AABR NEWS

Australian Association of Bush Regenerators

working with natural processes

Nº137

July

2018

AABR's NSW Rainforest restoration bus trip

20th to 25th of September 2018

Visit iconic bush regeneration sites on this AABR Trip

AABR is organising a charter bus trip to Lismore leaving Sydney Central on Thursday 20 Sept and returning Tuesday 25th Sept.

On the way to Lismore, the AABR bus will stop at Wingham Brush to witness the transformation from a highly degraded remnant to an irreplaceable Nature Reserve guided by the major bush regeneration pioneer Dr John Stockard. On the way back we will start with a visit to Rotary Park in Lismore and later visit the Coramba Nature Reserve rainforest restoration project at Coffs Harbour.

While in Lismore, the trip will join up with a 2-day field trip of restoration projects in the 'Big Scrub' area on the weekend of 22nd and 23rd September. We will be joined by participants in the pre-conference tour of the SERA 2018 Brisbane conference.

This weekend tour will take in a range of rainforest restoration sites in the Big Scrub. The first day will include an in-depth guided tour of three seminal rainforest restoration projects including on private land (The Handley's property 'Brockley') and two on public land (Victoria Park NR) and Lumley Park (a project initiated by dairy farmer Ambrose Crawford in 1935, making it earliest modern day ecological restoration project we know of in Australia). The day will be capped off with an early BBQ dinner, hosted by Big Scrub Landcare, on a highly scenic private property in the heart of Big Scrub country.

The second day will continue the tour of sites where restoration techniques have been pioneered and results are outstanding including Booyong NR and Rocky Creek Dam. The afternoon will include a visit to Brook farm to show how restoration can be integrated into the economic future of the Big Scrub Landscape.

Cost of Charter Bus Trip. Eventbrite tickets to this event will cover the cost of the bus travel ($418) and the weekend tour ($55). There will be an additional cost for accommodation for the 5 nights. This cost will depend the style of accommodation you want and could cost anywhere from $105 per night to $40 per night.

Note: your eventbrite booking will not be validated by AABR until you have also booked and paid for your accommodation through Tein after emailing **president@aabr.org.au** which is also the email address for enquiries.

For booking, visit the **eventbrite website**

Join one of the site visits

Local members and friends of AABR are welcome to join us at the various site visits. More information will be available about the times and meeting location shortly.

President's Perspective

Commemorating a bush regeneration pioneer. There are many interesting contributions in this issue – not least the article by Stephanie Lymburner on the work of Ambrose Crawford at Lumley Park, a restoration project in Alstoneville NSW, that started in 1935. (Yes - this is not a typo - 1935! This is the earliest date we can find for a restoration project in Australia or anywhere in the world from the 20th century onwards.)

Stephanie's article celebrates the role played by Ambrose Crawford in having the inspiration and vision to start this project – and it is my pleasure to announce that AABR will be holding a short ceremony marking Ambrose's contribution on the morning of Sat 22nd September, at Lumley Park, Alstonville.

Big Scrub field trip. This ceremony will be a feature of the upcoming field trip to the Big Scrub. (See information on the trip and associated site visits on Page1) In particular I would like to highlight that AABR has arranged a bus from Sydney with site visits in the Lismore area over the weekend of 22-23 Sept 2018. Sites en route (i.e. Wingham Brush and Coffs Harbour) will be visited. All details needed for booking, the bus trip including **accommodation** are available on the **Eventbrite booking site**. (https://www.eventbrite.com.au/e/aabrs-nsw-rainforest-restoration-bus-trip-2018-tickets-47140614848)

Future videos on regenTV will showcase the learning from these site visits and the management of the sites we visit.

The Albert Morris Award will be judged again this year. Last year saw AABR visit Broken Hill for the inaugural Albert Morris award. This year's award will be presented at the Society for Ecological Restoration Australasia (SERA) dinner on 27th of September 2018, part of the SERA conference in Brisbane. Nominations for the award are now open – the call for nominations was in our latest e-bulletin or see page 3 of this newsletter for information.

Contractors play a major role in the bush regeneration industry and there are numerous challenges for contractors in running teams, tendering and contracting. In this newsletter Scott Meier has written a letter about issues which are important. It is well worth a read. AABR is hoping to build on this information and provide an environment where issues such as these can be discussed.

Happy reading!

Tein McDonald
President AABR

Getting to know your Grasses

This AABR workshop held last month was attended by 20 people. The workshop with with Harry Rose was an insightful field day full of information you don't normally find in a textbook and embellished with anecdotes of Harry's agricultural and life experiences.

Each participant received a copy of Harry's book *Grasses of Coastal NSW* to guide us through the four hour session. The explanation of the book's layout showed us how to use the guide to identify the grasses by providing an introduction to flower-head, plant and spikelet structures. Harry was effusive about the ease of grass ID, 'there are only 5 flower-heads to know …how easy is that'.

Grass samples were provided to get our eye in and understand the key features and terms needed to become a grass guru, emphasising the need to look at multiple specimens to get an accurate ID as there can be considerable individual variation. Examples of a rhizome, node, leaf sheath, leaf blade, ligule and flower-head were all covered. With the assistance of a hand lens we went on to explore the spikelet structure; awns, glumes and florets appeared before our eyes.

The grass ID process using the guide was summarised as:

1. Look at the flower head structure to determine if it is
   a. Spike/raceme
   b. Digitate/subdigitate
   c. Primary axis of racemes
   d. Panicle
   e. Spatheate
   f. Hidden
2. Check how many florets are in the spikelet and whether it has any features such as awns, hairs or large glumes
3. Check the root base to determine if it is an annual or perennial. Annuals don't have runners. Weedy annuals are much easier to deal with; just run down the seedbank. Priority should be given to dealing with weedy perennials as they are much harder to control.
4. Determine the natural height of the grass. Don't hold it erect!
5. Compare the photos and descriptions with your grass.
6. When you've found the species you think it might be (never stop at the first one it looks like), check the 'similar species' section at the bottom of the page.

Harry's knowledge and expertise was evident as he shared the distinguishing features of many grasses and provided insights as to the role of grasses in the Australian landscape. Next Newsletter will have more specific information on some of the grasses we know.

Suzanne Pritchard

Welcome to new AABR Members

Trevor Allen
Maree Clancy
Tristan Black
Geraint Forbes
Bronwyn Murphy
Richard Noonan
Paul Thistlethwaite

Congratulations on Accreditation

Michael Cooper

AABR accreditation listing

The free Accredited Bush Regenerators Listing is moving along.

AABR is compiling an online list of accredited bush regenerators to support recognition and identification of bush regenerators and the industry at large. The free listing service is on AABR's website under the **Business Directory** and is for financial members who have attained accreditation.

By providing a place on the AABR website where people can search by region for an accredited bush regenerator, we are aiming to support people who would like to gain accreditation and are looking for mentors, and those looking for work

For currently accredited AABR members we would love to have your permission to include your name on the list. This shows the health of the industry, raises the profile and awareness of accredited practitioners and is a go-to place for employers looking to locate professionals.

Please complete the **1 minute online survey** which gives AABR permission to list you name. No personal contact details will be shown - contact requests will be facilitated by AABR.
For further information contact Suzanne on **admin@aabr.org.au**

Albert Morris Award

For an outstanding Ecological Restoration Project

This award commemorates the visionary work commencing in 1936 led by Albert Morris in creating the Broken Hill Regeneration reserves. The inaugural award was presented in 2017 at the awards dinner at Broken Hill.

Albert Morris

The Albert Morris Award will be presented at the Society for Ecological Restoration Australasia dinner at the SERA Conference to be held in Brisbane on the 27th of September 2018.

The recipient will be selected by the Albert Morris Award Committee with representatives from the four initiating Partner organisations - Australian Association for Bush Regenerators AABR, Greening Australia GA, Society for Ecological Restoration Australasia SERA and Australian Network for Plant Conservation Inc ANPC.

Nominations close on the 25 August 2018.

Prize: Certificate and trophy

CRITERIA FOR SELECTION AND ELIGIBILITY

Information on the criteria and eligibility is found on the AABR webpage - **http://www.aabr.org.au/about-aabr/aabr-awards/**

NOMINATION AND JUDGING

For further information on the process of nomination and judging please see information **http://www.aabr.org.au/about-aabr/aabr-awards/**

Enquiries: info@albertmorrisaward.org

Tein McDonald 0458 565 654

Albert Morris Ecological Restoration Award Partners

The Society for Ecological Restoration Australasia Awards - 2018

Nominations are now open for outstanding projects from Australia, New Zealand and the Pacific islands to be considered for SERA's biennial awards for (i) excellence in ecological restoration practice, (ii) the most outstanding student project and (iii) extractive industries restoration excellence.

The nomination period closes 25 August 2018.

(I) The SERA Award for Restoration Excellence

This award acknowledges individuals or organisations that have made a significant and enduring contribution to the practice of ecological restoration through outstanding on-ground restoration projects. There are two subcategories (a) Larger scale projects (i.e. 50ha and greater) and (b) Smaller scale projects (i.e. below 50 ha).

Prize for large-scale projects: $2,000 plus certificate and trophy

Prize for small-scale projects: $1,000 plus certificate and trophy

(II) The SERA Student Award

This award recognizes students that have made a significant impact in advancing the theory, practice, and/or public awareness of restoration through innovative research, tools, publications or technologies.

Prize: $1,000 plus certificate and trophy

(III) The Inaugural SERA International Award for Mining (Extractive industries) Restoration Excellence

This award recognizes exceptional restoration work undertaken by individual mines and mining companies.
Prize: certificate and trophy

(IV) The Albert Morris Award

See call for nominations notice on this page

FURTHER INFORMATION

Information on the criteria, eligibility, nomination and judging is found on the SERA webpage - http://seraustralasia.com/pages/SERAawards2018.html

Awards are presented during an Awards Dinner at the biennial SERA Conference on Ecological Restoration to be held in Brisbane on the 27th of September 2018.

Ecological Burning and Flame Weeders
AABR Walk and Talk

Louise Brodie, AABR

AABR members and friends met for a site visit to learn about ecological burning and the use of flames weeders. The event was hosted by Willoughby Council and around 40 participants were present for the visit at Artarmon Reserve in northern Sydney on the 8th May 2018.

Our day began with Alfred Bernhard from Council giving us a background to the reserve. The reserve is used for both passive and active recreation and has around 7 hectares of bushland.

The reserve is on shale sandstone soil and the plant communities include Sydney Turpentine-Ironbark Forest, which is an endangered ecological community, on the transitional/shale soils. Some remnants of the Blue Gum High Forest plant community survive in clay enriched soil. Artarmon Reserve has a population of *Epacris purpurascens* var. *purpurascens*, a plant listed as vulnerable under the NSW *Threatened Species Conservation Act 1995*.

Much of the bushland existing today is regrowth after past clearing. In the late 1970s the Reserve was assessed as important for bush regeneration in Willoughby and some weeding commenced along the creek but was poorly managed. Later a National Trust bush regeneration team worked in the reserve from 1980 for 4 years, and Sydney Water funded work in the reserve in the late 1980s and early 1990s. The regeneration work continues today by council and contract teams with support from local bushcare volunteers

The attendees were divided into two groups. Each group learnt about the use of flame weeders and ecological burning.

Flame Weeding

The use of flame weeders by the Willoughby Council bush regeneration teams was investigated as a way of reducing herbicide use circa 1999. Andrew, one of the team, explained that staff were concerned when traces of glyphosate were found in soil located where this herbicide had never been used. The herbicide had not broken down and possibly travelled through the sandstone based soils to new locations.

Willoughby Council demonstrating the use of the gas flame weeder
Photo: V Bear

Contractor Erick Vallis using the kerosene flame weeder. Photo: V Bear

Although the use of herbicide was cheaper, the decreased dependence on the use of herbicide was the prime motive for the use of flame weeders. It was also faster than hand weeding, encourages native plant regeneration and was more fun to use, particularly on cold days.

Members of the team demonstrated the use of the flame weeder using two different approaches. The demonstration area was dominated by bracken and some scattered natives with a ground layer of *Tradescantia*. Prior to the flame weeding the soft bracken fern was cut back to ground level and native plants were protected by hand weeding around them.

The first approach involved raking the trad and baring the soil. For the second method, the groundlayer was left unraked.

The unraked area takes longer to treat and uses more gas. However, the soil gets hotter and the chance of natural regeneration increases.

Safe work methods include checking for leaks in the flame weeder system with soapy water and staying on the site for 30 minutes after the flame weeders are turned off - this is to ensure that underground plant parts are not left burning. The team carries equipment to douse any flames or burning material. This includes a water spray which is used to spray a precise place. Shovels and rake-hoes are also available. Fire fighting knapsacks are also on site, although these are generally not needed.

The timing of use of flame weeders is carefully considered and depends on weather conditions, temperature and the bushfire fuel loads on the site. The weather conditions are regularly monitored during the flame weeding operation. Weather conditions are checked the day before, on the day (and fire bans are checked) and then again on the actual site

In Willoughby council area, flame weeders are used by both the council team and by contractors. Council demonstrated the use of gas flame weeders, both large and small. Contractor Erick Vallis showed us the use of a kerosene flame weeder. This was used over an area which had been prepared by removing any rubbish and larger logs.

For information on treating of particular species see AABR Newsletter No 96. http://www.aabr.org.au/images/stories/resources/newsletters/AABR_News_96_Feb_2007_Low_res.pdf

Bushland in Artarmon Reserve showing diversity post burn
Photo L Brodie

Ecological Burning

We were shown a number of areas throughout the bushland where ecological burning had been carried out. These were small areas of the bushland which were selected because it was judged that their resilience was good and so some good natural regeneration was expected post burn treatment.

The first site examined was burnt in 2013 and has had post-fire weeding - the weeds were mainly annual weeds. Prior to the burn treatment there was a paucity of native species with *Pittosporum undulatum* starting to dominate the vegetation. Currently, five years later, the team had noted an increase in diversity with species such as *Dodonaea* sp and *Acacia* sp with a variety of native grasses now on the site. Some *Angophora costata* were also seen, although this species appeared to not survive in large numbers after the burn – a sort of self-thinning.

The size of the burn area was dictated by the resources for follow-up weeding. Willoughby Council's bush regeneration team has been very stable with many of the regenerators being long standing members of the team. This means that the teams know the reserves intimately which results in sound knowledge of how different areas of reserve will respond. Most of the burns are done in autumn. Spring burns are to be avoided due to the presence of bird nesting and young fauna which can be affected by the burn. Wildlife habitat assessment is always carried out on any area where a burn is planned.

In the early days of the team using fire for ecological purposes, small pile burns on the ground were used. It is observed that piling fuel on the ground seems to overheat the soil and limit natural regeneration in those areas. Another trial involved stacking weeds on elevated platforms or 'rafts' to dry out the weeds which were then ignited. This helped by not directly heating the ground thus increasing the potential for native plant regeneration and diversity.

When planning a burn treatment there is a lot of background work to be carried out. The site needs to be identified and the preparation and timing of the treatment planned. Various authorities and the community need to be informed. Council's bushfire team undertakes burns generally in a one hectare area while for larger burns NSW Fire and Rescue are needed to assist. Willoughby Council has put time and effort in ensuring that council and the community are supportive of ecological burn operations.

Another burn area was looked at near the boundary of the bushland behind houses. In this case a barrier of lantana was left at the edge of the bush during the burn. The bushland regenerated well after the fire and the lantana helped with providing habitat and protection to the regenerating site. The lantana was later removed in stages by breaking it down and then treated by the flame weeder. The germination of native species and post-fire weeding resulted in a wonderful response with the recruitment of a good number of seedlings of turpentine (*Syncarpia glomulerifera*).

Another site area planned for a future burn was also looked at. This area has some plants of the *Epacris purpurascens* var. *purpurascens*. These specimens have been monitored with a declining loss in number since 2008. The expected results from the burn will be keenly watched by the NSW Office of Environment and Heritage (OEH) which has been involved with the planning of the burn in relation to this plant species.

In this area burn preparation has included the cutting of *Pittosporum undulatum* (considered an invasive native in this situation), to provide extra ground fire fuel. This fuel will assist with adding extra heat to the soil layer for good plant regeneration.

The planning and timing of burning after the preparation is crucial as extra light and disturbance to the site can help stimulate conditions for plant regeneration. These plants will die during the burn if there is a long delay between the preparation and the burn.

The visit provided much information about the use of fire in ecological restoration in an urban context with examples of sites burned over many years. Ecological burns are an important operation in continuing the protection and preservation of bushland remnants under council management.

Our thanks to Cameron Bennell, Andrew Souter, Alfred Bernhard and Sean Tooker from Council and contractor Erick Vallis for a most informative walk and talk – and of course yummy refreshments.

Fire and Restoration Network

Information and ongoing discussion is available at the Fire and Restoration Network http://fireandrestoration.org.au/. This is a hub and discussion forum hosted by Nature Conservation Council's Bushfire Program.
Information and articles pertaining to flame weeding :
http://fireandrestoration.org.au/flame-weeding/
http://fireandrestoration.org.au/forums/topic/fire-and-weeds/#post-10811

Lumley Park and rainforest restoration's early champion

Ambrose Crawford – Regeneration Pioneer. The Lumley Park story.

Stephanie Lymburner

We tend to think of bush regeneration as a new concept, but back in the 1920s and 30s an inspirational man and his fellow citizens decided that a piece of bushland was 'special' and needed to be protected for future generations.

Ambrose Crawford, a local dairy farmer, having always admired a small pocket of rainforest known as Lumley Park on the outskirts of Alstonville in far north NSW near Lismore, recognised that this pocket of rainforest needed protection.

Lumley Park had been declared a Public Recreation area in 1924 by Tintenbar Shire Council naming it Lumley Park in recognition of Councillor Clarence Lumley who volunteered and lost his life in the First World War.

Australia's first modern restoration project begins!

In 1934 Crawford and other like-minded citizens asked Tintenbar Shire Council to preserve and protect this small pocket of rainforest, as it was in their opinion representative of the Big Scrub.

The council officially declared the park as a Preserve for Native Trees in 1934, and the first recorded meeting of the Scrub Reserve Committee was held in December 1935.The committee advised the Council of their intention to rid the park of invasive weeds such as Madeira vine (*Anredera cordifolia)* (also known as jollop), lantana (*Lantana camara*), ochna (*Ochna serrulata*) and other invasive weed species.

Ambrose Crawford

The committee recorded a list of the species found within the park boundaries including red cedar (*Toona ciliata* syn.*australis*), four Flindersia species, silky oak (*Grevillia robusta*), rosewood (Dysoxylum rufum), Bangalow palms (*Archontophoenix cunninghamia*)and red bean (*Dysoxylum mollissium*). These trees are representative of the Big Scrub vegetation.

Ambrose not only worked doing weed removal with several other volunteers, he actively collected seeds from various remnants including Victoria Park and Davis Scrub and roadsides. He kept meticulous records of the place and season he collected them, propagating them before planting them in the Park and acquiring seeds and seedlings from the Queensland Botanic Gardens for planting.

By current standards some of his early methods of weed control are outdated – occasionally using a draft horse for lantana removal; mattocking out areas of lantana; scything out and or burning areas of wandering jew; grubbing out tobacco bush, ochna and privet and also burning the sandpaper figs!

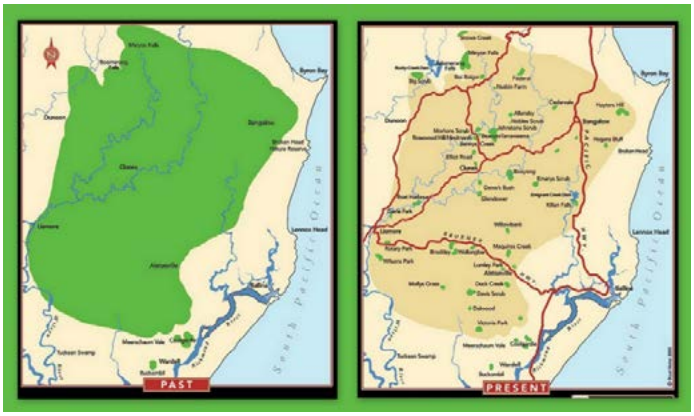
During his time at the park, several renowned people visited and gave advice on species selection and suitability, including Mr. De Bougainville (NSW Forestry Department), W.D Francis and Mr. Bick Director of the QLD Botanic Gardens, and later Alex Floyd.

He also had regular visits from Alstonville and Ballina High School students and hosted community events to assist in educating people about the importance and beauty of the rainforest.

What is the Big Scrub?

Prior to European settlement, the Big Scrub in northern NSW covered 75,000 hectares and was the largest contiguous area of Lowland Subtropical Rainforest in Australia accounting for 38% of its total area. Tragically 99% of this magnificent rainforest was cleared, initially for valuable timbers then for agricultural purposes, leaving only 1% as fragmented remnants scattered across the landscape between the Northern NSW towns of Byron Bay, Lismore, Ballina and Alstonville.

These remnants are now of international significance, supporting an incredibly rich biodiversity including Lumley Park.



The Big Scrub in Northern NSW

The first working bee on 26th October 1935. Present were, from right: Sam Gibson, unnamed, Ambrose Crawford, Alf Elvery, unnamed and Lyle Gerrard. (Photo courtesy Dorothy Crawford, Ambrose's daughter who took the photo.)

SGAP first working bee 1991.
Courtesy of the Australian Plant Society (APS)

As the park is within the boundaries of the village a group of garden loving individuals influenced the team to make the park 'pretty' by planting several exotics, primarily on the edges.

From the time Ambrose commenced work in the park until his final entry, the control of Madeira vine continues to be recorded. His diaries commence in August 1935 continuing through to February 1979!

He worked at the park regularly, with only a short break when he was serving in the Second World War, continuing right through until shortly before his death at the age of 99!

Before he stopped working at the park he sought assistance from Ballina Shire Council who provided a staff member to continue on his work. Unfortunately the maintenance was only kept up for a short period of time.

Ambrose made a wonderful contribution to the community, expanding our knowledge and appreciation of Lowland Subtropical Rainforest. He remains an inspiration for all bush regenerators who follow in his footsteps.

Subsequent management

1991 to 2007

In July 1991 The Far North Coast Group of the Society for Growing Australian Plants (SGAP) applied for a *Save the Bush* grant for the park. The group had consulted with various members of both Ballina and Lismore Councils for permission to carry out regeneration.

Though this grant application was unsuccessful they were inspired to form a Forest Restoration Group with working bees commencing that month with a small group of SGAP members. Marek Sojka, the leader of the group, was advised by Rosemary Joseph (bush regenerator) and Keith King (Head of Lismore City Council Parks and Gardens) about regeneration methods.

The group recorded the thick infestation of Madeira vine throughout the park and regarded it as the 'worst weed'! They worked regularly removing the weeds, setting up black plastic covered dump zones, pulling Madeira vine out of affected trees and using the cut, scrape and paint method for weed species saplings and the thickets of lantana. Over the years the volunteer

Lumley Park. Weed removal in the mid 1990s with the assistance of TAFE.
Left: Cocos palm removal Right: Pearces Creek road edge before removal of large leaf privets. Photos: Julian Lymburner

numbers decreased and the several dedicated members who continued eventually became demoralised by the enormity of the task.

In 1995, we (Julian and Stephanie Lymburner), members of SGAP and recently qualified bush regenerators, took over the leadership of the team organising half day weekly working bees and teaching the remaining volunteers more up to date methods of weed control.

One of their first projects was to remove the pretty plants that had been planted previously, including cassia (*Senna pendula* var *galbrata*), orange trumpet vine (*Pyrostigia venusta*), bougainvillea, azaleas, loquats (*Eryobotria japonica*), night jasmine (*Cestrum* spp.), cherry guava (*Psidium cattleianium*) and large areas of fishbone fern (*Nephrolepis cordifolia*) planted on the edge along the Bruxner Highway.

Madeira vine continued to be the major problem throughout the park, choking trees and with the sprouting tubers forming a dense cover on the forest floor with the wandering jew (*Tradescantia fluminensis* syn. *albiflora*).

After a discussion with Rosemary Joseph in regard to black bean regrowth on the southern side of the park, we commenced a program of thinning black bean seedlings (*Castenospermum australe*) from the edge facing the mown area, as there appeared to be a symbiotic relationship between the large seeds of black bean and wandering jew, with the wandering jew providing ideal conditions for the large black bean seeds to germinate. After the thinning of the black beans and wandering jew, many other rainforest species readily germinated as a large seed bank present.

Large leafed privet trees and saplings occurred throughout the park, so a concerted effort was made to poison all the larger trees and hand weed the saplings. A regular program was undertaken to spray the areas of wandering jew, sprouting Madeira vine tubers and emerging privet seedlings.

Two years later with the assistance of the TAFE Tree Surgery Class, Ballina Shire Council and other volunteers, thirteen mature large leafed privets (*Ligustrum lucidum)* were removed from the Pearces Creek Road edge of the Park and the two large Cocos Palms (*Syagrus romanzoffianum*) from the centre.

An early Plan of Management (PoM) had been written by Sharon Cummings as part of the Bush Regeneration TAFE Course. Now, with assistance from Total Catchment Management (TCM), we wrote a more up to date plan with a comprehensive plant species list, maps, work directions and aerial photo of the park in relation to Alstonville.

As a result of this new plan we were successful in obtaining a grant from TCM for the restoration works and supplementary plantings in the riparian zone, including to realign the northern boundary. Some of these funds were made available to the adjoining property owner to fence his small remnant of similar vegetation on the other side of Maguires Creek (previously the neighbour had allowed his cattle to roam along both sides of the creek. When this fencing was complete we were able to extend the edge of the Park to the bank of Maguires Creek.

With the cattle now excluded from the creek, a planting was organised with Bangalow palms, red cedars, lomandra (*Lomandra longifolia*) and blue quandongs (*Eleocarpus grandis*), with volunteers and a Greencorps team working to stabilise the creek banks, control erosion and increase the area of vegetation.

Areas of the park had in earlier times been used as the local rubbish dump for Alstonville. On Clean up Australia Day 1996, volunteers were organised to come and remove the junk and rubbish that lay in rusty layers along the stormwater channel that bisects the Park.

Supervised volunteers managed to fill two large skips with the rubbish, consisting of old car parts, broken crockery, glass, plastic bottles and other

Flying Foxes

Movements of grey-headed flying foxes are influenced by the availability of food. Their population is very fluid, as they move in response to the irregular blossoming of certain plant species. They are keystone pollinators and seed dispersers over 100 species of native trees and plants. The grey-headed flying fox is a partial migrant that uses winds to facilitate long-distance movement. It does not migrate in a specific direction, but rather in the direction that will be the most beneficial at the time.

The grey-headed flying foxes leave the roost and travel up to 50 km a night to feed on pollen, nectar and fruit. The species consumes fruit flowers and pollens of around 187 plant species. These include Eucalyptus, particularly *E. gummifera, E. muellerana, E. globoidea* and *E. botryoides*, and fruits from a wide range of rainforest trees, including members of the genus Ficus. These bats are considered sequential specialists, since they feed on a variety of foods. Grey-headed flying foxes, along with the three other Australian flying fox species, fulfill a very important ecological role by dispersing the pollen and seeds of a wide range of native Australian plants. The grey-headed flying fox is the only mammalian nectarivore and frugivore to occupy substantial areas of subtropical rainforests, so is of key importance to those forests.

According to records held with the Alstonville Plateau Historical Society grey headed flying foxes occurred in Lumley Park during the 1950's; because of their habit of eating fruit of exotic species being grown commercially at that time a cull of these perceived pest took place in the late 50's.

They re-established a camp in the 1990's and are present there in varying numbers still.

Flying foxes on dead tree
Photo Julian Lymburner

Southern Angle headed dragon. Photo Julian Lymburner

discarded objects.

It was around this time Flying Foxes (*Pteropus scapulatus*) were observed in the park for the first time in at least 50 years!

Another first was the flowering of the giant flowering orchid (*Pseudovanilla foliata*) on a dead large leafed privet that had been previously poisoned!

The southern angle headed dragon (*Lophosaurus spinipes),* a threatened species, was sighted in 1992 which was a new recording.

That year SGAP was successful in obtaining a National Heritage Trust grant that allowed for the payment for two regenerators one day a week.

Observing that flying foxes had set up a permanent camp damaging many of the trees, including a giant leaved stinging tree (*Dendrocnide excelsa*), a field day was held in the park to educate the local community about flying foxes and their role in the environment. This was attended by approximately 120 people.

Southern Cross University ran their annual Bat Count with the park now recognised as a 'permanent camp' – recording approx. 3000 bats using the park as their home camp!

David Mitchell, a neighbouring landholder observed the progress of restoration in the park. He approached the Lymburners for advice about planting similar vegetation along his section of Maguires Creek. Over several years he planted many trees that now form a dense canopy that increases the size of the overall remnant.

After several severe rain events produced serious erosion, the stormwater channel posed a risk for all park users.

In consultation with Wollongbar TAFE we negotiated for the bush regeneration students from TAFE to come with their teacher Gary Coleman to lay Geotech fabric along the stormwater channel and build rock filled gabions to stabilise the channel to prevent further erosion and dangerous objects surfacing during heavy rain.

As the support from SGAP waned, Big Scrub Rainforest Landcare Group (now Big Scrub Landcare) took over funding applications and financial management.

We (Julian and Stephanie) continued to work there regularly, with some volunteers implementing the recommendations in the Plan of Management until 2007 when we handed over the work to other regenerators from The Big Scrub Regeneration team.

Over the years we controlled the infestation of Madeira vine knowing that it would continue to require regular maintenance.

Post 2007

Ballina Shire Council is funding the ongoing maintenance work which is part of the overall Big Scrub Landcare remnant program. The council have a set amount that they give each year to cover a few remnants. Big Scrub Landcare and EnviTE Environment manage the remnant program that includes Lumley Park.

Bush regenerator Darren Bailey says they are currently working there 5 or 6 contractor days per year which is enough to manage regrowth of major remaining weed such as trad, tobacco bush, giant devils fig, white passionflower and Madeira vine across all parts of the site. Ongoing weed control is required for Madeira vine and trad, as the reserve borders a creek. As the site is prone to flooding there is always a weed threat and more funding could be used.

As part of the AABR trip the site will be visited on the 22nd September for a celebration of Ambrose's work. Current management and issues will be the subject of an article in the October 2018 AABR Newsletter.

Giant flowering orchid (*Pseudovanilla foliata*) orchid

Photo: Julian Lymburner

Membership renewals now due

Your should have received by email, an invoice for this years membership. If it has not arrived in your 'In box', check your spam. Thanks to those who have already paid. Those of you without email will receive an invoice in the post shortly.

AABR membership flows with the financial year cycle, so your membership is from 1 July to 30 June.

If you've changed your contact details or have not received an invoice, please take the opportunity to email Suzanne at admin@aabr.org.au so we can update our records.

Open letter to the Ecological Restoration Industry

Scott Meier, BARRC

There are troubling and interconnecting forces at play in the ecological restoration industry. These appear to be unique to this time and developmental stage of the industry. Some of these issues have been obvious since the earliest days of our still young and vibrant movement. Others are more recent. There is no particular order here, just a crude attempt to understand, conceptualise and critique some of the elements that shape the bush regeneration or ecological restoration industry, with a view to spurring debate and perhaps better considered development of our industry.

Some of these issues are not suitable for AABR to become involved with – others are.

Contracts and Tendering

As lovers of the natural environment, we generally enter this industry without a depth of knowledge of or any great love for the 'drier' legalistic and economic framework that has developed over centuries. It is this framework, however (e.g. contracts and tenders for them) that allows individuals, business and government to interact in the way to which we are accustomed.

The intricacies of ecological restoration make certain aspects of tender writing difficult; however state and local governments have generally not adequately addressed this issue. These authorities have adequate resources and in-house knowledge to be able to amend the most obvious of the impediments to efficient tendering and contracting (necessary to result in the appropriate quality of work being undertaken); but even after some decades of industry practice, these impediments have not yet been resolved.

In my experience the standout problem is that there is a clear and widespread misunderstanding among local and state government authorities of the distinction between the two types of contract; 'Schedule of Rates' and 'Lump Sum'. This potentially places contractors and themselves in a legal quandary.

Lump Sum refers to a quoted price for a given product or outcome, i.e. a Lump Sum Contract means the attainment of an 'Outcome' or 'Product' for a given 'Price'. The term 'Lump Sum' is not interchangeable with the term 'Budget' or for a given 'Budget'. A given budget for restoration works may be contracted according to Schedule of Rates or Lump Sum. The terms 'Schedule of Rates', 'Hourly Rates' and 'Hours' are contractually not relevant with respect to 'Lump Sum' jobs.

Frequent confusions arise when these two approaches (Lump Sum and Schedule of Rates) are misused in contracts - some examples are:

- Local and state government authorities frequently ask for a 'Fixed Lump Sum Quote' but then also ask for a precise breakdown of hours per task, with the total number of hours to be used for tender weighting. This is not a valid weighting as it is the 'outcome' that is relevant and not the 'time' taken per se.
- When tender documents ask for a 'lump sum quote' and also ask for 'hourly rates', this undermines the meaning of Lump Sum quote and is at times used to hold contractors to two (2) deliverables: an 'outcome' and a 'number of hours'.
- A Lump Sum contract is awarded for a particular outcome. However the government authority may accept less than completion by the contractor on the grounds of the 'difficulty in estimating bush regeneration' when this lack of completion may not be fully justified. This can undermine the integrity of the tendering process, disadvantaging experienced and accurate quoting and encourage 'rubbery outcomes'.

Lump sum contracts, when correctly drafted have some advantages including that contractors have the opportunity to work innovatively and efficiently, come in under the tender price and share profits with employees, thereby potentially addressing some of the remuneration issues for ecological restoration employees. Additionally, Lump Sum contracts give the purchaser (often government) certainty of outcome and price, without the need to continually supervise the work rate of the contractor. Disadvantages of Lump Sum contracts include that they are open to quality defects in order to achieve the outcome more quickly should the contractor not be adequately assessed. Also, specifications can be more lengthy and difficult to produce as the outcome must be very clearly defined.

In order for Lump Sum tendering to function correctly, the purchaser (often state or local government) must provide clear and exacting specifications that allow the contractor to quote effectively. The purchaser must be entirely familiar with the site or desired product prior to writing specifications and must be able to meaningfully compare the outcome with the specifications. As with any contract the fundamental prerequisite is that there be a 'meeting of minds' between the purchaser and the supplier.

Due to real and perceived difficulties in estimating outcomes in ecological restoration, Schedule of Rates contracts are the norm.

Schedule of Rates contracts allow councils etc. to undertake works without exacting specifications and allow maximum flexibility. However, as with Lump Sum contracting, there are advantages and disadvantages associated with the manner in which Schedule of Rates contracting is utilised in the ecological restoration industry.

Advantages of Schedule of Rates contracts include that they allow for the negotiation of long restoration timeframes (often decades per site), variable and uncertain funding streams, changing political climate, variable and evolving worksite environments, changing technology and techniques. In short, Schedule of Rates contracts allow flexibility and the capacity to negotiate uncertainty.

However, this also can have disadvantages. Schedule of Rates contracts can actually drive uncertain outcomes and lead to sites where work appears to be undertaken but meaningful outcomes may be slow due to poor site familiarisation and low level ecological understanding by the contractor. They also provide less incentive for outcomes to be achieved in a timely manner and can lead to a piecemeal approach where milestones are not adequately determined in advance by the purchaser.

There are other issues underlying all of this. We face a situation where many government environment officers are generalists and are not able to produce adequate specifications for the work they commission, nor are they able to reasonably assess tenders and written submissions. Supposed 'fair and equitable' tender

assessment is often anything but 'fair and equitable'. Weightings almost never, in my experience, take into account previous performance – the single biggest indicator of likely outcome, productivity and cost effectiveness.

Often meaningful restoration outcomes require long time frames and a stable and experienced workforce to deliver these outcomes; however many contracts are short term with breaks in between. I've experienced seven year contracts that should provide a significant level of certainty; however in practice many must be renewed annually which can take 3-4 months. These contract pauses are often avoidable and, at times, make employment within our industry very difficult.

Ecological restoration appears to be relatively unique among the trades, in that tender submissions (both Schedule of Rates and Lump Sum) are often assessed according to a 'contestable grant' style application, whereby the contractor must provide a concise plan of management for the restoration site. Inclusion of a plan of management in contracts for implementation is similar to asking a builder to include designs for the house in their construction tender. This not only undermines the legitimate remuneration for professional plans of management, but it means that tendering can be a very lengthy process even for relatively small sites and low value contracts. Also, perhaps uniquely among the trades, is the requirement for daily, monthly, quarterly and yearly progress reporting and monitoring.

This tendering and reporting process also includes the need for 'metrics' or 'data' from managers of all types (purchasing, WHS, tendering, ecological) and has greatly increased the contractors' office-based workload during recent years. Even modest ecological restoration trades practitioners require significant office space, dedicated resources and suitably qualified and experienced office staff to manage these demands. Lengthy tenders, regular reporting and monitoring are traditionally roles for the professional industries and not trades. Ask a plumber how many reports they do for a $10,000 job!

Indeed, reporting, planning and monitoring are often charged out at significantly higher rates in other industries (as well as other branches of our own industry). This reflects the intermittent nature of the activity and the requirement for qualified, experienced and available staff and expensive office resources.

In my opinion, poor contracts and tendering impact upon restoration outcomes and the viability of the industry. Without a healthy contracting industry, government authorities face great difficulty supplying cost effective environmental solutions to their environmental problems.

In order to advance the industry and the cause of ecological restoration there needs to be a way to communicate these points to local government and agencies in a constructive manner, but this is not straightforward. By necessity there needs to be some distance between council staff and contractors. Hence, contractors cannot directly bring these issues to the attention of local government and state agencies in a manner that appears detached. This is where it is necessary for a third party – e.g. an industry association like AABR – to help bring all industry players together to ensure that contracts optimise outcomes for the bush. When this is in place, then outcomes will be optimized for purchasers, contractors and the environment.

Rates of Pay and Charge-out Rates

In our industry sector, rates of pay for employees and charge-out rates for contractors have typically been regarded as low when compared to other trades, particularly for personnel with extensive experience and qualifications.

The Landscape Gardner's Award of 2010, that expressly includes our industry, has put a floor under the pay rates, brought uniformity to pay rates and provides a basic pay scale. Adherence to this scale sees an experienced supervisor earning around $28 per hour. This is marginal money for a mature person, especially if they are the chief income earner with a family and reside in one of the major cities.

Accountants have a simple rule of thumb: employee wages should be about 1/3 of business income. This rule often breaks down with any service industry, but particularly so with ecological restoration. In my experience, the majority of ecological restoration contracts are conducted according to Hourly Rates or Schedule of Rates contracts. Hourly charge-out rates per worker (which includes not only wages but all on-costs. for many contractors hover around the $50 per hour - this is significantly below other comparable trades.

The bulk of what many ecological restorationists supply is labour. Many other trades frequently supply large quantities of materials which provides an additional income stream to their labour income stream. Planning and some level of job reporting, reporting in the ecological restoration industry is onerous and is not adequately reflected in the pricing. Many councils specify monthly reporting of 1 hour and 3-4 hours for yearly reports, to be charged at standard hourly rates, which does not reflect the true value of this specialised service. Contractors often take and file digital photos of each site, record and file GPS tracks, and co-ordinates, quadrat and transect information, provide detailed maps and recommendations for future works, provide herbicide use records and significant other information.

Recent administration developments by many state and local government authorities include the introduction of automated Contractor Management Systems (CMS) that request detailed information on every employee and must be regularly updated. This same information is often requested for each new tender. Contractors are usually charged for this mandatory CMS and in my opinion these systems have increased the workload of contractors. New technologies have allowed the capture of various information but require administration for their sorting, updating and storage. The benefits of the CMS to the customer are clear yet there appears to be no reflection of the additional administration costs to contractors in their charge out rates.

While some ecological restoration outfits provide consulting services which are typically charged at significantly higher hourly rates and can help offset low contractor margins, a short accounting exercise will quickly reveal that typical margins in the practical ecological restoration industry are very tight, particularly when the significant compliance costs of dealing with a government authority are considered.

In my experience, low charge out rates and the resultant low wages are the single most common reason cited by bush regenerators as to why they do not see a career in bush regeneration in the longer term. Without adequate rates of pay, a suitable service cannot be provided, and outcomes are compromised.

Education

In NSW, the state government has significantly reduced the subsidisation of VET (Vocational Education & Training) courses and allowed the entrance of many new Registered Training Organisations (RTOs) in order to encourage competition in the education sector. This is a step towards 'user pays'. In our case the 'users' are often state and local government, restoration contractors and their employees. Two results of these changes over recent years include a significant increase in course fees and a dramatic reduction in students entering relevant Conservation

and Land Management vocational training courses.

Employee turnover in ecological restoration has traditionally been very high and many employers rely on the constant flow of the recently qualified practitioners, whom they can mentor. Many such practitioners do not, however, stay in the industry because of the low pay rates but benefit from the experience in the bush regeneration field as they move into other better paid positions in allied industries. Inability to offer a career pathway for bright employees is not a healthy situation for any industry.

In addition to the aforementioned training issue, the ecological restoration industry educational norms are at odds with some realities of being able to work effectively within the natural environment. Tender documents often define 'Qualified Bush Regenerator' as having Cert III CLM and two years experience, and a Site Supervisor as having Cert IV CLM. These courses are designed to specifically provide the industry with the appropriate competencies required in the workplace. An environmental science degree on its own rarely provides a student with exposure to on-ground realities in ecological restoration. Yet a contractor with a degree seems to be regarded as superior to a CLM III for a bush regenerator, in the tender evaluation process.

Australia's excellent university system should not be viewed as somehow 'superior' to our excellent VET system when it comes to the operational side of ecological restoration. They are different. Qualifications and experience need to be scrutinised much more carefully if our industry is to develop in a healthy direction.

Similarly, it is often interpreted during tender assessment that a Diploma is a 'Higher' qualification than a Cert III and ranked as such, even though some campuses in the NSW VET system do not require a Cert III or IV as a prerequisite. I understand these to be different qualifications, but in the field of ecological restoration it is generally imperative that a Cert III CLM (Natural Area Restoration) be completed prior to undertaking other CLM courses.

I would suggest that 'qualified' should retain the traditional trades-based meaning whereby an apprentice undertakes a 4-year apprenticeship and 4 years of VET training in order to become qualified and experienced. In my opinion, a regenerator with 4 years experience and 4 years VET is likely to be more capable of managing ecological restoration than an environmental science graduate with no practical experience.

Supply and Demand

The economic rationale of supply and demand would suggest that employers need to offer higher pay rates to increase the financial incentive for people to enter and remain within the industry and afford the higher VET fees. In turn, contractors' charge-out rates need to increase to be able to afford to pay higher wages (especially since there is little room within existing charge-out rates to be able to afford higher wages). Every single state and local government environment manager with whom I have spoken has said there has been no appreciable change in charge-out rates above CPI (Consumer Price Index) in recent years.

There are tremendous price pressures on the supply side (contractors and their employees), yet this has not translated to a change on the demand side (generally governments). The ecological restoration industry faces several impediments to the smooth functioning of this market.

Perhaps it can be explained this way: A very high proportion of ecological restoration work is managed, funded or overseen through government; federal, state and local. Standards for all restoration work (public and private sector) are usually set by a government authority. In short, government has tremendous market power.

The small amount of restoration works undertaken by the private sector (businesses and individuals) in my experience, are often seen as punitive by the respective business or individual (i.e. additional and excessive cost to development, reparation for illegal landclearing etc.) and are often planned and executed in a lower quality manner.

In economic terms concentrations of power on the purchasing or demand side are termed 'monopsony', 'duopsony' and 'oligopsony' for single, two or few purchasers respectively. On the supply side a single supplier has a 'monopoly' position, two suppliers a 'duopoly' and few suppliers and 'oligopoly'.

In ecological restoration we perhaps have a scenario akin to the Coles and Woolworths duopsony in the Australian supermarket landscape. Few on the demand side (price makers) are potentially able to determine the price that many small dairy farmers take for milk (price takers). In the ecological restoration scenario, the supplier (ecological restoration contractors) are 'price takers' with terms and conditions set by the state and local government which commands excessive market power (price maker). If we consider that the various levels of government are so interrelated that they are effectively a single purchaser, then we might apply the moniker: monopsony (it would be monopoly if it were on the supply side). Perhaps at best we could say that there are few on the demand or purchasing side, therefore we could apply the moniker: oligopsony. The upshot is that the purchaser controls the game and we have a situation where the price for ecological restoration services is not able to fluctuate adequately to reflect variations in quantity and quality of work performed. This reduces the incentive for contractors to supply superior services and more highly skilled employees and affects the quality of restoration outcomes and efficiencies.

Over the decades the understanding and practice of restoration has significantly improved throughout much of the industry yet pay rates have not taken into account these efficiencies and improvements.

The recent release by SERA of the *National Standards for the Practice of Ecological Restoration in Australia* clearly defines a framework of principles and should further improve on-ground outcomes and efficiencies if they are integrated into contracts adopted by RTOs and contractors.

There are many reasons why markets face difficulties when interacting with natural environments, which is why governments are so heavily involved in the first place.

This is not an attempt to 'bag' government involvement with the environment, it is an attempt to understand how the restoration industry has come to experience its present difficulties.

Where to?

Fixes for some of these issues are easily identifiable, others less so.

The distinction between Lump Sum and Schedule of Rates is an easy one – a matter of communication of legal responsibility. Contract drafting difficulties may require further education of contract managers through established VET courses, seminars and symposia such as the AABR symposia and online training resources such as the very popular *regenTV* on the AABR website.

Tendering in general could be improved if the SERA National Standards were utilized as a basis for all specifications, this would begin to standardise the language and emphasise the talking points. It would begin to remove the piecemeal approach to specifications and insert a solid ecological understanding.

Contracting experienced restoration ecologists would go some

way towards the development of meaningful specifications. Generalist ecologists can be very 'hit and miss' with restoration, I have a drawer full of management plans written by established ecologists specifying unsuitable techniques and timing. Common errors include inappropriate species selection for plantings (contravenes Site Attribute 3, 'Species Composition', and several others in the National Restoration Standards); recommendations for planting and natural regeneration in highly modified and inappropriate soils (contravenes Site Attribute 2, 'Physical Conditions' in the National Restoration Standards); inappropriate species control techniques including the use of heavy machinery for the removal of minor weed infestations on steep and erodible slopes and the frequent omission of fire from fire dependent communities (contravenes Site Attribute 5, 'Ecosystem Function' in the National Restoration Standards).

The restoration plans frequently being produced by VET students undertaking Cert IV CLM, address these fundamental site attributes correctly and include practical recommendations for timing, resource availability and timescale.

Presumably the NSW government assumed that the VET 'user pays' model would integrate more quickly into the economy and that shortages of graduates be minor. Given the stated inefficiencies of the restoration market we may be required to carefully and continuously communicate to local, state and federal government end users that contractors will now be required to charge higher rates to be able to pay for employee education.

In order to pay for education and retain more long-term employees, employers will need to pay higher wages and charge higher rates. Some would argue that a transfer to Lump Sum contracts would allow productive and efficient contractors to prosper and provide the higher rates of pay required. Poorly performing contractors would leave the industry.

However, effective Lump Sum contracting requires careful planning, meaningful specifications and accurate evaluation of outcomes. The nuances of the ecological restoration industry are unique, specific training and experience is required in order to function constructively within the industry.

It seems to me that the solutions to these concerns must come from all quarters of the industry. Bush Regeneration has developed significantly in recent decades through the commitment to continuous learning and adaptive management. Perhaps these are qualities that will see us through our present difficulties.

See also an opinion piece from June 2016 AABR Newsletter 129 by Frank Gasparre on issues with contracting. **www.aabr.org.au/images/stories/resources/newsletters/AABR_News_129.pdf**

Toni McKay Tales of early Bush Regeneration

Vale Toni McKay, who sadly passed away in June 2018. Many of us were privileged to see Toni at the 2017 Pioneer's lunch and shared memories with her.

Toni was a major force in bush regeneration in Sydney and one of the group who set up AABR in 1986. She was AABR Secretary for many years.

She is remembered by those who worked with her in the early days of bush regeneration in Sydney while working for many years with the National Trust and before that with Joan Bradley. As a supervisor she had a superb knowledge of managing a site. She was a very determined lady who wanted bush regeneration to evolve and change with new knowledge and techniques. She was not going to give in to only considering the Bradley Method which was being promoted at that time by some as the only way.

She is also remembered for being inclusive, and having a wonderful sense of humour and broad ranging interests which made work fun and interesting.

The excerpt below is from Toni's notes talking about starting work with Joan Bradley in the Lane Cove and Mosman areas of Sydney.

> ***Heather Cooper and I were concerned about the deterioration of Artarmon Reserve and did a bit of weeding. At a meeting of Willoughby Council we happened to hear a talk by Evelyn Hickey of the National Trust and questioned her about how to become a bush regenerator. She suggested we get in touch with Joan Bradley. It took a bit of time, but we finally found her phone number and I rang her asking if we could work with her. She said she had as many trainees as she could cope with.***
>
> ***Heather said she would try talking to Joan and did so, telling Joan that we intended to work in the bush anyway! Joan said we could join the Parrawi team (in Mosman) every second Saturday morning. After some weeks she offered us jobs with her Bradley & May team in Lane Cove. It met every second Friday, as I recall and for only 4 hours.***
>
> ***We worked Batten and Warraroon Reserves (Lane Cove) and not often as it was sometimes too wet and sometimes too dry. Despite this, bush regeneration in the early years was very exciting. We could see that it had a very real future. Heather and I were the first non-Lane Cove residents to join this team (as well as the first non-Mosman residents to join a team in that municipality).***
>
> ***Sometime after this I joined the National Trust team in Mosman and was there for years. Team members included Robin Buchanan, Helen Petersen, June Gram, Audrey Lenning, and others. The Lane Cove teams were expanded. Ralph Hawkins, Joan Larking, Joan Redgrave (probably there from the beginning), Shirley and Bob Slatyer were among those on the teams.***
>
> ***I don't remember in those early days of hearing any talk of where bush regeneration was headed. I must say I didn't know where it would lead. It was very exciting!***
>
> ***Bush regeneration took a long time to be accepted. We were seen as funny people who picked away in the bush with knives and forks; pinko greenies; loonies, and always assumed to be volunteers.***

Myrtle Rust

So what has been happening with myrtle rust?

Dr Jarrah Wills, Queensland Herbarium

Many bush regenerators are familiar with the problem of myrtle rust (MR). This is a fungal disease which infects plants in the Myrtaceae family. It was first detected in Australia at Gosford in NSW in 2010. (An article in the September 2010 AABR Newsletter www.aabr.org.au/images/stories/resources/newsletters/AABR_News_106.pdf noted that at that stage it was found in the Gosford and Wyong local government areas just north of Sydney.)

Since then, it has spread rapidly, particularly through air-borne spores, honeybees and the live plant trade. It has now been detected over the entire length of the eastern Australian seaboard, from gardens in Tasmania and Victoria to Bamaga at the tip of the Cape York Peninsula. More recently, it has also been detected in the Tiwi Islands and Darwin in the Northern Territory, and has spread to New Zealand, where their response has been huge.

Range and impacts

Myrtle rust (*Austropuccinia psidii*) is believed to have originated in South America. It was first described in Brazil in 1884, where it was observed infecting the common guava, and it has been infecting eucalypt timber plantation species on that continent since the 1970s. Since that time, it has spread rapidly, impacting many species of commercial and ecological significance in the US (Hawaii, Florida and California), the Caribbean, New Caledonia, South Africa, Indonesia and Singapore.

The risks posed by myrtle rust are a perfect storm for plant species within one of Australia's most important plant families, the Myrtaceae. This is a large plant family that is iconic in Australia as it includes the eucalypts (*Eucalyptus, Corymbia* and *Angophora* species) and paperbarks (*Melaleuca*).

Infection by myrtle rust is known to affect more than 347 species. So far, occurrence west of the Great Dividing Range is rare, and restricted to nurseries and urban gardens.

Globally, several different strains of myrtle rust occur, which can infect different hosts and here in Australia we have the pandemic strain. While the potential threat of this strain of myrtle rust is enormous, its full impact on our native species and ecosystems is not yet well understood. We do know the rust seems to be particularly threatening to the fleshy-fruited myrtle species that occupy rainforests and their margins. And it is believed the fungus could have a significant impact on more than 40 range-restricted myrtle species. The rust may dramatically decrease the range of these species, even pushing some of them to extinction within an estimated five to 10 years.

Active rust on *Rhodamnia argentea* at The Falls, south-east Qld.

The Threatened Species Recovery (TSR) Hub myrtle rust project

The TSR Hub is supported by funding through the Australian Government's National Environmental Science Programme (NESP), and matched by contributions from 10 of the country's leading academic institutions and the Australian Wildlife Conservancy. It brings together leading ecological experts to carry out research that improves the management of Australia's threatened species.

The TSR Hub is supporting a six-month pilot project that incorporates existing data to generate and store broad baseline information needed to evaluate the impact of the disease. This information will build on baseline data generated by a small group of plant pathologists to help us identify which plant species or populations are at greatest risk, enabling us to prioritise our responses.

The research team will gather information by interviewing botanists, researchers, bush regenerators, government scientists and engaged citizens. The research will also conduct targeted field surveys to fill the gaps in our knowledge.

We will bring the information together in a database to assess the impact of myrtle rust on Australian plant species and ecosystems. This database will help inform decision-makers and managers on the fate of individual species such as the native guava (*Rhodomyrtus psidioides*).

From information to action

Native guava was once common across its range, which extends north from Gosford in New South Wales to Tinana Creek, south of Maryborough, Queensland. Previous studies have identified that this species has declined by more than 50% in less than five years, with further declines expected. The database will identify guava populations that may be resistant to myrtle rust or determine whether this species is at risk of being lost in the wild and will require speedy conservation actions.

The database will also help us to determine threats to other

The large canopy tree *Ristantia pachysperma* found in Queensland, is severely impacted by Myrtle rust, with large trees experiencing tip-dieback, branch death and mortality. Photo from The Boulders, Babinda south of Cairns and show a 25m tree extremely defoliated due to myrtle rust.

The important riparian species in northern Queensland, *Tristaniopsis exiliflora* is severely impacted by myrtle rust, with consequences for erosion control and potential impacts on water quality.

These photos were taken at Golden Hole on the Russell River, south of Cairns and show sparse canopies with tip dieback and branch death that extended all the way down the river.

All photos: Jarrah Wills.

species and the impact on ecosystems. It will point to where the disease has been particularly damaging, which species may be resistant in certain parts of their range, and which species are at greatest risk of extinction across their range.

As myrtle rust evolves, the manner in which the disease impacts different plants will change. One aim of our research is to find populations that may show resistance or identify jumps in host species. To safeguard some species, we may need to translocate them beyond their current ranges.

Rusty plants

Rusts are fungal plant diseases that infect living plant tissues. Infections begin when a fungal spore lands on the plant surface, germinates and invades its host. Rusts are named for their infections which often make host plants look rusty, an effect caused by deposits of powdery rust-coloured or brown spores on the plant's surface. Humans have been contending with rusts since the beginning of agriculture.

The strain of myrtle rust spreading through Australia is having a severe impact on some myrtle species. The disease can cause deformed leaves, heavy defoliation of branches, reduced fertility, dieback, stunted growth and plant death. Each host species responds to the infection in a unique way and the environment in which the host is growing is also critical in determining the level of impact. Moist and warm habitats favour myrtle rust infection.

It is not known how myrtle rust entered Australia. However, now that it is here, its spores are easily spread via wind, people, infected plant material and equipment. It can also be dispersed by insect/animal movement. These characteristics make it extremely difficult to control and impossible to eradicate from natural settings.

Myrtle Rust and plantings

One concern is the potential waste of effort that may have occurred by planting vulnerable species in biodiversity plantings, i.e. the seedlings may have been carefully nurtured and leave the nursery free of MR but are rapidly picking up the rust when planted in the landscape-and subsequently die. However, no systematic monitoring has occurred to determine the short and long term effect of MR on vulnerable Myrtaceae in plantings.

An interesting conundrum has been raised: should nurseries avoid MR vulnerable species all together, or should they persist and use surviving plants that show strong resistance? Should nurseries persist with MR control measures or stop? Do nurseries/ restoration workers have the capacity to investigate survival of planted-out species and share knowledge of which species battle through and survive? Or are they better placed to avoid vulnerable species all together in search of maximum survival rates?

Prevention of other strains of MR from entering the country, selective breeding for resistance or tolerance, translocations outside of MRs range and monitoring ecological impacts as they unravel are actions that urgently need to be investigated.

Initially in Australia resources were targeted to the potential commercial consequences of the disease, but have dwindled when it was realised that natural ecosystems would suffer the major impacts. Given the wide range and rapid spread of the disease it is essential that assessment of impacts are extended in order to best prioritise conservation action.

How can you help?

Large data gaps occur in central Queensland and Cape York floristic regions and we need as many eyes as possible in order to better understand the impact and to find healthy populations. If you have observations of myrtle rust infected native plant populations, healthy myrtle populations, knowledge or capacity to provide input into Myrtle Rust Research, please contact Dr Jarrah Wills at email: Jarrah.Wills@des.qld.gov.au

Specifically we require a location (preferably with GPS coordinates) and a picture, which clearly displays the average level of damage or infection caused by MR on the plant population and a picture that can be used to confirm the plants identity.

What's happening

Sunday 9th to Wednesday 12th September 2018

21st Australasian Weeds Conference

The Weed Society of New South Wales Inc., on behalf of the Council of Australasian Weed Societies Inc., will be hosting the 21st Australasian Weeds Conference in the popular Sydney beach side suburb of Manly from 9 - 12 September 2018.

The conference will bring the weed management community together to discuss new developments and share information about cutting-edge and best weed management practices.

- New technologies in weed management.
- Biological, mechanical, and chemical weed control and research.
- Herbicide resistance.
- Weeds of crops and pastures.
- Environmental weeds and Weeds of National Significance.

Registrations are now open

WHERE: Novotel Sydney Manly Pacific

NSW Australia

More information: www.21awc.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/

Tuesday 25th - Friday 28th September 2018

The Society for Ecological Restoration Australasia (SERA) Conference 2018

STRIVING FOR RESTORATION EXCELLENCE

SERA is a collaborative effort. If you are a scientist, practitioner, manager, policy maker, planner or someone who cares about our bush, seas and waterways you do not want to miss this conference.

Registration opens 14th May 2018

WHERE: University of Queensland, Brisbane, Australia

For more details: https://www.sera2018.org/

Wednesday 10th to Friday 12th October 2018

2018 National Landcare Conference and Awards

Held over three days, the conference offers the opportunity for knowledge sharing, insightful discussion, as well as informative presentations by pioneers, leaders of NRM bodies, scientists, academics, government, and environmental, climate and biodiversity experts.

WHERE: Brisbane Convention & Exhibition Centre

More details: http://www.nationallandcareconference.org.au/

National Landcare Conference

National Landcare Awards

Monday 12th November - Friday 16th November 2018

12th Australasian Plant Conservation Conference (APCC12) 2018

The ANPC is delighted to announce that APCC12 will be hosted by the Centre for Australian National Biodiversity Research (CANBR) at CSIRO, and will be held at CSIRO Discovery at the Black Mountain Science and Innovation Park, Canberra.

See Page 14.

More details on APCC12 will be provided in the near future, so stay tuned!

ANPC members receive discounts on the conference registration fees!

http://www.anpc.asn.au/conferences/2018

Australian Association of Bush Regenerators

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, Ben Ford, Matthew Pearson, Agata Mitchell.

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.

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.

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

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