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AABR NEWS Australian Association of Bush Regenerators

Australian Association of Bush Regenerators working with natural processes AABR Guest Speaker and Annual General Meeting

Saturday 23rd November 2019

Where: YHA Sydney Central, Meeting room Level 8

11 Rawson Place, Corner of Pitt St and Rawson Place, Sydney (opposite Central Station)

Time: 11 am-2 pm (includes socialising time)

Join us for a talk and AABR's Annual General Meeting

At the AGM we will be foreshadowing a proposal to adopt a national structure for the group discussing the reasons why and what is involved. This will be a significant step in the evolution of AABR and all those who are interested in AABR's purpose are encouraged to contribute to the conversation. This will be made possible with teleconferencing facilities at the AGM. Please RSVP to receive login details.

For more information and to RSVP go to https://www.eventbrite.com.au/e/aabr-agm-guest-speakerand-get-together-tickets-79296430759

A copy of the AGM Agenda is also available from the eventbrite site.

Our speaker this year is Linda Groom whose talk is

Kosciuszko National Park – the horses, the damage and the arguments

Linda will present the issue of horses in the park from an environmentalist's point of view. It examines the most controversial aspect of the issue - the possible methods for reducing horse numbers - including arguments for and against each method. She explores the role of plants as 'natural water managers' at the head of the Murray catchment, and how they are affected by hard-hooved animals.

Linda is a volunteer with the Invasive Species Council's Reclaim Kosci campaign. Now retired, she was formerly Curator of Pictures at the National Library of Australia, Convenor of the National Photography Festival, President of the Canberra Bushwalking Club and president of a number of national professional organisations.

Would you like to join the committee and help AABR; talk to our President, Tein McDonald. email president@aabr.org.au.

After the AGM, socialising and a BYO buffet are planned. Bring something to share for a bush regen buffet. There is a kitchen available.



President's Perspective

Lots and lots to report, as ever. The committee has been busy organising the Seeds for the Future Forum with the Australian Network for Plant Conservation (ANPC) and subsequently progressing the communique and *regenTV* products from the forum. The first of the summaries of the talks are in this newsletter (See pages 9-12) with more in the next newsletter. The forum proved to be a substantial step in the process of ANPC's important NSW Environmental Trust-funded project Healthy Seeds.

CLM training package. Action is also hotting-up for the national review of the CLM training package. It is very important that we get as many bush regeneration industry people attending the consultation workshops listed on the AABR web page. Please consider attending one of these workshops or encouraging a friend or colleague to attend as this is our big chance to get training better aligned with industry needs and the chance won't come again for a long time so I can't overstate the importance this opportunity. (See page 7 for information)

Review of AABR's Accreditation system. AABR has (minimally) tweaked the 12 bush regenerator competencies and is now entering into an important campaign to encourage more AABR accreditation applications (see page 3). What you can do to help is to encourage a friend who meets the criteria of Standard

application but has not yet applied to apply for accreditation via our website! As an incentive, AABR is offering a 50% discount (on membership and accreditation fees for one year) for all Standard application approvals where the application was received between now and the end of November this year. (Unfortunately we are not calling for Non-standard applications at this stage due to the work load it generates. However, the next component of the campaign is to increase the size of our assessor team and open up again for non-standard applications as soon as we can in 2020).

The AABR AGM is also very important this year – not only because there is a fantastic speaker (Linda Groom talking about the very serious problem of feral horses in Kosciuszko National Park), but also because we will be formally commencing a year-long discussion about reconstituting AABR as a national organisation with a capacity for branches in each state. This is a very important topic so please try to attend either in person or by teleconference on Saturday 23rd November 11am at YHA Sydney Central. (If joining by teleconference you need to rsvp to receive the login details.)

Tein McDonald

President AABR

AABR will shortly be planning our events and site visits for 2020

We invite Expressions of Interest from groups/individual/councils/contractors who would like to showcase work on one of their sites.

Site Visits. Ideally your site will have a story to tell covering how regeneration and restoration work has been carried out on the site. This might include the sorts of techniques used, successes and failures and some special aspects of your work. How do you monitor your success and how does the local community view your work or get involved. Perhaps it is a site where research work is being undertaken or you would like to see how the recovery wheel works on your site.

How does AABR assist? AABR helps to organise and provides promotion for site visits. Whilst site visits are at no cost to participants, we set up a booking system so we can ascertain numbers. If you site is small, we are able to limit the numbers according to what you specify as a minimum and maximum. Organisation for the day is usually a combines effort between AABR and the host.

What would you like to see? Suggestions of the sorts of events you would like to see and hope to participate in are also welcome.

Please contact Suzanne on education@aabr.org.au

Welcome to new AABR Members

Elissa Averv Shayne Banks Trisha Barker **Megan Bartley** Martin Bell Hannah Belluccini Sarah Boys **Tony Bracey** Sai Buckley **Guy Cooper** Evangeline Cox Samantha Craigie Jye Dalton Jenny Donoghoe Chris Geary Patrick Hansen Tom Hazell **Phillipa Jones** Tamara Keyte

Alicia Langford Sophie Lavence Juliana Lee **Russell Linnane** Megan Maroney Caleb Martin Dom McKenzie Wendy Midgely Jane Pammer Lisa Preston **Robert Rogers** Paul Rymer Jessica Slade **David Sparks** Jayden Streatfeild **Brooke Studt** Lucy Tremain Marlien van der Merwe **Cameron Walls**

Morgan Waterworth Brad Willis Jennifer Wilson Charlotte Wood Lilian Wycisk

Businesses Sustainable Natives Waratah Ecoworks Gondwana Landscapes and Consultancy

Congratulations on Accreditation

Guy Cooper Fiona Dawson Todd Dudley David Khoury

Agencies

City Of Greater Dandenong Inner West Council

Organisations

Caleb Martin

Jason Rawnsley

George Roberts

Jacqueline Stewart

Merri Creek Management Committee



AABR Accreditation

Are you a skilled bush regenerator eligible for Standard application? Make it official

AABR is are currently calling for Standard applications for accreditation [1]. AABR accreditation is widely accepted recognition of competency as a bush regenerator. It is awarded to those having shown they possess AABR's 12 bush regeneration competencies.

For individuals - give yourself a reward for the skills, knowledge and experience you have worked hard to gain, increase your standing in the community and your employment prospects. Support the bush regeneration industry and the environment by growing the ranks of recognised practitioners.

For employers - enhance your team by sharing skills through peer learning, support ongoing professional development and minimise risk and optimise on-ground outcomes. Strengthen industry standards.

A Standard Accreditation application is open to anyone who has completed an AABR-recognised course in bush regeneration and 500 hours more practical experience in ecological restoration work (voluntary or paid) under an AABR-recognised supervisor over a period of at least two years.

12 Competencies

In order to become an AABR accredited bush regeneration practitioner — i.e. a person implementing assisted regeneration treatments at the industry entry level (generally under supervision), AABR considers a person should possess these 12 competencies, irrespective of whether they are paid or work voluntarily.

The competencies cover a broad range, including what may traditionally be recognised as theoretical knowledge and practical skills.

- 1. Identify processes which degrade native ecosystems and describe the basic ecological principles relating to these.
- 2. Discuss natural recovery capacity and specify how bush regenerators can maximise this through:
 - the strategy of working from areas of higher resilience to areas of lower resilience

[1] Non-standard applications require in-person assessments by AABR assessors and our assessor team is currently fully booked for this quarter.

Local Land Services

- matching the area of primary treatment to both the site's capacity to respond and the project's follow-up resources
- using intervention techniques which maximise natural recovery processes.
- 3. Discuss basic plant and animal habitat issues.
- 4. Name a majority of the indigenous and weed plant species at all life stages, on a familiar site and be able to identify species not recognised by using a botanical key or another process of identification.
- 5. Perform or describe efficient, effective and safe treatment of weeds over a range of plant life forms, including herbicide and non-herbicide treatments.
- 6. Discuss compliance with all relevant herbicide application legislation.
- 7. Discuss the need for commitment to follow up weed treatments and long-term management.
- 8. Indicate, on site, approximate boundaries between areas natural or assisted regeneration are likely to reinstate desirable ecological communities and areas where planting or other reconstruction methods would be required.
- 9. Discuss the basic techniques used for reconstruction in areas where no natural or assisted regeneration is expected.
- 10. Discuss the principles of genetic diversity and integrity in relation to propagule sourcing for supplementary planting in the context of maintaining biodiversity.
- 11. Describe a range of common WH&S hazards and specify ways to
- eliminate hazards or minimise risks. 12. Communicate:
 - appropriate information about sites and programs
 - ideas, concepts and recommendations to the site supervisor.

For more information

Check out the website www.aabr.org.au/about-aabr/accreditation/ email accreditation@aabr.org.au phone 0407 002 921

STOP PRESS. As an incentive, AABR is offering a 50% discount (on membership and accreditation fees for one year) for all Standard application approvals where the application was received between now and the end of November this year.

Richmond Woodlands Biodiversity Forum Meet, Learn, Participate ver why the remnant nds of Western Sydney sity and People 9

birdlife

Richmond Woodlands Biodiversity Forum

Saturday 16 November

At the Greater Sydney Local Land Services Demonstration Farm at 40 Edwards Road, Richmond Lowlands in western Sydney.

The aim is to bring together landcarers, land managers, biodiversity experts and birding enthusiasts to get to know and get involved in activities to support the Richmond Woodlands as a Key Biodiversity Area (KBA).

Speakers include Den Barber - Welcome to Country, Judy Harrington - Birdlife Southern NSW, Mick Roderick - Birdlife Australia, Elisabeth Karplus, Peter Spradbrow - reptiles and amphibians, Peter Mobbs - vegetation, Tony Hunt- bird banding in the Cumberland Plain Woodlands, Mark Fuller - Avianation P/L – Cumberland Land Conservancy, Dr Holly Parsons - Birds in Schools and the Urban Bird Project.

This is a free event but online registration will assist us with catering. Go to https://www.eventbrite.com/e/richmond-woodlands-biodiversity-forumregistration-73383799921.

Contact event organizer Cathy Goswell. cathycrg@bigpond.com or ring 0418 865 421.



Weed-infested Drain to Bushland Haven: Restoring Merri Creek

Ann McGregor, President Merri Creek Management Committee & Vice-President, Friends of Merri Creek

Michael Longmore, Program Co-ordinator & Ecological Restoration Planner, Merri Creek Management Committee

Flowing through northern Melbourne, Merri Creek extends for 75 km from the Dividing Range north of Wallan, to join the Yarra River in Abbotsford.

European settlement brought clearing, pollution and invasive weeds to the Merri valley. A planned freeway along the valley through Melbourne's northern suburbs would have obliterated its natural and landscape values. But over the past 40 years, the lower Merri valley has been restored to a much-loved bushland corridor. This has been achieved through the efforts of many community volunteers, Merri Creek Management Committee and local Councils, with assistance from State and

Federal government agencies. The story of this transformation is illustrated in a set of exhibition panels: https://mcmc.org.au/ images/MerriCreek_Exhibition_fronts.pdf.

Significant sites and species

The Creek and its catchment lie on the eastern fringe of Victoria's volcanic plains and retain endangered plant and animal communities, including plains grasslands, woodlands with River Red Gums several hundred years old, wetlands and rocky escarpments along the waterways. While these would have been familiar to the Wurundjeri Woi-wurrung people of the Kulin nation, they were rediscovered in recent decades as naturalists explored the valley.

The main areas of remnant vegetation are significant for nature conservation on a State and national level. Some of these remnants have been protected in conservation reserves, including Craigieburn Grasslands/Galgi Ngarrk (342 ha), Cooper Street Grasslands/Bababi Marning (52 ha) and Galada Tamboore (130 ha approx.). Craigieburn and Cooper Street Grasslands and the link along the Merri between them, are listed on the Register of the National Estate. The listing was on the basis that the grasslands are some of the best remaining examples of the grasslands which covered much of the western basalt plains grasslands in Victoria, now an endangered community.

Several species and communities are listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and the Victorian *Flora and Fauna Guarantee Act 1988*. These include golden sun moth, growling grass frog, Seasonal Herbaceous Wetlands, and Natural Temperate Grassland and Grassy Eucalypt Woodland of the Victorian Volcanic Plain. Many sites with these species and communities will disappear under houses and roads to accommodate Melbourne's rapid expansion northwards, which is planned to eventually cover most of the Merri catchment. However a corridor of land has been designated along the middle and upper Merri for growling grass frog conservation and there are several designated conservation areas for listed communities.

Steps to restore a degraded riparian corridor

The creek corridor in urban Melbourne is approximately 16 km long, with a strip of public open space of variable width, interspersed with some private land frontages. Almost all the indigenous vegetation along the urban reaches had been removed by the 1970s. Of the roughly 250 ha of open space south of the Ring Road, around 30-40 ha had remnant vegetation, with maybe 15 ha of high quality.

Initial efforts by volunteers to revegetate creekside sites in the suburbs met with limited success. Weeds and grasses weren't controlled before or after planting, stakes were removed for backyard tomatoes and council mowers truncated many plants. Very few people knew what plants are indigenous to the Merri valley, so a planting guide was produced by volunteers in 1982. This early guide was improved and expanded in two subsequent editions.

In the 1980s, neither local councils nor community volunteers had the capacity to undertake indigenous revegetation as per the shared vision for restoration. A new for-purpose organisation, Merri Creek Management Committee Inc. (MCMC), was established in 1989 with skilled staff to undertake ecological restoration, stakeholder co-ordination, input to plans and strategies and community education. Core funding comes from local councils, supplemented by contracts and grants. Its local government - community governance model has proven durable and effective.

Thirty years of professional ecological restoration

Since 1989, MCMC's Ecological Restoration team has improved the condition of remnant patches and revegetated extensive stretches of the Merri valley and tributaries. The work is varied, including ecological





burning, innovative approaches to re-establishing ground-layer plants (no longer using black plastic weedmat), increased use of non-chemical controls such as handweeding, partnership projects with the Wurundjeri Narrap team, trial monitoring with a drone and frequent engagement of corporate and community volunteers and students.

The team currently manages over 70 indigenous vegetation sites along Merri Creek, its tributaries and some high value vegetation beyond the Merri catchment. Over one-third of works focus on shrublands and woodlands, one third on wetlands and the banks of waterways and a quarter on grasslands. More than half of these works support the regeneration of remnant vegetation. Reconstruction of significantly degraded sites accounts for 40% of our works. Ecological monitoring and community engagement make up the remaining 6%. In 2017-18, MCMC



planted nearly 8,000 plants, 88% of which were ground-storey, 7% were shrubs and 5% trees. This included creating in-situ Seed Production Areas for three plant species rare to the catchment. Indigenous grasses were direct-sown, using over 12 kg of seed.

The size of the Ecological Restoration team fluctuates depending on availability of funds; currently it has 11 members. In 2018, 681 volunteers supervised by the team contributed 2,011 hours to ecological restoration projects. MCMC ecological restoration team hosted 42 community events including plantings, sowing seed, weed management, training and ecological surveys.

Priorities for works are largely determined by MCMC staff; annual site plans are submitted to several councils and site visits are held to discuss priorities. The ability to apply for grants provides some more leeway to work on priority projects, which are nevertheless discussed with and approved by local government, as the landholder. Council bushland management teams and specialist contractors now also operate along the Merri valley, extending the restoration work.

As Bush et al., (2003) stated, "Generally, weedy landscapes are



Galada Tamboore reserve Left: in 1990, a site for dumped cars. Above: in 2015 Photos:MCMC

replaced with a simplified version of the original ecosystem that incorporates the structure, wildlife habitats and some of the ecological processes of the original ecological communities. Characteristically the restoration and management projects aim to involve and inspire local communities."

MCMC was awarded the Thiess Riverprize in 2002 for best practice in river management by Australian community-based organisations. The Merri was rated as the most popular urban creek in Victoria in 2011 (Dept Sustainability & Environment 2011). Birds have returned to the lower Merri valley in both numbers and species richness – by 2015, 61 species had been added to the 53 recorded in 1993.

Friends of Merri Creek Inc. is a volunteer community group that works closely with the Management Committee to restore and protect the Merri Creek and its valley. The Friends' activities include planting and weeding (usually with site preparation and follow-up, and organisational assistance by MCMC staff or Council bush crews), bird surveys, water quality testing and litter blitzes. The Friends have also successfully campaigned against threats such as the proposed freeway, sale of public open space, and intrusive development proposals.



Hall Reserve Clifton Hill in 1982

Photo: W Grundmann

The same area in 2015

Photo: C Clarke

Ngarri-djarrang Grassland

An important site managed by MCMC is the nine hectare Ngarridiarrang Grassland (see the fact sheet under publications on the MCMC website). This site is on Central Creek, a tributary of the Merri. The main vegetation community at Ngarri-djarrang is the EPBC-listed critically endangered Natural Temperate Grassland of the Victorian Volcanic Plains. The reserve supports EPBClisted matted flax-lily (Dianella amoena) and swamp everlasting (Xerochrysum palustre), as well as a few species threatened in Victoria - plains yam daisy (Microseris scapigera), rye beetlegrass (Tripogon loliiformis) and short water-starwort (Callitriche brachycarpa), plus many regionally-threatened species. The site demonstrates that a small grassland reserve can be successfully maintained in an urban context and support a resident mob of kangaroos. Despite being surrounded by houses, patches are annually burnt by MCMC (supported by Darebin Council staff) and projects are underway to reintroduce past traditional indigenous horticultural practices.

A particularly successful technique used to introduce herbaceous species is the 'gap and soil disturbance' method, which has been far better than tubestock planting at reintroducing some of the threatened daisy species.

An article on the MCMC website provides more information about restoration work at Ngarri-djarrang.

Gap and Spoil Disturbance

Soil disturbance was once common in native grasslands through the digging for edible roots by traditional owners and feeding of small digging animals such as bettongs and bandicoots. The MCMC have been exploring how reintroducing such soil disturbance can enhance the establishment of native seedlings with signs of success.

Researchers have also identified the importance of gaps between tussock grasses for seedlings to survive in native grasslands. Creation of inter-tussock gaps has also been part of restoration work.



MCMC and Wurundjeri carrying out a cool cultural burn at the Bababi djinanang grasslands July 2019 Photo: MCMC



The former Whelan's tip. Now Kirkdale St Park (2015) Photo: C Clarke

Ingredients for success

What are some of the success factors underpinning the long-term transformation of the Merri?

- a widely-shared, positive vision for restoration
- skilled and dedicated staff with fair pay and conditions in a for-purpose organisation
- continuing core funding from six local councils
- the resilient local government-community governance model and mutually supportive relationship between MCMC, Friends of Merri Creek and local volunteer groups
- innovative and imaginative projects that attract grants to expand the scope and extent of ecological restoration and community engagement
- ongoing maintenance of remnant and revegetation sites.

Ecological restoration is ongoing: remnant and revegetated sites need regular maintenance; there are still plenty of gaps in the revegetated corridor; and urban development is proceeding rapidly across the middle and upper catchment bringing new challenges and opportunities.

For more information, visit the MCMC website mcmc.org.au, email admin@mcmc.org.au or call (03) 93808199.

Bush, J., B. Miles & B. Bainbridge (2003) 'Merri Creek: Managing an urban waterway for people and nature'. *Ecological Management and Restoration* Vol.4 No. 3, pp170-179.

Department of Sustainability & Environment (2011) 'My Victorian Waterway: Personal connections with rivers, wetlands and estuaries in Victoria' p6.



Planting by volunteers and the MCMC team May 2015 Photo: MCMC



AABR Walk and Talk Connecting Corridors with Cumberland Land Conservancy

In September 2019, AABR co-hosted a field day with the Cumberland Land Conservancy (CLC) in Mulgoa, western Sydney.

CLC is a volunteer operated not-for-profit charity dedicated to acquiring land for conservation with a focus on the 'Cumberland Plain' of western Sydney. The Cumberland Plain is one of the most heavily cleared landscapes in Australia. The dominant vegetation (Cumberland Plain Woodland) has been reduced to less than 6% of its original extent and is now Critically Endangered at both state and commonwealth level. This already heavily cleared and fragmented region is now being cleared and developed at an even more rapid rate with little or no planning to conserve key linkages for wildlife. Saving the Cumberland Plain requires the purchase and protection of these key linkages. CLC stands apart as a community-based charity successfully securing biodiversity corridors in western Sydney. Thanks to the generosity of supporters, CLC now owns and manages four properties protecting 49 hectares of habitat forever and linking key habitats in Western Sydney.

Using the Recovery Wheel

On recent AABR site visits, participants have been introduced to the National Standards for Ecological Restoration and the Recovery Wheel. The recovery wheel and 5 star rating system is a simple and effective tool to evaluate and present how a restored ecosystem is performing compared to a reference community. In our next newsletter we will go into more detail about this.

For an introduction see AABR Newsletter 128 www.aabr.org.au/ images/stories/resources/newsletters/AABR_News_128.pdf_

Watch *regenTV* http://www.aabr.org.au/regentv/ to see the recovery wheel in use at Rocky Creek Dam in northern NSW.

Find out more and download the Standards brochure at http:// seraustralasia.com/wheel/index.html



The field day was held at CLC's first property Wallaroo, a 38ha former cattle grazing property. It was purchased with assistance from the Australian Government and the NSW Nature Conservation Trust in early 2016. During the day attendees learnt about the aims of CLC and their land management techniques. Additionally, Agata Mitchell, teacher at Ryde TAFE, gave an overview about the national restoration standards and demonstrated how to use the recovery wheel.

Wallaroo consists of approximately 23 hectares of intact native vegetation with the remainder exhibiting previous clearing and/ or pasture modification. The property is adjacent to a biobanking site which links to Mulgoa Nature Reserve, the latter comprising 213 ha of Cumberland Plain Woodland. The eastern side of the Wallaroo is bordered by an old clay quarry which is now used for landfill. On the western and southern boundary Wallaroo is bordered by semi-rural properties with small numbers of livestock. Wallaroo is fenced off, but the fencing allows wildlife to move in and out. The property got its name from the mob of 20 Wallaroos that call it its home. Only since 2018 Eastern Grey



Wallaroos at Wallaroo Photo: Mark Fuller

Kangaroos have reinhabited Wallaroo. In the recovery wheel the property was rated with three stars for external exchange which describes landscape flows, gene flows, and habitat links. The connectivity is increasing and exchanges between the site and the external environment are starting to be evident.

CLC is managing weeds with various bush regeneration techniques and presented the event attendees with different examples of their on-ground work including fire management, biological control agents, carefully timed slashing and revegetation. The weed density has decreased drastically since 2016 but especially in the modified pastures. Recovery is still in its early stages and some of the adjoining properties are not yet involved in weed control along the boundaries. Therefore, the rating for the absences of threats in the recovery wheel was selected as two stars which means that threats from adjacent areas are beginning to be managed or mitigated.

The remnant woodlands at Wallaroo contain some beautiful old trees, especially on the western side of the property which is dominated by cabbage gums (*Eucalyptus amplifolia*), an important koala food tree. In 2018 a koala scat was found in this area and was identified by Sydney University as belonging to a





The rose robin, seen at Wallaroo. ^r Photo: Mark Fuller

Our hosts. Wayne Olling, Linda Brown and Peter Mobbs (CLC's Scientific Officer). Photo: S Pritchard

female chlamydia free koala. A few weeks later a male koala was found a few kilometres further north. During revegetation of the modified grasslands, CLC planted koala food trees to extend their habitat and hopefully in the future koalas will make Wallaroo part of their permanent home.

Within the eastern side of the property hollow bearing trees are scarcer. Therefore, CLC installed chainsaw carved hollows in six trees to increase the habitat value in this area. Additionally, over 6 tonnes of ground logs were installed to improve the habitat for small mammals, reptiles and the endangered Cumberland Plain Woodland Snail which mainly feeds on fungus or decaying wood. Overall the remnant vegetation had a good structural diversity and was rated with four stars which means that all strata were present and spatial patterning and substantial trophic complexity were developing.

Almost 200 native plant species, 146 bird species, 18 mammal species (12 of them are bats), 11 reptile species and 8 amphibian species have been recorded at Wallaroo and the list is growing constantly. During the field day CLC's ornithologist Mark Fuller went on a bird walk with the attendees to show them some of the lovely woodland birds such as the rose robin which presented well on the day. Birds are monitored at Wallaroo on the first Monday of every month by CLC volunteers and the monitoring revealed that ground nesting birds such as quail are returning to Wallaroo which is most likely the result of ongoing fox management. Foxes, deer and carp are managed by CLC but cannot be eradicated completely, due to the ongoing influx from surrounding properties. With the help of the Greater Sydney Local Land Services, the CLC co-founded a community group to extend pest management to surrounding neighbours. Five additional properties are already involved in pest control and CLC hopes to increase the number in the future because pest management is a shared responsibility and can only be successful with a tenure neutral approach. For the species composition the site was rated with three stars. Even though the species diversity is substantial there is still a low threat from undesirable species.

Apart from the biota CLC also monitors physical conditions of the property. CLC conducted soil testing which revealed that the soil structure showed some compaction. The soil chemistry was not altered by former land management techniques. During monthly streamwatch surveys, the water quality of Mulgoa creek is monitored, and the dam water is tested sporadically. In addition to chemical water analysis, extensive



The group learning about the Recovery Wheel from AABR commitee member, Agata Mitchell. Photo: S Pritchard macro invertebrate sampling was conducted in both the creek and the dams. The surveys indicated that both diversity and abundance of macroinvertebrates was higher in the dams compared to the creek which

is most likely caused by the presence of carp in the creek. So, even though the dams are an artificial structure and relics from past land management, they are an important habitat and biodiversity refuge for macroinvertebrates and aquatic plants. Due to the soil compaction in some areas and the influence of carp and run off from the landfill to the creek, the physical conditions were rated with three stars in the recovery wheel which indicates that the substrate is stabilised within the natural range and is supporting growth of characteristic biota. The ecosystem overall showed some evidence of nutrient cycling, habitat interactions and resilience and was rated with three stars for the ecosystem function section of the recovery wheel.

CLC is using different monitoring methods including vegetation assessments via transects and quadrats, photopoints, wildlife monitoring via motion sensor cameras, spotlighting and bird surveys. It also implemented the Checking for Change assessment which was developed in 2016 by the CSIRO. Checking for Change is a tool that helps land managers to keep track of their achievements of improving the environment by testing indicators, such as leaf litter depth, decomposition, invertebrates and native ground cover, that are sensitive to changes in land management in a relatively short timeframe (2 to 6 years). CLC was excited to learn about the recovery wheel during the field day and plans to utilise the tool in the future.

To find out more about Cumberland Land Conservancy visit their website https://www.cumberlandlc.org.au/



Ground logs have been installed at Wallaroo to improve the habitat. Photo: S Pritchard



Seeds for the Future

Forum- Summary of Presentations Part 1

Communique from the NSW restoration industry AABR /ANPC -'Seeds for the Future' Forum, Oct 8, 2019

The ecological restoration industry is small but critical to the future of biodiverse native ecosystems in Australia, ecosystems that are essential to our nation's clean water, functional soils and carbon capture and storage. Great strides have been made in developing successful methodologies for restoring complex ecosystems using a combination of assisted regeneration and reconstruction techniques.

Barriers exist, however, to the necessary expansion of the industry if it is to make a difference to biodiversity conservation. One critical barrier is the time lag required to collect and supply the seed required for restoration which is almost always longer than the short lead times for funding contracts. A second barrier is the wildly fluctuating demand for seed due to either dry years or the chance occurrence of large developments which impacts on the viability of many organisations or operators.

There is a need for more sustained drivers for the seed and restoration industry. Market demand needs to reach a larger scale to make it economically viable for suppliers to risk investment in seed collection and storage or cultivated seed production. Investment in seed production is required to reduce pressure from harvest from self-sustaining natural systems, increasing harvest volumes and efficiencies and managing genetic diversity of supply.

The primary current driver for restoration is for work required as a result of development consents (e.g., mining and urban development). More ambitious incentives for diverse ecosystem restoration for its own sake are required, as well as the necessary planning to ensure investment in appropriate physical and organisational infrastructure.

The Forum calls upon State and Federal governments to direct incentive funding to biodiversity restoration and the infrastructure required to support it, whether solely for conservation, as a co-benefit for developing more sustainable farming systems, better managed transport corridors, meeting carbon emission reductions, soil and water security or generating employment and community wellbeing.

With the increase in demand for restoration will come drivers for improvements to restoration training, native seed collection permitting and regulation, increased development of seed production farms and the establishment of standards for high quality seed supply.

As bureaucratic barriers to these improvements exist, the Forum calls upon agencies at all levels of government across Australia to work with industry and non-profit restoration organisations to streamline solutions in these areas.

Healthy Seeds Project. Current Barriers- Future opportunities

The Australian Network for Plant Conservation (ANPC)

Martin Driver. ANPC Project Manager

The NSW Healthy Seeds Project has been funded from the NSW Environmental Trust to enable ANPC and Consortium partners to examine issues that constrain or devalue investment in native vegetation restoration projects in NSW. The outline of the National Native Seed Industry Survey presented by Paul Gibson-Roy has identified a number of these key issues that impact on supply or quality of native seed supply and which will form the basis of the investigations in NSW.

The project assumes that NSW is intending to maintain and extend the support of vegetation restoration across NSW and that the supply of reliable and quality seed is integral to this. The project aims to look at all aspects of the native seed supply chain from seed sourcing, seed collection, seed processing, seed storage and data management to seed supply and sale and seed use in restoration.

ANPC is a lead partner in the Healthy Seeds Consortium consisting of NSW Environmental Trust, AABR, SERA, CSIRO, RBG, ASBP, GA, LLS, Landcare, Universities and several industry operator reference groups.

The Healthy Seeds Project will enable the resourcing of a number of interlinked products and outcomes. The funding will enable the publication of the **National Native Seed Industry**

Survey in both summary and extended forms through ANPC and its partners. It will also enable update of the **Florabank** Guidelines which are the key seed collection standards, training tool and benchmark requirement for seed collection licensing in NSW. A key element of investigation will be the investigation Audit of native seed supplies and seed use in NSW LLS NRM regions looking at funding, supply/demand quantities, species availability, staffing/ employment and training needs, coordination, collection sources, site access and licensing and permit systems, the role of SPAs. This process will also enable elicitation of the key local, regional and State Barriers and **Opportunities** to native seed supply quantity and quality. From this data and feedback a **Draft Roadmap** will be produced at the end of the eighteen month Stage 1 of the project that will outline some key likely effective and efficient interventions that could be tested in various critical stages of the seed supply chain and priority geographic areas of the State.

The intent of the entire project is to bring together a number of disparate elements of a fragmented native seed supply system to ensure that best practice is identified, specified and documented at all levels of delivery. It is also intended to try and identify and address those critical components where market failure is impacting on either quality, outcomes or sustainability in the most effective way.

Contact: Martin Driver projects@anpc.asn.au Mobile 0400170957



Reaching for the Sky at Scheyville

How a local project can dovetail into regional design for Greater Sydney

Katie Littlejohn

Manager, Cumberland Area, NSW NPWS

The NSW National Parks and Wildlife Service (NPWS) manages twenty reserves across the Cumberland Plain in western Sydney. Most of the vegetation in these reserves has been disturbed due to past land uses and contains mostly regrowth. Despite this history, these reserves have at least eighty percent of the area covered in threatened ecological communities and the restoration of these is challenging.

Scheyville National Park is no different and has had a long history of disturbance. In the early 1800s there was substantial clearing, logging and grazing with local settlement. From 1910 there was more intensive agriculture with cropping and ploughing as part of the Dreadnought Training Farm. The clearing stopped in the 1940s, but during the 1960-70s when the land was used as an Army Officer Training Unit there were several playing fields with turf established. By the time the reserve was gazetted in 1996, there was probably only about five trees remaining from pre-European settlement. This disturbance opened the door for African olive and introduced grasses, like African love grass, to take over and transform the landscape by limiting the ability of native species to naturally regenerate.

NPWS has been working with partners over the last eighteen years to complete various adaptive management trials to learn the best way to overcome these weeds to restore the threatened communities at Scheyville. The first trial used fire in plots with varying disturbance histories -grazing, ploughing, orchards. The first burn removed the dense sward of introduced grasses and a range of previously unseen native species appeared. However, more introduced species germinated than the natives. A second burn four years later had the opposite effect and it appeared that more frequent burning was tipping the balance towards native species regeneration. Unfortunately, lack of follow-up weed management meant this was not sustainable and African love grass became the dominant species ten years later.

A student from Western Sydney university then tried adding carbon (granulated sugar) following fire to these plots. This showed promising results as the nitrogen available to the plants was significantly reduced, it increased the soil microbial activity and markedly reduced the African love grass biomass. While it didn't remove the introduced species, it did encourage a more favourable environment for native recruitment.

A separate trial was established to look at combinations of fire and herbicide treatment to remove African love grass targeting its biomass, rootstock and seedbank. Taskforce[®] was applied first with plots burnt six to eight weeks later. Again, this method was successful for controlling the introduced grasses and in areas where there was a native seedbank, a range of local species appeared. However, there was no native establishment in former

sporting fields where we expected there was no longer a seed bank. Integration of fire with herbicide is essential to control the weeds, but the issue of native regeneration was still not resolved.

Another trial looked at native direct seeding into an area where the African love grass was removed by stripping the topsoil and seeding



Left: Treatment trials Photo: L Brodie



Western Sydney bushland

Photo: J Sanders

into the remaining subsoil. This has had excellent results with many species already flowering and setting seed a number of times, the seed bank germinating as good weather conditions allow, vegetation gradually increasing in density, some trees have started to re-establish and individual African love grass plants have been removed as needed. This method has proven that restoration is possible in completely altered landscapes providing there is a good supply of diverse native seed. This technique has been used in other areas and changed slightly depending on the project. For example, areas that needed immediate stabilisation, sterile rye grass was included in the seed mix. This had an added benefit of providing a palatable food source for macropods in the area.

We have learnt some lessons along the way. Herbicide application as a standalone treatment is ineffective. Sometimes the application has killed everything if not sprayed in the right conditions or replaced these areas with broadleaf weeds instead. Herbicides like Taskforce[®] are good at killing the weeds but leaves the dense biomass behind inhibiting native recruitment. Mass tube stock plantings have failed due to inadequate watering regimes, time of year of planting and/or very little site preparation. Often these programs are time limited because of funding requirements, which often doesn't allow for the climatic conditions needed for successful restoration.

Scheyville shows that restoration of native vegetation is possible and achievable even after 150 years of sustained disturbance. It involves using a range of techniques as appropriate including encouraging the innate regenerative capacity of native species through fire regimes, correction of soil problems (through carbon addition and/or removal of high phosphate soils or weed loads), removal of introduced species and addition of native groundcover seed to enhance the remnant seedbank. However, the Scheyville example does shows that species diversity is deficient. Direct seeding will recreate these native seed banks that will persist through time and germinate in good climatic conditions, unlike tube stock planting that may not survive following planting. Seeding, using a variety of techniques, is our only guarantee of success for large-scale restoration in western Sydney. If we can support the growth of the native seed industry, it will also be our most cost effective tool into the future.



Right: Dead biomass remaing after spraying. Photo K Littlejohn



Australian Native Seed Sector Survey

Paul Gibson-Roy, Greening Australia Nola Hancock,Macquarie University

Martin Driver, ANPC. Linda Broadhurst CSIRO

The native seed sector survey, organised by Australian Network for Plant Conservation (ANPC), was undertaken in 2016-17.

The survey had a number of aims:

- provide basic data on a range of sector-related subjects including seed collection practices, seed use and business structures and operating models
- test common perceptions, resolve uncertainties, explore relationships between the different users of seed, gauge opinions, and gather feedback on issues experienced within the sector
- gather knowledge on how (and why) the sector operates as it does and to discern pathways to a more productive future

The different groups surveyed included those who

- A. Collect seed or hold seed collected by others on consignment (i.e. community seedbank), for sale, or for use in your own projects (i.e.nursery production or direct seeding)? (70 responses)
- B. Grow seed in Seed Production Areas (i.e. plants grown in cultivation to produce seed) for sale or for use in your own projects? (24 responses)
- C. Purchase seed for your own projects or for distribution to other projects? (26 responses)
- D. Use seed for other purposes? (26 responses)

The responses were nationwide with almost half from NSW/ACT, over a quarter from Victoria, ~ 10% from WA and the remainder from the other states. They included community groups, non-government organisations, government, commercial seed collectors and individuals including landholders.

Ranking of Issues (Combined Group Values)

Issue	Range 0-5
Future demand for seed will be difficult to meet from wild harvest	4.1
The market is unwilling to pay for the true cost of seed collection/seed production	4.0
There is a lack of seed available from a broad range of species	3.9
Demand for seed is inconsistent &/or unpredictable	3.9
Seed orders are made at too short notice	3.7
To meet any shortfalls in demand for seed, seed should come from Seed Production Areas	3.7
(SPA) rather than wild populations	
There is a lack of suitable seed collectors	3.6
Seed supply is generally unreliable	3.6
Provenance range stipulations are too restrictive	3.3
Demand for seed is low	3.1
There are too many difficulties in obtaining access to wild populations for collection	3.0
There are too many difficulties in securing seed collection permits	3.0
Provenance range stipulations are too lax	2.7

Key Findings from the Survey

- Future demand for seed will be difficult to meet from wild harvest
- The market is unwilling to pay for the true cost of seed collection/ seed production
- There is a lack of seed available from a broad range of species
- Demand for seed is inconsistent &/or unpredictable
- The formation of a peak industry group to represent the native seed sector is highly desirable
- More seed is collected from private property than from other land tenures
- Seed for local provenance use is likely to be accepted from locations farther away from the planting site than commonly specified
- Current provenance range stipulations are considered to be too restrictive
- There is inconsistent interest across the sector in determining seed quality (e.g. seed testing, labelling standards)
- There is interest in training to guide Seed Production Areas

The full report will be released by ANPC later in 2019

Wildflowers Across the Northern Beaches

Michael Kneipp, Northern Beaches Council

Northern Beaches Council is setting up a project to establish wildflower beds within underutilised areas which are currently being habitually mown and have no recreational value. Examples are grass verges, end of walking tracks, edges of parklands and entry and exit points to suburbs. Council plans to collect, produce and store the seed for this project at our community nursery and develop a seed production area (SPA) within the nursery at North Curl

The aim of establishing locally native groundcovers/grasses and forbs is to assist ecosystem services such as filtration, carbon capture, fauna habitat, flow of genetic material, create living corridors. We will create a self sustaining native seed bank for wildflowers, grasses and forbs.

The project will also create a different type of environmental volunteering opportunity as well as an opportunity to educate the community on local environmental issues.

Implementation will involve the preparation of a detailed business plan.

Seed is to be sourced locally where possible and transplanted or directly sown into areas. Using the nursery and SPA will provide social, educational, and training opportunities for the broader community (i.e. horticulture, ecology, gardening). We will have some trial garden beds at the nursery, and at an already established permaculture plot on public land.

We will use the seed and plants produced at the community nursery to increase native diversity throughout the LGA via the



Above: Imagine the areas beside the path turned into a garden of wildflowers. Photo: Michael Kneipp

bush and urban-care programs. The community will identify an area they would like to establish and maintain. We will have an education program to promote the benefits of wildflower/ grasslands and provide guidelines on the establishment of the beds.

The initial response from the community has been very positive. But there are identified risks to the project which include lack of Council support and community interest, lack of funding, the community losing interest with the beds falling into an unruly state and a paucity of a large enough locally sourced seedbank to create diversity.

We might need to consider how important is provenance as opposed to diversity? Given that our landscapes are so modified, should we as land managers be managing the landscapes to ensure that we are not as precious with provenance and more concerned with diversity for both the flora and fauna?



Using Green Roofs for Conservation

Research at UNSW to conserve Eastern Suburbs Banksia Scrub

Dr John Blair, and Associate Professor Paul Osmond, UNSW

The Eastern Suburbs Banksia Scrub (ESBS) was the first ecological community to be listed as endangered under the NSW Threatened Species Conservation Act 1995 and its replacement the Biodiversity Conservation Act 2016. The ESBS is also been as endangered under the Australian Government's Environment Protection and Biodiversity Conservation Act 1999. Only 2.8% of the original coverage of 5,300 hectares remains and the NSW Threatened Species Scientific Committee has indicated that the community faces "an extremely high risk of extinction in Australia in the immediate future" (NSW TSSC 2016, p.4). Common species in the ESBS community include over-storey 4-5 metre trees eg heathleaved banksia Banksia ericifolia, old man banksia B. serrata and coast teatree Leptospermum laevigatum; shrubs and ground cover species - Epacris spp., pink wax flower Eriostemon australasius, variable sword sedge Lepidosperma laterale, tree-broom heath Monotoca elliptica and grass trees Xanthorrhoea resinifera.

Protecting such species at ground level in urban conditions of rapid development is extremely difficult. One option is to 'leap' a little higher to rooftops which are remaining vacant spaces in our cities and evaluate the capacity of green roofs to sustain key species, in this case, the ESBS.

Research objectives

The research should be medium term – a minimum of 3 years - to allow the monitoring of a full cycle of seed germination, growth to maturation, and further seed generation by the plants.

The key objectives are:

- To help combat the apparent on-going loss of species and diminishing gene pool in some fragments of the ESBS (Perkins et al 2012a) and to support Objective 3 of the ESBS Recovery Plan which is to "....connect and enlarge remnants of the community through appropriate management" (NSW DEC 2004 p.11);
- To determine the capacity of GRs to act as a conservation medium and seed bank for a range of species within the ESBS community;
- Test the ability of green roofs to mimic natural ground level habitats with a view to scaling up their role more generally in the conservation of threatened and endangered species;
- Develop the GRs as new ESBS sites to provide plants representative of the community and track their functioning on natural and artificial substrates of different depths;
- Compare the functioning of the representative plants on the GRs against identical species at ground level remnant sites; and
- Trial the re-introduction of species not currently present on remnant sites.

3. Cultivation principles

There are a number of cultivation principles which will be considered but the key ones suggest that successful research outcomes lie in examining existing site conditions carefully, possessing detailed knowledge of the species to be transferred to the GRs, acknowledging the small-scale characteristics that occur in the natural environment which provide niches for various forms of wildlife and paying attention to soil and microbial composition. The guiding principle would be to match conditions on the green roof closely with those enjoyed by the natural community (Razzaghmanesh et al, 2014). If this is achieved, it may become possible to replicate "unique ecological processes and ecological linkages in the space" (Huang et al 2017 p.1616).

Practical matters

- The researchers are seeking a suitable roof space at the UNSW's campus which simplifies management of the project considerably. A roof space has been identified and is being considered by UNSW's Estates Management (EM);
- Roof top research work and access will need to comply with the Work Health and Safety Regulation 2017 and a risk assessment form has now been completed on-line already;
- An installation crew will provide infrastructure and materials - a roof membrane, root barrier, drainage layer and substrate. Average depth of the substrate would be 100mm, ranging from 50mm to 150 mm maximum;
- A minimum of 120m² is needed for the research to cover a suitable number of variables such as substrate depth and natural versus artificial substrates:
- Water would be needed to help establish the seedlings at the commencement of the research; and
- Ongoing maintenance and monitoring plant condition will be carried out by the small research team.

An application for funding to conduct the research will be made once the roof research space has been formally approved by UNSW Estate Management. References

Huang, Yan, Yichao Ma, Wenting Wu, and Qinzhi Lv 2017. Applying Biotope Concepts and Approaches for Sustainable Environmental Design. Korean Journal of Civil Engineering, 21(5):1614-1622; DOI 10.1007/s12205-016-1077-1.

NSW Department of Environment and Conservation (DEC) 2004. Eastern Suburbs Banksia Scrub Endangered Ecological Community Recovery Plan. Sydney, NSW DEC.

NSW Threatened Species Scientific Committee 2016. Notice of and reasons for the Final Determination. Available at: https://www.environment.nsw.gov.au/resources/ threatenedspecies/determinations/FDESBSCEEC.pdf

Perkins, Ian, John Diamond, Georgina SanRoque, Lyn Raffan, Bettina Digby, Peter Jensen, and Daniel Hirschfeld 2012. Eastern Suburbs Banksia Scrub: Rescuing an endangered ecological community; Ecological Management and Restoration, Volume13, Issue3, pages 224-237; https://doi.org/10.1111/emr.12002.

Razzaghmanesh, M., S. Beecham, F. Kazemi 2014. The growth and survival of plants in urban green roofs in a dry climate. Science of the Total Environment 476-477, 288-297 October 16, 2019.



Banksia integrifolia Old Man Banksia and Epacris longifolia Native Fuchsia at Malabar Headland, a significant ESBS reserve. (Source: Friends of Malabar Headland 2018).



Conservation and Land Management Consultation Workshops

This is your opportunity to have a say in how appropriate training can be provided for the bush regeneration and restoration industry through the Agriculture, Horticulture & Conservation & Land Management Training Package

The Agriculture, Horticulture & Conservation & Land Management Training Package covers training for conservation and land management, and its related fields of lands, parks and wildlife, natural area restoration, conservation earthworks, and pest management. The skills required make up a key skill area within this package. It is one of the largest, most complex and diverse training packages in the Australian System, so it's vital these skills are regularly reviewed and updated.

Rapid technological advancements, changing markets and shifting climactic conditions are affecting the sector as a whole. Today's conservation and land management workers need to gain a broad set of skills and build the knowledge to successfully face these challenges of our fragile ecosystems. Nationally approved training is vital in supporting industry as it responds to these trends, addressing skills needs and creating new job outcomes.

To address these challenges, the Australian Industry and Skills Committee (AISC) is currently facilitating a strategic review of the AHC Training Package. This involves identifying and reviewing units of competency, skill sets and qualifications to support job roles. In total, 9 qualifications and 70 units are under review.

Subject Matter Experts are being consulted to review the structure of the qualifications, and feedback so far suggests some qualifications may need to be merged into one qualification with a wider scope. Skills sets and specialisations within the qualifications may be developed to support the specific job roles.

The Project has now reached the broad stakeholder consultation and feedback stage. This affects your industry and future skills and training outcomes that are critical to meeting employment demands. Public consultation workshops will allow you to have a say to ensure the future of the industry through the provision of appropriately skilled and trained personnel that meet the requirements of the varied job roles.

Public Consultation workshops are a 2 hour event, which are open to general Industry, RTO, Union, Association and Government bodies. During the workshops you will get a run through of the contents of the project and be able to provide your feedback to the proposed changes. Two webinars will be held as well, for those unable to attend a physical session.

You can read more about the project on Skills Impact website, and register for the Face-to-face consultation workshops and webinars

Workshop dates and places

Click on the link below to find out more 7th November 9:30am- 12:00pm Hobart 8th November 9:30am- 12:00pm Launceston 12th November 9:30am- 12:00pm Adelaide 13th November 9:30am- 12:00pm Broome 19th November 9:30am- 12:00pm Broome 20th November 9:30am- 12:00pm Brisbane 21st November 9:30am- 12:00pm Melbourne 26th November 9:30am- 12:00pm Darwin

Consultation webinars

28th November 9:00am- 11:00am 29th November 1:00pm- 3:00pm

If you would like to discuss the matter further Agata Mitchell, AABR Committee member and Head Teacher Applied Environmental Management Division TAFE is happy to talk. Phone +61 2 9448 6263 Email agata.mitchell@tafensw.edu.au

Recognition of International Standards

AABR's President Tein McDonald, was instrumental in the development of the *National Standards for Ecological Restoration in Australia* which was further refined to become the *International Principles and Standards for the Practice of Ecological Restoration*.

The United Nations Executive Secretary, recently acknowledged the significance of the international document.

"Recognizing that ecosystem restoration is one of the most costeffective solutions for achieving sustainable development, the UNCCD welcomes the publication of the International Restoration Standards developed by the Society for Ecological Restoration. We see significant potential for these Standards to assist countries in achieving their Land Degradation Neutrality targets under Sustainable Development Goal 15 "Life on Land". As we prepare to launch the UN Decade on Ecosystem Restoration (2021-2030), there will be a need for a scientific and principled approach to guide all stakeholders in taking effective restorative actions and ensuring sustained impact for people and nature," said Ibrahim Thiaw, Executive Secretary, United Nations Convention to Combat Desertification (UNCCD)

The second edition of the International Standards for the Practice of Ecological Restoration was released on September 27, 2019, in Cape Town, South Africa at SER's 8th World Conference on Ecological Restoration. It has been published as a special issue of Restoration Ecology - see https://onlinelibrary.wiley.com/toc/1526100x/2019/27/S1.

It uses the same restoration framework as in the Australian document (National Standards) - but has been through an extensive international peer review and consensus-seeking process and has an enlarged group of authors.

For more information go to https://knowledge.unccd.int/ publications/society-ecological-restoration-releases-essentialtool-address-climate-change-and

A Decade of Myrtle Rust

Spencer Shaw, Brush Turkey Enterprises

Next year will be the 10th anniversary of myrtle rust being brought into Australia. Note that I say 'brought into' Australia, as the terminology usually used is 'arrived' or 'was first detected'. The latter could be taken as inferring that myrtle rust arrived in Australia all by itself. This is clearly not the case. Myrtle rust was brought into the country as a result of the global trade and travel networks of human activity. We brought it here and we also need to be the ones responsible for preserving the amazing species diversity of Myrtaceae that has evolved in this land and is now threatened by myrtle rust.

So just how are we going to preserve the diversity of Myrtaceae in Australia? I can only speak of our personal experiences in observing the life cycles and propagation of our local Myrtaceae in south eastern Queensland, but I think we are onto something. And that is, that preserving species that are threatened by myrtle rust, can be tackled at a grass roots level (or at least at a tree and shrub level – pardon the pun), through the work of nurseries propagating myrtle rust resistant plants.

Back in 2011, when myrtle rust arrived in SE QLD, you could have been forgiven for thinking that nurseries were the only source of myrtle rust and that going near a nursery was potentially dangerous to you own health! Sure, nurseries could potentially speed the spread of myrtle rust due to interstate plant transport, but once established in NSW it was only a matter of time before trillions of microscopic spores blew across the landscape and spread rapidly to colonise whole new areas. To try and stem the tide, Biosecurity then quarantined a few nurseries, but the horse was well and truly bolted. Overnight the myrtle name was tarnished, as the fear of myrtle rust spread. Some production nurseries disposed of all their Myrtaceae stock rather than trying to manage the disease, as the potential damage to their business from growing Myrtaceae outweighed the cost of throwing them all away. For those who persisted with growing Myrtaceae, fungicide regimes became compulsory – although I'd argue that they mask the problem rather that treating it. What I'm trying to get to, in an albeit circuitous way, is that nurseries were perceived

as the problem, when in fact I believe that nurseries (native ones in particular) and horticulturalists have the tools to help assist in preserving the Myrtaceae species that are under threat.

Luckily in Australia, myrtle rust has yet to have a significant impact on the dominant tree and shrubs of our woodlands e.g. Eucalypts, Corymbia, Angophora, Lophostemon, Melaleuca, Leptospermum (although locally on the Sunshine Coast we have observed some impacts on Melaleuca quinquenervia). However, many of our rainforest Myrtaceae have been significantly affected. These include Gossia spp., Lenwebbia spp., Rhodamnia spp., Backhousia spp., Rhodomyrtus psidioides, Uromyrtus lamingtonensis, Decaspermum humile, Archirhodomyrtus beckleri and Acmena smithii. These species have been affected to varying degrees, with populations and individuals within

species showing variable degrees of susceptibility. Species such as *Rhodomyrtus psidioides* are bordering on functionally extinct, with the majority of individuals struggling to maintain foliage, let alone produce flowers or fruit. At the other end of the spectrum, species such as *Austromyrtus dulcis* and *Acmena smithii* (which have only shown susceptibility over the last few years) only appear to be affected under irrigation in nurseries and not affected (at least as much) when planted.

Personally, given nearly 10 years of observations of myrtle rust and its impacts on our flora, I believe the only real hope for assisting in the preservation of Myrtaceae species that have demonstrated that they are vulnerable, is to assist



Decaspermum humille silky myrtle

Above: Infected with myrtle rust : The foliage looks healthy but fruit is damaged and lost due to myrtle rust.

Below: a naturally myrtle rust resistant plant, abundant flower and fruit Photos: Spencer Shaw





those individuals and populations within a species that are demonstrating resistance and resilience. We (nurseries, horticulturalists, nature lovers in general) can assist these species by actively searching for, identifying and then propagating and cultivating those individuals. This cultivation whether it be in gardens, farms or revegetation projects will then assist their resistant and resilient genes to spread through their populations. Resistance to myrtle rust does appear to varying degrees within the species listed above. For example, in *Acmena smithii* vulnerability appears to be the exception, but *Archirhodomyrtus beckleri* is about 50/50 in our area. Our cultivated *Rhodamnia dumicola* and *Gossia acmenoides* can keep good leaf cover but are yet to produce viable fruit. *Rhodomyrtus psidioides*, which as mentioned before, appears to have very limited resistance across the majority of its population is really struggling.

Species that we have personally had success with so far include *Decaspermum humile* and *Lenwebbia sp. blackall range*, both of which we have selected and propagated from resistant individuals. We're also working on a few *Rhodamnia* spp. - so fingers crossed there too! Another observation we've made is that if plants that have been affected by myrtle rust and can be nurtured to produce flower, fruit and then seed, then the resulting seedlings appear to be more resistant than their known parent.

We don't use systemic fungicides as part of our selection work, as discussed earlier it would only mask the problem. Selection of resistant individuals is the key to producing myrtle rust resistant / disease free stock. We do however have to use systemic fungicides to comply with our Biosecurity requirements with



Lenwebbia sp., from the blackall range . Both growing in same conditions. Above: a naturally myrtle rust resistant plant

regards movement of myrtle rust infected stock. These are the only systemic pesticides we use in our nursery and on our property, to be honest we would much rather not (but have to, to meet compliance requirements). They have no benefit other than to kill potentially present myrtle rust on stock that will then be sent out into an environment where myrtle rust is present. Any beneficial fungi present (which could be a key player in controlling myrtle rust) will also be killed.

Nearly 10 years on, there is still talk about addressing myrtle rust on a national level and mainly just that – talk. Cynical as I am with regards the slow wheels and lack of focus nationally, I don't rule out how much we could be doing including: stopping the next 'myrtle rust' type disease from being brought into the country; co-ordinating the work done by nurseries and horticulturalists to select and breed myrtle rust resistant stock (e.g. funding research); and perhaps given the potential resources available federally, we could do the research that can help understand resistant genetics and maybe genetically engineer resistance into species that we would otherwise lose.

For the time being, however, the real action is taking place out in the bush as evolutionary processes select those individuals that are resistant myrtle rust to survive and reproduce. The best that we can do for now is get behind nurseries and horticulturalists who are passionate about our native flora. They are the front line in preserving our vulnerable Myrtaceae species. For 10 years we've seen major impacts to our rainforest ecosystems through the damage to Myrtaceae species and the loss of flowering and fruiting abundance they provided for our fauna, let's hope we can improve that situation somewhat over the next 10 years.



Above: a Myrtle rust susceptible plant Photos: Spencer Shaw



Brochure on Bird-friendly rodent control

Rodent control can pose a real threat to birds which predate on rodents. A new brochure from Birdlife Australia is about bird friendly rodent control.

Generally, we don't think about what happens to the rodents that have eaten baits. The most commonly used rodent poisons are anticoagulant rodenticides (ARs), and newer ones, called second generation anticoagulant rodenticides (SGARs) which are very powerful. These act as blood thinners, so rats and mice eat a lethal dose but do not feel sick and then die until later. Because of this time lag between taking a bait and feeling the effects, rodents can consume a more-than-lethal dose and still be wandering around. Predators that naturally eat rodents, like owls and birds of prey, can then easily consume multiple poisoned rodents, in turn becoming poisoned themselves. Native mammals like quolls and large reptiles like goannas and pythons are also likely to be affected.

When we decide to use rodent baits around our homes and workplaces, our choices can have a serious impact on the native wildlife around us.

The brochure and webpage tell us how to make better choices, by looking at the constituents of the bait and selecting less harmful ones. It also talks about other non-poisonous pest control.

Download the brochure http://birdlife.org.au/rodent-control/

Read the scientific background.

Lohr, M.T (2018) Anticoagulant rodenticide exposure in an Australian predatory bird increases with proximity to developed habitat. *Science of the Total Environment* 643: 134-144.



Bird-friendly rodent



Amsterdam-based Justdiggit works by digging

Spreading restoration knowledge

Some will remember the AABR field trip to Nyngan in 2017 to see the techniques of waterponding developed there over a period of decades. Learn about Waterponding at Nyngan on regenTV http://www.aabr.org.au/regentv/.

This work has influenced many in Africa because a total of 79 trainees from 26 African countries studied waterponding in Nyngan over a three year period (sponsored by AusAid). Resulting work in African countries is making a big difference to degraded lands particularly in North Sudan and Kenya. See the EMR Project Summary https://site.emrprojectsummaries. org/category/grasslandgrassy-understorey/

Have a look at this video on AABRs Facebook Page to see some of the results. https://www.facebook.com/670220429714439/posts/2557014324368364/

NSW Community Wildlife Survey

If you've seen brushtail possums, platypuses, wombats, koalas, spotted-tailed quolls, dingoes, kangaroos, echidnas, foxes or deer, please consider sharing your experiences in this year's NSW Government Community Wildlife Survey. These are the 10 animals targeted for the survey. The interactive survey uses the results to help the government gain a clearer understanding of where in the state these 10 animals are found, their health, and perceived threats in their environments.

It will help to improve the understanding of the distribution of koalas and other wildlife in New South Wales and how their populations have changed over time. A similar survey, undertaken in 2006, informed the development of the NSW Koala Strategy and other conservation initiatives. The information provided in this NSW Community Wildlife Survey for 2019 will build on the findings from earlier community surveys and allows a comparison of wildlife populations in 2006 and 2019. This will help to decide the priority sites for action as part of the NSW Government's Koala Strategy.

To participate in the survey and share the opportunity to contribute with your local community go to https://www.environment.nsw.gov.au/wildlife-survey For more information email the survey team Wildlife.Research@environment.nsw.gov.au.



Freshwater Research News

a resource for bush regenerators and restorationists

Kev Warburton, Adjunct Research Fellow School of Environmental Sciences, Charles Sturt University

While many environmentalists, conservationists and members of local catchment groups have great passion, curiosity and a thirst for knowledge, they often have only limited time to explore the science that underpins their activities. To help meet the demand for this type of information, I launched Freshwater Research News a few years ago. FRN is a free newsletter designed to increase awareness and understanding of aquatic issues by bringing recently published research findings from the primary literature to a general audience. FRN contains brief, easy-to read summaries of the background and significance of freshwater research projects from around the world. There's an emphasis on key physical and ecological processes, and on transferable ideas and applications. Commonly covered topics include animal behaviour, biodiversity, climate change, aquatic ecosystems, food webs, groundwater, habitat restoration, socio-environmental interactions, streamflow and water quality. The FRN subscription list includes conservationists, resource managers, scientists, students and educators. At the time of writing (July 2019) the FRN website had been visited by readers in 146 countries.

Issues of FRN appear four times a year and are distributed by email in PDF form. To add your address to the distribution list just contact me at KWarburton@csu.edu.au.

Newsletter articles are also posted as blogs on the FRN website, at http://freshwaterresearch.wordpress.com The website allows you to use topics or keywords to search for articles relevant to your interests. Currently, there are around 440 articles on the site.

To give you a flavour of FRN, I've pasted below a couple of restoration-related articles.

Hotspots for riparian plants

Streamside plants buffer the damaging effects of floodwaters and filter material and nutrients washed down from higher points in the catchment. While these processes are well understood, the effects of seepage and overland flows on riparian plants have been largely overlooked. To explore how streamside plant diversity is affected by groundwater discharge from upland areas, twenty pairs of study sites were established along forest streams of different sizes in northern Sweden. Paired sites were in similar locations 500 m apart, one at a stream bank with upland groundwater discharge and the other at a point with no discharge. At each site the topography was described and transect sampling was used to record plant species. Soil samples were taken for later analysis. Numbers of plant species were significantly (20%) higher at streamside sites with groundwater discharge, and 22% of all the 175 species recorded were found only at those sites. The same discharge sites also had higher soil pH and lower carbon: nitrogen ratios, which suggested that they were receiving beneficial nutrients and cations from the catchment. These trends were similar for streams of all sizes. The study findings have implications for forestry and conservation - for example, areas of high plant diversity can be protected by having wider riparian buffer strips around groundwater discharge areas. Such high-diversity hotspots can also be targeted for stream restoration.

Reference: Kuglerova, L. et al. 2014. Groundwater discharge creates hotspots of riparian plant species richness in a boreal forest stream network. Ecology, 95(3), 715–725. https://www.diva-portal.org/smash/get/diva2:717617/FULLTEXT01.pdf



A freshwater Brisbane creekscape.

Photo: Kev Warburton

Wetland plants: tips for translocation

Aquatic plants play an important role in sediment stabilisation, nutrient recycling and water purification, but many wetland plant populations are under threat as a result of land reclamation, species invasions, pollution and climate change. The recovery of rare or threatened aquatic plant species is sometimes possible only through human intervention, but because the physical and chemical parameters of water can be highly variable, the successful translocation of wetland plants is crucially dependent on the selection of a suitable release site. Translocation projects should be underpinned by a knowledge of genetic diversity and gene flow in the species concerned, since mixing plants from different populations can lead to outbreeding depression and reduce the adaptability of the original population. It's also important to maintain wetland diversity (for example, by creating networks of ponds, ditches and wet meadows) because while a few generalist species are usually responsible for water guality enhancement and nutrient removal, rare or threatened species typically live where the nutrient supply is low. An example of successful translocation is a project carried out to preserve the last alkaline fens in north-eastern Italy. The project aim was to connect remnant patches of fenland containing almost the entire populations of two threatened endemic species: Armeria helodes (thrift) and Erucastrum palustre (dogmustard). These species have suffered sharp declines in recent decades due to fen fragmentation, lowered water tables, eutrophication and management neglect. The restoration work created a mosaic of fens, small ponds and humid grasslands. Topsoil was removed to reach the water table and the ground was remodelled to create a water gradient suitable for a larger number of species. Buffer strips of meadow were created to separate natural habitats from cultivated fields and prevent eutrophication. Vegetation was reintroduced by planting seed mixtures and transplanting Armeria and Erucastrum, as well as dominant species such as sedges and rushes. As a result, the dominant species have flourished, new plant species have appeared, and the threat status of Armeria and Erucastrum has recently been downgraded.

Reference: Orsenigo, S. 2018. How to halt the extinction of wetland-dependent plant species? The role of translocations and restoration ecology. Aquatic Conservation: Marine and Freshwater Ecosystems 28, 772–775. https://onlinelibrary.wiley.com/doi/abs/10.1002/aqc.2962



Gooseberry Island - bush regeneration

Peter Poropat

1980 to 2019







1983. Left and Middle: Starting primary work on Ficus macrophylla Morton Bay Fig.

1985 Right: Ilawarra Fig Ficus superba var. henneana Prior to primary work, showing the lantana infestion.



1992. Above and below: These photos show the results of continued regeneration work, with weeds controlled and regeneration of rainforest species.





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2018-19. Stills from videos show the continued growth of rainforest species.

Above is the Illawarra Fig Ficus superba var. henneana area.

Top left shows the Morton Bay Fig which had primary work in 1980.

Left shows the western edge of the fig corridor.

Below shows part of the fig corridor



What rainforest remnants remain must have the highest protection, long term regeneration commitment and expansion of remnants, and major protection from herds of goats that continually year after year ringbark and eat killing seedlings, saplings, trees, and halt the regeneration processes at the Imperial Drive rainforest remnant in Berkeley. Bush regeneration started in 1990, and along with deer debarking trees with antlers and urban expansion on the hills must be continued. Gooseberry and adjacent Hooka Islands were gazetted as Berkeley Nature Reserve and fully protected in 1974

NSW National Parks and Wildlife Service (NPWS) started bush regen volunteer groups in 1997 on Gooseberry Island, and professional bush regeneration teams are doing great work since 2006 and have linked up to the fig corridor, that a 17 year old commenced with the vision and passion to start the first ecological restoration site in the Illawarra, in this unique plant community on Gooseberry Island.

Peter Poropat 2019. pgporopat@gmail.com



together with stills from videos filmed in 2018-2019 represent almost 40 years of the first ecological bush restoration on Dry Rainforest scrub on Gooseberry Island, Berkeley in the Illawarra region of NSW. Started in April 1980 by myself, then a 17 year old Berkeley boy. A corridor of 5 Figs were targeted on the SE side of the Island - 3 Morton Bay Figs *Ficus macrophylla*, and 2 Illawarra Figs *Ficus superba* var. *henneana*. A carpet of 6-8 feet high lantana was removed out to the drip-lines of the figs and beyond, along with wondering jew treated where present. These exotic weeds were suppressing rainforest floristic seeds, seedlings and saplings. Their removal allowed the processes of natural regeneration to occur. Germination of rainforest tree seedlings occurred in very large numbers after the primary works. Followup of weed control continued for over 3 and a half decades

Coastal morning glory arrived on the island around 2003 due to birds. This invasive vine was controlled/removed from the fig corridor. The key to the regeneration was long term commitment of exotic weed removal. I compiled a complete floristic treevine species list in 1988 on Gooseberry Island as I have been interested in identifying rainforest trees since age 17. Walking around in vast rainforest wilderness areas, I have experience and knowledge of Australian rainforest trees from Tasmania to far north QLD as I am able to identify/link rainforest trees to their family/genus/species by bark colourations, textures, trunk shapes, buttresses, and canopy structure. This all evolved having an appreciation of the geographical nature of the Illawarra region as a young boy, and understanding that these pre-existing sub-tropical dry rainforest plant communities with canopies of 30-50m, flourished and dominated the foothills east of Mt Kembla, and north of Lake Illawarra. These were covered in these rainforest plant communities, and evolved unchanged and protected with respect, harmony for eons by the indigenous Elouera tribe, until the 1790s when the first Europeans laid plundering eyes on this sacred eden in search of 'Red Gold' Toona ciliata red cedar trees, plus cattle and agriculture prospects.



What's happening

Saturday 16th November 2019

Richmond Woodlands Biodiversity Forum

At the Greater Sydney Local Land Services Demonstration Farm at Richmond Lowlands in western Sydney.

https://www.eventbrite.com/e/ richmond-woodlands-biodiversityforum-registration-73383799921.

Contact event organizer Cathy Goswell. cathycrg@bigpond.com or ring 0418 865 421 .

Saturday 23rd November 2019

AABR AGM and guest speaker

Where: YWCA Sydney Central

11 Rawson Place, Corner of Pitt St and Rawson Place, Sydney (opposite Central Station)

Time: 10.30 am-1.30 pm

Join us for a talk and AABR's Annual General Meeting

Our speaker this year is Linda Groom whose talk is

Kosciuszko National Park – the horses, the damage and the arguments

For more information contact Suzanne admin@aabr.org.au

Sunday 25th October - Thursday 29th October 2020

The 22nd Australasian Weeds Conference (22AWC)

This conference is officially returning to ADELAIDE in October 2020. Set to be held at the iconic Adelaide Oval, 22AWC will offer delegates a three day program with an additional day scheduled for industry tours.

Abstract submissions close 2pm ACST, Friday 14 February 2020

Conference Website wmssa.org.au/22awc

Friends of Grasslands

For a whole swag of interesting events, check out the FoG calendar.

Friends of Grasslands is a community group dedicated to the conservation of natural temperate grassy ecosystems in south-eastern Australia. FoG advocates, educates and advises on matters to do with the conservation of grassy ecosystems, and carries out surveys and other on-ground work. FoG is based in Canberra and holds a number of events and activities

www.fog.org.au/



President Tein McDonald president@aabr.org.au

Treasurer and Administration Suzanne Pritchard admin@aabr.org.au

Membership Officer

Louise Brodie membership@aabr. org.au

Secretary Jane Gye secretary@aabr.org.au

Website advertising

Mitra Gusheh advertise@aabr.org.au

Committee members

Scott Meier, Matthew Pearson, Agata Mitchell, Rob Scott, Deb Holloman, Victoria Bakker, Spencer Shaw, Peter Dixon.

Victorian Committee Enquiries please email Kylie at vicbranch@aabr.org.au

regeneration professionals, volunteers, natural area managers, landowners, policy makers, contractors, consultants, nursery people, local, state and commonwealth government officersand lots of people who just love the bush and want to see it conserved.

management of natural areas.

The Australian Association of Bush

Regenerators Inc (AABR) was incorporated in

NSW in 1986, and has several hundred members

Our aim is to promote the study and practice of

ecological restoration, and encourage effective

All interested people and organisations are

welcome to join. AABR members include bush

from all over Australia. AABR is pronounced 'arbor.'

AABR also offers accreditation for experienced practitioners.

AABR News is usually published in January, April, July, and November.

AABR C/O Total Environment Centre P.O. Box K61 Haymarket NSW 1240 0407 002 921

www.aabr.org.au enquiries@aabr.org.au ABN: 89 059 120 802 ARBN: 059 120 802

Membership fees

Individuals \$30 (unwaged \$15)

- Organisations (does not confer membership to individuals in the organisation)
- business (< 5 staff) \$120
- business (5-20 staff) \$300
- business (> 20 staff) \$480
 Government \$60
- Government Not for profit

\$30 (or \$0 with newsletter exchange)

Benefits of Membership:

- discount admission to all AABR events
- four newsletters per year
- increased job opportunities
- discount subscription to the journal Ecological Management & Restoration
- opportunities to network with others involved in natural area restoration
- helping AABR to be a strong and effective force to promote natural area restoration, and support the industry.

Newsletter contributions and comments are welcome

Contact Louise Brodie newsletter@aabr.org.au 0407 068 688 Opinions expressed in this newsletter are not necessarily those of AABR

Australian Association of Bush Regenerators