

Citizen science for monitoring biodiversity

By Nic Dunlop

Globally, amateur naturalists have generated some of the longest records of biodiversity change, particularly for popular, attractive things such as wildflowers, butterflies and birds. Such datasets are becoming increasingly important as we attempt to assess the shifts that may be occurring in relation to climate change or environmental contamination.



Unfortunately, the value of community-generated data is often not fully realised due to failings in elementary scientific rigour in sampling or project design. Government agencies will often be challenged to find adequate resources to manage or monitor biodiversity. Citizen science could assist in bridging some of the enormous gaps in our knowledge and surveillance capacity, especially if this can be guided by the application of relatively simple sampling and experimental design principles.

The Conservation Council of Western Australia (CCWA) has been working with its affiliate groups, other community groups, educational institutions and the Natural Resource Management (NRM) councils to build capacity in the citizenry to monitor changes in ecosystems and biodiversity at the local community level by:

- establishing a network that brings together professional biologists and ecologists and local natural history enthusiasts;
- engaging and training citizen naturalists in carrying out ecological sampling in a way that is experimentally designed and amenable to basic statistical analysis;
- production of the monitoring handbook *Citizen Science for Ecological Monitoring in Western Australia* (2009); and
- engaging citizen naturalists in CCWA's four demonstration projects (which are detailed below).

The Bush Canaries Project uses common bush birds and their feathers



Penguin Watch monitoring at the Great Greenie Gobfest on Woody Island, Esperance. Photo – Jenita Enevoldsen

to monitor lead contamination of the environment within the Esperance townsite.

The Charles Darwin Climate Change Observatory has established long-term biodiversity monitoring protocols for 10 biological indicators at Charles Darwin Reserve (on the mulga-eucalypt line between Wubin and Paynes Find).

The Marine Climate Change Observatory is monitoring the responses of seabirds, corals and fish to changes in ocean climate at Lancelin Island and within the Lancelin Island Lagoon Fish Habitat Protection Area.

The Penguin Watch Project studies little penguins (and their feathers) to monitor changes in marine ecosystems in the Perth and Esperance regions.

Ultimately, CCWA hopes to stimulate the establishment of citizen science-based ecological monitoring projects in communities all over WA, focused on measuring biological responses to climate change, the ecological impact of contaminants, the outcomes of land management actions (in an adaptive management context) and the evaluation of NRM projects. For more information visit www.conservationwa.asn.au or www.climatewatch.org.au.

Citizen science is research or monitoring conducted by individuals or communities in the public interest. As it is not directed by government or driven by the market, its participants are usually wholly or partly unremunerated, although this may not necessarily be the case.

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Urban Nature **UPDATE** *By Julia Cullity*

This issue focuses on citizen science projects and highlights the important contribution the community can give to scientific research. We look at programs that rely on the input of volunteers to collect data such as the Conservation Council's Citizen Science Program, ClimateWatch, Shorebirds 2020, Rapid Bushland Assessments and graceful sun-moth surveys. As a New Year's resolution you might want to consider involvement in citizen science. Choose initiatives that not only interest you but have well-defined questions and methods. In addition, projects need scientific expertise set aside to analyse research findings and plug the gaps in our ecological knowledge. Have a happy festive season!

Rapid Bushland Assessments *By Dr Geoff Barrett*

Rapid Bushland Assessments are simple methods, repeated in different areas and seasons, to give a measure of the biodiversity value of a patch of urban bushland. Six survey methods can be carried out; ant plates, bird list, birds in flowering trees, weed cover, tree health and rabbits/native mammals. Survey results allow bushland to be 'ranked' for biodiversity value and provides a framework for site improvements.

Since starting in November 2008, four community groups have carried out more than 200 surveys across 30 sites in the greater Perth region. Early results indicate:

- Ant diversity was similar across all sites.
- Birds identified as declining in the Perth region (e.g. western spinebill), were more common in larger (>35 ha), less isolated sites (>40 per cent bushland cover within 2 km).
- Fewer birds will visit a flowering tree if it occurs in a patch of bushland that is isolated from other remnant vegetation.
- Sites identified as having poor quality habitat (prior to survey) had greater weed cover, more bare earth, and tended to have less leaf litter.



One of the survey methods in Rapid Bushland Assessment requires volunteers to record how many birds visit flowering trees. Photo – Geoff Barrett

- Quenda (*Isoodon obesulus fusciventer*) will occur in small, degraded bushland sites if they have good ground cover (including weeds) and are not isolated from other remnant vegetation.

Preliminary results suggest larger and less isolated suburban reserves, with patches of dense ground cover, will conserve more biodiversity. The negative impacts of isolation and small patch size appear to be offset by management. For example, if a bushland patch is cared for by a friends group it is in better condition. For more information contact Geoff on 9423 2907 or geoff.barrett@dec.wa.gov.au.

Weed management and natural area restoration course

By Kate Brown

In November, Urban Nature ran the biennial weed management and natural area restoration course at the Department of Environment and Conservation's (DEC's) Dwellingup training centre. Twenty participants from DEC regions across the state as well as local government officers attended the four-day course. The program covered identification and regional prioritisation of invasive plants, techniques and standard procedures for mapping weeds, case studies in weed management and natural area restoration and monitoring the regeneration of native plant communities following removal of a serious weed. Field exercises were focused on Burnside Nature Reserve where Perth Hills District and Urban Nature officers have been restoring the threatened ecological communities '*Banksia attenuata* – *Eucalyptus marginata* woodlands of the eastern side of the Swan Coastal Plain' and '*Corymbia calophylla* – *Eucalyptus marginata* woodlands on sandy clay soils of the southern Swan Coastal Plain' through carefully targeted weed management.



Participants recording cover and diversity of native and introduced flora in permanently marked monitoring plots in Burnside Nature Reserve. Photo – Kate Brown

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Current and archived issues of *Bushland News* are available at www.dec.wa.gov.au/programs/urban-nature/index.html

Autumn Bushland News

Autumn *Bushland News* contributions should be sent to Urban Nature at urban.nature@dec.wa.gov.au by **Wednesday 23 February 2011**.
Compiled and edited by Jo Tregonning.

Beware the water weed salvinia

By Phil Williams

If you have a pond, aquarium or water feature containing a free floating water plant that grows very quickly during summer, you may have the serious water weed *Salvinia molesta*. Regarded as one of the worst water weeds in the world, salvinia has the potential to transform a healthy aquatic environment into a disaster area.

You may have originally received several pieces of the plant from friends who told you it was the fastest growing water plant they had ever seen. Well, on that point, they were correct. Under ideal conditions, salvinia can potentially double its volume every 2–3 days. It can spread to cover the entire water surface with a thick mat of vegetation, eventually reducing oxygen levels in the water leading to stagnation and pollution, and affecting aquatic invertebrates, fish and birds.

Salvinia reproduces solely by fragmentation, growing best when the water temperature is 20–30°C. It can survive being frozen, water temperatures up to 43°C, and salinity levels up to one-tenth that of sea water. These attributes allow it to colonise most water bodies.

Individual plants can be 5–30 cm long, with the younger plants resembling *Azolla*. The adult plant leaves (known as

fronds), are waxy and hairy and occur in groups of threes at each leaf node. Each node consists of a pair of floating leaves which dangle individual roots and a third submerged leaf, which also acts as a root.

Not surprisingly, most new infestations of salvinia occur through people disposing of aquarium or pond contents into waterways or drains that eventually connect to larger fresh water bodies.

Control

Physical removal and burial of the weed is the most practical form of control for backyard ponds. Early detection of small infestations is essential to control. There are several herbicides registered for use on salvinia. If not removed from the water, dead salvinia release nutrients, potentially affecting water quality and helping to fertilise new salvinia growth. Large infestations of salvinia are virtually impossible to eradicate. Biological control of larger infestations with the salvinia weevil *Cyrtobagous salviniae* has been used in eastern Australia from Sydney to Kakadu and elsewhere around the world.

Reporting

As a Weed of National Significance, it is illegal to grow, sell or give away salvinia. Despite this, the illegal importation and sale of salvinia occurs in Australia, and education is key to preventing further



Mature salvinia, showing the overlapping and deeply folded fronds. Photo – Colin Wilson

spread. If you find any water plants that look suspect please contact the Department of Agriculture and Food's Pest and Disease Information Service on freecall 1800 084 881.

More information

Salvinia molesta WONS Weed Management Guide www.weeds.gov.au/publications/guidelines/wons/.

Biological control of the aquatic weed, *Salvinia molesta*. Fact Sheet. www.csiro.au/resources/salvinia-control.html.

Salvinia control manual www.dpi.nsw.gov.au/agriculture/pests-weeds/weeds/profiles/salvinia/salvinia-control-manual.



The different growth stages of salvinia: (right) primary invading form with small flat fronds, (left) open water secondary form with larger, slightly curved fronds and (centre) mat-forming tertiary plants with folded fronds. Photo – Colin Wilson



The Howard River near Darwin, Northern Territory one month after salvinia infestation. Photo – Colin Wilson

Are our kangaroos different?

By Christopher Mayberry

Most people have heard how kangaroo reproduction is different from that of other mammals. Firstly, they carry their young, called a joey, in a pouch. Secondly, they can suspend the development of any unborn joey. And finally, they can have two joeys at different stages of development each drinking milk of a different composition. Well it's true – but not for all kangaroos, and not every marsupial that hops is a kangaroo.

Around Perth we have three types of wallaby, which are like small kangaroos. The quokka (*Setonix brachyurus*) at Rottnest Island is the smallest and probably the best known. They grow to about the size of a domestic cat. The tamar wallaby (*Macropus eugenii*) of Garden Island is a little bigger, as is the western brush wallaby (*M. irma*) that inhabit woodlands of the Darling Scarp.

Next up the size ladder are the wallaroos and euros. They are more heavily built than the kangaroos but otherwise very similar. None of them occur naturally around Perth.

Largest are the kangaroos. Male kangaroos can grow to 70 kg or more. Standing on tip-toe and tail, they can be taller than most men. The females are considerably smaller and rarely weigh much more than 30 kg. There are three species of kangaroo: *M. rufus*, the red kangaroo, native to inland Australia; *M. giganteus*, the eastern grey kangaroo, found in most of Victoria, New South Wales and the eastern two-thirds of Queensland; and *M. fuliginosus*, the western grey kangaroo.

There are three subspecies of western greys. *M. fuliginosus fuliginosus* is native to Kangaroo Island in South Australia. The two mainland subspecies, *M. fuliginosus melanops* in the east, and *M. fuliginosus ocydromus* in the west, form one continuous population from the southern third of Western Australia through South Australia to the north-west corner of Victoria and the western half of New South Wales.



Western grey kangaroo (*Macropus fuliginosus ocydromus*) at Melville golf course showing one joey in the pouch and one at-foot. Photo – Chris Mayberry

Red kangaroo

As inhabitants of the inland, the red kangaroo has developed a reproductive system that can respond quickly to sporadic rain. They can breed at any time of year. Their gestation period is short, about 33 days, and they usually mate again within one day of giving birth. Birth involves an arduous journey for the joey, virtually unassisted, from the mother's cloaca to the pouch. If the joey successfully attaches to a teat and begins to suckle, development of any joey resulting from the subsequent mating is suspended at about one week. This is known as embryonic diapause. Growth of the pouch-young is initially quite slow but beyond two months, the mother needs extra nutrition to maintain herself and supply the increasing needs of her joey. If the feed situation is inadequate her milk supply dries up and the pouch-young dies. The other joey, in diapause, then resumes development. If the feed situation is good, the first joey will continue to grow and leave the pouch at about seven or eight months, although it won't be weaned for a few months more. As the diapaused joey can resume development when the previous joey leaves the pouch, the mother ends up producing two different types of milk, one for the young-at-foot, and the other for her new pouch-young.

And she can end up supporting three joeys: one in diapause, one in the pouch and one at-foot.

Eastern grey kangaroo

The eastern grey kangaroos can also breed at any time of year but seasonal conditions in southern NSW and Victoria favour summer breeding. Mating usually happens after the existing pouch-young leaves the pouch, but eastern greys sometimes mate when the pouch-young is about six months old. Any joey conceived at this mating will go into diapause until the pouch-young leaves the pouch, so grey kangaroos only ever have to support two joeys: one in diapause and one in the pouch, or one in the pouch and one at-foot.

Western grey kangaroo

Although western grey kangaroos in captivity can breed at any time of year, they are spring–summer breeders in the wild. A recent study has found that Perth's western greys only breed in summer, even under year-round favourable conditions such as on a suburban golf course. They don't breed again until the last pouch-young is permanently out of the pouch and they don't have embryonic diapause.

So the answer is yes – our kangaroos are different!

Learning opportunities

Volunteers needed for graceful sun-moth surveys

DEC staff conducted surveys of existing and proposed national parks and nature reserves from Yalgorup to Leeman for the endangered graceful sun-moth (*Synemon gratiosa*). More than 120 volunteers undertook surveys of bushland remnants (mostly *Bush Forever* sites) across the metropolitan region.

The 2010 surveys have shown the species to range well beyond its previously known distribution in banksia woodland of the Swan Region, into the coastal parts of the northern South West and southern Midwest regions.

There will be extensive surveys for adult graceful sun-moths between **late February and early April 2011**. To help with surveys we are seeking the participation of volunteers. For more information email tim.gamblin@dec.wa.gov.au or carly.bishop@dec.wa.gov.au.

Swan-Canning Online Leadership Program

Are you 18–25 years of age with an interest in the Swan-Canning River Catchment? Millennium Kids Inc in partnership with the UWA Centre for Water Research is looking for 24 young people to share ideas and help develop a series of workshops for young people from New Norcia to Perth. This will include water quality monitoring, bush tucker programs, tree planting, birdwatching, photography and habitat protection.

A four-day training course will run during **January 2011**. Cost: \$200. Course costs will cover food, accommodation, a reptile workshop, first aid, kayaking on the Swan, a t-shirt, risk management and assessment, project planning, stakeholder meetings and Working with Children Check card. For more information phone 0418 923 968 or email info@millenniumkids.com.au. Program proudly supported by Lotterywest.

Help scientists study the effects of climate change

By Rich Weatherill

In 2007, the Intergovernmental Panel on Climate Change reported there were 29,000 data sets around the world showing how plants and animals were responding to the changing climate. Only six were from Australia.

ClimateWatch is an Australia-wide Earthwatch initiative to observe more than 100 different species of flora, fauna and fungi. The species have been specifically chosen by scientists to bridge the information gap and better understand how climate change is affecting our natural environment. Scientists are looking for subtle shifts in the timing of natural cycles across the country such as flower opening or bird migration. A similar program in the United Kingdom was launched more than a decade ago and has now recorded its three millionth observation.

At the opening of Western Australian Conservation Week in October 2010, an additional 25 species especially selected for WA were launched. In November, more than 40 people joined together to observe 12 indicator species along a WA pilot demonstration ClimateWatch Trail at the City of Melville's Piney Lakes Reserve in Winthrop.

Help us collect data on the indicator species in your own backyard or park so that climatewatch.org.au can become Australia's leading data resource for environmental scientists studying the effects of climate change. Register and record your observations at www.climatewatch.org.au.

Shorebirds 2020 is a count of waterbirds led by Birds Australia that will be held during **February 2011** in the Peel-Yalgorup Ramsar System. Interested volunteers should contact the Peel-Harvey Catchment Council's Ramsar Coordinator on 9550 3283 or email Dick.Rule@westnet.com.au.



Wendy Low and her son record the flowering time of native buttercups (*Hibbertia hypericoides*) as part of WA's ClimateWatch. Photo – Tony Issakov

Conservation Volunteers Summer of Discovery

program offers a fantastic series of activities, workshops and events across Australia during **December and January** to engage local communities and holiday-makers with the natural environment while promoting sustainability, conservation and health in the outdoors. For more information phone 1800 032 501 or visit www.conservationvolunteers.com.au.

Save OUR Bushland from *Phytophthora Dieback* is a promotional project to get greater community and school involvement in protecting bushland from *Phytophthora*. Upper primary school teachers will run the award-winning Discovering Dieback education program at their schools. With the help of the Dieback Working Group, Eastern Metropolitan Regional Council, local government and friends groups it is hoped that 20 ha of high conservation bushland will be protected. To participate contact Brendan Nock on 9424 2248 or brendan.nock@emrc.org.au.

what's on

Opportunities for you to take part! Visitors always welcome but please confirm activities with the contact person. Most activities are FREE!

Recurrent activities



Saturdays 9am

Bushcare activities with the Friends of Brixton Street Wetlands are on the third Saturday of each month. Call Regina 9459 2964.



Saturdays

Bushcare activities with the Mt Henry Conservation Group are on the fourth Saturday of each month. Email Jan.King@acquinas.wa.edu.au.



Sundays 9–11am

Bushcare activities with Cottesloe Coastcare are on the first Sunday of each month. Visit www.cottesloecoastcare.org for details or contact Robyn on 9384 7668 or info@cottesloecoastcare.org.



Sundays 9.45am–12 noon

Bushcare activities with the Friends of Piesse Brook are on the third Sunday of each month. Contact Gerry Brown 9293 2517, Bridgett Hogarth bhogarth@ozemail.com.au, Linda Stanley linda@johnstanley.cc or visit www.friendsofpiessebrook.org.au.



Sundays 9–10.30am

Bushcare activities at Throssell Reserve, Eastern Hills in the Jane Brook Catchment are on the second Sunday of each month. Phone Una Bell 9572 1447.



Sundays 8–10am

Bushcare activities every Sunday with the Friends of Shenton Park Bushland. Contact Dani 9381 3470 or bojel@it.net.au.



Sundays 9am–12 noon

Bushcare activities with the Friends of the Spectacles (Kwinana) are on the third Sunday of each month. Contact Lynda Smith on 9439 1928 or outback3@iinet.net.au.



Sundays 8.30am

Bushcare activities with the Friends of Wireless Hill are on the second and fourth Sunday of each month. Meet at main carpark. Contact Margaret 0402 105 649 or s3mmatthews@hotmail.com.



Mondays, Wednesdays, Fridays 9am–12 noon

Bushcare activities and wetlands walk trail maintenance with Yanchep National Park volunteers. Call Julia 9405 0771.



Tuesdays, Thursdays 8–11am

Koala maintenance at Yanchep National Park. Call Julia 9405 0771.



Thursdays 8–9am

Bushcare activities every Thursday with Byford Enviro-Link. Call Johanne Garvey or Kristy Gregory 9526 0199.



Conservation Volunteers Australia activity schedule.

Overnight country trips or one-day activities. Call Andrew 9227 5711 or visit www.conservationvolunteers.com.au.



Research into bird populations

with the Herdsman Lake Bird Banding Group. People are welcome to call Bill Rutherford (ABBBS Coordinator) 0438 910 252 and organise a visit.

February



4 Friday 7.30pm

WA Naturalists' Club Annual General Meeting. Hew Roberts Lecture Theatre, Nedlands. Visit www.wanats.iinet.net.au/index.html for all events.

Please send us your April, May and June 2011 events by Wednesday 23 February 2011.



19 Saturday 9am–1pm (optional 2.30pm)

GPS and mapping workshop for bush regenerators with Urban Nature. Learn how to collect GPS data and make maps using OziExplorer software overlaid onto GoogleEarth aerial photos. Contact Julia on 9423 2925 or julia.cullity@dec.wa.gov.au.



26 Friday 2–5pm

Environmental Weed Action Network (EWAN) Annual General Meeting. Piney Lakes, Melville. Call Cathie on 9339 2439.

March



6 Sunday 8.30am

Guided walk with the Friends of Mirrabooka. Meet at Thyme Court, Mirrabooka. Contact 9344 2872 or friends.of.mirrabooka.bushland@gmail.com.



12 Saturday 9am–12.30pm

Bushland conservation skills workshop. Protecting bushland, managing weeds and dieback. Serpentine–Jarrahdale. Free. Contact Green Skills to register on 9360 6667 or murdoch@greenskills.org.au.

Activities key



Hands on – bushland and wetland management activities.



Walks and tours – look, listen and enjoy guided walks and excursions.



Skills development activities – talks, presentations, training courses and workshops.



Meetings and events – group meetings, expos, festivals and conferences.

Highlights

2011 International Year of Forests. Celebrating forests for people. Visit www.un.org/en/events/iyof2011/index.shtml.

10 Monday–23 Sunday January

Nearer to Nature activities by DEC will be held daily during the summer holidays for children 4–14 years at Mundaring, John Forrest, Canning River, Woodman Point and Yanchep. Visit www.dec.wa.gov.au/n2n or contact 9295 2244 or n2n@dec.wa.gov.au.

19 Wednesday–21 Friday January

Catchments, Corridors and Coasts: A Snapshot of Environmental Education in WA. Australian Association for Environmental Education (AAEE). Learn about environmental education and how to undertake it. Cost: \$150–\$330. Contact Catherine Baudains on 0409 374 231 or c.baudains@murdoch.edu.au.

2 Tuesday February

2011 WA Wetland Management Conference. Cockburn Wetlands Education Centre, Bibra Lake. Contact Denise Crosbie on 9417 8460 or denise@cockburnwetlands.org.au.

2 Tuesday–5 Saturday February

Integrated Water Management Conference. Murdoch University. Visit www.iwm2011.com/pages/program.html.

6 Sunday March

2011 Clean Up Australia Day. Visit www.cleanup.org.au/au/.

19 Tuesday–23 Saturday July

6th World Environmental Education Conference, Brisbane, Australia. Visit www.weec2011.org.

Funding opportunities

Coastwest grants

Coastwest grants provide opportunities and resources to assist community groups and coastal managers to undertake on-ground coastal management activities, to facilitate community involvement and capacity-building through the implementation of existing coastal management plans. **Opens February 2011.**

Visit www.planning.wa.gov.au/Plans+and+policies/Statewide+planning/Coastwest/115.aspx.

Environmental Community Grants

2011 is the third year of the state government's \$6 million four-year Environmental Community Grants program administered by DEC. The funding round is likely to **open in late February 2011.** Visit www.dec.wa.gov.au/ecg.

Swan Landcare Program

For 12 years, the Swan Landcare Program (formerly Swan Alcoa Landcare Program) has run an annual funding program to assist community groups in the restoration and management of bushland, wetland and foreshore vegetation, and the protection and enhancement of surface and groundwater quality. **Opens February–March 2011.** Visit www.perthregionnrm.com.

State NRM Program, Community Grants Program 2010–2011

The state government has allocated \$3 million for a community grants component of the State NRM Program in 2010–11. Eligible groups can apply for grants of between \$10,000 and \$50,000 to take action to help protect and conserve natural resource assets in Western Australia. **Closes 7 January 2011.** Visit www.nrm.wa.gov.au/stateNRMprogram.



Western Australian Environment Awards

Helena River Catchment Group: Winner Bush, Land and Waterways Award for their 10-year program rehabilitating 5 km of the Helena River from Pipehead Dam to Scott Street Bridge.

Canning River Regional Park Volunteers: Winner Metro Community Award for their 20 years of work in the 266 ha reserve along the Canning River.

Green Skills: Winner Community Achievement – Regional Category and Overall 2010 WA Environment Awards Winner for 21 years of environmental sustainability programs, employment programs, and quality environmental training in metropolitan and regional areas.

For more information visit www.dec.wa.gov.au/content/category/16/530/1436/.

Bushcare at Quinns Rocks *By David Wake*

Located on the coast 35 km north of Perth, Quinns Rocks is on the northern edge of our expanding urban footprint. Twenty-five years ago the old townsite was surrounded by bushland and the Quinns Rocks Environmental Group formed to save some of it.

The group has advocated conservation of bush, lobbying on many development proposals and promoting community awareness. A significant campaign was to protect coastal bushland between Burns Beach and Mindarie resulting in a proposed conservation park to incorporate 380 ha of coastal heathland and banksia woodland. This park should link through to Neerabup National Park.

On the ground, we have worked in local reserves to regenerate bushland.

The local council (City of Wanneroo) now has a conservation team and by working together we are trying to maintain biodiversity in remnant bush at Quinns Rocks and Mindarie. Our survey of flora and fauna in the reserves in 1994–96 has informed planning and management of the reserves, though threats remain as the local school and recreational facilities expand at the expense of the bush.

The Quinns Rocks group sees protecting bushland as a long-term challenge. With rapid urbanisation of the local landscape over the past 25 years, looking after our remaining natural heritage is all the more important.

For more information contact David on 9305 9575 or quinnsenviro@yaho.com.au.



A decade of environmental, cultural and educational achievements were recognised when the partnership between Baldvis Children's Forest Inc and Baldvis Primary School won the 2010 National Landcare Australia Education Award in June and a 2010 NAB School's First Award in October. Photo – Jo Tregonning



Joan Payne was recognised in the Queen's Birthday Honours in June 2010, and has been made a Member of the Order of Australia for service to the protection and conservation of wetland bird species and the urban bushland environment in Western Australia. Congratulations Joan. Photo – Ruth Clark

Phascogales inspire *By Leonie Stubbs*

2010 has been a great year for our enthusiastic group and we have achieved much during our weeding, survey work and bush walks at Paganoni. Following a press article about our success in gaining an Environmental Community Grant into phascogale research, we were contacted by a year two class at St Bernadettes Catholic Primary School in Port Kennedy. The class was studying endangered Australian animals, saw the article and sent us letters of support for

our work with the phascogales. The class then organised a cake stall at the school's open night and raised \$125. Brian Chambers from The University of Western Australia, who is supervising the phascogale project, and I went to the school. Brian kept the class enthralled answering many questions about the work he does with animals as well as showing them how the phascogales would be captured and the bait used.

We are planning to update the class once the surveys are completed. It is likely that the funds will be put towards the purchase of nest boxes if the availability of tree hollows is found to be limiting the number of phascogales that Paganoni Swamp Reserve can support.

For more information contact Leonie on 0439 921 298 or FoP@westnet.com.au. For information on volunteering opportunities with Rockingham Lakes Regional Park call 9431 6500.



Please send us your regional report (150–200 words) and a photo by Wednesday 23 February 2011. Text may be edited in response to volume of submitted reports.

News from Kalamunda *By Rita Riedel*

In 2009, students from Lesmurdie Senior High School working in Ray Owen Reserve stumbled across a very large, old jarrah tree stump. Bruce Glover, Coordinator of Friends of Ray Owen Reserve, helped students measure the stump and excavate the stump's long lateral roots. The roots extended a distance of 9.2 metres across the top of the granitic sheet rock before descending through the rock. In July 2010, students celebrated Schools Tree Day by planting jarrah seedlings where each of the five lateral roots from the old stump started their descent to water.

Investigations by Bruce revealed some interesting history. Ray Owen Reserve was first logged around 1903, with the jarrah logs being dragged by horse and timber jinker to a number of small saw mills that had been established in Lesmurdie, South Kalamunda and Walliston. After milling, some of the timber was sent down the Kalamunda-to-Midland railway and on to Fremantle for export as railway sleepers. Other timber was made into fruit packing boxes for the district's expanding orchard industry.

A commemorative tree planting ceremony was also held in July to celebrate the birth of babies born between February 2009



Lesmurdie Senior High students assisting Friends of Ray Owen Reserve with measuring the roots of an old jarrah stump and planting new seedlings. Photo – Rita Riedel

and April 2010 in the Shire of Kalamunda. Commemorative plaques and 154 new trees were planted by the babies' families. In August as part of National Tree Day, more than 80 people planted 400 seedlings at Fleming Reserve.

For more information contact Rita on 9257 9825 or rita.riedel@kalamunda.wa.gov.au.

Botanical surprise at Porteous Park *By Mike Norman*

Porteous Park is a small remnant of banksia woodland in Sorrento with more than 100 species of flowering plants. A friends group was formed in 2002 to restore this degraded bushland remnant back to very good condition. We do most of the hand weeding (recently trialling various special tools) to target 22 weed species, while the City of Joondalup spray herbicide, particularly for veldt grass. A 2010 DEC Environmental Community Grant enabled us to continue to employ a skilled bushland regenerator to help remove one-leaf cape tulip (*Moraea flaccida*) and pink gladiolus (*Gladiolus caryophyllaceus*).

Planting of local provenance native seedlings in previously cleared patches has supplemented natural regeneration.

Some of this natural regeneration has seen species not recorded in the park since 2002. In 2009 we noted banded greenhood orchids (*Pterostylis vittata*) and in 2010 the bronze leek orchid (*Prasophyllum giganteum*). We hope that our work removing competing weed species is contributing to a return of normal ecological processes within the bushland. In October, whilst quietly weeding, I was rewarded by 20 Carnaby's cockatoos landing in the parrot bush next to me. A nice experience! But how long will it last? I applaud the efforts of all those trying to restore the populations of the black cockatoos.

For more information visit www.porteouspark.org.au or phone Mike on 9448 1978.

Twenty-five years of rubbish *By Don Poynton*

In October, volunteers from Friends of Marmion Marine Park, Joondalup Community Coast Care Forum and Stirling Natural Environment Coastcare surveyed 100-metre areas for litter on nine beaches between Bennion Street in Trigg and Burns Beach for the Coast to Coast Tangaroa Blue project.

The first clean-up and survey was conducted in 1985 to establish a baseline before the marine park was proclaimed in 1987. In the 25 years since the first survey there has been a great deal of urban development along the marine park, and this has led to greater quantities of litter being collected.

This year 43.8 kg (1,735 items) of rubbish were collected from the beaches and sorted at the Department of Fisheries workshop. There was a 16 per cent increase in the number of items collected, particularly cigarette butts, bottle tops and aluminium cans. Plastic again dominated the collection which is disappointing as it is particularly harmful to marine organisms and birds through ingestion and entanglement.

For more information call Don on 0419 460 301.

Friends of Mirrabooka

By Graham Zemunik

Formed in 2010, the Friends of Mirrabooka Bushland conduct walks through the reserve on the first Sunday of the month (excepting January and February) starting at 8:30 am, followed by our monthly meeting. The friends have input to the local council and the WA Planning Commission (who are currently fencing part of the reserve). We have recently assisted with flora surveys at the reserve with DEC.

Owned by the WAPC, the Bush Forever site covers more than 95 ha of banksia woodland. The bulk of the reserve sits between Mirrabooka and Alexander drives, north of Reid Highway, with a small fragment east of Alexander Drive. Much of the bushland is in excellent condition, with a diverse understorey of herbs, shrubs and sedges, and overstorey trees. Dominant trees include candle and firewood banksias (*B. attenuata* and *B. menziesii*), sheoak (*Allocasuarina fraseriana*), jarrah (*Eucalyptus marginata*) and the holly-leaved banksia (*B. ilicifolia*). The reserve is host to many bird species, including red-tailed black cockatoos (*Calyptorhynchus banksii*) and rainbow bee-eaters (*Merops ornatus*). It also sustains a population of black-gloved wallaby (*Macropus irma*).

All are welcome to contribute to the management of the reserve and to take part in monthly walks. For more information phone 9344 2872 or email friends.of.mirrabooka.bushland@gmail.com.



Jewel beetle on *Conospermum* at Mirrabooka bushland. Photo – Graham Zemunik



After three weeks of foxes, cats and rats caught on camera at Challenger Beach in Naval Base, the wildlife monitoring camera finally reveals bandicoot activity in our coastal rehabilitation area during October 2010. Note the clay refuge tube installed amongst the vegetation. Photo – Craig Wilson (Coastcare Officer, Perth Region NRM)

Carnaby's cockatoo flies into regional meeting

By Tori Lowe

Special guests at the quarterly Perth Region NRM East Reference Group meeting brought NRM issues to life recently. Harmony the Carnaby's cockatoo attended the meeting with Dr Geoff Barrett and Zara Kivell. The visit highlighted the declining numbers of Carnaby's cockatoos in Perth and gave NRM members the opportunity to interact with this beautiful threatened cockatoo. The need for a cross-regional, strategic approach to ensure the survival of this iconic bird was highlighted. Perth Region NRM has set up a series of geographical reference groups to establish the vision for the environment that we want for the future in the Perth region.

So what do Carnaby's require? Roosting preferences include: tall, dense-canopied trees; approximately 5ha of clumped trees; height in the landscape; close proximity of nesting site to feeding habitat and to a water source. Feeding preferences include seeds of *Banksia*, *Dryandra*, *Hakea*, *Eucalyptus*, *Grevillea* and *Pinus* and fruiting almonds. Breeding preferences include hollows of



Female Carnaby's cockatoo. Photo – Bansi Shah

smooth-barked eucalypts (mainly in the Wheatbelt).

For more information about black cockatoos visit www.cockatooicare.com. To be involved with the monitoring of cockatoos visit birdsaustralia.ala.org.au/BDRS/home.htm. For information about the East Reference Group contact Victoria Lowe on 9374 3325 or Victoria.Lowe@perthregionnrm.com.

World's largest arborescent mistletoe

By Professor Stephen Hopper

Few places on Earth have their bushland adorned with a flowering plant as stunning as the Western Australian Christmas tree, *Nuytsia floribunda*. Irresistible to the botanically curious, *Nuytsia* comprises just one species – an extensively clonal mistletoe endemic to the Southwest Australian Floristic Region.

This parasitic mistletoe has a remarkably diverse host range, from annuals to shrubs and trees, both exotic and native. Its roots may extend more than 100 metres out from the trunk in their search for hosts. So tenacious and exploratory is its quest for hosts, that sometimes underground telephone cables are severed by *Nuytsia* roots in shallow topsoil.

Botany

Botanically, *Nuytsia* is distinctive with three-winged, dry fruits 2–3 cm wide, anomalous among mistletoes in being dispersed by the wind. It has brittle arching branches and its seeds have a large embryo completely enclosed within the nutritious endosperm with the extraordinary number of 3–6 free, well-developed cotyledons or seedling leaves (the vast majority of plants have only one or two cotyledons).

A mechanism involving a secateur-like structure within an encircling 'haustorium' is used to sever the roots or rhizomes of host species. This enables *Nuytsia* tissue to plunder the host's vascular tissue in a unique manner. Such distinctive attributes point to a deep ancestry for *Nuytsia*, affirmed by DNA sequencing in recent decades indicating that the genus evolved at the point of origin of showy mistletoes.

History

The taxonomic journal of the Western Australian Herbarium, established in 1970, is named *Nuytsia* after the genus. The tree was named for Dutch official Pieter Nuyts (1598–1655), a politician, diplomat and explorer. Nuyts was part of the crew of the Dutch East India Company's *Gulden Zeepaard* or *Seepaert* (Golden Seahorse), under the command of Francois Thijssen, who first saw the WA coast at Point Nuyts, near Walpole, in January 1627.



The vibrant golden flowers of mistletoe Nuytsia floribunda at Condingup Peak. The blooms are a feature of our south-west bushland during our summer Christmas season. Photo – Stephen D Hopper

Sightings of the conspicuous orange-canopied *Nuytsia* were likely whenever the *Gulden Zeepaard* approached the coast as far as the Recherche Archipelago east of Esperance. Australia's most influential pioneering botanist and naturalist on the Flinders expedition, Robert Brown, coined the new generic name after Nuyts in 1832.

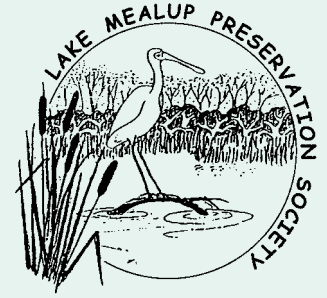
Of course, Nyoongar people had profound and long-lasting appreciation of such a distinctive south-west tree. Near Perth, Nyoongars held *Nuytsia* in awe, regarding them as sacred *Kaanya* trees where the *kaa-nya* or *wee-urn*, souls of the spirits of the newly dead, were to be found.

Consequently, no shelter was taken beneath *Nuytsia* trees, nor their leaves or flowers picked or disturbed. Further north, Nyoongars held different beliefs, and wore garlands of flowers as armbands and belts when attending meetings with neighbours. Moreover, the pith of the long roots of *Nuytsia* were regarded as a delicacy in some districts, known to Nyoongars as *moodgar* or similar (*mutdhoor*, *modyart*, *mungah*, *mandelup*, *modjar*, *muja*, *moojar*, *mooja*, *mutyal* – hence the locality of Muja).

More information

Hopper, SD (2010). '*Nuytsia floribunda* Loranthaceae'. *Curtis's Botanical Magazine* 26 (4): 333–368.

Lake Mealup Preservation Society Inc By Peter Wilmot



The Lake Mealup Preservation Society Inc (LMPS) was formed with the aim of preserving the natural values of Lake Mealup. The society purchased the land and worked to ensure land tenure for future conservation. Challenged by declining water levels in the past decade, the society is working proactively with other stakeholders to address water levels and water quality in the lake.

Lake Mealup is a large freshwater wetland 2 km east of the Harvey Estuary. It is part of the Peel-Yalgorup System listed under the Ramsar Convention as a Wetland of International Importance. The lake is completely surrounded by mature paperbarks, mainly *Melaleuca raphiophylla*, backed by flooded gum (*Eucalyptus rudis*). The bushland to the west of the lake consists of eucalypt and banksia woodland. More than 120 birds and 150 native plants have been recorded.

Land tenure

Prior to 1986, Lake Mealup was privately owned apart from a small nature reserve in the centre of the lake. Between 1986 and 1988 LMPS purchased 124 ha of wetland and bushland at Lake Mealup. During this time DEC (then CALM) purchased additional land adjoining its existing reserve. By 1988 virtually all of the Lake Mealup water body and surrounding bushland were under management for nature conservation. The property has been registered with the department's *Land for Wildlife* scheme since 1998. In 2003 LMPS placed a conservation covenant on the property through the National Trust of Australia (WA) covenanting scheme.

Management

LMPS actively manages the property. We have upgraded fencing to exclude stock and carry out weed control and revegetation. Bimonthly baiting is carried out for fox control. Monitoring of flora, fauna and water quality have been undertaken for many years.

A program to study the hydrology of Lake Mealup using an extensive piezometer network has been ongoing since 1996 under the direction of the V&C Semeniuk Research Group. Declining water levels in Lake Mealup since the early 1990s have been a major concern to LMPS. Lower rainfall has exacerbated a reduction in natural runoff due to the installation of agricultural drains, resulting in the lake now



Lake Mealup. Photo – Peter Wilmot



Society members at a management meeting in August. Photo – Peter Murphy (National Trust)

being dry for 4–6 months each year. The exposure of sulphidic sediments in the lake bed and consequent acidification has caused a serious deterioration in water quality. Waterbird use has declined and the bulrush *Typha orientalis* has increased in extent. Our records since 1987 show that when water levels were higher and the lake bed was not exposed for extended periods, water quality was better, waterbird activity was higher and *Typha* coverage reduced.

To respond to these concerns the *Lake Mealup recovery plan* has been developed by DEC in cooperation with LMPS, Peel Harvey Catchment Council and other stakeholders, now constituted in the Lake Mealup Technical Advisory Group (TAG). A key component of the plan is

the construction of a weir in the Mealup Main Drain which passes immediately to the south of Lake Mealup. The weir will enable water from the drain to be used to maintain water levels in the lake. The weir will be in place prior to the first rains in 2011. An intensive monitoring program is part of the adaptive management plan which will be overseen by the TAG. LMPS members are heavily involved in both the monitoring program and management plan. We are hopeful that this cooperative initiative will ultimately restore Lake Mealup to its former glory.

For more information or to get involved contact Peter Wilmot on 9244 3015 or Kate Creed on 9316 8109. Alternatively, email Pete at jknight@flyingedits.com.au.

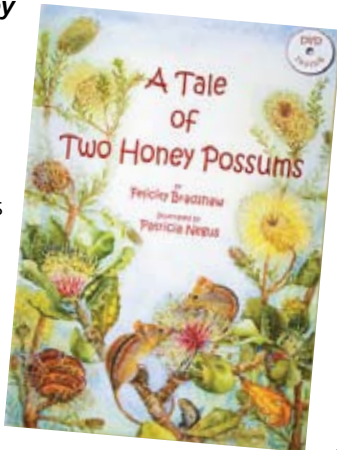
Resources

New publications

A guide to the use of pesticides in Western Australia (2010) provides information on legislation, policies and best practice for the safe and effective use of pesticides in WA. Department of Health. Visit www.health.wa.gov.au/publications.

A Tale of Two Honey

Possums by Felicity Bradshaw. Illustrated by Patricia Negus (2010). A beautifully illustrated children's book about two joeys during the first year of their life. Biological and ecological information based on 20 years of scientific research in south-west WA are interwoven in the story. Includes DVD. Cost: \$25 plus postage. Visit www.honeypossum.com.au.



Australia's Biodiversity Conservation Strategy 2010–2030 sets 10 targets to measure the nation's progress in protecting our natural environment. Available for you to review at www.environment.gov.au/biodiversity/strategy/index.html.

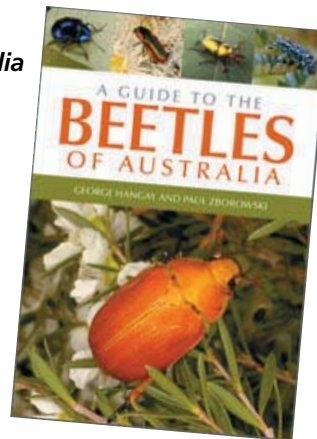
National Animal Pest Alert brochures on Canada goose, red-whiskered bulbul and barbary dove provide information on how to distinguish these non-native species from similar-looking native birds, and the risks these invasive species could pose to Australian agriculture and environment. Visit www.agric.wa.gov.au/PC_93140.html.

Treasuring wandoo – such a marvellous tree: a tribute to Joanna Seabrook.

This booklet portrays wandoo's magnificence as one of south-west Australia's most important trees. Its many virtues are highlighted along with the need to safeguard its dwindling remnants. Prepared by Liz Manning and Peter White on behalf of the Wandoo Recovery Group. Visit www.dec.wa.gov.au/content/category/147/839/1628/ and click on Wandoo Articles.

A Guide to the Beetles of Australia

by George Hangay and Paul Zborowski, (2010). Winner of the 2010 Whitley Medal, this book is a fascinating introduction to the huge and diverse group of insects, the Coleoptera. 248pp. CSIRO Publishing. Cost: \$44.95



Recent research

Riordan E C, Rundel P W, Brigham C, and Tiszler J (2008) 'Morphological traits and invasive potential of the alien *Euphorbia terracina* (Euphorbiaceae) in coastal Southern California'. *Madrono* 55 (1): 52–59.

Hingston A B (2006) 'Is the introduced Bumblebee (*Bombus terrestris*) assisting the naturalization of *Agapanthus praecox* ssp. *orientalis* in Tasmania?' *Ecological Management & Restoration* 7 (3): 236–240.

Crall A W, Newman G J, Jarnevich C S, Stohlgren T J, Waller D M and Graham J (2010) 'Improving and integrating data on invasive species collected by citizen scientists' *Biological Invasions* 12 (10): 3419–3428.

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