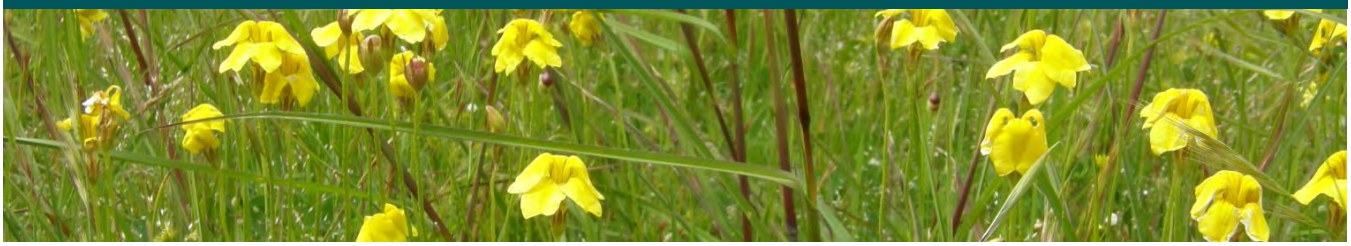
December 2015

Grassy Groundcover Gazette

News, updates and on ground action



Paul's Piece

Dr Paul Gibson-Roy

Lead Scientist, Greening Australia (NSW)

Hi folks. It's the end of the year again and how it seems to rush up on me with annual regularity. As always its pleasure to update our Grassy Gazette readership on the various GGRP projects and from others, such as those by Cath and her team at the Euroa arboretum, who are also involved in grassland and grassy woodland restoration. Sadly, these continue to be challenging times for our sector, whether that be from lack of rain or a lack of funding support or perhaps even more importantly, a lack of belief. In some ways it is quite disconcerting to have travelled as far as we have as a sector, and know of the possibilities that ecological restoration can achieve and yet continue to see situations where these possibilities are thwarted, delayed or ignored.

Sadly, I think this is amply demonstrated in Victoria by the Western Grassland Reserve (WGR). Now, upfront I'd like to make it clear that I agree with the importance of retaining large tracts of land for native biota, be they in peri-urban or rural footprints. But achieving anything like this at scale comes with considerable logistic and technical obstacles for project managers to overcome. This I think is beautifully illustrated by those charged with the onerous task of creating and then managing the WGR. That being said, after several years of talk among the sector and with the controlling agency DELWP there seems to be something of an impression by many of a lack of momentum or outcome on the WGR front. Admittedly it is a huge task: turning the land which is to become the WGR from weed infested grazing country or cropped paddocks to something that is nominally native dominated grassland. But at least at a cursory level after several years since the inception of the WGR, it seems little beyond minor works have taken place (at least on the restoration front).

I have spoken to occasion with well-intentioned agency and/or department staff who frustratingly (at least to me) suggest we/they still do not have the information or approaches required to launch into meaningful works at the reserve. And admittedly while there have been some trials undertaken in association with Universities and small scale tenders offered to the sector, not much more has occurred to transform it into native grassland. This is extremely disappointing when it can be clearly demonstrated through the work of people such as Rod, Jess and Candice at GA-Vic, Chris Findlay and Graham Huxley at Flora Vic, Dave Franklin and the Woorndoo Landcare Group and Cath Olive at the Euroa Arboretum (and many others) that native grassland can be successfully enhanced from a degraded state (through combinations of management and restoration) or restored from scratch from bare-field situations. And this does not even touch on the great work being undertaken by GA and other groups in other states.

At this very moment there are nearly one hundred restored grassland sites located right across Victoria and several of these are within the region where the WGR is located. Many are of such high quality, few would be able to determine if they had been restored or were simply historic remnants. I am sure those charged with overseeing the WGR have the best intentions in mind. However, it is bewildering when there is SO much work to be done to think that on-ground action there at least appears to have stalled, while in other locations and regions, through combinations of informed management and novel restoration techniques new grasslands are be re-created and degraded ones enhanced.

Perhaps at times like this we've got to try as best as we have to take the glass half full approach and pursue whatever steps forward we can to achieve positive outcomes in our various regions. I do hope however, that the amazing work done to-date in grassland restoration across SE Australia can more often in future inspire and inform the actions undertaken at what will be nationally important sites like the WGR in Victoria and Sydney's second airport at Badgerys Creek. And as long as we continue through forums and networks like the Grassy Gazette to let one another know of the fine work being done our collective spirits and momentum may be maintained and the glass will not only viewed as half full, but perhaps someday rise to overflowing.

I wish everyone all the best for the Christmas and New Year period, and congratulate all on their toils during 2015. Let us hope 2016 holds plenty of promise. For my part, I have been lucky enough to be a recipient of a Churchill Study Fellowship. In the early part of 2016 I'll be heading to South America and then to the US where I will visit many native seed farms. Here I hope to see firsthand how the Americans are routinely growing seed crops over hundreds of hectares. There must be great demand for the seed and sophisticated systems and structures established to grow, process and introduce it into restoration sites. I can't wait to come back to Australia and spread this knowledge far and wide to anyone interested in hearing it. 'I'll be back' as Arnie says so stay tuned!

Conservation Action Planning for the Victorian Volcanic Plain – it's a big job!

Rod White
Program Manager Grassy Ecosystems
Greening Australia (Victoria)

The grassy ecosystems of the Victorian Volcanic Plains (VVP) are rare and threatened. From heavily modified Stony Knoll Shrubland to the severely depleted Open Plains Grasslands and Grassy Woodlands, not to mention the underappreciated and misunderstood ephemeral herbaceous freshwater wetlands scattered throughout the VVP Bioregion and the numerous permanent salt and freshwater lakes. The VVP Bioregion is huge and incredibly diverse. It is a productive landscape, growing everything from sheep to wheat, and much in-between. It has a long European history, which is dwarfed by the rich and ancient aboriginal history of the region.

Despite the fact that the VVP is one of the most modified landscapes in Australia (only about 0.1% of grasslands remain in an area covering more than 22,000km^2), there are many organisations, friends groups, landholders and farmers who are doing a great deal to halt and even reverse the decline in native vegetation cover across the region.

So within the context of this complex history Greening Australia together with Trust for Nature and with funding from the Sunshine Foundation have embarked on a process known as Conservation Action Planning or CAP (see The Nature Conservancy website for an explanation of CAP) for the VVP. This process has engaged a large number of organisations and individuals, including:

Wathaurong Aboriginal Corporation
Wathaurong Cooperative
Gunditj Mirring
Glenelg Hopkins CMA
Corangamite CMA
Port Phillip & Western Port CMA
Department of Environment, Land, Water & Planning
Parks Victoria
Local government – councils
Private landholders & farmers

The CAP process so far:

- Scoping meeting – 02/12/14
    - Assembled a small representative group to scope the challenge
- 1st Workshop – 19/02/15
    - Identified assets and assessed health of those assets
- 2nd Workshop – 05/05/15
    - Held over 2 days looking at threats and identifying strategies
        - Day 1 – aquatic ecosystems
        - Day 2 – terrestrial ecosystems
- 3rd workshop – 13/10/15
    - Held over 2 days identifying objectives, actions and priorities
        - Day 1 – aquatic ecosystems
        - Day 2 – terrestrial ecosystems

A fourth workshop is being planned for early March 2016 and will look at further prioritisation of identified areas and associated actions as well as beginning the task of assigning those actions and resourcing appropriately.

If you would like to learn more about the CAP process and/or become involved/contribute to the process then contact me at:

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Hoary Sunray Rehabilitation Project Gippsland Woodland Revegetation project – Update

You may remember from our last edition of the Grassy Groundcover Gazette (Dec 2014), Martin Potts, Greening Australia, Project Officer in Gippsland, wrote a piece about how GA are adding a grassy understorey to a Woodland Revegetation project that is being funded by the East Gippsland Catchment Management Authority, through the National Landcare Programme. This project aims to restore at least 1hectare of grassy understorey for every 10 hectares of woodland that is re-established. Well the first of those 10 hectares is well and truly on its way. A visit to the site in the middle of November this year revealed the site establishing well, with a great cover of grasses and a good selection of wildflowers scattered throughout, including Common Everlasting, Milky Beauty Heads, Golden Everlasting, and Bluebells. Perhaps one of the more exciting aspects of the site is the ephemeral wetlands that have developed as a result of the removal of the topsoil in preparation for seeding. This subtle change in the topography of the site has facilitated the creation of a number of shallow freshwater wetlands, which have added to the habitat diversity of the site and allowed the establishment of a number of moisture loving and aquatic plant species, not to mention the birds - Chestnut teal, Straw-necked ibis, White-faced herons, Shell duck, Little Egret and Wood ducks.

This project is supported by Greening Australia, through funding from the Australian Government's National Landcare Programme and East Gippsland CMA.

Above: A good mix of grasses are establishing at the site
Below: Project officer Martin Potts – happy with the results

Golden Everlasting (*Xerochrysum bracteatun*)

Ephemeral wetland = habitat diversity

Extracts from a grassland spring journal

John Delpratt
University of Melbourne

Evans St Wildflower Grassland

It's been a tough spring in the grasslands of the Victorian Volcanic Plain (VVP) of south-western Victoria but nothing they can't handle in their own special way. In September I enjoyed carpets of Grasslands Candles (*Stackhousia subterranean*) spreading across the Themeda grasslands (Kangaroo Grass, *Themeda triandra*) in Evans Street Wildflower Grassland Reserve in Sunbury (Image 1). And while the early signs were for a bumper wildflower and orchid display later in the season, October's below average rainfall, above average temperatures and hot, northerly winds brought an early end to the season. A visit confirmed there was virtually no seed-set on the abundant Candles stems – giving pause for thought about the long-term impact of a changing climate on seedling recruitment in these communities. It also reinforces the importance of reserves such as Evans Street, which contain large populations of numerous species. The hope is that these populations have sufficient genetic diversity to adapt to whatever the future delivers. In the short term, it's good to be a long-lived perennial – there is always next year.

Image 1. Grassland Candles flowering profusely amongst recently-burnt Kangaroo Grass at Evans St Wildflower Grassland in October. The grey foliage of other wildflowers, such as Common Everlasting and Lemon Beauty-heads, can be seen but they are not yet in flower.

Woorndoo

In late October I attended a meeting at Woorndoo (central-western Victoria) to hear and discuss the resolution of a dispute over damage to significant roadside vegetation. The damage happened when power line clearance contractors used heavy machinery on wet soils. The roadsides in the Woorndoo/ Chatsworth area retain some of the finest examples of diverse grassland communities on the VVP. Like all such road reserves, the vegetation is constantly exposed to incremental degradation from various forms of disturbance and changes in management. Even with the best of intentions from all parties, degradation is bound to continue. I believe the Woorndoo case is a perfect example of where a portion of any fines resulting from damage to vegetation should be allocated not only to repairing damaged areas but also to extending representative native vegetation onto adjoining or nearby sections of roadside, which have already lost their native vegetation. The GGRP has shown (see Wickliffe entry below) that this can be done successfully, but the techniques are yet to be fully adopted by regulatory and management authorities.

Community custodians

By coincidence, under the experienced guidance of David Franklin the community at Woorndoo has recently reconstructed 1.5 ha of complex native grassland on a nearby road reserve (Image 2).

Image 2. A community effort - nearly half a kilometre of Woorndoo roadside direct-sown with a mix of native grasses and wildflowers under the skilled guidance of David Franklin. This restoration demonstrates what can be achieved when a culture of custodianship is combined with good science and local expertise.

As well as its spectacular and precious roadsides, Woorndoo boasts two other highly significant sites; the common and the cemetery. Both sites support large populations of many species typical of the VVP vegetation communities as well as a number of rarer species.

Wickliffe roadsides re-visited

In the June 2009 edition of the Gazette (http://www.greeningaustralia.org.au/uploads/knowledge-portal/7_Grassy_Groundcover_Gazette_June_2009.pdf), Paul wrote about two reconstructed grasslands on the Glenelg Highway a short distance to the west of Wickliffe. I revisited them in late October. In spite of the difficult season, both sites were looking magnificent. The site nearer to Wickliffe is between two extensive stretches of very high quality roadside vegetation, effectively extending both communities. While its most spectacular species is the rare, white Hoary Sunray (recently revised from variety to subspecies; *Leucochrysum albicans* ssp. *tricolor*), the restored community contains many local species including a large and expanding population of the nationally-endangered Button Wrinklewort (*Rutidosis leptorrhynchoides*), (Images 3 & 4). To my knowledge, the only nearby remnant of this species is a population of approximately 20 plants above a road cutting just north of Wickliffe.

Image 3. A forb-rich grassland community restored primarily by direct sowing in 2009. This site replaced a decades-old tree planting that was no longer considered appropriate by VicRoads. It lies between, and effectively reconnects, two extensive stretches of significant roadside vegetation.

Image 4. The more westerly of the two Wickliffe GGRP sowings has also matured into a spectacular grassland community, compatible with nearby significant remnants. Frank Carland (pictured at the site in November) and Natasha Kennedy were the (heroic) VicRoads officers who guided the project from concept to completion.

A direct-sown herbfield (forbfield)

Last month I was able to join a half-day bus trip organised by Greening Australia to demonstrate three constructed grassland communities. The trip was hosted by Rod White, with commentary provided by Paul Gibson-Roy. My fellow passengers were senior State Government and Parks Victoria staff, and GA Board Members. It gave me the chance to catch up with the development of the sown grasslands at the Werribee Open Range Zoo and the 15 ha sown grassland at Sydenham Park in Melbourne's west. Both sites are maturing nicely and their success will lead to further sowings. However, the highlight of the day for me was the chance to see a sown herbfield on private land within the area designated for the Western Grassland Reserve. The site (Image 5) was constructed and sown by Rod White on behalf of Debbie Reynolds from Victoria University. For her PhD, Debbie is researching the population biology and ecology of Spiny Rice-flower (*Pimelea spinescens*). Having successfully propagated this endangered species, she is undertakening field establishment experiments within this constructed, grass-free forb community. Paul and I have long-discussed the possible role of sown herbfields as a method for re-introducing wildflowers into depleted native grasslands, while reducing competition from the established grass sward. It was great to see one 'on the ground'.

Image 5. Debbie Reynolds explains the experimental protocols for establishing Spiny Rice-flower seedlings in a low-competition herbfield sown for the purpose.

Grasslands reach for the sky

In another piece of research exploring unusual applications for native grassland communities, Pam Spencer is investigating direct sowing techniques that will allow the rapid establishment of direct-sown grassland forb communities on green roofs. Pam is undertaking a Master of Urban Horticulture degree at the University of Melbourne, Burnley Campus. Pam's research component will run for a year with a supervision team consisting of Nick Williams (ecologist and green roof expert), Steve Livesley (soil scientist) and myself. Grassland species tend to establish too slowly to lend themselves readily to direct sowing for very public spaces such as roof gardens. However, previous research suggests that, once established, a number of species from grassland communities perform very well on these exposed sites. With meticulous attention to detail (including recognising and recording many hundreds of tiny seedlings from ten or so species), Pam is conducting two large experiments, initially under greenhouse conditions and now in the open, investigating species selection, seed and seedling responses, and the method and depth of sowing (Image 6 and 7). Initial observations are showing that careful management of sowing method and depth is having a significant effect on the speed at which a number of species emerge and establish. Later phases of Pam's study will assess how quickly and consistently good vegetative cover is developed in the various treatments. Pam is due to report her findings in May 2016.

Image 6. Pam Spencer is investigating the establishment of grassland forbs by direct sowing for green roof applications.

Image 7. Glasshouse experiment. One block of eight replicated sowing treatments with varying sowing depth and seed bed treatments, four weeks after sowing. From this initial experiment, treatments were chosen for the outdoor experiment (pictured above).

In spite of the difficult season, it has been a fascinating spring. Roll on 2016.

Cumberland Plain Regional Seed Production Area - Update

Kieran Kinney
Greening Australia Project Officer
Richmond SPA

The year 2015 at the Richmond SPA was an interesting and dynamic year, with many triumphs and even a few tears! We welcomed our first big crop of the large tufting C4 grass - Wild Sorghum (*Sorghum lieocladum*). It's a beautiful, soft, clumping species with pronounced golden anthers when in flower (Images 1&2). It is also a very long lived plant and individuals are thought to be able to survive for hundreds of years in the wild. This fact is truly remarkable and certainly focuses ones thinking on the epic time-scales involved in the natural processes around us.

We also welcomed into the fold three spectacular plants from the Asteraceae or daisy family. The first was the Emu Flower or *Craspedia variabilis*. This species has a most wonderful globular flower head in the richest golden yellow and I think is one of the most spectacular of all the vast Asteraceae family! (Image 3). Apparently it is a favoured food for Emus, thus its common name. Here in Western Sydney on the Cumberland Plain it's reduced to just a few tiny remnant populations. Sadly, many of these populations are close to extinction.

Image 3: The globular flowerhead of *Craspedia variabilis*

We also introduced into seed production the Chamomile Sunray (*Rhodanthe anthemoides*). This is a soft textured clumping species, which has also been reduced to a few small pockets in the Sydney area. I have seen Ground Parrots feasting on its seed. It is believed to have been common at the time of Sydney's early settlement but has since been decimated by grazing and clearing. We plan to begin reintroducing this wildflower to Western Sydney landscapes this season, and in doing so enable people to experience some of the delicate beauty of their natural heritage once again.

Image 2: Flowers and anthers of *Sorghum lieocladum*

Image 1: First Sorghum crop at the SPA

Another lovely species to soon come into production is the Showy Copper Wire Daisy (*Podolepis jaceoides*). It is yet another of our more showy wildflower species, somewhat like the familiar exotic Dandelion weed in appearance, but possessing an elegant, gracile inflorescence with deep golden yellow flowers and ligules. Its flowers are very attractive to native bees. (Image 4). The SPA here at Western Sydney University will soon be awash with the intense golden yellows and crisp whites of these delightful native plants and our teams will be flat out collecting seed before the wind gets hold of it!

Image 4: Podolepis with native bee

We have also recently welcomed Nina White to the SPA. Nina's a visiting student form the UK and is undertaking a project to investigate the invertebrate species that visit our SPA. Another new development we are proud of, is that after several seasons of wishing and hoping, we have finally installed large metal labels in all our growing cells, showing the common and scientific name for all our plants. These quality labels look very natty and help staff navigate the complex myriad of species. They are also of great benefit to visitors and the general public so they can see what species we have growing here.

For all these successes in 2015, we have shed a few tears when plants were lost to the cruel extremes of the Australian climate. By and large all the species we grow at the SPA are very hardy once established, but when newly planted they are vulnerable to the unseasonal heat waves – and these seem to be very common these days. It's possible we've perhaps always had such cruel and fickle weather, but its certain that young plants establishing in black matting have a very hard time of it on very hot days; even when we irrigate.

On personal level it is hard for me to see these plants die, as I have often collected some of the seed by hand from bushland, sorted, labelled, processed and propagated it, and then nurtured the young plants from the nursery to the SPA. But as PGR likes to remind me, that it is all part of the job, and something we have to come to terms with.

The extremes of summer mean that irrigation is a critical issue at this time of year. Happily we have finally perfected the use of our travelling irrigator. It is a wonderful piece of engineering but is somewhat complex and has little tolerance for error. Once it is finely tuned however, it is breathtaking to witness the mini rainstorms it provides our plants. Once it is up and running it allows me to concentrate on the myriad other tasks around the SPA and keeps the plants thriving through the dry times.

One of the biggest challenges for an operating SPA is timely seed collection. After all.... that is why we are here. This means that often other tasks have to be deferred or interrupted, so that seed collection can take place. Indeed, I try to schedule some seed collection every day of the week, regardless of other pressures or demands. Many of us who work here in the SPA find it the most satisfying thing to do. It is calming and pleasant to be in such close contact with living organisms, observing at close quarters the natural rhythms and details of the plants, the insect life buzzing around, and the many frogs, lizards and birds that use the SPA plants as habitat.

After seed is collected, it must be dried and stored correctly according to the needs of the species, sorted, processed and labelled! This means it's hectic all spring and summer, and the seed seems to never stop coming in. We can't afford to make mistakes or store it in haphazard fashion! It is never dull at this time of the year and seeing our processing area filling up and then full of seed freshly plucked from the SPA is an exhilarating experience that never seems to lose its attraction.

Our SPA here at Richmond is still very much a work in progress, with new areas still to come on-line and other challenges to be met. But it has already shown its potential to produce what were previously unimagined quantities of quality seed for this region. Our goal is produce seed in large volumes, which is genetically healthy and sufficiently robust to allow the restoration of our degraded ground-layer ecosystems.

All the team here at the SPA are ambitious to see the SPA thrive and prosper, and to continue to grow into the future. A final comment is that we are extremely excited right now to be watching the construction of our own large shed and other infrastructure near our in-ground grass beds. This shed and the other infrastructure will allow us for the first time to really hone our processing and storage of seed, and make it easier for us to host visitors more effectively and comfortably. This type of dedicated infrastructure will complete our seed production footprint and help us to grow these rare and oft forgotten species on a scale never before achieved or imagined.

Just visiting: Nina White at the Richmond SPA

Invertebrates in SPAs

Nina White
Visiting student from Cardiff University, Wales

I initially developed an interest in pollinators during my first years of studying Biology at Cardiff University, Wales. The extent of the socioeconomic importance attributed to crop pollination really caught my attention. I initiated insect hotel workshops with my Universities' conservation society to help provide homes for nesting pollinators and encourage them into an urban environment.

Cardiff University offers a fantastic third year placement opportunity – one that I jumped at the chance to take up. With a cold, wet winter ahead of me back in the UK in November 2014, I was comforted with thoughts of sunnier skies to come as I was accepted onto a research placement at the Hawkesbury Institute for the Environment in Western Sydney to begin the following September.

I am fortunate enough to now be working with pollinators half way around the world here in Australia. Through my supervisor, Professor James Cook, I met Dr Paul and was introduced to the exciting grassland restoration project being undertaken here in Western Sydney, with its large seed production facility based just over the road at the University. I was surprised at how little native grassland really remains in Australia, but at the same time enthused by the potential of the seed production area as a means to grow the seed required to restore native plant communities as well as the passion displayed by the team behind it for all things native.

It seemed that native plants are known inside and out by Paul, Kieran and the rest of the GA team. However, Paul indicated that while many of the people involved in setting up SPAs were aware that they seemed to attract many interesting insects there had been few opportunities to study this facet in detail. Therefore, he invited me to devise a study to follow my interest in pollinators while helping to shed some light on type and range of insects visiting the species growing in the SPA.

And from this he hoped the sector might gain insights into what that trophic component of a remnant or restored grassland community might look like. In short I felt this was really a perfect opportunity. Briefly, for this study I am investigating the flower-visiting insects of native ground-layer species using a variety of survey methods including visual observations, sweep netting, trap nests and pan traps. I hope to gain an insight into the abundance and diversity of the insect species foraging amongst the flowers at the SPA. I am also interested in seeing if there are any preferences apparent from certain groups of flower visitors for particular native flowers.

It's a pleasure to work with such beautiful native flora and fauna…yes there are many faunal species also visiting the SPA! While it probably isn't very scientific to take favourites; from the plants I can't deny the appeal of the fabulous Fringe Lily (*Thysanotus tuberosus)* and for the insects, it's the stunning Blue Banded Bee (*Amegilla cingulate)* (Image 1). Both these species have caught my attention! Of the day to day experience here at the SPA – there's not much to complain about really - besides the heat and the flies! But I am trying to see both as part of an authentic Aussie experience… (Or at least that's what everyone tells me).

I now look forward to watching the progression of the plants and the insects in the SPA throughout the year. I should complete my project by June of 2016, when I hope it produces some interesting and useful results. Until then, I am going to enjoy this valuable insight into a career working within scientific research and make the most of spending a year in Australia.

Image 1:
Blue Banded Bee on a Native Blue Bell (*Wahlenbergia communis*)

NSW Governor General visits our Western Sydney Seed Production Facility

Sam Craigie
Seedbank & Program Manager, Greening Australia (NSW)

On Monday 23rd of November, the Greening Australia team in western Sydney had the pleasure of hosting His Excellency General the Honourable David John Hurley AC, DSC and Mrs Hurley at our seed production facility in Richmond. The invitation to visit had been extended by Paul who had met his Excellency at the award ceremony for the Churchill Fellowship.

This was a special event for us. Beyond getting the chance to take the Governor on a tour of our facility and a restoration site, it also provided us the opportunity to acknowledge the work of other organisations and individuals who have been integral to our grasslands project here in western Sydney. Our other guests included researchers & managers from Western Sydney University, the NSW Office of Environment and Heritage, the Greater Sydney Local Land Services, National Parks, and Western Sydney Parklands. We also had John Gray from R&D Maintenance in attendance and were keen to acknowledge the key role he has played in delivering so much of the work we've been involved in.

The official tour commenced with an introduction to the project by Paul and myself at the high diversity seed production area where we grow all our sub-dominant forbs and grasses. After 4 years of development, we have almost 100 local ground cover species in production. Almost all are locally rare and some nationally endangered.

We were thrilled that his Excellency & Mrs Hurley showed great interest in the work we've done and its potential applications in the Sydney region and beyond. They both acknowledged the important role of seed production and for species-rich restoration after viewing our SPA and restoration paddock (which had been seeded only 12 months before). Also evident was Mrs Hurley's passion for gardening when we noted her crouching down to remove a weed she recognised during the SPA tour.

We concluded our tour at the nearby restoration paddock to give them an indication what a restoration looks like in the early stages of development, and talk about how we hope it will transition over time. We also had an interesting discussion among the group on the potential for establishment of complex grasslands on the Badgerys Creek airport site which is to be built in this region in coming years, and more broadly, about conservation and restoration along Australia's road corridors and other public spaces. At the end of the day we presented the Governor and Mrs Hurley with two pots with mixed wildflowers and grasses as a memento. It's lovely to think that some of our plants might now have a place back at Government House.

It was a pleasure to host His Excellency and Mrs Hurley on the day. Their knowledge and enthusiasm for land management in rural and urban settings was evident. Since then we have already seen new connections arise as a consequence of His Excellency & Mrs Hurley's visit. We look forward to their return.

Paul, Mrs Hurley and his Excellency Governor David Hurley standing among native wildflowers seeded at the Yarramundi paddock restoration site.

Woorndoo recreated native grassland update

David Franklin
Grassland Flora, Chatsworth

Seeded in September 2013, this site continues to exceed expectations given the low rainfall spring seasons of the last two years. There is a dominance of Wallaby Grass species, with increasing populations of Kangaroo grass, Spear grass (Stipa spp.) and forbs such as Hoary Sunray, Common Everlasting, Lemon Beauty Heads, and Scaly Buttons. The site exceeded expectations again this year with a nice little harvest of grass species, when most crops in this district shrunk into very much below average yields. One wonders what might happen given a year of good rainfall. The ground surface is also developing a really good soil crust which helps in preventing weed invasion. We were also lucky to secure the services of the Green Army for a day in August and they did a great job removing introduced perennial grasses.

This site has also become a popular inclusion in the various grassland tours being run, which allows participants to compare remnant vegetation in various states of decline with sites like ours that have been recreated (using the tried and true method developed by the Grassy Groundcover research Project).

Sadly, shortly after this site was seeded, there was an unfortunate incident of destruction of pristine diverse species grassland just several km's away. This was done by a Company under the guise of bushfire mitigation - clearing under powerlines. Because of this action, we have had several visits to the area from the Assistant Director of Compliance, EPBC. He now makes a point of checking out our recreated grassland and in his words stated "This is very impressive". All this work has been undertaken through voluntary labour and the generous gift of earthworks by the Moyne Shire Council.

This just shows what can be done when committed people get together with a common goal. What I cannot understand is why more of this type of restoration work cannot be funded o that grassland restoration can actually happen. It seems to me that bureaucracies continue to reassess the vulnerability of the VVP but do nothing much to support on ground action.

The accompanying photo shows what this recreated site has achieved (Image 1). The foreground shows the result of some 15 years of roadside cropping of a once diverse native grassland. Interestingly, the CFA in this region includes this our site in educational tours about of the importance of protecting and maintaining remnant grasslands. No prizes given to the answer of which area they would prefer to conduct their annual fuel reduction roadside management burns on!

Image 1. Before and After

APARTMENTS FOR FREE

David Franklin
Grassland Flora, Chatsworth

This amazing Redgum outside my backdoor makes me ponder on how short a human life is in the context of the environment. All the more relevant in today's debate on global warming. After living here for the last 60 years, I swear that there is no noticeable difference in its size. How old is it then?

We always had parties under the Redgum. Firstly I remember my father putting on a barrel on Christmas morning for any of the neighbours who wanted to call in and have a beer and chat. All the important birthday milestones were celebrated here when friends came to visit from all over. Then there were the teenage years when my brothers and I that took it to another level. All this time we did not take much notice of the tree except for comments like "it provides great shade "and "it will probably fall on the house one day".

What a huge asset these trees are in the environment. The little birds are in and about it all the time: wrens, honeyeaters, treecreepers, finches, golden whistlers, and a family of crimson rosellas. The New Holland honeyeaters do like to show off by splashing around and empting the birdbath in quick time. The Kookaburras love the old gumtrees, they perch on a dead branch in this one, cock their head on the side for some time and suddenly dart to the ground and grab a worm. How do they do that? Some years ago we had a pair of eagles raise a "chick" high up in a redgum further down the paddock. It was fascinating to see this chick become a fledgling in about 13 weeks, truly magnificent creatures.

I look at this old redgum near our house realising the habitat it provides and wonder how in this age such destruction of these very old trees around Buangor in Victoria be allowed to happen - no matter what the argument is for progress. Given 500+ years of surviving the elements and providing habitat, 5 minutes of human action with a chainsaw and it's all over. Each of those trees was a special individual. Something tells me our leaders are failing us. It's a bloody disgrace but what can we do to make the 'decision makers' so uncomfortable, that they do not allow this type of thing to happen? There will be more redgum destruction in the future as the duplication of the Western Highway continues west of Ararat. I'd say 'well done' to all those people who tried to stop this unfortunate event and 'gear up for the next episode'! It will be a long time before the plantings done since European settlement (most in the last 50 years) could take provide the type of habitat that our home tree or those felled provide. If we don't make a serious effort to preserve these old trees and remnants, it seems to me that there will be a conspicuous gap on the horizon.

Euroa Arboretum activities for 2015

Cath Olive
Euroa arboretum

Euroa Arboretum was a grazing property for a century and a half, and then a VicRoads depot while the Hume Bypass was being built. As such, we share the legacy of these activities. Annual grasses persist under the old remnant trees where stock once camped, and we have large areas of weedy perennial grasses – phalaris and paspalum predominantly. Trees and shrubs have been planted over the 27 hectares since it was been declared an Arboretum in 1992, but the weedy grasses remain.

We are working on a few trials to shift this grassland to be more native dominated. After 3 years of spraying annual Veldt grass and having minimal discernible effect, we are trialling cool burns to control these annual grasses. The Veldt grass is sprayed in spring to prevent seeding, but late enough to leave standing dead grass (or biomass). The burns are then timed once the Veldt grass has germinated in the following autumn. The trick is to get enough heat into the area so that the dead standing grass carries a flame, and also so hot enough to 'cook' the newly germinated Veldt seedlings without roasting nearby shrubs. We suspect we'll need a few repeats of these treatments, but the results so far are quite pleasing – working in patches, we just need to keep adding to the patch size and extending our control. Once we feel we have shifted or reduced the Veldt grass dominance, we'll over-sow the site with native groundcovers.

We've also scalped 1.2 hectares of the weediest areas during 2015. Phosphorous and nitrogen had been assessed and were at quite low levels, but scalping was still undertaken to a depth of 10 cm to remove the worst of weed seed bank from that zone.

Rod White and Dave Franklin from Greening Australia seeded the site in August 2015 with about 60 species of native grass, herbs, lilies, daisies and peas. There have been minimal rainfall events since sowing, but we are still pleased to see some germination. Already daisies are identifiable, and wallaby grasses are starting to emerge in numbers. Unfortunately, so is the Sweet Vernal grass and some Paspalum, but it is currently in such low numbers as to be easily identified and sprayed for control. Now we just need some summer rain!

Restoring Diversity to a Grassy Woodland

Wallaby grass or Kangaroo grass paddocks can still be found if you look hard across north east Victoria. By and large, these have had a grazing history, but have been the 'back paddock or rough paddocks' of a farm and so not received the same input with fertilizer as other more productive areas. These are the type of paddocks that are often carved off the main farm and sold to folk looking for a bit of 'country living'. Many of the new landholders don't need to earn their total income off their new patch of dirt, and many are interested in conserving the natural assets of their land.

There are opportunities to enhance the floral diversity of these native grass paddocks. Having grown a number of low growing legume species in seed production for a number of years at Euroa Arboretum, we were keen to see some of these plants sown into these grassy paddocks. We assumed it would be a simple job. However, sowing *Glycine tabacina* with a traditional direct seeding machine, we have consistently been dismayed at the poor success – minimal germination in year one, then nothing.

Two years ago, we decided to get serious. We were fortunate to pick up funding through State funded Communities for Nature. With a visit to Paul in Sydney and also to the GA Moolapio site in Geelong, plus conversations with John Delpratt from Burnley College along the way, we decided we needed to work harder on reducing competition at the root zone before sowing – opening up the grass sward where it seems the grasses may be too competitive and not allowing other species to germinate.

We selected one trial site at Upotipotpon in north east Victoria with excellent native grass cover. The site had low soil phosphorous and nitrogen, but was heavily infested with Onion Grass (*Romulea rosea)*, during the winter and spring. While most local conservationists suggested this species had minimal effect on the presence of lilies, we decided to control the Onion Grass – if only to reduce the competition at the root zone. We sprayed with Brush Off six weeks after the Onion Grass had re-emerged in 2014, and hoped it would make a difference.

After a season last summer of collecting daisies, lilies, peas and herbs, we worked on some follow up control of Onion Grass in winter 2015. We were thrilled with the results we observed. The Onion Grass was visibly reduced, and good gaps were present between the grass tussocks. Rod White and Dave Franklin visited in August this year and over-sowed the 2 hectare area with 10 kg of native seed – about 60 species in total. The sheep's foot-like attachment on the seeder makes neat little divots for the seed to sit in, but was gentle enough to do minimal damage to the bryophytes (mosses and lichens) present between the grass tussocks.

Unfortunately, we are still waiting for signs of germination and emergence. But given the severity of spring with next to no rain, and the early onset of hot temperatures this is perhaps not surprising. Still we're hopeful for the longer term. We'll be watching avidly come autumn 2016 and keep you posted with results.

Rytidosperma paddock – treated for *Romlea* infestation (the area below vehicle is untreated).

Bryophytes intact in grassland after sowing. Heavy browsing of Rytidosperma setacea by kangaroos has necessitated a kangaroo proof enclosure.

Dave and Rod over-sowing the native grassland with 60 different species of herbs, lilies, daisies and peas.

New germination

Installation of Wildflower Boxes at the Arboretum

Thirty boxes were installed and planted at Euroa Arboretum in Oct 2014.

They are each 1.2 x 1m in size, drip irrigated and dedicated to growing wildflowers – mostly daisy varieties with fluffy seeds. We have been thrilled and surprised with the production of seed! Being located under our noses in the nursery precinct, volunteers and staff can monitor the seed constantly and collect several times a week. Being irrigated, the flowering season is extended, and while many roadside populations have failed to flower or set seed this year, ours are still booming. A great investment!

Craspedia variabilis. During the dry 2015 spring, we have found almost zero wild *Craspedia* – with the irrigated boxes, this has still been booming.

Below: *Vittadenia cuneata* – This is our best producer! This little plant required vacuuming of seed up to 3 times per day during summer 2014/15. It kept on flowering and seeding for about 6 weeks. With the boxes under our noses, this was relatively easy, but if it had been a wild population, the chances of harvest would have been greatly diminished.

Hot Times Seeding in Sydney's West

Dr Paul Gibson-Roy

Lead Scientist, Greening Australia (NSW)

This year we had a target of seeding 15 ha of grassy woodland at sites across the Cumberland Plain. This was scheduled to take place during August or September, but due to all the dastardly things that conspire to thwart or hinder restoration projects, it did not. Last Thursday on the 10th of December we seeded the last square metre of our final location for the year. In all, over four working weeks we had seeded almost 17 ha on eight different areas at four disparate locations. We had also successfully used our newly built revamped seeder/hopper (Image 1). I am very indebted to Mark Cefai the engineer and John Gray for helping me to bring this concept to reality.

Image 1. Rebuilt seed hopper with belt that raises seed up and out of the hopper. This ensures there is no bridging or blocking of seed/chaff, while still allowing regulation of seed flow.

Image 2. Seeding in horrible temperatures and with windy conditions were par for the course this year, both testing the resolve of the humans.

Much of the time we were seeding temperatures soared close to 40C and it seemed only people's passion and steely determination to get the job done got us over the line. This week we are very relieved, and markedly fitter and lighter than when we started.

This year we used several different approaches across the sites. At all sites we had to remove grass, and at one site, woody biomass. At Bungarribee in the Western Sydney Parkland we worked Justin Pinson and his team at the Rural Fire Service (Cumberland Zone) to burn an area between 10 and 15 ha in size. This was quite an achievement considering the site abuts the M7 motorway on one side and the Great Western Highway on the other. On the day we had crews from five different brigades present and the burn went like clockwork.

Image 3. RFS crews undertake a significant ecological burn within the heart of western Sydney.

At another site near Narellan called Parrot Farm, we had to remove thick stands of African Olive which routinely clog the middle storey of vegetation in Sydney's south west. Here we worked with Brad Parish who used a trittering machine to 'munch' the trees to ground level.

Image 4. Parrot Farm following trittering and scalping by Brad. Note the dense African Olive in the background. All the site was covered in this woody weed.

At most sites we also had to use large earth movers to take away topsoil. Unlike last year at Richmond we did not 'invert' spoil into islands, but laid it flat and thin beside scalps to be also seeded (with grass).

Image 5. Wayne in his large scalper starts laying topsoil in spoil zone at Bungarribee.

Image 6. Tony comes in with a road grader after Wayne has finished scalping to 'clean up' the surface in readiness for seeding.

In the seeding zones we mixed things up again. In some sites we seeded bands of wildflowers between wider bands of grasses. At others we mixed the wildflowers and grasses together at different rates. At another site we over-sowed grasses into sprayed out weedy grass areas, and at yet another, we seeded wildflowers directly under an open tree canopy following a burn.

Image7. John runs wildflower seed directly under tree canopy in an area that had been recently burnt. Note this GGRP seeder no longer has a person riding behind.

It will be fascinating to see how these various configurations progress over time. If successful, many will expand our repertoire of seeding approaches and may further inform the possibilities for other locations and regions, such as the Western Grassland Reserve in Victoria or the Badgerys Creek airport.

Under our federally funded grassy woodland restoration program, we are charged with restoring 40 ha of Cumberland Plain grassy woodland by 2017. At present we have seeded 27 ha, which is no small achievement. To do this has required a huge ramping up in skills at a local level and the building of significant technical, machinery and SPA capacity. As you may have gleaned from Kieran's

Image 9. Sam addresses the AABR members visiting the SPA and restoration site.

SPA report, movement towards establishing 5ha footprint of seed production has been the only way this scale of restoration could have been possible. Indeed, as a result of the hard work and effort our team put into the SPA over the past three years we had 45 kg of seed from sub-dominant species available for seeding and approximately 40kg of native grasses per hectare.

Image 8. Each of these bin contains approximately 4.5kg of herb seed from representing nearly 100 species. This collection was intended for use at our large Bungarribee site in the Western Sydney Parklands.

As I write the temperature is still in the high 30s. Crews have been working in the SPA to collect seed, and others (thank you Sammy and Dave) have been out with mechanical harvesters collecting grasses. I am so grateful to everyone who's worked with us this year – and there have been many. It's been a such huge effort to seed our targeted area for this year, while continuing to build the SPA, and construct a large shed (we are pouring the slab for a 30 x 20m shed this week), while in between all this hosting groups such as the Australian Association of Bush Regenerators and His Excellency David Hurley the Governor of NSW. One cannot say people involved in this sector lack passion for a challenge, and this is exemplified by the GA team and those others we work closely with in Sydney who have made amazing things happen this year against the odds.

Image 10. NSW Governor and Mrs Hurley leave under police escort (police escorts are something of an unusual event for our SPA).

Raising awareness of the Drunken Poa

Candice Parker

Project Officer, Greening Australia (VIC)

Drunken Poa, otherwise known as Salt-lake Tussock Grass (Poa sallacustris) is a perennial, rhizomatous grass that grows to around 30cm in height. It gets its 'Drunken' reference through the way its leaves are often bent over. It is endemic to Victoria, occupying a very narrow physical and chemical niche around saline lakes in the Western District between Colac and Hamilton.

As part of State funding received through the Threatened Species Protection Initiative, Greening Australia will be undertaking field surveys to acquire population data. This information will enhance and increase population knowledge on this species.
The funding will also benefit existing populations with resources available to support the reduction of biomass and to reduce competition from threatening weeds such as Tall Wheat Grass and Phalaris.

Engagement with local communities will help with project delivery and support the undertaking of recovery actions. By working with community we also hope to create better opportunities for information and knowledge sharing.

Salt-lake tussock grass (*Poa sallacustris)* rhizomatous nature allows it to form in patches. Highlighted during summer by the browning off of stems.

A Tale of Three Scrapes - not too heavy, not too light, it's just right (or is it?)

How deep should you scrape?

Nicki Taws

Project Manager, Greening Australia Capital Region

Here in the Capital Region we have been pondering that question as we view the progress of three of our grassland restoration projects. The Grassy Groundcover Gazette December 2014, reported on our first trials in the region including two at the Bush Heritage Australia reserve "Scottsdale" near Bredbo NSW.

Soil testing indicated that at 150mm depth phosphorus levels would be very low (<10 mg/kg). Scraping at the first site (the Yellow Box patch) successfully achieved this level and 18 months later the patch is a sea of Hoary Sunray (*Lecochrysum albicans* var. *tricolor*) and Wallaby Grasses (*Rytidosperma* spp.). Prominent weeds have been Tall Fleabane (*Conyza albida*) and Skeleton Weed (*Chondrilla juncea*).

Yellow Box patch, ready for sowing, April 2014

Yellow Box patch, October 2015

Apple Box patch, site preparation, April 2014

The second site (the Apple Box patch) was partway through preparation when a heavy fall of rain transformed the lovely red soil into thick sticky clay. Each pass of the bulldozer brought up great clods of earth taking the final scrape depth beyond what we had anticipated. Eighteen months on, this site, now affectionately known as "The Quagmire is quite different visually from the Yellow Box patch. Slowly, slowly, in lower numbers and size, a similar suite of native species have emerged, but very few weeds. Quite exciting has been the emergence of species that we didn't sow, but which must have (we presume) arisen from deeply buried rootstocks – *Stackhousia monogyna, Pimelea curviflora* var. *sericea, Gonocarpus tetragynus, Goodenia pinnatifida*. The surrounding grassland is wall-to-wall African Lovegrass (*Eragrostis curvula*) and other weeds, so these emergent' s haven't come from seed blown in.

Apple Box patch, October 2015

A third grassland restoration site was prepared in April 2015, as part of the larger Barrer Grassy Woodland Restoration Project in the ACT. We hired the same operator and requested 150mm of topsoil be removed in two passes, effectively inverting the soil profile on the spoil dump. Perhaps our operator was a little cautious after the Quagmire experience, but we suspect that the depth of soil removed was less than optimal. Native species have germinated as expected but so has an abundance of exotic annual grasses and a number of broad-leaf weeds.

Barrer: Site preparation and inverting the soil profile April 2015.

Barrer: Germination of native forbs and exotic annual grasses, November 2015.

Monitoring of these sites has revealed the tale of three scrapes (see Table 1). The Apple Box patch (the “too deep?” scrape) was monitored 12 months after the other sites but still showed lower germination rates than the other two sites. The very positive story was that 90% of plants on the site were native compared to about 60% on the Yellow Box “just right” scrape, and the Barrer “too shallow” scrape. But is this site so nutrient-reduced that it won’t be able to support anything more than a sparse groundcover, limiting its biodiversity value and leaving it open to erosion?

Table 1.

Plant numbers in three grassland restoration sites.

Site	Apple Box	Yellow Box	Barrer
Depth of scrape (mm)	300+	150	100
Plants/m2	44	136	131
Natives/m2	40	80	38
Exotic/m2	4	56	76
% individuals native	90	59	33
% individuals exotic	10	41	67
No of native spp in quadrats	14	17	14
No of exotic spp in quadrats	9	18	18

Despite the slow growth on the Apple Box site we feel that this demonstrates, it is better to err on the deeper side than the shallower side (eg. Barrer site) when reducing the nutrient levels. After a summer of germination of C4 grasses we expect that the Apple Box site will increase in native plant numbers and cover. The Barrer site will also increase in plant numbers but we expect a significant proportion of these will be exotic, and could require ongoing management.

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