AABR NEWS

Australian Association of Bush Regenerators

working with natural processes

№ 133

July 2017

AABR events 2017

Tuesday 22nd to Thurs 24th August. Broken Hill NSW including the Water Ponding Sites at Nyngan

For more information See Page 3.
Visit the event website
http://www.aabr.org.au/event/broken-hill-field-trip-and-restoration-awards/
or contact Tein at president@aabr.org.au

Friday 22nd September, Blackheath (Blue Mountains NSW)

Wasteland to Wetland, Popes Glen

See the restoration of a weedy, willow-infested creekline subject to urban stormwater pressures to a functioning wetland ecosystem in the Upper Blue Mountains. Join members of the Popes Glen Bushcare group to hear how they did it and what they learnt along the way.

Go to the eventbrite booking site, which has more detail and book so we know who is coming (the event is free).

https://www.eventbrite.com.au/e/wasteland-to-wetland-popes-glen-tickets-36299649228

For more information contact Louise on membership@aabr.org.au or 0407 068 688

Saturday October 28th, Lake Macquarie NSW

The Fern & The Burn, Coal Point

This field trip will highlight the transformation that is underway in Stansfield Reserve at Coal Point after the medium-high intensity environmental burn of 6/4/16. Half of the *Asparagus aethiopicus* infested reserve was burnt and is now undergoing a native regeneration explosion. See how the local group is trialling different techniques to manage the asparagus fern regrowth.

A presentation will also be given on the 6-year Environmental Trust project, Threatened Species Last Stand on the Coal Point Peninsula.

Go to the eventbrite booking site, which has more detail and book so we know who is coming (the event is free).

https://www.eventbrite.com.au/e/the-fern-and-burn-coal-point-tickets-36301151722

Or contact Suzanne on admin@aabr.org.au or 0438 596 741

For other events, see Page 16

President's Perspective

AABR Membership renewals can now be paid online! The great news is that we have a streamlined invoicing system and AABR members can now pay their renewals online. Very soon new members will be able to join online. Advertising is also streamlined and will now be invoiced at the beginning of the financial year.

Constitutional change. Importantly we are also tightening the winding-up clause in AABR's constitution to ensure it reflects our non-profit status. Look out for a formal notice of the AGM in September, and the associated resolutions on notice.

Our education program. Wearing her Education Officer hat, Suzanne reports on page 15 that the Regen TV program is progressing well. There are a number of other steps forward:

Industry Reference Committee (IRC) nomination successful. At the end of June we received news from the Australian Industry Skills Committee (AISC) that AABR's nominee, Jen Ford, has been accepted onto the Amenity Horticulture, Landscaping, Conservation and Land Management IRC. This is a very significant step for our industry to have a rep on this high level IRC that drives the process of development of our training package. Jen will help the committee with its brief to ensure our training package addresses the needs and concerns of employers, employees, training providers and other stakeholders.

Environmental Trust Education Grant submission lodged. AABR made a full submission to the Environmental Trust for a three year grant to facilitate the revision of the 2003 document *Bush Regeneration: A Practical Guide to Contract Management,* in light of the National Restoration Standards, and develop a training program based on this to assist agencies and local government optimise the environmental outcomes arising from bush regeneration contract work. This arose from issues raised at last year's AGM by AABR's industry action group. We have our fingers crossed that the application will be successful as we think the Guidelines and Standards will be particularly useful if there are increases in contracts to carry out bush regeneration work as a result of the NSW Native Vegetation Reform package.

Albert Morris Award. I made another trip to Broken Hill in May (on behalf of the Albert Morris Award Committee) to meet with our Broken Hill partner organisations - Broken Hill Council, Barrier Field Naturalists, Landcare Broken Hill and BH Art Exchange. All these organisations are preparing their exciting activities for the field trip in August, as well as taking the lion's share of organisational responsibility for the 2017 event.

History of the Broken Hill Regeneration Reserves. AABR has published online a very helpful essay written by Peter Ardill on the history of the Broken Hill regeneration reserves. Warm thanks go to Peter for this major work that has taken him many months of painstaking archival searches – and to now make the fruits of his labours available to others. You can read a summary of Peter's main findings on page 11 of this newsletter.

The National Standards for the Practice of Ecological Restoration in Australia, prepared by the Standards Reference Group of SERA, have now undergone a 2nd Edition that should be uploaded on the SERA webpage by the end of July. While it is only 16 months since the 1st Edition was released, a minimal revision was required to ensure that the main precepts are consistent with the international adaptation launched in December in Cancun, Mexico. The only major change is that a project can be considered an ecological restoration effort if it aspires to full recovery *insofar as possible.* This might sound minor but it actually allows ecological restoration to be more inclusive of projects where full recovery is not possible but highest possible outcomes are to be encouraged.

Tein McDonald

President AABR

Annual Renewals now due

As the new financial year ticks over so does your membership and accreditation with AABR. Some members have already paid should have received a recent receipt or email informing them that they have paid to at least June 2018.

Those due to pay will hopefully have received an invitation, aka invoice, to renew your support of AABR through membership or retain your commitment to competency via accreditation renewal. If you haven't received an invoice yet, first check your 'junk mail' folder, and if it is not there, then please contact Suzanne at admin@aabr.org.au and a renewal will be forwarded.

This year AABR has provided an online payment option via Paypal. This allows for Paypal account holders and non Paypal credit card users to make one click online transactions, however convenience does have a price. Paypal services incur a processing charge of about $1 to AABR. The Direct Debit option still exists and is our preferred payment method as it is fee free.

Hiccoughs in the new renewal system

As to be expected, in implementing the new system there have been some teething problems. Sincere apologies for any confusion this has created. Notably all the renewals for membership & accreditation were sent as 'Draft Invoices'. Please feel free to pay on these draft invoices. if you require an invoice that does not have draft on it contact Suzanne at admin@aabr.org.au and it will be resent.

Another issue that has surfaced has been good regenerator-folk being charged incorrectly for membership or accreditation or a combination thereof. Unfortunately some of the intricacies of the renewal system did not transfer as accurately as hoped. Your patience and understanding is greatly appreciated. If you are unsure about your membership and the amount on your invoice contact Louise on membership@aabr.org.au

In a few weeks a reminder will be sent out on any unpaid invoices, if you need your details updated please contact us.

Thank you to all the bush regenerators and businesses who have renewed already, your support is greatly appreciated.

Welcome to new AABR Members

Luiz Bispo
Ben Coddington
Lee Courtwood
Wesley DeMuth
Marlen Dyne
Benjamin Jones
Wendy Maddocks
Dmitry Stakhin
Sebastian Van der Eyk

Business

Technigro Pty Ltd
Little Eagle Bush Regeneration

Organisation

Illawarra Local Aboriginal Land Council

Albert Morris Award - field trip to Broken Hill

22-24 August 2017

Early bird discounts close July 30

The Albert Morris Award Committee (a collaboration of the Australian restoration organisations AABR, ANPC, GA and SERA) has planned a once-in-a lifetime ecological restoration-themed field trip to Broken Hill with organised activities occurring on three days.

The event is to celebrate and recognise the outstanding contribution of Albert Morris and others who - in the 1930s - developed one of the world's earliest ecological restoration projects, the Broken Hill Regeneration Reserves.

This field trip will be unique in the history of ecological restoration in Australia - a first-hand look at one of the world's earliest ecological restoration projects, the Broken Hill Regeneration Reserves.

THE BROKEN HILL FIEID TRIP PROGRAM Highlights include:

Optional stop for Nyngan field trip on Mon 21st (see below)

Welcome reception

Tour of regeneration areas; guided bushwalk; working bees.

Albert Morris Award dinner.

COLLABORATING ORGANISATIONS

BARRIER FIELD NATURALISTS' CLUB INC.

Broken Hil Art Exchan

Landcare Broken Hill

BROKEN HILL CITY COUNCIL

BOOK NOW ON THE BOOKING SITE

Or go to www.eventbrite.com.au and search for Albert Morris.

(Booking is essential for all activities for logistic reasons)

All details you will need to decide whether or not to book (e.g. transport, accommodation details and the event program) are on the booking website.

[If you are a Broken Hill local please book on the separate booking site]

Get in early for your place on the charter bus - and the group accommodation is booking fast.

There will be a choice of organised activities on three days (22-24 August 2017)

Enquiries: info@albertmorrisaward.org

SPONSORS:

THE UNIVERSITY OF SYDNEY

Silver Sponsors Bushland Restoration Services

Bronze Sponsor Jane Lemann

Platinum sponsors: Broken Hill City Council, Dr Barbara Briggs

Gold Sponsors:

The School of Life and Environmental Sciences (SOLES) University of Sydney,

The Nyngan field trip – a plus if travelling by car or bus to Broken Hill

Tein McDonald

The Broken Hill field trip promises to be a lot of fun – not only because of the obvious delights of joining in the activities but also (at least for those travelling by car or bus from Sydney) the opportunity to visit **waterponding sites at Nyngan** on the way ...and be shown them by the mild mannered waterponding guru himself, Ray Thompson.

Waterponding is the ultimate outcome of decades of field research by NSW Soil Conservation Service into ways to capture water and improve conditions for the natural regeneration of 'scalds' – i.e. historic sites where the sandy topsoil has been completely blown away after having been stripped of vegetation by overgrazing in the late 19th Century. Failure of tens of thousands of hectares to regenerate due to the hard claypan surface left behind was a long term challenge for rangelands managers – at least until the development of waterponding.

Ray Thompson and his team have achieved regeneration of native vegetation on tens of thousands of hectares of such scalded country, for pastoral production. (http://onlinelibrary.wiley.com/doi/10.1111/j.1442-8903.2008.00415.x/full).

Okay - it is not conservation per se – but it is pastoral production based on native vegetation; hence it has very important biodiversity benefits over very large areas. These techniques can be used in conservation reserves just as well as any other context.

I have been reading about Ray's work for some decades now – and using his photos in slide presentations. But this field trip provides an opportunity to actually see these sites for myself and to hear Ray's presentation on his outstanding work transforming a degraded landscape into a regenerating one.

Driving is not for everyone – but...when a few committee members drove to Broken Hill last February for our reccie trip, we found it interesting to see the vegetation changing from the well-watered coastal vegetation communities and give way to the drier forests of the Great Dividing Range and then open out into the Central West woodlands and grasslands and then gradually shift to the semi-arid vegetation of the Western Division.

We have only a few places left on the 24-seater bus – but we can assist with putting people interested in carpooling in touch with each other - or assist a group to hire a u-drive 11-seater minibus.

Hills M2 Macquarie Park Motorscapes

combining bushland restoration with public art

Illustrative render of the M2 Motorscapes project with ***Kinetica*** stylised waratah, banksias, acacias and eucaplyt leaves set in restored bushland

Dr Shane Norrish
Landcare Australia

The Hills M2 Motorway runs for 21.4 kilometres in northwest Sydney and was completed in 1997. Up until around a year ago, motorists and pedestrians passing the M2 Motorscapes site at Macquarie Park would have seen vegetation dominated by a wall of weeds adjacent to native bushland. Now when they drive by, they see a vibrant art installation sitting within an area being restored to native bushland. Since 2015, the site of approximately five hectares, has been subject to constraints studies, soil and hydrology characterisation studies, ecological surveys, water quality and riparian improvement works, and bushland restoration including weed removal and planting of over 60,000 native seedlings.

The task was undertaken by the toll-road company, Transurban, as part of its Motorscapes program and sustainability agenda. Other Motorscapes projects include Power Street Loop, Melbourne (completed) and Heathwood, Brisbane (in planning phase). The Motorscapes program is about combining environmental restoration with public art or other social infrastructure on areas of disused land near Transurban's motorways.

The M2 Motorscapes site at Macquarie Park is leased by Transurban from New South Wales Roads and Maritimes Services (NSW RMS). Transurban partnered with Landcare Australia to undertake the rehabilitation works on the site, which borders Lane Cove National Park (LCNP) as well as residential, commercial and road infrastructure. The area was significantly degraded and more recently occupied by a works compound for the neighbouring motorway. The area was dominated by weed growth and a major source of weed infestation for LCNP.

When faced with an unwanted sea of green of this scale, where do you begin? The rationale underpinning the Bradley method is well known and accepted. However, it has limited applicability when the mid-canopy and under-storey of the entire site planned for restoration is dominated by a wall of

Location of the M2 Macquarie Park Motorscapes Project at Macquarie Park (NSW Land and Property Information, 2015)

Kinetica

An Ideas Competition was launched by Transurban in October, 2015 in search of public submissions for an artistic concept that would be ecologically, socially and economically sustainable.

Kinetica, from Sydney-based designers Justin Sayarath and Sarah Anne Rodriguez of Wilde Designs, was awarded first place and will sit boldly on the M2Motorscapes as a representation of Australia's native flora.

Mr Sayarath, of Ryde, said "Our idea behind Kinetica is to combine our love of flora, colour and shape and turn it into one cohesive body of work. The name is also from our idea of having moving parts and motion." The fan-like arms of the centrepiece, a giant waratah, will rotate. The eyeballs on one structure are the banksias coming to life – with blinking pods.

almost impenetrable Weeds of National Significance (WoNS), noxious weeds and other environmental weeds. One could reasonably question whether the resources for restoration could be prioritised to more resilient locations. However, some sites have strategic conservation, connectivity or historical importance, and warrant the significant effort and commitment to achieve restoration. In recent times, advances in technology, machinery capability and operator skill/experience have allowed a strong restoration platform to be established on difficult sites characterised by extremely dense weed populations.

Rehabilitation projects in natural areas with extremely dense weed populations are often short term 2-3 year projects. Bush regenerators, and in this case Landcare Australia, know the keys to success are good planning, expert technical input, stakeholder/community engagement, use of appropriate techniques, committed partners, frequent monitoring and consistent control of re-emerging weed species and maintenance of the site to ensure establishment of regenerating natives and plantings.

Weed density on the site prior to commencement of the project showing domination by weeds including *Lantana camara, Ligustrum* spp., *Genista linifolia, Ipomoea indica, Cardiospermum grandiflorum* and *Asparagus asparagoides*.

The M2 Motorscapes project has multiple features, including the public art installation, *Kinetica*, which evokes iconic Sydney bushland vegetation species, in a restored native bushland setting. The installation is visible to passing traffic and neighbouring properties and complements the improved environmental assets of the location. As an important component of Transurban's Sustainability Strategy, Motorscapes and *Kinetica* aim to stimulate community awareness of the interface between urban areas and the Lane Cove National Park, and urban impacts on conservation areas. The project will also improve the environmental amenity for the surrounding community by re-establishing the former native bushland and riparian vegetation communities.

The main drainage features on the M2 Motorscapes site are two natural watercourses, Shrimptons and Industrial Creeks, which carry gross pollutants and contaminants from upstream into the site. Both creeks flow in a northerly direction from pipes and a culvert under the M2 and discharge into the Lane Cove River approximately 300 metres away. The riparian zones of Shrimptons and Industrial Creeks were severely degraded by woody weeds, particularly *Ligustrum* spp., with an understory of exotic ground covers. In many sections, the banks of both creeks were being undercut and badly eroding. Storm water runoff from the Hills M2 Motorway road surface also drains through the site. It is collected by pipe and table drain and directed to a retention basin on the northwestern site boundary, located approximately 50m from Shrimptons Creek.

Prior to submitting a Review of Environmental Factors for approval by NSW Roads and Maritime Services, pre-project

Left:

Looking across the Motorway showing the degraded work site where *Kinetica* now sits, with the bushland of Lane Cove National Park behind.

M2 Motorscapes Site, Macquarie Park.

Right: Shrimptons Creek prior to any work on the site

Left: Shrimptons Creek after weed control and creek stabilisation works

planning included an Ecological Investigations study completed by UBM consultants in early 2016, surveying flora and fauna on site and in the surrounding areas. The naturally occurring native vegetation immediately surrounding the site is mapped as Hornsby Enriched Sandstone Exposed Woodland (HESEW; OEH 2013), and was confirmed by UBM. The HESEW community typically occupies sites with a substantial shale derived soil component present in otherwise low nutrient sandy soil and is widespread in the Sydney Basin Bioregion. Site characterisation studies completed on behalf of Transurban confirmed that significant quantities of fill had previously been consolidated on the site. These modifications had altered the edaphic properties for the vegetation communities. The survey work found more than 170 flora species on the site and in adjoining areas, of which at least 22 were noxious weeds and seven were WoNS. They dominated the flora in much of the site, particularly the riparian and sloped embankment areas.

In spring of 2016, Landcare Australia and Transurban commenced rehabilitation of the site. The first major task was construction of an access ramp onto the site from the M2 Motorway. Entering and leaving a site with passing traffic at 100km/hour required a well designed and constructed entry/exit system with accompanying traffic management controls. Prior to the initial weed clearing, geo-referenced transects and plots were established to benchmark flora on the site and evaluate rehabilitation over time. Benchmarking included a reference site established nearby in the National Park. The survey results were consistent with the earlier UBM investigation and confirmed the majority of flora as exotic species. The dominance of weeds on the site was demonstrated by examples of the ratio of total exotic/native plants in the surveyed locations; 102:2; 51:0; 90:2; 71:5; 43:0.

Following pre-clearing surveys and marking of native species and sensitive habitat areas, woody and semi-woody weed biomass was managed using a combination of excavator and positrak-mounted forestry mulching heads and manual lopping. Areas on the steep gradient above the two creek culverts were cleared manually by teams on rope and harness. Following the initial intervention, teams of bush regenerators were immediately involved in follow-up work, controlling existing and emerging

Industrial Creek before (above) and after (right) weeding and creek stabilisations

weeds in the understorey. This continued throughout the project.

A road was formed on the site to service the area for the delivery of 4,000m^3 of low-P native topsoil mix, 2,250m^3 of recycled hardwood mulch, plants, materials, the *Kinetica* installation and on-going access for maintenance. Over 60,000 seedlings of species mainly of the HESEW community and suited to the modified fill and drainage characteristics were planted on site. Temporary irrigation for the revegetation was established prior to planting, which involved reticulating water from the other side of the M2 through one of the culverts.

Sight lines to the art installation by passing traffic will be maintained through planting appropriate small shrub and groundcover species. For bushfire safety and prevention of damage from mature trees, an Asset Protection Zone is being established that limits the mature height of planted species in proximity to assets, including *Kinetica*, the sound wall and adjoining residential properties (Figure 4). Botanical composition reflects a gradual increase in plant height at maturity commensurate with distance from assets. Only groundcovers and small shrubs are planted in the inner planting zone, with larger shrub species added incrementally and canopy trees being restricted from within 30m of assets.

Riparian and aquatic habitat on Shrimptons Creek and Industrial Creek is being improved by stabilising the creek banks with sandstone revetment to reduce erosion and sediment transport downstream. In combination with the revetment, the riparian rehabilitation works have included installation of gross pollutant traps on each creek and the replacement of a degraded gabion wall with sandstone logs.

The swale drain catching storm water run-off from the M2 pavement, was regraded and stabilised, and the invert of the swale sectioned with a series of rock and coir berms to slow water flow, and retain particulate material. The water draining from the swale is now directed to a retention basin, preventing direct flows to the creek. The water quality improvement work on the site was completed in conjunction with designs by GHD and implemented by Total Earth Care, with particular emphasis on methodologies to minimise downstream impacts. As with all clearing works on site, wherever possible, root biomass was maintained in-situ to reduce soil disturbance.

Given the dramatic intervention on this site over a relatively short time frame, on-going, intensive maintenance by a committed bush regeneration team is essential to secure the continued rehabilitation of the site and prevent a reversal to weed dominance. Once the restoration work is completed, the site will form an important transition between urban infrastructure and LCNP. It will greatly improve ecological functionality and the aesthetic characteristics of the site and surrounding environs. The rehabilitation and on-going management of the site will remove the significant source of weeds for the National Park and improve downstream water quality in both Shrimptons and Industrial Creeks.

For more information go to:

https://www.transurban.com/m2-motorscapes-project

https://landcareaustralia.org.au/m2-macquariepark-project/

Photos: Landcare Australia and Transurban

Left: Plan layout of works and relevant infrastructure for the M2 Macquarie Park Motorscapes Project (NSW Land and Property Information, 2015)

Genetic research to assist restoration

Restoration of native vegetation covers a wide range of scenarios. Assisted natural regeneration is able to be used where the site shows resilience. When work spreads into severely degraded landscapes revegetation is used. The prospect of future changing climatic conditions poses an additional challenge. The two projects below are addressing the issues of selecting species and seed sources to equip restorationists with knowledge to implement best practice revegetation.

Genetic diversity key to revegetation

CSIRO Research Case Study

Research by CSIRO has found that the key to successful restoration of native vegetation where revegetation is part of the project, relies on sourcing genetically diverse seed. This approach is being used to enhance revegetation efforts across Australia.

The challenge

Land and water degradation resulting from vegetation clearance is a global problem.

Restoring impoverished landscapes requires the use of effective restoration techniques such as revegetation to reduce environmental damage and improve the environment. Effective revegetation can improve plant biodiversity.

CSIRO Research

The aim of the research was to investigate the best seed source. CSIRO collaborated with the ARC-NZ Research Network for Vegetation Function to explore the issues associated with collecting seed for broadscale restoration projects.

It is common belief that local native plants are the best source of seed for revegetation projects, as they should be adapted to local conditions.

However, research found that where vegetation loss is high and across large areas, 'local' seed sources are often small and isolated and can be severely inbred resulting in poor seed crops or low quality seed. This can lead to germination failure and poor seedling growth.

It was also found that seed sourcing should concentrate less on collecting from local environments and more on capturing high quality and genetically diverse seed.

The results

The results aim to help revegetation projects be as successfully as possible.

The approach is being used to ensure that restored plant populations across Australia have ample genetic diversity to respond to changing environments over the coming decades.

The information obtained will assist conservationists revegetate native flora and re-establish biodiversity in impoverished landscapes with an increased chance of success.

For further information: https://www.csiro.au/en/Research/Collections/ANH/Our-research/Plant-conservation-and-biodiversity/Genetic-diversity-essential-for-revegetation

Restore and Renew: a new flagship project at the Royal Botanic Garden Sydney.

Maurizio Rossetto – Senior Principal Research Scientist (Royal Botanic Garden Sydney)

The Restore & Renew project at Royal Botanic Garden Sydney aims to equip restoration practitioners and land managers with easily accessible genetic, environmental, and ecological information on a range of species to assist in using those most likely to result in high quality restoration. The information can be usefully applied to land restoration projects which include small areas in urban and rural areas as well as large-scale projects in mining, agriculture and forestry. This ambitious project has the potential to save time and resources by increasing the chances that newly planted areas are genetically suitable and likely to flourish over time.

In addition, an improved understanding of plant evolutionary patterns is likely to increase the success of restoration projects, especially in the context of a changing climate and increasing habitat fragmentation. Restore & Renew will answer questions such as, what are 'local' genetic and climatic boundaries; what are 'natural' levels of diversity and fitness; what future environmental shifts are expected? In the past obtaining such information was perceived as being too complex, time-consuming and costly. However new hi-tech developments have come to the rescue, and researchers are no longer constrained by the availability of data, so that large-scale multispecies projects are now possible.

The four main goals of Restore & Renew are to

- Provide maps showing where genetically suitable seed can be collected for restoration projects;
- Give information about how to create genetically diverse plantings for maximum health and longevity;
- Help habitats to be adaptable to climate change.;
- Support creation of seed production areas that can be harvested for use in bush regeneration.

To ensure Restore and Renew NSW provides useful outcomes, restoration practitioners were consulted in the early stages of project development. An online survey inviting the participation of anyone involved in native vegetation restoration projects in NSW was conducted in 2013. Survey respondents were provided with a summary of the type of information the Restore and Renew NSW project will provide and asked how useful they thought this information would be. Of those who responded, 86.4% claimed the information would be 'extremely useful', 'very useful; or 'useful'.

Acacia dealbata, a wattle, is one of the sequenced species identified by the Restore & Renew project. *Photo: RBGS*

Selecting the species to include in Restore and Renew NSW

This flagship project will target around 250 plant species commonly used in restoration work across NSW and beyond. These were selected with the assistance of restoration groups and ecologists to ensure functional, ecological and practical relevance.

The online survey of restoration practitioners identified 730 species as 'commonly used' by 147 respondents. The final group of around 250 plant species were selected after a critical review, which took into account frequency of use as well as the need to capture sufficient geographic, environmental and functional diversity.

Most of the "top 200" taxa listed by survey respondents are included in the final list, suggesting that NSW restoration practitioners are using a geographically and functionally diverse range of taxa in restoration projects.

The final list of species to be included in Restore and Renew NSW can be viewed on the web page.

To obtain the relevant information, for each species the Restore & Renew team will collect specimens from up to 50 sites which will cover geographic and environmental diversities. For each sampled individual, whole-genome data will be obtained and used to explore landscape-level dynamics and likely adaptation to local environmental conditions (current and future) of the species.

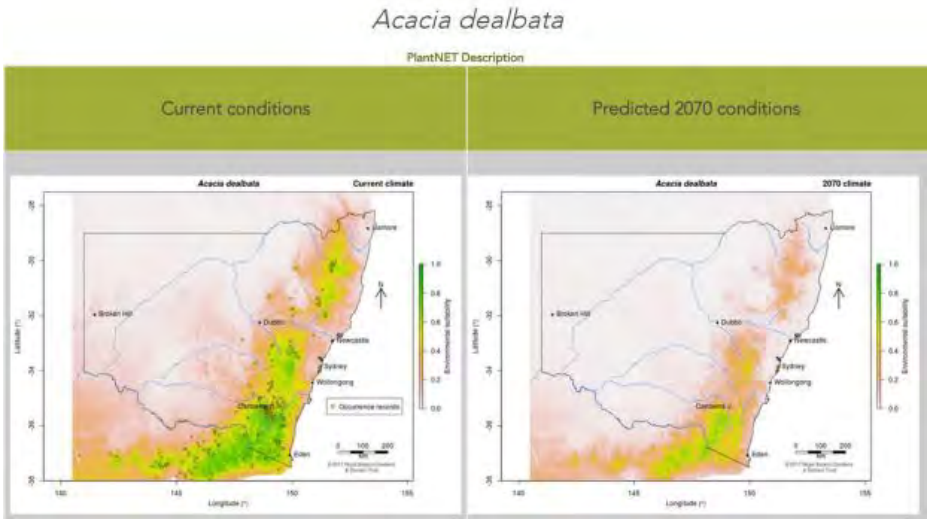
The genome of a cell or organism is the complete set of genes or genetic material present. The information resulting from our species-wide genomic and environmental analyses will be displayed on an easy to use and easy to interpret website.

On the Restore & Renew website, users will be able to enter the location of their restoration project and select species of interest. Alternative practical scenarios will be presented showing how much diversity can be gathered by varying the locations and numbers of source plants sampled. Providing such tailored answers for each species, at each location (rather than generalisations) will ensure that suitable material is used and that populations are restored which aim to be resilient and self-sustaining.

Although Restore & Renew was only officially launched a few months ago, the research team has been working for over a year on all logistic and analytical procedures to ensure that the project is a success. The team has already sampled over 10,000 leaf samples from over 900 sites for genomic analyses. To date, 20 species have been fully analysed, and we hope that the Restore & Renew website will be functional by early 2018.

Restore & Renew is supported by sponsorships and donations and new collaborations are always welcome (restore.renew@rbgsyd.nsw.gov.au).

For further information please go to the Restore and Renew NSW website. https://www.rbgsyd.nsw.gov.au/Science-Conservation/Our-Work-Discoveries/Restore-Renew-NSW



Restore & Renew land restoration planning maps for the wattle species *Acacia dealbata*, showing optimum planting sites now and expected in 2070 based on IPCC data.

Photo: Royal Botanic Garden

Update on tick research from Murdoch University

Professor Peter Irwin
Vector and Waterborne Pathogen Research Group, Murdoch University

Since the 2 May 2014 edition of AABR's 'Ticks and tick-borne diseases – protecting yourself', (found on thre AABR website) the research group at Murdoch University has been very busy. The group currently comprises team leaders Prof Peter Irwin, Prof Una Ryan, Dr Charlotte Oskam, and Dr Andrea Paparini, four PhD students and two Honours students.

We have been fortunate in the last few years to receive two major research grants through the Australian Research Council (ARC) Linkage Project scheme and together with industry partners Bayer Australia and Bayer Healthcare (Germany). We have just about completed the first of these grants, and we are just starting on the second with collaborators Dr Peter Banks (wildlife ecologist, University of Sydney), Prof Roy Hall (virologist, University of Queensland), and Dr Sonja Hall-Mendelin (Queensland Health). The aims of this project, entitled *Tiresome ticks: Understanding the ecology and transmission dynamics of tick-borne disease in Australia*, are to:

1. Determine the diversity of microbes (bacteria, parasites and viruses) in vector ticks and wildlife reservoir populations using our molecular toolkit (developed with our first Linkage grant);
2. Conduct full scientific descriptions of all novel microbial organisms detected;
3. Quantify the timing and dosage of expulsion of microorganisms from ticks.

We have also just received a gift of $35K from the Lyme Disease Association of Australia, through the generous work of the NSW branch of the Country Women's Association of Australia (CWA). This funding will go towards a specific pilot study that we are conducting into people with chronic symptoms attributed to tick bite. For more details please look here: http://www.murdoch.edu.au/Research-capabilities/Vector-and-Waterborne-Pathogens-Group/Pilot-Study/ and Cryptick.pilotstudy@gmail.com.

Later this year, once the tick season starts again, we will be conducting another study of people acutely bitten by a tick. Of course we hope that the AABR members manage to keep ticks off them, but if you or a colleague/friend is bitten we would be most interested to contact your medical doctor and arrange for some samples from you (and the tick itself). Please email us at Cryptick.lab@gmail.com for more information.

Over the last four years the group has published about ten research papers in peer-reviewed journals on microorganisms in ticks and the potential for tick-borne illness in animals and people, and we have quite a few more papers 'in the pipeline'. Moreover we have presented this work at meetings and conferences in Australia and overseas. We would like to emphasise that almost all of our work is ultimately directed towards the most important questions of all; which organisms are transmitted to people by which tick species and do they cause illness? This is all painstaking work that requires methodical scientific study. Our research is in the early stages of development and we do not have any specific answers to these questions yet, but we are getting closer! Here is a very brief summary of our findings to date:

- We have received between 10,000-20,000 ticks from collectors living all over Australia! Prior to the start of our research there was concern that overseas ticks, such as those responsible for the transmission of Lyme disease in other countries, may have been introduced and become 'established' in Australia. We have found no evidence for this.
- **Two species of native tick**, the paralysis tick (*Ixodes holocyclus*) in Eastern Australia and the ornate kangaroo tick (*Amblyomma triguttatum*) in the west are **responsible for the vast majority of tick bites** of people in Australia. This is not new information. The results provide confirmation of what had been suspected for a long time. There are certainly other ticks that bite people occasionally, but much less frequently as far as our data shows.
- Our research has shown, for the first time, that the species of Australian ticks that we have examined using our molecular 'toolkit' **contain many different species and types of microorganisms**, including bacteria (the most abundant), parasites (protozoa), and viruses. **Collectively these organisms inside ticks are referred to as their "microbiome"** (or "microbiota"). In ticks overseas, some bugs within tick microbiomes are known to be pathogenic (i.e. cause disease in people). To date, with the exception of *Coxiella* and *Rickettsia* species, we have not discovered any known tick-borne pathogens amongst these microorganisms in Australia.
- We have however discovered **new species of microorganisms in the Australian ticks studied so far that <u>are related to</u> those known pathogens** in the northern hemisphere. Amongst the groups of bacteria that we have identified are *Anaplasma, Babesia, Ehrlichia, Francisella, Neoehrlichia and Borrelia*. **We are working hard to further classify these organisms and to understand whether they could be transmitted to people (and animals) in Australia and if they can cause disease.**
- It is important to emphasise that we have <u>not</u> found in Australia any evidence of *Borrelia burgdorferi* (sensu lato), the cause of Lyme borreliosis overseas. Interestingly **we have found a new type of *Borrelia* in ticks from echidnas in NSW and Qld**, but like the other organisms, it is only distantly related to the causative agents of Lyme borreliosis. It has been named *Borrelia tachyglossi* and so far we do not know if it causes illness in echidnas, let alone people.
- We also reported on a study using dogs as <u>sentinels</u> for infection by pathogens of humans, notably the cause of Lyme borreliosis. (Essentially dogs act as 'early warning' for a vector borne disease in people, since they get bitten

more frequently than humans by ticks in an area, and will therefore develop antibodies to any infectious organism carried by those ticks.) We tested 555 dogs from four groups: (1) dogs living in the Northern Beaches area of Sydney (a 'hotspot' for paralysis ticks and reported illness in people), (2) dogs owned by people with a diagnosis of 'Lyme disease-like illness' (**some of whom are members of the AABR, thank you!**), (3) foxhounds used for the commercial production of antivenom to the paralysis tick, and (4) a control group of dogs living in an indigenous community in northern WA, where there are no paralysis ticks). We did not find any evidence in these dogs for locally-acquired Lyme borreliosis (or any other zoonotic tick-borne pathogen). **However, given that we have unique tick species in Australia, it is much more likely that the unique bacteria and other microorganisms that they carry are candidates for the cause of disease in Australian humans**. We are working hard to provide scientific evidence around this, and to continue to search for answers to help people suffering suspected tick-bite illness.

We would like to advise readers of this AABR publication that we are doing our very best to contribute solid scientific information to the complicated debate about tick-borne illness in Australia. We are always willing to receive tick specimens for our research, and more information can be found at our website or by emailing us at Cryptick.lab@gmail.com.

We appreciate all your help so far!

Contact Us:

Website: http://www.murdoch.edu.au/Research-capabilities/Vector-and-Waterborne-Pathogens-Group/

Twitter: https://twitter.com/cryptick_lab

Two ticks of the species ixodes holocyclus, picked off koalas in the Koala Hospital in Port Macquarie, New South Wales, Australia. The small tick had not yet started feeding, while the other had probably been at work for a couple of days. The amount of blood inside the larger tick is probably around 5 millilitres. Photo from Wikipedia.

The Broken Hill regeneration area: a concise chronology of key events

Peter Ardill July 2017

One of the earliest known and documented ecological regeneration projects to occur in Australia and the world took place in Broken Hill over the period 1936-1958. It was a collaborative effort led by Albert Morris, a mining company senior assayer and also a skilled amateur botanist, ecologist, conservationist and regenerator. Other major players were his wife Margaret Morris, Doctors William and Ian MacGillivray (son) and Edmund Dow, all members with Albert of the Barrier Field Naturalists Club. The Club was an active and influential natural sciences, history and cultural organisation based in Broken Hill. Zinc Corporation mining administrators AJ Keast and Maurice Mawby ably supported the implementation of the regeneration project.

Albert was not only possessed of extensive botanical and ecological knowledge. The degradation of the arid landscapes of the far west of NSW by overstocking, rabbits and vegetation clearing and the decimation of indigenous fauna numbers by shooting, poisoning, habitat destruction and foxes distressed him. He was concerned by and sought solutions to the wind erosion and sand-drifts that plagued Broken Hill and constantly threatened his and Margaret's and many other resident's homes over the early decades of the twentieth century.

As a result of his botanical studies, home experimentation and field trials, Albert had, by the commencement of 1936, developed an effective regeneration technique: fence to exclude stock and facilitate the regrowth of the natural vegetation. Furrowing to facilitate moisture absorption and seed and soil retention, seed spreading and the planting of native trees and shrubs complemented this main technique.

In August, 1936, Albert initiated the construction of the first set of Broken Hill regeneration reserves. He lived to see them successfully develop but sadly, aged 52, a brain tumour cut short his life. Margaret Morris and other members of the Barrier Field Naturalists Club continued the work. After the Second World War (1939-1945) new reserves were constructed and by 1958 Broken Hill was fully encircled by a completed regeneration area.

The work of Albert and Margaret Morris and their restoration colleagues in Broken Hill ranks alongside the efforts of Ambrose Crawford (1935 onwards) on the north coast of New South Wales and Joan and Eileen Bradley in Sydney (1960s and 1970s) in the pioneering history of bush regeneration in Australia. Presented here is a concise chronology of the main events that led to the construction and completion of the innovative Broken Hill regeneration area. Albert's work on two tree plantation projects (1936-approx.1938) and another regeneration project (1936-1939) that involved the fencing of two Broken Hill reservoir sites to encourage natural regrowth of vegetation, is also documented in the chronology. A detailed essay, chronology and a map on the same subjects are available for viewing at http://www.aabr.org.au/aabr/wp-content/uploads/2017/04/ArdillBrokenHill.pdf .

c1880-1900: Overstocking by pastoralists, timber felling and rabbits leads to widespread native vegetation loss in the far west of New South Wales and many parts of Australia. Extensive soil erosion develops.

c1900-1920: In the absence of government facilities and research it is largely left to concerned local residents in Broken Hill to study and devise solutions to the erosion problem. Dr William MacGillivray observes that fencing to exclude stock promotes native vegetation regrowth. Albert Morris becomes interested in and studies the botany and ecology of the arid landscapes of far western New South Wales.

1920: MacGillivray, Albert and Margaret Morris form the Broken Hill based Barrier Field Naturalists Club (BFN), a natural science, history and cultural organisation.

c1920-c1930: Albert Morris participates in BFN field trips and lectures on and studies topics such as botany, seed viability, local fauna, the impacts of pastoralism and introduced animals, ecology, plant propagation and erosion and its causes.

1935: Albert participates in field trials that test fencing, furrowing and seed dispersal regeneration techniques.

1935: Albert, Dr Ian MacGillivray (son of Dr W MacGillivray) and Edmund Dow of the BFN lobby the NSW state government to ban the cutting of green timber in the far west of the state and to fence the eroded Broken Hill Common to promote regrowth of the natural vegetation and so control sand-drift there.

1936 April: Albert, I. MacGillivray and Dow of the BFN make submissions to the NSW Soil Erosion Committee during its visit to Broken Hill. Albert calls for the fencing of sections of paddocks on pastoral stations to foster the regrowth of native vegetation and to encourage natural seed distribution.

1936 May: Albert agrees to advise the Broken Hill Zinc Corporation on the development of two planted tree plantations to control sand-drift near it new mining operation.

1936 May: Albert and the BFN seek permission and funding from the NSW government to fence the land of the two water reservoirs (Waterworks Hill and Block 10 Hill) in Broken Hill, to allow natural regeneration of the native vegetation.

1936 August: Albert negotiates with and convinces the management of the Zinc Corporation to construct regeneration reserves in the south-west sector of the city. The intention is to fence and exclude stock and allow the natural vegetation to regenerate. The other two Broken Hill mining companies agree to participate. These regeneration reserves are the first reserves of what will eventually become the Broken Hill regeneration area.

1936 October-November: Construction of the first set of regeneration reserves commences.

1937 February: Construction of the first set of regeneration reserves is completed.

1937 August -September: The regeneration reserves are extended to the south of the city.

1937 September: The NSW government approves the Morris/ BFN plan to fence and regenerate the surrounds of the two water reservoirs in Broken Hill, Waterworks Hill and Block 10 Hill.

1937 December - 1938 March: The regeneration reserves are extended along the north-west sector of the city.

1938 August: By this stage of their development all of the regeneration reserves have been left to regenerate naturally, except for one, which has been ploughed for scald treatment, irrigated and partly planted with trees and shrubs.

1938 December - 1939 March: The regeneration reserves are extended to the south-east of the city.

1939 January: Death of Albert Morris due to illness.

1939 April: The land of the two city reservoirs, Waterworks Hill and Block 10 Hill is fenced and the reservoir regeneration project becomes operational.

1939 October: At this stage of their development some of the regeneration reserves have had seed scattered in them, planting has been done in some and others have been left untouched. One reserve has been irrigated and planted. The regeneration of the natural vegetation is progressing well, due to the good rains of this year.

1940-44: During the Second World War (1939-45) no further reserves are created. Margaret Morris is extensively involved in their restoration and botanical management, and also reports on and publicises them in a journal and numerous newspaper articles. Broken Hill is afflicted with a severe drought and there are frequent dust storms in 1944-45.

1946 May: NSW Premier McKell visits Broken Hill and is urged by civic administrators to take action to solve the dust problem. A Broken Hill regeneration conference is held in October.

1948: NSW Conservation Minister approves a plan to construct further regeneration reserves to the north and east of Broken Hill.

1951-58: The final regeneration reserves are constructed: one to the north of the city (1951), one to the north-east (1953) and the last, to the east (1958). The construction of the Broken Hill regeneration area is completed.

(This article is a summary of the key points provided in Ardill P.J. (2017) "Albert Morris and the Broken Hill regeneration area: time, landscape and renewal" Australian Association of Bush Regenerators. Sydney, found on http://www.aabr.org.au/aabr/wp-content/uploads/2017/04/ArdillBrokenHill.pdf)

Review of Backyard Habitat Programs

Doctor Louise Metcalf

ARIES (The Australian Research Institute for Environment and Sustainability) Macquarie University.

Increasing the habitat for struggling Australian wildlife is becoming increasingly important. Many native animals at the risk of extinction in Australia are in trouble due to spreading urbanisation. Most of those species including ones that are endangered could be helped significantly if enough of us created habitat in our backyards. This means the work of those who regenerate bush in urban environments is literally becoming critical to the lives of birds, frogs, and many small Australian marsupials. Interestingly, existing research indicates it probably also improves the health of the local community around it, creating a positive cycle.

Many councils run backyard habitat programs. However few track the progress of these environmentally crucial efforts, making the case for financial support difficult. In July 2016 The Australian Research Institute for Environment and Sustainability (ARIES) at Macquarie University was asked by the Salty Communities Project to review the programs of up to 18 councils who currently run backyard habitat programs, alongside 3 external programs. The purpose of the review was to work out what people are doing, and to determine what works, so that these programs could be better supported, and hopefully achieve better results. (Sydney's Salty Communities has been a three year grant program funded by the Australian Government, focusing on research, capacity-building and on-ground rehabilitation for biodiversity and carbon storage in 'salt-influenced ecosystems' across Sydney's coastal and urban waterways.)

How did we measure success

The first problem ARIES faced in working through the review was the question of how to define success. It was tempting to simply work from the research, however there were only a small number of Australian case studies. This meant there were serious questions about whether cases completed in the US or Europe could guide notions of what works here in any useful way. So we decided to form an expert group and run a critical incident technique process. The process asked the expert group to read some cases and to comment on success and failure. We then used qualitative techniques to draw out critical criteria.

The criteria included:

- the extent to which the program was formally designed
- how the community was engaged
- how officers approached continuous improvement and engaged senior management.

We then asked each council who had a program to fill out a questionnaire on these things, and interviewed those who felt they could tell us more about the criteria. We faced some time and budget constraints in the interviews because all the councils were doing such amazing work, however we did manage to draw out the important information. We also used the interviews to write 12 case studies, one on each of the council programs.

What we found

We discovered that each council was making decent inroads into creating backyard habitat in their communities, however there were some things that really helped speed things along.

Perhaps the most boring of these is the formal measurement of what people actually do when they create habitat. Many of the programs wanted to measure the number of animals that returned due to habitat creation, and while that is certainly ideal, it was much too difficult for officers to do this with sufficient accuracy. However, it was certainly possible to measure the number of elements that people put in to create habitat, and of course the more the merrier! In addition, the one external program that tracked the number of habitat elements going in to an area was better able to show change through measurement.

We also found that councils were really crying out for that formal measurement to demonstrate the effectiveness of the programs, because the programs really worked best when they had longer lifespans. There is quite strong evidence that time was one of the strongest factors to enable the success of a program. This is simply because it takes time to get people on board, and plants need time to grow! In essence, we found that programs needed to be funded for at least 3 years at a time.

Another reason that time was so important was simply that these programs are really micro-communities, drawn together by the council officer, and the idea of cute or interesting animals. It might seem cheeky or cynical to market these programs using cutesy possum pictures or talks on stingless bees, however the truth is… it works! Remember that we are trying to save animal lives (and improve human health as a nice side effect), and I think I am okay with being this kind of cynical!

People are drawn to the program initially in this way, but they stay because they become a community. So the next critical thing was the council officer's database of participants. Those programs that had a contact database that was regularly used for communicated with participants, did substantially better. It's all about talking to people. Face to face communication through related workshops to get people on board worked really well, and the most efficient process seems to be getting details and staying in contact.

The other key factor was not trying to replicate what the external programs do - instead just use them! The external programs had advantages that related to being larger than a single council area. They generate a sense of a larger ecological movement, and increased peer pressure through online networking. Only Habitat Stepping Stones then measured what people did to increase habitat though, so while all these programs are worthwhile getting involved with, the Habitat Stepping Stones program also solved that critical measurement issue and provided reports to council officers that could then be used to seek additional senior management support and funding. Solving that problem, then meant that councils could focus on the most important part - getting people involved! (Habitat Stepping Stones , www.habitatsteppingstones.org.au, is a project run by ARIES to enable those who want to create habitat to have easy access to information.)

So what we found was really that these programs are essential to Australian wildlife habitat and human habitat too, and councils should collaborate and just focus on getting as many people in their community engaged as possible. Also, of course, there is no time to waste!

July 2017

More information: http://aries.mq.edu.au/projects/backyard-habitat-review/index.php

Studies in the US on Privet removal can provide information relevant to bush regeneration in Australia.

With Privet Gone, Native Plants and Pollinators Return

Research shows long-term benefits of removing Chinese privet (Ligustrum sinense) from forests

Zoë Hoyle, Science Delivery Group, Southern Research Station, US Department of Agriculture.

Forests infested with privet invoke a kind of despair in people attuned to the problem of invasive plants. Privet invades a forest quickly, sprawling across the understory and growing into thickets that crowd out native plants and change the very ecology of an area. Even if the woody shrub can be removed effectively, can a forest return to any semblance of its previous condition?

Results from a five-year study by U.S. Forest Service researchers shows that a thorough removal of privet can last at least five years without a follow-up, and that native plant and animal communities steadily return to areas cleared of the invasive shrub.

In 2005, Forest Service Southern Research Station (SRS) and State and Private Forestry started an experiment to assess the long-term effects of removing Chinese privet from streamside forest land in northern Georgia. SRS research entomologist Jim Hanula and entomologist Scott Horn, both based in Athens, Georgia, as part of the SRS Insects, Diseases, and Invasive Plants unit, worked with John Taylor (retired, Forest Service, Region 8, State and Private Forestry) to set up plots to test methods of removing privet and to document the return of native plant communities and the response of insect pollinators.

They also wanted the project to have a strong educational component, so they teamed up with the University of Georgia's State Botanical Garden and Warnell School of Forestry, the Sandy Creek Nature Center, and the Oconee National Forest.

Researchers in a 40-year-old privet stand within the forest.
Photo courtesy of the U.S. Forest Service.

That allowed the plots they established to be widely dispersed and representative of the region, as well as readily available for education and outreach. "The plan has worked very well," said Hanula. "Now hundreds of school children tour the plots every year to learn about invasive species, and college classes conduct lab exercises in them."

First introduced into the U.S. as an ornamental in 1852, Chinese privet (*Ligustrum sinense*) escaped cultivation by the 1930s and spread across the Southeast. "It's common in streamside areas, possibly because they're similar to its native habitat in China," says Hanula. "Chinese privet is the primary cause of the decline in the abundance and diversity of native herbaceous plants and tree seedlings in the areas along streams and rivers it infests."

Researchers tested two methods for removing privet. In one set of plots, they used a mechanical mulching machine to grind up privet to the ground level, leaving the mulch on the plots. In the other set of plots, crews with chainsaws and machetes felled privet by hand. Stumps in both sets of plots were initially treated with herbicide to prevent resprouting, and the areas were treated again with a foliar spray a year later to address new sprouts. By 2007, the plots had less than one percent of their surfaces covered by privet compared to over 60 percent on control plots where privet was left untreated.

Hanula and Horn began investigating how privet removal affected the recovery of plant and animal communities by comparing the treated plots to reference areas that had never been invaded by privet and control plots that were invaded and not treated. They published their initial findings on plant communities two years after control in 2009 (http://www.treesearch.fs.fed.us/pubs/34542)

"The results were dramatic," said Horn. "The hardwood forests we're working on are some of the most beautiful places in the South when they're not choked with privet. We saw the return of native plant species in all of the treated plots."

Results from their studies on pollinators (http://www.treesearch.fs.fed.us/pubs/39743) were even more dramatic. "After only two years, there were four to five times more bee species in privet-free areas, 40 or 50 compared to the 10 on control plots infested with privet," said Hanula. "We caught three times as many butterfly species on the mulched plots and nearly seven times as many individuals."

This year, five years after treatment, University of Georgia graduate student Jacob Hudson, along with Hanula and Horn, published an article in the journal Biological Conservation (http://www.treesearch.fs.fed.us/pubs/45489) documenting the continued long-term benefits of removing privet to both bees and butterflies.

Plot where privet was removed and canopy traps installed for research. Photo courtesy of the U.S. Forest Service

In an additional article just out in the journal Forest Ecology and Management (http://www.treesearch.fs.fed.us/pubs/46015), Hudson, Hanula and Horn also reported on the status of plant communities and the growth of canopy trees five years after complete removal of privet. This is one of the longest studies on the effects on forests of removing invasive plants. "Long-term monitoring of native plant recovery and potential reinvasion after invasive plant removal is crucial for determining the efficacy of removal efforts and for justifying future control efforts," said Hanula.

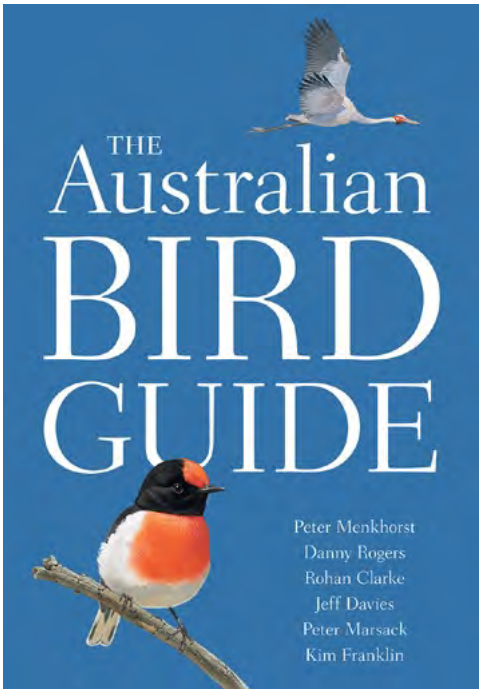
At five years, approximately seven percent of the mulched plots were covered with privet seedlings, higher than the three percent in the hand-felled plots. Both were much lower than the 34 percent cover in the control plots. Native plant species richness also differed among treatments. Mulched plots had the highest number of species, significantly higher than in felled and control plots, but comparable to the uninfested reference plots. Removal of Chinese privet caused no detectable changes in the growth of trees.

"Overall, these results are encouraging, since we expected to have to re-treat the privet more frequently to preserve the integrity of the removal plots," said Horn. "These results show that control following one removal event lasts at least five years. We plan to continue to document reinvasion to decide when follow-up treatment is needed."

For more information, email Jim Hanula at jhanula@fs.fed.us or Scott Horn at shorn01@fs.fed.us.

This article is found at https://www.srs.fs.usda.gov/compass/2014/07/15/with-privet-gone-native-plants-and-pollinators-return/

Books:



The Australian Bird Guide

Authors: Peter Menkhorst, Danny Rogers, Rohan Clarke, Jeff Davies, Peter Marsack, Kim Franklin

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The Australian Bird Guide sets a new standard in field guides, providing an indispensable reference for all birders and naturalists looking to explore Australia's magnificent and unique birdlife.

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Follow hashtag #ausbirdguide on social media.

Published by CSIRO Publishing. Paperback | May 2017 | $ 49.95
ISBN: 9780643097544 | 576 pages | 245 x 170 mm

See more at: http://www.publish.csiro.au/book/6520/

Coming soon to regenTV

RegenTV has had over 1700 viewings in the past year. The next release of videos will be over the coming months including these restorative treats.

- The Dewfish Demonstration Reach: Aquatic habitat restoration for native fish recovery Andrew Norris, DAF-QLD
- Protecting paradise: restoring the flora and fauna of World Heritage listed Lord Howe Island Hank Bower and Sue Bower, LHI Board
- Collecting seed and plant production for restoration. Ross Rapmund, Community Nursery & Bushwalk Coordinator, Hornsby Council.
- Dune and Littoral Rainforest Restoration Wamberal Lagoon Nature Reserve, Foresters Beach Deb Holloman Bush Regeneration Coordinator, NSW National Parks and Wildlife Service - OEH.
- Woorim Dune Recovery Project, Moreton Bay Qld, Sunshine Coast Qld. Spencer Shaw, Principal, Brush Turkey Enterprises.

What's happening

Tuesday 1 August 2017

Threatened Plants Translocation Information Day

The day will cover the "how to" of threatened plant translocation, and present a range of case studies (including on *Persoonia pauciflora* and *Wollemia nobilis*). Speakers will include Lucy Commander (ANPC), Jen Silcock (University of Queensland), Leonie Monks (Department of Parks and Wildlife, WA), Cathy Offord (Australian Botanic Garden), Tony Auld (OEH) and more.

TIME: 9.30am - 5pm

WHERE: Royal Botanic Garden Sydney.

For more information

http://www.anpc.asn.au/workshops

Monday 16th to Thursday 19th October 2017

19th NSW Weeds Conference

Experience the Highs – working smarter together

The main theme is biosecurity, due to the introduction of the *Biosecurity Act 2015*. In addition, innovation and technology will once again be at the forefront of the conference. Other themes are collaboration and social marketing / extension.

WHERE: University of New England campus, Armidale

For more details: http://conferencecompany.com.au/weedsconference

Wednesday 25 to Friday 27 October 2017

NSW Landcare and Local Land Services Conference

The NSW Landcare and Local Land Services Conference is a biannual event charged with showcasing the best in partnership, landcare and natural resource management. The conference invites community, industry and government to come together to network and share their successes.

The 2017 NSW Landcare and Local Land Services Conference will be held in Albury, NSW. The Conference is being hosted by Landcare NSW and Murray Local Land Services, and is being coordinated in partnership with local Landcare and community groups.

Renowned science communicator, Dr Karl Kruszelnicki, who is best-known for his weekly radio spot on Triple J, will be the keynote speaker at the conference.

This conference is the premier event to showcase sustainability, Landcare and volunteering across NSW and includes the annual Landcare Muster and the NSW State Landcare Awards. Don't miss this chance to gather with around 300 people from Landcare and community groups, farmers, Aboriginal groups, industry and government representatives from across NSW and Australia.

The theme for the Conference is 'Sharing our Stories'. Conference topics will focus on agriculture, biodiversity, water and Aboriginal Landcare.

WHERE: Albury Entertainment Centre, Albury, NSW

For more information

http://nswlandcareconference.com.au/

Sunday 26th November to Friday 1st December 2017

Putting ecology to work

The joint conference of the Ecological Society of Australia and the New Zealand Ecological Society

The Ecological Society of Australia and the New Zealand Ecological Society are delighted to announce EcoTAS 2017, the sixth joint meeting organised by the two societies.

EcoTAS 2017 promises an exciting programme of plenary speakers, symposia, workshops and social events. The theme of EcoTAS 2017, 'Putting ecology to work', is a call to focus on how ecological science can contribute to the economy, society, culture and public policy, as well as to the health of the environment and quality of life.

WHERE: Cypress Lakes Conference Centre in the Hunter Valley in NSW

For more details: http://ecotas2017.org.au/

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/

Australian Association of Bush Regenerators

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miked@envite.org.au

Coffs Harbour subcommittee
Lindy Davis 0448 651 239 or 02 6654 5313

The Australian Association of Bush Regenerators Inc (AABR) was incorporated in NSW in 1986, and has several hundred members from all over Australia. AABR is pronounced 'arbor.'

Our aim is to promote the study and practice of ecological restoration, and encourage effective management of natural areas.

All interested people and organisations are welcome to join. AABR members include bush regeneration professionals, volunteers, natural area managers, landowners, policy makers, contractors, consultants, nursery people, local, state and commonwealth government officers—and lots of people who just love the bush and want to see it conserved.

AABR also offers accreditation for experienced practitioners.

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

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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
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