

New weed database for the Swan Region

By Karen Bettink

Environmental weeds pose a serious threat to the rich natural biodiversity of the Swan Region in Western Australia. *Swan Weeds* is a database recently developed to provide information on the most problematic environmental weeds in the region.

Swan Weeds aims to provide web-based delivery of the latest information on the biology and management of environmental weeds which are problematic in WA, with particular emphasis on those species occurring on the Swan Coastal Plain, Darling Scarp and Plateau. It is designed to help individuals, land managers and community groups understand and manage their most threatening bushland weeds. Available on the State Herbarium's website Florabase, *Swan Weeds* supplements the descriptions, images and distribution information with additional details of weed taxa origin, biology, suggested methods of management and control, and a management calendar.

Initially there is information on 58 geophyte (bulbous, cormous and tuberous) species. The aim is to expand this to more than 300 weed taxa, covering grasses, other herbs, trees and shrubs.

Information sources

Information has been collated from a large number of sources and agencies but principally:

Brown, K. and Brooks, K. (2002) *Bushland Weeds: A practical guide to their management*. Environmental Weeds Action Network, Perth.

Hussey et al (2007) *Western weeds. A guide to the weeds of Western Australia*. Second Edition.



Gladiolus undulatus growing amongst the priority sedge *Carex tereticaulis* and invading remnant fringing vegetation along Bennett Brook.
Photo – Kate Brown

Project team

Building the database has been a collaborative effort involving the Department of Environment and Conservation's (DEC) Western Australian Herbarium and Urban Nature Program, and the 2006-2008 Invasive Species Project administered by the Perth Region NRM (formerly the Swan Catchment Council) funded through the Commonwealth Government's Natural Heritage Trust program. The project team included Kate Brown, Brett Glossop, Ben

Richardson, Karen Bettink, Greg Keighery and David Mitchell.

How to access *Swan Weeds*

Accessing the information is simple. Example pages, a list of species currently in *Swan Weeds* and further information on the project are available on the Florabase website, via 'themes-weeds-swan weeds' or at www.florabase.dec.wa.gov.au/weeds/swanweeds/. Individual species' information can also be accessed directly by searching Florabase for individual weed taxa.

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Department of
Environment and Conservation

Our environment, our future



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 has been preparing for our busy winter season with training sessions, on-ground weed management and restoration activities at demonstration sites. We also have been working on making our resources more readily available on the internet. The cover story of Urban Nature's delivery of environmental weed management notes on Florabase is one example, and we are posting our publications on the Urban Nature website when copyright allows. You can access research papers, brochures, presentations and past copies of *Bushland News* at www.dec.wa.gov.au/programs/urban-nature/index.html.

Penguin Island



Penguin Island Ranger Shawn Thomas examining weedy Malva. Photo – Kate Brown

In recent months, Urban Nature has been developing a weed management program for DEC staff at Penguin Island. Island ecology is fascinating, with distinct patterns of comparatively limited native plant species occupying available niches. The objectives for weed management will be to remove the isolated populations of invasive weed species and some WA plants not naturally found on the island. Restoration will also include gradually replacing areas of South-African sea spinach (*Tetragonia decumbens*) with native seaberry saltbush (*Rhagodia baccata*) to maintain shelter and nesting habitat for penguins and other seabirds that call this bird sanctuary home.

Seed biology of two invasive South African geophytes and implications for natural area management



By Grazyna Paczkowska

Understanding how environmental weeds establish populations in undisturbed bushland requires an understanding of their reproductive biology and recruitment strategies. This knowledge underpins effective control and provides an understanding of how to manage the weed with minimum impact on the native plant community it is invading.

Urban Nature has undertaken a one-year study to investigate the seed biology, including seed viability, patterns of germination and persistence in the soil seed bank, of two invasive South African iridaceous geophytes: freesia (*Freesia alba x leichtlinii*) and sparaxis (*Sparaxis bulbifera*).

The study involved the burial of freesia and sparaxis seed in mesh bags in the soil and retrieval of sub-samples for each species throughout the year. For each retrieved sub-sample the number of viable seeds was recorded. Results showed both freesia and

sparaxis have high seed viability under controlled and natural conditions. Most seed of both species had germinated by winter (July) and the seed bank was completely exhausted by early spring (September), only four months after burial.

These results have important implications for the control of infestations of freesia and sparaxis. The lack of a persistent soil seed bank implies that both species can be effectively controlled in one or two seasons once the adult and seedling plants are removed by herbicide control. Such a control strategy may be particularly applicable in a post-fire environment.

For full details on the study please refer to Brown, K. and Paczkowska, G. (2008) Seed biology of two invasive South African geophytes and implications for natural area management. *Ecological Management & Restoration* 9(3), 232-234. If you would like a copy of the paper please contact Urban Nature.

Spring Bushland News

Spring *Bushland News* contributions should be sent to Urban Nature by **Friday 21 August 2009**.

Compiled and edited by Jo Tregonning.

Contacts

Urban Nature office

David Mitchell	9423 2913
Julia Cullity	9423 2925
Kate Brown	9423 2905
Karen Bettink	9423 2904
Grazyna Paczkowska	9423 2914

Department of Environment and Conservation, Swan Region office
7 Turner Avenue, Bentley WA 6102

PO Box 1167
Bentley Delivery Centre WA 6983

Fax 9423 2901
Email urban.nature@dec.wa.gov.au

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

Don't be fooled – that Oxalis may be native

By Greg and Bronwen Keighery

****Oxalis corniculata* has been considered a widespread bushland weed in southern Western Australia. Recent studies of **O. corniculata* from the WA Herbarium collection have revealed some plants included in this species complex are native and the weed is relatively uncommon.**

At least 23 species of *Oxalis* are naturalised in Australia, with 14 recorded as weeds in WA. Introduced for their colourful flowers, many *Oxalis* are now weeds of gardens, agriculture and bushland. Perhaps the best known weed is soursob (**O. pes-caprae*), or wet the bed, whose slightly acid stems and succulent leaves containing oxalic acid have been chewed by generations of children.

The *O. corniculata* group has been considered either as a variable species containing both native and naturalised forms, or as a series of closely related species of more restricted ranges. In eastern Australia, members of the group have been intensively reviewed to reveal six Australian native species (*O. perennans*, *O. rubens*, *O. exilis*, *O. thompsoniae*, *O. chnoodes*, *O. radicata*) and the weedy **O. corniculata*. They are all variable species that are difficult to identify without very good material or being separated on combinations of characters of the rootstock, fruit hairs, fruit length and width and stipule shape. While not ideal, using this approach to herbarium collections aggregated under the weedy **O. corniculata* in WA, we have separated many of our records as natives not weeds.

Three native species

Most collections previously listed under **Oxalis corniculata* have now been allocated to *Oxalis exilis* A. Cunn., a spreading soft-wooded herb easily distinguishable by its thin white to brown carrot shaped tuberous rhizome, and large yellow flowers with long styles (produced beyond the anthers). Producing tubers along the rhizome each growing season, the plant dies back in summer and re-sprouts after winter rains. They are self-fertile and plants we have cultivated set copious seed. We have never encountered seedlings of this species in the bush, of which the tubers and plants are favoured rabbit food! This native species is a



Characteristics of *Oxalis exilis* include (A) long rhizome, (B) slender tubers (2mm wide x 50 mm long), (C) rhizome covered by loose brown bark and last years growth still attached, (D) short fruits (20 mm long) with downward pointing hairs and only sparsely hairy, (E) leaf, (F) flower. Illustration – Greg Keighery



Native *Oxalis exilis* is a common component of woodlands throughout the higher rainfall areas of WA's south-west. Photo – Kate Brown

common component of native woodlands throughout the higher rainfall areas of the south-west.

Inland from this species is *O. perennans* Haw., which is similar to *O. exilis*, but has long slender fruits and a stout brown tuberous taproot rather than a creeping rhizome. This species occurs in the Wheatbelt, Goldfields and southern Nullarbor and eastern Australia.

We have segregated collections of an apparent unnamed native *Oxalis* as *Oxalis* sp. Pilbara. This rarely recorded, apparently annual herb is confined to rocky hills in the Pilbara. The Pilbara populations require further genetic, ecological and taxonomic study.

Weedy **O. corniculata*

**Oxalis corniculata* L. is now considered a spreading annual herb, usually very hairy on young stems, with small yellow

flowers with the style at the same level as the anthers. It is normally only found in gardens, lawns and wasteland in towns and not, or very rarely, in bushland. Another indication that this is a weed is that there are no early collections of this species in any Australian herbarium we have searched.

Weedy Oxalis to control

Weedy *Oxalis* species in WA can be readily distinguished by the presence of round tubers and normally a rosette of succulent leaves (**Oxalis compressa*, **O. flava* and **O. pes-caprae*) or flower colour (pink or white – **Oxalis bowiei*, **O. caprina*, **O. corymbosa*, **O. depressa*, **O. glabra*, **O. hirta*, **O. incarnata*, **O. polyphylla*, **O. purpurea* and **O. violacea*). Of these, the worst weeds appear to be **O. depressa* – invading dune vegetation at Busselton; **O. incarnata* – karri and creek-line vegetation in high rainfall areas; **O. purpurea* and **O. glabra* – urban remnants; and **O. pes-caprae* –Wheatbelt woodlands.

Further information

Soursob, Fingerleaf and Four O'clock – *Oxalis pes-caprae*, *O. glabra* & *O. purpurea*. Environmental Weeds Action Network brochure series 'Managing Weeds in Bushland'. Available from www.environmentalweedsactionnetwork.org.au/oxalis.html.

ECONOTES:

Ants in urban bushland By Geoff Barrett

Turning and aerating soil, controlling insect pests and dispersing and burying seeds are among the many services provided by ants in your local bushland. Considered to be more important for nutrient cycling than earthworms, ants enrich the soil as they devour decaying matter. As a consequence of their ecological importance, exceptionally high abundance and diversity, and sensitivity to environmental change, ants are considered to be useful bio-indicators.

Urban bushland often occurs as small isolated patches in which the ground vegetation is disturbed by earthworks, fire and weed control measures, and access tracks. In such sites, local ant assemblages are often dominated by a handful of highly active, aggressive or opportunistic species. A typical example is the native purple meat ant (*Iridomyrmex greensladei*), which forms large colonies within gravel-covered mounds. Purple meat ants swarm along well defined runways, devouring any insects or small animals unable to get out of the way. Less aggressive, shade tolerant ant species that tend to be habitat specialists, will re-occupy the sites as the vegetation recovers. Mine sites undergoing restoration suggest that while ant abundance is re-established after approximately ten years, it takes at least this long for the full suite of habitat specialists to return. Similar studies at bauxite mines in WA show that the assemblage patterns for ants, as well as for spiders, beetles and bugs (Hemiptera) are all correlated with the condition of the environment. At a broader scale, disturbance to the ground vegetation and the loss of ground-dwelling invertebrates in smaller patches of urban bushland is also reflected in the absence of ground-feeding insectivorous birds and mammals such as the quenda.

Across Australia an estimated 1500 plant species have formed a 'partnership' with ants (referred to as myrmecochory) where ants are provided with a food 'reward' (a fleshy part of the seed called an elaiosome) in return for having the seed dispersed and deposited underground in a safe, nutrient rich environment. The dominance of a few, aggressive ant species have consequences for long-term ecological function. For example, the regeneration of Acacias and other native plants can be suppressed by the South American Argentine ants (**Linepithema humile*). Argentine ants will invade

patches of urban bushland and form super colonies that dominate the local ecology. Argentine ants will remove the seed 'reward' without dispersing and burying the seed.

The relative ease with which ants can be sampled and sorted is also reason for the popularity of ants as indicators of the condition of urban bushland habitat. The extensive use of volunteers for invertebrate surveys has shown that a lack of formal training in ant taxonomy is no barrier to their ability to classify ants to physical types (or morphospecies).



The purple meat ant (Iridomyrmex-greensladei) is a highly active opportunist that will dominate other ant species. Photo –Geoff Barrett



Ants are excellent bio-indicators. Sardines placed on white plastic plates for 20 minutes to attract ants can be counted to measure bushland disturbance. Photo –Geoff Barrett

With this in mind, DEC has included ant surveys in their rapid assessments of the ecological function of reserves in the Swan Region, along with surveys of bird activity, tree health and weed invasion. Plates with a sardine are placed on the ground for 20 minutes and the number and diversity of ant 'types' is then estimated. If you are interested in finding out more about these 'ecosystem engineers' in your local patch of bushland and think you may be able to do some rapid habitat surveys of ants, birds and vegetation in your local patch of urban bushland, please call Geoff Barrett on 9423 2907.

Further information

Andersen, A. (1997) Ants as indicators of ecosystem restoration following mining: a functional group approach. In *Conservation outside nature's reserves*. P.Hale and D. Lamb (Eds). The Centre for Conservation Biology, University of Queensland. p.319-325.

Majer, J.D., Orabi, G., Bisevac, L. (2007) Ants (Hymenoptera: Formicidae) pass the bioindicator scorecard. *Myrmecological News* 10, p.69-76.

Chuditch spotted in Perth By Julia Cullity

For the first time in almost 20 years a chuditch (*Dasyurus geoffroii*) or western quoll has been recorded in the Swan Coastal Plain area of metropolitan Perth. In April, a male chuditch was captured by DEC after a home owner in Wandí reported that the chuditch had been visiting for food over a number of days. Unfortunately the animal had been severely injured by a rabbit trap and was euthanased, but the implications are that urban bushland may contain populations of this rare, carnivorous mammal.

Historically the chuditch ranged over two-thirds of mainland Australia and was common enough in the early part of last century to be regarded as a pest by farmers for killing poultry. Chuditch are now listed as vulnerable and are confined to the south-west of WA, with the majority found in the jarrah and karri forests. Over recent years chuditch sightings on the Swan

Coastal Plain in Perth were very rare, with the closest records being from Ellenbrook to the north, Wattle Grove and Byford in the foothills and Serpentine to the south.

DEC's *Western Shield* program of sustained fox baiting has seen population numbers recover in the jarrah forest. Chuditch are normally solitary and territorial, and could be slowly moving back down the Scarp and onto the Plain and we hope to have more sightings in the future.

If you see an endangered or unusual native animal you need to provide a good description and if possible take a photo or video. Distinguishing features, an accurate location and the date and time are vital to record. The Wildcare Helpline 9474 9005 is a 24-hour referral service operated by



Chuditch have soft brown fur with large white spots, a plain brown tail, pointed muzzle, large dark eyes and large rounded ears. Photo – Babs and Bert Wells

volunteers for community members who encounter sick, injured or orphaned wildlife. They will be able to refer your sighting to the relevant person at DEC. Wildcare Helpline need more volunteers so if you can spare some time contact Marg Buckland 9423 0251 or marg.buckland@dec.wa.gov.au.

Fishing for *Phytophthora* update By Daniel Hüberli

**Phytophthora cinnamomi*, often referred to as the notorious plant pathogen Dieback, is just one of the *Phytophthora* group that is destroying native ecosystems in the south-west and south-east of Australia.

Phytophthora organisms have a swimming phase and may be transmitted via streams and other water bodies. Stream surveys in California and Europe are used in the early detection of areas infested with **P. ramorum* to contain and eradicate 'Sudden Oak Death'. With the aim of cataloging what *Phytophthora* species currently are present in WA's water bodies, a monitoring tool was developed to detect introduced species from interstate or overseas.

Dr. Daniel Hüberli at the Centre for Phytophthora Science and Management (CPSM) at Murdoch University implemented the innovative project called 'Fishing for Phytophthora'. More than 50 water bodies from Kununurra to Esperance, including several locations within the Perth metropolitan area, were surveyed for *Phytophthora* species. During October to December 2008 more than 20 volunteers used 'fishing' leaf baits designed at CPSM.



'Fishing' leaf baits are used to sample water bodies for *Phytophthora*. Photo – City of Subiaco

Water bodies sampled included creeks, rivers, private dams, estuaries, and lakes.

A total of eight species of *Phytophthora* were found in the 2008 survey, five of which are yet to be described. Depending on the success of future funding, further sampling will be carried out seasonally throughout 2009 across each of the sites. A website funded by the World Wildlife

Fund was officially launched at Dieback Information Group conference on 5 June 2009, and shows what water bodies were tested and which species were recovered.

For more information contact Dr Daniel Hüberli on D.Huberli@murdoch.edu.au or Professor Giles Hardy on G.Hardy@murdoch.edu.au or go to www.f4p.murdoch.edu.au.

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

Please send us your October, November and December events by Friday 21 August 2009.

Recurrent activities

 **Conservation Volunteers Australia 2009 conservation activity schedule.** Overnight country trips to one-day activities. 2/343 Newcastle Street, Northbridge. Contact Andrew 9227 5711 or 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.




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 held second and fourth Sunday of each month. Meet at main carpark. Contact Margaret 9315 9075 or s3mmatthews@hotmail.com.

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 held on the third Saturday of each month. Call Regina 9459 2964.

July

 **4 Saturday 8am Planting.** Meet at Point Walter car park. Contact **BEAG**.


 **6 Monday 9am–12 noon Planting** with Wandl Landcare Group. Meet at Wandl Community Centre, Lot 33 De Haer Rd, Wandl. Sausage sizzle provided. Call Fred 0428 604 032.


 **7 Tuesday 5.30pm–7.30pm Frog Forage** at Canning River Eco-Education Centre. Age 7–12 years. Cost \$16pp/\$14 DC. Contact **N2N**.

 **11 Saturday 4pm–8pm Around the Campfire** for sing-alongs, yarns and camp cooking at Perth Hills National Parks Centre. Cost \$18pp/\$16 DC. Contact **N2N**.


 **12 Sunday 10am–4pm Fungi Foray** at John Forrest National Park with Perth Urban Bushland Fungi experts. Help identify and survey fungi. Lunch provided. Participants receive a copy of the fungi field report. Contact **BSFH**.


 **12 Sunday 1pm–3pm Tour of Mundaring Weir.** Adults only. Cost \$12pp/\$10 DC. Contact **N2N**.


 **12 Sunday 9am–12 noon Planting** at Eskdale Reserve, Roleystone. Morning tea provided. Contact **RBC**.

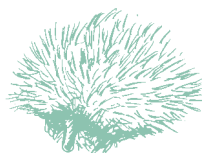
 **12 Sunday 8.30am–9.30am Fungi walk** at Cottonwood Crescent Bushland Reserve, Dianella. Contact **FDB**.

 **14 Tuesday 8pm Fine Food & Fragrance: commercial crops from native plants** with guest speaker Geoff Woodall. Call **WSWA** (Perth).


 **15 Wednesday 5.30pm–7.30pm Frog Forage** at Beelair National Park Age 7–12 years. Cost \$16pp/\$14 DC. Contact **N2N**.

 **16 Thursday 5.30pm–7.30pm Frog Forage** at John Forrest National Park Age 7–12 years. Cost \$16pp/\$14 DC. Contact **N2N**.


 **18 Saturday 8am Fungi foray and guided walk** at Lake Gwelup. Call **FLG**.




 **18 Saturday 8am Planting** at Canning River Regional Park with the Waterbird Conservation Group. Meet at Ferndale Crst car park. Call Helen 9457 1872.

 **19 Sunday 10am–1pm Bush regeneration and fungi spotting** with Friends of Warwick Bushland. Contact **FWB**.

 **Sunday 19 July 10am–2pm Frog-Friendly Garden Workshop.** Canning River Eco-Education Centre. Age 10+ years. Cost \$22pp/\$20 DC. Contact **N2N**.

 **22 Wednesday 9am Infill planting** with the Friends of Mary Carroll Lake. Call Unice 9398 7126.

 **24 Friday–26 Sunday 8.30am Planting** with the Friends of Spring Road Block. Meet NE end Spring Rd, Kalamunda. Call Dell 9293 4431.

 **26 Sunday 2pm The Birds Around Us** with guest speaker Rod Smith, Birds Australia. AGM. Call **FSS**.

 **26 Sunday 11am Lunch and tour** with Busselton Naturalist's Club. Capelite Café, Capel. Tour of sustainable house and goat farm, Ludlow River. \$35 includes 3 course meal and bus. Contact **BNC**.

 **26 Sunday 1pm–3pm Planting** at Bungendore Park, Admiral Rd, Bedforddale. Bring wet weather gear, spade and afternoon tea to share. Call Bill 9399 8829.

 **26 Sunday 9am–12 noon Planting** with the Friends of the Spectacles. Meet at car park on McLaughlan Rd, Kwinana. Contact Lynda Smith 9439 1928 or outback3@inet.net.au.


 **26 Sunday 10.30am Chase the Grape** guided 6 km walk in Jarrahdale. Cost \$10pp. Includes wine tasting. Call **JHS**.

 **26 Sunday 8am Planting** at Folly Pool, Baldivis with the Waterbird Conservation Group. Call Ruth 9339 5501 for directions.


August

 **1 Saturday 8am Weeding.** Contact **BEAG**.


 **2 Sunday 9am–12 noon Community tree planting** at Rotary Wildflower Reserve, Sulphur Road, Orelia. Contact Angela Jakob 9439 0418 or angela.jakob@kwinana.wa.gov.au.

 **2 Sunday 9am–12 noon Planting** with the Friends of Mary Carroll Lake. Call Unice 9398 7126.

 **7 Friday 6pm Frog walk** at Herdsman Lake. BYO torch. Includes sausage sizzle. Cost \$15pp. Contact **WAGL**.

 **9 Sunday 9am–12 noon Planting** at Stonegate Reserve, Roleystone. Tools, drinks and snacks provided. Contact **RBC**.

 **11 Tuesday 8pm Leaf and Branch: Trees and Tall Shrubs of Perth** with guest speaker Robert Powell. Call **WSWA** (Perth).

 **12 Wednesday 7.30pm How to describe a new species** with guest speaker Dr Mark Harvey, WA Museum. Contact **BNC**.

REGISTRATION/CONTACT DETAILS

BEAG **Bicton Environmental Action Group** Contact Peter Neesham 9339 7795 or pneesham@bigpond.net.au.

BNC **Busselton Naturalist's Club** Meet RSL Hall, Causeway Dr, Busselton. Excursion bus departs Pries Ave, Busselton. Contact Bernie 9727 2474 or bmasters@inet.net.au.

BSFH **Bush Skills for the Hills** offers free Hills-focused workshops. Contact Roberta Circosta 9424 2222 or roberta.circosta@emrc.org.au.

FDB **Friends of Dianella Bushland** Meet at Cottonwood Crescent Reserve car park. Entrance from Dianella Dr, Gay St. Then Channel 7 private road. Contact Jan 9344 2872 or webwrite@crystal.com.au.

FLG **Friends of Lake Gwelup** Meet at scout hall car park, Huntriss Rd, Gwelup. Call Christine 9447 2983.

FSS **Friends of Star Swamp** Meet at Henderson Environment Centre, Groat St North Beach. Call Christine 9447 2983.

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.

JHS **Jarrahdale Heritage Society** Informative guided walks of natural heritage in Jarrahdale. Meet at Old Post Office. Call Joy 9526 0121 or Sheila 9525 5352.


N2N **Nearer to Nature** activities by DEC. Affordable prices. Discount for Discovery Club (DC) members. Bookings call N2N 9295 2244 or visit www.naturebase.net/n2n.

RBC **Roleybushcare** Contact Diane Horgan 9397 5300 or info@roleybushcare.com.


WAGL **WA Gould League** Herdsman Lake Wildlife Centre. Bookings essential. Call 9387 6079. Visit www.wagouldleague.com.au.

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


12 Wednesday 9am

 **Planting** and bushcare with the Friends of Mary Carroll Lake. Call Unice 9398 7126.

16 Sunday 9am–12 noon

 **Bushcare** at Lake Gwelup. Volunteers needed. Call **FLG**.


16 Sunday 10am–1pm

 **Bush regeneration** with Friends of Warwick Bushland. Contact **FWB**.


21 Friday 6pm

 **Frog walk** at Herdsman Lake. BYO torch. Includes sausage sizzle. Cost \$15pp. Contact **WAGL**.


23 Sunday 9am

 **Cape to Cape walk**, Hillview Road to Cape Leeuwin 14km, moderate. Bus \$10. Carry own lunch. Contact **BNC**.


23 Sunday 10.30am

 **Challenging 10 km guided walk** in Jarrahdale. BYO binoculars. Call **JHS**.

29 Saturday 8am

 **Foreshore cleanup** at Blackwall Reach Pde. Contact **BEAG**.


30 Sunday 2pm

 **Wildflower walk** at Star Swamp Bushland. Contact **FSS**.

September**5 Saturday 8am**

 **Weeding**. Contact **BEAG**.

8 Tuesday 8pm

 **In Search of Orchids** with guest speaker Pat Dundas. Call **WSWA** (Perth).


9 Wednesday 7.30pm

 **Groundwater Replenishment** with guest speaker Nick Turner Principal Engineer, Water Corporation. Contact **BNC**.

11 Friday 6pm

 **Frog walk** at Herdsman Lake. BYO torch. Includes sausage sizzle. Cost \$15pp. Contact **WAGL**.


13 Sunday 8.30am–9.30am

 **Orchid walk** at Cottonwood Crescent Bushland Reserve, Dianella. Contact **FDB**.


19 Saturday 9.45am–3pm

 **Explore Talbot Road Bushland** to discover the bird life, fire response in a Threatened Ecological Community, weed control and photo point monitoring. Contact **BSFH**.


20 Sunday 9am

 **Wildflower walk** 7km Quarry Rd, Dardanup Forest Reserve and Crooked Brook Forest. Bus \$10. Contact **BNC**.

20 Sunday 9am–12 noon

 **Bush regeneration** with Friends of Warwick Bushland. Contact **FWB**.

27 Sunday 10.30am

 **Easy 6 km orchid walk** in Jarrahdale. Call **JHS**.

Learning opportunities**2009 Ribbons of Blue Macroinvertebrate 'Snapshot' 1 Tuesday–18 Friday September**

WA schools and community groups are invited to participate in the 'Macroinvertebrate Snapshot'. The survey involves sampling the abundance and diversity of macroinvertebrates - tiny aquatic creatures, living in wetlands, rivers and streams. Ribbons of Blue coordinators and volunteers assist groups sample, classify and identify a range of aquatic 'mini-beasts' including insects and their larvae, beetles, worms, water fleas and tiny crustaceans. These animals are important indicators of the health of a waterbody, as certain species are very tolerant of poor water quality, while others are very sensitive. By comparing your results with previous years, groups can develop a greater understanding of their waterbody and can help decide what needs to be done to improve the environment.

For more information or to register call the State Coordinator on 6467 5127 or visit www.ribbonsofblue.wa.gov.au/snapshot/macroinvertebrate-snapshot.html.

Education Programs at Canning River Eco Education Centre

Opened in June 2008, the Eco Education Centre is situated on the banks of Kent Street Weir within Canning River Regional Park. Created for students and the wider community, the Centre services primary and

secondary schools, local volunteer groups and corporate organisations by providing environmental education programs, resources and workshops. Open Monday–Friday 8am–5pm. Contact the Education Officer on 9321 0606 or email pksecocso@canning.wa.gov.au.

Basic Wildlife Rehabilitator's Course

This introductory two-day course, facilitated by DEC, is designed for anyone in the community interested in the welfare and protection of our native wildlife. Information is presented by Perth Zoo's veterinary staff and some of WA's most experienced wildlife rehabilitators. They will share their expertise in their specialised fields - marsupials (kangaroos and possums), reptiles, and birds (including raptors).

This course caters for those interested in volunteering their time at an established wildlife rehabilitation centre. It is also a prerequisite for those volunteers who would like to become an accredited DEC Wildlife Rehabilitator and care for animals in their own home.

Cost: \$198 (incl GST). Held at DEC State Operational Headquarters, Kensington. Dates: 11 Saturday–12 Sunday July and 5 Friday, 12 Saturday–13 Sunday September. Course enquiries 9334 0582; registration 9334 0279 or email Community.Involvement@dec.wa.gov.au.

Highlights**24 Friday July**

2009 WA Environment Awards nominations close. Nominate yourself or your community group for commitment to the environment in 11 categories contact 6467 5147 or awards@dec.wa.gov.au or visit www.dec.wa.gov.au/awards

31 Friday July and 2 Sunday August Schools Tree Day and National Tree Day.

Visit www.treeday.planetark.com/.

24 Monday–31 Monday August Keep Australia Beautiful Week.

Visit www.kabc.wa.gov.au/.

23 Sunday–27 Thursday August 2009 SER International Conference on Ecological Restoration: making change in a changing world, Perth.

Email Conference Secretariat on eecw@eecw.com.au. Visit www.seri2009.com.au.

1 Tuesday September

Wattle Day. Visit www.wattleday.asn.au/.

7 Monday September

National Threatened Species Day. Visit www.environment.gov.au/biodiversity/threatened/ or www.wwf.org.au/ourwork/species/ntsdl/.

7 Monday–13 Sunday September

Landcare Week. Visit www.landcareonline.com.

7 Wednesday–9 Friday October

Western Australian Coastal Conference, Fremantle. 'Whose Coast Is It? Adapting for the Future'. Visit www.keynotewa.com/wacoastal2009. Contact Erin Wright 9374 3309 or erin.wright@water.wa.gov.au.

27 Tuesday–30 Friday October

Changing Environments – New Challenges for the Living Country Conference, Geraldton. Contact Northern Agricultural Catchments Council, Communications Officer Jackie Gill on 99649774 or 0409 886 982.

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.

Please send us your regional report (150–200 words) and a photo by Friday 21 August 2009. Text may be edited in response to volume of submitted reports.

Brixton Street Wetlands *By Regina Drummond*

The Friends of Brixton Street Wetlands formed in 1994 and although membership fluctuates, we are fortunate to have others join us to look after the wetlands for future generations. We meet at the reserve in Kenwick in the City of Gosnells on the third Saturday of every month. During the hotter months we just walk through and say g'day to this much-loved place and admire the summer flowering plants. When weather permits we pick up rubbish, hoe or hand pull weeds and fix fences.

In January, DEC worked in the reserve to fill in a large pit, level mounds and brush and fence vulnerable areas. What a great start to the year – the best Christmas present ever! Unfortunately, vandalism (trees cut and ring-barked) and unauthorised access by trail and quad bikes continue to cause considerable damage, and much

of this rehabilitation effort was undone by vandals in the following months.

During a morning tea in February we met with Andrew Waddell our local MLA and DEC at Brixton Street to express our concerns. We hope this will lead to some action. In March we hosted a very successful 'Clean Up Australia Day' and took the



Friends of Brixton Street Wetlands collecting wattle seed. Photo Grazyna Paczkowska

opportunity to promote our work and group. A fire on 4 March, that we believe spread from an adjoining back yard, wiped out a large section of the bushland. We have spent time cleaning up the burnt area. Our May activity day was spent repairing cut fences, picking up rubbish, locating our stolen gate (found under the Brixton Street

Bridge) and taking photos of nine raucous Carnaby's black cockatoos (*Calyptorhynchus latirostris*). Seed collected last November in partnership with Urban Nature yielded seedlings for our 2009 winter planting on Saturday 20 June.

We hold guided flora and insect walks each year during October and November as well as our monthly work days. We look forward to seeing you at Brixton Street.

Call Regina on 9459 2964.



Winter weeding at Piesse Brook

By Linda Stanley

This winter the Friends of Piesse Brook are removing seed heads from Watsonia, pulling cotton bush and cutting bamboo (*Arundo* grass). We work in Kalamunda National Park as well as with private land owners upstream of the park along Piesse Brook. The group estimates they have a work zone equivalent to 400 rugby fields, so volunteers are always appreciated and welcomed.

The group meets on the third Sunday of every month from April to November at the entrance gate to Kalamunda National Park at the end of Schipp Road in Piesse Brook. For more information on the work we do visit www.friendsofpiessebrook.org.au.

Bushland conservation activities in Wandii *By Fred Erdsieck*

Wandii Landcare Group (WLCG) and DEC have joined forces to remove weed infestations that are threatening natural bush at the Wandii Nature Reserve. This fine example of *Banksia* woodland covers 30 ha and is part of Jandakot Regional Park – a Bush Forever site managed by DEC.

Teams from WLCG and DEC rolled up their sleeves and carried out a large-scale weed mapping exercise over a period of four days. We found spot infestations of pigface and mapped the density of perennial veld grass (*Ehrharta calycina*), an invasive South African weed that competes with native plants. It was discovered that large tracts of bushland in the reserve had such a low density of weed infestation that singular plants were individually GPS marked. A grant application has been submitted for the control of veld grass by contractors, and the pigface will be 'attacked' by volunteers.

This is the first time that the WLCG has ventured beyond working exclusively with the Town of Kwinana on landcare projects.

Previous work centred on the rehabilitation of degraded bushland surrounding Magenup Lake in Wandii; a worthy cause but not the complete solution. Wandii is surrounded by wonderful areas of bushland in excellent condition and if these reserves succumb to weeds, we won't have any real bush left to enjoy or habitat for our native animals. With just a minimum of effort, these areas can be returned to a manageable condition. Public awareness is paramount to getting the community on-board.

A community planting day at Magenup Lake was held on Saturday 27 June and a second planting day will be held on Monday 6 July. A community wildflower walk, including pigface removal, will be held in spring to showcase the reserve and discuss ways to improve and maintain the bushland. Everyone is welcome to attend and participate.

Call Fred on 0428 604 032.

Roleybushcare *By Diane Horgan*



Roleybushcare volunteers after planting seedlings along the banks of the Canning River in Roley Pool Reserve, Roleystone. Photo – Roleybushcare

Roleybushcare is an environmental community group that is focused on maintaining and protecting bushland in the Roleystone and Karagullen areas. We have worked extensively in the Stinton Cascades Nature Reserve.

Roleybushcare was formed in 2007 as a result of a merger between Roleystone Dieback Action group (aka the Dieback Busters formed in 1991) and an independent website

www.roleybushcare.com (originally created by Chris Horgan and Paul Mutton in 2006).

Roleybushcare usually holds a three-hour field day each month in local reserves. We have a lovely morning tea and everyone is welcome to join us. We encourage the community to come along and learn how to protect their bushland properties from dieback disease.

Contact Roleybushcare by emailing info@roleybushcare.com.

TAFE students find work *By Brian Inglis*

This year, Challenger TAFE assisted in a collaborative approach with the DEC funded Biodiversity Conservation Initiative (BCI) program. TAFE Lecturer Diana Corbin recommended three enthusiastic students from the Murdoch Campus to become the BCI Bush Forever crew. Work by the crew focuses on high conservation Bush Forever sites in the metropolitan area.

The students are currently in their third semester of study towards Certificate Four in Conservation and Land Management and have been able to apply their existing technical knowledge directly to the field. To date, most of the work has involved weed eradication and management, fencing projects, reserve clean ups and interaction and liaison with various friends groups and the general public. As well as reserve management skills, DEC has also been able to provide training to the students in chainsaw handling, GPS mapping and driver training.



The BCI Bush Forever crew, (from left) Sam Nunn, Michael Sarich and Phillipa Carboon working in Leda Nature Reserve. Photo – Brian Inglis

The Bush Forever crew has also had the opportunity to work alongside and learn from bushland management experts – Kate Brown and Grazyna Paczkowska from DEC's Urban Nature. Interaction with other DEC staff in general has added to their overall operational experience and made the BCI-funded program a great success.

Rainbow lorikeets – bold, beautiful and destructive



Rainbow lorikeets (*Trichoglossus haematodus*) are a serious agricultural and environmental pest and do not naturally occur in WA south of the Kimberley. In summer 2008, lorikeets were reported in several towns to the east of Perth. Department of Agriculture and Food (DAF) staff removed six birds from Walpole, Capel and Ravensthorpe. In contrast, this summer there have been few reports outside Perth except small numbers in Woorlooloo and Wundowie.

A third annual count by DAF, DEC and a contractor of the large lorikeet roost at Perth Domestic Airport in February 2009 indicated a slight reduction in numbers (3985 compared with a 2008 average of 4154), even though well over 1000 birds have been removed from the airport. Damage assessments in grape crops in the Swan Valley indicate almost no damage this year compared with 0–9.25% in the previous two years. Anecdotally it would appear that fewer birds have been seen in the valley this summer.

To ensure populations of this declared bird pest do not become established in new areas and cause further damage please report sightings to DAF at info@agric.wa.gov.au or call 1800 084 881.

Developing a regional conservation strategy for Southwest Australia

Australia's only global biodiversity hotspot, the Southwest Australia Ecoregion, is one of 34 of the most naturally diverse areas on earth. The Southwest Australia Ecoregion Initiative (SWAEI) aims to develop a large scale conservation plan for this region.

By Cheryl Gole (WWF)

Southwest Australia is recognised as one of the world's most important biodiversity hotspots based on high levels of natural diversity, particularly for plants and amphibians, together with high levels of threat to that diversity. It is also one of only five Mediterranean regions. The Mediterranean 'biome' is the most threatened of eight biomes on earth. Mediterranean regions have extremely high levels of biodiversity and very high levels of threat due to rapidly expanding urban development and agricultural activity.

The Southwest Australia Ecoregion is an 'ecoregion complex' consisting of the Southwest Australia Botanical Province and the Transitional Zone. The Ecoregion is a large area of land containing a geographically distinct assemblage of species, natural communities, dynamics and environmental conditions.

An ecoregional perspective

Whilst regional conservation groups do work collaboratively across boundaries, they do not necessarily have the resources to plan and act at scales necessary for cross-regional, broad-scale, ecoregion-wide conservation planning. SWAEI is a multi-stakeholder, multi-disciplinary group co-chaired by WWF-Australia and DEC, and managed by a

working group. Stakeholders, including natural resource management regions and community members, provide input through a stakeholder reference group.

The development of an ecoregion conservation strategy will enable a systematically planned, coordinated and prioritised strategy for Southwest Australia to ensure the long-term sustainability of its biodiversity. Recently, the Australian Government recognised the significance of the region and the validity of this approach when it funded the first phase of this project through 'Caring for our Country'.

Systematic conservation planning

The scale of threat and the need to prioritise to effectively utilise precious financial and human resources, are dual imperatives that drive large-scale conservation planning processes for areas the size and complexity of the Southwest Australia Ecoregion. Often, explicit targets are set for the conservation of particular assets or features. 'Systematic conservation planning' identifies the best set of conservation areas that together achieve explicit conservation goals. Conservation areas may be any area, including private land, which meet the goals and can adequately protect associated biodiversity assets.

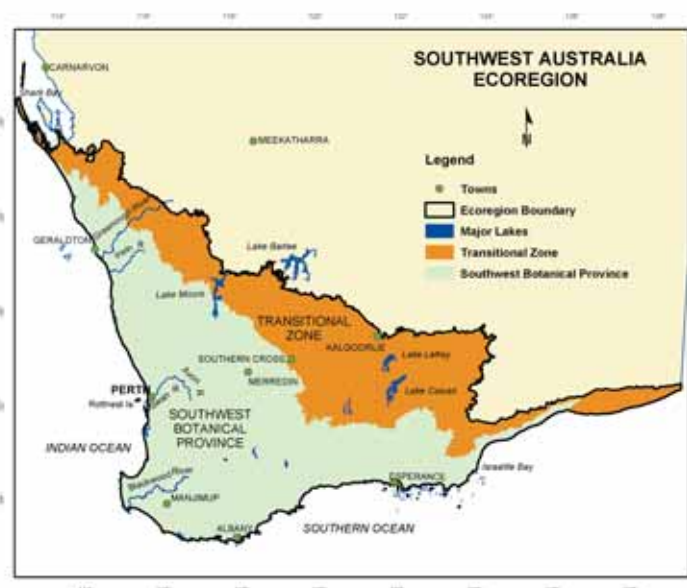
Some of the biodiversity assets within the Ecoregion include: habitats (kwongan plant

communities, granite outcrops, eucalypt woodlands, naturally saline wetlands and aquatic habitats); 53 threatened ecological communities; and fauna (many of which are endemic to the region). Threats to this biodiversity include the clearing and fragmentation of native vegetation, Phytophthora dieback, dryland salinity, weeds, feral animals, fire and climate change.

Much will be gained by working at an ecoregional scale. Goals and targets for the Ecoregion will help inform the future planning of many stakeholders. Greater opportunities for collaboration on conservation projects that cross existing boundaries will become possible. Lastly, a greater awareness of the Ecoregion's biodiversity and the processes that threaten it will lead to an increased ability to attract funding for the work necessary to achieve conservation goals.

Further information

Southwest Australia Ecoregion: Jewel of the Australian Continent is a 32-page booklet available on request or download at wwf.org.au/publications/southwest-australia-ecoregion-jewel-booklet/. For more information about the conservation planning project contact Danielle Witham at WWF-Australia on 9387 6444 or email dwitham@wwf.org.au.



Isolated by oceans and deserts, the Southwest Australia Ecoregion has high levels of natural diversity, particularly for plants and amphibians. Image – DEC



Salmon gum woodlands at Lake Johnston (near Norseman) form part of the transitional woodlands east of the Wheatbelt clearing line within the Southwest Australia Ecoregion. Photo – Martin Gole

GROUPPROFILE:

Busselton Naturalists Club



By Bernie Masters

Founded in 1964, the Busselton Naturalists Club has grown to be one of the largest and most active conservation groups in rural WA. The Club's objectives are to increase public interest in, and conservation of, the natural values of south-west WA. This is achieved by providing the community with opportunities to understand and value the natural environment.

We hold monthly public meetings and excursions on a range of interesting or topical environmental issues, with attendances averaging 50 people. Our long-range camping excursions to remote and regional parts of the State began in 1990. Our first camp was to the Kennedy Ranges, with the Gascoyne, Murchison and Eastern Goldfields being visited in more recent years.

Our most popular excursion – the Meelup Moon Rise Walk – is held on a summer or autumn night when the full moon rises over Geographe Bay soon after dark. The five km walk from Dunsborough to Meelup Regional Park has attracted up to 150 people, with another 200 waiting with champagne and picnic meals on Meelup Beach.

Club projects and activities

- The Club manages the 75 ha Ambergate Reserve, protecting its amazing biodiversity on behalf of the Busselton Shire. The reserve is now a major tourism attraction and is well used by school groups for environmental education. Management activities since 1987 include rubbish removal, control of weeds and feral animals, revegetation of degraded sections and provision of a four km walk trail.
- In the 1990s, we fenced off, revegetated and modified the drainage on a privately owned four hectare wetland on a salt-affected section of the Swan Coastal Plain. The salt problem was being caused by a mechanism different to that causing dryland salinity in the Wheatbelt and this project's aim was to show farmers that removal of excessive amounts of fresh winter rainfall was allowing the underlying shallow saline groundwater to reach the surface.
- Club members helped form the Busselton Dunsborough Environment Centre in the early 1990s. Most of the Centre's original goals have now been achieved, including employment of an environmental officer by the Busselton Shire and mapping of remnant vegetation within the Shire.
- In the 1980s, we successfully lobbied State Government agencies to reduce fish kills within the Vasse and Wonnerup estuaries by allowing fresh seawater to enter the estuaries in summer. In spite of concerns that moving the estuaries closer to their pre-European settlement conditions might adversely impact usage by waterbirds, recent surveys have confirmed on-going use of the estuaries by up to 38,000 birds.



Hiking at Meekadarabee Cave near Ellensbrook Homestead on the Cape to Cape walk. Photo – Bernie Masters



Ashley Rains (left) and Greg Hill repairing a well at Ambergate Reserve. Photo – Bernie Masters

- The Club has adopted the Cape Naturalists to Sugarloaf Rock section of the Cape to Cape track for annual maintenance.
- The Club lobbied strongly in support for better coordination between all government agencies and research institutions on tree decline issues, in particular, the flooded gum *Eucalyptus rudis* which is in serious decline in the south-west.
- The Club actively supported community opposition to the Water Corporation's Southern Yarragadee proposal, expressing concerns about water table drawdown impacts on valuable areas of native vegetation and wetlands, including the only wetland on the Swan Coastal Plain containing a population of mainland quokka.

Monthly meetings of the Busselton Naturalists' Club are held at the RSL Hall, Causeway Rd, Busselton. Regular bushland management activities and recreational excursions are also held. For more information contact Bernie Masters on 9727 2474 or email bmasters@iinet.net.au.

Resources

Publications

Guidelines for Local Government Bushland Management in the Perth and Coastal South-West NRM Regions (2009).

Part A guides the prioritisation of natural areas to develop a five-year Management Action Plan by considering ecological values and threats. Part B lists applicable management considerations affecting bushland reserves. Trialed by the Shire of Kalamunda and the City of Gosnells the guidelines help identify information gaps and prioritise resources. Produced and launched in March by the Perth and South-West Biodiversity Projects. Contact Sonia Lamond on 9213 2065 or slamond@walga.asn.au. Download at www.walga.asn.au/about/policy/pbp/bushland_management.



Fungi of the Perth Region and Beyond

by Neale Bougher (2009) is an essential field guide to the colourful fungi of WA's south-west. A colourful visual index enables quick navigation to find fungi species. Each species is photographed and lists key features. The book has an open design to enable more species, photos and notes to be added as they become available. Available as a DVD, bound book (limited number) or download at www.fungiperth.org.au. Call the Perth Urban Bushland Fungi team on 9334 0500 or the Western Australian Naturalists' Club on 9228 2495.



Website watch

River Smart Australia is a new non-government, not-for-profit organisation supporting stakeholder-based management and restoration of Australia's river systems. The vision of *RiverSmart Australia* is: "Managing rivers for people, wildlife and sustainability". Visit www.riversmart.net.au/.

Wetland Wiki is a collaborative website created by WetlandCare where you can edit, exchange ideas and contribute to the latest wetland news and information. It's like Wikipedia for wetlands. Visit www.wiki.wetlandlink.com.au.

Swan Weeds database supplements the State Herbarium's website Florabase. It supplements the descriptions, images and distribution information with additional details of weed taxa origin, biology, suggested methods of management and control and a management calendar. Visit www.florabase.dec.wa.gov.au/weeds/swanweeds/.

Recent research

RabbitScan – where are the rabbits?

To coincide with the 150 year anniversary of the wild rabbit being introduced into Australia, the National Rabbit Management Advisory Group coordinated a public survey of rabbits in Australia during May 2009. Visit www.rabbitscan.net.au.

Richardson D.M. and Kluge R.L. (2008) **Seed banks of invasive Australian *Acacia* species in South Africa:** Role in invasiveness and options for management, *Perspectives in Plant Ecology, Evolution and Systematics* 10: 161-177.

Davis J. and Brock M. (2008) **Detecting unacceptable change in the ecological character of Ramsar wetlands.** *Ecological Management and Restoration* 9(1): 26-32.



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