Species and Communities Branch newsletter for species and ecological communities conservation
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Rakali – no ordinary rat

By Karen Bettink

The native water rat or rakali (*Hydromys chrysogaster*) is by no means an ordinary rat. It is a large, highly specialised predator whose presence is often a sign of ecosystem health.

In the eastern states the Australian Platypus Conservancy also study rakali and refer to it as 'our other platypus'. It does indeed overlap in distribution, habitat and behaviour with platypus. With oversized whiskers and aquatic lifestyle it is also often referred to as a native otter.

They are fairly well recognised in the eastern states but relatively little is known about their ecology, abundance and genetic differences.

Rakali are referred to as an 'old endemic' species that has been present in Australia for at least four million years. Early last century the species was hunted almost to extinction in the east due to its prized fur. They are now protected and a priority 4 species in WA, in need of monitoring and survey.

In WA, rakali are incredibly difficult to spot, let alone study. They are almost entirely nocturnal, restricted to waterways and very shy. Clusters of crayfish or mussel shells and sets of tracks are usually good signs of their presence. Trapping rates can be extremely low, however, animals are frequently drowned in illegal marron or gilgie nets. Remote cameras are going a long way in uncovering the presence, abundance and behaviour of rakali, and are also helping to shed light on the current status of populations.

It is clear that some local populations have become extinct, and that others are under significant threat from habitat loss and degradation. Being particularly susceptible to hydrological change, it is not known what the impacts of the south-west's drying climate and increasing water supply needs will be.

For more information contact Karen on (08) 9423 2904 or email karen.bettink@dec.wa.gov.au.

Top Rakali male before release.

Middle Rakali before release.

Above Rakali male swimming at Charlies Flat near Dwellingup.
Photos – Karen Bettink

Inside this issue

Recovering warru in the Western Desert

By Amber Clarke

Above Female warru with pouch young. Photo – Louise Beames

Left (Left to right) Arthur Samson, Mark Jeffries and Timmy Patterson from the Jigalong Rangers, processing a warru at Kaalpi before releasing it. Photo – Brett Lewis

Warru or black-flanked rock-wallabies (*Petrogale lateralis lateralis*) were once widespread across the rocky ranges of inland Australia and throughout much of Western Australia, including the South West and Avon-Wheatbelt regions. Unfortunately like many Australian small to medium-sized mammals, this species has declined significantly in the last 100 years. Predation by foxes and feral cats is thought to be the primary cause of this decline. Other factors, such as degradation of habitats due to introduced camels, rabbits and buffel grass and changed fire regimes, are likely to have also had a negative impact on population numbers and distribution of this species. Only a single population is thought to remain in the Western Australian arid zone, located in the Little Sandy Desert at the Calvert Range, or Kaalpi, approximately 320 kilometres east of Newman. Kaalpi is located in WA's Western Desert, the traditional lands of the Martu people who know the rock-wallaby as warru.

The Department of Environment and Conservation (DEC) has been working with Martu traditional owners and their representative group Kanyirninpa Jukurrpa (KJ) since the early 1990s to manage warru at Kaalpi. This has primarily focused on 1080 baiting targeting foxes and feral cats. In particular the use of *Eradicat* (an experimental cat bait) has been effective in reducing feral cat numbers and enabling the rock-wallaby population to expand both in number and in extent across the range.

As part of the next step for the recovery of warru in the Western Desert, DEC and KJ are in the process of planning and preparing to translocate some animals from the Kaalpi population to Jilakurru (Durba Hills), about 60 kilometres to the west. Before translocation can occur a significant amount of work needs to be undertaken. At Kaalpi intensive trapping is required to gain a greater understanding of warru population characteristics to allow the project partners to be certain that the removal of animals for translocation will not significantly affect this population. At Jilakurru, monitoring is being undertaken to assess predator numbers and 1080 aerial and ground baiting will occur before translocation of the animals. It is planned that these activities will occur in the early to mid part of 2012 with translocation to occur later in the year.

The translocation project is only possible through the collaboration between DEC, KJ and Martu, and with additional funding support through BHP Billiton and the Foundation for National Parks and Wildlife.

For more information contact Amber on (08) 9182 2004 or email amber.clarke@dec.wa.gov.au.

Kangaroo exclusion fence trial to protect the Busselton ironstone threatened ecological community

By Ben Lullfitz

Staff from the South West Region and Blackwood District have recently erected 2.8 kilometres of kangaroo exclusion fencing around two occurrences of the critically endangered 'Shrublands on southern Swan Coastal Plain Ironstones' (Busselton area) threatened ecological community (TEC) using State Natural Resource Management (NRM) Program funding. This project has been the culmination of a small-scale exclusion trial started in 2005 within an area of ironstone TEC subject to heavy rabbit and kangaroo activity. Two enclosures were established in this trial, together with a control, with one that excluded all herbivorous mammals and one that only excluded kangaroos. The results indicated that kangaroos were having a significant impact on the growth of native sedges, grasses and certain shrub species through selective grazing. The impact of this grazing was particularly notable on flower head production in herbaceous sedges and grasses (see photo above left) which, in turn, can be assumed to affect seed production and species recruitment.

Above left Control quadrat, no flower heads on grass. **Above right** Kangaroo exclusion quadrat, this season's flower heads on grass. Photos – Ben Lullfitz

The recently fenced TEC occurrences are particularly vulnerable to high level kangaroo impact. One small seven-hectare occurrence is totally surrounded by cleared pasture and had become the resting area for more than 25 kangaroos. The other 14-hectare occurrence supports the

only wild populations of four critically endangered flora species, but is surrounded by farmland on two sides and heavily used for kangaroo resting and travel to and from the adjoining pasture. Armed with the knowledge from the small trial, it was decided that exclusion fencing would be the most effective method to address the vegetation damage and lack of recruitment observed within the community.

Fences were constructed without any clearing or kangaroo entrapment and, while the kangaroos will have to get used to a new travel route, there has been no restriction of kangaroo movement from pasture to bushland adjoining the TECs. Monitoring has been established within three different plant communities of the larger fenced area to document the effectiveness of this project in promoting community recruitment.

Using funding from the regional NRM group South West Catchments Council through the *Caring for our Country* program, herbivore exclusion fencing was erected around two translocation sites in which critically endangered flora, endemic to the Busselton ironstone TEC, are being grown. This funding has allowed other projects to continue within the ironstone TEC including weed control, annual rabbit baiting and phosphite spraying. Other works have been conducted by Blackwood District staff including threatened flora monitoring, seed collection and access control to prevent illegal firewood cutting.

For more information contact Ben on (08) 9752 5555 or email ben.lullfitz@dec.wa.gov.au.

Top Total exclusion quadrats, with this season's and the remains of last season's flower heads on grass. **Above** Kangaroo exclusion fence. Photos – Ben Lullfitz

Dryandra Woodland – Barna Mia

By Matt Harding

Dryandra Woodland is one of the largest and most important areas for nature conservation in the central western wheatbelt. The importance of the area is based on the presence of a relatively large proportion of the original mammal fauna, with 12 of the 27 mammal species (excluding bats) recorded or likely to have been present still remaining. Although numbers of some species fell to dangerously low levels, a fox-baiting regime introduced in 1982 led to the recovery of remnant populations to the point where woylies and tammar wallabies were removed from the endangered species list.

Only one of the fauna species formerly found in the Dryandra area is extinct. However, the isolation of Dryandra from extant populations of the other species means that recolonisation can only occur through reintroduction. This prompted DEC's Return to Dryandra (RTD) project, an ambitious field-breeding and translocation program centred at Dryandra Woodland. Western-barred bandicoots, banded hare-wallabies, rufous hare-wallabies, bilbies and burrowing bettongs were first reintroduced into specially constructed breeding enclosures in 1998 with the aim of reintroducing animals into the wild. However, based on current information and recent experience, some of these species won't be released into Dryandra Woodland due to the high likelihood of them being predated by foxes and feral cats. Captive-bred animals that have been reintroduced include bilbies with as many as 100 individuals being released into the wild between 2000 and 2004.

Above left Juvenile bilby before release. **Above Right** Boodie before release. Photos – Matt Harding

Dryandra is also the most important site in the Wheatbelt Region for nature-based tourism. Approximately 25,000 visitors a year visit Dryandra for its natural features,

and in particular to observe wildlife such as woylies, numbats, kangaroos and possums. The accommodation within the Dryandra Village accounts for approximately 5,500 visitor nights annually, comprising mainly family groups. The annual visitation to Dryandra Woodland is estimated at 45,000 to 60,000 visitors. Visitation has increased steadily for the past few years and is predicted to increase even further as the reputation of Dryandra as a nature-based tourism destination expands.

In 2002, Barna Mia animal sanctuary was constructed within the Dryandra Woodland and opened to the public. The sanctuary promotes nature-based tourism and provides information on DEC programs such as *Western Shield* and the RTD. The Barna Mia experience also keeps visitors to Dryandra Woodland up to date with recent or ongoing projects such as the mesopredator program and the numbat recovery program.

Barna Mia was established using animals from RTD but over the years has expanded its use to include housing some rehabilitated animals. Through Barna Mia, visitors to Dryandra Woodland can experience five species in their natural habitat. Bilbies, rufous hare-wallabies, woylies, burrowing bettongs (boodies) and quenda can be seen on regular occasions feeding and moving through the *Xanthorrhoea* (grass tree) habitat surrounded with a predator-proof enclosure.

Most of Barna Mia's animals are long-term inhabitants that are not planned for translocation. This is due to the age of the animals or that they are hand-reared rehabilitated animals. Other animals that have come from the RTD enclosure are regularly rotated back into the enclosure and new ones sought to keep the genetic diversity broad and to allow the animals to be considered for any translocations that may be planned. Trapping for health checks are conducted twice a year and any transfers and reintroductions involving RTD occur during this time.

Above Releasing a juvenile bilby back into Barna Mia. Photo – Matt Harding

Visitor numbers for each tour are limited to minimise the impact on the wild animals so Barna Mia only receives about 2,000 visitors each year; however, interest in bookings has increased significantly over the past few years. Another enclosure at Barna Mia is planned to allow for an increase in visitor numbers during the evening animal viewing tours and to improve the long-term management of the animals.

For more information contact Matt on (08) 9881 9207 email matt.harding@dec.wa.gov.au.

A great sandy discovery

By Ben Ansell

Keraudrenia exastia is a genus of Australian shrubs in the Sterculiaceae family, which includes the better-known kurrajong tree (*Brachychiton* species). *Keraudrenias* occur principally in arid and tropical Australia. At least three *Keraudrenia* taxa are known to occur in the Kimberley Region; however, until recently, the poorly known *K. exastia* was thought to only occur in the vicinity of the Port of Broome.

Following a vegetation survey in the area in May this year, it was brought to DEC's attention that there may be a new *K. exastia* population occurring in the Great Sandy Desert. Unfortunately poor samples were collected from this survey and to clarify the identity of the plants as *K. exastia*, West Kimberley District (WKD) DEC officers Bel Catcheside, Matt Byrne and Ben Ansell, accompanied by volunteer Tom Harley, ventured out to the Great Sandy Desert to visit this population.

Above Taking samples of the newly discovered *K. exastia*. Photo – Tom Harley

The *K. exastia* population was found to be in good health, growing in abundance and flowering prolifically. While the expedition involved confirming the *K. exastia* population at the site, a second population was discovered 30 kilometres away during the return journey. It was noted that these two newly discovered Great Sandy Desert populations are the dominant species within the local area. This differs from the Port of Broome populations, where the *K. exastia* plants are associated species among a more complex vegetative structure within the local area. WKD DEC staff have recommended DNA testing of the Port of Broome plants to determine if there is a link between them and the Great Sandy Desert population.

It is thought that the newly discovered *K. exastia* populations remain in such good health and dominate the area due to minimal threats through their isolation and exclusion of frequent fire. *K. exastia* is known as the 'fire weed' due to its ability to regenerate after a fire. There were no observed signs of *K. exastia* being heavily grazed, however small pockets of the populations indicate camel disturbance. The potential impact from camels may increase as their numbers expand in the Great Sandy Desert and so DEC will regularly monitor the two populations of *K. exastia* to assess whether action needs to be taken to mitigate future disturbance.

This discovery of two populations of *K. exastia* in the Great Sandy Desert indicates the prospect that there may be more populations of *K. exastia* within the WKD yet to be discovered.

For more information contact Ben on (08) 9195 5511 or email ben.ansell@dec.wa.gov.au.

Above *Keraudrenia exastia.* Photo – Tom Harley

Science Week – monitoring vegetation

By Val English

The Species and Communities Branch attended Science Week at Woodlupine Primary School in Forrestfield. National Science Week was from 13 to 21 August 2011 and provided an exciting opportunity to showcase the science and innovation that drives our communities. Branch staff gave a presentation on biodiversity and took the opportunity to show students some of the activities DEC staff undertake, as well as to show them how the biodiversity values of their neighbouring bushland are monitored.

Woodlupine Primary is located adjacent to areas of bushland that have been modified through partial clearing, repeated fires and trampling. However, parts of the bushland have remained in quite good condition and still have a healthy woodland structure of jarrah (*Eucalyptus marginata*) and sheoak (*Allocasuarina fraseriana*). This small area of bushland still also contained a diverse range of flora including the native honeysuckle *Lambertia multiflora* subspecies *darlingensis*, that until recently was listed priority flora. The students were surprised that a closer look at the smaller plants revealed more than 30 different native flora species in a very small area. The groups noted that the main threats to the bushland include too frequent fire, weeds, too many tracks and possibly dieback disease. The students then looked at the condition of another nearby area that had been so extensively impacted by burning and trampling that only a few trees remained over an understorey of weeds.

Above DEC staff and Woodlupine students discuss GPS use. Photo – Jill Pryde

The students compared the condition of the two areas by filling in a 'bushland recording sheet' for a specific portion of each area contained within a quadrat. To complete the session, the students discussed the sorts of activities that they could take part in to improve the condition of their local bushland, such as cleaning up rubbish, pulling out weeds and possibly replanting in large bare areas.

Good feedback was received about the day, with some students having a particular interest in identifying plants through *FloraBase*, DEC's online herbarium, and others interested in detecting clearing of the bushland through aerial images on Google Earth.

For more information contact Val on (08) 9334 0409 or val.english@dec.wa.gov.au.

Adopt an Orchid project (ADORP)

By Andrew Brown

DEC's monitoring and survey program for threatened and poorly known (priority) flora is prioritised towards threatened flora (species listed under the Western Australian *Wildlife Conservation Act 1950*). Less time is available to monitor and survey priority flora species. These species are often known from few locations and may be under threat but require further information to accurately ascertain their conservation status. Some 30 orchid species fit into this category and, because many have not been adequately monitored or surveyed, could potentially be highly threatened.

The Adopt an Orchid project was born out of the West Australian Native Orchid Study and Conservation Group's (WANOSCG) desire to assist DEC in obtaining better and up-to-date population, threat and survey information for priority orchid species. This way, DEC can be more certain of their conservation status, including threats and necessary recovery actions and can better manage and protect them.

There are four priority categories for flora but for the purposes of this project only priority 1 to priority 3 species are being adopted. Priority 4 species are generally better known and are not thought to require urgent monitoring and survey.

To obtain this important information WANOSCG and DEC have each put in place an Adopt an Orchid coordinator to oversee the project and individuals or small groups of volunteers, no more than six in each group, have been enlisted to monitor and survey specific priority orchid species.

Each participant or group has been provided an information pack that contains:

- a general introduction to the program
- threatened and priority report forms and the field manual
- contact details for the nominated DEC regional or district officer. Once contacted, the district officer discusses hygiene measures and sensitive areas, and has often provided additional locations to survey
- how to identify the orchid/s they have adopted, including photographs, descriptions, life cycle information (flowering, fruiting) and other relevant information
- known locations of selected orchid species. Survey of private properties is only being done with the owner's permission and awareness of who will be receiving the information
- type of habitat to search.

Although the program has been running for just four months there have already been some notable achievements:

- There are now 32 participants covering 20 orchid species ranging from Kalbarri to Esperance.
- Fifty populations of priority orchids have been visited and monitored.
- More than 100 flowering plants of *Caladenia uliginosa* subsp. *patulens* (P1) was found in an area where just three were located previously.
- A population of *Caladenia startiorum* (P2) that had not been seen for many years was relocated and flowering plants found.
- New populations of *Caladenia abbreviata* (P3), *C. cristata* (P1), *C. luteola* (P1), *Cyanicula fragrans* (P3) and *Paracaleana alcockii* (P2) were located.

The program is proving to be a fun and rewarding experience. Participants are seeing some of our rarest orchids growing in their natural habitat and are getting to interact with other dedicated enthusiasts. Some adoptees have already located new populations of some of our rarest priority orchid species. Even when new populations have not been located, the information obtained has been invaluable to DEC and will result in positive actions being undertaken to protect and conserve these species.

For more information contact Andrew on (08) 9334 0122 or email andrew.brown@dec.wa.gov.au.

Above (from top left) Priority 1 species *Paracaleana alcockii*. Priority 1 species *Caladenia dundasiae*. Priority 2 species *Caladenia luteola*. Priority 2 species *Caladenia startiorum*. Priority 3 species *Thelymitra jacksonii*. Priority 3 species *Thelymitra magnifica*. Photos – Andrew Brown

Sedgeland recovery plan updated

By Val English

Above 'Sedgelands in Holocene dune swales' TEC occurrence at Golden Bay. Photo – Val English

The updated recovery plan for the critically endangered 'sedgelands in Holocene dune swales' threatened ecological community (TEC) has just been completed with funding assistance from the federal Department of Sustainability, Environment, Water, Population and Communities. Since the original plan was completed in 2002, a very significant number of recovery actions have been completed.

Activities undertaken for the sedgeland community that have been completed since 2002 include searching likely habitat for new occurrences of the community, and providing advice and recommendations with regard to possible reservation of occurrences at East Rockingham heavy industrial area, Lark Hill, Golden Bay, Dalyellup, and Port Kennedy.

Large quantities of illegally dumped rubbish have been removed from the sedgeland community including garden waste containing seriously invasive weeds, and asbestos that causes major contamination. Several areas have also been fenced to manage illegal activities such as dumping and igniting cars and rubbish. Burning rubbish causes frequent fires and increases weed invasion in the bushland that contains the sedgelands TEC. Fire response plans have been developed for occurrences of the community in regional parks to also help reduce the frequent fires that occur in the coastal areas that contain the community, mainly around Rockingham.

Some of the most serious weeds in the community include Geraldton carnation weed (*Euphorbia terracina*), dune onion weed (*Trachyandra divaricata*), bridal creeper (*Asparagus asparagoides*) and sharp rush (*Juncus acutus*). Weed mapping and weed control plans have been developed. Weed mapping has been completed in regional parks that contain the community and specific control of the most serious weeds has also been completed.

Areas of the community have been declared as reserves including parts of Port Kennedy Scientific Park. The purpose of Lake Richmond reserve, that also contains the sedgelands community, has been amended to reflect its conservation value and is now 'conservation and recreation'. The previously privately owned portion of Lake Richmond has also been reserved. Just recently, a stipulation was placed on development of the East Rockingham heavy industrial area that a 90-hectare reserve containing the sedgeland community and habitat for Carnaby's cockatoo will be declared as part of the development of the site.

New and ongoing recovery actions in the updated plan include defining the composition and habitat of the community in detail, and continuing to manage fire, recreational use, weeds and feral animals. The plan also specifies the need for ongoing monitoring and investigations into the hydrology that drives the community, and continuing to seek reservation of areas that contain the sedgelands to help ensure the future conservation management of areas of this important community.

For more information contact Val on (08) 93340409 or val.english@dec.wa.gov.au.

Highlights from recovery team annual reports for 2010–11

Full versions can be obtained from the editors.

Geraldton District threatened flora recovery team

Alanna Chant

Stylidium amabile was monitored following a successful recruitment trial which recorded additional recruitment of this species and *Pityrodia axillaris*.

Monitoring indicated greater than 80 per cent survival for the three threatened flora translocations including *Eremophila nivea, Acacia imitans* and *A. unguicula*. Works undertaken at translocation sites include protection by fencing and/or weed/rabbit control and rehabilitation.

Three field trips for the Regional Herbarium Group were completed during spring.

Great Southern District threatened flora and communities recovery team

Greg Durell

Numerous surveys were undertaken of threatened flora populations, with emphasis on translocations. Species that were included in the Caring for our Country (CFOC) 'Reducing the impact of rabbits on threatened flora' project include critically endangered (CR) species and other threatened taxa that have not been surveyed for some time. This survey work highlighted the need for a more rigorous monitoring approach. A prioritisation process was implemented to produce a list of 66 threatened flora populations to be surveyed to have permanent monitoring quadrats installed. A three-year program was developed with implementation to begin in 2011.

The Wheatbelt Orchid Rescue project was successfully completed with field assistance provided by members of the recovery team, the Orchid Society and community volunteers. The project has lead to the discovery of new populations and population extensions within the Great Southern District.

Assistance was given to Southern Aboriginal Corporation to successfully apply for CFOC groundworks funding to undertake weed control, revegetation and enhance threatened flora habitat at 'Marribank' where three threatened flora species occur.

Central Wheatbelt District threatened flora and ecological communities recovery team

David Joliffe

New threatened populations have been discovered for seven critically endangered (CR), seven endangered (EN) and two vulnerable (VU) taxa and new priority flora populations were discovered and surveyed.

A number of recovery actions were included under the Caring for our Country program including:

- field assessments of approximately 95 per cent of species that are listed by the federal government
- a total of 11 kilometres of rabbit proof fences erected around populations of five threatened species
- 1080 baiting for rabbit control over 5500 hectares of threatened critical habitat
- seed collection undertaken of four threatened species
- rabbit warrens fumigation/destruction completed near threatened flora populations located in nature reserves, private property and shire road verges.

Invertebrate sampling was undertaken at four different sites in the 'Pools of the Avon and Dale Rivers' priority 1 ecological community. Results indicate that the invertebrate species in each pool have altered.

Swan Region threatened flora and communities recovery team

Anne Harris, Cathy Page

Above '*Corymbia calophylla – Kingia australis* woodlands on heavy soils'. Photo – Val English

Flora species were monitored in 22 quadrats to obtain data for floristic analysis of threatened ecological communities (TECs) present and to determine vegetation condition. Four transects and eight quadrats were monitored to established the effects of fire on flora species composition in a priority ecological community on granite outcropping, and in a Banskia woodland TEC. Transects previously established within Moore River National Park were monitored for ongoing assessment of impacts of bunding to control the flow of water within the boundary of the TEC 'Herb rich saline shrublands in clay pans'.

Weed mapping was completed for the TECs: '*Corymbia calophylla – Kingia australis* woodlands on heavy soils', '*Corymbia calophylla – Xanthorrhoea preissii* woodlands and shrublands', and 'Communities of Tumulus Springs (Organic Mound Springs, Swan Coastal Plain)'. Fences were installed or repaired for ten bushland areas that contain TECs. Dieback disease caused by *Phytophthora* species was mapped to help determine on-ground management requirements for seven areas containing four different TECs.

Moora District threatened flora and communities recovery team

Benson Todd

Focus during the year was the establishment and maintenance of four translocations sites of threatened species. This activity was funded by the State Natural Resource Management Program.

Populations monitored included *Eremophila glabra* subsp. *chlorella, Acacia aprica, A. splendens, Grevillea batrachioides, G. humifusa, G. calliantha* and *Darwinia polychroma*. New populations of *A. aprica* and *D. polychroma* were identified. New translocations established included populations of *A. choclocarpa* subsp. *cochlocarpa, G. calliantha* and *G. humifusa* in nature reserves and a population of *A. aprica* was established on private property.

The district assisted Species and Communities Branch staff to established baseline flora monitoring quadrats and further hydrological monitoring in occurrences of the Bentonite Lakes threatened ecological community. Work has also continued to rehabilitate disturbed areas around Lake Thetis stromatolite community.

Albany District threatened flora recovery team

Sarah Barrett

Above Montane thicket of the eastern Stirling Range. Photo – Sarah Barrett

Recovery of critically endangered (CR) Stirling Range taxa threatened by *Phytophthora* dieback has progressed through phosphite application, herbivore (vertebrate and invertebrate) control, concerted efforts to collect seed from remote and 'difficult' species and translocations of four species.

Phosphite continues to slow the rate of decline for Stirling Range and other CR taxa threatened by *P. cinnamomi* and allowed seed collection and ex-situ conservation to progress.

Persoonia micranthera and *Leucopogon gnaphalioides* have shown a positive response to baiting of habitat with 1080 oats to exclude rabbits and *Daviesia ovata* and other species have responded to fencing of their habitat to exclude rabbits.

Goldfields threatened flora recovery team

Jennifer Jackson

Conospermum toddii has been removed from the threatened list and is now priority 4. The Cliffs/DEC land management project commenced, with a project botanist employed to undertake priority flora searches in the northern Yilgarn area, concentrating on 86 priority flora species.

A survey for *Acacia denticulosa* in Neale Junction Nature Reserve was undertaken and confirmed that this acacia does not occur in the reserve.

A survey undertaken by the region confirmed that more than 200 taxa occur within the Wanna area of the Great Victoria Desert, with two confirmed new species.

'Sedgelands in Holocene dune swales' recovery team

Val English

Members of the recovery team dealt with a series of issues including negotiations and advice about areas that contain the sedgeland community and are the subject of proposals for reservation or development.

Resources were received from the Australian Government to update the recovery plan (see article in this edition), and Species and Communities Branch undertook surveys of new occurrences of the community in Golden Bay and monitored most other occurrences to collect current data for inclusion in the updated plan.

Under the direction of DEC's Regional Parks Branch, work continued on controlling the weeds sharp rush (*Juncus acutus)*, cotton bush (*Gomphocarpus fruticosus*), and pampas grass (*Cortaderia selloana*) at Port Kennedy Scientific Park within occurrences of the sedgelands. DEC's Urban Nature group in conjunction with Greening Australia continued trials of *Euphorbia terracina* (Geraldton carnation weed), and recovery of the sedgeland community following control.

Warren Region threatened flora and communities recovery team

Brad Barton

Above Reedia swamps. Photo – Val English

Six new occurrences of the TEC Reedia swamps of the Warren Region was recorded west of Mt Chudalup. The priority ecological community (PEC) *Epiphytic cryptogams* of the Karri forests has had 544 locations within the Dombakup and Warren forest blocks scored for developmental stage, and potential reserves that could be protected from burning have been identified.

Annual monitoring was carried out for *Andersonia annelsi* and *Caladenia christineae* with all district populations monitored. Numbers were down 90 to 100 per cent at most population sites where plants have been observed in recent years. Habitat was extremely dry at the time of monitoring. *Grevillea acropogon* was translocated successfully and the population fenced and additional translocation sites were assessed.

A flora survey of the Donnelly District was undertaken of 87 threatened flora species including *Caladenia dorrienii*.

In the Frankland District survey of approximately 30 new populations of threatened and priority flora species was undertaken during the year including two new populations of *Verticordia fimbrilepis* subsp. *australis* previously only known from two locations.

Fire response monitoring and fencing of two populations for *Reedia spathacea* was undertaken. This was funded through the State NRM Program.

A rare orchid survey of Wambellup Reserve was completed with orchid society volunteers.

Thrombolite (Stromatolite-like Microbialite) community of a coastal brackish lake (Lake Clifton) recovery team

Jill Pryde

The health of the Lake Clifton thrombolites appears to be in decline. In 2010 the lowest water levels were recorded at Lake Clifton and data collected by DEC and its predecessors over a 30-year period under the South West wetlands monitoring program listed Lake Clifton as a wetland of interest or concern. The trend of increasing salinity in Lake Clifton continues with a record high level in November of 2010 at 62ppt (about twice that of seawater).

One key point summarised in a review conducted by C Nobel (2010) indicated that "the thrombolite-forming cyanobacteria *Scytonema* sp. is no longer found in Lake Clifton, and this is either due to being out-competed by other algal species due to environmental changes such as increased salinity, nutrients or both".

Recovery plans approved

Five new and two revised flora interim recovery plans (IRPs) and revised IRPs for two critically endangered TECs have recently been endorsed by DEC's Director of Nature Conservation. The flora plans have been completed with funding assistance of DEC's Specific Nature Conservation Projects, the Australian Government and, in the case of *Ricinocarpos brevis*, by Cliffs Asia Pacific Iron Ore.

The update of the 'sedgelands in Holocene dune swales' plan was completed with funding assistance from the Australian Government.

No.	Title	Prepared by	DEC region involved
311	*Acacia vassalii*	Robyn Luu, Gillian Stack, Andrew Brown	Midwest, Wheatbelt
312	*Ricinocarpos brevis*	Jennifer Jackson, Robyn Luu	Goldfields
313	*Pandanus spiralis* var. *flammeus*	Nic Casson, Valerie English, Robyn Luu	Kimberley
314	Sedgelands in Holocene dune swales (Swan Coastal Plain community type 19)	Gemma Grigg, Valerie English	Swan, South West
315	*Corymbia calophylla* – *Kingis australis* woodlands on heavy soils (community type 3a)	Valerie English	Swan, South West
316	*Caladenia procera*	Nick Casson	South West
317	*Grevillea brachystylis* subsp. *grandis*	Nick Casson	South West
318	*Banksia pseudoplumosa*	Nick Casson	South Coast
319	*Schoenia filifolia* subsp. *subulifolia*	Nick Casson	Midwest

Top *Petrophile latericola* occurs on the Busselton Ironstone TEC. Photo – Jill Pryde. **Above right** '*Corymbia calophylla – Kingia australis* woodlands on heavy soils'. Photo – Val English. **Above** 'Sedgelands in Holocene dune swales' TEC occurrence at Secret Harbour. Photo – Gemma Grigg.

Department of Environment and Conservation

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