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Conserving the nature of WA

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The Newsletter of the Western Australian Threatened Species & Communities Unit

Recovering threatened plants in the Moora District ~Val English

Inside this Issue:

"located new populations, or expanded the known populations of most of the nine taxa"

Some excellent results have been achieved in implementing recovery actions for the project entitled 'Conservation of Nine Critically Endangered Plant Taxa in the Moora District'. The two year project has been completed with major funding support from the Endangered Species Program of the Natural Heritage Trust (NHT).

The taxa covered by the project are *Gastrolobium hamulosum*, *Synaphea quartzitica*, *Jacksonia pungens, Eremophila scaberula*, *Grevillea batrachioides*, *Grevillea humifusa*, *Grevillea althoferorum*, *Acacia aprica* and *Acacia cochlocarpa* subsp. *cochlocarpa*. All of the taxa are under threat from a range of issues such as road and rail maintenance, weed invasion, dieback caused by the plant pathogen *Phytophthora cinnamomi*, grazing, and low genetic diversity. The project involved completing recovery actions to deal with threats as listed in Interim Recovery Plans for each of the taxa.

Some of the major achievements include field translocation undertaken for three species. In addition, major investigations have been done on the biology and ecology of six of the above mentioned taxa. Information, such as the likely reasons for fruiting failure, gained from this work will help in designing management strategies to help maintain the species into the future.

Further surveys have located new populations, or expanded the known populations of most of the nine taxa. In particular, the only known population of *Grevillea batrchioides* in Lesueur National Park was nearly doubled to 100 plants through surveys done with the help of volunteers. New populations of *Gastrolobium hamulosum* were also located with the help of information from a local farmer. The numbers of plants in the only known population of *Grevillea humifusa* increased an amazing nine fold from 150 to over 1300. This result was gained during detailed and time-consuming survey with the help of volunteers from the Jurien Bay Regional Herbarium. The plants are tangled and prostrate and are very difficult to count accurately.

The project also funded fencing for some populations that were under threat from grazing. In addition, the habitat of one of the translocated populations was under threat from feral pig damage, and a pig control and fencing program was implemented to help eliminate this threat.

Collections of seed or cutting material have been placed in storage for all nine taxa to ensure that the genetic information is safely stored should wild populations become extinct for any reason.

Grevillea humifusa: Photo Andrew Brown

Volunteers monitoring threatened plants.

***Chamelaucium* sp. Gingin**

Photo: Leonie Monks (left); and

Jacksonia pungins

Photo: Anne Harris (below)

The project has been completed with the assistance of volunteers from the Jurien Bay Regional Herbarium; staff from the local Department of Conservation and Land Management (DCLM) Moora District (especially Alice Reaveley, Gina Broun and Rebecca Carter); a number of staff from DCLM's Science Division (Colin Yates and Leonie Monks in particular) and students, volunteers and contract staff supervised by Science Division; and two contractors, Anne Harris and Ben Bayliss. The involvement of everyone who has helped produce the very successful results of this project is much appreciated. In the short term, the management of each taxon has been improved by the project, but in addition the quality of information to guide future management of all of the nine taxa has been greatly enhanced as a consequence of the outcomes.

For further information contact Val English on 08 9405 5169 or email: vale@calm.wa.gov.au

Important land purchase adds to conservation reserve system ~Val English

A property that has recently been purchased on Breera Road Gingin will significantly improve the reservation of the Dandaragan Plateau and a species of Declared Rare Flora. The property is a joint purchase between the Department of Conservation and Land Management and the Commonwealth's Natural Heritage Trust National Reserve System Program.

The 108 ha of bushland in near pristine condition was a high priority for purchase as it has very high conservation values, and occurs in an area that is very poorly reserved. The 'Dandaragan Plateau', on which the property is situated, is just east of the Gingin Scarp that forms a boundary between the plateau and the Swan Coastal Plain. Although there are still large areas of native bushland on the Dandaragan Plateau, there is very little held in reserves in areas of the plateau between Gingin and Perth.

The Breera Road property contains yellow-red sands with species-rich *Banksia* woodlands. These communities appear to be restricted to the western Dandaragan Plateau, according to data collected for the System Six update by the Department of Environment and Ted Griffin. In addition to these special woodlands, the property contains about 16% of the total known plants of the Declared Rare Flora species – *Chamelaucium* sp. Gingin.

***Chamelaucium* sp. Gingin.**

The acquisition of this important property will help to ensure the future conservation of *Chamelaucium* sp. Gingin, and commence the formation of a significant reserve system between Boonanarring and Walyunga.

For further information contact Val English on 08 9405 5169 or email: vale@calm.wa.gov.au

Changes to the list of Declared Rare Flora ~ Andrew Brown

In the recently published 2003 schedule of declared rare flora three new taxa of threatened plants were added to the list and one species delisted. A brief description of each species follows.

Additions

Calectasia cyanea was once thought to be a common species that was distributed widely throughout the south-west. However, many populations previously considered to be *Calectasia cyanea* are now known to represent the new species *C. narragara*. Commonly known as cape tinsel lily, *Calectasia cyanea* is a small, tufted shrub to 25 cm high with attractive blue tinsel-like flowers with red anthers. Flowering mainly in October and November it is currently known from just one small population in a coastal area near Albany where it grows in yellow, gravely sand with *Adenanthos* species. Due to its extreme rarity, it is ranked as Critically Endangered.

Dryandra pseudoplumosa is an erect, more or less columnar shrub to 1.5 m tall with broadly linear saw-toothed leaves. It has a naturally restricted distribution on laterite ridges in the Stirling Range area where plants grow in areas of mallee woodland over heath with *Eucalyptus tetragona*, *Dryandra sessilis* and *Lambertia inermis*. Soil is orange gravely-clay-loam over laterite. The species is vulnerable to frequent fire and, as *Phytophthora cinnamomi* (dieback) is present at two of the known population sites, it is currently ranked as Endangered.

Eucalyptus recta is an upright Mallet to 15 m high with grey or pale satiny pink smooth bark and glossy dark green leaves. The species is confined to the Wongan Hills - Cadoux area where it grows in pale yellow sandy-lateritic soils with *Eucalyptus gardneri*, *E. oldfieldii*, *Casuarina, Acacia and Dryandra* species. Extensive surveys have been carried out over the last few years with only 4 populations being located. Due to its limited range and low number of populations the species is currently ranked as Vulnerable.

Deletions

A recent review of the taxonomy of ***Eucalyptus olivacea*** **ms** by M.I.H. Brooker and S.D. Hopper has shown that it is identical to the widespread *E. macrandra.* The latter species is a common taxon, and is not on the Department of Conservation and Land Management's Declared Rare and Priority Flora List.

For further information contact Andrew Brown on 08 9405 5166 or email: andrewbr@calm.wa.gov.au

Establishing a Monitoring Program for Threatened Ecological Communities

The Threatened Ecological Communities Scientific Committee undertook a review of the category of threat for several Swan Coastal Plain floristic communities in December of 2002. The recommendation of the Committee was that a monitoring program should be initiated to clarify whether any significant change in the condition of the TECs has occurred since they were first assessed.

The WA Threatened Species & Communities Unit (WATSCU) has taken on this task. Four Swan Coastal Plain communities have been selected initially: the endangered community 'Southern wet shrublands' (Swan Coastal Plain community type 2); the vulnerable community 'Herb rich shrublands in clay pans' ('Swan Coastal Plain community type 8); the vulnerable community 'Forests and woodlands of deep seasonal wetlands' ('Swan Coastal Plain community type 15), and the vulnerable community 'Shrublands on calcareous silts' (Swan Coastal Plain community type 18). At this early stage in the project it is thought that weed mapping will be undertaken for the occurrences and that a series of transects will be set up in each occurrence to detect changes in the condition of the community.

As there is currently no monitoring protocol within the Department it is hoped that the procedures developed through the establishment of this program will be applicable for monitoring of other plant-based communities. WATSCU will be seeking the support and assistance of officers within the DCLM's districts and regions, shires, landholders and community groups to support this project.

For further information contact Melissa Hoskins on (08) 9405 5170 or email on melissah@calm.wa.gov.au or Jill Pryde on (08) 9405 5128 or email on jillp@calm.wa.gov.au

Writing and implementing Interim Recovery Plans for salinity affected threatened flora and communities ~ Robyn Luu

Funding has been committed through the State Salinity Strategy (SSS) to undertake a two year project to write and implement Interim Recovery Plans (IRPs) for Declared Rare Flora and threatened ecological communities (TECs) in areas at risk from hydrological change due to broad-scale clearing. Forty three species and two TECs (one on the Scott and the other on the Swan Coastal Plain) were identified by Greg Keighery and WATSCU staff as being under threat from salinity and are included in the project. The species are located throughout the southwest of Western Australia.

Of the floristic TECs, the Scott Ironstone and Busselton Ironstone assemblages are believed to be those that are under most threat from salinity. A number of the flora taxa listed by Greg Keighery as under serious threat from salinity are endemic to these communities. Recovery work such as translocations of all of the Critically Endangered taxa, dieback control, and hydrological studies have been undertaken recently for the Busselton Ironstone assemblage, with funding assistance from the Natural Heritage Trust. Some of the SSS funds are therefore likely to be used to continue this implementation of recovery actions for the Busselton Ironstone TEC and component Declared Rare Flora. The IRP for the Busselton Ironstone assemblage will also be updated through this project.

To date, limited resources have been available for recovery of the Scott Ironstone heaths. Much of the community occurs on private land and many of the landholders are likely to be unaware of the significance of the vegetation. Recovery actions to be undertaken will include surveying and mapping the Scott Ironstone vegetation, determining current land title holders, and working with the landholders to determine ways and means of improving the security and conservation of these heathlands. As the community type is also under serious threat from dieback caused by the plant pathogen *Phytophthora cinnamomi*, disease control using the chemical phosphite will also be undertaken. There is no IRP for the Scott Ironstone Heaths and this will also be developed as part of this project.

The funds support the Project Officer, Robyn Luu, to both write the IRPs, and to coordinate the implementation of recovery actions for both flora and TECs for two years.

For further information contact Robyn Luu on 08 9505 5165 or email: robynl@calm.wa.gov.au

Recharge trials at Yanchep Caves ~ John Blyth

As reported in the last *WATSNU*, a solution to the drying out of all caves containing the Critically Endangered Yanchep Caves Root Mat Community is being sought via an artificial recharge scheme.

A trial at Cabaret Cave using water from Loch McNess, funded by the Water Corporation, has been successfully completed. The first stage of the trial, releasing about 800GL of water some 200m from the cave, established a small local water mound and brought water level up significantly, but it remained some 20cm below floor level. Moving the discharge point, of the same amount of water, to within about 30m of Cabaret Cave brought the water level up sufficiently to re-create a small stream on the floor of the cave.

Pumping for the next trial, at Crystal Cave, funded by Water and Rivers Commission, Water Corporation, Forest Products Commission and DCLM, is due to start in the second week of July. This will involve over three times as much water, still from Loch McNess, and has much bigger pools to fill. The water is being discharged into the cave itself. If this trial creates a mound under Crystal Cave that provides surface water to the large pools (and their endemic amphipod), planning for a long-term system to serve all faunal caves will begin.

For further information contact John Blyth on 08 9505 5161 or email: johnbl@calm.wa.gov.au

Completion of conservation project for 'Busselton Ironstone' community ~Val English

The two year project entitled 'Conservation of the Critically Endangered "Southern Ironstone" community in Busselton' is nearing completion. The Endangered Species Program of the Natural Heritage Trust (NHT) has provided funding support for the project.

The project involved implementing recovery actions for the threatened ecological community (TEC) 'Shrublands on southern Swan Coastal Plain Ironstones community' ('Busselton Ironstone community') and the component Declared Rare Flora (DRF). The TEC and component Rare Flora are under major threat from dieback disease caused by the plant pathogen *Phytophthora cinnamomi*, extremely restricted geographic range and altered hydrology.

The rare flora involved are; *Gastrolobium* (previously *Brachysema*) *papilio*, *Darwinia* sp. Williamson; *Grevillea maccutcheonii*, *Lambertia echinata* subsp. *occidentalis*, *Petrophile latericola* and *Grevillea elongata.* The first four taxa are only known from one wild population and are under very high threat of extinction.

Specifically, the NHT funds provided operational funds for conservation actions including: the use of phosphite to control dieback disease; large scale translocations of each taxon; investigation of hydrology of the southern ironstone community; storing of seed and other genetic material; obtaining biological and ecological information toward preparation of full Recovery Plans; rehabilitation of degraded habitat; development of educational materials; and monitoring and survey of the ironstone community and component taxa.

Grevillea maccutcheonii
Photo: Jill Pryde

Busselton ironstone Community
Photo: Val English

The continuing involvement of community groups in conservation actions such as translocations, fire management, weed and vermin control, and in the long-term management of the taxa and the ecological community has been strongly encouraged throughout the project. This was mainly through the mechanisms of the Recovery Team that includes members of the local community, and the Department of Conservation and Land Management's (DCLM's) Regional Field Officer (previously Meredith Spencer). Community groups such as the 'Ruabon Tutunup Rail Reserve Preservation Group' and the Bunbury Naturalists Club provided much needed assistance in implementing conservation actions. Funds were also received through NHT by 'Geocatch' (a community based council sponsored by the Water and Rivers Commission that works with community groups in achieving strategic conservation projects) to cooperatively manage the Abba Plains/Flats vegetation communities within which the Southern Ironstone community occurs. The two projects were mutually supporting.

The project was managed by DCLM's South West Region and Blackwood District, and has been extremely successful. The major contribution from volunteers, many staff from the local DCLM Blackwood District and South West Region, and staff from DCLM's Science Division (Leonie Monks and Bryan Shearer in particular) in completing the project is gratefully acknowledged.

Translocation site
Photo: Jill Pryde

For further information contact Val English on 08 9405 5169 or email: vale@calm.wa.gov.au

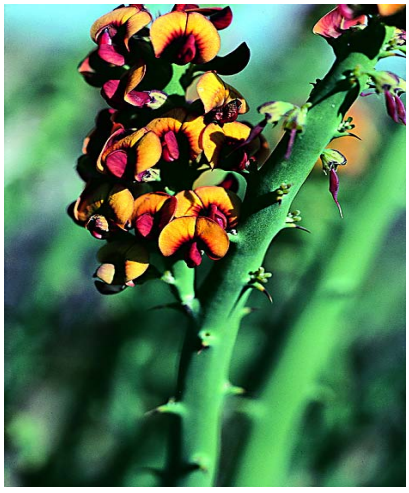
What's flowering? ~ Andrew Brown

Although the majority of Western Australia's threatened plant species flower during the Spring and early Summer many can be found at other times of the year. A few to look out for in the Winter are:

Acacia cochlocarpa* subsp. *Cochlocarpa is a sprawling

glossy shrub to 70 cm tall with slightly zig-zag branchlets and narrow, incurved phyllodes up to 7.5 cm long. Commonly known as spiral-fruited wattle it produces stalkless, elongated, golden flower heads in Winter. All recent sightings have been in the Watheroo area where it grows mainly in disturbed roadsides on sand, or clayey sand with laterite in open shrubland.

Even when not in flower ***Daviesia euphorbioides*** is easily recognised by its cactus-like habit, a feature that lends the species its common name of Wongan cactus. It is a leafless shrub to 45 cm



high with erect, cylindrical, very thick (1 cm in diameter) slightly tapering branches on which clusters of attractive orange-yellow pea shaped flowers appear in Winter. Wongan cactus is a short-lived species and requires fire or soil disturbance to regenerate from soil-stored seed. Typically, plants grow vigorously for 5 or so years then gradually die back and are usually completely dead within ten years of germination. The species is found in areas of remnant sandplain between Wongan Hills and Dowerin, over a geographic range of 85 km in length.

Daviesia speciosa was first collected by Charles Gardner in 1958 from an area near Mingenew that has since been

cleared for agriculture. Since then, a few more populations have been found growing in lateritic soils in areas of low dense shrubland north-east of Eneabba. Commonly known as beautiful daviesia, the species grows to 1 m high and has distinctive rounded, powdery, blue leafless stems and attractive large, nodding, red pea-shaped flowers to 2.5 cm long. Seed pods have never been recorded on this species and it is believed that the flowers may be sterile.

Grevillea humifusa is an attractive species, commonly cultivated since the 1960s as *Gre-*

villea thelemanniana grey-leaf prostrate form but, in its natural habitat, has only ever been found in one small area to the south of Eneabba. Known as spreading grevillea due to its distinctive long trailing branchlets, the species has prominently divided leaves to 2 cm long and pink to pale red flowers that appear in Winter. Habitat is gravelly loam in open low woodland.

All *Wurmbea* species resprout annually from dormant underground storage tubers and, with the majority appearing soon after the first Winter rains, are among the first of our herbaceous perennials to flower each year. In fact, a few weeks after good rains it is not uncommon to see many hundreds or even thousands of plants flowering in some areas. Although most species are common and widespread some are restricted to a few locations and are listed as threatened. Two threatened species that flower during the Winter are *Wurmbea tubulosa* and *W. calcicola*:

Commonly known as long-flowered nancy, ***Wurmbea tubulosa*** is a small herbaceous plant to 5 cm tall with 3 leaves, the lower two of which are very broad and held flat to the ground. The smaller, erect upper leaf emerges from the 2 lower leaves or is attached to the

stem just above them. The species has separate male and female plants. The white to pale pink male flowers form an erect, open inflorescence while the female flowers are in a short, dense inflorescence that is almost concealed between the two basal leaves at ground level. Long-flowered nancy is found between Dongara, Mullewa and the Three Springs area, growing in york gum woodland in clay and sandy clay, or loamy soils under shrubs on riverbanks, along drainage lines and in seasonally wet places, flowering in June.

Wurmbea calcicola is a small herb to 18 cm tall with 3 broad, glossy leaves between 10 and 18 mm wide. Commonly known as Naturaliste nancy due to its re-

striction to the Cape Naturaliste area, it is known only from the edge of steep coastal limestone cliffs, growing in small colonies in shallow pockets of brown loam. Flowering is in late May-June when it produces 2 to 5 attractive white flowers with prominent pink nectaries.

There are two subspecies and one variety of *Verticordia staminosa* all of which are confined to granite outcrops in the Wheatbelt. The rarest of these is

Verticordia staminosa* subsp. *staminosa that is known from a single granite outcrop near Wongan Hills. Commonly known as Wongan featherflower, it is a small, spreading shrub with many branches, more or less stalkless leaves to 1.5 cm long and unusual feathery flowers with long protruding stamens that are bright red with yellow tips. At the single known location it grows in shallow soil pockets on a massive granite outcrop amongst other low shrubs.

For further information contact Andrew Brown on 08 9405 5166 or email: andrewbr@calm.wa.gov.au

Wildfire as a golden opportunity

~ Val English

For many species of Declared Rare Flora (DRF), there is little information about response to fire. As every population of Rare Flora is viewed as highly significant to conservation, there is a general reluctance to burn populations unless it is known that this will benefit the species, for example, by stimulating germination of soil stored seed. Information about fire response is therefore generally only gained following chance events such as unplanned wildfire burning through populations of Rare Flora. Much useful information can be gained from careful monitoring of populations of Rare Flora following such chance events. This can include time to reach maturity (first flowering); whether the subspecies is an 'obligate seeder' (and requires disturbance such as fire to germinate), or a resprouter, or can do both; and growth rates of natural populations.

In mid-January 2003, a wildfire burnt through large areas of land in Gingin, north of Perth. One particular species of DRF – *Grevillea curviloba* subsp. *incurva* was in the path of the fire, and several plants in the population of 46 plants were burnt. An initial survey of live and dead plants was undertaken soon after the fire. In May a more detailed survey was done of the plants, including tagging, measuring, and noting health and flowering status for a specific subset of the population. Plants examined in the survey included some that had been burnt and some that had not.

Initial data indicate that all plants whose entire stem bases were burnt had died. Several plants that were only partially burnt survived and were resprouting rapidly. Interestingly, previous observations of the species indicated that the subspecies can survive quite major disturbances such as slashing, and is also tolerant of quite high levels of weeds in the habitat. Initial data following the fire suggests the subspecies may not be able to survive being burnt in hot wildfires. The species is known to produce quite a lot of seed, so it is likely that there was seed stored in the soil in the habitat of the population. Future monitoring of the subspecies will indicate if the fire has stimulated the germination of this seed.

For further information contact Val English on 08 9405 5169 or email: vale@calm.wa.gov.au

Giving nature a helping hand – Bankwest *Landscope* Conservation Visa Card 10 year on ~ Jill Pryde

Since its successful launch in June 1993 the Bankwest *Landscope* Conservation Visa Card has provided funding for 63 biodiversity projects in Western Australia. Funding has enabled many small but significant projects to be accomplished that have had not other obvious source of funding. We wish to thank supporters for their continued patronage of the affinity card.

During the year another three projects were completed with these trust funds:

Cave Gating project - Yanchep National Park ~ Nicole Lincoln (Swan Region)

Project aims: To protect and preserve critically endangered aquatic root mat communities and the associated fauna species within these communities, from direct physical vandalism.

Seedbank dynamics and response to disturbance of the Critically Endangered Grevillea maxwellii (Proteaceae) ~ Anne Cochrane and Sarah Barrett (South Coast Region, Albany)

Project aims: Research into the reproductive biology, soil seedbank dynamics and response to disturbance (including fire) on recruitment and seedling survival of *Grevillea maxwellii*. With further collection of propagation material will increase knowledge of the biology and ecology of the species that will provide better scientific basis for management in the wild. This will then enable better understanding in site rehabilitation efforts.

Condition of tuarts (*Eucalyptus gomphocephala*) growing above the root mat caves, in Yanchep National Park, Based on field survey and interviews in April-May 2000 ~Dr Edyta Jasinska (now Post Doctoral Fellow University of Alberta, Canada) and Paul Tholen (Swan Region)

Project aims: Asses the condition of tuarts (*Eucalyptus gomphocephala*) growing above the root mat caves, in Yanchep National Park; and to determine from the survey, interviews and literature what management actions are required to ensure the survival of potentially root-mat-producing tuarts above the caves.

Full reports are lodged in the Department's Science Division Library at Woodvale

For further information contact Jill Pryde on 08 9405 5128 or email: jillp@calm.wa.gov.au

TRANSLOCATION OF THREATENED FLORA AND FAUNA

Four flora translocations proposals have been approved since the last edition of *WATSNU*. The following provides details of the translocations.

Species	Translocation	Proponent/s
Phalanx grevillea *Grevillea dryandroides* subsp *dryandroides*	This is an extension of the original proposal submitted in 2000.	Paul Blechynden, Kate Brunt
Dryandra montana	Considered an introduction to enable establishment of a seed orchard within 30 km of natural habitat north of Porongurup Range	Sarah Barrett / Anne Cochrane /Leonie Monks
Eremophila nivea	This is an extension of original translocation proposal	Leonie Monks
Grevillea batrachioides	Seed and cuttings from plants in the wild and raised at Botanic Garden & Parks Authority	Leonie Monks / Gina Broun

CARNABY'S BLACK COCKATOO SYMPOSIUM ~

John Blyth

Mainly as a result of habitat changes Carnaby's Black-Cockatoo has undergone a major decline, particularly in the drier parts of its range and the central wheatbelt. Regional extinctions could continue for some decades since the birds are long-lived. It is recognised in the Action Plan for Australian Birds (2000) by Stephen Garnett and Gabriel Crowley as fitting IUCN criteria for the Endangered Category, and is listed under both Commonwealth and State conservation acts.

A Recovery Team was established in 1999, and a Recovery Plan has been in draft form for some time. It is due to be provided to the Minister for the Environment for her endorsement in the very near future.

The Recovery Plan places great importance on achieving a high level of public support and involvement in the recovery program. Many priority actions depend critically upon the support of landowners and other members of local communities. These actions include habitat management within key breeding areas, the provision of appropriate feeding resources near key breeding sites, management of feeding areas used in the non-breeding season, and monitoring.

Progress with some of these actions was reported by Leonie McMahon in the last edition of *WATSNU*.

The Recovery team decided to hold a Future Directions Symposium in recognition of the increasing community interest and involvement, and their importance, in contributing to the recovery effort for Carnaby's Cockatoo.

The symposium's aims were to:

- Clarify the aims and activities of the Carnaby's Recovery Team to all people interested in the Cockatoo;
- Provide an opportunity to hear about recovery actions undertaken by a wide range of people;
- Provide the opportunity for networking between rural and metropolitan people who are engaged in conserving Carnaby's Black Cockatoo;
- Bring together and disseminate existing knowledge; in particular, present key elements of research as they relate to on-ground recovery actions and show the links between knowledge and actions on ground;
- Assess how effective we are being and what improvements can be made, especially identifying any gaps in research and recovery actions, determine how those gaps might be filled, and who might best fill them.

Carnaby's Cockatoo

Photo: Leonie McMahon

Over 110 people who have contributed, or wish to contribute, to the recovery of Carnaby's Black Cockatoo attended the symposium.

The collaborative nature of the Carnaby's Black Cockatoo recovery program is illustrated by the large number of sponsors for the symposium. It was directly sponsored by DCLM, Birds Australia, CSIRO, the Cockatoo Recovery Project (funded by Natural Heritage Trust), Binocular Telescope and Optical World, and the Million Trees Program, with indirect contributions by several others.

There were thirteen presentations relating to many aspects of present efforts to conserve Carnaby's Black Cockatoo. Notably, five presentations were either by landowners/managers or about projects directly involving them. A proceedings is to be produced and will be available from Birds Australia WA.

Dr Denis Saunders, ex CSIRO, who did much of the research on Carnaby's Black Cockatoo, on which the current recovery program is based, was the symposium's keynote speaker. Denis, who came from Canberra to the symposium, also provided a summary of key issues and gaps in knowledge for discussion in the last session of the day.

The symposium was very successful in allowing all those who attended to share their experiences and in providing a solid foundation of knowledge on which to base future management. The recovery team will be considering the outcomes of the workshop in detail in the near future and expects a further strengthening of the recovery program, and continuing improvement in the status of Carnaby's Black Cockatoo.

The recovery team is indebted to Cheryl Gole of Birds Australia and Leonie McMahon, Birds Australia's Carnabys Cockatoo Project Officer, who worked tirelessly in arranging the symposium and on the day. Thanks also to all speakers and others who contributed to the success of the symposium.

For further information contact John Blyth on 08 9505 5161 or email: johnbl@calm.wa.gov.au

Threatened Species & Communities Recovery Team Annual Reports 2002

Recovery Team Annual Reports are submitted on an annual basis to the Department's Corporate Executive and to the Conservation Commission. The following reports have been submitted for the 2002 year, and a few highlights for each are reported below.

Carnaby's Black Cockatoo

John Blyth for the Recovery Team

The Team met twice during the year, in June and December.

The Carnaby's Black Cockatoo Recovery Plan was completed and sent to the Director for Nature Conservation for his approval and submission to the Conservation Commission and the minister for the Environment and Heritage. The recovery actions described in the draft recovery plan guided the major activities of the Recovery Team during the year.

The Carnaby's Black Cockatoo Recovery Project, being implemented by the Project Officer Ms Leonie McMahon (employed by Birds Australia (WA) and using funds provided by the Natural Heritage Trust) continued to provide a major thrust for implementation of recovery actions. Many other significant steps relevant to the recovery of Carnaby's Black Cockatoo, and involving landholders and community groups, were also taken.

Noisy Scrub-bird

Sarah Comer & Alan Danks for the South Coast Threatened Birds Recovery Team

The establishment of a Noisy Scrub-bird population in a Western Management Zone continued this year with the translocation of a further six birds from the Mt Manypeaks and Normans areas to the Darling Range. Four females were caught and one released at each of four sites: West Samson, King Jarrah West, Sixty-one Form and Tiger Rd. One male was released at King Jarrah West, and one at Sixty-one Form.

Noisy Scrub-bird

Photo: Alan Danks

Comprehensive surveys were conducted of two Albany Management Zone sub-populations, Mt Gardner and Bald Island. The population index on Mt Gardner was 172, six more than 2001. The decline in the population index observed between 1997 and 1999 is no longer evident in this subpopulation. The number of singing males on Bald Island was 44, an increase of seven from 2001. Management of the Two Peoples Bay Nature Reserve continued under the guidelines provided by the Management Plan. Fox baiting was carried out regularly in the Reserve and on adjoining Crown Reserves throughout the year.

Western Swamp Tortoise

Lyndon Mutter, Gerald Kuchling, Andrew Burbidge, Dean Burford and Nicky Marlow for the Recovery Team

- Monitoring of the population at Ellen Brook Nature Reserve continues to suggest a gradual increase in the number of tortoises over the past decade; many of these are juvenile animals.
- Perth Zoo currently holds 178 tortoises comprising 20 breeding males, 20 breeding females and 127 other tortoises comprising hatchlings, juveniles, sub-adults and non-breeding adults. Forty-four hatchlings were obtained in 2002 from eggs laid in 2001.
- Eighteen tortoises, bred and raised to about 100 g body weight at Perth Zoo, were released at Mogumber Nature Reserve and five at Twin Swamps Nature Reserve. Growth rates have been satisfactory at Mogumber, further confirming that the site is suitable for the species.
- A number of actions have been conducted at Twin Swamps Nature Reserve. These include: pumping groundwater to one of the swamps to maintain suitable levels for the tortoise; continuation of rat control; and prescribed burning to reduce the risk from wild fires.
- Artificial aestivating tunnels were installed at Mogumber to encouraged tortoises to aestivate below ground and reduce the risk of being killed in a wildfire. The value of this action was confirmed when the entire Mogumber reserve was burnt by a large wildfire under extreme conditions on 20 December 2002. Despite the loss of about half of the population, all tortoises us-

ing artificial aestivation tunnels survived!

- The lack of further translocation sites to release captive-bred tortoises continues to be of concern. Westralia Airports Corporation has not agreed to a translocation to Perth Airport, the Recovery Team's preferred site. The Team has also investigated another possible site at Caversham, on Department of Defence land.
- A third edition of the Recovery Plan for the period January 2003 to December 2007 has been prepared.

Lancelin Island skink
David Pearson for the Recovery Team

The Lancelin Island Skink Recovery Team has not met officially since 1998. However, most of the contacts and networks were maintained through ongoing research. The pairing of adults for breeding, the capture of gravid females, the measuring and marking of neonates and the selection of animals for translocation has continued.

Geocrinia Recovery Team Annual Report
By Kim Williams for the Geocrinia Recovery Team Annual Report

During 2002 the Recovery Team focused on monitoring the larger *G. alba* populations and post fire survival of McCloud Creek populations. Fire protection and environmental remediation within Location 83 were also conducted.

This seasons population monitoring resulted in 10 new sub-populations being discovered, 8 consisting of only 1 to 3 calling males and one with 8 calling males. The two translocation sites for *G. vitellina* (GV7a and GV7b) established in 2000 in Adelaide Creek, were monitored throughout the year. As in 2001 there was no evidence of calling males at GV7b, and a single calling male within a few metres of the 2001 location at GV7a. Monitoring of both sites will continue for another two seasons.

A wildfire in Feb 2002 burned approximately 55 ha area of the *G. alba* populations along the McCloud Creek in the Boranup section of Leeuwin Naturaliste NP under extreme summer conditions. Four monitored sub-populations were burnt in the fire, including a large sub-population with mean calling male count of 50+.

Improved landholder representation on the recovery team and better coordination with the local sub-regional Natural Resource Management groups will be sought in the coming year.

Orange-bellied Frog (*Geocrinia vitellina*)

Albany District Threatened Flora and Eastern Stirling Range Montane Heath & Thicket community

Sarah Barrett for the recovery teams

The Albany District Threatened Flora Recovery team met twice in 2002 and the Eastern Stirling Montane TEC Recovery Team met once. This team will now also co-ordinate recovery actions for the 'Montane Mallee of the Stirling Range' TEC (informally ranked Endangered).

Recovery actions carried out during 2002 included the following:

Phosphite application to 154 ha of vegetation affected by *Phytophthora cinnamomi*, targeting threatened flora populations, many of which were in either the Eastern Stirling Range TEC or Montane Mallee TEC.

154 taxa of threatened (54) and priority (100) flora were surveyed or monitored in 2002 (389 site visits). New populations or sub-populations were located for threatened taxa (25) and priority taxa (97).

16 CR taxa were monitored once to twice annually (104 site visits). Four new populations of CR taxa were located.

Volunteer assistance was integral to survey and monitoring and several new populations of priority and threatened taxa were located by volunteers including Recovery Team members.

Additional survey was conducted for the Montane mallee TEC.

Five Research studies were carried out, and seedlings of *Dryandra montana* were caged to protect them from herbivore grazing.

Fencing of a private property remnant containing *Grevillea maxwellii* was completed, and

roadside rare flora markers were installed at eight sites.

Negotiations to purchase a private property population of *Lambertia orbifolia* ssp *orbifolia* are underway.

A fire management plan is being developed for the Montane TECs, rabbit control was trialed in the eastern Stirling range TEC, and GIS mapping of phosphite targets and monitoring sites for both Stirling Range TECs is underway.

Narrogin District Threatened Flora

Kim Kershaw and Greg Durell for Recovery Team

The translocation of *Darwinia carnea* (CR) continued with a further 180 plants being planted into two secure sites in partnership with

the Central South Naturalist Club and Botanic Gardens and Parks Authority. The DCLM Threatened Flora Seed Centre has collected seed from the *Darwinia carnea* translocation sites for the second year and will conduct tests on seed viability. Previous tests have shown that the two translocated populations are producing viable seed.

The translocation of *Symonanthus bancroftii* (CR) into two secure sites commenced in partnership with the Bruce Rock Land Care District Committee and Botanic Gardens and Parks Authority. Cross-pollination studies were conducted on cuttings of *Symonanthus bancroftii* (CR) propagated at the Botanic Parks and Garden Authority. Further experiments are under way to access the viability of the seeds. Some of this seed will be cryostored to assess the efficacy of long term storage.

A draft Interim Recovery Plan for *Caladenia hoffmanii* subsp. *graniticola* (CR), prepared by the Recovery Team, was submitted to the Western Australian Threatened Species and Communities Unit for approval.

Two species of flora were added to the Narrogin District Declared Rare Flora List as Endangered, and three added to the Priority list, following confirmation of voucher specimens lodged at the WA Herbarium. *Eucalyptus olivacea* ms has been found to be synonymous with *Eucalyptus macrandra* and has been deleted from Declared Rare Flora List.

South West Threatened Flora and Communities
By Kim Williams and staff on behalf of the Recovery Team

The South West Region Threatened Flora and Communities Team again achieved a number of milestones with which it can be pleased.

Caladenia hoffmanii* subsp. *graniticola

Photo: Andrew Brown

- translocations continued into the two southern ironstone community reconstruction sites.

- considerable community involvement in planting and weed control for Ironstone species translocations, assistance with re-scoring flora plots in a number of CR TEC occurrences, and the Regional Herbarium based in Bunbury.

- continued healthy growth of the *Eucalyptus phylacis* ramet which underwent a regeneration trial in 2000.

- updating of the regional threatened flora dataset and GIS system.

- a successful priority projects application for NHT2 funding negotiated through the regional NRM process for ongoing management of Busselton Ironstone TECs.

- discovery of a new occurrence of the CR species *Lambertia echinata* subsp *echinata* in the Williamson Rd Ironstone TEC occurrence increasing the number of known plants from 10 to 100+.

- field inspections and assessment across the region resulted in 24 new populations of DRF and priority flora being discovered.

Project officers can be equally pleased with progress made towards implementing the 17 interim recovery plans for critically endangered species and communities within the region.

The year was not without its disappointments, the most significant being EPA's approval to mine mineral sands on land immediately adjoining the Williamson Rd occurrence of the CR Busselton Ironstone TEC. This action will potentially put at risk, through disturbance to the local hydrological patterns, 5 species of CR flora, 3 of which are only known to occur at this locality. Two wildfire events in Feb 2002 resulted in TEC occurrences at Manea Park (Bunbury) and Byrd Swamp NR (Harvey) being burnt under extreme conditions.

Goals for 2003

- fill vacant positions in both operations team and recovery team.

- collate, analyse and review recovery data collected for all CR species and communities where translocations have been undertaking.

- revise strategies for above species and communities.

- implement collaborative flora conservation priority projects with the South West Catchments Council (SWCC) and subregional groups.

Katanning District Threatened Flora
By Bethea Loudon for the Recovery Team

Germination/research trials were conducted on *Eremophila verticillata* at a known and extinct site to determine the best methods for a future translocation to a safe and secure site.

The Department's Threatened Flora Seed Centre (TFSC) collected seed from the threatened *Verticordia staminosa* subsp. *cylindracea* var. *erecta, Acacia auratiflora, Orthrosanthus muelleri, Goodenia integerrima* and *Hemigenia ramosissima;* as well as from

five Priority taxa.

A draft Interim Recovery Plan (IRP) was prepared by the Recovery Team in collaboration with the Narrogin District Threatened Flora Recovery Team for *Caladenia hoffmanii* subsp. *graniticola* (CR). This was submitted to WATSCU for approval.

Interim Recovery Plans were prepared by WATSCU for *Eremophila subteretifolia* (CR), *Dryandra mucronulata* subsp. *retrorsa* and *Verticordia staminosa* subsp. *cylindracea* var. *erecta* (CR).

Posters have been produced by WATSCU for distribution to the community/public, volunteers, Shires and other agencies for *Verticordia staminosa* subsp. *cylindracea* var. *erecta, Caladenia hoffmanii* subsp. *graniticola* and *Eremophila verticillata*.

A total of 6 new populations of three CR taxa (plus one population not seen for some years), 6 new populations of five EN taxa and five new populations of four VU taxa were found,. In addition, a total of at least 42 new populations of at least 13 Priority Flora species were discovered.

Two species of flora were added to, and one species deleted from, the Katanning District Declared Rare Flora (DRF) List, and13 species were added to the Katanning District Priority Flora List.

Three Katanning species were nominated for addition, or upgrading, and five for downgrading, on the DRF list, to be reviewed at the Threatened Species Scientific Committee (TSSC) meeting in March 2003:

Moora District Threatened Flora and Ecological Communities by Gina Broun for the Recovery Team

The principal District contact for threatened flora issues is the Conservation Officer for the Moora District DCLM. The position was granted recurrent funding and permanency in 2002 and was filled by Ms Gina Broun in August after a 6 month vacancy from the contract-funded position.

Within the District there are 70 species of DRF, of which 25 are Critically Endangered, 24 Endangered, and 21 Vulnerable . There are a further 327 Priority species and 7 TECs, of which 6 are ranked as Endangered and the other as Vulnerable.

The Recovery Team met once during 2002, its members having worked successfully towards conservation of threatened species and ecological communities throughout the year.

Actions included monitoring of known populations, surveying for 'new' populations, seed and propagule collection, translocation measures, community education, procuring external funds for on-ground works, obtaining ecological and biological information, industry consultation, field trials and further development of IRPs.

Esperance District Threatened Flora By Ryan Butler, for the Recovery Team

There have been two meetings of the Recovery Team during the year and members have continued to contribute to survey work, recovery actions and management issues.

Underground Orchid

(*Rhizanthella gardneri*)

Photo: B & B Wells / CALM

Fieldwork carried out over the last year has resulted in a DRF-Vulnerable species being nominated for downgrading to P4 and several Priority species being put up for removal from the list. Several other P1 species are currently being surveyed to determine a more suitable status.

Implementation of Wildlife Management Program No. 21 Declared Rare and Poorly Known Flora in the Esperance District has continued.

Interim Recovery Plans or Draft Plans for the following have been produced and are being implemented for *Lambertia echinata ssp. echinata 2001-2004*, *Daviesia microcarpa 1996-1999*, *Eremophila lactea 1999-2002*, *Myoporum turbinatum 2002-2007* and *Rhizanthella gardneri 2002-2007*.

Geraldton District Threatened Flora & Ecological Communities By A M Chant for the Recovery Team

There has been one meeting of the Recovery Team during the year and members have continued to contribute to survey work and recovery actions.

A large amount of productive fieldwork has been undertaken during the year. This has resulted in several species having improved conservation status and several Priority Species have been recommended as DRF.

Promotion of Threatened Flora conservation within the community has continued, including a series of local newspaper articles.

Implementation of Wildlife Management Program No. 26 Declared Rare and Poorly Known Flora in the Geraldton District has continued.

Interim Recovery Plans or Draft Plans have been produced and are being implemented for fourteen threatened taxa and for three threatened ecological communities.

Thrombolite Community of a Coastal Brackish Lake (Lake Clifton)

Robyn Phillimore for the Recovery team

The 'thrombolites of Lake Clifton' community was assessed as Critically Endangered in February 2000. Since the recovery team was established in May 2002, the Lake Clifton thrombolites Recovery Team has overseen the writing of the Interim Recovery Plan.

The thrombolitic structures (similar to stromatolites) in Lake Clifton are formed through precipitation of calcium carbonate within the microenvironment of microbes as a result of photosynthetic and metabolic activity. In order for thrombolites to continue to grow, they need a continuous supply of fresh groundwater that is low in nutrients and alkalinity. Local land use is causing increasing nutrient enrichment of the Lake, and the resulting algal blooms can smother the thrombolites and prevent growth. Increasing salinity within the lake may also threaten the survival of the thrombolites.

The Recovery Team is working closely with the local community and Mandurah Council to attempt to reduce nutrient inflow to the Lake. The team has also commissioned a study by CSIRO to attempt to clarify the reasons for the increasing salinity.

Aquatic Root Mat Community 1-4 of Caves of the Leeuwin Naturaliste Ridge

Robyn Phillimore for the Recovery Team

On the Leeuwin-Naturaliste Ridge, permanent streams occur below the surface and support dense root mats. The root mats, which provide a constant and abundant primary food source, sustain some of the richest faunal communities known from groundwater in caves anywhere in the world. Each of four caves containing aquatic root mat assemblages is considered to contain a distinct community as the species composition differs significantly.

The Aquatic Root Mat community was assessed as Critically Endangered in April 1996.

Water levels have been dropping in these root mat caves since the 1970s, but the overall causes of this decline are not well understood. The original water levels in these caves were much higher than in the Yanchep caves, so that the threats have not been seen as being so immediate as those for the Yanchep caves.

Recent information gathered by Stephan Eberhard for the Augusta- Margaret River Tourist Bureau, suggests that very dense and long-unburned vegetation above the caves may be significant in reducing the amount of groundwater in the caves. This and other information gathered during Stehpan's PhD studies have significant implications for the status and management of the threatened root mat communities. The recovery team is considering this information, and management recommendations arising from it, and will rewrite the recovery plan for these communities.

Lake Bryde Recovery Catchment

Alan Kietzmann for the Recovery Catchment Team

Along with its wider tasks, the team takes responsibility for recovery actions related to the Critically Endangered community 'uwooded freshwater wetlands of the southern Wheatbelt of Western Australia, dominated by Muehlenbeckia horrida subsp. abdita and Tecticornia verrucosa across the lake floor' that occurs within the catchment.

Lake Bryde

Photo: Sheila Hamilton-Brown

Progress on implementation of recovery actions has been slow, influenced by staff turnovers and the difficulty of getting completion of complex hydrogeological and biodiversity studies within the intended time frames. In addition, drought conditions have affecting farmers' ability to invest in landcare activities.

Many on-ground recovery actions have focused on fencing and revegetation activities, and numerous investigations were undertaken to provide improved direction for the project. These included completion of surface water management plans, an EIA of these plans, groundwater drilling (geohydrological survey), implementation of surface water monitoring equipment to better understand surface water flow dynamics, a bird survey to determine presence of focal species and an assessment of nature conservation values in the wetlands.

The land purchase in the valley floor linking Lake Bryde, Lake Janet and the Lakeland Nature Reserve was also finalised. Two hectares of revegetation has been undertaken on degraded areas.

Having a full recovery team will ensure more efficient implementation of on-ground works during the coming year.

Toolibin Lake

J. Wyland for the Recovery Team

The 10 year Recovery Plan is current until September 2004. Resources and assistance from the following groups have contributed to implementation of the Recovery Plan over the 2001/2002 period:

- State Salinity Strategy

- Department of Conservation and Land Management
- Agriculture Western Australia (AGWEST)
- Edith Cowan University
- Endangered Species Program, through the Natural Heritage Trust
- Environment Australia
- Lake Toolibin Catchment Group
- Toolibin Catchment landholders
- Water and Rivers Commission (WRC)

Recovery actions undertaken in 2001 and 2002 were as follows:

1. Groundwater Pumping

Iron Biofouling

Telemetry

2. Surface Water Control

Toolibin Flats Drainage Survey

No significant flows were recorded in either the Toolibin Flats drains or the Northern Arthur River during 2002.

3. Lake Inlet Control and the 'Separator'

2001 - Below average rainfall was experienced during 2001. However, a small volume of saline water (containing approximately 40 tonnes of salt) was diverted around Toolibin Lake via the separator gate and diversion channel.

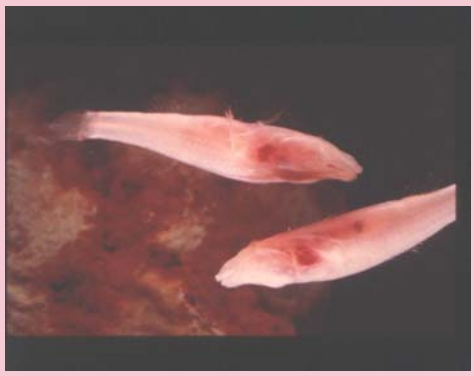
2002 - Below average, winter rainfall was experienced during 2002. No flow was recorded in the Northern Arthur River and subsequently, no flows were diverted around Toolibin Lake.

Various planning and management projects involving Actions 4; 'Lake and Reserve Revegetation', 5: 'Catchment Revegetation' and 6: 'Agronomic Manipulation' continued throughout 2002.

North West Cape Karst Management Advisory Committee Report May 2001 – June 2003

By Peter Kendrick for the North West Cape Karst Management Advisory Committee

The committee has not met since March 2002. However, significant progress has been made toward the group's objectives, and the next meeting will be held in August 2003. Traditional owners (Gnulli) are now represented on the NWCKMAC.



Blind gudgeons (*Milyeringa vertas*)

Photo: Douglas Elford, Western Australian Museum

Monitoring bores have been established at Camerons Cave, and monitoring of fauna and groundwater will begin in 2003. Further scientific characterisation of Bundera Sinkhole was completed by the WA Museum, and preliminary results are available. An application has been made for taking blind gudgeons (*Milyeringa veritas*) from the wild for commercial breeding. Feral fish remain a problem, although the Kailis bore outflow population has been destroyed.

TEC boundaries available soon ~ Melissa Hoskins

An update of the boundaries for threatened ecological communities (TECs) will soon be available to DCLM districts and regions. The updated version will include the boundaries for many new occurrences of TECs that have been surveyed by WATSCU officers and entered onto the Department's Threatened Ecological Communities database. The new boundaries have been digitised by DCLM's Information Management Branch in Kensington and will be ready for distribution very soon. The boundaries will be distributed on CDs.

For further information contact Melissa Hoskins on (08) 9405 5170 or email on melissh@calm.wa.gov.au

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NEW AND REVISED INTERIM RECOVERY PLANS APPROVED

Eighteen more Interim Recovery Plans were approved by the Acting Director Nature Conservation. All these have been sent to the Commonwealth for adoption under the *Environment Protection and Biodiversity Conservation Act* 1999.

IRP No.	*Species*	Author/s
111	Cactus Dryandra, *Dryandra anatona*	Robyn Phillimore and Andrew Brown
112	Lake King eremophila, *Eremophila subteretifolia* ms	Robyn Phillimore, Gillian Stack and Andrew Brown
113	Hook Point Poison, *Gastrolobium hamulosum*	Gillian Stack and Val English
114	Mt Lesueur Grevillea, *Grevillea batrachioides*	Gillian Stack and Val English
115	Round-leafed Honeysuckle, *Lambertia* ssp. *orbifolia orbifolia* ms	Robyn Phillimore and Andrew Brown
116	Salt Myoporum, *Myoporum turbinatum*	Robyn Phillimore and Andrew Brown
123	Pingaring Spider orchid, *Caladenia hoffmanii* subsp. *Graniticola*	Kim Kershaw, Bethea Loudon, Brett Beecham, Greg Durell and Andrew Brown
124	Pinnate-leaved Eremophila, *Eremophila pinnatifida*	Gillian Stack and Andrew Brown
125	Branched Hemigenia, *Hemigenia ramosissima*	Robyn Phillimore and Andrew Brown
126	Pine Featherflower, *Verticordia staminosa* subsp. *cylindraceae* var. *erecta*	Gillian Stack and Andrew brown
127	Underground Orchid, *Rhizanthella gardneri*	Andrew Brown, Andrew Batty, Mark Brundrett and Kingsley Dixon
128	Quartz-loving Synapea, *Synaphea quartzitica*	Gillian Stack and Val English
129	Split-leaved Grevillea, *Grevillea althoferorum*	Gillian Stack and Val English
130	Spreading Grevillea, *Grevillea humifusa*	Gillian Stack and Val English
131	Ironstone Grevillea, *Grevillea elongata*	Gillian Stack and Val English
132	Green Hill Thomasia, *Thomasia sp.* Green Hill	Val English
133	Western Prickly Honeysuckle, *Lambertia echinata* subsp. *occidentalis*	Gillian Stack and Andrew Brown
134	Wing-fruited Lasiopetalum, *Lasiopetalum pterocarpum* Ms	Gillian Stack and Val English

Lambertia echinata* subsp. *occidentalis

Photo: Andrew Brown