

Understanding Perth's biodiversity in 2010 International Year of Biodiversity

Issue 73

Autumn 2010

Time of Djeran and Makuru in the Nyoongar calendar.

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We often hear that the South West Region of Western Australia has been named as one of the world's 34 biodiversity hotspots, but what does this mean?

Biodiversity can be defined as 'the variety of all life on Earth, including ecosystem diversity, species diversity and genetic diversity'. Biodiversity hotspots were first identified in 1988. They are found across every continent except Antarctica and are characterised by exceptional levels of plant endemism (at least 1,500 endemic vascular plant species) that are threatened by loss of habitat (at least 70 per cent of original).

The South West Region of WA (from Kalbarri in the north-west to Esperance in the south-east) is one such hotspot. Approximately 53 per cent (2,950) of the area's vascular plants, 4.4 per cent (12) of native bird species, 20 per cent (12) of mammals, 75 per cent (22) of amphibians and 15 per cent (30) of reptiles are endemic to the region. This endemism is attributed to millions of years of isolation from the rest of Australia by the country's vast central deserts, extreme climate shifts and poor soils.

Levels of species richness and endemism are very high in areas such as the Stirling and Ravensthorpe ranges, Fitzgerald River and Mt Lesueur. Greater Perth, although having lower levels than these country areas, is also considered a biodiversity node with a very high total number of plant species and a high proportion of short-range endemic plants (confined to very small geographical areas).

Perth is also the city with the greatest known number of reptile species in the world (we have 71 species). The greatest number of reptile species are found in the coastal



View towards Perth city from the Darling Scarp near Lesmurdie. Photo – Julia Cullity

sands with species decreasing as we move east across the landforms. The Swan River is a natural barrier with many different species of reptiles occurring to the north and south.

The greatest human impact in the South West Region has been the clearing of an estimated 70 per cent of original native vegetation for agriculture, urbanisation and mining. Other serious threats to the natural vegetation are the spread of *Phytophthora*, the introduction of alien species, pollution and climate change.

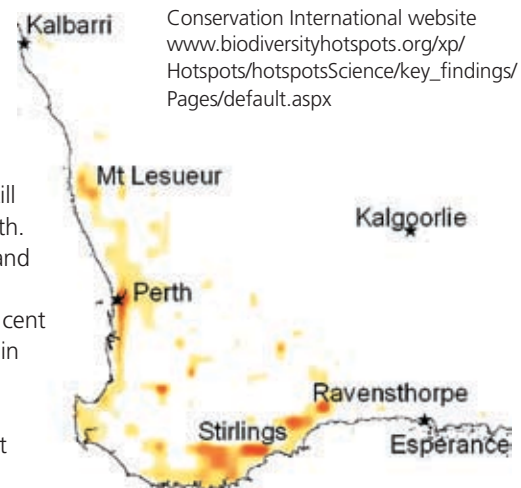
Vegetation clearing is still occurring in greater Perth. Figures from the Perth and South West Biodiversity Projects indicate 72 per cent of the Swan Coastal Plain IBRA region had been cleared by 2001 with this rising to 78 per cent cleared some five years later. This trend was mirrored in the Jarrah Forest IBRA region with 24 per cent cleared by 2001 and a further two per cent cleared during the following five years. Approximately one quarter

of the remaining bushland in these IBRA regions is in the formal conservation estate.

Biodiversity hotspot habitats face a high risk of elimination if not protected. Community involvement in protecting and actively managing bushland is very important in helping ensure our biodiversity values remain.

More information

Conservation International website www.biodiversityhotspots.org/xp/Hotspots/hotspotsScience/key_findings/Pages/default.aspx



Total number of plant species in South West Australia (species richness in 25 x 25 km grids). Centres of high plant diversity are located in urban, agricultural and natural 'wilderness' areas. Source: Adapted from Hopper and Gioia (2004)

www.dec.wa.gov.au



Department of
Environment and Conservation



Bushland News is a quarterly newsletter of Urban Nature, a Department of Environment and Conservation (DEC) program to support community involvement in bushland conservation.

Urban Nature **UPDATE** *by Julia Cullity*

The Urban Nature team and many community volunteer groups have been involved in surveys for the critically endangered graceful sun moth (*Synemon gratiosa*), a rare local that only flies during March. We will pass on the survey results when they come to hand; however, several new populations have been found. Autumn is a good time to plan for the management of grassy weeds in time for winter treatment programs and this issue looks at the ubiquitous weed of the Swan Coastal Plain, perennial veldt grass (*Ehrharta calycina*). Did your patch experience bushfire this summer? Many weedy bulbs as well as grasses are stimulated by fire so plan to protect intact bushland from weed invasion with a control program that targets priority weeds as they emerge. Funding rounds are open that could help you put plans into action. Autumn is also the time to listen for frogs as they begin to call and breed after the first breaking rains.

Grass weed species management notes now on *FloraBase*

Following on from the release of management notes on geophyte and woody weed species in the Swan Weeds Database, profiles of 73 of the most serious grass weeds in the region have been completed and are now available on *FloraBase*. The project is a collaboration between DEC's Urban Nature program, the WA Herbarium, and also draws funding from a \$4.75 million targeted investment by DEC in 2009–10 to implement projects for the conservation of Western Australia's native plants, animals and ecosystems.

In addition to the information normally available on *FloraBase*, the grass weed management notes provide valuable information on biology, ecology and methods to control some of the region's most serious established and emerging perennial and annual grass weeds. One example is the little-known but highly invasive wetland grass, reed sweet grass (*Glyceria maxima*). Reed sweet grass is an aggressive species that forms dense impenetrable stands over large areas, reduces plant species diversity, restricts access to waterways, inhibits germination of other species, makes aerobic waterways anaerobic, impedes water flow, accelerates siltation, reduces native



Reed sweet grass (*Glyceria maxima*) invading understorey of the Gingin Brook. This species is currently limited in distribution, but can have significant impacts on wetlands and waterways. Photo – Kate Brown

macroinvertebrate diversity and creates suitable environments for mosquito larvae and other pests. Reed sweet grass grows actively during the summer months and can be controlled by herbicide application in late summer to autumn.

The notes contain the most current information available and highlight some of the impacts and interesting biology of some introduced grasses, from allelopathic properties, ability to hybridise, methods of dispersal, and seed biology. Control information is given to help manage these species where they occur in bushland or wetlands.

The notes are available by searching by species on <http://florabase.dec.wa.gov.au>.

Environmental weed publications

Urban Nature has recently added several publications to its webpage. These publications are the outcomes of a Perth Region NRM (formerly Swan Catchment Council) and a Department of Environment and Conservation (DEC) environmental weed project completed in 2008. Visit www.dec.wa.gov.au navigate using the tabs 'management and protection' and 'programs'; go to the 'urban nature' webpage and scroll down to publications.

The first publication is a census and prioritisation of all environmental weeds known in the region. A tabled list of all 900 species is in a searchable spreadsheet, and a summary document outlines the region's highest 30 priority species and explains the spreadsheet terminology.

The second group of publications includes individual strategic plans for six of the priority weeds within the region, including the two National Alert species, yellow soldier (*Lachenalia reflexa*) and white weeping broom (*Retama raetam*).

Winter Bushland News

Winter *Bushland News* contributions should be sent to Urban Nature at urban.nature@dec.wa.gov.au by **Friday 21 May 2010**. Compiled and edited by Jo Tregonning.

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

Perennial veldt grass (*Ehrharta calycina*) By Julia Cullity

Perennial veldt grass (*Ehrharta calycina*) is a serious environmental weed of Perth's bushland capable of invading good condition vegetation, competing with and displacing native plants and disrupting fire ecology.

A native of southern Africa, perennial veldt was introduced to Australia as a pasture grass but was of limited use for agriculture. During the past century it has naturalised and become widespread in southern Australia and is also a threat to natural areas in the USA, Chile and New Zealand.

Description and biology

Perennial veldt is a long-lived clumping perennial grass 30–70 cm high with short rhizomes and purple-red flowers held above the leaves. It grows actively through the winter and dies back and becomes dormant over the dry summer months. Perennial veldt reproduces from seed and is a prolific seeder that accumulates a large soil seed bank. The seeds persist in the soil for less than five years. Germination occurs in response to seasonal rainfall with the majority of germination concentrated in early winter (June). Adult plants begin to flower in late winter (mid-August) and seed is normally set by late spring (November). Work in Kings Park has shown that seedlings produce very few seed in their first year but go on to produce prolific seed in subsequent years.



If left unmanaged, perennial veldt grass can out-compete native plants and dominate the understory. Photo – Julia Cullity

Confusing species

Two other grass species could be mistaken for perennial veldt. Weeping grass (*Microleana stipoides*) is a native grass, distinguished from perennial veldt by a more prostrate, spreading habit, wirier stems, deeper-green leaves and a weeping and differently-shaped inflorescence. Annual veldt grass (*Ehrharta longiflora*) is distinguished from perennial veldt by its annual life history, less erect habit, brighter lime-green leaves and larger florets with long awns.

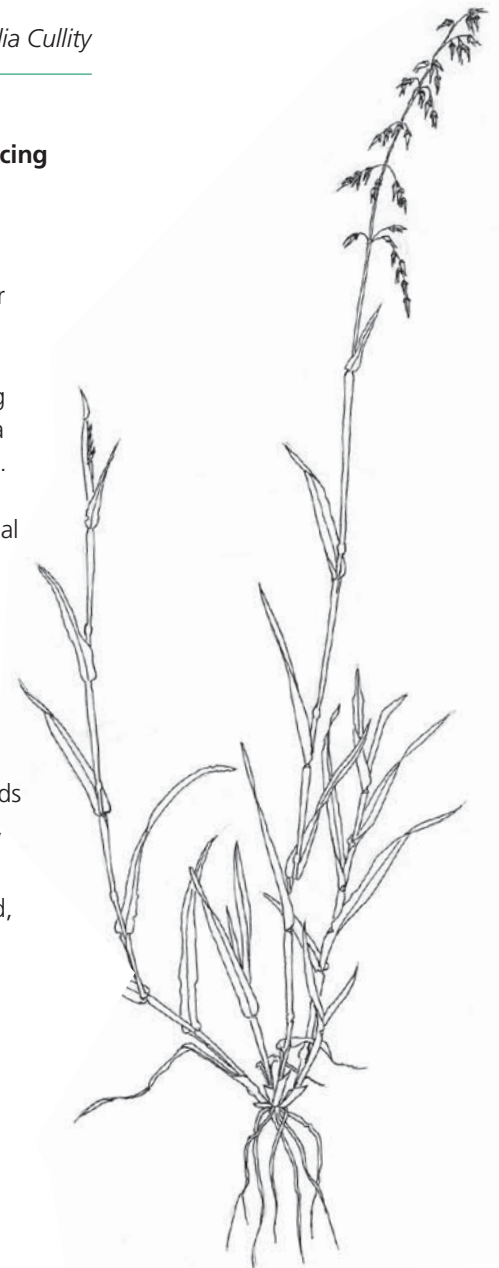
Ecological impacts

Perennial veldt has been listed in *Swan Environmental Weed Assessment 2008* as one of the top 30 priority environmental weeds in the Swan catchment due to its distribution, invasiveness and ecological impacts.

While it is capable of invading intact bushland, disturbance (particularly fire) aids its spread. Perennial veldt responds well to the extra nutrients and open conditions after fire and it not only has the ability to resprout, but germinates rapidly compared to native species, leading to early dominance. The dense, dry, fine fuels of the grass invasion then promotes more frequent fires which in turn favour the regeneration of weedy grasses over native shrubs, herbs and grasses. In time this can lead to almost monocultures of perennial veldt in the understory of our banksia and eucalypt woodlands.

Management

With an ability to establish a persistent soil seed bank, a successful control program for perennial veldt will require an annual treatment over successive years. For small infestations, cut out plants ensuring crown removal, at any time of year. For widespread populations, spot spray the grass selective herbicide Fusilade Forte® at 3.3–6.6 L/ha (13 mL) in winter on actively growing plants prior to the sending up of flower stalks (usually June to early August). It is important to spray regrowth and seedlings following unplanned fires to reduce further spread.



Perennial veldt grass (*Ehrharta calycina*).
Illustration – Libby Sandiford

More information

Dixon B. (1999) Best Management Practices for the Control of the Perennial Veldt Grass *Ehrharta calycina* In: *Managing Our Bushland* K. Tullis (ed) p147-149. Urban Bushland Council, Perth.

FloraBase <http://florabase.dec.wa.gov.au>

Keighery, G.J. & Bettink, K.A. (2008) *Environmental weed census and prioritisation summary for the Swan NRM Region 2008*, Swan Catchment Council and DEC visit www.dec.wa.gov.au/content/view/3582/2024/

It's not easy being brown

By Johnny Prefumo

Searching for frogs in Western Australia will reveal very few green, water-loving, climbing frogs with big toe pads like 'Kermit'. Many of our frogs are brown, have claws for digging and will drown in water. They only enjoy water at a certain time and some frogs don't have an affinity for water at all.

We live in the driest inhabited landscape on this planet and our lack of rainfall and impoverished yet productive soils have resulted in an incredible diversity of flora and fauna species. Interestingly, our seasonal winter wetlands contain a higher diversity of frogs than permanent wetlands. Many of our frogs are endemic – their biology and physiology is unique and not seen in frogs elsewhere. They all have specific habitat niches for shelter, foraging, calling, egg-laying and rearing tadpoles.

The moaning symphony

Moaning frogs (*Heleioporus eyrei*) live in the banksia–eucalypt woodlands of southern WA. The Autumn Equinox from 20–22 March is the trigger for males to start making their way from upper landscapes down to a dry seasonal wetland. From here they burrow about 30 cm into the ground and begin to call a few weeks after. Moaning frogs have the loudest calls of all our frogs, joining together in a synchronised symphony which really 'cranks up' with the first rains.

This is the time things start to get a little busy on the switchboards of the DEC and WA Museum (special acknowledgments to June and Renate) with calls from people who are being kept awake for weeks on end (remember sleep deprivation is a form of torture). Turning off your reticulation on opening rains should reduce this happening.

The opening rains of autumn are the trigger for the females at the top of the landscape to start moving. The poor fellas have to call from their burrows, night



Above: Metamorph. Top: Adult. Right: Moaning frogs have short legs and claws which they use for burrowing. Photos – Johnny Prefumo

after night, for weeks on end, to their lovers up the top of the hill. Last year our opening rains came on 19 May and, that was it, the boys were going off. As for the girls, they were on the march down to greet their lovers *en masse*.

In the wetland burrows they breed and produce eggs. They then make their way back up the landscape to do more 'frog stuff' such as eating beetles and cockroaches or being eaten themselves. In the burrows when the eggs are laid there is usually little to no water. The eggs and tadpoles are adapted to this dry environment and are highly resistant to desiccation, tolerating moist conditions for a period of time.

Tadpole development is completed in approximately two months. In September–October when the tadpoles have completed their metamorphosis, out emerges a frog-like creature with a tail. Like their parents, they will now disperse into the leaf litter of the dry banksia–eucalypt woodlands.

Conservation

Sadly, like many frogs worldwide, the moaning frog is becoming locally extinct in many parts of the metropolitan area. Why? Because Australians are the biggest water consumers per capita with the least amount of rainfall on the planet. The Water Corporation uses the motorbike frog (*Litoria moorei*) as its mascot. The motorbike frog is the most water-dependent species in the south-west. If we better understood and accepted our landscape perhaps the moaning frog would have been the mascot.

To see the iconic long-lived moaning frog in decline means many things for us. Tadpoles improve the quality of wetlands by keeping sediment build up on plant surfaces to a minimum; in turn the vegetation provides food, shelter and oxygen. Lost will be the resonating moaning chorus that reflects the need for life-giving rains and the health of our environment. So on opening rains when you're driving, watch out for all the female moaning frogs making their way to the wetlands and, importantly, reduce your water consumption all year round.

Samples of bush stone curlews needed

The Australian Museum in Sydney is analysing the DNA of bush stone curlews (*Burhinus grallarius*) to determine if there is a WA subspecies and provide information for recovery plans and conservation actions. *B. grallarius* is a nocturnal ground-dwelling species standing 50–60 cm high, with long gangly legs, large yellow eyes, and grey-streaked upper parts. Curlews prefer a sparse, grassy understorey with fallen timber and are distributed throughout Australia.

If you come across a dead curlew please collect a tissue sample (0.5–2 cm) and freeze before sending. A small piece of muscle tissue is more than adequate for DNA analysis even if more than a week old. Shed feathers are also very useful for analysis. Post samples to Robert Mason, Molecular Biology Technical Officer, Australian Museum, 6 College St, Sydney NSW 2010. Contact Robert if you have any questions on (02) 9320 6488 or Rob.Mason@austmus.gov.au.



The bush stone curlew is easily distinguishable from other birds by its height (50–60 cm), distinctive long legs with thick knees, and grey or brown streaked feathers. Photo – H. and J. Beste, Australian Museum

Progress of the Southwest Australian Ecoregion Initiative

By Danielle Witham

Phase One of the Southwest Australian Ecoregion Initiative (SWAEI) Conservation Planning Project delivered a draft plan that prioritised areas representing high biodiversity value to be managed and protected for conservation, in a context of limited resources.

WWF has successfully negotiated funding for Phase Two which will include:

- i) a review of methodology, expert review of outputs, identification of additional data (socio-economic, land use tenure and cost data in particular)

- ii) demonstration of how planning in Phase One can be implemented.

A demonstration area north-east of Perth has been chosen and we will engage land managers and facilitate on-ground management activities

- iii) integration of the conservation planning process into institutional and legislative decision-making processes.

The SWAEI would like to acknowledge Federal and State governments, WWF-Australia and the many people and organisations that have provided expertise and guidance to the process.

Regional framework for local biodiversity conservation priorities

The Perth Biodiversity Project is running a series of stakeholder meetings to inform and seek feedback on a regional framework for local biodiversity conservation priorities titled 'Local Community Bushland Protection Plans for Perth'. The primary objective is to develop a tool for identifying priority areas for local biodiversity conservation in the Perth and Peel Scheme regions, building on Bush Forever, Swan Bioplan and the local biodiversity planning process.

The Western Australian Local Government Association has secured State NRM program funding through

the Western Australian Planning Commission. The project is being delivered by the Perth Biodiversity Project with contributions from local governments.

The first in a series of stakeholder meetings was held on 25 February 2010, bringing together representatives from local government and State agencies that discussed their perspectives on local biodiversity values, opportunities and barriers to their conservation. Contact Renata Zelinova, PBP Manager on rzelinova@walga.asn.au.

Enroll now for City Bush Guides 2010

The Urban Bushland Council's second City Bush Guides (CBG) training course begins in autumn. The first CBG training course was conducted in association with Whiteman Park in spring 2009, when 18 community members trained to become bush guides. Presentations covered ecology, fauna and flora, social skills (e.g. planning a walk, storytelling, leading and guiding). Sessions varied between lecture-based role-play and interactive walks in bushland settings.

Whiteman Park is planning to lead guided walks through the park and a number of trainees have enlisted. Some of the others have joined bushland groups, and see the course as the beginning of a new journey, with many learning opportunities along the way.


The 2010 course will be held at Harold Rossiter Reserve (Victoria Park) beginning Wednesday 14 April from 9am–1pm, and continuing each Wednesday until 26 May. There are only 30 places available. To register contact Lesley Shaw on 9420 7207 (leave a message) or email Lesley at ubc@inet.net.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

 **Sundays 9am–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 Sue on 9384 6331 or email info@cottesloecoastcare.org.


 **Thursdays 8am–9am Bushcare activities** every Thursday with Byford Enviro-Link. Call Johanne Garvey or Kristy Gregory 9526 0199.


 **Saturdays 9am Bushcare activities** with the Friends of Brixton Street Wetlands are on the third Saturday of each month. Call Regina 9459 2964.


 **Sundays 9.45am–12 noon Bushcare activities** with the Friends of Piesse Brook are on the third Sunday of each month. Email linda@johnstanley.cc or visit www.friendsofpiessebrook.org.au.

 **Sundays 8am–10am Bushcare activities** every Sunday with the Friends of Shenton Park Bushland. Contact Dani 9381 3470 or bojel@it.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 car park. Contact Margaret 9315 9075 or s3mmatthews@hotmail.com.


 **Monday, Wednesday, Friday 9am–12 noon Bushcare activities** and wetlands walk trail maintenance with Yanchepp National Park Volunteers. Call Julia 9405 0771.


 **Tuesday, Thursday 8am–11am Koala maintenance** at Yanchepp National Park. Call Julia 9405 0771.

 **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.


April


 **7 Wednesday 10am–12.30pm Treasure Hunt** using a GPS to find clues and solve the puzzle. Baldivis Children's Forest. Lunch included. Age 8+. \$15 adults, \$10 child. Contact **BCF**.


 **7 Wednesday 5.30–6.30pm Great Cocky Count.** Birds Australia census of 100 Carnaby's Cockatoo roost sites in Perth to compare with 2006 survey numbers. Call Quinton to register and be allocated a site 0401 007 971.

 **7 Wednesday 5pm–9pm Night safari** at the Gravity Discovery Centre, Gingin. Includes pasta dinner, night safari bush walk, stargazing and games. \$186 family, \$64 adults, \$56 snr, \$36 child (5–16 years). Bookings www.ginginobservatory.com/.


 **7 Wednesday 10am–3.30pm Ramble with a ranger.** Age 8–12 years. \$25 DC/\$27pp. Call **N2N**.


 **8 Thursday 9am–1pm or 1.30pm–5.30pm Microbat nest box building workshop** with Joe Tonga at Perth Zoo. \$165pp/ box to take home. Bookings Suzi Greenway on 94740497 or www.perthzoo.wa.gov.au.


 **8 Thursday 7.30pm Wildflowers of South-east Asia** with guest speaker Dr Tony Start. WSWA Armadale Branch, Field Study Centre, Armadale Settlers' Common, Triton Cr. Call Chris 9398 9140.


 **9 Friday 7.30pm Conservation in WA** with guest speaker John Bailey. Contact **WANC**.

 **10 Saturday 6pm–7.30pm Twilight and torches** at Woodman Point. Age 6+. \$13 DC/ \$15 pp. Call **N2N**.


 **10 Saturday 10.15am–12.45pm Munda Biddi, Birds n Brunch** at Jarrahdale. Age 6+. \$18 DC/ \$20 pp. Call **N2N**.


 **12 Monday 1pm–3pm Bush cooking for kids.** Age 7–12 years. \$15 DC/\$17 pp. Call **N2N**.


 **13 Tuesday 10am–3pm Bush survival skills.** Age 8–12 years. \$25 DC/\$27pp. Call **N2N**.


 **13 Tuesday 8pm South Eastern Australian Plants** with guest speaker Dr Kerry Smith. Call **WSWA(P)**.


 **14 Wednesday 5pm–9pm Night safari** at the Gravity Discovery Centre, Gingin. Includes pasta dinner, night safari bush walk, stargazing and games. \$186 family, \$64 adults, \$56 senior, \$36 child (5–16 years). Bookings www.ginginobservatory.com/.


 **17 Saturday 8am Guided walk** with the Friends of Lake Gwelup Reserve. Contact **FLG**.

 **18 Sunday 9.30am Guided Indigenous walk** along C Y O'Connor Beach Coastal Walk with the City of Cockburn. Morning tea provided. Contact **CC**.

 **18 Sunday 9am Bushcare** at Warwick bushland. Contact **FWB**.


 **19 Monday Catchment Carers' Trail** professional learning workshop featuring water resource management, the water cycle, erosion and nature conservation. Perth Hills National Parks Centre. Contact **EE**.

 **27 Tuesday 7.30pm Vital seagrass meadows** with guest speaker Gary Kendrick. Wildflower Society WA (Northern Suburbs). Call Christine 9447 2983.


 **28 Wednesday 7pm–9pm Film: Thin Green Line** documents the personal lives of ranger's in protected areas around the world. Kalamunda Performing Arts Centre. Contact **BSFH**.


May

 **1 Saturday–2 Sunday 9am–11am 'Pancakes in the Park' and guided bush walk** (10am) at Bungendore Park, Admiral Rd, Bedforddale. In conjunction with Hills Heartbeat Festival; enter at Armadale Christian College. Call Kim 9470 2297.

 **1 Saturday 8.45am–1pm Rock Group on Tour** explores interesting geological landscapes around the eastern hills with CSA Global geotourism expert. Contact **BSFH**.

 **4 Tuesday 9am–3pm Showcasing Sustainability Expo** at Perth Zoo with the Australian Sustainable Schools Initiative and its partners. Displays, workshops, guest presenters and networking. Free but bookings are essential. For information call Laura Connell on 9474 0457 or register on 9474 0365.


 **7 Friday 7.30pm Mycorrhizal fungi speaker.** Contact **WANC**.

 **10 Monday Bird walk** at Paganoni Swamp with Mary Vaughan of Birds Australia. Contact **FPS**.

 **11 Tuesday 8pm Hakea Ecology: Prickly leaves, woody fruit** with guest speaker Dr Philip Groom. Call **WSWA(P)**.


 **14 Friday–15 Saturday A Night with Nature** professional learning workshop includes fauna trapping, data recording, night walk and dinner conversations with experienced DEC rangers. Perth Hills National Parks Centre. Contact **EE**.

 **15 Saturday 9.30am–1pm Noongar Booja cultural walk** at John Forrest National Park. Learn traditional cultural ways – bush food, medicine, stories of plants and animals. Contact **BSFH**.


 **15 Saturday Pigface removal** with the Friends of Wandii Nature Reserve. Call Fred 0428 604 032.

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.

Registration/Contact details

BCF Baldivis Children's Forest
Contact Mary 9524 1150 or mary.rayner@det.wa.edu.au, Wednesdays during school hours.

BSFH Bush Skills for the Hills offers free hills-focused workshops. Contact Joanne Woodbridge on 9424 2216 or joanne.woodbridge@emrc.org.au.

CC City of Cockburn Registrations essential for all events: Contact Environmental Services 9411 3444 or customer@cockburn.wa.gov.au.

EE EcoEducation DEC professional learning experiences. Call Lisa Ingram 9295 6149.

FLG Friends of Lake Gwelup Meet at scout hall, Huntriss Rd Karrinyup. Contact Christine 9447 2983 or folgmail@inet.net.au.

FPS Friends of Paganoni Swamp Contact Leonie 0439 921 298 or Friends_Paganoni_Swamp@westnet.com.au.

FSS Friends of Star Swamp Meet at Henderson Environment Centre, Groat St North Beach. Contact Christine 9447 2983 or starswamp@hotmail.com.

FWB Friends of Warwick Bushland Meet at bowling/tennis club car park, Lloyd Dr, Warwick. Contact Janina Pezzarini 9447 9494 or neen@ext.uwa.edu.au.

N2N Nearer to Nature activities with DEC. Affordable prices. Discount for Discovery Club (DC) members. Bookings 9295 2244.

WSWA(P) Wildflower Society of WA (Perth Branch) Subiaco Community Centre. Call Nina 0427 936 566.

WANC Western Australian Naturalists' Club Meetings at Hew Roberts Lecture Theatre UWA, Clifton St, Nedlands. Visit www.wanats.inet.net.au/comp.html



Funding opportunities

Swan Landcare Program (SLP)

SLP provides funds for community groups involved in on-ground revegetation and rehabilitation projects. Projects up to \$20,000 can be funded. **Closes Friday 30 April 2010.** Visit www.perthregionnrm.com/default.aspx?MenuID=87

NRM 2010–2011 Caring for our Country grant

The 2010–11 Federal Government Caring for our Country Business Plan was released on 7 January 2010. There are some changes from 2009; section 2 outlines the Priorities for Investment. **Closes Thursday 15 April 2010.** Visit www.nrm.gov.au/business-plan/10-11/pubs/business-plan-2010-11.pdf.

Filtering the Nutrient Storm

Funding available through the Peel-Harvey and South West Catchment Councils to protect and restore rural drains and waterways in the Peel-Harvey. Contact Kristy Gregory 9526 0199 or Kristy@landcaresj.com.au by **Friday 16 April**.

Environmental Community Grants Program

2010 is the second year of the State Government's \$6 million four-year environmental grants program administered by DEC. **Closes Thursday 8 April 2010.** Visit www.dec.wa.gov.au/ecg.

Yates School Environmental Management Planning Grants

Through the Landcare Australia Junior Landcare Grants Program, any school or organisation that would like to involve students in landcare projects, in conjunction with local landcare groups, can apply for grants up to \$1,000 (ex GST). **Closes Friday 14 May 2010.** Visit www.juniorlandcare.com/yates.

Learning opportunities

Treat Weeds course provides useful tips on identifying weeds and how to control them. Course begins Thursday 29 April 5.30pm–7.45pm at TAFE Midland campus, Lloyd Street. Cost \$67.40 (concession available). For more information contact Anne Taylor on 0414 845 064 or 9374 6314 or anne.taylor@polytechnic.wa.edu.au.

'In the Wild West' Harry Butler Lecture Series is a program of lectures by WA Museum scientists and associates at locations in Perth, Fremantle, Albany, Geraldton and Kalgoorlie-Boulder. Visit www.museum.wa.gov.au/whatson/year-of-biodiversity.asp. **Life Underground** by Dr Bill Humphreys.

What fossils tell us about sea-level and climate change by Dr Geoff Deacon.

Searching in the deep seas of the Southwest by Dr Jane Fromont.

Marine life of the Northwest by Andrew Hosie.

Biodiversity – the Barrow Island story by Dr Harry Butler.

Biodiversity in the 'burbs' by Dr Ric How.

Cockatoos in crisis by Ron Johnstone.

Seabirds of Western Australia by Ron Johnstone.

Nearer to Nature volunteering: Becoming a part of DEC's *Nearer to Nature* team is easy and fun! If you have a little spare time and enjoy the outdoors, there is a wide range of opportunities in assisting *Nearer to Nature* to run programs at venues all around the Perth metropolitan area. Interested? Phone our Programs Officer for more information on 9295 2244.

Highlights

2010 International Year of Biodiversity was declared by the United Nations to celebrate life on Earth and the value of biodiversity for our lives. Visit www.cbd.int/2010/welcome/.

5 Saturday June
World Environment Day

11 Friday June
Arbor Day

30 Friday July
Schools Tree Day

1 Sunday August
National Tree Day

Transforming the Rangelands Conference The Conservation Council of WA, Rangelands NRM WA and the Western Australian Environmental Defenders Office, as a joint venture in mid-2010, will host a conference to explore policy, law, science and management issues of the Western Australian rangelands. Email consrwa@conservationwa.asn.au or krissh@rangelandswa.com.au.

21 Wednesday April 7–9 pm
Evening with Richard Louv at Perth Concert Hall. Author of *Last Child in the Woods* and chairman of the Children and Nature Network, Richard works with communities to change legislation, develop programs and promote children reconnecting with nature. Book your free ticket at www.dsr.wa.gov.au/an-evening-with-richard-louv

27 Sunday–30 Wednesday
September
Australian Association of Environmental Educators (AAEE) Conference 2010, Canberra. Visit www.conferencecco.com.au/aaee.

20 Sunday 9am–1pm
Planting at CY O'Connor Beach (supported by Coastwest). Barbecue lunch provided. Contact **CC**.

20 Sunday 9am
Planting and fungi spotting at Warwick Bushland. Contact **FWB**.

26 Saturday 9am–1pm
Planting at Coogee Beach (supported by Caring for Country). Barbecue lunch provided. Contact **CC**.

26 Saturday 8am
Guided walk at Star Swamp. Contact **FSS**.

26 Saturday 9am–12 noon
Planting at Magenu Lake with Wandu Landcare. Meet at Wandu Community Centre, de Haer Road, Wandu. Contact Angela 94390418 or Angela.Jakob@kwinana.wa.gov.au.

26 Saturday 6pm–9pm
Lunar eclipse special event with Grant Thornett at Gingin Observatory. \$110 family, \$38 adults, \$33 snr, \$19 child (6–16 years). Bookings www.ginginobservatory.com.

Please send us your July, August and September 2010 events by Friday 21 May 2010.

16 Sunday 9am

Fungi survey at Warwick Bushland. Contact **FWB**.

18 Tuesday 7.30pm

Nocturnal walk with the Friends of Lake Gwelup Reserve. Contact **FLG**.

21 Friday

Arts and the Environment/ Aboriginal culture professional learning workshop. Perth Hills National Parks Centre. Contact **EE**.

21 Friday 7.30pm

Nocturnal walk at Star Swamp. Contact **FSS**.

22 Saturday – 23 Sunday
10am–4pm

Fungi photo exhibition and Star Swamp open days. Contact **FSS**.

23 Sunday 8am

Nature walk with the Friends of Lightning Swamp Bushland, Noranda. Call John 9275 7338.

25 Tuesday 7.30pm

Native plant breeding at Kings Park with guest speaker Max Crowhurst. Wildflower Society WA (Northern Suburbs). Call Christine 9447 2983.

25 Tuesday 7pm–9pm

Film: Taking Root is a compelling personal journey of Maathai's work in Kenya founding the 'Green Belt Movement' to improve rural women's daily lives. Contact **BSFH**.

31 Monday

Weeding with the Friends of Paganoni Swamp. Contact **FPS**.

June

Monday–Friday 9am–2pm

Planting experienced volunteers needed for Stirling Natural Environment Coastcare. Meet at Watermans Bay Marine Centre, West Coast Drive, Watermans. Contact Shel 0488 190 651 or stirlingnaturalenvironmentcoastcare@hotmail.com.

8 Tuesday 8pm

Tropical Carnivorous Plants with guest speaker Allen Lowrie. Call **WSWA(P)**.

11 Friday 7.30pm

Ocean currents speaker. Contact **WANC**.

12 Saturday 5pm–7pm

Night stalk at Baldvis Children's Forest. \$10 adult/\$5 child (6–16 years, under 6 is free). Includes bush damper supper. Contact **BCF**.

13 Sunday 9am–1pm

Planting at Market Garden Swamp. Barbecue lunch provided. Contact **CC**.

13 Sunday 9am–12 noon

Planting at Chalk Hill with Medina Residents. Meet at Chalk Hill car park off Beacham Cr, Medina. Contact Angela 94390418 or Angela.Jakob@kwinana.wa.gov.au.

14 Monday

Weeding with the Friends of Paganoni Swamp. Contact **FPS**.

Please send us your regional report (150–200 words) and a photo by Friday 21 May 2010. Text may be edited in response to volume of submitted reports.

A return on our investment *By Leonie Stubbs*

The Friends of Paganoni Swamp have 'hit the ground running' with a big year planned to tackle weeds, complete surveys and take part in walks around the reserve, all with a view to increasing our knowledge of Paganoni Swamp and alleviating threats to its ecological integrity. We have been pleasantly surprised to note a reduction in fleabane numbers in the swampy areas of the reserve following two years of intensive hand weeding, in contrast to a significant increase in cotton bush compared to last year. A pennyroyal mint infestation in one of the areas has been contained but certainly not beaten, so may require a change of strategy.

What we have learnt is the need to set aside sufficient time to return to the sites each year and weed out the seedlings and juveniles. This requires discipline as it is so tempting to move on to new areas or new weeds hoping that the work carried out the previous year(s) will be sufficient. It has been extremely satisfying to find that persistence has paid off and progress in the control of particular weed species has occurred.

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

Friends of Star Swamp Bushland turns 25

By Christine Curry

2010 marks the 25th anniversary of both the gazettal of Star Swamp Bushland as an A-class reserve and the formation of the Friends group.

Star Swamp was 'saved' from becoming a housing estate when a group of local residents, under the auspice of the Trigg/North Beach/Waterman Ratepayer's Association, began action in July 1977 to have the area preserved as natural bushland. The local community rallied behind the group and a series of public meetings followed, at which respected scientists, local politicians and prominent citizens spoke in favour of reserving the entire 96-ha site. A petition of more than 2,000 signatures was put to State Parliament, helping to sway political opinion. It took a lot of argument, negotiation, lobbying and hard work, but nine years later the area was gazetted as an A-class reserve in March 1985.

The Friends of Star Swamp Bushland was formally established in July 1985 and has worked closely with the City of Stirling, the managing authority, since that time to conserve, regenerate and manage the reserve. A wonderful three-day celebration to mark the 25th anniversary was held from 26–28 March at Henderson Environment Centre.

Contact Christine on 9447 2983 or starswamp@hotmail.com.

Winter fungi surveys – enroll now *By Roz Hart*

In 2009 the Perth Urban Bushland Fungi (PUBF) project collaborated with many community groups including the Friends of Ellis Brook Valley, Friends of Island Point, Busselton Naturalists' Club and the Youngnats and Darling Range groups of the Western Australian Naturalists' Club. Many of our experienced fungi volunteers assisted on the inaugural coordinated fungi survey of Kings Park and with the 10th anniversary fungi survey at Bold Park. We also joined forces with Bush Skills for the Hills and the Australian Wildlife Conservancy and produced the first fungi reports for six more local bushlands.

Surveys by the PUBF project in 2009 included FR Berry Reserve (Gidgegannup), Ellis Brook Valley Reserve (Gosnells), Paruna Wildlife Sanctuary (Avon Valley), John Forrest National Park, Locke Nature Reserve and Captain Baudin's Reserve (Busselton). In all cases, these are the first comprehensive fungi reports produced for these bushlands.

PUBF project is continuing to collect fungi that are new to WA and in some cases, new to science. Mycologist Dr Neale Bougher (DEC, WA Herbarium) observes that there are still many new fungi to be discovered in our local bushlands. In 2010 International Year of Biodiversity, join us in June–July and be part of this exciting project to discover fungi and learn how to identify some of our colourful, ephemeral local fungi.

Information will be posted on our website in April or May and we encourage you to sign up early as we get oversubscribed. If we could find ourselves a generous benefactor, we could offer many more fungi events for the community. We have the ability, just not the funds. *To sign up for a fungi event or to access bushland fungi reports visit www.fungiperth.org.au.*



Collecting fungi in John Forrest National Park as part of the PUBF project surveys in 2009. Photo – Jeff Langley

Friends of Roscommon Reserve *By Elizabeth Eaton*

We have developed a local action plan for Roscommon Reserve in conjunction with Janine Roets from the Town of Cambridge. We are grateful to Robert Powell for his work in identifying more than 60 native plant species, which will form the basis for future replanting. We are also grateful to Julia Cullity for the follow-up of her 2004 weed assessment, which highlighted Geraldton carnation weed has become well established.

Community effort has targeted removal of non-woody non-native introduced species, as well as re-planting in conjunction with

the school and local council. The council has removed woody euphorbia and other waste, and has plans for trialing removal methods of the large Agave patch. We are having success with hand-pulling Geraldton carnation weed; and with bridal creeper, watsonia and arum lily when we dig up the whole root system. Brazilian peppers and Cotoneaster remain a challenge for us.

These efforts all build on the community interest generated by the WALGA-supported Perth Biodiversity Project. Contact Elizabeth on eeaton@inet.net.au.

Weed control in Wandri Nature Reserve *By Fred Erdtsieck*

A joint project between DEC and Wandri Landcare Group (WLCG) to rehabilitate Wandri Nature Reserve began in 2009 (see *Bushland News* 70). The 30-ha reserve is surrounded by semi rural properties and is part of Jandakot Regional Park. It is predominantly banksia woodland in very good condition, but is slowly being invaded by weeds such as perennial veldt grass and pigface.

A four-day weed survey mapped the density of veldt grass and spot infestations of pigface. Large tracts of the bushland had such a low density of weed infestation that singular plants were individually GPS recorded. A DEC grant of \$10,000 will enable contractors to spray veldt grass commencing in June 2010.

WLCG held three field days in 2009 to remove pigface. Our main wildflower walk and pigface removal day was well attended and everyone had a great time. After the satisfying feeling you get from removing swathes of pigface and enjoying a wonderful

morning tea, Julia Cullity took us on an informative bush walk. The two follow-up pigface removal days enabled us to rid the reserve of approximately 75 per cent of mapped infestations – a fantastic effort by all those who took part!

Our next pigface removal day is on Saturday 15 May. Call Fred 0428 604032.



An overflowing trailer following removal of pigface from Wandri Nature Reserve, November 2009. Photo – Friends of WNR

Woodlupine Living Stream Project update

By Nicole O'Neill

The Area 1 Concept Plan for Woodlupine Living Stream Project in the Shire of Kalamunda is being implemented in early 2010. The project aims to improve local natural and built amenities through rehabilitation, regeneration and management of the remnant bushland, wetlands and water courses in the existing areas of public open space.

A 'Connectivity Path' has been installed between Coyong and Maamba Roads. Granite and Ord riverstone aims to stabilise the created banks and reduce erosion. Created seasonal ponds along the drainage line will slow water flow into the basin. This will create habitats for macro and micro fauna and assist in improving water quality. The Hale Road compensation basin has been revegetated with local endemic sedges.

For more information call Giles Glasson on 9257 9999.

'Zero weed tolerance' at Porteous Park *By Mike Norman*

Porteous Park is a small remnant of banksia woodland in Sorrento of vegetation type 'Cottesloe Complex – Central and South' with at least 100 species of native flora. Described in 2002 by the council's then Manager of Parks and Gardens as a "clapped out bit of bush", the nearby residents thought otherwise and formed a Friends group. Our aim is to restore it back into a valuable remnant, representative of the bushland type that once existed in the area. The park is frequently visited by Carnaby's black cockatoos and the endangered graceful sun-moth has been found on site.

In winter 2009, a banded greenhood orchid (*Pterostylis vittata*) was found in the park, photographed and added to our species list. In November there was a particularly good display of trigger plants (*Stylidium maritimum*).

The Friends weeded (June–mid-November) and planted sedges along degraded edges during six scheduled Friends' group events. Friends groups within the City of Joondalup

are only allowed to use manual weed control methods, so a number of specially designed tools are being trialled. The City sprayed fence boundaries, grass invasion on the southeast bank, supplied some local provenance seedlings, and mowed the weedy 'turf' more frequently to prevent seed set.

The Friends have decided on a zero tolerance to the most aggressive weed species in an attempt to exhaust the weed seed bank. We are aiming to reduce weed densities in the park so weeds can be manually removed with no more than four weeding events per year, so other visits can be used for more enjoyable and easier activities! Also, we would like to minimise herbicide spraying so that it is not required in the bushland areas but only along turf edges.

Despite the efforts of the Friends and City there is always more work to do than we are able to reasonably achieve. To bridge this gap, a Corporate Day was organised in August with BP Australia,

Conservation Volunteers Australia and facilitated by Perth Region NRM. About 29 employees contributed 159 weeding hours. In September the Sukyo Mahikari Community group also had a Service Activity Day at the park.

The biggest step in 'bridging the gap' was our successful 2009 DEC Environmental Community Grant to employ an Ecojobs team for four days. Under my supervision, the team manually pulled 20 weed species, 11 of which were totally removed from the whole reserve prior to seed shed. This is a highly effective arrangement, because the Friends have the knowledge about what needs to be done and can work directly with contractors.

We have applied for another grant under the State NRM Program 2009–10 to continue the momentum on weed eradication, weed mapping and also to collect seed of at least 15 native species to facilitate future revegetation.

Call Mike on 0438 710 527 or visit www.porteouspark.org.au for more details.

Veldt grass control: to spray or not to spray?

By Deanna Rokich

As bushland managers, many of us are faced with the dilemma of safely and effectively managing invasive species in our natural communities. The Botanic Gardens and Parks Authority (BGPA) is no exception and, as custodian of the Kings and Bold Park bushlands, is confronted with this dilemma on a regular basis, most recently in relation to the management of the pernicious perennial veldt grass (*Ehrharta calycina*), a native of South Africa.

Without a doubt, herbicide application is considered to be more economical and effective than mechanical or biological means of invasive species management within natural communities. But how safe are herbicides, and indeed other chemical products when considering our unique biodiversity?

Given its selective nature and post-emergent effects, the chemical fluazifop-p-butyl (known by the herbicide trade name of Fusilade®) is globally employed as an over-the-top (blanket) spray to control a long list of perennial and annual grass weeds in a variety of situations, with reportedly minimal damage to non-target species. In Australia, Fusilade® is widely used as a blanket spray to control perennial grass weeds, such as perennial veldt grass, in parks, bushlands and recreational reserves that may support natural communities.

Herbicide effects on off-target species

Research by the BGPA suggests that Fusilade®, and its replacement, Fusilade Forte™, each applied at recommended field application concentrations, have the potential to impede seed germination and seedling emergence of native (non-target) species. This is of serious concern given that seed germination and seedling establishment are keys for plant gene flow and continuation of a species. It also raises questions about the effects of the chemical fluazifop-p-butyl, and possibly others, on biological processes that occur below ground or at soil surface level.

To answer some of these questions, the BGPA recently completed a series of experiments related to fluazifop-p-butyl effects on seed germination, and on seedling emergence, growth and health of species native to WA, together with co-occurring invasive species. To summarise, both herbicides, at half to quadruple strength of recommended field application concentrations, adversely affected seedling development of native and invasive species, both grasses and non-grasses (Rokich *et al.* 2009). Herbicidal effects were observed during the seed germination phase, and if germination had occurred, during seedling emergence and, finally, during seedling establishment. However, effects were more pronounced after seed germination, particularly on development of seedlings, with retardation and/or discoloration of either radicles or shoots. Not unexpectedly, seedlings from seeds buried deeper in the sand medium (e.g. 20 mm) struggled to

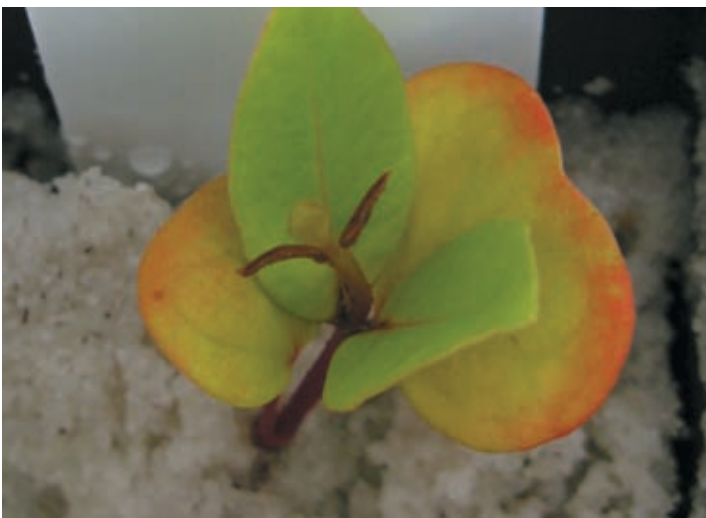
emerge. Both herbicides demonstrated residual characteristics by impeding seedling emergence and growth from seeds sown at various dates (up to maximum test duration of three weeks) following exposure of the sand medium to the herbicides. Further, herbicide application to sand only, produced effects on seedlings that were similar as application to foliage only, demonstrating herbicide uptake from sand by the seedlings. The findings seem to contradict the purported herbicide characteristics – namely, that the herbicides are grass selective, effective post-emergent, non-residual, rapid in breakdown, and active through foliar application only.

Management outcomes

As a result of the findings, the BGPA no longer undertakes blanket spray operations (at the recommended application rates) to manage perennial veldt grass. Instead, direct spraying (spot-spraying) of each individual plant is advocated, ensuring minimal contact of the soil, and the accompanying soil seed bank and seedlings, with the herbicide. Moreover, the BGPA is undertaking a long series of experiments to collect information related to chemical usage in general (e.g. herbicides, surfactants, and fire-suppressing agents) within natural communities. Stay tuned!

More information

Rokich DP, Harma J, Turner S, Sadler RJ, Tan B. (2009) Fluazifop-p-butyl herbicide: implications for germination, emergence and growth of Australian plant species. *Biological Conservation* 142: 850-869.



(Left) An untreated three-month old *Eucalyptus marginata* seedling and (right) the same age seedling subjected to the herbicide Fusilade Forte™ with visible signs of stress on the cotyledons and juvenile leaves, including resprouting at the shoot tip in response to death of the original shoot tip. Photos – Mark Bundock

Jane Brook Catchment Group Inc By Jenny Mackintosh

There are currently 23 Friends groups and catchment groups that form part of Jane Brook Catchment Group Inc. that are working to protect and revegetate Jane Brook and its tributaries from Mount Helena to the Swan River.

In 1988, Una Bell and some friends formed the 'Bugle Tree Creek and Jane Brook Protection Society' to protect the creek lines from effluent coming from the new shopping centre in Mundaring. A lot of fund raising, lobbying and planting were carried out for some years. In 1999 the society became a broader umbrella group to protect the whole of the Jane Brook catchment and had a change of name and logo. With the support of Mundaring Shire and the Eastern Metropolitan Regional Council it was incorporated.

Many of the 23 groups have been successful in applying for Swan Alcoa Landcare Program funding over the years, and we then get local nurseries to grow local plants. We try to plant with the first soaking rains and finish by the end of July. Very boggy areas may have to be planted later. The success rate has been very good, about 80 per cent when we have good follow-up rains. A lot of time and effort is taken up by weeding. There is other work to be done such as erosion control, bird counting, fungi hunting, trials of dieback-resistant jarrah trees, water monitoring and plant species identification – something of interest for everyone.

I can't single out individual groups as it would take pages and pages to tell about everything they are doing! We have



(Above) Picking up rubbish at Lion Mill Creek Reserve before revegetation (March 2000), and (right) after 10 years of work (February 2010). Lion Mill Creek is one of the three creeks that join in Mount Helena to become Jane Brook. Photos – Jenny Mackintosh



had great success with clearing weeds and controlling erosion, especially in Parkerville. Lion Mill Creek has gone from a wasteland to restored wetland and dense plantings. Pioneer Park, where the headwaters of the Jane Brook are in Mount Helena, has had a lot of planting done along the creek. It is a difficult place to deal with because of its public use. There is a great new playground and after the Whim Festival was held there last October, many people have commented on how good it is looking. Some private landowners are going to great lengths to conquer weeds on old paddocks and then replant with local species.

The group has also joined the River Guardians and taken part in promotional filming to promote river protection.

As with most volunteer groups we have trouble attracting young people to continue the work. The Scouts and Guides are usually willing to help with big plantings and one group is getting corporate groups to help. Maybe we should encourage more participation from city people. Schools sometimes get involved depending on an enthusiastic teacher or two and their curriculum. Most contributions come from people who have been involved with the groups for some years. We hold information displays at shopping centres to try to spread the word to people about their local environment. Interest is shown but not much enthusiasm to come and join us.

We have a newsletter which goes out every two months to members and anyone else who is interested. For a copy of the newsletter contact Shenaye Mehmet (NRM Officer, EMRC) on 9424 2264 or shenaye.mehmet@emrc.org.au or alternatively contact Mike Mackintosh (Secretary, Jane Brook Catchment Group Inc) on 9572 1697 or mikemack@inet.net.au.

2010 Banksia Awards

Community groups make huge contributions to bushland conservation. Attract recognition and celebrate achievements by nominating your group or others for an award. 2010 Banksia Awards are now open for entry to communities, business, governments, and individuals engaging in and leading the way in innovative and sustainable practices.

For more information on award categories, contact or entry kit visit www.banksiafdn.com. **Entries close Monday 2 August 2010.**



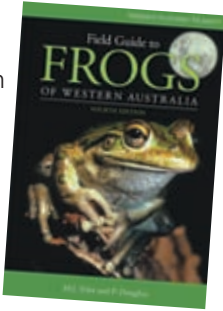
Resources

New publications

Field Guide to the Frogs of Western

Australia (2009) Tyler, MJ and Doughty, P. Fourth Edition, Western Australian Museum, Perth. 208pp. RRP \$35.

Western Australia is home to more than one third of the known frog species in Australia and new ones are still being discovered. This guide presents up-to-date information on all species, including their distribution and habitat – including the cane toad, which has just arrived in WA. The book also features extensive colour photographs and location maps to assist identification.



Australian Botanists Companion

(2009) George, A. Four Gables Press, Kardinya, Western Australia. 671pp. Biographical data (where known) on 2,600 people who collected plants in Australia up to the year 1900. Information on standard texts and sources, current and historical data, place names, people, expedition ships and much more. RRP \$77. Postage in Australia \$13. Payment by cheque or money order, made out to A.S. George, or direct deposit by prior arrangement.

Contact Alex George, 'Four Gables', 18 Barclay Road, Kardinya, Western Australia 6163. Phone 9337 1655 or email a.george@murdoch.edu.au.

A Guide to the Management of Pesticides in Local Government Pest Control Programs in WA

(2009) Health Department of Western Australia. www.public.health.wa.gov.au/cproot/2663/2/A%20guide%20to%20the%20management%20of%20pesticides%20in%20local%20government%20pest%20control%20programs%20in%20Western%20Australia.pdf

Website Watch

2010 International Year of Biodiversity

www.cbd.int/2010/welcome/ and www.environment.gov.au/biodiversity/

Perth Metro Coast e-news (Issue #1, 2009) of the Perth NRM Coastcare Program www.perthregionnrm.com/default.aspx?MenuID=115

Coastcare Group Google Map enables you to find a Coastcare group. Zoom in to an area, search by postcode, NRM region or by state, find your local council or CMA/NRM office. Coastal groups can register to be included on the map. Visit www.coastcare.com.au/FindGroupMap.aspx

Environmental weed publications

are available on DEC's Urban Nature website at www.dec.wa.gov.au/content/view/3582/2024/.

Weeds CRC website closed in September 2008 but will be online until mid 2010 so you can download resources. Visit www.weedscrc.org.au/index_flash.html. Try their guidelines pages e.g. *Herbicides: knowing when and how to use them and Herbicides: guidelines for use in or around water* www.weedscrc.org.au/publications/factsheets_guidelines.html.

The Gravity Discovery Centre has launched its new website at www.gravitycentre.com.au

Recent research

Van Kleunen, M and Johnson, SD (2007) South African Iridaceae with rapid and profuse seedling emergence are more likely to become naturalised in other regions. *Journal of Ecology* 95(4): 674-681.

Are your details correct?

Please check your mailing details and let us know if we need to change anything by phoning us on 9423 2914. If you'd prefer to receive this newsletter electronically, send an email titled 'email me' to urban.nature@dec.wa.gov.au.

