



Stromatolite symposium a success

By Val English

About 70 scientists and land managers attended the international symposium 'Research and conservation: Western Australia's microbialites' on 29–30 October 2012. The symposium was held at the Western Australian Conservation Science Centre and hosted by Department of Environment and Conservation's (DEC) Species and Communities Branch.

The main aim of the symposium was to discuss the status, knowledge, research and conservation of structures built by microbes (such as stromatolites and thrombolites) that are generally termed 'microbialites'.

Local, interstate and international experts in fields as varied as geology, palaeontology, hydrology, microbiology and ecology gave a series of excellent presentations about WA's extraordinary array of microbialites.

WA is well placed to host a symposium on conserving microbialites, as it contains

the world's most well-known living stromatolites: at Hamelin Pool. The world's oldest-known microbialite fossils, at about 3.4 billion years old, also occur in the state's Pilbara region.

Other topics included: the conservation of other important living microbialites in WA including the stromatolites in Lake Thetis near Cervantes, the extensive thrombolite reefs of Lake Clifton near Mandurah and the smaller reefs in Lake Richmond near Rockingham, the unusual microbial 'tufa' that grow on coastal rocks near Augusta, and the delicate microbial mantles in the waters of Nullarbor caves.

Presenters provided information about a vast array of cutting-edge science, including studies seeking to explain how bacteria influenced early life on Earth and the formation of ancient rocks.

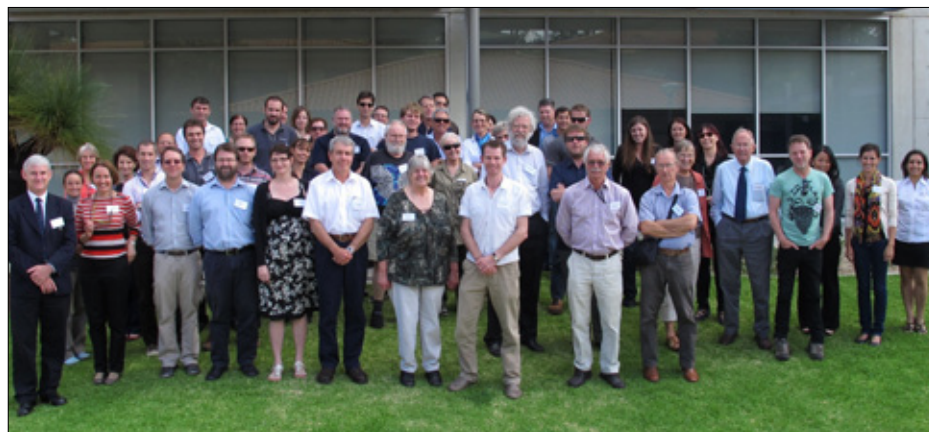
The possibility of the formation of a multifaceted research group to address questions about the conservation of WA's microbialites was discussed during a field trip to the interesting and little-known microbialites in Lake Richmond and Lake Walyungup, Rockingham.

Species and Communities Branch Manager Dr Ken Atkins closed the symposium, remarking that the two-day event had substantially increased awareness of microbialites. He said it was amazing how much research was underway that will greatly expand our understanding of WA's modern microbialites, and exciting that more was being planned.

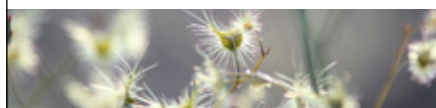
For more information contact Val on (08) 9334 0409 or email val.english@dec.wa.gov.au.

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Top Microbial symposium attendees. Photo – Margo O’Bourne
Above Group discussion. Photo – Val English



Rock-and-roll recovery for wallabies

By Mia Podesta

A new recovery plan for five species of rock wallabies has been approved by DEC. The plan aims to ensure the survival of the populations and, where applicable, improve their conservation status.

The species covered by the plan are the black-footed rock wallaby (*Petrogale lateralis*), short-eared rock wallaby (*Petrogale brachyotis*), monjon (*Petrogale burbidgei*), nabarlek (*Petrogale concinna*) and Rothschild rock wallaby (*Petrogale rothschildi*), which occur across WA, the Northern Territory and South Australia. There are also several subspecies and races within these species that are covered in the plan.

In general terms, rock wallabies can occur on a wide variety of rock types, but require sufficient cave and crevice development to provide shelter from extremes of temperature and predators. Rock wallabies are primarily crepuscular (active during twilight) and nocturnal (active at night), emerging from their shelters to feed on nearby grasses and forbs, and occasionally browse on seeds and fruits.

The main threats to rock wallabies are: predation by foxes, feral cats and dogs; competition for food and shelter from introduced herbivores; changes to fire



Above Monjon (*Petrogale burbidgei*) on Bigge Island.

Left Pearson Island rock wallaby (*Petrogale lateralis pearsoni*) on Pearson Island. Photos – David Pearson

regimes; habitat destruction from clearing, mining and quarrying; habitat degradation due to weed incursions; small population sizes and population fragmentation, disease, disturbance by tourists and the effects of climate change.

The plan outlines recovery actions including information-gathering on poorly surveyed tropical taxa, as well as conducting and monitoring threat-management actions such as predator and herbivore control.

Because several populations of rock wallaby occur on islands, the plan includes an action to maintain and enhance biosecurity to prevent the introduction of feral predators, competitors, weeds and disease to what is often otherwise pristine habitat. As populations are generally isolated, translocations to establish new or to supplement existing populations may be imperative to prevent localised extinctions.

Typically, rock wallabies forage close to their rocky refuges to allow rapid retreat from predators. Managing adjoining foraging habitat is therefore essential to sustain or improve rock wallaby populations.

In order to implement the plan in WA, DEC will consult and seek advice from a range of stakeholders including scientists, Indigenous representatives, non-government organisations and the community. It is anticipated that after additional consultation with the major stakeholders, the plan will be adopted at the national level.

For more information contact Mia on (08) 9334 0174 or email mia.podesta@dec.wa.gov.au.

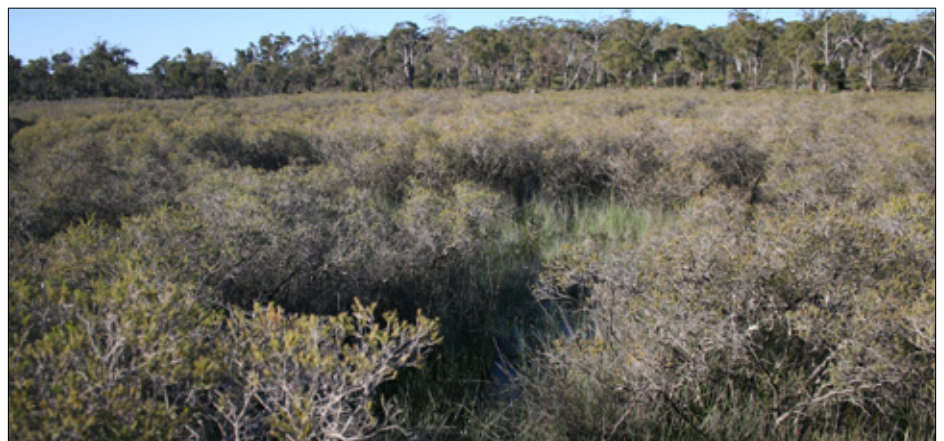
Claypans of Drummond Nature Reserve

By Wendy Chow

Drummond Nature Reserve, which is 439 hectares in area and located 100 kilometres north-east of Perth, contains a diverse range of vascular plants.

Located within the reserve are two freshwater claypans—some of the last of their type to remain in their natural state. These claypans are officially called ‘claypans with mid dense shrublands of *Melaleuca lateritia* over herbs’ and have been listed as critically endangered by the Australian Government, along with other claypans of the Swan Coastal Plain. The community in Drummond Nature Reserve is currently ranked as Priority 1 WA.

continues on page 3



Above An occurrence of the claypan community. Photo – Wendy Chow

continued from page 2

Drummond Nature Reserve is the key part of the sixth Natural Diversity Recovery Catchment declared under the Western Australian Government's State Salinity Strategy. Management of these claypans is a combined effort, with the involvement of staff from DEC's Species and Communities Branch, Natural Resources Branch, Science Division and the Perth Hills District.



The reserve's two claypans are dominated by the shrub *Melaleuca lateritia* over a series of herbs, and contain the aquatic herb *Trithuria australis* (Priority 4). They are predominately deeper basin claypans characterised by aquatic (*Hydrocotyle lemnoides* (Priority 4)) and amphibious taxa (such as *Glossostigma diandrum*, *Liparophyllum capitatum* and *Eleocharis keigheryi* (threatened flora)), with the shrub layer of *Melaleuca lateritia*.

In 2011, a Priority 2 species *Phyllangium palustre* was found in the claypans, which extended the known distribution of this species eastwards.

These claypans are characterised by a suite of annual taxa that germinate as the claypan dries. Therefore survey efforts need to be repeated over a season to ensure as many of the species that occur in the claypan are recorded. In 2010, staff from the Species and Communities Branch installed six quadrats in each claypan, with the aim of recording species composition. These claypans were sampled extensively in late spring 2011 and 2012. The quadrats

have been placed in different areas around the claypan, some of which dry faster than others. This is to ensure that species that germinate in different niches (for example, aquatic versus drying substrate) are recorded when the claypan is visited.

Other programs occurring in and around the claypans are: invertebrate surveys, weather data collection, recruitment and seed collection trials for *Melaleuca lateritia*, weed control, as well as extensive hydrological monitoring. Recently, fencing has been erected around the entry points of the claypan and nature reserve to restrict vehicle access.

The main threat to these claypans is clearing on nearby lands. This has altered the area's hydrology, which has impacted one of the claypans as nutrient-enriched water flows into the nature reserve causing weed infestation. Other threats include trampling and grazing by high numbers of kangaroos.

For more information contact Wendy Chow on (08) 9334 0554 or email wendy.chow@dec.wa.gov.au.



Top left DEC staff member collecting and recording samples.
Photo – Marissah Kruger

Left The claypan when inundated. Some of the species present include: *Tribonanthes longipetala*, *Eleocharis keigheryi*, *Liparophyllum capitatum* and *Hydrocotyle lemnoides*.
Photo – Wendy Chow

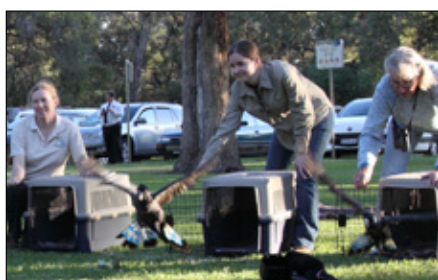
Satellite tracking Carnaby's cockatoo

By Christine Groom

Satellite tracking devices have been fitted to 11 rehabilitated Carnaby's cockatoos.

The tracking is being undertaken as part of a University of Western Australia PhD project investigating roost site fidelity, movement patterns and resource use by Carnaby's cockatoo on the Swan Coastal Plain. This is the first time such devices have been attached to a black cockatoo species in Australia.

Released in May 2012, the cockatoos have been providing researchers an insight into their daily lives, something that



hasn't previously been possible. The data has shown new roost site locations, daily movement patterns and long-distance movements.

The released cockatoos have part of the white panels of their tail feathers coloured pink or blue so they can be spotted more easily in the field, and each is marked with an individual identifying letter. Though the colour is now faded, it is still possible to distinguish them if they cooperate by perching long enough to get a good look. They have also been fitted with a leg band for individual identification. More cockatoo releases are planned for early 2013.

You can help with the project by looking out for black cockatoos with colourful tails. Please report any sightings to Christine Groom (0409 087 631 or email christine.groom@dec.wa.gov.au).

This project is being undertaken in collaboration with DEC, Murdoch University, Perth Zoo, Kaarakin Black



Cockatoo Rehabilitation Centre and Native Animal Rescue.

If you would like to follow the progress of the project please visit www.carnabyscockatoo.blogspot.com.au.

For more information contact Christine on (08) 9334 0579 or email christine.groom@dec.wa.gov.au.

Left Kris Warren, Christine Groom and Marg Owen releasing Carnaby's cockatoos fitted with satellite tracking devices at Perry Lakes. Photo – Peter Mawson

Above Carnaby's cockatoo with its tail coloured pink and fitted with a satellite tracking device. Photo – Christine Groom

Feral pig control aids conservation

By Janine Liddelow

Feral pigs threaten a wide range of flora, fauna and ecological communities. Their impacts may be direct (through predation on flora and fauna) or indirect (through habitat alteration as a result of their digging and wallowing, and their potential to spread diseases such as chytrid fungus and dieback (and possibly toxoplasmosis)). In peat swamps, soil disturbance by pigs has potential to result in acidification processes as iron sulfides in the soil are exposed to air.

Formal records of feral pig presence in DEC's Frankland District trace back to 1994. Since 2006 the Frankland District has had a consistent and organised control program for feral pigs. This program revolves around feral pig behaviour patterns and a prioritisation process based on nature conservation values.

Feral pigs are relatively intolerant to heat, so their distribution in summer becomes restricted to areas with good vegetative cover and availability of water. This provides an opportunity to intensify control operations for these animals. As it is not possible to control pigs across the whole Frankland District, priorities for targeted control are based on the presence of federal- and state-listed threatened

species and ecological communities, endemic species and communities, and dieback-free areas.

Four threatened species have been identified as being particularly at risk from the activities of feral pigs. These are *Reedia spathacea*, sunset frogs (*Spicospina flammocaerulea*), quokka (*Setonix brachyurus*) and the Walpole burrowing crayfish (*Engaewa walpolea*). These species are considered at high risk due to their required habitat consisting of either dense riparian zones or peat swamps. Frankland District has implemented a habitat characterisation project for these species to clarify what impact feral pigs are having on critical habitat for these species.

Frankland District uses a multifaceted approach to the control of feral pig impacts. Surveillance undertaken by foot and vehicle is carried out over the summer period to determine their impact. Sighting records are collected and compiled to establish a dispersal pattern. Sensor cameras have been installed at key areas to determine the visitation pattern of feral pigs.

Feral pig traps are situated in areas where pigs regularly visit and where potential for capture is high.

Recently Frankland District has also trialled the use of a Judas pig—a radiocollared pig used to find and remove other feral pigs. Critical habitat of *Reedia spathacea* and sunset frogs has been fenced to protect it and staff have used thermal sensors to find a unique pig signature to help identify pigs from other animals during aerial surveys.

In the 2011–12 summer season, the Frankland District completed vehicle-based pig surveys covering 6,815 kilometres (equating to 34,075 hectares of habitat), as well as 136 kilometres of repeated foot-based surveys within habitat critical for taxa listed under the *Environment Protection and Biodiversity Conservation Act 1999* (10 sites for quokka, 10 sites for *Reedia*, 10 sites for burrowing crayfish and 10 sites for frogs). Staff also set 22 traps for 93 trap nights, with 52 pigs killed.

Frankland District would like to thank the Albany Sporting Shooters Association, the Lake Muir-Denbarker Feral Pig Eradication Group and the Denmark Vet Clinic (in particular Dr David Edmonds) for their assistance in the efforts to control feral pigs.

For more information contact Janine on (08) 9840 0400 or email janine.liddelow@dec.wa.gov.au.



Above Pig wallows in a threatened ecological community.

Above right *Engaewa walpolea* (Walpole burrowing crayfish).

Right The threatened species *Reedia spathacea* within a threatened ecological community.

Photos – Frankland District staff



2012 DEC flora conservation course

By Kelly Griffiths

In October 2012, 17 eager DEC staff from all parts of WA made their way to Perup Forest Ecology Centre near Manjimup to participate in the 2012 flora conservation course. This was organised by Species and Communities Branch and aimed at providing DEC staff with a basic introduction to threatened flora conservation and management.

The week-long course included activities and presentations by a range of knowledgeable DEC staff. Participants enjoyed talks on the conservation and future of plant diversity in south-western Australia, flora legislation, plant identification, DEC's online database *Florabase*, plant disease, fire ecology, seed conservation, monitoring techniques, fungi

of the south-west, recovery catchments, translocations, ecophysiology and threatened flora data management.

The course's field sessions were a highlight. They included specimen collection and identification, seed collection demonstrations, fire response monitoring, quadrat monitoring and a threatened flora survey. DEC's Warren Region facilitated the major field sessions and participants learnt skills useful for their work, while collecting data that will benefit the Warren Region.

Throughout the week, participants photographed flora for a photo competition. A number of fantastic photos were submitted but there could only be one winner: Janine Kuehs.

The course was a great opportunity for like-minded flora enthusiasts to come together and discuss flora conservation, while learning new skills and sharing expertise.

For more information contact Kelly on (08) 9334 0422 or email kelly.griffiths@dec.wa.gov.au.



Top left Course participants. **Above** The winning photograph. Photos – Janine Kuehs **Top right** Threatened flora monitoring. Photo – Kiera Foster

Highlights from recovery team annual reports 2011-12

Full versions can be obtained from the editors.

Albany District threatened flora recovery team

Sarah Barrett

Highlights for 2012 include the fencing of threatened flora taxa *Acacia avestoniana*, *Daviesia ovata*, *Latrobea colophona*, *Leucopogon gnaphalioides*, *Darwinia collina*, *Banksia montana* and *Banksia anatina*. Populations of these species have been grazed by kangaroos and rabbits over many years and protective fencing will enhance growth and survival, and enable populations to produce seed and reproduce more effectively. This will greatly increase the number of individuals from which seed can be collected, thus facilitating translocations of several of these species (for which minimal amounts of seed are in storage).



Above *Darwinia collina*.

Right *Daviesia euphorbioides*.

Far right *Rhizanthella gardneri*.

Photos – Andrew Brown

Central Wheatbelt District threatened flora and ecological communities recovery team

David Jolliffe

As a result of the Caring for Country project—which aimed to reduce impacts of rabbits and regenerate threatened flora, communities and critical habitat—approximately 90 per cent of 201 threatened flora populations (35 species) found in the Central Wheatbelt District were surveyed and assessed for rabbit activity.

A recruitment burn at the site of a population of the threatened species Wongan cactus (*Daviesia euphorbioides*) resulted in 86 seedlings appearing in early December 2011, with most of the seedlings still alive in February 2012.

The Wongan Hills conservation management plan is currently being updated. Wongan Hills is a 46-square-kilometre area that contains 16 threatened flora species, of which five are endemic.



Esperance District threatened flora and communities recovery team

Stephen Butler and Emma Adams

Major recovery actions were implemented for a number of threatened flora taxa, including *Eremophila lactea*, *Eucalyptus insularis*, *E. platydisca*, *Lambertia echinata* subsp. *echinata*, *Marianthus aquilonaris*, *Myoporum turbinatum* and *Rhizanthella gardneri*.

Actions included surveying and monitoring threatened flora populations, surveying for new habitat, monitoring translocations, researching fire and disturbance, mapping critical habitat, developing fire management strategies, promoting awareness and reviewing interim recovery plans that had been in place for more than five years.

Under DEC's Specific Nature Conservation Project (SNCP), key recovery actions have been implemented for the threatened species *Marianthus aquilonaris*, which occurs in the Bremer Range. The known distribution has been extended and there is now an improved understanding of its biology and ecology.

A new priority ecological community 'Allocauarina globosa assemblages on greenstone rock'—which also occurs in the Bremer Range—was nominated to the WA Threatened Ecological Communities Scientific Committee as Priority 1, and *Allocauarina globosa* was listed as threatened flora.



Geraldton District threatened flora and communities recovery team

Alanna Chant

In 2012, volunteer flora recovery team members discovered new populations of three of the Geraldton District's most threatened flora species: *Pterostylis sinuata*, *Dasymalla axillaris* and *Lechenaultia chlorantha*. All populations were reported as being in relatively good health.

A population of the threatened flora species *Stylidium amabile* was monitored in 2012 following the third winter after a successful recruitment trial. New recruits were found, giving a total of 337 individuals in that population.

A second round of planting was undertaken at translocation sites for threatened flora species *Eremophila nivea*, *Acacia imitans* and *Acacia unguicula*. The total number of *Eremophila nivea* plants is now 278. A total of 255 individuals of *Acacia imitans* and 257 *Acacia unguicula* have been planted during the translocation projects for these species.

Flora and vegetation surveys were completed for the Kalbarri National Park roading and infrastructure project. The surveys were conducted with assistance from volunteers and included a threatened and priority flora survey within the project area.

Goldfields Region threatened flora recovery team

Jennifer Jackson

Funding was obtained for the completion of the Goldfields Region threatened flora management plan, which has been in draft since 2006. The plan aims to improve flora conservation efforts in the Goldfields Region in the future.

Lake Clifton recovery team

Jill Pryde

DEC is undertaking investigations into the hydrology and microbial composition of the thrombolites of Lake Clifton and other microbial structures in liaison with a University of Western Australia hydrogeologist. Preliminary work in 2012 supports the findings of other scientists that the thrombolites in Lake Clifton are in serious decline. A PhD student is currently writing her thesis on Lake Clifton thrombolites. The thesis is likely to guide research in the future.

Great Southern District threatened flora and communities recovery team

Greg Durell

Recovery team members discovered an additional eight populations of threatened flora, including six new populations of *Acacia auratiflora*, one new population of *Tetratheca aphylla*, and *Allocasuarina tortinamula*. Three new priority flora populations were found, including *Acacia insolita* subsp. *efoliata*, *Eucalyptus deflexa* and *Grevillea aneura*. Other recovery team actions included erecting fences on private property to help prevent threatened flora populations being damaged by stock and rabbit activity, translocating threatened flora, and replacing rare flora markers. A number of scientific research projects were also undertaken. One of these included an adaptive management project to investigate the effect of disturbance regimes and rabbit grazing on survival and recruitment of *Gastrolobium lehmannii*.

Moora District threatened flora and communities recovery team

Benson Todd

Ongoing monitoring and maintenance continued following translocations of threatened flora *Acacia aprica*, *A. cochlocarpa* subsp. *cochlocarpa*, *Grevillea calliantha* and *G. humifusa*. This activity was funded by the State Natural Resource Management program.

New occurrences of threatened ecological community (TEC) Coomberdale chert hills have been mapped and included in the TEC database and the interim recovery plan has been revised.

Weed control focusing on eradicating *Juncus acutus* continued around the stromatolite TEC at Lake Thetis and the interim recovery plan for the TEC has now been completed.

Sedgeland in Holocene dune swales recovery team

Val English

In 2012, recovery team members dealt with a series of issues including negotiations and advice on areas that contain the sedgeland community and are the subject of proposals for reservation or development. This included negotiations to minimise impacts of the development of land at east Golden Bay, IP14 Rockingham Industrial Zone, Bakewell Drive Port Kennedy, Waikiki Station, as well as the proposed Mangles Bay Marina near the Lake Richmond occurrences. Commitments

associated with the development at IP14 include the establishment of a 90-hectare reserve that contains the sedgeland TEC, as well as monitoring, rubbish removal, weed control and fencing.

Under the direction of DEC's Regional Parks Branch, work continued on controlling Geraldton carnation weed and *Pelargonium capitatum* at Port Kennedy Scientific Park. Control of cottonbush and *Juncus acutus* continued around Lake Cooloongup and Lake Walyungup.

Toolibin Lake recovery catchment team

Greg Durell

A review of the Toolibin Lake recovery plan was completed by DEC's Natural Resources Branch and progress has been made on a new recovery plan.

Workshops were held to identify biological assets. Operational management of the project was continued, including monitoring of fauna, vegetation health, and ground and surface water.

Lake Bryde recovery catchment team

Greg Durell

The TEC 'Unwooded freshwater wetlands of the southern Wheatbelt dominated by *Muehlenbeckia horrida* subsp. *abditata* with *Tecticornia verrucosa*' exists on three lake beds within the Lake Bryde Recovery Catchment (Lake Bryde, East Lake Bryde and one lake in Lakelands Nature Reserve). The monitoring project for this TEC is moving into its second phase, with an annual monitoring regime as opposed to the six-monthly regime that has been in place over the past three years.

The third occurrence of the TEC in Lakelands Nature Reserve has been partially fenced to protect it from kangaroo and rabbit grazing.

Numbat recovery team

Tony Friend

Thirteen numbats from Perth Zoo made a long trip by air to Australian Wildlife Conservancy's Scotia Sanctuary in western New South Wales, before being released on the same day. In WA, a new project to control cats at Dryandra was undertaken through the SNCP program after concern was expressed by the recovery team about the future persistence of the extremely valuable Dryandra numbat population.

Community involvement continues to provide important support for the numbat recovery program. Project Numbat has again funded radio collars for translocated numbats, and the Friends of the Fitzgerald River National Park assisted with monitoring of a translocated population at Cocanarup.

Dibbler recovery team

Tony Friend

Recovery actions for the dibbler have continued. Following the first good winter rains for some years, the reintroduced population at Peniup Nature Reserve has recovered to the point that a proposed top-up was cancelled and instead the translocation planned for the following year was bought forward. Sixty-four dibblers from Perth Zoo were released into a new translocation site at Waychinicup National Park in October 2011. Follow-up trapping has been promising, with the rate of survival of released animals in line with that seen at Peniup Nature Reserve.

Dibbler populations in the Fitzgerald River National Park and the Jurien Bay islands are still at low levels but individuals are in good condition. Revised captive breeding strategies employed at Perth Zoo in 2011 have been successful, resulting in the highest number of young yet produced.



Above Female dibbler with attached pouch young captured within the Fitzgerald River National Park.

Photo – Tim Button

Right *Caladenia winfieldii*.

Photo – Andrew Brown

Far right White-bellied frog (*Geocrinia alba*).

Photo – Kim Williams

Warren Region threatened flora and communities recovery team

Janine Liddelow

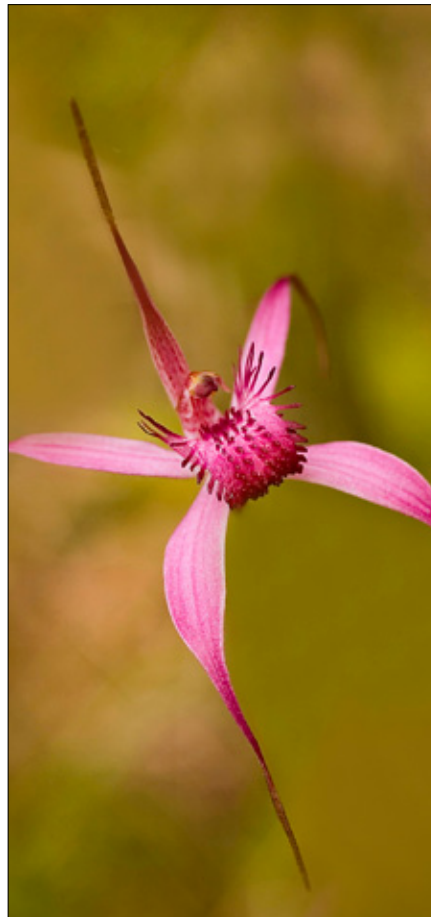
In 2012, six new records of the TEC 'Reedia spathacea-Epodismia gracillimum-Schoenus multiglumis dominated peat paluslopes' were mapped. Ten monitoring transects were installed with the aim of collecting data to help understand *Reedia spathacea*'s response to fire. Initial assessment suggests that the *Reedia* may not regenerate well.

Twenty sites have been selected to install plots within the Priority 3 Epiphytic cryptogams of the karri forest's ecological community. The aim is to follow the development stages of the community and assist monitoring prior to harvesting and prescribed burning.

Numerous surveys of threatened flora species were undertaken in 2012, including a number of orchid species; *Caladenia christineae*, *C. dorrienii*, *C. harringtoniae*, *C. winfieldii* and *Diuris drummondii*.

Numbers of the threatened species *Grevillea acropogon* have tripled since the population was fenced, with a total of 68 new plants found in 2012. An 'apron' has also been added to the fence to exclude rabbits.

Germination has been observed at the Mount Chudalup population of the threatened species *Kennedia glabrata*, which was burnt in February 2012.



Forest black cockatoos recovery team

Brad Barton

DEC continues to liaise with fruitgrowers in DEC's Warren Region and has engaged with Fruit West (the fruit-growing representative body) to provide information to growers about managing cockatoo damage. DEC has continued to look for methods to scare birds from orchards to prevent significant fruit loss and potential impacts on bird numbers. Unfortunately there continue to be reports of illegal shooting. These were investigated by DEC wildlife officers.

There has been an increased focus on forest black cockatoos through the *Environment Protection and Biodiversity Conservation Act 1999* and the impacts of development and infrastructure on critical habitat.

In planning for the next forest management plan, members of the recovery team are providing advice and guidance regarding silviculture and forest practices to better facilitate forest black cockatoo conservation.

Geocrinia recovery team

Kim Williams

The annual monitoring program was completed and field assistance was provided to the Perth Zoo's captive frog breeding program to collect source animals and egg masses for future breeding and release.

The first successful captive breeding of white-bellied frogs (*Geocrinia alba*) was achieved by the Perth Zoo during the year, possibly paving the way for future translocations of this species and an increase in the number of extant populations.

Five captive-reared orange-bellied frogs (*G. vitellina*) were released to augment existing populations.

A revised recovery plan has recently been completed and is awaiting endorsement.



Gilbert's potoroo recovery team

Sarah Comer

Gilbert's potoroo took further steps towards recovery with strong growth of the Bald Island translocated population recorded during a two-week monitoring trip in June–July 2011. Fifty-eight independent potoroos were recorded.

Potoroos from Bald Island and Two Peoples Bay Nature Reserve have been released into the 380-hectare enclosure in Waychinicup National Park. Breeding has been recorded in the enclosure and three enclosure-bred potoroos have been captured so far.

The translocation has not been without setbacks, including a flood that damaged the culverts and fences and resulted in at least two fox incursions. The enclosure has been repaired and is stronger than ever.

Muir's corella recovery team

Brad Barton

The Muir's corella count was a great success in 2011 with 53 properties being surveyed (including 29 self-counted properties). These surveys will continue to be undertaken by the DEC Warren Region every two years. This data contributed to the downlisting of the species to 'Other specially protected fauna' in 2012.

Muir's corellas continue to have impact on properties and communities in the Tonebridge and Frankland River areas, with birds feeding on freshly sown cereal crops, and causing damage to gardens and infrastructure. DEC is continuing to try to find alternative techniques to deter the birds.

Right A male Western ground parrot in captivity.

Below A noisy scrub-bird translocated from Bald Island to Angove.
Photos – Alan Danks



Quokka recovery team

Brad Barton

A review of draft recovery plan was undertaken by members of the recovery team. The plan is now awaiting final approval.

South Coast threatened birds recovery team

Sarah Comer

A full census of noisy scrub-birds was carried out in the Albany management zone in 2011. This is the first time since 2006 that a complete population count has been conducted for this species. Six male noisy scrub-birds were translocated from Bald Island to the Angove Water Reserve in an attempt to re-establish this sub-population, which was lost to bushfires in 2001 and 2003.

The South Coast integrated fauna recovery project—which is focused on the protection of habitat for the critically endangered western ground parrot—conducted the third year of toxic baits trials targeting feral cats. Non-toxic baits were also dropped at Waychinicup National



Park, Two Peoples Bay Nature Reserve and Many Peaks Nature Reserve. This will enable staff to observe non-target species uptake for future toxic bait drops within the critical habitat for all south coast birds covered by this recovery team.

The eight captive western ground parrots continue to be well maintained and have furthered our understanding of their ecology. There have been breeding attempts, but so far they have been unsuccessful.

South Coast threatened invertebrate group

Sarah Comer

Nominations were completed for 16 millipedes of the South Coast Region and one nomination for the nomenclature change of assassin spiders was submitted to the WA Threatened Species Scientific Committee. The 16 millipedes were subsequently listed as threatened fauna.

A report on co-extinction of insects on threatened plants in New South Wales and WA was completed by Melinda Moir and a number of these dependent insects have now been listed as threatened fauna.

Western swamp tortoise recovery team

Jacqui Maguire

In 2011, 30 captive-bred western swamp tortoises from Perth Zoo were translocated to Twin Swamps Nature Reserve, and 33 to Moore River Nature Reserve. Twelve of each group were radio-tracked and have shown good growth rates.

For the first time, population monitoring demonstrated recruitment of hatchlings into the juvenile population at Mogumber where two 1½-year-old tortoises were found.

No recruitment had been demonstrated at Twin Swamps Nature Reserve since the turn of the century, but following the installation of a new groundwater bore in 2010 and an earlier start of water supplementation into two swamp areas, one hatchling from 2011 and one 2½-year-old juvenile were captured in 2011. The new management regime is therefore showing positive results.

At Ellen Brook Nature Reserve, where the last self-sustaining wild population occurs, recruitment has been demonstrated over the last few years. During 2011, the team found three new juveniles (two of which had hatched in 2008 and one in 2009) and four hatchlings from earlier that year.

The reasonably good rains during the spring of 2011 extended the activity season for the western swamp tortoises. All hatchlings from 2011 had grown to a good size by late spring/early summer.

Recovery plans approved

Six fauna recovery plans and six interim recovery plans for threatened flora and ecological communities have recently been endorsed by the DEC's Director of Nature Conservation.

No.	Title	Prepared by	DEC region involved
325	Stromatolite community of stratified hypersaline coastal lake – Lake Thetis	Nick Casson, Valerie English, Wendy Chow	Midwest
326	<i>Acacia leptoneura</i>	Robyn Luu, Andrew Brown	Wheatbelt
327	Western trithuria, <i>Trithuria occidentalis</i>	Robyn Luu, Terry Macfarlane, Andrew Brown	Swan
328	<i>Banksia attenuata</i> and/or <i>Eucalyptus marginata</i> woodlands of the eastern side of the Swan Coastal Plain (community type 20b)	Mia Podesta, Monica Hunter, Valerie English, Suyee Ku	Swan
329	Wilson's wattle, <i>Acacia wilsonii</i>	Robyn Luu, Andrew Brown	Midwest
330	<i>Phalanx grevillea</i> , <i>Grevillea dryandroides</i> subsp. <i>dryandroides</i>	Robyn Luu, Andrew Brown	Wheatbelt
49	Western-barred bandicoot (<i>Perameles bougainville</i>), burrowing bettong (<i>Bettongia lesueur</i>) and banded hare-wallaby (<i>Lagostrophus fasciatus</i>) recovery plan	Jacqueline D Richards	Midwest, Pilbara
51	National recovery plan for the woylie (<i>Bettongia penicillata ogilbyi</i>)	G J Yeatman and C J Groom	Midwest, Swan, Wheatbelt, Southwest, Warren
52	Carnaby's cockatoo (<i>Calyptorhynchus latirostris</i>) recovery plan	J Goldberg, K Bleby and P Mawson	Midwest, South Coast, South West, Swan, Warren and Wheatbelt
53	Western spiny-tailed skink (<i>Egernia stokesii</i>) recovery plan	David Pearson	Midwest, Wheatbelt
54	Chuditch (<i>Dasyurus geoffroii</i>) recovery plan	Judy Dunlop and Keith Morris	Goldfields, Midwest, South Coast, South West, Swan, Warren, Wheatbelt
55	Recovery plan for five species of rock wallabies: black-footed rock wallaby (<i>Petrogale lateralis</i>), short-eared rock wallaby (<i>Petrogale brachyotis</i>), monjon (<i>Petrogale burbidgei</i>), nabarlek (<i>Petrogale concinna</i>) and Rothschild rock wallaby (<i>Petrogale rothschildi</i>)	David Pearson	Wheatbelt, South Coast, Swan, Pilbara, Kimberly, Midwest

These plans will be made available on the Department of Environment and Conservation site:

www.dec.wa.gov.au/management-and-protection/threatened-species/recovery-planning-and-implementation/approved-recovery-plans.html.

Recent changes to WA threatened species lists

The *Wildlife Conservation Act 1950* provides for taxa (species, subspecies and varieties) of native flora and fauna to be specially protected because they are: under an identifiable threat of extinction, are rare, or otherwise in need of special protection. Such specially protected wildlife is considered to be 'threatened'. The WA Minister for Environment approved changes to the list of threatened species recommended at the 2012 Threatened Species Scientific

Committee (TSSC) meeting. The changes included a major review of threatened birds in Australia following the release of the *Action Plan for Australian Birds 2010*.

The new lists were published on the 6 November 2012 and can be viewed on DEC's listing of [threatened species and ecological communities](#)' web page along with the following summary of changes in the tables below.

Fauna	Common name	Scientific name	Status 16 February 2012	Status 6 November 2012
Additions to Schedule 1	McCarthy's plant-louse	<i>Acizzia</i> sp. 70	None	VU D2
	<i>Banksia brownii</i> plant-louse	<i>Trioza</i> sp. 03	None	CR B1+2ab(i,ii,iii,iv,v)
	Red knot (New Siberian Islands)	<i>Calidris canutus piersmai</i>	Schedule 3	VU A3c+4bc
	Red knot (north-eastern Siberia)	<i>Calidris canutus rogersi</i>	Schedule 3	VU A3c+4bc
	Curlew sandpiper	<i>Calidris ferruginea</i>	Schedule 3	VU A2bc+3c+4bc
	Great knot	<i>Calidris tenuirostris</i>	Schedule 3	VU A3c+4bc
	Greater sand plover (Mongolian)	<i>Charadrius leschenaultii leschenaultii</i>	Schedule 3	VU A2bc+3c+4bc
	Lesser sand plover	<i>Charadrius mongolus</i>	Schedule 3	EN A2bc+3c+4bc
	Grey falcon	<i>Falco hypoleucos</i>	Priority 4	VU D1
	Bar-tailed godwit (western Alaskan)	<i>Limosa lapponica baueri</i>	Schedule 3	VU A3c+4bc
	Bar-tailed godwit (northern Siberian)	<i>Limosa lapponica menzbieri</i>	Schedule 3	VU A3c+4bc
	Purple-crowned fairy-wren (western)	<i>Malurus coronatus coronatus</i>	Priority 4	EN B2ab(ii,iii,iv,v).
	Eastern curlew	<i>Numenius madagascariensis</i>	Schedule 3 & Priority 4	VU A2bc+3c+4bc
	Hutton's shearwater	<i>Puffinus huttoni</i>	None	EN B2ab(ii,iii)
Campbell albatross	<i>Thalassarche impavida</i>	None	VU D2	
White-capped albatross	<i>Thalassarche steadi</i>	None	VU D2	

Deletions from Schedule 1	Graceful sun moth	<i>Synemon gratiosa</i>	VU A3(b)	Priority 4
	Muir's corella	<i>Cacatua pastinator pastinator</i>	EN C2b	Schedule 4
	Gouldian finch	<i>Erythrura gouldiae</i>	EN C2a	Priority 4
	Northern crested shrike-tit	<i>Falcunculus frontatus whitei</i>	EN C2a	Priority 4
	Southern giant petrel	<i>Macronectes giganteus</i>	EN A1a	Priority 4
	Cape gannet	<i>Morus capensis</i>	VU D1+2	None
	Light-mantled albatross	<i>Phoebastria palpebrata</i>	VU A2d	Priority 4
	Western rosella (mallee)	<i>Platyercus icterotis xanthogenys</i>	VU A4c, C2a(i)	Priority 4
Masked booby (eastern Indian Ocean)	<i>Sula dactylatra bedouti</i>	VU D2	None	
Addition to Schedule 4	Muir's corella	<i>Cacatua pastinator pastinator</i>	EN C2b	Schedule 4

Changes to IUCN category and criteria	Lesser noddy	<i>Anous tenuirostris melanops</i>	VU D2	EN B2ab(iii,v)
	Tristan albatross	<i>Diomedea dabbenena</i>	EN B1+2e	CR A4ade
	Gibson's albatross	<i>Diomedea gibsoni</i>	VU D2	EN A4ad
	Sooty albatross	<i>Phoebastria fusca</i>	VU A1a	EN A4bd
	Australian painted snipe	<i>Rostratula benghalensis australis</i>	VU A1b	EN C2a(ii)
	Indian yellow-nosed albatross	<i>Thalassarche carteri</i>	VU A1a, D2	EN A4bde
	Black browed albatross	<i>Thalassarche melanophris</i>	VU A2d+A3d+A4d	EN A4bd
Abrolhos painted button-quail	<i>Turnix varia scintillans</i>	VU D2	EN B1ab(v)+2ab(v), C2a(ii)	
Changes to IUCN criteria only	Noisy scrub-bird	<i>Atrichornis clamosus</i>	EN B2abcde	EN B1ab(iii,v)+2ab(iii,v)
	Forest red-tailed black cockatoo	<i>Calyptorhynchus banksii naso</i>	VU A4bce	VU A2c+3c+4c
	Carnaby's cockatoo	<i>Calyptorhynchus latirostris</i>	EN A1abc+2abc	EN A2bcde+3bcde+4bcde
	Recherche Cape Barren goose	<i>Cereopsis novahollandiae grisea</i>	VU D1+2	VU D1
	Western bristlebird	<i>Dasyornis longirostris</i>	VU C2a	VU C2a(i)
	Wandering albatross	<i>Diomedea exulans</i>	VU A1ade	VU A4bd
	Partridge pigeon (western)	<i>Geophaps smithii blaauwi</i>	VU C2b	VU C2a(ii)
	Malleefowl	<i>Leipoa ocellata</i>	VU A1c	VU A1bce
	Western ground parrot	<i>Pezoporus flaviventris</i>	CR A3b+A4b+C2b	CR A2bc, C1+2a(ii)
	Night parrot	<i>Pezoporus occidentalis</i>	CR C2a	CR C2a(ii)
	White-chinned petrel	<i>Procellaria aequinoctialis</i>	VU A1d+2d	VU A4bcde
	Western whipbird (western heath)	<i>Psophodes nigrogularis nigrogularis</i>	EN D	EN B2ab(iii)
	Grey-headed albatross	<i>Thalassarche chrysostoma</i>	VU A1a	VU A4bd
	Salvin's albatross	<i>Thalassarche salvini</i>	VU D2	VU A4bd
Changes to IUCN category/criteria	Graceful sun-moth	<i>Synemon gratiosa</i>	Endangered B1 and B2(a) (b)(i, ii, iii, iv)	Vulnerable A3(b)
Nomenclature changes	Previous name	Current name	Notes	
Scientific name changes	<i>Austrarchaea mainae</i> (Platnick)	<i>Zephyrarchaea mainae</i> (Platnick)	Rix MG, Harvey MS (2012) Australian Assassins, Part II: A review of the new assassin spider genus <i>Zephyrarchaea</i> (Araneae, Archaeidae) from southern Australia. ZooKeys 191: 1–62. doi: 10.3897/zookeys.191.3070 www.zookeys.org urn:lsid:zoobank.org:pub:2540D0CD-28B4-4079-A63D-4A6156615B8E	
	<i>Aipysurus foliosquama</i> Leaf-scaled sea snake	<i>Aipysurus foliosquama</i> Leaf-scaled sea snake	Spelling error corrected	
	<i>Thalassarche melanophrys</i>	<i>Thalassarche melanophris</i>	Spelling error corrected	
Common name changes	<i>Pezoporus flaviventris</i> ground parrot	<i>Pezoporus flaviventris</i> western ground parrot	Common name corrected	

Flora	Scientific name	Status 16 February 2012	Status 6 November 2012
Additions	<i>Allocasuarina globosa</i> L.A.S.Johnson	Priority 1	Vulnerable D2
	<i>Aluta quadrata</i> Rye & Trudgen	Priority 1	Endangered B1ab(iii,v)+ 2ab(iii,v)
	<i>Gastrolobium humile</i> G Chandler & Crisp	Priority 1	Endangered B1ab(iii,iv)+B2ab(iii,iv)
	<i>Grevillea sp. Gillingarra</i> (R.J. Cranfield 4087)	Priority 1	Critically Endangered D
	<i>Hypocalymma sylvestre</i> Strid & Keighery	Priority 1	Critically Endangered B2ab(iii)
	<i>Leucopogon sp. Flynn</i> (F.Hort, J. Hort & A. Lowrie 859)	Priority 2	Critically Endangered B1ab(iii,v)+B2ab(iii,v).
	<i>Stylidium wilroyense</i> Lowrie, Coates & Kenneally	Priority 2	Critically Endangered C2a(i)
	<i>Picris compacta</i> S.Holzapfel	Priority 1	Presumed Extinct
Change from list of 'Taxa Presumed To Be Extinct' to list of threatened flora (extant)	<i>Ptilotus pyramidatus</i>	Presumed Extinct	Critically Endangered B1 +B2 ab(iii); D
Changes to IUCN category/criteria	<i>Acacia insolita</i> subsp. <i>recurva</i> Maslin	Endangered B1+2ce	Critically Endangered B1ab(ii,iii,v)+2ab(ii,iii,v).
	<i>Ricinocarpos brevis</i> R.J.F. Hend. & Mollemans	Critically Endangered B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v)	Endangered B1ab(ii,iii,v)+2ab(ii,iii,v)
Nomenclature changes	Previous name	New name	Publication/notes
	<i>Muelleranthus crenulatus</i> A.T.Lee	<i>Paragoodia crenulata</i> (A.T.Lee) I.Thomps.	I.R. Thompson in Muellera 29:175(2011)
	<i>Commersonia</i> sp. Mt Groper (R. Cranfield & D. Kabay 9157)	<i>Androcalva perlaria</i> C.F.Wilkins	See C.F.Wilkins & B.A. Whitlock in Austral.Syst.Bot. 24:332 (2011)
	<i>Commersonia adenothalia</i> C.F.Wilkins ms	<i>Androcalva adenothalia</i> C.F.Wilkins	See C.F.Wilkins & B.A. Whitlock in Austral.Syst.Bot. 24:290 (2011)
	<i>Pityrodia axillaris</i>	<i>Dasymalla axillaris</i> Endl.	See B.J. Conn et al. in Austral.Syst.Bot. 24:5 (2011)
	<i>Rulingia</i> sp. Trigwell Bridge (R. Smith s.n. 20.6.89)	<i>Commersonia erythrogyna</i> C.F.Wilkins	See C.F.Wilkins & B.A. Whitlock in Austral.Syst.Bot. 24:257 (2011)
	<i>Stylidium</i> sp. Yalgoo (D. Coultas et al. Opp 01)	<i>Stylidium scintillans</i> Wege	See J.A. Wege in Austral.Syst.Bot. 25:162 (2012)

The next TSSC meeting will be scheduled within the first quarter of 2013.

For further information including application forms and guidelines visit DEC's website (*Call for public nominations for listing (and delisting) of threatened plants and animals*) or contact DEC's Species and Communities Branch on (08) 9334 0455.



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