (*Acacia lasiocarpa*) and basket bush (*Spyridium globulosum*), over shallow soil on ridge slopes and ridge tops.

A recent survey of remnant areas of vegetation in the City of Wanneroo carried out as part of the Perth Biodiversity Project, and a survey done by the Wildflower So-

ciety of WA, has identified several new small areas of this community type. An unknown species of *Melaleuca* has been recorded at two of the sites. These new occurrences have been added to the Threatened Ecological Communities database, which is maintained by CALM’s WA Threatened Species and Communities Unit. The TEC database contains information such as threats to the community, a list of dominant species that occur in it and the general condition of the site, for all known occurrences of TECs in the State.

The greatest threats to community type 26a are limestone extraction and clearing for residential development and associated infrastructure. The invasion of weeds into these small remnants and the occurrence of too frequent fire also impact this community.

The TEC database is utilised by a number of State Government Departments and private companies such as Environmental Consultants to help identify areas of environmental significance. A more complete data set will support early identification of these significant areas and help to minimise potential impacts to them.

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TRANSLOCATION OF FLORA AND FAUNA

Two translocation proposals have been approved since the last edition of *WATSNU*, details follow:

Mt Lesueur Grevillea, <i>Grevillea batrachioides</i>	Seed and cuttings obtained and raised at Botanic Garden & Parks Authority and introduced to a site on Drummonds Track north of current population in Lesueur National Park	Leonie Monks, Gina Broun, CALM
Dibbler, <i>Parantechinus apicalis</i>	From captive bred animals at Perth Zoo to Stirling Range National Park	Tony Friend, CALM for the Dibbler Recovery Team

New Population of Endangered Grevillea ~ Val English

Grevillea curviloba subsp. *incurva* (narrow curved-leaf grevillea) is known from approximately 900 plants that occur within 15 confirmed populations. The subspecies is currently listed as endangered. Most of the populations are located on road and rail reserves, and the habitat has generally been quite degraded by weed invasion, road and rail maintenance activities, altered hydrology and too frequent fire.

The subspecies is very easy to recognize when in flower during September to October. Flowers usually occur in the leaf axils and are creamy white, 7 to 10 millimetres long and 0.5 millimetres across. The subspecies differs from the Critically Endangered *G. curviloba* subsp. *curviloba* in having prominently incurved, narrowly linear leaf lobes, 0.8 to 1.2 millimetres wide.



Melissa Hoskins and John Blyth counting stems of *Grevillea curviloba* subsp. *incurva* at Timaru Nature Reserve

Photo: Val English

A previously unknown population of the subspecies was very recently located in Timaru Nature Reserve near Gingin, to the north of Perth. The population occurs within the critically endangered 'Perth to Gingin Ironstone association'. WATSCU staff counted the plants, and recorded the exact locations of individuals. The five plants in the new population are very large and woody, with some estimated to be 7 metres in diameter! The plants appear to be very old, but are quite healthy. The habitat of the new population is well protected within the Nature Reserve, and weed control is planned for this site using funds available through a Natural Heritage Trust project for recovery work on the threatened ironstone habitat.

As a consequence of the threat of hydrological change, there are also funds available through the State Salinity Strategy for recovery work on this threatened Grevillea. These funds are being utilized to clarify the genetics and taxonomic characteristics of the two subspecies, as the separation of the two is currently unclear.

The genetic variability between and within populations of this subspecies is being investigated by Dr Margaret Byrne, from CALM's Science Division, and the taxon has recently been confirmed to have clonal reproduction. Although there are only five plants in the newly located population, these may add to the demonstrated genetic variation within the subspecies.

Studies of the leaf morphology by CALM Senior Principal Research Scientist Greg Keighery indicate that populations south of Timaru have highly variable leaf shapes often corresponding to both subspecies of *Grevillea curviloba*, with one leaf shape per clone. The narrow-leaved populations on the Gingin ironstone, which are killed by fire, are much less variable in leaf shape. *Grevillea curviloba* subsp. *incurva* is named from one of the southern variable populations. This suggests that the species should be managed at the population rather than the subspecies level to conserve its genetic variation.

**For further information contact Val
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Beyeria lepidopetala, rediscovered again! ~ Alanna Chant

A plant collection made during a Wildflower Society survey near Kalbarri National Park has recently been identified as *Beyeria lepidopetala*, which confirms this species' rediscovery for the second time!

For approximately 135 years *Beyeria lepidopetala* was known only from the type collection, made prior to 1859 by Augustus Oldfield, near the Murchison River. It was presumed extinct until 1994, when the Department of Conservation and Land Management officer Ray Cranfield rediscovered it further south in the Kalbarri National Park. At the site Cranfield recollected the species in 1994, he described its occurrence as 'frequent', and recorded the location specifically. A survey of the site in 1995 revealed only one *Beyeria* plant, then in 1996 five plants were recorded. However, specimens collected at the site during these surveys were later confirmed to be a different species!

There have been many subsequent surveys of Cranfield's site, which have failed to locate any plants, despite knowledge of the specific location of the plants found in 1994. Cranfield's site was recorded as regenerating after fire, so it was suggested that the *Beyeria* might be a very short-lived disturbance opportunist.

A draft interim recovery plan was prepared in 1998, although possible recovery actions were limited. With no living plants to observe, it was impossible to determine anything about its biology or ecology and survey was complicated by the fact that nobody actually knew what the plant looks like, other than that it looks like a quite common *Hibbertia*. Recovery team members continued to search Cranfield's site each year without success.

Despite the searches of previous collection sites being unsuccessful, *Beyeria lepidopetala* has now been rediscovered again, by members of the Wildflower Society undertaking a Bushland Survey Project in pastoral country north of Kalbarri. "We were not actually surveying for this species, our intention was to cover a good representation of the vegetation present" said Anne Gunness from the Wildflower Society. The survey was undertaken by around 25 volunteers, over two extended weekend trips and was extremely successful, "We were all very excited with what we had found, the identification from the survey is almost complete and we have collected over 500 plant taxa, including 5 Declared Rare Flora and 31 Priority Flora. We have also collected a lot from the Myrtaceae family which are new or undescribed taxa so it has been very interesting" said Anne.

Beyeria lepidopetala was collected at two separate sites during the survey and both are secure locations. "The first collection was in one of our quadrats and the second was an opportunistic collection. It will be interesting to learn more about the plant now it has been found,



Beyeria lepidopetala

Photo: Alanna Chant

such as its life span and regeneration", Anne said.

B lepidopetala has now been re-surveyed at both sites, by Recovery Team members and CALM District Staff, with site details carefully recorded in the hope that this plant does not disappear again. Future recovery actions are likely to include monitoring and recording observations about the plants and their habitat and further survey in nearby habitat.

Alanna Chant is the Conservation Officer (Flora) based in Midwest Region and can be contacted on (08) 99215921 or email: alanna@calm.wa.gov.au

Pilot South Coast Threatened Species Project ~ Sandra Gilfillan

WA's South Coast has been selected as one of three locations in Australia to explore the benefits and feasibility of a more integrated approach to threatened species recovery through a regional recovery plan.

The project, entitled 'A Regional Recovery and Threat Abatement Plan for Threatened Species and Communities on the South Coast of Western Australia', aims to improve understanding and acceptance of threatened species recovery in the community.

The project will be developed by South Coast Region staff assisted by a steering committee made up of representatives from the three partners in the project: CALM, South Coast Regional Initiative Planning Team (SCRIPT) and the Australian Government Department of the Environment (AGDEH). The project team consists of Alan Danks (Project Leader), Sarah Comer and Sandra Gilfillan.

The first steering committee meeting was held in Albany in September. Recently a second meeting was held at Woodvale.

Sandra Gilfillan said the project will enable the inclusion of a large number of threatened species occurring in the SCRIPT Region into a broader landscape scale "recovery plan".

With about 100 threatened and priority fauna and 840 threatened and priority flora to be considered, the project will necessarily take a strategic view and will be underpinned by numerous existing recovery plans.

Although integration is a key concept this would not negate

the need for single species recovery plans for species such as Gilberts Potoroo, Western Ground Parrot and Noisy Scrub-bird that require specific recovery actions.

"The project would also include the Region's many threatened flora species such as *Banksia brownii*, and marine species that breed in the regions coastal areas such as southern right whales and Australian sea lions," Sandra said.

as *Phytophthora cinnamomi*, and feral predators and inappropriate fire, and a long history of active recovery projects.

The other regions within Australia working on similar projects are the Mt Lofty Ranges in South Australia and the Border Ranges in the South-east Queensland/ Northern NSW.

Photo: - Members of the Steering Committee and Project team at the first Steering Committee Meeting on the on the Bluff Knoll walk trail in the Stirling Range National Park.



"Among other threatening processes, the project will also investigate the impacts of climate change on threatened species within the region"

Sandra said the South Coast Region was chosen because of the large number of threatened plant and animal species, the presence of a number of key threatening processes such

From left to right: Sarah Comer, Sandra Gilfillan (CALM, Project Team), John Blyth (WATSCU, Steering Committee), Alan Danks (CALM, Project Team Leader), Sue Rymer and Liz Thorburn (AGDEH, Steering Committee)

Photo by Nathan McQuoid

For further information please contact Sandra Gilfillan, Sarah Comer or Alan Danks at the CALM South Coast Regional Office on (08) 9842 4500

Recovery of Threatened flora and Ecological Communities in the South Coast Region ~ Andrew Brown, Sarah Barrett and Ryan Butler

This project, funded by the Natural Heritage Trust (NHT) through the South Coast Regional Initiative Planning Team (SCRIPT) has now been completed. The project was managed by Andrew Brown from WATSCU and coordinated by Threatened Flora Recovery Teams in Esperance and Albany.

In July 2003 \$111.603 was allocated over a 12 month period to combat threatening process affecting 18 Critically Endangered (CR) species, one Endangered (EN) species, one CR Threatened Ecological Community (TEC) and one EN TEC. Although the final report has now been submitted this work is ongoing with funding being sought through SCRIPT to continue and expand the project.

The aims of the project were to: protect and restore the habitat of threatened species and TECs; reduce threatening processes, in particular weeds and *Phytolophora cinnamomi*; increase the knowledge of the distribution and abundance of threatened species; preserve the genetic diversity of threatened species; and increase the community awareness of threatened species and TECs. With these aims in mind, Threatened Flora Recovery Team meetings were held at Albany and Esperance at the beginning of the project and planning for recovery actions discussed, with dates set for each action. On ground works were carried out by Sarah Barrett from CALM's Albany Work Centre and Ryan Butler from CALM's Esperance District with help from regional staff, Shire workers and volunteers. Populations of all threatened plant taxa covered by the project were monitored, threats assessed and recovery actions planned and implemented.

The project was a great success with 22 CALM staff, six local government and 62 volunteers in-

involved in the development and implementation of numerous recovery actions that were put in place to combat threatening processes affecting threatened plant species and TECs in the SCRIPT Region.

Some of the highlights include:

New populations: Surveys conducted (often with the help of Community volunteers) resulted in the discovery of new populations of threatened flora including the CR species *Eremophila lactea*, *Eremophila subteretifolia*, *Myoporum turbinatum*, *Lambertia fairallii*, *Banksia brownii* and *Dryandra pseudoplumosa*. New populations of EN flora were also located and include *Darwinia wittwerorum*, *Orthrosanthos muelleri* and *Anigozanthos bicolor* subsp. *minor*. The *Eremophila lactea* population is the largest known and contains over 700 plants. Although no new populations of the CR species *Eremophila verticillata* were found during intensive surveys for it south of Lake Magenta, several priority and poorly known species were located at this time. Three new occurrences of the Montane Mallee Thicket TEC were located, surveyed and threatening processes assessed.

Seed Collections: Seed collections were made from most threatened species included in the project and are stored at CALM's Threatened Flora Seed Centre. Plants obtained from these seeds will be used for future translocations where appropriate.



Esperance Senior High school students (Bushrangers) and CALM staff cleaning up at the *Lambertia echinata* subsp. *echinata* translocation site in Cape Le Grand National Park.

Seed Orchard: A seed orchard was established on private land for the CR species *Dryandra montana* with the total number of seedlings now numbering 97. All plants are healthy and in active growth. It is hoped that once they are mature seed extracted from them will result in the propagation of enough plants for translocations to take place back into the area of natural populations. Currently, natural populations are so small that insufficient seed is available to do this.

Translocations: Cuttings of the CR species *Persoonia micranthera* and *Leucopogon gnaphalioides* were collected and are being propagated in the nursery at the Botanic Gardens and Parks Authority (BGPA). A translocation plan is currently being written for these taxa with a view to establishing seed orchards. *Lambertia echinata* subsp. *echinata*, seedlings were grown by Botanic Garden and parks Authority staff and translocations undertaken to sites on Woody Island and Cape Le Grand National Park. *Eremophila lactea* disturbance trials have been conducted and it is hoped this will assist in regeneration through the germination of soil-stored seed. Some germination has already been noted in the plots but it is too early to determine which species they are.

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Phytophthora control: Thirty targets were sprayed with Phosphite comprising an area of approximately 160 ha containing 16 species of threatened flora, all significant occurrences of the CR Montane Thicket TEC and five occurrences of the EN Montane mallee TEC. Aerial application of Phosphite was also carried out on populations of *Lambertia echinata* subsp. *echinata*. Support was provided to CALM's Science Division for a new project that will assess impacts of phosphite application on above ground fungi in two phosphite targets near Albany. Assistance was also provided to Science Division Staff using 'Hemispherical Field of View' photography to assess the impact of *Phytophthora cinnamomi* on plant communities at threatened (*Banksia brownii*) populations. Historical and current phosphite application data including spray dates, application rates, target area, weather conditions and target species was entered into a new Phosphite Access database. Entry of monitoring data into the same database was commenced.

Fencing: Fencing material was supplied to private landowners to fence populations of the CR species *Lambertia orbifolia* subsp. *orbifolia* and a new population of the EN species *Orthrosanthus muelleri*.

Interim Recovery Plans (IRPs): Draft plans have been completed for *Banksia brownii*, *Dryandra montana* and the Montane mallee TEC.

Posters: Posters have been produced for a number of species covered by the project including *Dryandra montana*, *Lambertia orbifolia* subsp. *orbifolia*, *Drakaea confluens*, *Caladenia bryceana* subsp. *bryceana*, *Daviesia microcarpa*, *Eremophila lactea*, *Lambertia echinata* subsp. *echinata* and *Myoporum turbinatum*.

Limited copies of these posters can be obtained by contacting Andrew Brown by email: andrewbr@calm.wa.gov.au

Breeding Antina at Perth Zoo ~ Jill Pryde



The Antina revealing the tuft at the end of its tail
Photo: Cathy Lambert (Perth Zoo)

The Bankwest *Landscape* Conservation Visa Card continues to provide funds for small projects supporting threatened species and ecological communities research and implementation. Many of the projects have achieved outstanding results.

One such project included assisting Perth Zoo in their captive breeding program of the Antina or Central Rock Rat (*Zyomys pedunculatus*). The project's applicants were Principal Research Scientist, Keith Morris, CALM Science Division and Dr Colin Hyde, Perth Zoo.

The Antina is considered as one of Australia's rarest rodents and despite extensive surveys in Western Australia based on sub fossil evidence, has not been located in this State.

The Antina was thought to be extinct until 1996 when it was re-discovered in the west MacDonnell Ranges, near Alice Springs.

Despite extensive searches it is still known from only three sites in this area. This species once had a wide distribution over arid parts of Australia, including the Pilbara and Cape Range areas in Western Australia.

Searches of Cape Range in 1997-8 failed to find the species. The rock rat is listed in WA as Critically Endangered and an Interim Recovery Plan was approved in 1997. One of the recovery actions is to hold animals in captivity as insurance against loss of the species in the wild and to provide animals for translocation to sites in WA. Captive animals are currently held at the Perth Zoo so that there is potential to increase numbers quickly when it is clear a translocation will proceed.

Funding from the Bankwest *Landscape* Conservation Visa Card has been used to feed and house the Antina at Perth Zoo. It is anticipated that up to 50 Antina will be required for translocation.

New occurrence of Critically Endangered mound spring added to conservation reserve ~

Melissa Hoskins

Organic mound springs occur where the heavy clay soils on the eastern side of the Swan Coastal Plain and the porous sands of the Bassendean dunes meet. At this point groundwater from the Gngangara Mound is continually forced to the surface under pressure. This creates a permanent supply of fresh water that encourages the growth of vegetation and the formation of the peat mounds that give the community its name.

A new occurrence of this 'critically endangered' threatened ecological community has been identified on a Bush Forever site in Bullsbrook that was recently pur-

chased for conservation purposes by the Department for Planning and Infrastructure. There are now four known occurrences of this community type.

The greatest threats to the mound springs are changes to the quality and quantity of the water supplied from the Gngangara Mound. These changes occur largely as a result of activities on surrounding land. To detect changes in the water quality staff from the WA Threatened Species and Communities Unit have collected a number of water samples from the spring. The samples



are currently being analysed by the Chemistry Centre. It is planned that monitoring bores will be installed at this site to gain an understanding of long-term hydrological changes in this community.

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A community partnership is helping to protect the Hinged Dragon Orchid (*Caladenia drakeoides*) ~

Gillian Stack

The Hinged Dragon Orchid (*Caladenia drakeoides*) is a Critically Endangered species that grows on freshwater seepages. It has a wide range, occurring west of Coorow to east of Kalannie in the northern wheat-belt. Most populations are small and threatened by rising salinity. Weed competition is also a threat to these tiny herbs at most populations.

This orchid is quite difficult to see even when in flower, as it is usually 10 to 20 cm tall, very fine and mostly pale green and reddish brown in colour. It often grows in association with other small orchids (such as *Caladenia roei* and *C. douthiae*) in the shelter of medium shrubs such as *Melaleuca* and *Acacia* species.

One population in the Coorow

area is badly affected by rising salinity and the probably related senescence of the existing habitat, particularly the *Melaleuca* overstorey. No recruitment of the overstorey has occurred over an extended period. Lecturers and students from C.Y. O'Connor TAFE in Moora have become involved in the rehabilitation of this site with the support of the landowners. Students have collected seed from species associated with the Hinged dragon orchid, germinated it, grown seedlings on in their nursery, and planted the seedlings back into bare areas of the site. This was monitored in September, when most plants were growing well. Monitoring after their first summer will examine their survival rate.

It is hoped that this project can be continued next year, with additional plantings of associated species in conjunction with weed control. Hand pollination trials may also be conducted, with orchid specialists from Botanic Gardens and Parks Authority providing their expertise.

For further information contact Gillian on (08)9405 5167 or
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Seedlings planted by TAFE team, seen in September 2004. Photo by Mark Brundrett

Management Plan for Declared Rare and Poorly Known Flora in the Warren Region ~ Rachel Meissner

The Warren Region is located in the south west of the state and consists of two CALM districts, Frankland and Donnelly (Figure 1). The region covers an area of 14,230 km² with about two thirds managed by CALM. There are several national parks in the region, including D'Entrecasteaux National Park, Nuyts Wilderness and Mount Frankland National Park, as well as large areas of state forest.

Within the region there are 19 Declared Rare Flora (DRF), and 152 Priority Flora. Two species of DRF, the Hay River Feather flower, *Verticordia apecta*, and Webb's moss, *Rhacocarpus rehamnianus* var. *webbianus*, are listed as Critically Endangered (CR) under the Wildlife Conservation Act 1950.

The Warren region is rich in

relict and Gondwanan flora, such as the fern, *Asplenium obtusatum* subsp. *northlandicum* (Shore Spleenwort). These species are often associated with high annual rainfall and short summer droughts resulting in low evapotranspiration rates. There is also a high incidence of endemic species with restricted distributions, such as Rate's Tingle, *Eucalyptus brevistylis*, and the Walople Wax, *Chamelaucium floriferum* subsp. *floriferum* ms. These endemic species are often associated with granite and gneiss outcrops and peaks, or wetlands. Many of the relict and Gondwana flora, and highly endemic species, are rare or in need of special protection.

A management plan for the declared rare and priority flora began in the late 1990s. It provides a brief description of the appearance, distribution, habitat and conservation status of flora declared as rare under the Western Australian Wildlife Conservation Act (Threatened Flora) and poorly known flora (Priority Flora). The plan makes recommendations for research and management actions necessary to ensure their continued survival. It provides a regional strategy for recovery of these species and identifying and managing the major threats to their survival.

The major threats in the region come from inappropriate fire regimes, dieback caused by *Phytophthora*, changes in hydrology caused by land clearing, salinisation and weed invasion. Climate change and forecast impacts of global warming associated with the greenhouse effect are significant threats to the State's southwest especially to Warren Region's flora.

The final draft of the plan was recently completed and is currently under review.

For further information contact Rachel on (08)9405 5168 or email: rachelm@calm.wa.gov.au

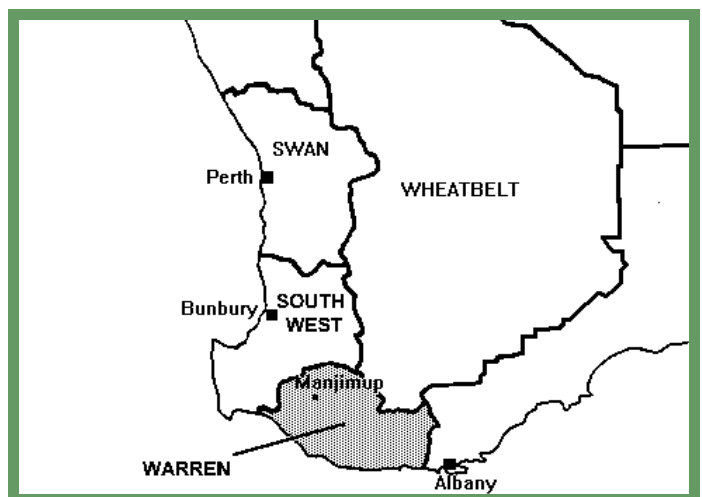


Figure 1. CALM's Warren Region located in the south west of the state and covers an area of 14,230km².

CALM Staff participate in New Flora Management Course ~ Rosemarie Rees

A new course has been developed to improve the skills of field-based CALM staff in managing Threatened Flora and Ecological Communities. Seventeen participants attended the week long training program held at Jurien during September. The course, now in its second year, has been developed by the CALM Training Centre and researchers from CALM Science, Nature Conservation and Regional Services Divisions.

The course covers legislation, plant identification, flora survey and monitoring, seed collection, translocations, *Phytophthora cinnamomi* (dieback) management and Threatened Ecological Communities (TECs). Val English and Rosemarie Rees from WATSCU presented the TEC section of the course. This included a lecture component outlining the policy and legislative framework for how TECs are dealt with in WA, procedures for nomination and listing of TECs, and a field component that involved visits to two nearby TECs and discussions of some of the management options for these communities.

The first site visited was the *Lake Thetis Microbial Community* near Cervantes which is listed as a vulnerable TEC. Lake Thetis is home to a diverse assemblage of microbial communities each producing distinctive mats and being associated with specific zones within the lake. Blue-green algal mats occur in the low-lying areas adjacent to the lake; Rocklike stromatolites with mats of living blue-green algae are found in the shallow lake edge areas; and thick aggregated mats of primitive single celled organisms occur in the centre of the lake. Lake Thetis differs from other coastal saline lakes in having these unusual aggregated



Course participants at Lake Thetis

Photo: Rosemarie Rees

mats and the presence of the stromatolites, which are similar to those found at Shark Bay. In addition to its unique microbial assemblages the lake is home to a number of waterbird species and is surrounded by a buffer of coastal vegetation.

The second site visit was to the '*Lesueur-Coomallo Floristic Community A1.2*' that is only known from a single 31 ha area on the eastern boundary of the Lesueur National Park and is listed as an Endangered TEC. This species-rich low heath with emergent *Hakea obliqua* (needles and corks) is found on sandy soils and is characterised by the presences of *Hakea obliqua*, *Beaufortia elegans* (bottlebrush), *Dasypogon bromeliifolius* (pineapple bush) and *Stirlingia latifolia* (blueboy). Course participants discussed the challenges of managing the site, which is downslope from a gravel road and at risk from the introduction of weeds and dieback disease.

The course was generally well received and a similar course is now planned for spring 2005

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New populations of Critically Endangered Flora (in the Esperance District) ~ Ryan Butler

Anigozanthos bicolor subsp. *minor*

Photo: Ryan Butler



What an elusive plant! Since being spotted at several new populations east of Esperance in 1999, there have been no recorded sightings of *Anigozanthos bicolor* ssp. *minor* at any of its previously known populations. Then in October 2004, two new populations were stumbled upon in the Lake Shaster Nature Reserve ~100km west of Esperance. The plants were found quite by chance during a Western Shield fauna monitoring trip in October by CALM Esperance and Albany staff. There was plenty of *Anigozanthos rufus* (a taller, all red kangaroo paw) in the area and since it was similar habitat to other populations, the comment was made to keep an eye out for “little green and red ones”. Sure enough about five minutes later there was a cry of “was that one of yours?” So the brakes went on rather quickly and there it was – a single, little green and red kangaroo paw! After further exploration, we counted approximately 70 plants. Two kilometres further west another population was found containing over 200 plants.

Anigozanthos bicolor ssp. *minor* only grows 5 – 20 cm high with a hairy red stem and hairy, light green flowers. Its known range extends from Fitzgerald River National Park in the west to Lake King in the north and Condingup in the east. The new

populations were found on shallow, white sandy soils overlying granite. Both sites were quite low in the landscape with depressions nearby that would be inundated during winter. The area was burnt in a summer wildfire in 2000. It is not surprising that this species has been so difficult to find considering it is a disturbance opportunist. Though most often linked with emergence after summer fires, it has been known to appear after other severe disturbance events. One population was thought to have come up after a strong summer hail storm!

Due to the end of the flowering season and despite more surveying in the immediate area, no other populations were found. Surveys next season may see an extension to the distribution in Lake Shaster NR and beyond. The follow up surveys were part of the previous round of SCRIPT (NHT2) funding for the project entitled ‘Recovery of Critically Endangered Flora and Threatened Ecological Communities in the South Coast Region’. Without this funding for these surveys, this species may have been placed on the extinct list.

Eremophila lactea

Photo: Ryan Butler



Unlike many rare *Eremophilas*, *Eremophila lactea* has been in stable numbers at four populations for many years, though in low numbers. Although not many deaths have been

recorded, very few new plants or seedlings have been found. Due to the low numbers and restricted range this species has been listed as Critically Endangered since 1998.

On a recent survey of a possible new *Stylidium* sp. with David Coates, Neil Gibson, Greg Keighery and Ryan Butler, the decision to go back to Esperance past the *Eremophila lactea* sites was made (at the last minute!). After inspecting the disturbance trials conducted earlier in the year the group made their way through Roberts Swamp (a Yate swamp) and then south back to Esperance. Upon reaching the bitumen of Grass Patch Rd it was decided to take the scenic route and continue on down the gravel. For some unknown reason it appears that this small stretch of road has not been surveyed for *Eremophila lactea* at any other time in the past. After suggesting that *Eremophila lactea* plants may be found along here, less than a minute later the call went up to stop the car. Sure enough five plants were found on the roadside. Excited by this unexpected discovery the group continued south and came to a large limestone borrow pit (roadbase) that had been rehabilitated. This site contained what appeared to be the largest known population of *Eremophila lactea*. Further surveys the following week, with members of the Esperance Wildflower Society, revealed 4 new sites (populations 5a, 5b, 5c & 6) containing a total of over 900 individual plants. Two of these sites (5a and 5b - two rehabilitated limestone borrow pits ~500m apart) contain 390 and 420 plants respectively. This takes the total number of known

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plants in the wild to over 1200.

Eremophila lactea is an erect shrub growing to 3m in height. It tends to grow up rather than out and when reaching old age appears skeletal as the leaves tend to only grow near the tips of the branches. Previously its numbers have remained stable at about 400-500 plants with the majority (~90%) found in one population. In the last year, many of the plants have shown signs of senescence and as a result some deaths have occurred

from old age.

With many plants in the older known populations seemingly reaching the end of their natural life span, it appeared that disturbance trials, prescribed burning or translocation may have been the only option available for the continuation of this species. These new populations have reduced this need in the immediate future. Seed will be collected, with the assistance of Anne Cochrane, from these new sites in 2005 and stored in the Threatened Flora Seed Centre.

The SCRIPT (NHT2) funding entitled 'Recovery of Critically Endangered Flora and Threatened Ecological Communities in the South Coast Region' is what covered the further survey of this species and monitoring of current disturbance trials.

Ryan Butler is the Conservation Officer (Rare Flora) based in the South Coast Region at Esperance, he can be contacted on (08) 99071 3733 or email: ryanb@calm.wa.gov.au

NEW RECOVERY PLAN

DIBBLER (*Parantechinus apicalis*) Recovery Plan

By Tony Friend for the Dibbler Recovery Team

Wildlife Management Program No. 38 2004

The Dibbler (*Parantechinus apicalis*) was presumed extinct for much of the 20th Century but in 1967 two were caught in a trap at Cheyne Beach east of Albany. Dibblers have since been found sporadically on the WA south coast mostly within the Fitzgerald River National Park. In 1985 they were also discovered on two small islands, Boullanger and Whiflock in Jurien Bay.

The dibbler is listed as "fauna that is rare or likely to become extinct" pursuant to the Western Australian Wildlife Conservation Act 1950. It is listed as Endangered under the Commonwealth *Environment Protection and Biodiversity Act 1999*. It is listed as Endangered in the 1996 Action Plan for Australian Marsupials and Monotremes (Maxwell *et al.* 1996) and the 2000 IUCN Red List of Threatened Species (Hilton-Taylor 2000).

The dibbler's recovery depends upon ensuring the persistence of known populations, searching thoroughly for further existing populations and establishing additional populations through translocation of wild and/or captive-bred individuals. Regular monitoring, habitat protection, adaptive management, especially in the control of threatening processes, and strong community participation contribute to an active recovery program.

The new Plan proposes eight recovery actions:

1. Monitor known populations.
2. Protect existing and reintroduced populations from threatening processes.
3. Survey to locate further populations.
4. Maintain a captive breeding colony to produce stock for translocation.
5. Translocate captive-bred and/or wild stock to establish at least three further self-sustaining mainland populations.
6. Carry out genetic monitoring and management of reintroduced populations.
7. Encourage community involvement in dibbler conservation.
8. Improve knowledge to underpin dibbler recovery.

The implementation of these actions will be coordinated by the Dibbler Recovery Team, which currently consists of representatives from the Department, Perth Zoo, the University of Western Australia, the Malleefowl Preservation Group and the communities of Albany and Jurien Bay, as well as several members with particular expertise in dibbler biology.



Young dibblers

Photo: Cathy Lambert (Perth Zoo)

Busselton Ironstones Threatened Ecological Community Workshop ~ Rachel Meissner

The shrubland vegetation of the “Busselton Ironstones” (shallow soils over massive ironstone hardpans) is a critically endangered Threatened Ecological Community (TEC) that occurs within the Department of Conservation and Land Management’s (CALM’s) South West Region. The community is characterised by a high proportion of endemic flora (at least 13 species are found nowhere else). For the last 8 years, the Region has focused a great deal of effort in managing and recovering this TEC with funding assistance from the Natural Heritage Trust program, and more recently, with a contribution from Cable Sands Pty Ltd. The Busselton Ironstone vegetation was once more extensive, covering about 2,100 ha. Today, there is less than 10% remaining and the slight differences in plant community composition between occurrences illustrates its diverse nature. About 150 species are found on the Busselton ironstones, commonly with 50 to 70 species per 100m² quadrat. The plants that grow in this community have to survive climatic extremes, inundation or flooding in winter, and dry, hot summers.

A group of people with an interest in the future management of this ironstone community attended a workshop in November 2004 that was organised by CALM’s South West Region. The aim was to review past recovery actions and to set directions



Flowers of *Petrophile latericola*, one of the many endemic species of the Busselton Ironstone community

Photo: Rachel Meissner

and priorities for the next five years. People from many different groups attended the workshop. These included WATSCU and other CALM Nature Conservation staff, members of CALM’s Regional Services and Science Divisions, local community members, Geocatch, Cable Sands Pty Ltd., Ruabon Tutunup Rail Reserve Preservation Group and Busselton-Dunsborough Environment Centre attended the workshop.

The workshop began with site visits to some of the ironstone occurrences. The main threats to the community are dieback caused by the plant pathogen *Phytophthora cinnamomi*, introduced weeds such as *Watsonia*, changes in hydrology, mining and too frequent fire.

Greg Keighery, of CALM’s Science Division provided an overview of the plant communities on areas of ironstone in WA. This was followed by a review of the recovery actions already implemented in the Busselton Ironstone community, and discussions on future directions in management.

Over the last eight years, different

rehabilitation techniques have been trialled, and translocations have been conducted on several critically endangered flora that are endemic to the community. Aerial spraying for the control of dieback disease is done every one or two years at sites that contain flora that are most susceptible to the disease.

High priority areas for research, such as the plant community’s response to fire, were then discussed. Future climate change and changes in the regional hydrology were also highlighted as potential threats to the community.

An Interim Recovery Plan was written in 1999 for the Busselton Ironstone community and is currently being reviewed and updated with funding assistance from the Natural Heritage Trust’s National Program. Many new ideas and actions were suggested and discussed at the workshop and will be included in the revised plan.

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INTERIM RECOVERY PLANS APPROVED

Another 21 Interim Recovery Plans (IRPs) that includes two threatened ecological communities and 19 threatened flora species, have been written with funding provided under the Natural Heritage Trust. Some of these plans have been updated and include new information. Most of these plans have been sent to the Department of Environment and Heritage to be considered for listing on their internet site for public comment. It is then expected that these plans will be adopted under the Commonwealth's *Environment Protection and Biodiversity Act 1999*.

- IRP 153 Thrombolite (Stromatolite-like Microbialite) Community of a Coastal Brackish Lake (Lake Clifton), Robyn Luu, David Mitchell, John Blyth
- IRP 154 Ferricrete Floristic Community (Rocky Springs type), Sheila Hamilton-Brown and Rosemarie Rees
- IRP 155 Meelup Mallee, *Eucalyptus phylacis* **updated**, Julie Patten, Val English
- IRP 156 Large-fruited Tammin Wattle, *Acacia ataxiphylla* subsp. *magna* Anne Harris, Andrew Brown
- IRP 157 Hairy-Stemmed Zig-Zag Wattle, *Acacia subflexuosa* subsp. *Capillata*, Anne Harris, Andrew Brown
- IRP 158 Tangle Wattle, *Acacia volubilis*, Anne Harris, Andrew Brown
- IRP 159 Matted Centrolepis, *Centrolepis caespitosa*, Sandra Gilfillan and Sarah Barrett
- IRP 169 Mountain Villarsia, *Villarsia calthifolia*, Sandra Gilfillan and Sarah Barrett
- IRP 170 White-flowered Philotheca, *Philotheca basistyla*, Karen Bettink, Robyn Phillimore, Kate Brunt and Andrew Brown
- IRP 171 Northampton Midget Greenhood, *Pterostylis* sp. Northampton **updated**, Robyn Luu, Alanna Chant, Val English
- IRP 172 Elegant Spider Orchid, *Caladenia elegans* ms **updated**, Robyn Luu, Alanna Chant, Andrew Batty
- IRP 173 Scott River Boronia, *Boronia exilis* **updated**, Robyn Luu, Val English
- IRP 174 Ironstone Brachyscias, *Brachyscias verecundus*, Robyn Luu, Val English
- IRP 175 Carburnup King Spider Orchid, *Caladenia procera*, Gillian Stack, Val English
- IRP 176 Scott River Darwinia, *Darwinia ferricola* ms, Robyn Luu, Val English
- IRP 177 Whicher Range Dryandra, *Dryandra squarrosa* subsp. *argillacea*, Robyn Luu, Val English
- IRP 178 Scott River Lambertia, *Lambertia orbifolia* subsp. Scott River Plains, Robyn Luu, Val English
- IRP 179 Eneabba Mallee, *Eucalyptus impensa*, Gillian Stack, Gina Broun
- IRP 180 Swamp Starflower, *Calytrix breviseta* **updated**, Robyn Luu, Val English
- IRP 181 Blue Babe in-the-cradle Orchid, *Epiblema grandiflorum* var. *cyaneam* **updated**, Robyn Luu, Val English
- IRP 182 Cadda Road Mallee, *Eucalyptus balanites*, Julie Patten, Gina Broun, Rebecca Evans, Nicole Willers

WATSNU

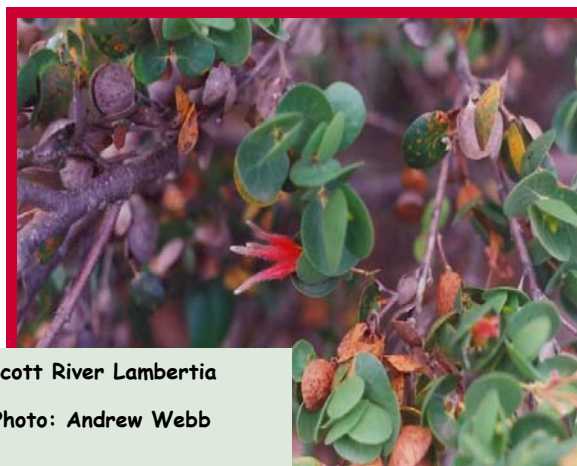
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http://www.calm.wa.gov.au/plants_animals/watscu_splash.html



Scott River Lambertia

Photo: Andrew Webb