

NARROGIN DISTRICT THREATENED FLORA MANAGEMENT PROGRAM

Annual Report
2005

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For the Narrogin District Threatened Flora Recovery Team



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SUMMARY 2005

Threatened Flora recovery within the Narrogin District is a collaborative project between the Department of Conservation and Land Management (CALM), the Commonwealth Department of Environment and Heritage (through the NHT program) the Avon Catchment Council (ACC), the Southwest Catchment Council (SWCC), the Botanic Gardens and Parks Authority (BGPA) and the community.

CALM supports the program by providing both direct and indirect funding, including the full time employment of a Conservation Officer and percentages of FTEs for a number of other staff. Funds have been received from the Avon and Southwest Catchment Councils through NHT and allocated to on-ground recovery actions. Funding has also been obtained from NHT for the development of Interim Recovery plans for several Narrogin District threatened plant species. The BGPA has provided direct costs to the program for two species recovery projects. The community has provided significant in-kind volunteer support to implement many of the recovery actions.

CALM's Narrogin District manages ten Critically Endangered flora (CR), ten Endangered flora (EN) and sixteen Vulnerable Flora (VU) flora. All are declared as Rare Flora under the *Wildlife Conservation Act* (1950). In addition, 218 flora species are listed for the Narrogin District on CALM's Priority Flora List. Many of these require additional monitoring and survey to determine their threatened status.

Highlights of the program for 2005 are:

- A new population of *Caladenia graniticola* (CR) was discovered on Pingaring Nature Reserve (NR 23993) by recovery team members.
- The Weam Nature Reserve *Caladenia williamsiae* (CR) population was extended with the discovery of a new plant on the eastern edge of the reserve by Fred Hort. Members of the WA Native Orchid Study and Conservation Group assisted in conducting surveys for the species in September 2005. Several reserves were search but no additional plants were located.
- Further translocation for *Darwinia carnea* (CR) occurred in July 2005 with assistance from Central South Naturalist Club Volunteers. Sixty-two plants were translocated in total, 49 at a Shire Reserve and 13 at Penny Block. Naturally occurring seedlings continue to appear at the translocated Shire Reserve population and a new seedling was recently discovered at Penny Block. More translocations will occur in winter 2006.
- The translocation program for *Grevillea scapigera* (CR) continued. 31 seedlings were transplanted to the Corrigin Airstrip translocation site during winter 2005. These seedlings germinated from cryostored material and were grown in root air pruning pots and have established well. Natural recruits have been found at Airstrip and Bullaring. Seed predation, seed storage, root system and herbicide trials continue at the translocation sites.
- All *Grevillea scapigera* (CR) populations were monitored in December 2005. One adult plant and one seedling were found at population 9 and 10 respectively. These populations have been dormant for more than six years. Three adult plants and two seedlings are currently the only representatives of this species in the wild over the 13 known population sites. Genetic material for tissue culture was collected from the plant found at population 9.

- Research posters were produced for two of Narrogin District's Critically Endangered Flora, *Grevillea scapigera* and *Rhizanthella gardneri*. The posters were presented at the 'Advances in Plant Conservation Biology' Symposium held in Perth 25-27 October. Both posters detailed research and management actions that have been carried out for each species, along with future directions for recovery. The *Grevillea scapigera* poster was produced collaboratively with CALM and BGPA and funded by the federal government through the Avon Catchments Council (ACC). The *Rhizanthella gardneri* poster was produced by CALM, BGPA and UWA.
- The Narrogin District, BGPA and the University of Western Australia's Ecosystem Research Group (PhD student) are continuing to conduct scientific investigations on *Rhizanthella gardneri* (CR) and its habitat requirements. Measurements of site characteristics and habitat health are currently being taken from quadrats at the Kunjin townsite population. A tank and reticulation system has been set up at the site to irrigate some of the quadrats. These will be compared with control sites to determine whether water availability has an impact on *Melaleuca* habitat and the survival and recruitment of *Rhizanthella gardneri* at the site.
- The translocation of *Symonanthus bancroftii* (CR) into secure sites continued in partnership with the Bruce Rock Land Conservation District Committee and BGPA. In accordance with the approved Translocation Proposal, a total of 800 micro propagated seedlings were planted at the Ardath and Nangeen Hills translocation sites with assistance from Master Gardeners and local community volunteers.
- All *Banksia cuneata* (EN) populations were monitored in 2004/05. The findings were collated in a District report entitled 'Banksia cuneata: 2005 census and population condition.' The field related study and completion of the report has assisted with the development of an IRP for this species which will be finalised in 2006.
- A number of recovery actions were undertaken for *Muelleranthus crenulatus* (VU). One population occurs in the Narrogin District in the Forrestania area. Good relationships have been developed with Western Power Corporations Senior Environmental Officer and the Environmental Officer from mining company Western Areas NL as mineral exploration, power line activities and roadside maintenance are often conducted in the vicinity of this population. Surveys and monitoring were conducted in July-August 2005 with Woodman Environmental Consulting. One new population was found and accurate mapping of population extent along with details of plant health, site characteristics, flowering times and associated vegetation descriptions were recorded.
- The District contributed to a national CSIRO study on the *Melaleuca* genus during 2005. A *Melaleuca agathosmoides* (P1) population near Hatters Hill was visited to collect leaf material for genetic analysis. Plant, population and associated vegetation characteristics were also recorded.

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Objective

The objective of the Department of Conservation and Land Management's Conserving Biodiversity Output is: "To protect and where possible, restore Western Australia's natural biodiversity."

Strategy 1.4 of CALM's Corporate Plan 2002-2005 is to "Recover threatened flora, fauna and ecological communities." This provides a broad guideline for the Recovery team to determine how to best recover threatened species in the Narrogin District.

Based on these overarching statements the Narrogin District Threatened Flora Management Program aims to:

- ensure through the implementation of recovery actions¹ the continued survival in the wild of populations of threatened flora species and other plants in need of special protection and their associated habitat;
- implement recovery, research and management actions for Critically Endangered (CR), Endangered (EN) and Vulnerable (VU) flora in the Department's Narrogin District;
- assess the status of 218 other poorly known species in the Department's Narrogin District, many of which, may warrant ranking as CR and EN but require further survey;
- implement, under a community based Flora Recovery Team, recovery actions listed in the Narrogin District Wildlife Management Program, Recovery Plans and Interim Recovery plans, and
- promote within the Narrogin District, at the community level, the protection and conservation of the District's remaining biodiversity. This includes the protection of threatened flora and the protection and care of remnant vegetation, on farms and land reserved in government and local government agencies whose primary functions are non-conservation based.

Recovery Team

The Narrogin District Threatened Flora Recovery Teams primary focus is the recovery of threatened flora within CALM's Narrogin District. The team is structured to allow for the encouragement, promotion and participation of associated government, community and other groups in the protection of ecosystems across the District. This is done by linking private landowners, community volunteer groups, landcare groups, community catchment groups, local government authorities and other government agencies to carry out recovery projects.

¹ The 'recovery process' provides the overall framework for the conservation of threatened species and communities. It can be summarised as:

1. review the conservation status of all species and ecological communities,
2. prepare conservation priority lists of threatened species and ecological communities,
3. where insufficient information exists to prescribe conservation actions, conduct the necessary research,
4. produce costed Recovery Plans, and
5. for each Recovery Plan, obtain funding, implement, and monitor and review implementation.

The following are members of the Narrogin District Threatened Flora Recovery Team and represent specific groups or agencies:

1. Janette Dellabona representing roadside conservation interests of Main Roads WA and local government,
2. Robin Campbell represents central portion of the District in respect to Land Conservation District Committee's,
3. Fran Alcock and Shirley Wells represent the South Central Naturalist Club,
4. Katherine Miller represents World Wide Fund for Nature Australia,
5. Jeanette Buegge and Mark Brown represent the northern portion of the District in respect to Land Conservation District Committee's,
6. Bob Dixon and Eric Bunn represent Botanic Gardens and Parks Authority,
7. Barbara Black represents the 14 Local Government authorities within the Narrogin District,
8. Judy Williams represents the Wildflower Society and the Western Land Conservation District Committee's,
9. Bruce McLaren represents the interests of Environment Australia,
10. Greg Durell (Chairperson) represents the Narrogin District of the Department of Conservation and Land Management and other controlling government agencies.

The participation of community groups, private land holders, local government agencies and government land managers is essential to ensure the protection of threatened species and the maintenance of biological diversity. The recovery team is structured to enhance the process of regional land recovery through broad community representation.

The Recovery Team also comprises of the following professional advisers:

1. Dr Kingsley Dixon, Director of Divisional Plant Science Kings Park and Botanic Gardens; and
2. Mr Andrew Brown, Coordinator (Flora) Species and Communities Branch, CALM Woodvale.

Other Technical advisers consulted as a matter of course during the recovery process include:

1. Dr David Coates, Senior Principal Research Scientist (Genetics) Science Division, CALM Kensington;
2. Dr Ken Atkins, A/Manager, Species and Communities Branch, CALM Kensington;
3. Mr Brett Beecham, Regional Ecologist, CALM Wheatbelt Region; and
4. Ms Sue Patrick, Senior Research Scientist W.A. Herbarium.

The Conservation Officer is responsible for coordinating and implementing recovery actions listed in Recovery and Interim Recovery Plans and the Narrogin District Threatened Flora Management Plan. The Recovery Team assigns priorities for proposed recovery.

The Recovery Team meets twice yearly. In 2005 members met on February 16 in Narrogin and then on October 5 in Pingaring. The October meeting incorporated surveys and monitoring for *Caladenia graniticola*. With the assistance of recovery team members a new population of this species was found in a Pingaring Nature Reserve.

Staff and Funding

Marie Strelein commenced in the Conservation Officer role on January 10 2005 on a 12-month contract. This initial contract has been extended a further 6 months to June 30 2006. After this time the recurrent position will be transferred to the new Northam District. Kim Kershaw is still on secondment to Albany.

The Conservation Officer salary costs are provided from CALM's recurrent budget. Operational costs including vehicle costs and on ground costs are provided through external grants provided through the Avon and South West catchment Council's.

The BGPA provided salary and vehicle costs for their staff from recurrent budgets.

Threatened Flora Status for the Narrogin District

The Narrogin District supports ten species of Critically Endangered Flora, ten Endangered Flora and sixteen Vulnerable Flora. All are declared as Rare Flora under the *Wildlife Conservation Act* (1950).

Two hundred and eighteen species are also on CALM's Priority Flora List. Many of these species require significant research to determine their rarity.

The Recovery Team's priorities for 2005 were based primarily on the implementation of recovery actions identified for CR flora. The four highest priority threatened species for the district are summarised in Table One below.

Table 1. Priority threatened species for the Narrogin District.

Species	Ranking	Status
<i>Symonanthus bancroftii</i>	CR	One known plant to exist in the wild. Translocation success is problematic. Success still to be confirmed.
<i>Rhizanthella gardneri</i>	CR	One plant located in 2004 in the Narrogin District. The current research program is continuing.
<i>Grevillea scapigera</i>	CR	Wild plants number only a few. Three translocated populations established in natural species range.
<i>Darwinia carnea</i>	CR	A single known Narrogin wild population exists of approximately 20 plants. Two translocation sites established in more secure sites.

Table 2 provides a brief summary of recovery actions assigned to the recovery team for Critically Endangered Flora for 2005.

Table 2: Recovery Team priorities and description of recovery action status for Critically Endangered (CR) Flora in 2005.

Species	Recovery Actions	Status
<i>Caladenia graniticola</i>	Information dissemination Monitoring Survey Weed control Rabbit control Fencing Research	Completed Completed Completed Not implemented Completed Not implemented Commence in 2006
<i>Caladenia williamsiae</i>	Monitoring Survey	Completed Completed
<i>Darwinia carnea</i>	Rabbit control Translocation	Completed Assessment completed. Monitoring to

	Genetic analysis Monitoring Weed control Collect & preserve genetic material Seed collection	continue. Further planting completed in 2005 Partly completed. Publication in 2006 Completed Completed Completed. Mother plants to be maintained at BGPA. Commenced. Continue 06/07
<i>Dryandra ionthocarpa</i> subsp. <i>chrysophoenix</i>	Monitoring Survey	Completed. Checked status of all populations Not completed
<i>Eremophila verticillata</i>	Survey	Not completed
<i>Grevillea scapigera</i>	Monitoring Further translocation Research Weed control Ex-situ conservation Replace/reposition DRF markers Collect seed and cuttings Rabbit control Seed viability trials Increase awareness Surveys	Completed Continued at two sites. Monitoring completed Seed longevity & predation trials. Herbicide trials. Seedling establishment trials Completed as part of research program BGPA maintained clonal material Complete 2006 Completed. New plant located and genetic material collected Completed Complete 2006 Research poster produced for 'Advances in Plant Conservation Biology' Symposium Not completed
<i>Guichenotia seorsiflora</i>	Monitoring Survey	Completed Completed
<i>Rhizanthella gardneri</i>	Information dissemination Habitat Rehabilitation Research Monitoring Survey Weed control Fire management strategy Seed & Fungi collections Translocation	Research poster produced for 'Advances in Plant Conservation Biology Symposium' Completed and ongoing Ex situ cultivation undertaken at BGPA. Habitat degradation research completed and ongoing Completed Completed Not completed Not completed Completed by UWA and BGPA Propagation by BGPA
<i>Symonanthus bancroftii.</i>	Monitoring Further translocation Survey Research Weed control Rabbit control	Completed Plantings 2005. Fences maintained Not completed Partial completion by BGPA Completed as part of translocation project Completed
<i>Verticordia fimbrilepis</i> subsp. <i>fimbrilepis</i>	Information dissemination Monitoring Survey Ex situ conservation Fire management Rabbit control Disease management	Not completed Completed Not completed Not completed Not completed Completed Guidelines to be developed in 2006

Critically Endangered Flora

In 2005 nine species, with populations in the Narrogin District were ranked as Critically Endangered:

<i>Caladenia graniticola</i>	<i>Grevillea scapigera</i>
<i>Caladenia williamsiae</i>	<i>Guichenotia soersiflora</i> ms
<i>Darwinia carnea</i>	<i>Rhizanthella gardneri</i>
<i>Dryandra ionthocarpa</i> subsp. <i>chrysophoenix</i>	<i>Symonanthus bancroftii</i>
<i>Eremophila verticillata</i>	

A brief summary of the work undertaken to implement identified recovery actions for each species is described below:

5.1 *Caladenia graniticola*

Monitoring

Monitoring was conducted at population 1 in the Narrogin District during 2005. Brett Beecham, Regional Ecologist for the Wheatbelt is collating and analysing this monitoring data, which has been collected since 1998. Plant numbers at all populations have increased since the last surveys.

Further surveys

Surveys were conducted for this species on 6 October 2005. A number of sites at Pingaring rock were resurveyed along with the nearby Pingaring Nature Reserve (NR 23993) and Flat Rocks Nature Reserve (NR 27487). A new population was discovered on Pingaring NR. The granite outcrops searched on Flat Rocks NR did not have appropriate habitat to support the species. Further surveys are scheduled for other granite outcrops in the area during 2006.

Translocation

A proposal for translocation of this species will be developed during 2006.

5.2 *Caladenia williamsiae*

The species was gazetted as DRF in May 2004 and is ranked as CR under IUCN criteria.

Monitoring and Further Surveys

Surveys were conducted by CALM and members of the WANOSCG on 2 September 2005. These targeted further sites within Weam Nature Reserve and Pingeculling Nature Reserve. The land-locked Crown Reserve 14214 off Davis Road in the Brookton Shire was also surveyed. One new population consisting of one plant was found on the eastern edge of Weam Nature Reserve by Fred Hort. Some suitable habitat areas were found at the other sites but the species was not present. Monitoring was conducted at Population 3 with the plants and their habitat observed to be in good health. Plant numbers had increased since 2004, with 38 plants recorded at the site. All populations will be monitored during 2006.

5.3 *Darwinia carnea*

Information dissemination

A line drawing of the Narrogin form of *Darwinia carnea* was completed in 2005. This was part of an agreement made in 2004 between the Narrogin District and the WA Herbarium.

The drawing, a description of the species and its morphological variation from the Mogumber form will be collated and published in *Nuytsia* during 2006.

Translocation

The establishment of two populations of *Darwinia carnea* on crown land (State Forest and a Shire Reserve) commenced in 1998. Subsequent plantings to increase numbers at the translocation sites were undertaken in July 2000 and June 2002. Regular monitoring and occasional 'top up' of new seedlings has been occurring at the translocation sites since this establishment.

A report summarising the *Darwinia carnea* translocation process from 1997 through to 2004 and assessing whether the translocation has met the aims outlined in the original proposal was completed in December 2004 by Leonie Monks (Research Scientist, Science Division, CALM Kensington). The assessment found that translocation has been successful, however further recommendations were made for future management of the sites to ensure the survival and viability of the translocated populations. Some of these recommendations were implemented in 2005 and will continue during 2006.

Further translocation of propagules occurred in July 2005. Sixty-two plants were translocated, 49 at Shire Reserve and 13 at Penny Block. Monitoring has continued at the sites but a comprehensive monitoring program will be developed during 2006 that will include information on fruit production and comparisons with the natural population that have not been recorded in the past. Naturally occurring seedlings continue to emerge at the Shire Reserve population and a new seedling was recently discovered at Penny Block. More translocations will occur in winter 2006.

Seed collection took place at both translocated populations during December 2005 with assistance from Anne Cochrane at the Threatened Flora Seed Centre and volunteers. Germination and viability testing will occur in 2006. The seed collection program will continue in 2006/07.

Reticulation systems will be set up in 2006 to allow summer watering of newly planted propagules. Funding for *Darwinia carnea* works has been received from the Federal government through the South West Catchments Council (SWCC).

Monitoring

Population 1 and both translocation sites were monitored during 2005.

Weed Control

Weed impacts at Population 1 and the two translocation sites were assessed during 2005. As a result hand pulling of weeds was implemented at Shire Reserve with the assistance of volunteers.

Collecting and preserving genetic material

Tip cuttings were collected from individuals at population 1 to replace some of the old nursery material and ensure that healthy plants are propagated in the future. Fourteen cuttings in total were collected and forwarded to BGPA nursery. Plants from this material will be maintained at the nursery for future use.

5.4 *Dryandra ionthocarpa* subsp. *chrysophoenix*

Four populations currently exist in the District, only one of these occurs on Conservation estate. During 2003 this species was recognised through notice in the Government Gazette to

be taxonomically distinct from an Albany population, which is now known as *Dryandra ionthocarpa* subsp. *ionthocarpa*. Detailed surveys to assess population status were conducted on 7 December 2005. Populations 2, 3 and 4 appear to be declining due to various threats, including habitat decline and weed invasion. Rabbit control will be implemented at those sites where rabbit numbers are high and are impacting on habitat health. Population 1 on Jingaring Nature Reserve is in good health.

5.5 Eremophila verticillata

No extant populations are currently known to exist in the Narrogin District. The area where the previously known population existed was cleared prior to the species being gazetted. No surveys were completed during 2005. Consideration is needed to determine whether the population can be recovered at this site through natural regeneration and stock prevention. This will be investigated in 2006 and further surveys will be carried out to determine if other populations occur in the District.

5.6 Grevillea scapigera

Monitoring

All populations were monitored in December 2005. Two new plants were found, one adult and one seedling, at population 9 and 10 respectively. These populations have been dormant for more than six years. Three adult plants and two seedlings are currently the only representatives of this species in the wild over the 13 known population sites. During the visits to check population status, many of the sites observed were severely degraded with some no longer supporting native vegetation. Road verge sites in particular are being impacted on a number of occasions by Shire works, which are altering water flow, removing vegetation and introducing weeds. During 2006 Narrogin CALM officers will be working with the Corrigin Shire to ensure these sites are protected. This will include site visits with Shire representatives and replacement/repositioning of DRF markers.

Translocation

Intensive work began in 1993 to recover the rare and critically endangered Corrigin grevillea (*Grevillea scapigera*). One of the main aims was to establish additional plants in natural ecosystems through translocation. At the time the Corrigin grevillea was extremely rare with only forty-three plants in seven populations known in the wild. The majority of these occurred on roadside remnants over a very small range near the town of Corrigin. The main threat was land clearing and fragmentation, with as much as 95 per cent of the species' habitat destroyed.

Translocation efforts began in 1996 when large scale plantings were implemented at three secure sites near Corrigin and Bullaring. Further plantings have been made each year through collaboration with BGPA scientists, CALM officers, the Corrigin Shire Land Conservation District Committee, the Bullaring community and many other volunteers. The species is now only known in the wild from six plants across 13 known populations. Monitoring and accompanying research at the translocation sites have shown that translocation efforts have been successful.

During 2005 the translocation program for *Grevillea scapigera* continued and has included a number of research trials as outlined below. Thirty-one seedlings were transplanted to the Corrigin Airstrip translocation site during winter 2005. These seedlings germinated from cryostored material and were grown in root air pruning pots and have established well.

Natural recruits have been found at Airstrip and Bullaring.

Research Trials.

The Botanic Gardens and Parks Authority (BGPA) continue to undertake research studies such as seed storage trials and seed predation trials. Seed predation trials show that rats and mice are predating on seed at Bullaring and Hartley's. The animals ate through the flywire material and consumed all the seed from the three sachets at each site. The only site to avoid this predation is the Airstrip where the sachets were replaced and will be checked again in 2006. A small trial to improve seedling survival rates is continuing. This trial uses root air pruning trays. The intent of this program is to improve seedling establishment at the sites. The trial and control plants will be dug up during 2006 to study and compare the root systems. A trial to assess the impact of herbicide on seedlings continues. In this program seedlings treated with herbicide have been planted at the airstrip translocation site and growth and survival rates have been monitored.

Weed Control

BGPA staff implemented weed control at Hartley's and Bullaring translocation sites.

Collecting and preserving genetic material

Seed collection was completed during 2005. Only small volumes of seed were collected as the majority will now be left to build up the soil seed bank. Cuttings were taken from the new plant found at Population 9, Poultney Nature Reserve (NR 21424) for tissue culture. BGPA continues to maintain clonal material for this species.

Information dissemination

A research poster was produced for this species and presented at the 'Advances in Plant Conservation Biology' Symposium held in Perth 25-27 October. The poster was produced collaboratively with CALM and BGPA and funded by the federal government through the Avon Catchments Council (ACC).

5.7 Guichenotia soersiflora ms

This species was gazetted as Rare Flora by notice in the Government Gazette in July 2004. Five populations of this species are known in the wild and only one of these occurs in the Narrogin District. Surveys and monitoring were conducted during 2005. The status of the single Narrogin population was assessed and a full search of the surrounding remnant was carried out on 8 August 2005. This search resulted in an accurate count and indication of population extent. A total of 63 plants were recorded, all in good condition. The habitat appears healthy, however soil stabilisation and reshaping of the gravel pit area nearby will benefit the population, as water erosion is already affecting the breakaway and may become a major threat in the future.

Surveys of nearby remnants and reserves were also carried out to locate new populations. Some suitable habitat was found but no new populations were discovered.

5.8 Rhizanthella gardneri

Further surveys

Surveys were conducted in 2005. Wheatbelt CALM officers, staff from BGPA, UWA and CALM's Species and Communities Branch (SCB) along with community members and the WA Native Orchid Study and Conservation Group (WANOSCG) assisted in surveying a number of locations. The known population areas were searched (Babakin, Sorenson's Nature Reserve and Kunjin Townsite Reserve) with only one plant found at Sorensons

Nature Reserve. Other remnants in the Corrigin and Bruce Rock Shires were surveyed, no new populations were found.

Research

The Narrogin District, BGPA and the University of Western Australia's Ecosystem Research Group (PhD student) are continuing to conduct scientific investigations on *Rhizanthella gardneri* and its habitat requirements. Currently measurements are taken from various quadrats at the Kunjin townsite population to document site characteristics and monitor habitat health. A tank and reticulation system has been set up at the site to irrigate some of the quadrats. This will simulate average rainfall and will be compared with non-irrigated quadrats to determine if the *Melaleuca* habitat and the survival and recruitment of *Rhizanthella gardneri* at the site improve. It is anticipated that soil moisture probes and a weather station will be installed at the site in 2006 as part of the research program.

Genetic analysis

Genetic studies have been conducted on the species and its host, these will continue during 2006. Tissue cultures of the orchid, its host and associated fungi are stored at BGPA. The orchid has also been propagated but none of the plants have produced flowers. Further propagation and observations will continue in 2006.

Information dissemination

An Interim Recovery Plan for *Rhizanthella gardneri* has been written and is currently being revised.

A poster was produced for this species and presented at the 'Advances in Plant Conservation Biology' Symposium held in Perth 25-27 October. The poster was produced collaboratively with CALM, BGPA and UWA. The poster outlined current research and management for the rare orchid.

5.9 Symonanthus bancroftii

Symonanthus bancroftii is known from one naturally occurring plant in the wild. This plant occurs near Ardath and was found in 1997 by a flora volunteer. Another plant was found nearby in 1998, when material for tissue culture was collected, but has since died. Historically, the species has been found over a range of 80 km but recent surveys have failed to locate additional populations. One of the main recovery actions for this species has been translocation to two secure sites in the Shire of Bruce Rock.

Translocation

The translocation of *Symonanthus bancroftii* into secure sites continued in partnership with the Bruce Rock Land Conservation District Committee and BGPA and some funding from World Wide Fund for Nature Western Australia and the Federal government through the ACC. Three sites were prepared in 2005, one at Ardath and two at Nangeen Hills Nature Reserve. The new site at Nangeen Hills is sandier compared to the other two sites. Approximately 800 micro propagated seedlings were planted at the translocation sites in June 2005. More micro propagated seedlings are being produced for planting in winter 2006.

A comprehensive monitoring program is occurring at the translocated populations. This will continue in 2006. A more detailed irrigation plan will be developed for 2006/07 to ensure that plants are well watered. Weed control continues to be conducted at both translocation sites.

Research

Research trials are being conducted with the aim of improving seedling establishment. During 2005 propagules grown in root air pruning trays were planted along with some grown in cylindrical pots. These will continue to be monitored.

Monitoring

Population 1 was monitored in 2005. One plant is known to exist in the wild. No surveys were conducted in 2005.

Endangered Flora

In 2005 ten species, with populations in the Narrogin District were ranked as Endangered:

<i>Acacia insolita</i> subsp. <i>recurva</i>	<i>Hakea aculeata</i>
<i>Banksia cuneata</i>	<i>Jacksonia quairading ms</i>
<i>Banksia oligantha</i>	<i>Lasiopetalum rotundifolium</i>
<i>Conostylis seorsiflora</i> subsp. <i>trichophylla</i>	<i>Ptilotus fasciculatus</i>
<i>Grevillea involucrata</i>	<i>Thelymitra stellata</i>

Priorities for the implementation of recovery actions for each species are ranked on a basis of maintaining or improving their status in the wild. For example, *Banksia cuneata* requires significant management at the local level to maintain population numbers at existing levels whereas *Thelymitra stellata* will only require minimal direct management at the local level.

A summary of actions implemented is described below:

6.1 *Acacia insolita* subsp. *recurva*

Information dissemination

A draft IRP is available for this species.

6.2 *Banksia cuneata*

Monitoring

All populations were monitored in 2004/05. The findings were collated in a District report entitled 'Banksia cuneata: 2005 census and population condition.' The report outlines population status, threats to each population and recommendations for management.

Wildfire monitoring continued at the established quadrats in Quairading Common reserve (population 3 was burnt in 1996). Monitoring shows that survival of individual *B. cuneata* plants has declined to a few individuals per quadrat. In 1998-2001 600-700 seedlings were estimated across a nine hectare area (17 plants per quadrat). In 2004 plants per quadrat had reduced to six, providing an estimate of 200 plants across the nine hectare area. Quadrats will continue to be monitored each spring, to compare survival and growth trends with the co-occurring *Banksia prionotes* (Acorn Banksia).

Information dissemination

A census and report on the current status of *Banksia cuneata* populations in the Narrogin District has been compiled. All field related study has been completed. This report has assisted with the development of an IRP for this species which will be finalised in 2006.

Negotiation continues with relevant stakeholders to have the Quairading Common reserves vested as a nature reserve to ensure adequate protection of this species.

Negotiation will also continue with Dept. Main Roads and landholders to implement a revegetation project to help recover this species. A corridor project has been proposed, which will enhance the current habitat and allow for movement of pollinators between a translocation site and two extant *Banksia cuneata* populations.

Future Research

The challenge to ensure extant populations of *B. cuneata* occur into the future is to research and develop suitable techniques using natural processes such as fire as a tool for periodic regeneration. This is the case for most of the larger remnant based populations where the absence of periodic fire is causing a decline in populations. A burn prescription will be developed in 2006.

6.3 *Banksia oligantha*

Information dissemination

A new population was found on Private property near Toolibin Townsite in 2004 with 188 mature plants and a number of seedlings. The landholder has expressed interest in selling this remnant for conservation purposes. The Narrogin District considers this a priority for land purchase. The IRP for this species was completed and approved in 2005.

6.4 *Conostylis seorsiflora* subsp. *trichophylla*

No actions were conducted in 2005.

6.5 *Grevillea involucrata*

No actions were conducted in 2005.

6.6 *Hakea aculeata*

Monitoring

Population condition and threats were surveyed in September 2005 for population 14, 23, 16A and 16B. Liaison occurred with the Quairading Shire during this time.

6.7 *Jacksonia quairading ms*

A disused sandpit near the *Jacksonia quairading ms* population in the Quairading Rifle Range Reserve 13002 was rehabilitated in 2004. Follow up monitoring at the site will be required (the species is a disturbance opportunist).

6.8 *Lasiopetalum rotundifolium*

No actions were conducted in 2005.

6.9 *Ptilotus fasciculatus*

No actions were undertaken in 2005. Population monitoring and further surveys for this species will be conducted in 2006.

6.10 *Thelymitra stellata*

No actions were conducted in 2005.

Vulnerable Flora

Seventeen taxa, with populations in the Narrogin District were ranked as vulnerable:

<i>Acacia brachypoda</i>	<i>Grevillea dryandroides</i> subsp. <i>hirsuta</i>
<i>Allocasuarina fibrosa</i>	<i>Lechenaultia laricina</i>
<i>Allocasuarina tortiramula</i>	<i>Muelleranthus crenulatus</i>
<i>Banksia sphaerocarpa</i> var. <i>dolichostyla</i>	<i>Pultenaea pauciflora</i>
<i>Boronia capitata</i> subsp. <i>capitata</i>	<i>Roycea pycnophylloides</i>
<i>Boronia revoluta</i>	<i>Thomasia montana</i>
<i>Calectasia pignattiana</i>	<i>Verticordia fimbrialepis</i> subsp. <i>fimbrialepis</i>
<i>Conostylis rogeri</i>	<i>Verticordia staminosa</i> subsp. <i>cylindracea</i> var. <i>cylindracea</i>
<i>Eucalyptus steedmanii</i>	

As for Section 6, priorities for the implementation recovery actions for each Vulnerable ranked species is based maintaining or improving their status in the wild. In most cases surveys and monitoring are the main recovery actions undertaken.

A summary of actions during 2005 for each species is described below:

7.1 *Acacia brachypoda*

No actions were conducted in 2005.

7.2 *Allocasuarina fibrosa*

No actions were conducted in 2005.

7.3 *Allocasuarina tortiramula*

No actions were conducted in 2005.

7.4 *Banksia sphaerocarpa* var. *dolichostyla*

Information dissemination

Mineral exploration activities have been conducted in the vicinity of a number of populations in the Forrestania area and District office will continue to liaise with the relevant companies to ensure protection of this DRF species.

7.5 *Boronia capitata* subsp. *capitata*

No actions were conducted in 2005.

7.6 *Boronia revoluta*

Information dissemination

Mineral exploration activities have been conducted in the vicinity of a number of populations in the Forrestania area and District office will continue to liaise with the relevant companies to ensure protection of this DRF species.

7.7 Calectasia pignattiana

Monitoring

All populations were visited in 2005 to check population status and survey threats. The majority of populations are healthy and not in significant decline. Searches were carried out at a number of the populations to accurately determine population extent and abundance. A brief search of Population 6B at Plain Hills Nature Reserve found 24 plants, which are very infrequent throughout their preferred habitat. This is a higher number than the 2 plants recorded in 1995. This species is difficult to locate, even when in flower, therefore it is likely that a more comprehensive search throughout this habitat would discover more plants. Further surveys in the Narrogin District and monitoring of Katanning populations may see this species nominated for removal from the DRF list.

Information dissemination

Staff from the Department's Wellington District provided information on a potential population located within the Narrogin District. This information requires follow up.

7.8 Conostylis rogeri

Information dissemination

The Narrogin District assisted in compiling an IRP for this species. Populations will be monitored in 2006.

7.9 Eucalyptus steedmanii

This species was nominated for deletion from the DRF list by the Narrogin threatened Flora Recovery Team. The reasons for nomination included that it is more common than previously thought, with over 24,500 plants surveyed in the wild (post-fire regeneration). The species was not deleted from the DRF list.

7.10 Grevillea dryandroides subsp. hirsuta

Populations 1A, 1B, 1C, 2A and 2B were visited in December 2005. Markers need to be replaced at all of these sites.

7.11 Lechenaultia laricina

No actions were conducted in 2005.

7.12 Muelleranthus crenulatus

Liaison

Mineral exploration, power line activities and roadside maintenance are often conducted in the vicinity of this population. The District office has liaised with the relevant industry and state and local government agency representatives. Good relationships have been developed with Western Power Corporations Senior Environmental Officer and the Environmental Officer from mining company Western Areas NL. The District office will continue to liaise with these companies to ensure protection of this DRF species.

Survey and Monitoring

Part of Population 1 lies under a Western Power distribution line that was scheduled for vegetation management during 2005. This vegetation management for safety and system security reasons was proposed for the entire line (60km's) involving the removal of

vegetation by contractors. Woodman Environmental Consulting Pty Ltd (Woodman Environmental) was commissioned to undertake a flora and vegetation assessment along the distribution line prior to vegetation management. The survey recorded and mapped DRF and Priority Flora, described and mapped plant communities present, provided information about TECs and gave recommendations regarding impacts of proposed works on significant flora species and plant communities. *Muelleranthus crenulatus* was included in the survey and mapping.

After the initial flora and vegetation assessment Woodman Environmental put forward a proposal to accurately map the full extent of the *Muelleranthus crenulatus* population, not just the extent in relation to the power line. The proposal also included further surveys to locate new populations, with all activities carried out in conjunction with CALM District staff. One new population was found and accurate mapping of population extent along with details of plant health, flowering times, site characteristics and associated vegetation descriptions were recorded. The findings assisted CALM and Western Power to make decisions regarding vegetation management at these populations. Machinery was excluded from the site and hand pruning was carried out to remove vegetation greater than 5m tall from beneath the line.

7.13 Pultenaea pauciflora

A new population found near Williams in 2004 was surveyed. The population occurs on a road verge and is represented by approximately 220 plants of various ages. Population status and threats were recorded and DRF markers erected. The CEO at the Shire of Williams was notified about the occurrence of this population. No other actions were conducted in 2005.

7.14 Roycea pycnophylloides

An IRP for this species has been completed and is awaiting approval.

7.15 Thomasia montana

No actions were conducted in 2005.

5.16 Verticordia fimbrilepis subsp. fimbrilepis

Information dissemination and Genetic analysis

Colin Yates from the WA Herbarium is continuing to work on the population biology of this subspecies. Genetic studies conducted during 2004/05 to determine the variation between the populations of *Verticordia fimbrilepis subsp. fimbrilepis* are yet to be published (the species occurs in discreet pockets over a large range). More will be known about the availability of the results in 2006.

Monitoring and further surveys

No surveys were conducted during 2005. All populations were visited in December 2005 to check population status. Many of the populations are persisting despite declines in habitat health at roadside populations. DRF markers need to be replaced during 2006.

7.17 Verticordia staminosa subsp. cylindraceae var. cylindraceae

Monitoring

All Narrogin District populations were monitored in 2005. Good population health and recruitment was observed at Population 7 on Pingaring Nature Reserve (NR 23993). The

Pingaring Rock populations are impacted by a number of threats, including weed invasion, recreational activities and rabbit activity. These populations are showing stress and lack of recruitment.

Priority Flora Species

Surveys to verify rarity and distribution is the basis for most work undertaken on species listed on the Department's Priority Flora List. Priority flora surveys are largely opportunistic except where specific projects are approved to survey for specific species. In 2005 some priority species were looked at in the Forrestania area as part of a Western Power distribution line survey by Woodman Environmental (see 7.12). During 2006 Priority 1 and 2 species thought to be significantly rare will be targeted so that an application to Declared Rare Status can progress. Information gathered during priority flora surveys is used to prepare these applications.

8.1 Priority 1 species

In 2005, 36 species, with populations in the Narrogin District were ranked as Priority 1. A *Melaleuca agathosmoides* population near Hatters Hill was visited as part of a national CSIRO study into the genus and surveys were conducted in the Forrestania area for the other three species:

<i>Dicrastylis capitellata</i> (V. English 2004)	<i>Melaleuca agathosmoides</i>
<i>Microcorys</i> sp. Forrestania	<i>Pultenaea daena</i> ms

8.2 Priority 2 species

In 2005, 55 species, with populations in the Narrogin District were ranked as Priority 2. Surveys were conducted in the Forrestania area for the following:

<i>Acacia asepala</i>	<i>Dampiera orchardii</i>
<i>Logania exilis</i>	

8.3 Priority 3 species

In 2005, 76 species, with populations in the Narrogin District were ranked as Priority 3. Surveys were conducted in the Forrestania area for the following:

<i>Eutaxia</i> sp. Hatters Hill (K. R. Newbey 6532)	<i>Grevillea pilosa</i> subsp. <i>redacta</i>
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8.4 Priority 4 species

In 2005, 51 species, with populations in the Narrogin District were ranked as Priority 4. Surveys were conducted in the Forrestania area for the following:

<i>Calamphoreus inflatus</i>	<i>Eremophila biserrata</i>
<i>Eremophila racemosa</i>	

Recovery Plan and Interim Recovery Plan Status for Threatened Flora

Current Interim Recovery Plans are published for *Eremophila verticillata*, *Caladenia graniticola*, *Banksia oligantha*, *Grevillea dryandroides* subsp. *hirsuta*, *Grevillea scapigera*, *Symonanthus bancroftii* and *Verticordia staminosa* subsp. *cylindracea* var. *cylindracea*.

Interim Recovery Plans are being prepared by Species and Communities Branch with assistance from the Recovery team for the following species; *Acacia insolita* subsp. *recurva* (in draft), *Banksia cuneata* (in draft), *Conostylis rogeri* (in draft), *Conostylis seorsiflora*

subsp. *trichophylla* (in draft), *Darwinia carnea* (in draft), *Grevillea involucrata* (draft to be approved), *Roycea pycnophylloides* (draft to be approved) and *Rhizanthella gardneri* (draft to be approved).

There are no current Recovery Plans for Threatened Flora in the Narrogin District.

Translocations

Four species translocation projects are being carried out by the Recovery Team. These are *Banksia cuneata*, *Darwinia carnea*, *Grevillea scapigera* and *Symonanthus bancroftii*. See Section 5 (*D. carnea*, *G. scapigera* and *S. bancroftii*) and Section 6 (*B. cuneata*) for the current status of these translocation projects.

Education, Publicity and Sponsorship

Research Posters for 'Advances in Plant Conservation Biology' Symposium Perth 25-27 October 2005

Research posters were developed for two of Narrogin District's Critically Endangered Flora, *Grevillea scapigera* and *Rhizanthella gardneri*. Both posters detailed research and management actions that have been carried out for each species, along with future directions for recovery. The *G. scapigera* poster was produced collaboratively with CALM and BGPA and funded by the federal government through the Avon Catchments Council (ACC). The *R. gardneri* poster was produced by CALM, BGPA and UWA.

Conclusion

The Narrogin District Threatened Flora Management Program to recover threatened flora within the Narrogin District continues to be an important program for species (populations) based recovery.

The program focuses on ten species ranked as Critically Endangered with one species, *Symonanthus bancroftii* (Bailey's Symonanthus), an extremely rare species with only 1 plant known to exist in the wild. *Grevillea scapigera* (Corrigin Grevillea) and *Rhizanthella gardneri* (Underground Orchid) are also known to be extremely rare with only several individuals known to exist in wild populations.

Through successful species research and collaborative translocations with the Kings Park and Botanic Gardens Authority, CALM and the community, *G. scapigera* now exists in the wild predominantly because of human intervention in cultivating and establishing seedlings.

Successful applications for external funding to NHT to meet annual operational expenses and submitted through regional Catchment Councils will ensure on-ground recovery actions are implemented and local community involved.

By working with the local community members and groups the Narrogin District Threatened Flora Recovery Team implements a well-developed recovery program for the long-term recovery of threatened species over a large, sparsely populated area. Developing links and good relationships with local government authorities, other land management agencies, landowners, and other community based environment programs significantly contribute towards the success of the recovery program.

Continued support from within the Department is also required for a successful threatened Flora Management Program and this has been shown through commitment to a full time permanent Flora Conservation Officer. However, the Narrogin District Threatened Flora Recovery Team would like to highlight the increasing need for a comprehensive and accessible Departmental Threatened Flora database. It is understood that a Threatened Flora database is being developed by the Department that will be accessible for Regional and District input and allow for inclusion of management and threat information for a species. The progress of this database was discussed at a recent Narrogin District Threatened Flora Recovery team meeting with all members showing a high level of support for the continued and expeditious development of this data management system.

Proposed major activities/challenges for the Recovery Team in 2006 are:

- Review the ranking/status of a number of Priority species and make recommendations to the Threatened Species Scientific Committee
- Develop and implement recovery programs in alignment with the NRM framework
- Deliver the Flora and Natural Ecological Communities component of the Avon Catchment Council's 'Back from the Edge' Project
- Develop and implement recovery actions for *Banksia cuneata*. Includes developing a revegetation plan and burn prescription.
- Develop a threatened flora data management system for the District
- Review species recovery actions for the Narrogin District and re-assign priorities for the District Flora Management Plan
- Work closely with Shires in the District to raise awareness of threatened flora populations in their area
- Replace/reposition DRF markers throughout the District
- Continue to undertake rabbit control at a number of populations
- Implement weed control at a number of sites
- Search for new populations of DRF
- Survey a number of DRF populations that have not been observed for some time
- Concentrate on surveys of a number of Priority species
- Investigate methodologies to recover *Rhizanthella gardneri* and undertake habitat rehabilitation
- Continue the translocation project for *Symonanthus bancrofti*.
- Undertake research on the success and sustainability of *Grevillea scapigera* translocation sites
- Continue monitoring, address recommendations and implement further plantings for the translocation of *Darwinia carnea*

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